

Final Determination



هيئة تنظيم الاتصالات
Telecommunications Regulatory Authority
مملكة البحرين - Kingdom of Bahrain

Determination of Significant Market Power and Determination of Dominant Position in the Markets for Domestic Data Connectivity Services

Final Determination

10 April 2014

Ref: MCD/04/14/026

Public Version

(Confidential information has been replaced by [X])

Purpose: To define the relevant retail and wholesale markets for domestic data connectivity services providing guaranteed bandwidth and to determine whether any Licensed Operator holds SMP or dominance in those markets.

Final Determination

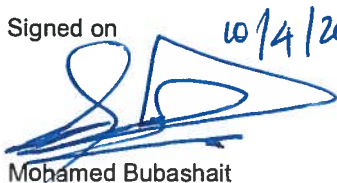
SMP Determination

DETERMINATION

HAVING REGARD TO THE LEGISLATIVE DECREE NO. 48 OF 2002 PROMULGATING THE TELECOMMUNICATIONS LAW, THE COMPETITION GUIDELINES ISSUED BY THE TELECOMMUNICATIONS REGULATORY AUTHORITY OF THE KINGDOM OF BAHRAIN ON 18 FEBRUARY 2010, ALL ADMISSIBLE EVIDENCE AND THE SUBMISSIONS MADE BY INTERESTED PARTIES, THE TELECOMMUNICATIONS REGULATORY AUTHORITY OF THE KINGDOM OF BAHRAIN HEREBY MAKES THE FOLLOWING DETERMINATION:

1. For the reasons set out in the Annex to this Determination the Telecommunications Regulatory Authority of the Kingdom of Bahrain (the 'Authority') has identified and defined the following relevant markets:
 - a. the retail market for the supply of domestic data connectivity services in Bahrain, with the exception of Amwaj Islands; and
2. The Authority has identified and determines that:
 - a. Batelco has a position of Significant Market Power in the retail market for the supply of domestic data connectivity services in Bahrain, with the exception of Amwaj Islands.
3. This Determination will be reviewed when market conditions, as determined by the Authority, warrant it.
4. This Determination is without prejudice to the Authority's powers under the Telecommunications Law, promulgated by the Legislative Decree No.48 of 2002, the Competition Guidelines, issued by the Authority on 18 February 2010, the Access Regulation, approved by Regulation No. 1 of 2005, and the outcome of any on-going or future investigation, consultation or other regulatory process or measure carried out pursuant to such powers, all or any of which may result in the application of different terms and/or findings than those of this Determination, including the determination and definition of new markets and the designation of Significant Market Power and dominance.
5. This Determination shall come into effect from the date of its issuance.
6. This Determination supersedes the Determination of Significant Market Power in certain relevant retail markets issued by the Authority on 3 June 2008 only to the extent that that determination relates to the supply of domestic leased line services.

Signed on

10/4/2014


Mohamed Bubashait

General Director

Telecommunication Regulatory Authority

Manama, Kingdom of Bahrain

Final Determination

Dominance Determination

DETERMINATION

HAVING REGARD TO THE LEGISLATIVE DECREE NO. 48 OF 2002 PROMULGATING THE TELECOMMUNICATIONS LAW, THE COMPETITION GUIDELINES ISSUED BY THE TELECOMMUNICATIONS REGULATORY AUTHORITY OF THE KINGDOM OF BAHRAIN ON 18 FEBRUARY 2010, ALL ADMISSIBLE EVIDENCE AND THE SUBMISSIONS MADE BY INTERESTED PARTIES, THE TELECOMMUNICATIONS REGULATORY AUTHORITY OF THE KINGDOM OF BAHRAIN HEREBY MAKES THE FOLLOWING DETERMINATION:

1. For the reasons set out in the Annex to this Determination the Telecommunications Regulatory Authority of the Kingdom of Bahrain (the 'Authority') has identified and defined the following relevant market:
 - a. the wholesale market for the supply of domestic data connectivity services in Bahrain, with the exception of Amwaj Islands.
2. The Authority has identified and determines that:
 - a. Batelco has a Dominant Position in the wholesale market for the supply of domestic data connectivity services in Bahrain, with the exception of Amwaj Islands.
3. This Determination will be reviewed when market conditions, as determined by the Authority, warrant it.
4. This Determination is without prejudice to the Authority's powers under the Telecommunications Law, promulgated by the Legislative Decree No.48 of 2002, the Competition Guidelines, issued by the Authority on 18 February 2010, the Access Regulation, approved by Regulation No. 1 of 2005, and the outcome of any on-going or future investigation, consultation or other regulatory process or measure carried out pursuant to such powers, all or any of which may result in the application of different terms and/or findings than those of this Determination, including the determination and definition of new markets and the designation of Significant Market Power and dominance.
5. This Determination shall come into effect from the date of its issuance.
6. This Determination supersedes the Determination of Dominance in Wholesale Markets by Batelco, issued by the Authority on 22 January 2006 only to the extent that that determination relates to the wholesale supply of leased line services.

Signed on

10/9/2014



Mohamed Bubashait

General Director

Telecommunication Regulatory Authority

Manama, Kingdom of Bahrain

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List of acronyms

AREGNET	Arab Regulators Network
BD	Bahraini Dinar
BSC	Base Station Controller
BTS	Base Transceiver Station
CAT	Customer Access Tail
DSL	Digital Subscriber Line
EWA	Electricity and Water Authority of Bahrain
Gbps	Gigabits per second
GCCIA	Gulf Cooperation Council Interconnection Authority
GHz	GigaHertz
IPLC	International Private Leased Circuit
kbps	Kilobits per second
LLCO	Local Leased Circuit for OLO
LTE	Long-Term Evolution
Mbps	Megabits per second
MP2MP	Multipoint-to-Multipoint
MPLS	Multiprotocol Label Switching
NCT	Notified Controlled Tariff
NGN	Next Generation Network
OLO	Other Licensed Operator
P2MP	Point-to-Multipoint
POP	Point Of Presence
PPP	Purchasing Power Parity
RNC	Radio Network Controller
RTN	Retail Tariff Notification
SDH	Synchronous Digital Hierarchy
SLA	Service Level Agreement
SMP	Significant Market Power
SSNIP	Small but Significant Non-Transitory Increase in Price
STM	Synchronous Transport Module
TDM	Time-Division Multiplexing
TRC	Telecommunications Regulatory Commission of Jordan
USD	United States Dollar
VPN	Virtual Private Network
WiMax	Worldwide Interoperability for Microwave Access
WLA	Wholesale Local Access

Short Title
Annex – Reasoning for the Final Determination

1 Introduction and purpose of this Annex

1. This Annex sets out the underlying reasoning for the adopted market definitions and conclusions regarding SMP and dominance in the supply of domestic data connectivity services providing guaranteed bandwidth at the retail and wholesale levels in Bahrain (referred to hereafter as “domestic data connectivity services”). The purpose of this Annex is to identify the relevant markets in which domestic data connectivity services are supplied at the retail and wholesale level, and to assess whether any Licensed Operator has SMP or holds a Dominant Position in those markets.
2. An SMP designation in respect of retail services and a dominance designation in respect of wholesale services provide the legal basis whereby regulatory obligations deemed necessary and/or mandated by the provisions of the Telecommunications Law promulgated by the Legislative Decree No. 48 of 2002 (the “Telecommunications Law”) can be defined and implemented.

2 Background to this Final Determination

3. On 19 December 2013, the Authority issued a draft SMP and Dominance Determination for domestic data connectivity services (the “Draft Determination”)¹, in which the Authority proposed to find that Batelco has SMP and dominance in the relevant retail and wholesale markets respectively.
4. On 30 January 2014, the Authority received submissions from Menatelecom², 2Connect³, Zain⁴, Batelco⁵, and Viva⁶.
5. In coming to a final determination on each of the relevant markets, the Authority has carefully considered the arguments raised in the submissions received on the Draft Determination. In each of the market definition and competition assessment sections of this Annex, the text from the Draft Determination is first set out, followed by a summary of the submissions received, and the Authority’s final analysis and conclusions.
6. In this background section, the Authority provides an overview of the following:

¹ The Authority, “Determination of Significant Market Power and determination of Dominant Position in the Markets for Domestic Data Connectivity Services Draft Determination”, 19 December 2013 (Ref MCD/12/13/118).

² Menatelecom submission, “Response to TRA consultation on the Determination of Significant Market Power and Determination of Dominant Position in the Markets for Domestic Data Connectivity Services”, 30 January 2014 (Ref Exec/44/14).

³ 2Connect submission, “Determination of Significant Market Power and Determination of Dominant Position in the Markets for Domestic Data Connectivity Services; Response from 2Connect WLL”, 30 January 2014 (Ref 2C/TRA/0434).

⁴ Zain submission, “Zain Bahrain’s response to the public consultation regarding Determination of Significant Market Power and Determination of Dominant Position in the Markets for Domestic Data Connectivity Services”, 30 January 2014 (Ref RI/1401/007).

⁵ Batelco submission, “Response to the Telecommunications Regulatory Authority of Bahrain (TRA) Draft Determination of Significant Market Power and Determination of Dominant Position in the Markets for Domestic Data Connectivity Services”, 30 January 2014 (Ref GCL/58/14).

⁶ Viva submission, “Submission to the Telecommunications Regulatory Authority by Viva Bahrain in response to the public consultation: Determination of Significant Market Power and Determination of Dominant Position in the Markets for Domestic Data Connectivity Services”, 30 January 2013 (*sic*).

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- a. a description of domestic data connectivity services and relevant inputs;
- b. previous determinations by the Authority on domestic data connectivity services; and
- c. a summary of the regulation of domestic data connectivity services in Bahrain.

2.1 Description of domestic data connectivity services and relevant inputs

7. The Authority has previously described domestic data connectivity services using the term leased lines, defining these services as being fixed permanent connections providing predominantly business customers with capacity between two points. For example, in 2008 the Authority defined the main distinguishing features of leased lines to include:⁷
 - a. symmetrical and dedicated capacity available for the exclusive use of the end user;
 - b. guaranteed bandwidth available permanently;
 - c. the ability to send and receive voice and data between sites; and
 - d. secure communications channels and high levels of customer service.⁸
8. The Authority considers that the above features remain broadly relevant for the current review of domestic data connectivity services. However, the Authority notes that although the previous definition of leased lines referred to guaranteed capacity between two points, the emergence of point-to-multipoint (P2MP) and multipoint-to-multipoint (MP2MP) services (such as Batelco's Local MPLS service) provide guaranteed capacity between multiple sites. In addition, while retail leased line services were characterised in 2008 as providing dedicated capacity available for the exclusive use of the end user, the Authority notes that the provision of guaranteed bandwidth services to end users typically involves transmission capacity that is shared between end users. While capacity supplied to a customer will be guaranteed, if that customer does not utilise that capacity it may be made available to other customers. The Authority has therefore used the term 'domestic data connectivity' in this review to refer to services that provide guaranteed bandwidth between locations within Bahrain.
9. The connectivity provided by domestic retail data connectivity services to business customers supports a range of downstream services such as access to the internet and the delivery of voice and data communications, for example using virtual private network ("VPN") services. The current market review is not concerned directly with these downstream services which use data connectivity services as an input, but instead focuses on competition in the supply of the underlying domestic connectivity. Similarly, the Authority is not concerned with international retail leased lines in the current market review, although international leased lines use domestic connectivity as an input.
10. According to the Authority's Telecommunications market indicators report issued in September 2013, there were 12 licensed operators who were actively supplying leased

⁷ see the Authority, "Significant market power designation in certain relevant retail markets: Determination", 3 June 2008 (the "2008 SMP Determination"), paragraph 98.

⁸ another important characteristic of domestic data connectivity services is transmission transparency, according to which the data bits are transmitted unchanged.

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line services in Bahrain in 2012.⁹ Revenues earned from supplying these domestic data connectivity services at the retail level amounted to BD16.8 million in 2011, and BD17.1 million in 2012. In the three years to 2012, domestic retail data connectivity revenues in Bahrain have increased by an average of 13.5% per annum.

11. A number of the operators supplying retail data connectivity services in Bahrain use their own network infrastructure (including fibre and microwave links), wholesale services (typically purchased from Batelco), or a combination.
12. As discussed later in this determination, the main supplier of domestic data connectivity at the retail level is Batelco. Other retail suppliers include (in no particular order) Viva, 2Connect, BT, Lightspeed, and Menatelecom. For example, Viva offers a number of domestic connectivity services to business in Bahrain, such as national leased circuits (providing dedicated symmetric point-to-point connections) and national MPLS VPN. Menatelecom also offers a fibre- or microwave-based dedicated VPN service.
13. At the wholesale level, Batelco offers a number of regulated access services through its Reference Offer. Batelco's Customer Access Tail (CAT) service, Local Leased Circuit for OLOs (LLCO), and Wholesale Local Access (WLA) service, which are discussed further in Section 2.3.2, provide wholesale connectivity which enables OLOs to supply domestic guaranteed bandwidth services to businesses in Bahrain. The LLCO and WLA services can also be used to meet the OLOs own demand for domestic transmission capacity (rather than to supply a service directly to an end user), for example where the OLO is a mobile operator requiring transmission capacity between mobile base stations, or where the OLO requires backhaul for the purposes of providing broadband services. Wholesale domestic data connectivity is also used for the domestic transmission component of international leased line services.
14. In principle, there are a number of potential alternatives to Batelco's CAT, LLCO, and WLA services which could be used by OLOs for the purposes of acquiring domestic data connectivity (although not all of these alternatives are available in practice within Bahrain). These options include:
 - a. domestic wholesale data connectivity offered by other operators;
 - b. microwave links;
 - c. dark fibre – the OLO could rent dark fibre (if available) and install its own equipment to light the fibre;
 - d. duct access – the OLO could rent existing ducts through which to pull its own fibre;
 - e. installation of new ducts – the OLO could build its own backhaul infrastructure by digging new trenches and installing its own ducts and fibre.
15. The extent to which each of the above options are available in practice and being used in Bahrain is discussed in more detail in the competition assessment section of this determination.

⁹ see the Authority, "Telecommunications markets indicators in the kingdom of Bahrain", September 2013, page 8.

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2.2 Previous determinations on domestic data connectivity services in Bahrain

16. The Authority has previously considered the markets in which domestic data connectivity services are supplied in Bahrain:
- on 3 June 2008, the Authority determined that Batelco held Significant Market Power in the retail market for domestic leased lines¹⁰;
 - on 22 January 2006, the Authority found that Batelco was dominant in the wholesale market for high-bandwidth access to customer premises, and in the wholesale market for access to transmission capacity¹¹. In respect of both of the defined wholesale markets, the Authority considered that the relevant inputs were wholesale leased lines and dark fibre.
17. Each of the 2006 and 2008 Determinations relating to leased lines are summarised below.

2.2.1 2008 SMP Determination – Retail leased lines

18. In the 2008 SMP Determination, the Authority defined a retail market for domestic leased lines. In the draft SMP Determination, the Authority considered whether a range of alternative wireless-based technologies could provide a sufficiently similar service (in terms of price, performance, and quality) to be included in the same market, but concluded that such alternatives face limitations which result in greater latency and lower reliability than traditional leased line services¹².
19. In the final 2008 SMP Determination, the Authority expanded its market definition to include alternative technologies, including leased lines provided over MPLS, optical¹³ and satellite links. The Authority noted that there may be some demand-side substitution between alternative technologies and traditional leased lines, noting the example that Batelco supplies retail IPLCs via cable or satellite links, depending on the destination. The Authority also noted that the results of its competition assessment at the time did not depend on whether such alternatives were included or excluded in the defined market.
20. The Authority estimated Batelco's market share to be well in excess of 90% of the number of domestic leased lines supplied, noting that competitors using alternative technologies (such as optical and satellite-based leased lines) had a trivial market share. In the Authority's view, it was unlikely that any WiMax-based provision of leased lines would be sufficient to constrain Batelco's market power within the relevant timeframe.
21. The Authority also referred to the high barriers to entry and expansion for facilities-based entry into the leased lines market, due to the sunk costs involved and the difficulties for OLOs to gain access to ducts and road corridors to deploy their own infrastructure. Access-based entry using regulated wholesale products such as the CAT service was considered by the Authority to have not at that stage been effective in curbing Batelco's market power at the wholesale and retail levels.

¹⁰ the Authority, 2008 SMP Determination.

¹¹ the Authority, "Dominance in Wholesale Markets by Batelco", 22 January 2006 (the "2006 Dominance Determination").

¹² the Authority, "Draft Determination of Significant Market Power designation in certain relevant retail markets", 28 February 2008, paragraph 70.

¹³ In the 2008 SMP Determination, the term 'optical' referred to Free Space Optics, a form of wireless link providing a point-to-point line-of-sight circuit (see for example, 2008 SMP Determination, paragraph 93).

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22. The Authority concluded that Batelco had SMP in the retail market for domestic leased lines.

2.2.2 2006 Dominance Determination – Wholesale leased lines

23. In the 2006 Dominance Determination, the Authority defined two relevant wholesale markets. The first was a wholesale market for high-bandwidth access to customer premises. In proposing this market in the draft Determination, the Authority noted that the terminating segments of leased lines and dark fibre loops provide retail service providers with the ability to offer permanent connections over which to supply retail services requiring “always on”, high capacity and uncontended bandwidth¹⁴. The Authority considered that an acquirer of a terminating segment of a leased line would switch to dark fibre (and vice versa) in response to a 10% price increase, and that the two services should therefore be included in the same wholesale market.
24. The Authority also defined a wholesale market for access to transmission capacity and related facilities. This reflected the view that in order to be able to supply a retail service, a service provider would require not only wholesale access to end user customers premises but would also require access to capacity between local switches¹⁵. This could be achieved by gaining access either to trunk segments of leased lines or to dark fibre.
25. In assessing the level of competition in each of the defined wholesale markets, the Authority noted that Batelco was the only licensee at the time that owned and operated leased lines and dark fibre in Bahrain. Given that new infrastructure-based entry was unlikely to represent a competitive constraint on Batelco in the near future, the Authority concluded that Batelco held a dominant position in each of the defined wholesale markets.

2.3 Summary of existing regulation of domestic data connectivity services in Bahrain

2.3.1 Retail regulation

26. Following the 2008 SMP Determination and the issuance of the Retail Tariff Notification (RTN) Regulation in 2010, the services that Batelco supplies in the retail leased line market are subject to the RTN Regulation. The RTN Regulation requires that any Licensed Operator who has been determined by the Authority to have SMP in a relevant retail market demonstrates to the Authority's satisfaction that any retail tariff that it wishes to introduce or modify complies with the relevant tariff controls. The tariff controls set out in the RTN Regulation are designed to ensure that the proposed tariffs do not give rise to undue discrimination, excessive pricing, margin squeezes, predatory pricing, or abusive bundling.¹⁶
27. Given the 2008 SMP Determination, Batelco's retail domestic data connectivity services (see paragraph 51 below) are subject to the RTN Regulation, and therefore any changes to the tariffs of these services must be notified to the Authority to ensure that they comply with the relevant tariff controls.

¹⁴ the Authority, “Dominance in Wholesale Markets Consultation”, 27 October 2005, page 20.

¹⁵ *ibid*, page 22.

¹⁶ the Authority, “Retail Tariff Notification Guidelines”, 18 February 2010 (Ref: MCD/02/10/018), paragraph 22.

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2.3.2 Wholesale regulation

28. As a result of the 2006 Dominance Determination, Batelco is obliged to offer wholesale high-bandwidth access to customer premises and wholesale access to transmission capacity in accordance with Article 57 of the Telecommunications Law.
29. According to Article 57(e), an operator holding a dominant position must offer access on fair and reasonable terms. Under the Access Regulation issued in 2005, such a dominant operator must make available a Reference Access Offer which is reviewed by the Authority to ensure that the tariffs and terms and conditions comply with the Telecommunications Law. In the event that the Authority finds that the proposed tariffs, terms and conditions are unreasonable, the Authority may determine such tariffs, terms and conditions in accordance with the criteria set out in Article 57(b), specifically that they be fair, reasonable, and non-discriminatory, with tariffs based on forward-looking incremental costs or benchmarking.
30. Since July 2006¹⁷, Batelco has offered wholesale domestic data connectivity to the industry through two wholesale services:
 - a. wholesale high-bandwidth access to customer premises is offered by way of Batelco's CAT service, which is described by Batelco as "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"¹⁸;
 - b. wholesale access to transmission capacity is available through Batelco's LLCO service. Batelco defines the LLCO service 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".¹⁹
31. The CAT and LLCO services offer a range of speeds up to 2Mbps, as well as three higher speed services: DS3 (44Mbps), STM1 (155 Mbps), and STM4 (622 Mbps). While Batelco is migrating the lower speed CAT and LLCO services to its NGN, the three high-speed services remain SDH-based.
32. In addition, since 27 November 2012²⁰, Batelco has offered a WLA service, which is "a wholesale dedicated private leased circuit service within the Kingdom of Bahrain between a Point of Presence of an Access Seeker and an End User Premises/Point of Presence providing guaranteed symmetrical bandwidth".²¹ The launch of the WLA service followed the Authority's review and approval of the terms and tariffs for the new service²². The WLA service is Ethernet-based, which is cheaper compared to the SDH-based wholesale leased lines. The WLA also provides OLOs with greater granularity of choice in terms of speeds above 2Mbps.²³

¹⁷ the Authority, "Draft Order on the Wholesale Local Access Service", 12 July 2012 (Ref: MCD/07/12/097), paragraph 38.

¹⁸ Batelco Reference Offer, Schedule 1 2-6.

¹⁹ *ibid*, Schedule 1 2-5.

²⁰ Effective Date for WLA Service, Schedule 3, Batelco's Reference Offer (accessed September 2013).

²¹ *ibid*, Schedule 1 2-16.

²² letter from the Authority to Batelco, 31 October 2012 (Ref: MCD/10/12/135).

²³ Compared to the 3 high-speed (>2Mbps) CAT/LLCO services, the WLA service offers speeds of 4, 8, 10, 15, 20, 25, 50, 75, 100, 150, 200, 300, 400, 500 Mbps and 1Gbps.

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33. A CAT or WLA service cannot be used to connect two customer premises. In order to offer a point-to-point connectivity service (i.e. between two customer premises), an OLO would require 2 CAT circuits or 2 WLA circuits.
34. The CAT, LLCO, and WLA services are currently regulated. According to information provided to the Authority, Batelco supplied a total of 402 wholesale leased line circuits to OLOs in Bahrain as of December 2010, 420 circuits by the end of 2011, 478 circuits by the end of 2012, and 428 circuits by the end of 2013.

3 Analytical framework

35. To determine whether a licensed operator or operators hold SMP or a Dominant Position in a relevant market, the Authority adopts a three-step process:
 - a. definition of the relevant market(s);
 - b. analysis of competition in the relevant market(s); and
 - c. identification of any operator(s) who holds SMP or a Dominant Position, if any.
36. At each step, the Authority relies on well-established economic principles and tests to define markets, such as the hypothetical monopoly test,²⁴ to assess demand- and supply-side substitution. The Authority's market definitions focus on the markets in which domestic data connectivity services are supplied.
37. The identification of relevant markets is not an end in itself, but is a critical step in assessing the extent to which any firm or firms in those markets have market power. Defining markets and assessing competition within those markets involves a degree of judgment, with the overarching purpose being to ensure that all relevant competitive constraints operating in a market (from both existing and potential competitors) are identified.
38. Throughout the three-step process, the Authority applies an analytical framework that is consistent with the Telecommunications Law and the Authority's Competition Guidelines²⁵. The tools and principles employed by the Authority are similar to those employed by other regulators and competition authorities, including the European Commission and national telecommunications regulatory authorities of the European Union.
39. Having identified the relevant markets, the Authority then looks at relevant factors to determine the level of competition in those defined markets, such as barriers to entry and expansion, and market shares. The purpose of this competition assessment is to identify any constraints, such as those from existing competition, potential competition, and any countervailing buyer power, that may limit the ability of an incumbent supplier of retail and

²⁴ As set out in the Authority's Competition Guidelines, the "hypothetical monopoly test" identifies a group of products which are sufficiently close substitutes to be regarded as being in the same market. The approach is to assume that the products are supplied by a hypothetical monopolist. If the monopolist is able to profitably maintain a "small but significant non-transitory increase in price" ("SSNIP") for those products, then the appropriate market boundary has been defined (i.e. to include only those products), as no other products are regarded as being close demand-side or supply-side substitutes.

²⁵ the Authority, "Competition Guidelines: Guidelines issued by the Telecommunications Regulatory Authority", 18 February 2010 (Ref: MCD/02/10/019).

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wholesale domestic data connectivity services to act independently of its competitors or customers and exercise market power.

40. The Telecommunications Law refers to two concepts of market power, namely a Dominant Position and Significant Market Power. Findings of a Dominant Position and SMP impart different ex ante regulatory obligations on the affected operators:
 - a. Article 57 of the Telecommunications Law states that an operator with a Dominant Position in a market shall make available access and interconnection services by way of a Reference Offer, with tariffs, terms and conditions that are fair, reasonable, and non-discriminatory;
 - b. Article 58 of the Telecommunications Law states that operators with SMP shall be subject to tariff controls as specified by the Authority by way of regulation or Licence conditions.
41. The regulatory obligations set out in Article 57 apply at the wholesale level. In February 2010, the Authority issued the Retail Tariff Notification Regulation pursuant to Article 58, setting out a number of tariff controls that must be satisfied by an SMP operator's retail tariffs.
42. Article 1 of the Telecommunications Law defines both SMP and a Dominant Position. An operator with SMP is defined as holding a share of 25% or more of the relevant market as determined by the Authority²⁶. However, in determining whether an operator has SMP, the Authority must also take into account a number of other factors, including the ability of the Licensed Operator to influence market conditions, its turnover relative to the size of the market, its control over access to end users, its financial resources, and its experience of providing products and services in the market. The Authority may determine that a Licensed Operator has SMP even if its market share is less than 25%, or that it does not hold SMP even though its market share exceeds 25%.
43. According to the Telecommunications Law, a Dominant Position is defined as "the Licensee's position of economic power that enables it to prevent the existence and continuation of effective competition in the relevant market through the ability of the Licensee to act independently – to a material extent – of competitors, Subscribers and Users."²⁷
44. In practice, the Authority considers that the concepts of SMP and dominance are similar and seek to capture similar types of behaviour²⁸, namely the ability of a firm to act independently of its competitors, its customers and ultimately of consumers, for example by sustaining prices above the competitive level. This interpretation is consistent with international best practice²⁹. However, the legal definition of SMP in the Telecommunications Law places special emphasis on market shares while recognising the need to carefully consider the ability of an operator to influence market conditions, i.e. to act independently.

²⁶ Telecommunications Law of the Kingdom of Bahrain, page 8.

²⁷ *ibid*, page 7.

²⁸ see the Authority, "Competition Guidelines", 18 February 2010 (Ref: MCD/02/10/019), paragraph 92.

²⁹ For example, the regulatory framework governing the EU telecommunications sector considers the concept of SMP to be equivalent to that of dominance.

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45. The Authority notes that in undertaking an *ex ante* assessment of market power, the aim is to understand how competitive the market is currently and whether this is likely to evolve within a reasonable timeframe. As noted in the Competition Guidelines, the Authority typically takes the following factors into account when undertaking such a forward-looking competition assessment³⁰:
- a. the market share of individual entities;
 - b. competitive constraints arising from existing competitors, potential competitors, barriers to entry and expansion, and the degree of countervailing buyer power; and
 - c. evidence on behaviour and pricing.
46. In its competition analysis, the Authority assumes that existing regulations remain in place, with the exception of the regulation of retail and wholesale domestic data connectivity services³¹. This approach is consistent with the so-called Modified Greenfield approach. In its analysis the Authority specifically identifies which existing regulations impact its findings (and how).
47. In reaching its conclusion the Authority has considered relevant facts and information, including information that the Authority has gathered through its periodic market data questionnaires³² as well as a specific questionnaire that was issued for the purpose of this market review (referred to below as the Authority's "Request for Information")³³.
48. In the following sections, the Authority defines the relevant retail and wholesale markets relating to domestic data connectivity (Sections 4 and 5 respectively). The Authority then evaluates whether any Licensed Operator has SMP in the relevant retail markets (Section 6), and whether any Licensed Operator has a Dominant Position in the relevant wholesale markets (Section 7). In each case, the text from the Draft Determination is first presented, followed by a summary of the submissions received on the draft. The Authority's final analysis and conclusions are then set out.

4 Identification of the relevant retail markets

49. As discussed earlier, the relevant retail services provide domestic data connectivity with guaranteed and symmetric bandwidth between multiple customer premises. Such services are typically supplied to business customers who require secure communications channels with high levels of customer service.
50. In considering the relevant retail market in which domestic data connectivity is supplied, the Authority has taken Batelco's domestic data connectivity services as a starting point, and then considered which other services are likely to be regarded by retail customers as close economic substitutes for those services. The issue of economic substitutability will be influenced by the technical features and pricing of alternative services. The Authority

³⁰ the Authority, Competition Guidelines, paragraph 93.

³¹ see the Authority, "Competition Guidelines", Section 3.3

³² For example, the Authority's letter to Licensees, "Article 53 Request: Periodic Telecommunications Markets data request", 12 February 2013 (Ref: MCD/02/13/013).

³³ see letter from the Authority to Licensed Operators "Leased Lines Market Review – Request for Information under Article 53 of the Telecommunications Law", 14 July 2013 (ref. MCD/07/13/074).

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has had regard to these price and non-price features in defining the relevant retail markets below.

51. Batelco offers a number of retail domestic data connectivity services to business customers in Bahrain. According to Batelco's website, Batelco offers "National Data Connectivity" services to business customers in the form of the following³⁴:
- a. Local MPLS service (of which there are 3 variants: MPLS Layer 2 Point-to-Point, MPLS Layer 2 Point-to-Multipoint, and MPLS Layer 3 IP-VPN);
 - b. Local Leased Circuit; and
 - c. LAN Connect.
52. The Authority understands that Batelco's Local Leased Circuit is equivalent to the Local MPLS Layer 2 Point-to-Point service, and that all new circuits are delivered over MPLS. The Authority also understands that Batelco intends to migrate LAN Connect customers to the Local MPLS Layer 3 service.³⁵

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4.1 Relevant product market

53. In considering the product dimension of the market in which Batelco supplies its domestic retail data connectivity services to business customers, the Authority is interested in identifying any other retail services which may be regarded as being close economic substitutes in the eyes of those customers. Potential alternative retail services include retail broadband services, and domestic connectivity services supplied using wireless technology.
54. The Authority has also examined whether traditional SDH-based data connectivity services are likely to be supplied in the same market as newer Ethernet-based connectivity services, and whether there are likely to be distinct retail markets according to different speeds.

4.1.1 Guaranteed bandwidth connectivity services and broadband services

55. Domestic data connectivity services typically provide guaranteed symmetric capacity to the end user.³⁶ By contrast, fixed broadband services are based on shared backhaul capacity and involve varying levels of contention between end users, with the result that the bandwidth actually supplied to an end user cannot be guaranteed and is instead provided on a "best efforts" basis.

³⁴ see http://portal.batelco.com/main-business/cc-overview/cc_national_data_connectivity_overview/

³⁵ see the Authority 'Decision relating to Batelco's Local MPLS services', 27 March 2012, (Ref MCD03/12/047), page 18.

³⁶ For example, the European Commission distinguishes between broadband internet services, and dedicated access, with the latter typically involving the provision of symmetric bandwidth with guarantees on contention rates or other quality of service parameters. See European Commission "Regulatory framework for electronic communications in the European Union", page 176, available at <https://ec.europa.eu/digital-agenda/sites/digital-agenda/files/Copy%20of%20Regulatory%20Framework%20for%20Electronic%20Communications%202013%20NO%20CROPS.pdf>

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56. For example, Batelco's wholesale DSL service and bitstream service involve contention ratios of 15:1 for residential services and 8:1 for business services³⁷. By contrast, a local leased P2P circuit provides guaranteed capacity between customer sites³⁸. In the case of P2MP services, symmetric bandwidth can also be guaranteed depending on the configuration of the service purchased by the customer³⁹.
57. For broadband services delivered over wireless networks (such as WiMax-based and mobile broadband services), the level of contention can be higher, as the service is provided using shared spectrum. For example, one mobile operator in Bahrain has estimated that the contention ratio for its mobile broadband services is 40:1. As a result, the actual performance of such networks can vary significantly, depending on the number of other customers using the network (as well as on other factors such as the location of the end user from the nearest network node). While the level of contention associated with wireless-based networks may not be a significant competitive drawback in terms of supplying mass-market broadband services⁴⁰, it is likely to be a significant consideration for customers demanding connectivity with guaranteed bandwidth.
58. The security dimension is also an important point of differentiation between a domestic data connectivity service offering guaranteed bandwidth and a broadband service. A broadband service involves the provision of connectivity via the internet, which will be more vulnerable to external security threats. A data connectivity service such as a leased line provides connectivity over a secure closed circuit, as well as providing the customer with greater ability to control the routing of its traffic.
59. The provision of guaranteed bandwidth means that the service performance of a data connectivity service is generally of a higher quality. Service characteristics such as latency are lower for guaranteed bandwidth services such as leased lines than for broadband services, where the shared nature of the service means that performance levels cannot be guaranteed⁴¹.
60. In addition, guaranteed bandwidth services provide symmetric bandwidth to the customer, whereas fixed broadband internet services are typically asymmetric, offering higher download bandwidth and lower upload bandwidth.
61. In the Authority's Request for Information, the Authority asked several questions relating to the competitive alternatives to retail leased line services, and specifically what distinguishes retail leased lines from retail broadband internet services. A number of operators, including Viva, 2Connect, Lightspeed, and Zain, responded that retail broadband internet services are not comparable to leased line services. In particular, broadband services are not dedicated and do not provide guaranteed Quality of Service,

³⁷ The exception for business services is the 256kbps service, which has contention of 15:1.

³⁸ For example, Batelco describes its Local Leased Circuits as providing a permanent dedicated link. See http://www.batelco.com/portal/business/cc_national_data_connectivity_local_leased.asp. Batelco has also confirmed that its Local MPLS P2P service provides symmetrical guaranteed bandwidth. See the Authority 'Decision relating to Batelco's Local MPLS services', 27 March 2012 (Ref MCD03/12/047), paragraph 41h.

³⁹ *ibid*, paragraph 41i. Batelco's Local MPLS P2MP service is a 'hub-and-spoke' configuration, and the service provides guaranteed symmetric bandwidth as long as the speed provisioned at the hub is sufficient to accommodate the aggregate speeds of the spokes served by the hub.

⁴⁰ As evidenced by the high penetration of mobile and fixed wireless broadband services in Bahrain and the competitive pricing compared to fixed broadband services.

⁴¹ see for example, Ofcom Business Connectivity Market Review Statement, 28 March 2013, Figure 3.14.

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security, or symmetrical traffic. In addition, retail leased lines provide much lower latency and higher reliability.

62. Menatelecom and Batelco referred to the pricing differentials that exist between retail leased line and retail broadband internet services in Bahrain.
63. The Authority considers that the pricing differentials between leased line and broadband internet services reflect the higher quality of domestic data connectivity services offering guaranteed bandwidth. Table 1 summarises the monthly rentals currently charged by Batelco for its Local MPLS P2MP service (where the prices shown are for a single hub or spoke), and Business Inet Broadband services, in the case where the end user signs a one-year contract.

Table 1: Comparison of Batelco's Local MPLS (P2MP) and Business Inet Broadband Prices

Speed	Monthly rental (BD), 1 year contract	
	Local MPLS P2MP	Business Broadband
256kbps	180	
512kbps	220	15
1Mbps	390	45
2Mbps	490	60
10Mbps	900	150

Source: Batelco website (accessed September 2013)

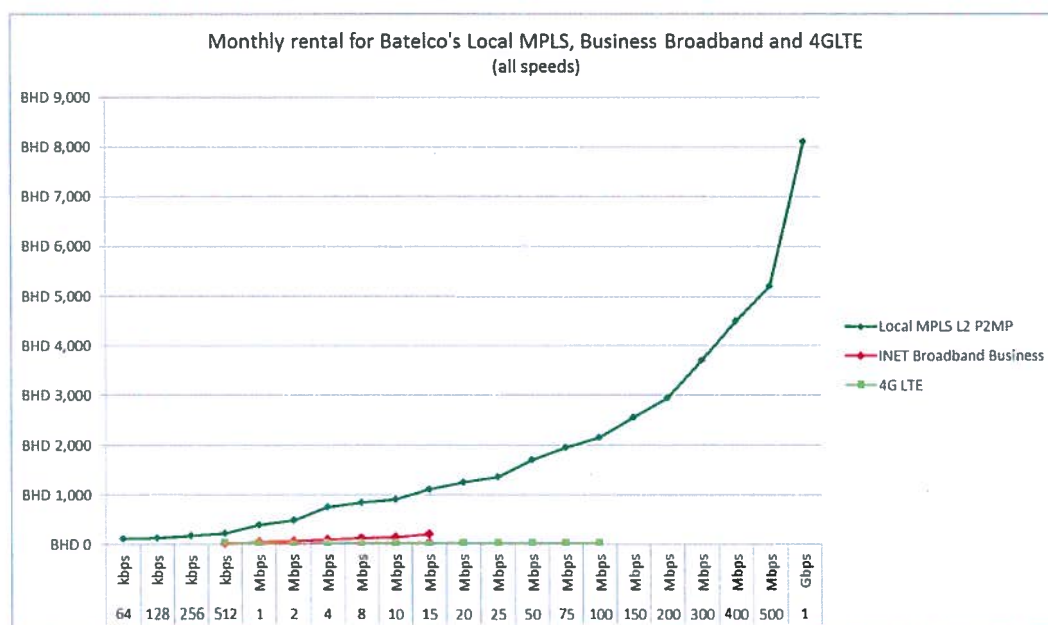
64. The monthly rentals for the Local MPLS service are significantly higher than the monthly rentals for Batelco's business broadband service. For example,
- for a 512kbps service, the price of the Local MPLS service (BD220 per month) is 15 times as expensive as the price for a fixed broadband service (BD15 per month);
 - for a 10Mbps service, the Local MPLS option (BD900 per month) is 6 times as expensive as the fixed broadband service (BD150 per month).
65. The Authority has found similar retail price differentials between broadband and MPLS services offered by other operators, based on the industry responses to the Authority's annual market indicators survey.
66. Figure 1 extends the pricing comparison to include Batelco's Local MPLS and fixed and mobile broadband services, across the range of speeds for which each service is available:
- Batelco's Local MPLS service is available for speeds between 64kbps and 1Gbps;
 - Batelco's fixed business broadband service (Inet) is available for download speeds of between 512kbps and 16Mbps;
 - Batelco's mobile broadband service (O-net) is available for speeds of up to 42Mbps. On 27 February 2013, Batelco announced the introduction of 4G LTE

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mobile broadband plans, offering speeds of up to 100Mbps⁴². In September 2013, Batelco announced that it had increased the speeds available on its 4G LTE plans to up to 150Mbps⁴³.

Figure 1: Batelco's Domestic Data Connectivity and Broadband Prices



Source: Batelco website (accessed September 2013)

67. Figure 1 shows that the magnitude of the pricing differential is even greater when the Local MPLS prices are compared to Batelco's high-speed mobile broadband prices:
- the price of a 10Mbps Local MPLS circuit (BD900 per month) is 26 times the price of Batelco's 4G LTE mobile broadband service (BD35 per month);
 - the price of a 100Mbps Local MPLS circuit (BD2,150 per month) is 61 times as expensive as the 4G LTE service.
68. Such pricing differentials support the view that domestic data connectivity services and broadband services are supplied in different markets. If business customers regarded broadband services to be a close substitute for domestic data connectivity with guaranteed bandwidth, businesses would switch away from acquiring the relatively high-priced leased lines and instead purchase broadband services⁴⁴. This reduction in demand for connectivity with guaranteed bandwidth and increase in demand for broadband would be

⁴² see http://www.batelco.com/batelco_cms/NewsStory.aspx?nid=1094. Batelco's 4G LTE mobile broadband plans are available at http://www.batelco.com/portal/mobile/4g_lte.asp.

⁴³ see http://www.batelco.com/batelco_cms/NewsStory.aspx?nid=1210.

⁴⁴ The Authority notes that the 5-10% price increase (a small but significant non-transitory increase in price or "SSNIP") that is typically used to test substitutability between services for the purposes of defining the boundaries of a market is substantially less than the price differentials observed between leased line and broadband services. Even if the observed pricing differentials have induced some switching away from leased lines and towards broadband services, this would not indicate that a SSNIP would be unprofitable.

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expected to lead to some convergence in pricing between the two competing types of services.

69. To test this further, the Authority has examined the volumes of domestic retail data connectivity services supplied by Batelco and other operators in Bahrain, which are summarised in Figure 2.

Figure 2: Number of Domestic Data Connectivity Services

[X]

Source: Authority analysis of market data

70. As shown in Figure 2, the number of domestic retail data connectivity services supplied by Batelco has fallen from [X] in Q4 2010 to [X] in Q4 2012, a reduction of –[X]% over the two years. However, the total number of domestic retail data connectivity services supplied in Bahrain over the same period increased slightly, from 2,204 lines in 2010, to 2,278 lines in 2012. This indicates that the reduction in the number of retail domestic data connectivity services supplied by Batelco is in large part due to the emergence of some competition from other suppliers of such services in Bahrain.
71. There is also some evidence that customers have been migrating from lower speed guaranteed bandwidth services towards higher speed guaranteed bandwidth services in recent years. For example, at the end of Q4 2010, 37% of retail data connectivity supplied in Bahrain had speeds of 2Mbps or more; by the end of Q4 2012, this proportion had increased to 47%.
72. The stability in the size of the domestic data connectivity market overall indicates that customers have not replaced their data connectivity service with a broadband service, despite the significantly lower prices for broadband services.
73. The high pricing differential and the lack of customer switching between domestic guaranteed bandwidth services and broadband services is likely to be due to customers valuing the features offered by the guaranteed bandwidth services.
74. The evidence discussed above supports defining separate and distinct retail markets for domestic data connectivity services offering guaranteed bandwidth and broadband services, on the basis of differences in service features and differences in pricing. This is also consistent with pricing trends for each type of service in recent years. The Authority's retail price benchmarking reports summarise trends in retail prices of key telecommunications services across the Arab region. Table 2 contains the retail prices for domestic data connectivity services and broadband services in Bahrain since 2008⁴⁵.

⁴⁵ The 2012 retail price benchmarking report is available at <http://www.tra.org.bh/en/pdf/2012PriceBenchmarkingofTelecommunicationsServiceintheArabCountriesvF.pdf>. The prices shown in Table 2 above are taken from slides 110 to 115 (business fixed broadband), slides 132 to 133 (business mobile broadband), and slides 74 to 76 (leased lines) of the 2012 retail price benchmarking report.

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Table 2: Retail Prices for Domestic Data Connectivity Services (Leased Lines) and Broadband in Bahrain, 2008-2012

Service	Usage/speed	Price per month (USD, PPP)					Average Annual % change
		2008	2009	2010	2011	2012	
Fixed BB	low/low	114.48	114.48	82.09	80.97	80.97	-8%
Fixed BB	low/medium			715.21	711.27	488.61	-17%
Fixed BB	low/high			1,626.08	1,622.14	974.41	-23%
Fixed BB	high/low	310.37	310.37	154.64	153.51	89.06	-27%
Fixed BB	high/medium			715.21	711.27	488.61	-17%
Fixed BB	high/high			1,626.08	1,622.14	974.41	-23%
Mobile BB	low/medium				32.39	20.24	-38%
Mobile BB	low/high				40.60	32.95	-19%
Mobile BB	low/medium				60.73	36.44	-40%
Mobile BB	low/high				57.24	32.95	-42%
Leased Line	64kbps	526.00	526.00	526.00	526.00	526.00	0%
Leased Line	256kbps	1,012.00	1,012.00	1,012.00	1,012.00	1,012.00	0%
Leased Line	2Mbps	3,603.00	3,603.00	3,603.00	3,603.00	3,603.00	0%

Source: 2012 Telecommunications Retail Price Benchmarking Report for Arab Countries (March 2013)

75. There have been substantial reductions in retail prices for fixed and mobile broadband services in Bahrain. Annual price reductions for fixed broadband services have ranged from -8% to -27% per annum. For mobile broadband services, retail prices in Bahrain fell by between -19% and -42% between 2011 and 2012.
76. These price reductions for broadband services in Bahrain are in stark contrast to what has been observed for leased line services, where prices have remained unchanged over the four years between 2008 and 2012.
77. It is clear that a degree of competition has emerged in the supply of broadband services in Bahrain, leading to the price reductions shown in Table 2. It is also evident that the competitive alternatives that have emerged in respect of broadband services have had no pricing impact on the supply of domestic data connectivity services in Bahrain. The competitive conditions in the supply of broadband services and guaranteed bandwidth connectivity services in Bahrain appear to be quite different, which supports the use of separate economic markets for these services.
78. It is the Authority's preliminary view that there is a distinct market for the supply of domestic retail data connectivity services which does not include broadband services⁴⁶.

⁴⁶ This is consistent with the conclusions drawn by other regulators such as Ofcom, ComReg, and TRC Jordan.

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4.1.2 Fixed versus wireless leased line services

79. From the perspective of a business customer purchasing a retail data connectivity service from Batelco, wireless-based connectivity services may be viewed as a good alternative if they were available at similar prices and offered comparable levels of performance, security and customer care.
80. A number of operators in Bahrain supply retail data connectivity services using point-to-point microwave links. As discussed further below (see Table 5), the majority of licensed microwave links in Bahrain are used by mobile and Wimax-based operators for the purposes of providing for their own domestic backhaul requirements. For these operators, microwave equipment can be collocated on their existing infrastructure. In addition to providing backhaul, a small number of licensed microwave links are also used to access end user premises. For example, Lightspeed and 2Connect have deployed microwave links to customer premises. Menatelecom and Viva also use microwave links to connect to end user premises. Table 3 summarises the Authority's upper bound estimate of the number of domestic retail data connectivity services supplied to customers relying on microwave links at the end of 2012.

Table 3: Domestic Data Connectivity Services supplied via Microwave

	Q4 2012
Microwave-based Data Connectivity services	[X]
Total Retail Data Connectivity services	[X]
Microwave %	[X]%

Source: Authority estimates

81. According to responses to the Authority's Request for Information, operators other than Batelco supplied a total of [X] domestic data connectivity circuits using their own infrastructure. This includes where the circuit is supplied using microwave, as well as where the operator has deployed its own duct. The Authority understands that the deployment of alternative duct (other than Batelco's) is limited in Bahrain, and so the majority of the 'own infrastructure' relates to microwave-based supply. The [X] data connectivity circuits supplied over non-Batelco infrastructure represented less than 10% of total retail domestic data connectivity services as of the end of 2012.
82. There are a number of technical issues associated with microwave links which may limit the extent to which they are able to constrain wireline domestic data connectivity services such as Batelco's leased lines. In the Draft Order on the WLA service, the Authority referred to a number of these limitations⁴⁷:
- microwave links require the dish antennae located at each site to have a clear line of sight, which is not always available in Bahrain. As a result, additional hops are required (increasing the cost of the microwave solution);
 - microwave links also require the dish antennae to be located at the appropriate height (10-20 metres), which is not always available;

⁴⁷ The Authority, Draft Order on the Wholesale Local Access Service, 12 July 2012 (Ref: MCD/07/12/097), paragraph 62.

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- c. microwave links are more vulnerable to security threats;
 - d. spectrum congestion, especially in lower frequencies, represents a barrier to deployment on a widespread scale;
 - e. the performance of microwave links is less reliable and stable compared with wireline links.
83. One operator who makes some use of microwave links has informed the Authority that its customers generally prefer fibre-based solutions, and that although it has offered microwave-based services to its customers, there has been little interest in such services.
84. The congestion issue is particularly important for microwave-based links in Bahrain. There is currently significant congestion in the frequency bands below 23GHz, while in the higher frequency bands, congestion is likely to occur as demand for bandwidth increases as a result of upgrades to the mobile networks in Bahrain⁴⁸. The sub-23GHz bands (7GHz, 13GHz, 15GHz, 18GHz, and 22GHz) are important in that they allow for high-capacity transmission over relatively long distances.⁴⁹ The presence of significant congestion will limit the ability of microwave to act as a constraint on Batelco in the supply of retail leased lines, as leased line customers may not be able to switch away from Batelco's leased line services and towards microwave-based solutions.
85. In the dominance determination for wholesale international services, the Authority also noted the limitations of wireless point-to-point links, in particular quality-of-service and capacity limitations when compared to fixed-line backhaul⁵⁰. The Authority noted that while microwave links had been used to reach some of the cable landing points in Bahrain, these had been used initially as secondary or back-up links, and have progressively been replaced with other forms of backhaul. In that dominance determination, the Authority concluded that Batelco was no longer dominant in the wholesale market for the supply of international capacity from locations within Bahrain, as long as Batelco provided access to its ducts (and associated facilities) and wholesale leased lines. In the Authority's view, the availability of microwave-based domestic links was not sufficient to overcome the domestic backhaul bottleneck, leaving duct access and domestic leased lines as the two options for providing the domestic backhaul component of international capacity to and from locations within Bahrain⁵¹.

⁴⁸ see paragraphs 164 to 168 below.

⁴⁹ For example, in the Authority's licensing policy for fixed point-to-point links, the Authority has determined minimum path lengths (MPLs) for different frequency bands "to preserve spectrum in the lower frequency bands for longer, high-capacity links (which can be accommodated only in those bands)." For example, the MPL for a high capacity link in the 6GHz band is 16kms; for a high capacity link in the 13GHz band, the MPL is 5.5kms; and for a high capacity link in the 38GHz band, the MPL is 1km. See the Authority, "Fixed Point to Point Links – Licensing and Assignment Policy", 1 July 2011, Annex 2, available at <http://www.tra.org.bh/en/pdf/FixedLinkPolicy.pdf>. In its BCMR Statement, Ofcom also referred to submissions citing the lack of spectrum availability in some bands below 20GHz as being a significant issue, and that while high-speed transmission could be achieved using higher frequencies, a significant limitation for these bands is the relatively short maximum hop length of less than 3 kms. See Ofcom, BCMR Statement, paragraph 4.361.

⁵⁰ The Authority, "Dominance Determination for Wholesale International Services", 20 February 2013, paragraph 219.

⁵¹ *ibid*, paragraph 220.

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86. In its Business Connectivity Market Review (BCMR)⁵², Ofcom raised similar concerns regarding the performance of microwave links compared to fibre-based backhaul:
- a. the requirement for line of sight connectivity;
 - b. the ability to support only lower capacity links compared to fibre;
 - c. lower transmission range than fibre-based backhaul; and
 - d. microwave antennae are exposed and have a higher risk of failure.
87. Ofcom excluded wireless links from the relevant leased line markets it was considering, on the basis that the technical limitations associated with wireless technology (arising from the line-of-sight requirement) and the costs to a network operator of switching to microwave-based solutions were such that wireless links would not impose an effective competitive constraint.⁵³
88. Ofcom has also noted that in markets where the use of radio-based links is more widespread, this may be a consequence of unsatisfactory leased line services in those markets driving other operators to rely on less efficient solutions such as microwave⁵⁴. In Bahrain, there have been similar issues with Batelco's wholesale data connectivity services. A number of operators have raised concerns over the terms on which the wholesale CAT service has been available in Bahrain. [X] informed the Authority that a key reason why it uses microwave links is that they have lower delivery lead times than Batelco's wholesale CAT service, and that this is a critical factor in delivering services to business customers. [X] referred to the lack of a Service Level Agreement ("SLA") for the CAT service as being an issue. Responses to the Authority's Request for Information outlined similar concerns regarding the use of Batelco's wholesale domestic leased line services.
89. A further example of the difficulties experienced with Batelco's wholesale data connectivity services occurred during 2009, when the Authority received a number of complaints from OLOs regarding the speeds provided by Batelco's new NGN-based CAT service. Batelco had started migrating the CAT service to its NGN in July 2008. According to the complaints, Batelco's new CAT service was failing to deliver the speeds that had been available prior to the migration, resulting in a general degradation of the quality of the wholesale service and disruptions for the OLOs' customers. In September 2010, the Authority issued a Draft Order to Batelco, requiring Batelco to undertake a number of remedial steps, including the provisioning of CAT services that supported the speeds set out in Batelco's Service Description for the CAT service. Batelco was also required to develop transparent technical specifications for the CAT service.
90. The Authority also notes that Batelco's CAT and LLCO services have been available at a relatively limited range of speeds. The CAT and LLCO services were initially available only at low speeds of up to 2Mbps. A number of higher speed services were introduced during 2011 at the Authority's request, although as an SDH-based service, the high-speed options were limited to DS3 (44.736Mbps), STM1 (155.52Mbps), and STM4 (622.08Mbps).

⁵² Ofcom, "Business Connectivity Market Review Statement", 28 March 2013, paragraph 4.337.

⁵³ *ibid*, paragraph 4.398.

⁵⁴ *ibid*, paragraph 4.374.

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91. Such issues with Batelco's wholesale data connectivity services, and in particular the absence of SLAs for the CAT and LLCO services, are likely to have resulted in Batelco's competitors making greater use of alternative options for providing domestic business connectivity services in Bahrain. That competitors have been using less-efficient alternatives in such circumstances does not mean that those alternatives are close economic substitutes for the service in question and should necessarily be included in the same market. This is an example of what is known as the "cellophane fallacy" in market definitions⁵⁵, where markets may be defined too broadly if the reference or focal product – in this case, Batelco's data connectivity services – has only been available on terms that are less favourable than if the product were supplied in a competitive market.
92. The recent introduction of the WLA service has addressed a number of the issues outlined above. For example,
- a. in conjunction with the Authority, Batelco has developed a detailed WLA service description, including an SLA specifying, for example, provisioning and fault restoration timeframes (and associated service rebates in the event that these timeframes are not met);
 - b. the WLA service is available for a wider range of speeds above 2Mbps⁵⁶;
 - c. While the pricing of Batelco's wholesale CAT and LLCO services have been regulated in Bahrain since the 2006 Dominance Determination, the recent introduction of the Ethernet-based WLA service has resulted in significant price reductions for the higher-speed wholesale services. This can be seen from Figure 3, which summarises the prices for the wholesale CAT service and the WLA service.

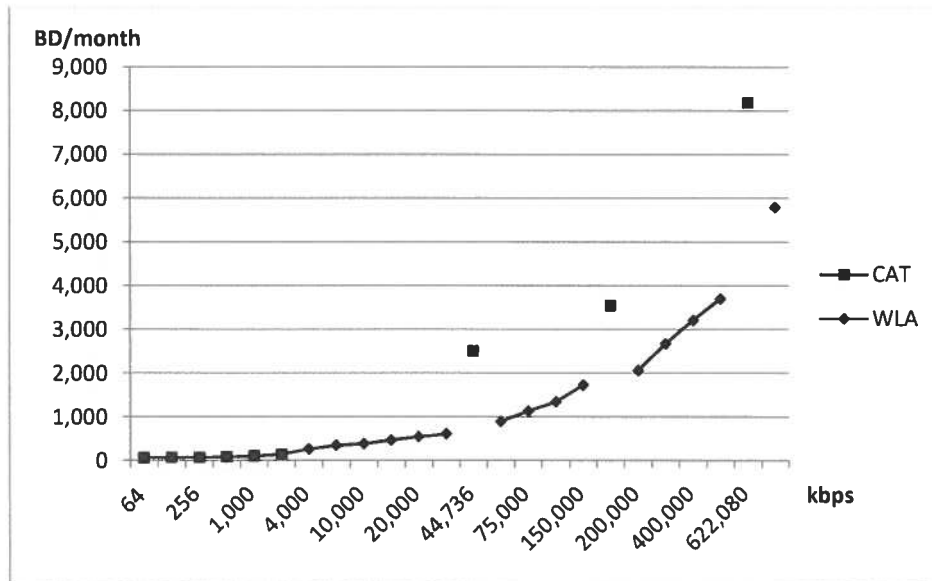
⁵⁵ The term "cellophane fallacy" arose as a result of a court case taken by the US Justice Department against Du Pont, over the company's alleged monopolization of the cellophane market. The Supreme Court decision was criticized on the basis that it used the prevailing 'monopolized' price rather than the competitive price to test substitutability. As a result, the Supreme Court defined the relevant market too broadly and concluded that Du Pont was not dominant.

⁵⁶ see paragraph 190 below.

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Figure 3: Comparison of CAT and WLA prices



93. Although the WLA service may address some of the historical issues associated with the CAT and LLCO services going forward, the difficulties experienced with the CAT and LLCO services in recent years (as outlined above) are likely to have resulted in a greater deployment of microwave links than would have been the case had Batelco offered a fit-for-purpose wholesale data connectivity service and SLA in the first place. In the Authority's view, the current level of microwave deployment is likely to grossly overstate the extent to which microwave is a close economic substitute for a fit-for-purpose wholesale service offering guaranteed bandwidth over a fixed line network.
94. For the purposes of this Draft Determination, the Authority has included microwave-based data connectivity services in the same market as wireline data connectivity services, although for the reasons set out above, the Authority considers that microwave-based services are unlikely to exert a significant competitive constraint in this market.

4.1.3 Traditional SDH-based connectivity and Ethernet-based connectivity

95. The technologies used to deliver retail data connectivity can broadly be described in terms of two main groups:
- the first group includes traditional leased lines supplied as analogue and digital interface services using Time-Division Multiplexing ("TDM") transmission standards, including Synchronous Digital Hierarchy ("SDH") based leased lines. SDH-based leased lines have robust transmission characteristics, such as low levels of transmission delay or latency, and low levels of variations in transmission or 'jitter';
 - the second class of technology is based on modern interfaces such as Ethernet, which are generally more cost-effective in delivering high-bandwidth services.
96. The issue of whether to include traditional SDH-based connectivity services in the same retail market as Ethernet-based connectivity will depend on the characteristics of the two types of services, and in particular whether there are particular limitations on one type

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such that end-users acquiring domestic data connectivity would not consider it to be a close economic substitute for the other.

97. In this regard, Ofcom has recently summarised the key features of the two types of connectivity services, using the following table.

Table 4: Comparison of SDH-based and Ethernet-based connectivity

Service feature	Point-to-point Ethernet (carrier class)	SDH/PDH-based
Contention	Dedicated	Dedicated
Distance limitations	Not limited	Not limited
Jitter	Low (load dependent)	Low
Latency	Low (load dependent)	Low
Resilience	High	High
Symmetry	Symmetrical	Symmetrical
Synchronisation	Networks supporting resilient synchronisation beginning to be deployed. Not supported by older carrier Ethernet services.	Networks support resilient synchronisation of end-user equipment

Source: Ofcom, "Business Connectivity Market Review Statement", 28 March 2013, Figure 3.4.

98. According to Ofcom, the emergence and widespread deployment of newer 'carrier class' Ethernet services have narrowed the differences between older Ethernet-based services and SDH-based services. In particular, Ofcom has noted that the newer Ethernet services offer comparable levels of latency and jitter performance as SDH-based services, and also support synchronisation which is important for mobile backhaul⁵⁷.
99. One of the reasons Ofcom nevertheless decided to define separate markets for SDH-based ("Traditional Interface") leased lines and Ethernet-based ("Alternative Interface") leased lines was the substantial differential in prices, with SDH-based prices being considerably higher than Ethernet-based prices for bandwidths above 6Mbps. Ofcom's analysis was based on the underlying wholesale inputs used to supply the respective retail services.
100. A similar conclusion is likely to hold in Bahrain, where for speeds up to 2Mbps, the wholesale inputs (the CAT/LLCO service and the WLA service) have identical prices, but for higher speeds, the Ethernet-based WLA service is substantially cheaper (see Figure 3 above).
101. However, there is some evidence suggesting that retail customers in Bahrain have responded with a preference for Ethernet-based retail services. According to information supplied to the Authority as part of the bottom-up cost modelling exercise, Batelco supplied:

⁵⁷ Ofcom, "Business Connectivity Market Review Statement", 28 March 2013, paragraphs 3.39 and 3.41.

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- a. [X] retail Ethernet-based leased line connections in 2011, of which [X] connections were below 2Mbps; and
 - b. [X] retail SDH-based leased line connections in 2011, of which [X] connections were below 2Mbps.
102. In other words, for bandwidths below 2Mbps, where wholesale input prices are identical between the CAT and WLA service, Batelco's SDH-based services accounted for approximately [X]% of Batelco's retail data connectivity; for bandwidths above 2Mbps, where wholesale input prices are considerably higher for the CAT service, Batelco's SDH-based services accounted for less than [X]% of Batelco's retail data connectivity. For bandwidths where there is a significant price premium for SDH-based services, customer demand for SDH-based connections appears to be significantly lower.
103. The Authority understands that Batelco does not offer SDH-based retail data connectivity to new customers, and that all new retail connectivity supplied by Batelco is Ethernet-based. According to another operator in Bahrain ([X]), businesses are now only interested in Ethernet-based connectivity services, with SDH-based connectivity no longer being demanded.
104. In the responses to the Authority's Request for Information, a number of operators (Batelco, Rawabi, and Lightspeed) submitted that there are no major differences between SDH-based and Ethernet-based retail leased lines. One operator noted that some customers require SDH circuits due to previous investments that have been made, while another noted that SDH circuits have an advantage in terms of carrying PBX voice supporting ISDN-PRI services.
105. ComReg has also adopted a 'technologically neutral' market definition in relation to leased lines, arguing that all carriers' high bandwidth products which offer dedicated, symmetric, point-to-point connection belong in the same market, irrespective of the technology used to deliver the product.⁵⁸
106. One advantage of SDH-based connectivity is that it supports synchronisation, which is important for mobile backhaul purposes. As noted above, newer 'carrier class' Ethernet services support synchronisation, allowing such services to be considered for mobile backhaul. The Authority understands that Batelco uses carrier class Ethernet (MPLS) for its 3G mobile backhaul in Bahrain, although similar services do not appear to be available to third parties. However, such demand only relates to the wholesale market for data connectivity services, rather than the retail level.
107. In Bahrain, the number of Ethernet-based domestic data connectivity services has been increasing, from [X] services in 2010 to [X] services in 2012. Over the same period, the number of SDH-based retail services has been declining, from [X] services in 2010 to [X] services in 2012. According to responses to the Authority's Request for Information, demand for Ethernet-based services is expected to dominate in the next 2 years, although SDH-based services will still be important.
108. The Authority considers that SDH-based and Ethernet-based retail data connectivity services are becoming increasingly similar in terms of functionality, and that there is some evidence to suggest that retail customers may be switching towards Ethernet-based

⁵⁸ ComReg, "Market Analysis – Leased Line Market Review", 22 December 2008, for example paragraph 8.5 (page 17), paragraph 8.1 (page 21).

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services. However, whether Ethernet-based and SDH-based domestic data connectivity services are included in the same retail market is unlikely to affect the outcome of the competition assessment. According to the information collated from the responses to the Authority's Request for Information, Batelco's share of retail domestic data connectivity services has exceeded [X]% in the case of both Ethernet-based and SDH-based services during 2010-2012. The proportion of retail domestic data connectivity services supplied using Batelco's network over this period has exceeded [X]% for both Ethernet-based and SDH-based services.

109. The Authority also notes that the Telecommunications Regulatory Commission (TRC) in Jordan had initially proposed to exclude Ethernet-based retail services from its retail market for dedicated capacity.⁵⁹ In its submission on the public consultation document issued by TRC, Batelco Jordan strongly disagreed with the exclusion of Ethernet-based services, arguing that dedicated Ethernet services are demand-side and supply-side substitutes for traditional interface leased lines.⁶⁰ According to Batelco Jordan, the exclusion of Ethernet services would provide the dominant incumbent operator with a first-mover advantage to retain its "ultra-dominant position" in the dedicated capacity markets⁶¹. In its final decision, TRC included Ethernet-based services within its market definition.⁶²
110. For the purposes of this Draft Determination, the Authority has defined the relevant retail market to include both traditional SDH-based data connectivity services as well as Ethernet-based data connectivity services.

4.1.4 Differentiation by bandwidth

111. The Authority has considered whether the relevant product market for retail data connectivity should be differentiated according to bandwidth. The Authority has taken into account both demand-side and supply-side considerations.
112. From the demand-side, distinct product markets for retail data connectivity services of specific bandwidths might be appropriate in the event that retail customers acquiring a low bandwidth service were unlikely to switch to higher bandwidth services in response to an increase in price of the low bandwidth service. For example, a business customer acquiring a 64kbps Local MPLS service from Batelco (at a current tariff of BD130 per month under a 1-year contract) is unlikely to switch to a 100Mbps service (BD3,140 per month) in the event that the price of the 64kbps service increases by 10%. This could suggest that the 64kbps and the 100Mbps MPLS services are supplied in separate retail markets.
113. However, there are a range of retail data connectivity services available at intermediate bandwidths, such that a 'chain of substitution' is likely to exist between retail leased lines of adjacent bandwidths. For example, the business customer acquiring a 64kbps service could switch to a 128kbps service (BD180 per month) when faced with a SSNIP. Batelco's Local MPLS service is also available at speeds of 256kbps, 512kbps, 1Mbps,

⁵⁹ TRC, "Review of Dedicated Capacity Markets in Jordan", April 2010, page 16.

⁶⁰ "Umniah and Batelco Jordan's joint response to the Public Consultation Document issued by the TRC Review of Dedicated Capacity Markets in Jordan", 9 June 2010, page 8.

⁶¹ *ibid*, page 9.

⁶² TRC, "Regulatory Decision on the Dedicated Capacity Markets Review", 21 December 2010, page 7.

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2Mbps, 4Mbps, 8Mbps, 10Mbps, 20Mbps, 25Mbps, 50Mbps, 100Mbps, 200Mbps, 500Mbps and 1Gbps.

114. In terms of supply-side substitution, there are also likely to be substitution possibilities from one bandwidth to another. Once an operator has deployed a network over which it supplies leased line services, it is likely to be able to easily offer (and switch between offering) low and high bandwidth retail services. This is because the majority of the cost associated with deploying a network capable of supplying leased line services is invariant to the bandwidth of the services supplied.⁶³
115. The Authority has also examined whether defining distinct retail markets for data connectivity services above and below 2Mbps would be likely to lead to different conclusions regarding the state of competition in each market. This is unlikely to be the case, as in both market segments (above and below 2Mbps) Batelco's market share of retail services remains very high (in excess of 75% as of Q4 2012). Competitive conditions are therefore unlikely to be significantly different for retail services of different bandwidths.⁶⁴
116. The Authority's preliminary view is that the relevant product market for retail leased line services should not differentiate according to bandwidth.

4.2 Relevant functional market

117. Retail data connectivity services are supplied to business customers such as financial institutions, administrations or manufacturing companies. The relevant functional level of the market is therefore the retail level.

4.3 Relevant geographic market

118. In considering the relevant geographic dimension of the market, focus on demand-side substitution is likely to result in very narrow geographic markets, as demand for domestic data connectivity services is location-specific. A customer requiring domestic connectivity between two specific sites is unlikely to regard connectivity between two other sites as an economic substitute.
119. The geographic market for telecommunications services are therefore typically defined having regard primarily to whether there are likely to be variations in the intensity of competitive conditions across different regions. The geographic area across which uniform prices are set is also a relevant consideration, as is the materiality of the market definition issues⁶⁵.
120. Batelco's fixed infrastructure over which it offers domestic data connectivity services is national in scope, providing largely ubiquitous connectivity throughout Bahrain. While there are some examples in other jurisdictions of sub-national markets being defined for some broadband services, these markets have typically been defined where several localised competitors have become established (such as competitors who have installed

⁶³ Most of the cost of deploying such a network relates to the installation of passive infrastructure such as ducts.

⁶⁴ This is also reflected in the market shares shown in Table 6 below, which shows that Batelco's share of retail data connectivity services remains high irrespective of whether market shares are based on the number of services or bandwidth.

⁶⁵ see the Authority, "Competition Guidelines", 18 February 2010, paragraph 58.

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their own equipment in the incumbent's local exchanges in order to access unbundled local loops).

121. The Authority also notes that Batelco's pricing of domestic data connectivity services does not exhibit geographic variations throughout Bahrain. This indicates that localised competition has not emerged, and that competitive conditions are likely to be relatively uniform across the country.
122. The Authority's preliminary view is that the relevant geographic market for the supply of domestic retail data connectivity services is national, with the exception of Amwaj Islands where Batelco does not currently have infrastructure in place.

4.4 Preliminary conclusions on the relevant retail market

123. The Authority's preliminary view is that the relevant retail market for this Draft Determination is the retail market for the supply of domestic data connectivity services in Bahrain, with the exception of Amwaj Islands.

Summary of submissions

124. In its submission on the Draft Determination, Batelco submitted that the Authority should take greater account of the approach taken in the European Union, where the main focus has been on wholesale markets and remedies.
125. Batelco noted that the number of retail domestic data connectivity services supplied by Batelco has been falling, while the total number of retail services has been increasing. According to Batelco, this is a clear sign of increasing competition. Batelco expects the retail market to continue becoming increasingly competitive due to technological advances. Batelco claimed that the fact that its retail share had not fallen significantly in the past 2-3 years does not necessarily mean that competition is non-existent or that there is no prospective competition.
126. Batelco also submitted that the majority of leased line customers subscribe to services of less than 2Mbps. Batelco claimed that higher speed broadband services represent a reasonable alternative to lower speed leased line services, especially for smaller enterprises who primarily require download speed, bandwidth, and lower prices.
127. Batelco referred to overseas examples of wireless broadband suppliers offering services in competition with leased lines. Enterprise customers within the region (such as the National Bank of Abu Dhabi) are becoming more agreeable to using wireless alternatives to leased lines. Customers are increasingly taking up back-up solutions using 4G/LTE rather than fibre-based leased lines.
128. On the issue of whether there are distinct retail markets for different bandwidths, Batelco argued in support of a market definition at both the retail and wholesale level based on low/high speed bandwidths, as is typically adopted in Europe. According to Batelco, the current distribution of Batelco's circuits by throughput suggests that there is no smooth and even chain of distribution at higher throughputs. Batelco referred to the German example where the regulator defined a market for bandwidth up to and including 2Mbps, and another market for bandwidths above 2 Mbps, with Deutsche Telekom only found to have SMP in relation to the lower bandwidth market.
129. Batelco also made a number of comments on the relevant geographic dimension of the relevant retail market. Batelco submitted that in addition to Amwaj, there are other

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geographic areas (such as Reef Island, Bahrain Financial Harbour and Bahrain Bay) which should be defined separately as Batelco has no fixed infrastructure.

130. Batelco proposed a sub-market for multi-nationals at a regional level, as many multi-national tenders require the provision of both domestic and international data connectivity across the region. According to Batelco, supply-side switching occurs as an ICT supplier in one GCC country can team up with a Bahraini licensee, and demand-side switching can occur where a multi-national relocates to another GCC location partly on the basis of ICT costs.
131. Viva disagreed with the inclusion of microwave-based data connectivity services in the same market as wired data connectivity services, due to the limitations of the former which were discussed in the Draft Determination. According to Viva, wireless solutions are unable to offer the same service levels and customer experience, due to line-of-sight requirements, switching costs, distance limitations, and capacity bottlenecks. Viva submitted that the superior functionality offered by fixed wired data connectivity services justifies the definition of separate markets for wired and wireless data connectivity services.
132. Zain supported the retail market definitions proposed by the Authority in the Draft Determination, although emphasised that business customers perceive wired data connectivity to be superior than wireless connectivity, primarily due to lower contention. Zain submitted that such customer preferences remain even where an uncontended microwave solution is offered to the business customer.
133. Zain supported the Authority's view that dedicated data connectivity solutions are supplied in a distinct market from broadband services.
134. Both Menatelecom and 2Connect agreed with the Authority's view on the relevant retail markets for domestic data connectivity services.

The Authority's analysis and final conclusions on the relevant retail markets

135. In response to Batelco's submission, the Authority notes that the Draft Determination did not say that competition was "non-existent"⁶⁶, but that such competition remained limited such that Batelco continued to have SMP. The Authority also said that the retail market is potentially competitive in the future, as long as fit-for-purpose wholesale products are available.⁶⁷ However, the Authority noted that further improvements to existing wholesale access products are needed, and to the extent that these improvements enhance downstream competition, the retail market may be reviewed again.
136. The Authority's view set out in the Draft Determination is consistent with the direction given in the Third National Telecommunications Plan (3rd NTP). According to Section 7.5 of the 3rd NTP, more progress is needed towards effective competition in certain telecommunications markets, which would allow for a reduction in reliance on ex ante regulation and a greater reliance on market mechanisms supported by ex post regulation. The development of a set of fit-for-purpose wholesale access products which enables efficient competitors to compete with Batelco in the downstream domestic data

⁶⁶ see for example the last sentence of paragraph 67 of the Draft Determination.

⁶⁷ Draft Determination, paragraphs 212-213.

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connectivity market is a necessary pre-requisite for considering a reduction in ex ante regulatory obligations in that downstream market.

137. Although Batelco submitted that higher speed broadband services represent a reasonable alternative to lower speed leased line services, the Authority notes that there is a significant pricing differential between leased line and broadband internet services (as shown in Table 1 above). This differential remains significant irrespective of speeds; for example, the price of the Local MPLS service exceeds Batelco's business broadband pricing by a factor of 14x for a 512kbps service, and by a factor of 8x for a 1Mbps and 2Mbps service. This suggests that the pricing of the MPLS service is largely unconstrained by broadband pricing, even at low speeds, where the guaranteed performance of the MPLS service comes at a significant premium.
138. In terms of the competitive constraint from wireless, Batelco's submission that wireless solutions are increasingly comparable to fixed-line data connectivity services contrasts with a statement made by Batelco's Chief Executive Officer following the publication of the Draft Determination, in which he characterised wireless solutions as being "temporary and often unreliable", and that Batelco's competitors still prefer to invest in such solutions rather than invest in their own fibre pulled through Batelco ducts.⁶⁸
139. It is also in contrast with the other submissions received on the Draft Determination, all of which supported placing little weight on the competitive constraint arising from wireless-based services.
140. On Batelco's argument for separate markets for low and high bandwidth services, the Authority has considered whether such a distinction is likely to change the conclusions of its competition assessment. The Authority has found that Batelco is likely to retain a position of SMP for both low and high bandwidth services (unlike the case in Germany, where competition differed in the low bandwidth and high bandwidth sub-markets).
141. This can be seen from Table 6 below, which shows that Batelco's market share at the end of 2012 was very high in terms of the number of retail services ([X]%), capacity ([X]%), and revenues ([X]%).⁶⁹ If competitors had captured a higher share of higher bandwidth services, Batelco's capacity and revenue shares would be relatively low (as higher bandwidth services are typically higher value).
142. To test this further, and taking the 2Mbps bandwidth break used in the German example referred to in Batelco's submission, Batelco supplied [X] retail leased line circuits of less than 2Mbps as of Q4 2013, which represented a market share of [X]% of sub-2Mbps retail circuits. Batelco also supplied [X] retail leased lines of 2Mbps or greater, for a share of [X]% of such circuits.⁷⁰ In both cases, no other operator had a market share in excess of 10%. In other words, Batelco's share of retail circuits is very high across the sub-2Mbps and the 2+Mbps bandwidth segments. This indicates that Batelco is likely to retain SMP

⁶⁸ GDN, 26 December 2013.

⁶⁹ As discussed later, Batelco's market share at the end of Q4 2013 remained high, at [X]% of the number of retail services, and [X]% of retail revenues.

⁷⁰ If a higher threshold of 45Mbps is used instead, Batelco's share of retail circuits less than 45Mbps was [X]% in Q4 2013, and [X]% of retail circuits of 45Mbps or greater. In both cases, Batelco's share exceeds 75%, indicating that it is highly likely to have SMP in both segments.

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across both lower and higher bandwidth domestic data connectivity services, with competitors failing to gain significant traction in either of these segments.⁷¹

143. On the relevant geographic market, most of the submissions received agreed with the proposal in the Draft Determination to define a national market, with the exception of Amwaj Islands. The exception was Batelco, who submitted that additional areas should be excluded where Batelco does not own fixed infrastructure. However, in the Authority's view, it would be inappropriate to exclude such areas if Batelco has obtained exclusive access to infrastructure in those areas. Where effective open-access arrangements are in place, for example which would meet the conditions that were discussed in the Authority's consultation on the deployment of telecommunications infrastructure in new developments,⁷² it may be appropriate to withhold ex ante access obligations. However, for the purposes of this Determination, the Authority has not defined the relevant geographic market to accommodate such exclusions.
144. Regarding Batelco's argument that there is a 'sub-market' for multi-national customers, this appears to relate to international leased line services throughout the region, which is beyond the scope of the current determination (although domestic data connectivity services are an input to the supply of international leased lines).
145. Having considered the submissions received on the Draft Determination, the Authority's view is that the relevant retail market is for the supply of domestic data connectivity services in Bahrain, with the exception of Amwaj Islands.

5 Identification of the relevant wholesale markets

146. Domestic data connectivity at the wholesale level is used by OLOs as an input into the supply of downstream services such as retail data connectivity services and fixed broadband services as well as for their own transmission requirements. Wholesale connectivity services may be used to directly connect the OLO with the customer premises (i.e. the CAT service or the WLA service), or may be used to connect OLO sites (i.e. the LLCO service or the WLA service), for example in the case where wholesale connectivity is used by a mobile network operator for the purposes of mobile backhaul.
147. As was the case with the relevant retail market, the Authority has taken Batelco's domestic wholesale connectivity services as a starting point, and then considered which other services are likely to be regarded by its wholesale customers as close economic substitutes for those wholesale services. The issue of economic substitutability will again be influenced by the technical features and pricing of alternative services at the wholesale level. The Authority has had regard to these price and non-price features in defining the proposed wholesale markets below.

⁷¹ The Authority reiterates that Batelco's main competitors at the retail level rely to a significant extent on microwave, which as discussed in this Determination has a number of limitations by comparison to fixed-line data connectivity services.

⁷² see the Authority, "Draft Position Paper on the Deployment of Telecommunications Networks in New Property Developments", 27 May 2009 (TOD/0509/024), in particular Section 7.

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148. Batelco offers a number of wholesale domestic data connectivity services to OLOs in Bahrain:
- a. the CAT service, providing wholesale capacity between an end user's premises and the OLO's point of presence (POP);
 - b. the LLCO service, providing wholesale capacity between two of the OLO's POPs; and
 - c. the WLA service, providing wholesale capacity between an end user's premises and the OLO's POP, or between two of the OLO's POPs.
149. At the wholesale level, a potentially important consideration is the treatment of self-supplied services. The concept of 'self-supply' arises where an operator is vertically-integrated across a number of functional levels in the value chain, supplying retail services using its own wholesale inputs. Such an operator will implicitly or explicitly 'self-supply' the relevant wholesale services to its own downstream operation. In addition, it may decide to offer wholesale services to third parties.
150. In the current case, such supply (either to its own downstream operation or to a third party) may be based on the vertically-integrated operator having access to upstream inputs from Batelco, such as duct, or may be based on the competitor's own infrastructure where this has been deployed independently of Batelco.
151. Whether such a vertically integrated competitor will constrain the existing supply of domestic wholesale data connectivity, and should as a result be included in the same wholesale market, will depend on a number of factors. In the Authority's view, the most important of these for the current market review are the following:
- a. whether the rival operator relies on Batelco's own wholesale leased lines. If the rival's supply of wholesale leased line services would be based on resale, it is unlikely to be an effective constraint on Batelco's wholesale service; if, however, the rival relies on an upstream input (such as duct), it may be an effective competitive constraint on Batelco's wholesale data connectivity services, as long as the upstream input is available on fair, reasonable, and non-discriminatory terms;
 - b. whether the rival operator has sufficient capacity and geographic coverage to offer a meaningful alternative to existing wholesale leased line services. For example, where the rival operator currently utilises microwave-based infrastructure in order to self-supply its downstream operations, this is unlikely to represent a strong competitive constraint on Batelco, for the reasons given elsewhere in this determination. Where the rival operator self-supplies connectivity using fibre, the competitive significance will depend on the geographic extent of the rival's fibre footprint.
152. Other relevant considerations relating to the wholesale supply to third parties may include whether the rival operator in question has sufficient spare capacity on their network to switch into supplying third parties; and whether there are significant incremental costs associated with such switching, either from the rival operator's perspective (for example, in terms of new investment required to serve third parties) or from the wholesale customer's perspective.
153. In Bahrain, the ability of self-supply by rival vertically integrated operators to constrain Batelco's wholesale leased line services (CAT, LLCO, and WLA) is likely to depend on the

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nature of the infrastructure that the rival operator has deployed. As discussed earlier, a number of operators in Bahrain are wireless-based, with Viva, Zain, and Menatelecom using microwave links for their domestic capacity requirements. These operators have also begun to deploy their own fibre through Batelco's ducts, while continuing to rely on wholesale leased lines supplied by Batelco. However,

- a. while there is likely to be significant capacity available on competing fibre deployments, the fibre footprint of these operators remains relatively limited, with a number of operators highlighting the difficulties faced with deploying their own fibre through Batelco ducts, including provisioning and fault restoration delays⁷³;
- b. regarding the use of microwave links, the congestion which currently exists in the sub-23GHz bands (and which is likely to occur in higher frequency bands as LTE is deployed) limits the extent to which capacity on these links can be expanded;
- c. where rival operators use Batelco wholesale leased lines, the ability to switch capacity on these leased lines to supply third parties will not constrain Batelco in the event that Batelco introduced a SSNIP, as the SSNIP would also apply to the wholesale leased line inputs upon which the rivals rely.

154. In the following assessment of the relevant wholesale market, the Authority has taken into account the ability of OLOs to self-supply their domestic data connectivity as an alternative to Batelco's wholesale data connectivity services. In particular, the capacity constraints associated with microwave, and the limited fibre footprint of alternative operators in Bahrain, indicates that self-supply by rival operators may not be a significant constraining factor on Batelco in the supply of wholesale data connectivity services in Bahrain.

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5.1 Relevant product market

155. The relevant product dimension of the market in which Batelco supplies wholesale data connectivity services to other Licensed Operators in Bahrain will include similar wholesale data connectivity services supplied by other operators, as well as any other options which may be regarded by Batelco's wholesale customers as being close economic substitutes for Batelco's wholesale services. Such potential alternatives may include self-supply in the event that OLOs deploy their own infrastructure instead of purchasing wholesale data connectivity services from Batelco.

156. As with the discussion of the relevant retail market, the Authority has considered whether wholesale data connectivity services supplied by way of wireless infrastructure (such as microwave links) should be included in the same market as wholesale services supplied over fixed-line infrastructure.

157. The Authority has also examined whether there are grounds to distinguish between customer access and transmission markets, whether traditional SDH-based data

⁷³ A number of respondents to the Authority's Request for Information outlined the ongoing difficulties they face in relation to Batelco's duct access service. These include the long lead times taken by Batelco to implement requests, the length of the term commitment required by Batelco in order to rent ducts, the absence of any SLA for the duct access service and the lack of a clear process for maintenance and fault restoration. Such concerns were repeated in a number of the submissions received on the Draft Determination, as summarized elsewhere in this determination.

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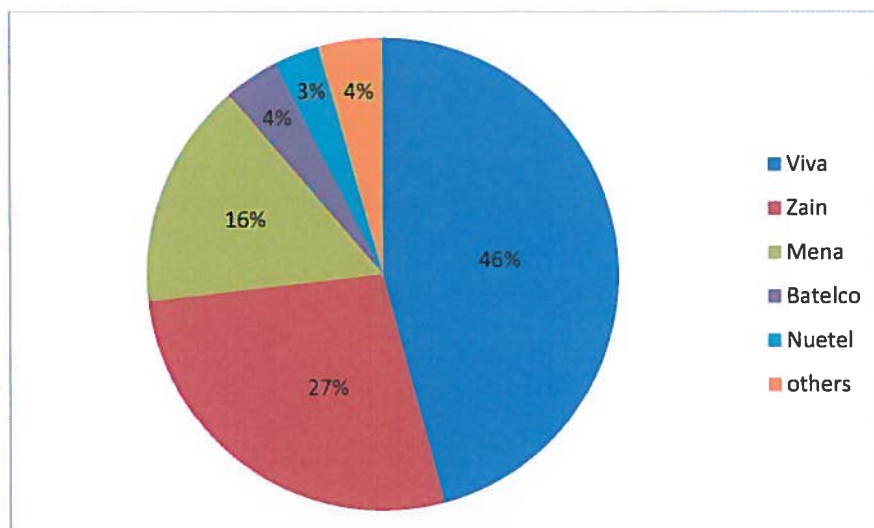
connectivity services are likely to be supplied in the same wholesale market as newer Ethernet-based connectivity services, and whether there are likely to be distinct wholesale markets according to different speeds.

5.1.1 Fixed versus wireless infrastructure

158. The use of wireless-based technology may represent an alternative for OLOs to Batelco's domestic wholesale data connectivity services. In particular, where an operator has its own infrastructure upon which microwave equipment could be collocated, microwave-based links could be a viable option for the purposes to providing domestic connectivity.

159. In 2013, there are approximately 1,375 licensed microwave-based fixed links being used in Bahrain by public telecommunications network operators, predominantly in the frequency bands between 6 – 42 GHz. The majority of these licensed links are used by Viva, Zain, and Menatelecom, primarily for backhaul purposes. Figure 4 summarises the distribution of licensed microwave-based links in Bahrain.

Figure 4: Distribution of licensed microwave-based links in Bahrain (2013)



160. Viva and Zain use microwave links to connect their mobile base transceiver stations (BTS) and Node B (3G) sites to their respective base station controllers (BSC) and radio network controllers (RNC). Both microwave and fixed wireline links (including wholesale leased lines as well as own fibre deployed through Batelco ducts) are used to connect higher-level network nodes within Viva's and Zain's mobile networks. In such cases, microwave links are typically used to provide back-up or redundancy within the core networks of the mobile operators.

161. Batelco makes considerably less use of microwave links than the other mobile and Wimax-based operators in Bahrain. Batelco's relatively low use of microwave-based capacity and its preference for using fixed-line infrastructure points to the advantages of the latter for meeting domestic connectivity needs. If OLOs had similar access to

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Batelco's fixed-line network, OLOs use of microwave-based links might be expected to be more in line with Batelco's.⁷⁴

162. A small number of microwave links are also used to access end-user premises. For example, Lightspeed and 2Connect have deployed microwave links to customer premises. Menatelecom and Viva also use microwave links to connect to some end user premises.
163. However, as discussed in the earlier section on retail markets, there are a number of technical issues associated with microwave links which may limit the extent to which they are able to constrain wireline domestic connectivity services such as Batelco's wholesale connectivity services. One of the mobile operators ([X]) using microwave links in Bahrain has informed the Authority that the microwave links have throughput limitations compared to fixed backhaul and that even though it does employ microwave links in parts of its network, it remains reliant on Batelco for its domestic transmission needs. According to another mobile operator ([X]), microwave links cannot sustain the higher speeds that are required for backhaul purposes.
164. The limitations of microwave-based backhaul are likely to become more pronounced as demand for bandwidth increases with the deployment of LTE mobile networks. In its consultation on the proposed award of new mobile spectrum to support high-speed mobile broadband services ("post 3G" services) in Bahrain, the Authority made the following observation:⁷⁵
- "Post 3G mobile services are expected to significantly increase traffic usage, thus increasing operators' backhaul bandwidth requirements. Although some backhaul may still be provided via microwave links, the demand for alternatives, including leased capacity and self-supplied fibre-based backhaul is likely to increase."
165. The Authority also referred to the congestion in the sub-23GHz bands used for microwave-based backhaul.⁷⁶
166. In responding to the Authority's consultation on the award of post-3G spectrum, Menatelecom and Zain both referred to the importance of fibre-based backhaul for the purposes of supporting LTE deployments⁷⁷, with Menatelecom in particular pointing to the prevailing constraints on microwave backhaul. Both Viva and Zain had previously expressed concerns over congestion on microwave-based backhaul links as being an issue for LTE deployments. The Authority notes that the deployment and launch of LTE services has already begun in Bahrain⁷⁸, with further deployment and expansion expected within the timeframe of this review.
167. As noted earlier⁷⁹, the sub-23GHz bands are important in that they allow for high-capacity transmission over relatively long distances. The presence of significant congestion, which

⁷⁴ This is consistent with the earlier discussion of the "cellophane fallacy", for example at paragraph 91 above.

⁷⁵ the Authority, "Award of Individual Mobile Telecommunications Licences and associated Frequency Licences for the delivery of mobile telecommunications services in the 900, 1800, 1900, 2100 and 2600 MHz frequency bands in the Kingdom of Bahrain : A consultation issued by the Telecommunications Regulatory Authority", 28 November 2012, paragraph 210.

⁷⁶ ibid, paragraph 212.

⁷⁷ the Authority, "Award of Individual Mobile Telecommunications Licences and associated Frequency Licences for the delivery of mobile telecommunications services in the 900, 1800, 1900, 2100 and 2600 MHz frequency bands in the Kingdom of Bahrain: Consultation Report", 28 January 2013, pages 31 and 44.

⁷⁸ For example, Batelco launched 4G LTE retail mobile services in early 2013.

⁷⁹ see paragraph 84 above.

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is likely to increase with LTE deployments, will limit the ability of microwave to act as a constraint on Batelco in the supply of wholesale connectivity services.

168. Such concerns have led other regulators such as Ofcom to exclude microwave backhaul from the relevant wholesale markets in which leased line services are supplied. As noted above⁸⁰, Ofcom excluded mobile backhaul over wireless links from the relevant markets it was considering, on the basis that the technical limitations associated with wireless technology and the costs of switching were such that wireless links would not impose an effective competitive constraint. Ofcom noted that although microwave was used by mobile operators particularly towards the edge of their mobile network to connect radio base stations, the deployment of 4G/LTE networks was expected to increase demand for fibre-based backhaul, with a corresponding reduction in demand for wireless backhaul.⁸¹
169. For the reasons given above, the Authority considers that microwave-based connectivity will only have a limited degree of economic substitutability with wholesale connectivity services over a fixed-line network. The relationship between microwave-based links and Batelco's wholesale connectivity services may in some instances be of a more complementary nature, with both microwave links being deployed and wholesale services being purchased from Batelco. As discussed above, both forms of connectivity are typically used by the other mobile network operators in Bahrain, with microwave links used at the edge of the network and wholesale connectivity services used towards the core of the mobile networks. This will to some extent reflect differing economics in different parts of a mobile network, but is also likely to reflect the 'cellophane fallacy' discussed earlier, resulting in a relatively high utilisation of microwave for backhaul purposes by the other network operators compared to Batelco.
170. In the dominance determination for wholesale international services, the Authority noted that while microwave links had been used to reach some of the cable landing points in Bahrain, these had been used initially as secondary or back-up links, and have progressively been replaced with other forms of backhaul. This again supports the view that microwave links are not close economic substitutes for fixed-line connectivity such as Batelco's wholesale data connectivity services.
171. For the purposes of this Draft Determination, the Authority has included microwave-based data connectivity services in the same wholesale market as wireline data connectivity services, although for the reasons set out above, the Authority considers that microwave-based services are unlikely to exert a significant competitive constraint in this market.

5.1.2 Access and core transmission

172. In a number of other jurisdictions, a distinction is drawn at the wholesale level between that part of a leased line which provides access to an end user premises (often referred to as the 'terminating' segment, although this typically includes an element of backhaul from the end user's local exchange to a higher-level node at which traffic is aggregated) and that part which provides core transmission capacity between network nodes (the 'trunk' segment). As ComReg has noted, market definition is the means to an end, namely the assessment of market power, and it is therefore important that the market definition

⁸⁰ see paragraph 87 above.

⁸¹ *ibid*, paragraph 4.336.

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exercise captures any central competitive differences between the trunk and the terminating markets.⁸²

173. ComReg refers to the basis for proposing separate wholesale markets for trunk and terminating segments of leased lines.⁸³

"The European Commission's first Recommendation, that trunk and terminating segments of leased lines belong in different markets, is primarily based on differences in the conditions of supply. The reasoning was that the economics of supplying a dedicated connection to an end-user are sufficiently different from the economics of supplying high capacity aggregated trunk connection to warrant the definition of separate markets."

174. ComReg expands on this distinction, noting that traffic in the core network is usually aggregated, such that economies of density and scale can generally be achieved more rapidly or at lower levels of investment in the core network than in the access network.⁸⁴ According to ComReg, the actual pattern of network deployment in Ireland supported the proposed definition of separate wholesale markets for trunk and terminating segments, with competing network build being restricted in most cases to certain high-density, typically intercity routes on the core network.⁸⁵ For example, in its competition analysis, ComReg refers to the emergence of ESB Telecom (a subsidiary of the Electricity Supply Board), which supplies predominantly wholesale managed bandwidth services and dark fibre based on its intercity fibre optic network.

175. In the case of Bahrain, the distinction between the terminating and trunk segments of a leased line is likely to be less evident due to the relatively small geographic size and the lack of 'intercity' routes. It may however be appropriate to retain such a distinction in the event that there are clear differences in competitive conditions between the supply of end user access and core transmission, in particular whether the opportunities for substituting away from Batelco's wholesale data connectivity services, and towards third party supply or self-supply, are greater in respect of one segment or the other.

176. As a preliminary point, the Authority notes that the deployment of competing fibre optic networks in Bahrain has been relatively limited. Competing fibre has been deployed in a small number of cases by OLOs, either through their own ducts or increasingly through existing ducts owned by Batelco. The competing fibre that has been deployed in Bahrain to date is generally limited to core network deployments by mobile operators or for the purpose of reaching landing points of international cables or dark fibre.

177. The Electricity and Water Authority ("EWA") owns a fibre network consisting of 24 fibres, of which 8 fibres (4 pairs) are surplus to EWA's requirements and potentially available to other operators. According to the Expressions of Interest document published by the EWA in October 2009, the fibre can be accessed at any of the 83 EWA substations throughout Bahrain. The EWA network is unlikely to be used for last mile access, as the EWA fibre connects EWA substations rather than end user premises.

⁸² ComReg, "Market Analysis: Leased Lines Markets Response to Consultation and Consultation on Draft Decision", 6 August 2008, paragraph 3.69.

⁸³ *ibid*, paragraph 3.44.

⁸⁴ *ibid*, paragraph 3.48.

⁸⁵ *ibid*, paragraph 3.57. Ofcom also found that more extensive competitive transmission infrastructure was present at BT's major metro nodes than at BT's local exchanges. For example, see Ofcom, BCMR Statement, 28 March 2013, Figure 4.4.

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178. If EWA were actively wholesaling its fibre, this might support maintaining a distinction between access and core transmission, on the basis that the EWA network represented a competitive alternative in respect of the latter but not the former, and hence competitive conditions would likely be different. However, there remains considerable uncertainty over the timeframe of availability of EWA dark fibre for OLOs, and so the Authority has placed little weight on the likelihood that EWA dark fibre will be a competitive source of domestic data connectivity within the timeframe of this review.⁸⁶
179. Another potential source of competitive supply of domestic data connectivity comes from the availability of access to Batelco ducts. As noted in paragraph 176, the deployment of fibre through Batelco ducts has typically been for the purposes of core transmission.
180. The uptake of duct access from Batelco has been relatively recent. According to information supplied to the Authority, Batelco supplied [X] metres of duct to OLOs in the first half of 2011, increasing to [X] metres in Q3 2011 and [X] metres in Q4 2011, mainly due to [X] (who increased its demand for ducts from [X] metres in Q3 to [X] metres in Q4). By Q4 2012, Batelco was supplying [X] metres of rented duct. In particular, Viva reported an increase in the length of duct rented from Batelco, from [X] metres in Q4 2011 to [X] metres in Q4 2012. The main operators currently renting Batelco ducts are [X] (backbone), [X] (for backbone including connectivity to the GCCIA dark fibre, as well as for access to some business premises), and [X] (deploying fibre to GCCIA and KFC). Zain also placed an order with Batelco for duct access (for a total of [X] of duct) in order to provide for the deployment of a fibre core network connecting [X].⁸⁷
181. Although there has been increasing uptake of duct access in recent years primarily for the purpose of deploying competing fibre-based core networks (including connectivity to international cables such as GCCIA), the geographic footprint of the competing fibre remains relatively small. For example, the total length of rented duct at the end of 2012 ([X] metres) represented less than 5% of Batelco's total duct network (based on information from the Authority's bottom-up cost modelling project)⁸⁸. In addition, the Authority is aware that OLOs have faced a number of ongoing difficulties in gaining access to Batelco ducts, including the length of time it takes to install OLO fibre, as well as delays in relation to the restoration time for faults where the OLO fibre is damaged. A number of OLOs have also complained about the 8-year minimum contractual term required by Batelco.
182. The Authority therefore considers that the competitive conditions in the wholesale supply of domestic data connectivity for the purposes of accessing an end user premises (i.e. customer access) are unlikely to differ substantially from the competitive conditions where domestic data connectivity is supplied for core network transmission purposes. In other countries where such a distinction is made, separate access and transmission markets have typically been defined on the basis that there are competitive alternatives available

⁸⁶ This contrasts with the experience noted above in Ireland, where the Electricity Supply Board subsidiary, ESB Telecom, has been active for a number of years in supplying wholesale managed bandwidth services and dark fibre based on its fibre optic network. Another example where competitive conditions between the access and core transmission networks differ is New Zealand, where independent fibre network operators such as FX Networks and the former TelstraClear (recently acquired by Vodafone) have deployed national core transmission infrastructure involving inter-city meshed networks, providing competition to Chorus and Telecom NZ.

⁸⁷ see [X] email to the Authority dated 4 February 2013.

⁸⁸ The Authority notes that this proportion will be lower to the extent that multiple OLOs are renting space within the same duct.

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and being used, such as wholesale leased line services offered by competing infrastructure-based network operators. The Authority does not consider that such a distinction is currently justified in Bahrain.

183. The Authority has therefore concluded that it is appropriate to define a single wholesale market for domestic data connectivity services which encompasses both access to end-user premises as well as domestic transmission capacity. In the event that separate access and transmission markets were defined, the Authority does not consider that the conclusions of its competition assessment would differ.

5.1.3 *Traditional SDH-based leased lines and Ethernet-based leased lines*

184. In an earlier section, the Authority considered whether retail data connectivity services provided using SDH-based technology were likely to be supplied in the same market as Ethernet-based retail services. The Authority noted that a number of operators had submitted that there are no major differences between SDH-based and Ethernet-based retail leased lines, although the prices of Ethernet-based services are typically lower than the prices of SDH-based services. According to most operators, retail demand for data connectivity services is expected to continue to move more towards Ethernet-based services.
185. At the wholesale level, demand for data connectivity services will to some extent reflect demand for retail data connectivity services, with Ethernet-based wholesale services such as Batelco's WLA service being used as an input to supply Ethernet-based retail services. However one important difference at the wholesale level is where connectivity is required for the purposes of mobile backhaul. Operators who require wholesale connectivity in order to connect mobile network nodes are only likely to regard Ethernet-based connectivity as a suitable option if synchronisation is supported. Synchronisation is a critical factor for mobile backhaul in relation to UMTS TDD, LTE TDD and WiMax services. As noted earlier, SDH-based mobile backhaul supports synchronisation. Newer 'carrier class' synchronous Ethernet services also support synchronisation and so are likely to be closer substitutes for SDH-based links. However, while Batelco uses synchronous Ethernet (MPLS) for its 3G mobile backhaul in Bahrain, the other mobile operators tend to rely on SDH-based wholesale services supplied by Batelco for backhaul purposes.
186. For the purposes of this Draft Determination, the Authority has included both SDH-based and Ethernet-based wholesale data connectivity within the same market. Whether a single wholesale market or separate wholesale markets are defined is unlikely to affect the outcome of the Authority's competition assessment.

5.1.4 *Differentiation by bandwidth*

187. The Authority has considered whether the relevant product market for domestic wholesale data connectivity should be differentiated according to bandwidth. Similar to the earlier analysis of bandwidths for data connectivity at the retail level, the Authority has taken into account both demand-side and supply-side considerations.
188. On the demand-side, distinct product markets for wholesale leased lines of specific bandwidths might be appropriate in the event that wholesale customers acquiring a low bandwidth connectivity service were unlikely to switch to higher bandwidth connectivity in response to an increase in price of the low bandwidth service. For example, a wholesale

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customer acquiring a 64kbps CAT service from Batelco (at a current tariff of BD58.508 per month) is unlikely to switch to a 155Mbps STM-1 CAT (BD3,552.331 per month) in the event that the price of the 64kbps service increases by 10%. This could suggest that the 64kbps and the 155Mbps wholesale data connectivity services are supplied in separate markets.

189. However, as is the case at the retail level, there are a range of wholesale data connectivity services available at intermediate bandwidths. For example, the customer acquiring a 64kbps CAT service could switch to a 128kbps CAT service (BD60.963 per month) when faced with a SSNIP. The CAT service is also available at 256kbps, 512kbps, 1Mbps, 1.5Mbps, 2Mbps, 45Mbps, 155Mbps and 622Mbps.
190. The chain of substitution effect is likely to be strengthened at the wholesale level with the increasing granularity of bandwidth options becoming available through Ethernet-based services. As noted earlier⁸⁹, Batelco's WLA service provides OLOs with a greater range of bandwidth options above 2Mbps: compared to the 3 variants of the high-speed CAT/LLCO service, the WLA service offers 15 variants above 2Mbps. As a result, there is less likely to be a clear 'break' in the chain of substitutability between bandwidths in the eyes of a wholesale customer purchasing domestic data connectivity.
191. In terms of supply-side substitution, there are also likely to be substitution possibilities from one bandwidth to another. As discussed earlier in relation to retail services, once an operator has deployed a network over which it supplies leased line services, it is likely to be able to easily offer low and high bandwidth wholesale services. Such substitution on the supply-side supports the use of a single wholesale market for all bandwidths.
192. The Authority's preliminary view is that the relevant product markets at the wholesale level should not differentiate according to bandwidth.

5.2 Relevant functional market

193. Domestic wholesale data connectivity services are supplied to other licensed operators, who use the wholesale services to supply downstream services such as retail data connectivity, as well as retail broadband services and mobile services (in the cases where the wholesale input is used for fixed or mobile backhaul respectively). The relevant functional level of the market is therefore the wholesale level.

5.3 Relevant geographic market

194. For the reasons given in the earlier section on the relevant geographic boundaries for the retail market, the Authority's preliminary view is that the relevant geographic market for the supply of domestic wholesale data connectivity services is national, with the exception of Amwaj Islands where Batelco does not currently have infrastructure in place.

5.4 Preliminary conclusions on the relevant wholesale market

195. The Authority's preliminary view is that the relevant wholesale market for this Draft Determination is the wholesale market for the supply of domestic data connectivity services in Bahrain, with the exception of Amwaj Islands. This market includes SDH-based and Ethernet-based wholesale services which provide guaranteed bandwidth to wholesale customers.

⁸⁹ see footnote 23 above.

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Summary of submissions

196. In line with its comments on defining the relevant retail markets, Batelco submitted that the relevant wholesale markets should be defined at sub-national, national, and regional levels, and that a distinction should be drawn between low bandwidth and higher bandwidth services. In addition, Batelco submitted that most European jurisdictions do not wholesale trunk routes to ex ante regulation, and that in relation to terminating segments, many jurisdictions either do not regulate newer Ethernet technologies or adopt a more relaxed form of price regulation.
197. Batelco also argued that uptake of duct access has been significant, especially once the growth in orders are taken into account. According to Batelco, the low regulated pricing of duct access since 2007 has encouraged uptake of duct access rather than wholesale leased lines.
198. Batelco proposed to define the following distinct wholesale markets:
- a. a wholesale market for the provision of mobile backhaul service, which would only include mobile operators, and for which the sole remedy available for such operators would be Batelco's duct rental service;
 - b. a wholesale market for domestic data connectivity services, with the main remedy being WLA encompassing a range of technologies (not just MPLS).
199. In its submission, Viva argued that wireless-based data connectivity services are not supplied in the same wholesale market as wired data connectivity services (for the same reasons given for the relevant retail market). Viva referred to Ofcom's conclusions in its 2010 WLA market review, that the relevant market excludes WLA services based on mobile, fixed wireless, and satellite technologies.
200. Zain supported the Authority's view on the relevant wholesale market, and agreed with the exclusion of Amwaj for the reasons given in the Draft. Zain proposed that the Authority initiate a market review to determine whether there is SMP or dominance in Amwaj and in other similar private developments where a licensee has exclusivity to deploy telecommunications infrastructure.
201. Menatelecom agreed with the Authority's views on the relevant wholesale market. Menatelecom also agreed that the current level of microwave deployment is a result of Batelco failing to offer a fit-for-purpose wholesale service with guaranteed bandwidth over its fixed network.
202. 2Connect also agreed with the Authority's preliminary conclusions on the relevant wholesale market, and pointed to the difficulties, including high costs and delays, which 2Connect has faced in deploying its own fibre through Batelco ducts. These difficulties explain the limited deployment of competing fibre in Bahrain.

The Authority's analysis and final conclusions on the relevant wholesale markets

203. In relation to Batelco's submission on the geographic markets and its proposal to define distinct wholesale markets for low and high bandwidth services, the Authority has set out its views on these issues in the earlier discussion of the relevant retail markets. For the reasons given earlier, the Authority considers that the relevant market is national (with the exception of Amwaj Islands), and that it is appropriate to define a single market for all bandwidths.

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204. Batelco claimed that most European jurisdictions draw a distinction between trunk and terminating segments of leased line services, and that wholesale trunk segments are generally not subjected to *ex ante* regulation.⁹⁰ In the Draft Determination, the Authority discussed this distinction⁹¹, noting that the more competitive trunk segments (providing core transmission between network nodes) have typically been deregulated in European markets. However, the Authority noted that in such markets, competing fibre networks were usually available and offering alternative wholesale leased line or dark fibre access. For example, in Ireland, the subsidiary of the Electricity Supply Board (ESB Telecom) offers wholesale managed bandwidth services and dark fibre, whereas such competitive alternatives are not currently available in Bahrain (with considerably uncertainty over whether the EWA fibre will become available).
205. For the reasons given in the Draft Determination, including the lack of competitive alternatives to Batelco's network and the difficulties faced by competitors in gaining access to Batelco ducts, the Authority remains of the view that a distinction between trunk and terminating segments is not currently justified in Bahrain.
206. Batelco's submission on the relevant wholesale market discusses the nature of remedies, including more relaxed forms of price regulation. The issue of appropriate remedies is discussed later in this Annex, as these are a consequence of a dominance finding.
207. While Batelco claimed that the uptake of its duct rental product has been significant, the Authority notes that there have been a number of barriers associated with the use of Batelco ducts by competitors. A number of these barriers have been addressed through the Reference Offer review process, such as the charges for duct surveys. However, as noted below, competitors have continued to complain about the terms on which duct access is made available in Bahrain, including the absence of tight Service Level Agreements. Such concerns are likely to have limited the uptake of the duct rental product, both in terms of core transmission (where, for example quick restoration of any faults is critical), and in terms of accessing customers (where, for example, Batelco's requirement for a minimum term commitment of 8 years has been raised by OLOs as being excessive).
208. There is also some uncertainty over whether the deployment of competing fibre through Batelco ducts is consistent with the policy direction as set out in the 3rd NTP. For example, the 3rd NTP states (paragraph 7.3.5) that:
- "Government requires that, should it so determine, Other licensed operators may be enabled to self-supply fibre-optic and other links for the purpose of connecting their infrastructures to the NBN, but they shall not be permitted to seek to employ self-supplied fibre links to bypass the NBN or in any way undertake activities that undermine the viability or security status of a Government supported NBN."
209. In addition, the 3rd NTP explicitly refers to the provision of wholesale access services at both Layer 1 and Layer 2 levels. The Authority therefore considers that the development of dark fibre access should be considered as a potential remedy in this market. This is discussed later in this Annex.

⁹⁰ There appears to be a typographical error in Batelco's submission, which states that "most if not all [European] jurisdictions do not subject wholesale trunked leased lines segments to less *ex ante* regulation." The Authority understands Batelco's submission to mean that most European jurisdictions do not subject wholesale trunked leased lines segments to *ex ante* regulation.

⁹¹ see paragraphs 172 to 183 above.

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210. On Batelco's proposed definition of separate wholesale markets for mobile backhaul services and domestic data connectivity services, the Authority notes that Batelco provides no reasoning, justification, or evidence for its proposed definition of 2 separate wholesale markets. For example, Batelco provides no analysis of the lack of substitutability between services in its proposed 'mobile backhaul' market and its proposed 'domestic data connectivity' market, nor whether competitive conditions in each of its proposed wholesale markets are likely to be sufficiently different to justify such a distinction.
211. The Authority notes that Zain, Menatelecom, and 2Connect all agreed with the Authority's wholesale market definition. Although Viva submitted that wireless solutions such as microwave-based services should be excluded, the Authority considers that this will not alter the conclusions of the competition assessment, as little weight is placed on the competitive constraint arising from wireless-based services.
212. In response to Zain's submission that the Authority initiate a market review to determine whether there is SMP or dominance in Amwaj and in other similar private developments, the Authority notes that the market for leased line services in Amwaj is currently very limited. For this reason, the Authority does not consider Nuetel to be a likely candidate for having a dominant position in relation to the supply of wholesale data connectivity services in Amwaj Islands.
213. Having considered the submissions received on the Draft Determination, the Authority's view is that the relevant wholesale market is for the supply of domestic data connectivity services in Bahrain, with the exception of Amwaj Islands.

6 Assessment of whether there is SMP in the relevant retail markets

214. The Telecommunications Law defines an "Operator with Significant Market Power" as⁹²:

"a Licensed Operator which holds twenty-five percent or more of the market share of the relevant market as determined from time to time by the Authority.

When determining such matter, there shall be taken into consideration the ability of a Licensed Operator to influence market conditions, its turnover relative to the size of the market, its control of the means of Access to Users, its financial resources and its experience of providing products and services in the market. The Authority may determine that the Licensed Operator has significant market power even if such operator holds a share of less than twenty-five percent of the market or that it does not have significant market power even if it holds more than such percentage."

215. In its Competition Guidelines⁹³, the Authority sets out the relevant considerations for assessing market power in a relevant market. The Authority notes that in undertaking an *ex ante* assessment of market power, the aim is to understand how competitive the market is currently and whether this is likely to evolve within a reasonable timeframe.
216. In the current market review, the Authority is interested in whether any Licensed Operator has a position of SMP in the retail market for the supply of domestic data connectivity

⁹² Telecommunications Law, Article 1.

⁹³ The Authority "Competition Guidelines", 18 February 2010, Section 3.

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services. A Licensed Operator with SMP is subject to tariff controls as per Article 58 of the Telecommunications Law.⁹⁴

217. As noted in the Competition Guidelines, market power generally derives from a combination of several factors which, taken in isolation, may not necessarily be determinative. The main factors that the Authority considers when assessing market power are as follows:⁹⁵
- a. the market shares of individual entities;
 - b. other competitive constraints, including those from existing and potential competitors, barriers to entry and expansion, and the degree of countervailing buyer power; and
 - c. evidence on behaviour and performance.
218. For the purposes of assessing SMP in this market review, the Authority has defined a retail market for the supply of domestic data connectivity services in Bahrain. In this retail market, Licensed Operators supply end users with guaranteed bandwidth connectivity between locations in Bahrain. The above competition factors are considered in the context of each of this retail market.
219. Consistent with the Modified Greenfield approach⁹⁶, the existing RTN Regulation has been excluded from the Authority's assessment of competition in the retail market. As a result, the Authority's assessment focuses on the competitive constraints that operate independently of any SMP finding in this market.

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6.1 Market shares and existing competition

220. The main supplier of retail domestic data connectivity services to business customers in Bahrain is Batelco. As noted in paragraph 51 above, Batelco currently offers a number of retail data connectivity services, including Batelco's Local MPLS services, Local Leased Circuits, and LAN Connect service.
221. According to the Authority's Telecommunications market indicators report issued in September 2013, there are a number of other Licensed Operators actively supplying domestic leased line services in Bahrain.⁹⁷ The Authority has gathered information from Batelco and competing suppliers of retail data connectivity services through its Request for Information and from its ongoing market intelligence activities.
222. Table 5 summarises the supply of retail data connectivity services in Bahrain as of December 2010, 2011, and 2012. Table 5 highlights the number of retail services supplied by Batelco and each of the three largest competitors, as well as the total number of retail services supplied.

⁹⁴ see paragraph 40 above.

⁹⁵ *ibid*, Section 3.2.

⁹⁶ see paragraph 46 above.

⁹⁷ see the Authority, "Telecommunications markets indicators in the kingdom of Bahrain", September 2013, page 8.

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Table 5: Number of Domestic Data Connectivity Services

	December 2010	December 2011	December 2012
Batelco	[X]	[X]	[X]
2Connect	[X]	[X]	[X]
Menatelecom	[X]	[X]	[X]
Lightspeed	[X]	[X]	[X]
Others	[X]	[X]	[X]
Total	[X]	[X]	[X]
Share (%)			
Batelco	[X]%	[X]%	[X]%
2Connect	[X]%	[X]%	[X]%
Menatelecom	[X]%	[X]%	[X]%
Lightspeed	[X]%	[X]%	[X]%
Others	[X]%	[X]%	[X]%
Total	100%	100%	100%

223. According to Table 5, Batelco's share of retail domestic data connectivity services at the end of 2012 was [X]%. Although Batelco's share of retail data connectivity services has slowly been declining in recent years, Batelco's share remains very high. Batelco's competitors remain fragmented, with no other operator having had a market share in excess of 10% during the 2010-2012 period.
224. The Authority has also examined market shares based on capacity and revenues. The revenue shares are based on the responses to the Authority's Request for Information. In order to estimate the bandwidth associated with SDH-based services, the Authority has taken the specific bandwidth (e.g. STM-1 155Mbps etc) and number of services reported by each respondent to the Authority's Request for Information. For Ethernet-based services, the Request for Information contained speed bands (such as 2 Mbit/s \leq x < 10 Mbit/s), and so the Authority has applied the midpoint of each band to the number of services in that band reported by each respondent. This has enabled the Authority to estimate capacity-based shares of retail domestic data connectivity services.
225. Table 6 summarises Batelco's share of retail domestic data connectivity services in Bahrain, based on the number of services supplied, capacity, and revenues. In all cases, Batelco's market share has been consistently high, exceeding 80% throughout 2011 and 2012. This comfortably exceeds the threshold (25%) which is referred to in the definition of SMP in the Telecommunications Law.

Table 6: Domestic Data Connectivity Services – Batelco Market Shares

	December 2010	December 2011	December 2012
Number of services	[X]%	[X]%	[X]%
Capacity	[X]%	[X]%	[X]%
Revenues	[X]%	[X]%	[X]%

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226. The Authority also notes that Batelco's competitors rely to a significant extent on access to Batelco's wholesale connectivity services in order to compete at the retail level. By the end of 2012, OLOs supplied [X] domestic data connectivity services at the retail level, representing [X]% of the total number of services supplied. Of these [X] retail services, [X] services were supplied using Batelco's wholesale leased lines, and a further [X] retail services were supplied using OLO fibre deployed in Batelco ducts. In other words, nearly two-thirds of OLO-supplied retail data connectivity services were based on Batelco's wholesale access services (wholesale leased lines or duct access), indicating the importance of access to Batelco's network as a source of retail competition. As a result, over 90% of domestic data connectivity services supplied in Bahrain were delivered over Batelco's network at the end of 2012.⁹⁸
227. The reliance of competitors on access to Batelco's network is a result of Batelco having a near-ubiquitous network reach. The benefit of having a near-ubiquitous fixed network in supplying data connectivity services was recognised in Batelco Jordan's submission on the draft decision issued by TRC in relation to dedicated capacity services. In commenting on the competitive position of Orange, the incumbent fixed operator in Jordan, Batelco Jordan stated that:⁹⁹
- "The objective reality is that Orange Fixed is alone in benefiting from a quasi-ubiquitous fixed network and is uniquely placed to serve business customers and public administrations, be they single-site or multi-site entities, and that Orange Fixed has no incentives to share its bottleneck resources with third parties. Orange Fixed's structural advantages shield it from competition, and absent decisive ex ante regulatory intervention, there is no prospect for effective competition in the DC markets and the markets downstream thereof."
228. In Bahrain, Batelco's persistently high retail market share of domestic data connectivity services has exceeded the 25% threshold that is referred to in the definition of SMP in the Telecommunications Law. In addition, Batelco faces fragmented competition at the retail level, with no other operator supplying more than 5% of domestic data connectivity services as of the end of 2012 (and no competitors having exceeded 10% of the market in the last three years). The combined market share of Batelco's 3 largest competitors in Q4 2012 was less than 15%. Such a distribution of market shares strongly suggests that Batelco continues to have SMP in the retail market.
229. In addition to examining market shares, the Authority has also had regard to recent trends in retail prices of domestic data connectivity services in Bahrain. The Authority notes that as Batelco has previously been found to have SMP in respect of the supply of retail leased line services, Batelco's retail services have been subject to the Retail Tariff Notification (RTN) Regulation, and this may have constrained to some extent any excess profits that Batelco would otherwise have earned on these retail services. Nevertheless, the trends in retail prices for Batelco's domestic data connectivity services may be informative as to the extent of competitive pressure that Batelco has faced in supplying these services in Bahrain.

⁹⁸ In undertaking its market review into the supply of dedicated capacity services, TRC Jordan found that Orange Fixed had a similar market share (in excess of 90%) once retail services supplied by OLOs using Orange Fixed's network are attributed to Orange Fixed (see TRC, April 2010, page 24). Combined with high barriers to entry, this supported TRC's conclusion that Orange Fixed had a dominant position. Batelco Jordan supported TRC's conclusion.

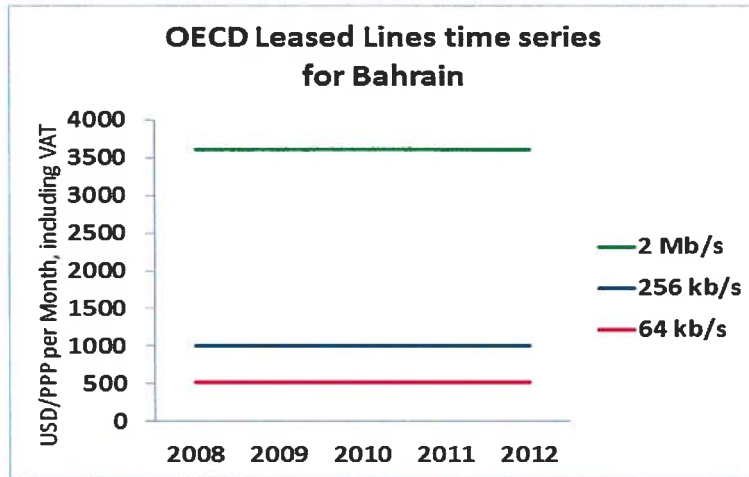
⁹⁹ "Umniah and Batelco Jordan's joint response to the Public Consultation Document issued by the TRC Review of Dedicated Capacity Markets in Jordan", 9 June 2010, page 11.

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230. Figure 5 summarises the prices of leased line services in Bahrain over the period from 2008 to 2012. This shows that leased line prices have not changed in Bahrain since the first Arab price benchmarking study took place in 2008. This supports the finding that Batelco has faced little competition when supplying domestic leased line services in Bahrain.

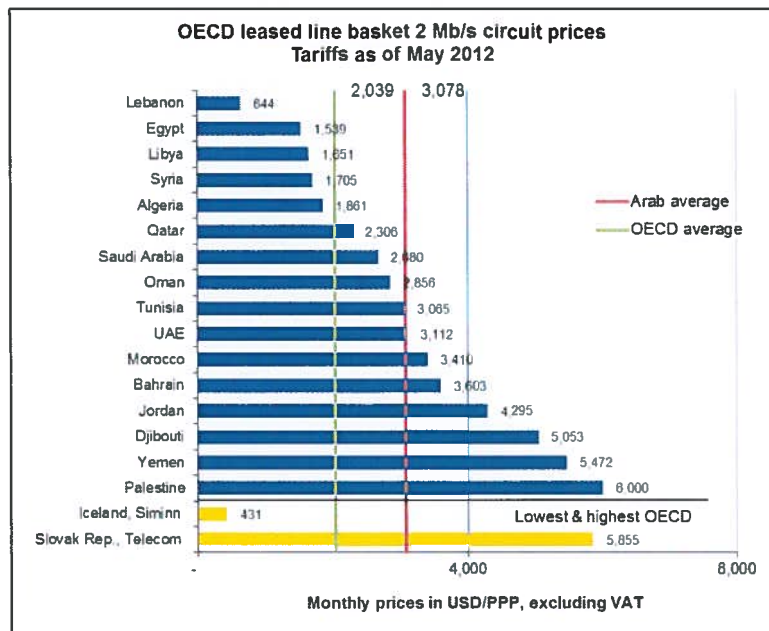
Figure 5: Retail Leased Line Prices, Bahrain 2008-2012



Source: the Authority "Bahrain Telecom Pricing: International Benchmarking, March 2013"

231. Figure 6 compares the prices of a 2Mbps leased circuit in AREGNET countries and in the OECD in 2012. This indicates that Bahrain's prices are relatively expensive.

Figure 6: Retail Leased Line Prices, AREGNET benchmarking



Source: the Authority "Bahrain Telecom Pricing: International Benchmarking, March 2013"

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232. The static pricing of domestic leased line services is in stark contrast to what has happened to retail prices in other markets which have become increasingly competitive in Bahrain in recent years. As shown in Table 2 earlier, retail prices of fixed broadband services in Bahrain have fallen by up to 27% per annum since 2008, with particularly large reductions seen in the period since 2010 when mobile broadband has emerged. The lack of movement in leased line pricing as evidenced in Figure 5 indicates that similar competitive pressures have not been present in respect of these services.
233. During 2012, Batelco submitted for the Authority's approval a proposal to revise its retail tariffs for its Local MPLS services¹⁰⁰. Batelco's proposed revisions included the addition of new speed variants of the Local MPLS services, as well as reductions in retail prices for the majority of the speeds offered. According to the proposal, the new tariffs would be available to new customers as well as existing Batelco customers who wished to migrate from Batelco's domestic leased line services (local leased circuits, LAN Connect, or Local MPLS) to the new tariffs.
234. In discussing the reasons for the proposed changes, Batelco noted that the Local MPLS tariffs prevailing at the time had been approved by the Authority in 2004, and that there had been no changes to the Local MPLS tariffs since 2004¹⁰¹. Batelco also stated that since 2004, its local customers in Bahrain have been asking for better prices for a long time. According to Batelco, it had been charging prices that exceeded regional benchmarks¹⁰².
235. In the reasoning given for the proposed revisions to its Local MPLS tariffs, Batelco makes no mention of increasing competition in the supply of domestic leased line or MPLS services in Bahrain. The ability of Batelco to have maintained prices unchanged at relatively high levels (relative to Batelco's benchmarking against regional operators) since 2004 suggests that domestic competition has not been a motivating factor for Batelco.
236. The reasoning given by Batelco for the proposed revisions to its Local MPLS tariffs again contrasts with the reasoning given in NCTs that relate to Batelco's fixed broadband services. For example, in NCT 52, which is related to consumer broadband services, Batelco proposed to introduce discounted monthly rentals and discounted devices for customers subscribing to qualifying packages¹⁰³. According to Batelco, the proposed offers were necessary in order to compete in a broadband market which had become highly competitive. Batelco referred to the consumer broadband offers of competing operators in Bahrain as being extremely competitive in terms of price and value for money¹⁰⁴.
237. In summary, Batelco has a very high share of retail domestic data connectivity services in Bahrain, both in terms of the number of services supplied and in terms of capacity and revenues. Most of Batelco's competitors who supply retail domestic data connectivity services either rely on access to Batelco's wholesale services, or offer retail services over microwave links. For the reasons given in the earlier discussion of the relevant markets,

¹⁰⁰ NCT 46 was submitted to the Authority in June 2012, and followed an earlier NCT (NCT 42) submitted in January 2012.

¹⁰¹ Batelco NCT 46 Local MPLS, page 5.

¹⁰² *ibid*, page 6.

¹⁰³ Batelco NCT 52 Consumer Broadband Subsidy Offer, page 2.

¹⁰⁴ *ibid*, pages 4 and 5.

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while the Authority has included microwave-based services in the relevant retail market, the competitive constraint of microwave on Batelco is considered by the Authority to be relatively weak, which further exacerbates Batelco's high market share.

238. In addition, pricing evidence indicates that competitive pressures faced by Batelco in this market have been relatively weak, with Batelco's retail prices for domestic leased line services unchanged since at least 2008.
239. In the Authority's preliminary view, Batelco's persistently high retail market share and its stable retail pricing since 2008 supports a finding that Batelco faces limited existing competition in the supply of retail domestic data connectivity services in Bahrain.

6.2 Potential entry and expansion

240. The extent to which existing operators will be constrained by the threat of potential entry or by expansion by other operators will depend on whether barriers to entry or expansion are significant. Entry barriers occur when an existing operator in a market has an advantage over potential entrants into that market. Barriers to expansion are similar but relate to the ability of an existing operator to expand; for example, where an existing competitor faces capacity constraints that limit its ability to increase its scale of production.
241. In order to supply retail domestic data connectivity services, an entrant would need to either deploy its own network or gain access to the network infrastructure or wholesale capacity of another network operator. In order to represent a competitive constraint on existing operators within a market, such entry must be likely to occur on a sufficient scale and within a reasonable timeframe.
242. An infrastructure-based entrant could deploy microwave links or a fixed network (or a combination of both) in order to access customer premises and provide the necessary transmission between those premises. New microwave-based entry is unlikely as such an entrant would have to acquire the relevant spectrum, and there is currently congestion in the spectrum bands that are likely to be of most interest (the sub-23GHz bands) for the development of new high-capacity transmission. In addition, the limitations of microwave-based supply¹⁰⁵ mean that any such entry that did occur is unlikely to represent a significant competitive constraint on existing fixed operators such as Batelco in the retail market.
243. Another form of potential infrastructure-based entry would be where an entrant deploys a competing fixed-line (most likely fibre-based) network. In principle, such entry could be occur in a number of ways:
- a. installation of new ducts: the entrant deploys its own ducts and fibre in new trenches;
 - b. access to existing ducts: the entrant rents existing ducts through which to pull its own fibre; or
 - c. dark fibre: the entrant leases dark fibre from another operator.
244. The first and third options are unlikely to represent viable forms of new entry during the timeframe being considered in this review. The installation of new ducts is unlikely to be

¹⁰⁵ see paragraph 82.

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feasible for OLOs in Bahrain,¹⁰⁶ while dark fibre is not currently offered by Batelco. A potential source of dark fibre in Bahrain is the EWA, although EWA fibre is not currently available on a commercial basis and it is unlikely to be so within the timeframe of this market review¹⁰⁷. In any case, the EWA fibre will not provide access to end user premises, as the fibre only runs between EWA nodes. It is therefore unlikely that EWA fibre would provide a sufficiently extensive platform on which a new entrant could enter the retail market for domestic data connectivity.

245. This leaves access to existing ducts. A number of operators supply domestic data connectivity services to retail customers using their own fibre that has been pulled through Batelco ducts. The main operator using access to Batelco ducts to supply retail data connectivity services is [X], although [X] and [X] also supply a small number of services through Batelco ducts.
246. Although duct access is available in Bahrain through Batelco's Reference Offer, the number of retail data connectivity services supplied by OLOs using duct access remains small. As of the end of 2012, only 58 out of a total of 2,278 domestic retail data connectivity services in Bahrain were supplied by OLOs using their own fibre deployed in Batelco ducts (representing 2% of the total).
247. In addition, a number of OLOs have complained about the terms on which access to Batelco ducts is available in Bahrain. Such complaints centre around the complexity, preliminary study costs, point of service limitations and time taken to process orders for duct access, as well as the minimum contractual period required by Batelco in respect of duct access.
248. In summary, of the above options for new entry and/or expansion by existing competitors, the Authority considers that wholesale access to capacity on existing networks is likely to be the most viable form of potential competition.¹⁰⁸
249. In terms of potential expansion, the Authority notes that Batelco's market share has been persistently high in recent years, and that Batelco's retail competitors have generally been unable to capture a substantial share of the retail market. Market shares of individual competitors have typically been static, with the combined market share of Batelco's three largest competitors remaining just above 10% over the 2010-2012 period. This indicates that new entrants have struggled to expand beyond a relatively small scale.

6.3 Countervailing buyer power

250. Countervailing buyer power refers to the ability of buyers to limit the ability of sellers to exercise market power. It refers to the relative bargaining power of buyers and sellers, and is most evident where buyers and sellers have to negotiate. In the current context,

¹⁰⁶ The Authority, "Dominance Determination for Wholesale International Services", 20 February 2013, paragraph 220.

¹⁰⁷ EWA issued an Expressions of Interest on 29 October 2009 – however there is no evidence of effective use of EWA fibre for public telecommunications purposes since.

¹⁰⁸ This is consistent with Batelco Jordan's submission on TRC's draft decision on the market review for dedicated capacity services. According to Batelco Jordan, fixed-wireless access (FWA) "is not suitable at this time and for the foreseeable future to deliver high-quality high-capacity services for businesses and administrations. It is also clear that deployment of direct access fibre connections is only feasible to an extremely limited extent in the present circumstances." See "Umniah and Batelco Jordan's joint response to the Public Consultation Document issued by the TRC Review of Dedicated Capacity Markets in Jordan", 9 June 2010, page 11.

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countervailing buyer power may exist where business customers acquiring domestic data connectivity services can threaten to divert its demand away from a particular supplier.

251. Countervailing buyer power will be enhanced where the following conditions apply:

- a. the buyer has alternative choices;
- b. the buyer is well-informed about alternative sources of supply;
- c. the buyer could switch to alternative sources of supply without incurring significant costs;
- d. the buyer could produce the input itself or “sponsor” new entry by another suppliers; and
- e. the buyer is an important outlet for the seller and therefore the seller would be prepared to negotiate i.e. limited alternative buyers.

252. For business customers acquiring domestic data connectivity services in Bahrain, there have been very few alternatives to Batelco. While a number of OLOs so offer retail services in competition with Batelco, these competitors typically use microwave-based links and do not have the ubiquity of Batelco’s network. Batelco has itself stated that its local customers in Bahrain had been asking for lower prices for a long time¹⁰⁹. If such customers had possessed countervailing buyer power, they would have been able to exercise that power in order to obtain better deals.

253. The Authority’s preliminary view is that customers acquiring domestic data connectivity services in Bahrain possess little or no countervailing buyer power.

6.4 Preliminary conclusion on SMP

254. In the Authority’s preliminary view, Batelco’s persistently high share of retail domestic data connectivity services (in terms of the number of services, capacity, and retail revenues), the absence of price reductions in recent years, difficult entry and expansion conditions, and the lack of countervailing buyer power, support a finding that Batelco has SMP in the retail market for the supply of domestic data connectivity services in Bahrain.

255. The Authority does consider the retail market for domestic data connectivity services to be potentially competitive in the future, as long as a set of fit-for-purpose wholesale connectivity services are available. In this regard, the introduction of the WLA service has been a step forward in developing the range of wholesale access services available. Further improvements are nevertheless likely to be necessary to ensure that wholesale access services make conditions for entry into the downstream retail market more conducive, increasing competitive pressure on existing suppliers in this retail market.

256. In the event that the Authority’s final determination in this market review finds that Batelco currently retains SMP in this market, the Authority may undertake a further review of this retail market as evidence of increased competition emerges.

Summary of submissions

257. In its submission, Batelco noted that its market share of domestic data connectivity services has been gradually declining in recent years, in particular since the introduction of

¹⁰⁹ see paragraph 234 above.

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the WLA service. Batelco disagreed with the view in the Draft Determination that competitive pressures have not been present in this market. Batelco submitted that irrespective of market share trends, there are enough wholesale remedies available to remove barriers to entry and to allow existing and potential competitors to enter and compete. As a result, Batelco argued that the Authority should reconsider its conclusion that Batelco has SMP in this market.

258. Batelco also noted that the market shares in the Draft Determination are based on 2012 data (or up to Q2 2013 in limited cases), and hence do not take account of potentially important developments during 2013, such as the introduction of the WLA service (with [X] WLA circuits delivered to OLOs to date) and lower prices for the CAT and LLCO services. In addition, Viva entered this market in March 2012 and may have developed throughout 2013.
259. Batelco submitted that the RTN Regulation has stifled its ability to lower retail MPLS prices and to respond to wholesale and retail customer demand in a more timely manner. Batelco also argued that competitive pressure arising from Viva's imminent launch of leased line services (based on duct access) was a significant contributor to Batelco's proposal to lower leased line prices in Bahrain.
260. Batelco concluded that a high retail market share and stable retail pricing alone does not support a finding that Batelco faces limited competition in the supply of domestic data services in Bahrain. According to Batelco, barriers to entry into the retail market have been virtually removed through the introduction of duct access, CAT, LLCO, and WLA services, and with these wholesale remedies in place, it is unfair to continue to regulate Batelco at the retail level as well. Batelco submitted that the fact that competitors have not chosen to fully utilise these wholesale services does not warrant continued *ex ante* regulation at both the wholesale and retail levels.
261. The submissions from Viva, Zain, Menatelecom, and 2Connect all agreed with the Authority's view in the Draft Determination that Batelco has SMP in the retail market for domestic data connectivity services. In addition,
- a. Zain's submission referred to the lack of availability of dark fibre in Bahrain, despite the Telecommunications Law (Article 40) providing for such access. According to Zain, Batelco's ducts and fibre provide Batelco with a significant competitive advantage to attract business customers;
 - b. Menatelecom agreed that the limited fibre footprint of Batelco's competitors provides little or no competitive constraint on Batelco, and that this is evidenced by the markets over-dependence on microwave deployment;
 - c. According to 2Connect's submission, Batelco is the only operator with fixed infrastructure in Bahrain, due to the freeze imposed on OLO deployment of fixed infrastructure and the infeasibility of using EWA fibre. As a result, customers have no alternatives for operator diversity, which may lead to larger organisations (who value such diversity for security reasons) relocating to outside of Bahrain.

The Authority's analysis and final conclusions on SMP

262. Contrary to Batelco's submission, the Authority did not state that competitive pressures were not present in the retail market for domestic data connectivity services. The Authority acknowledged that Batelco's retail share had been slowly falling due to the

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emergence of some competition from other suppliers. However, compared to other markets (such as the broadband market), the level of competition seen in the supply of retail data connectivity services has been more limited.

263. As noted by Batelco, the Competition Guidelines issued by the Authority state that it is important to analyse market shares over time, and that barriers to expansion may be low where new entrants have been able to grow rapidly. However in the retail market for domestic data connectivity, Batelco's market share has remained very high during 2010-2012 (as shown in Table 6 above), while no competitor had a retail share of more than 5% in 2012. Both the level of market share for Batelco, and the trend in market shares over time, support the view that competitors have found it difficult to enter and expand in this market, and that Batelco continues to have SMP.
264. Batelco claim that there have been potentially important competitive developments during 2013 which were not reflected in the Draft Determination. However, the Authority has reviewed responses to the annual market indicators questionnaire, containing data up to the end of Q4 2013. According to the information on domestic data connectivity, Batelco continued to have a high market share, for example at [X]% of the number of retail domestic data connectivity services as of Q4 2013 ([X]% as of Q4 2012), and [X]% of retail revenues ([X]% as of Q4 2012).
265. While there are a number of wholesale remedies available (such as CAT/LLCO, WLA and duct access), submissions from a number of other operators referred to a number of limitations of the existing wholesale remedies offered by Batelco. For example, according to Menatelecom, long lead times, length of term commitments, lack of SLAs, and lack of appropriate maintenance and fault restoration processes restrict the ability of OLOs to offer competitive retail services. 2Connect submitted that Batelco continues to take an extremely long time to deliver wholesale circuits, which has adversely affected the services offered by OLOs.¹¹⁰
266. This indicates that the existing regulated wholesale products require some enhancements in order to allow competitors to compete more effectively. For example, the lack of SLAs on some wholesale products (such as CAT, LLCO, and duct access) may have hampered downstream competition. These are issues which the Authority has been working on (such as the introduction of the WLA service with a well-defined SLA), and will continue to work on as a result of this Determination.
267. While the availability of wholesale access products has lowered barriers to entry into the downstream retail market, a number of price and non-price issues with the various wholesale products (lack of SLAs, term commitments etc.) are likely to have limited the extent to which downstream competition has emerged to date. As noted above, the Authority will continue to enhance the wholesale terms of access to ensure that such access is available on fair, reasonable, and non-discriminatory terms. The Authority expects that such access will translate into a more dynamic retail market for domestic data connectivity services, and as evidence of such competition emerges, the Authority may reconsider whether Batelco retains SMP in that retail market.
268. The Authority also disagrees with Batelco's submission that the Authority has applied "rigorous and somewhat over-enthusiastic tests maximising entry assistance" which has

¹¹⁰ In the Draft Determination, the Authority noted that Batelco had argued in favour of strong SLAs with effective penalties in the context of the 2010 market review for dedicated capacity in Jordan.

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stifled Batelco's ability to respond in a more timely manner to wholesale and retail customer demand. The tests that are established in the RTN Regulation are standard tests that are designed to ensure that a vertically-integrated operator such as Batelco sets its retail and wholesale prices in such a way that does not give rise to an anti-competitive effect in a relevant market.

269. The objective of such tests is not to subsidise inefficient entry, but instead to allow an efficient entrant to replicate Batelco's downstream services using an upstream wholesale input. Where Batelco offers a relevant wholesale service on terms that enable such replication, and where Batelco submits complete information and analysis demonstrating that its proposed pricing complies with such tests, the RTN Regulation allows for the timely approval of Batelco's pricing. This framework promotes efficient competition while at the same time providing Batelco with the ability to respond to customer demand in a timely manner.
270. In the specific case of Batelco's Local MPLS pricing, the Authority notes that prior to 2012, Batelco had not been offering an equivalent Ethernet-based wholesale service that would enable the replication of its retail MPLS pricing. In order to facilitate the introduction of such a wholesale service and to allow Batelco to introduce new pricing at the retail level, the Authority provided extensive guidance and assistance to Batelco, which is summarised in the Authority's Draft Order on the Wholesale Local Access Service.¹¹¹ This culminated in the introduction of the Wholesale Local Access service in November 2012.
271. For the reasons given above, the Authority has concluded that Batelco continues to have SMP in the retail market for the supply of domestic data connectivity services in Bahrain.

7 Assessment of whether there is dominance in the relevant wholesale markets

272. According to the Telecommunications Law, a dominant position is defined as follows:¹¹²

"the Licensee's position of economic power that enables it to prevent the existence and continuation of effective competition in the relevant market through the ability of the Licensee to act independently – to a material extent – of competitors, Subscribers and Users."

273. In the current market review, the Authority is interested in whether Batelco has a dominant position in the relevant wholesale market for the supply of domestic data connectivity services in Bahrain, with the exception of Amwaj Islands. A finding of dominance at the wholesale level triggers a regulatory obligation to submit a Reference Offer to the Authority for approval under article 57 of the Telecommunications Law. The competitive constraints that operate in respect of the services supplied in this wholesale market are considered below.

¹¹¹ see the Authority "Authority's Draft Order on the Wholesale Local Access Service", 12 July 2012 (Ref: MCD/07/12/097), paragraphs 6-29.

¹¹² Telecommunications Law, Article 1.

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7.1 Market shares and existing competition

274. The main supplier of wholesale domestic data connectivity services to Licensed Operators in Bahrain is Batelco. As shown in Table 7, there are very few alternative suppliers who are active in this wholesale market, with Batelco's share being well in excess of 90%.

Table 7: Supply of wholesale domestic data connectivity services

	2010	2011	2012
Batelco	[X]	[X]	[X]
Viva		[X]	[X]
Lightspeed	[X]	[X]	[X]
Zain	[X]	[X]	[X]
Total	[X]	[X]	[X]
Share (%)			
Batelco	[X]%	[X]%	[X]%
Others	[X]%	[X]%	[X]%
Total	100%	100%	100%

Source: industry responses to Request for Information.

275. According to its response to the Authority's Request for Information, Batelco identified Viva as its main competitor in supplying wholesale local connectivity in Bahrain, using microwave technology and its own fibre deployed through Batelco ducts. Batelco submitted that both microwave and fibre through rented ducts are the main competitive alternatives to its wholesale leased line services.

276. A number of OLOs referred to Viva as offering wholesale connectivity, although noted that Viva has limited coverage in Bahrain. Although Viva itself submitted that [X], and that it is not aware of any nationwide wholesale services supplied by OLOs in Bahrain other than Batelco, Viva has confirmed that it does provide wholesale connectivity to other operators as part of its IP Transit service by which the interconnection link is required to connect the OLO POP with the Viva node. The Authority's preliminary view is that it is appropriate to include these interconnection links in the competition assessment at the wholesale level, as such Viva-supplied links represent an alternative to connectivity that may have otherwise been acquired from Batelco.

277. Although there are few alternative wholesale suppliers of domestic data connectivity services in Bahrain (other than Batelco), an OLO may have options for meeting its needs for domestic connectivity, in addition to Batelco's wholesale data connectivity services (i.e. the WLA, CAT, and LLCO services). These options include the possibility of using microwave links as well as deploying OLO fibre through Batelco ducts. In its response to the Authority's Request for Information, Batelco referred to both these as being competitive alternatives to its wholesale leased line services.

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278. A number of operators in Bahrain effectively self-supply their own domestic data connectivity needs, typically using microwave links or their own fibre deployed through Batelco ducts. Even where such operators do not actively offer wholesale services to other OLOs through this self-supplied infrastructure, Batelco's supply of wholesale services may be constrained by these options.
279. However, as discussed earlier, microwave-based supply of domestic data connectivity is likely to represent only a limited competitive constraint on fixed-line services, due to the limitations of wireless networks in supplying guaranteed bandwidth services. According to one operator who has deployed both microwave and fibre-based links, most of the business customers that it has approached have shown little interest in microwave-based connectivity and have instead preferred fibre. Batelco has also acknowledged that while the use of microwave is technically quite feasible, one of the main disadvantages is its instability during extreme weather conditions¹¹³.
280. One of the main areas where microwave links have been employed by OLOs is for the purposes of providing mobile backhaul in Bahrain. As shown earlier in Figure 4, approximately three-quarters of licensed microwave links in Bahrain in 2013 are used by Viva and Zain, both of whom operate mobile networks and employ microwave links predominantly around the fringe of their networks.
281. While microwave links may continue to be important, mobile operators are likely to increasingly rely on fibre-based links as higher-speed mobile broadband services become more established in Bahrain, especially with the emergence of LTE-based services¹¹⁴. In addition, the use of microwave-based links is likely to be in part a result of frustrations experienced by OLOs with respect to the wholesale services offered by Batelco¹¹⁵. The introduction of Batelco's WLA service has addressed a number of these issues, such as the lack of a comprehensive SLA for the prevailing wholesale services. However, the current WLA service still remains to be improved with some technical features such as the support of synchronisation which is a critical feature for mobile backhaul and an effective end to end SLA. The Authority notes that it has received complaints in 2013 regarding the quality of the WLA service supplied by Batelco.
282. In terms of the deployment of competing fibre in Bahrain, the footprint of the competing fibre remains relatively limited.¹¹⁶ An OLO with its own fibre deployed in Bahrain is likely to rely at least in part on wholesale access to Batelco's ubiquitous network in order to meet its own or third-party demand for domestic data connectivity.

7.2 Potential entry and expansion

283. In the absence of wholesale access to an existing network being available, a potential entrant would have to deploy its own infrastructure, either by accessing the ducts of existing operators (most likely to be Batelco in the current case), or by developing its own network using either microwave facilities or installing its own ducts. For the reasons given in relation to potential entry into the relevant retail market, the Authority does not consider

¹¹³ In addition, in its submission on the market review for dedicated capacity services in Jordan, Batelco Jordan argued that FWA is vulnerable to interference affecting quality-of-service and is not suitable to deliver high-quality high-capacity business services.

¹¹⁴ see paragraphs 164 to 166 above.

¹¹⁵ see the earlier discussion at paragraph 88 and following.

¹¹⁶ see paragraph 181 above.

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that the threat of potential entry or expansion is likely to represent a significant competitive constraint on existing operators within the timeframe of this competition assessment.

7.3 Countervailing buyer power

284. In the wholesale market for the supply of domestic data connectivity services in Bahrain, OLOs acquire wholesale capacity from Batelco or from other OLOs. In this market, countervailing buyer power could exist where the wholesale customer could credibly threaten to switch its demand away to another source of supply in order to discipline any attempt by the supplier to raise its wholesale prices.

285. For the reasons given in relation to countervailing buyer power in the relevant retail market, the Authority's preliminary view is that wholesale customers acquiring domestic data connectivity services possess little or no countervailing buyer power.

7.4 Preliminary conclusion on Dominant Position

286. In the Authority's preliminary view, Batelco's persistently high share of wholesale domestic data connectivity services, ubiquitous fixed network infrastructure, difficult entry and expansion conditions, and the lack of countervailing buyer power, support a finding that Batelco has a dominant position in the wholesale market for the supply of domestic data connectivity services in Bahrain.

Summary of submissions

287. Batelco disagreed with the Authority's conclusion that Batelco remains dominant in the wholesale market for domestic data connectivity. As discussed earlier, Batelco proposed two distinct wholesale markets and identified a remedy for each.

288. The other submissions received on the Draft Determination all agreed with the Authority that Batelco has a dominant position in the wholesale market for domestic data connectivity services.

289. Viva requested that the Authority ensure that the remedies are appropriate and that wholesale products are available on terms that are fair, reasonable, and non-discriminatory, with tariffs based on forward-looking incremental costs. Zain referred to the lack of access to dark fibre as an important issue for OLOs, while Menatelecom repeated a list of issues with Batelco's wholesale products. Menatelecom also encouraged the Authority to impose strict and potentially structural separation between Batelco's wholesale and retail arms, to create the opportunity for Batelco's wholesale division to expand. Menatelecom further submitted that the Authority should periodically audit Batelco's duct availability and publish its findings, and agreed with Batelco Jordan's statement that there is no prospect for effective competition in the downstream markets unless there is decisive *ex ante* regulation.

The Authority's analysis and final conclusions on dominance

290. The Authority has discussed Batelco's proposal to define distinct wholesale markets in the earlier section on the relevant wholesale markets. The Authority discusses the issue of appropriate remedies in the concluding section of this Annex.

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291. The Authority notes the submissions made by the other Licensed Operators, which support the Authority's view that Batelco continues to be dominant in the wholesale market for domestic data connectivity services.
292. The Authority also notes that Batelco's share of the supply of wholesale domestic data connectivity services has remained very high throughout 2013. For example, as shown in Table 7, Batelco supplied in excess of 90% of wholesale domestic data connectivity services in Q4 2012; by Q4 2013, Batelco's share was virtually unchanged according to responses to the Authority's latest annual market indicators questionnaire.
293. For the reasons given in the Draft Determination, the Authority has concluded that Batelco continues to have a Dominant Position in the wholesale market for the supply of domestic data connectivity services in Bahrain.
294. In particular, Batelco continues to have a very high wholesale market share of domestic data connectivity services in Bahrain. The main alternatives for an OLO requiring such wholesale connectivity are to self-supply such connectivity using either microwave links or to deploy their own fibre through Batelco ducts. As noted earlier,¹¹⁷ the use of microwave links faces a number of limitations, and Batelco has itself characterised wireless links as being "temporary and often unreliable".¹¹⁸ As a result, the Authority does not consider that self-supply using microwave links represents a significant competitive constraint.
295. While self-supplied fibre-based connectivity deployed in Batelco ducts is potentially a good option, and is currently being used by some OLOs, the footprint of competing fibre remains relatively limited. The issues raised by OLOs in relation to the process for accessing Batelco ducts are likely to have constrained the uptake of duct access.

8 Summary of final views and Implications

296. For the reasons set out above, the Authority has defined the following markets for the purposes of this Determination:
- a. the retail market for the supply of domestic data connectivity services in Bahrain, with the exception of Amwaj Islands; and
 - b. the wholesale market for the supply of domestic data connectivity services in Bahrain, with the exception of Amwaj Islands.
297. Having reviewed the submissions received on the Draft Determination, the Authority has concluded that Batelco has SMP in the above retail market, and has a Dominant Position in the above wholesale market.
298. With respect to remedies in the **retail** market, Batelco will, as a result, continue to be subject to tariff controls under Article 58 of the Telecommunications Law and the RTN Regulation in respect of retail services supplied in that market. As outlined earlier,¹¹⁹ the RTN Regulation requires that any Licensed Operator who has been determined by the Authority to have SMP in a relevant retail market demonstrate to the Authority's satisfaction that any retail tariff that it wishes to introduce or modify complies with the

¹¹⁷ see paragraph 82 above.

¹¹⁸ see paragraph 138 above.

¹¹⁹ see paragraph 26.

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relevant tariff controls. The tariff controls set out in the RTN Regulation are designed to ensure that the proposed tariffs do not give rise to undue discrimination, excessive pricing, margin squeezes, predatory pricing, or abusive bundling.

299. With respect to remedies in the **wholesale** market, Batelco is required to continue to make available access to its network in accordance with Article 57 of the Telecommunications Law. Specifically, Batelco would have to continue to offer wholesale high-bandwidth access to customer premises and wholesale access to transmission capacity on terms that comply with the Telecommunications Law.
300. Given the importance of the wholesale data connectivity services in supporting competition in a number of downstream retail markets, the Authority is concerned to ensure that the existing wholesale services, including the CAT, LLCO, and WLA services, should be made available to OLOs on terms that enable competitors to compete with Batelco in the relevant downstream markets.
301. In the Authority's view, it is also important that wholesale access is available at the passive level, as well as at the active level (such as wholesale leased line services). In particular, access at the passive level provides OLOs with greater flexibility, control, and incentives to invest in their own facilities. Such access also avoids duplication of key infrastructure such as ducts.
302. The two main options for access to Batelco's network at the passive level are duct access (which is currently offered by Batelco through its Reference Offer), and dark fibre (which is not currently offered by Batelco). The Authority takes cognizance of the views of some OLO's that the lack of access to dark fibre provides Batelco with a significant competitive advantage to attract business customers. Access to dark fibre is provided for under the Telecommunications Law, specifically at Article 40, and is also referred to in the Access Regulation issued by the Authority in 2005.¹²⁰
303. Furthermore, the Authority considers that the introduction of a dark fibre service is consistent with the Government policy direction given in the 3rd NTP. Specifically, Section 7.3.4 of the 3rd NTP states the following:
- "The NBN arising with Government financial support must provide only wholesale services at Layers 1 & 2, as described by the International Standards Organisation (OSI) model definitions, to all other licensed operators that wish to buy them for onward sale, within their own products, to end Users."
304. Within the context of a fibre-based NBN, Layer 1 access refers to dark fibre. The Authority therefore believes that Batelco should offer access to dark fibre, as this is consistent with Section 7.3.4 of the 3rd NTP. Once such a fit-for-purpose dark fibre access product is available and being used, the Authority may consider allowing for the withdrawal of the existing duct access product from Batelco's Reference Offer.

¹²⁰ see the Authority "Access Regulation", 30 April 2005, paragraph 3.5(g).

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305. Having reviewed the submissions on the Draft Determination, the Authority's view is that there remain a number of areas where further work is required in order to have a set of fit-for-purpose wholesale remedies in place which are capable of sustaining effective competition in the relevant downstream markets and which are consistent with the Government policy direction set out in the 3rd NTP. These areas for further work include the following:
- a. CAT and LLCO: current lack of comprehensive end-to-end SLAs covering service ordering, provisioning, and fault restoration;
 - b. WLA: does not currently support the necessary technical characteristics for mobile backhaul (including, but not necessarily limited to, synchronisation);
 - c. Dark fibre: product not currently offered by Batelco.
306. It may be appropriate to introduce more stringent performance parameters (for example, in terms of fault restoration times) in respect of key transmission links which are used for backhaul purposes. It may also be appropriate to introduce a mechanism for the automatic payment of service rebates in the event that Batelco fails to meet the performance criteria set out in the SLAs, rather than OLOs having to claim such rebates.
307. The Authority is also of the view that the terms and conditions of the wholesale access products should be enhanced to include a set of optional features that would enable OLOs to better respond to the specific needs of certain business customers (such as banks) which highly value service continuity and thus usually require some form of redundancy. This set of options would typically include different levels of physical and logical protections (i.e. redundancy of aggregation links, access links and ports/CPEs) as well as mechanisms to rapidly re-route traffic in case of primary link failure. Such optional protection features would most likely also be considered as important by OLOs that use Batelco's wholesale access products for their network transmission.
308. The Authority therefore expects Batelco to address the issues outlined in paragraphs 305 to 307 above, through the introduction of comprehensive SLAs for existing wholesale services, as well as the introduction of a dark fibre product with comprehensive SLAs. The Authority intends to provide Batelco with further detailed directions on the specific areas that need to be covered in Batelco's Reference Offer to address the issues highlighted in this determination.
309. In conclusion, the terms of access, both for existing wholesale access products as well as for any new product (such as dark fibre), must include comprehensive SLAs. In addition, the Authority's view is that an Ethernet-based wholesale connectivity service should be offered by Batelco to OLOs which supports mobile backhaul, including the need for synchronisation. As discussed earlier¹²¹, 'carrier class' Ethernet services support synchronisation, and the Authority understands that Batelco uses carrier class Ethernet (MPLS) for its 3G mobile backhaul in Bahrain.
310. SLAs should include all relevant processes relating to the delivery and maintenance of data connectivity services, including (but not necessarily limited to) ordering, provisioning, quality of service and fault restoration processes, as well as penalties to be imposed upon Batelco for failing to adhere to these processes.

¹²¹ see paragraph 106.

Short Title

Annex – Reasoning for the Final Determination

311. The Authority emphasises that under Article 57(e) of the Telecommunications Law, the terms and conditions and tariffs offered by Batelco for access to its network shall be fair, reasonable, and non-discriminatory.
312. In this regard, the Authority refers to the submission made by Batelco Jordan in response to the TRC's draft decision on dedicated capacity (DC) markets in Jordan. According to Batelco Jordan¹²²,
- "The SLAs need to explicitly cover all aspects of wholesale DC provision, including associated co-mingling/co-location conditions and any backhaul. Clear and effective penalties need to be associated to failure to meet SLAs. KPIs must explicitly be comparative and published, and need to measure individual processes as well and end-to-end provisioning, migration and repair times on a comparative basis, also with Orange Fixed's own and affiliate retail operations, enabling competitors to be confident that they are not discriminated against. Penalties on the dominant operator for failure to provide equivalent access and associated facilities should be very severe, to ensure non-discrimination from the outset. Umniah/BTJ call upon the TRC to include each of the above suggestions as explicit regulatory obligations."
313. The Authority agrees with Batelco Jordan's concerns over the potential for discrimination to occur between the internal and external provision of wholesale data connectivity services in respect of both price and non-price terms, and for the leveraging of market power from the wholesale level into the relevant downstream markets.
314. The Authority does consider the retail market for domestic data connectivity services to be potentially competitive in the future, as long as a set of fit-for-purpose wholesale connectivity services are available which take into account the above considerations. Although the Authority concludes, based on current market evidence, that Batelco continues to have SMP in this retail market, the Authority may undertake a further review of this retail market as evidence of increased competition emerges. In the event that such a review concluded that SMP no longer existed, ex-ante regulation would no longer apply, and Batelco would only be subject to ex-post measures. This is entirely consistent with the 3rd NTP, which signals a move towards greater reliance on *ex post* regulation as long as structural imbalances within the telecommunication sector that prevent the achievement of effective competition are addressed.¹²³ In setting out its policy in this area, the Government refers to the possibility of separation of business elements and units in order to remove barriers to the efficient operation of markets. In this regard, the Authority notes that one of the main motivations of separation (either functional or structural) is to ensure that the separated entity has commercial incentives to develop its wholesale business, and to address issues of discriminatory treatments by a vertically-integrated operator in favour of its downstream operation. In the context of the current market review, the Authority considers that the enhancements discussed above to the set of wholesale connectivity services should go a long way to addressing competitive imbalances and facilitating an outcome of effective competition in the relevant downstream markets as envisaged by the 3rd NTP.

¹²² "Umniah and Batelco Jordan's joint response to the Public Consultation Document issued by the TRC Review of Dedicated Capacity Markets in Jordan", 9 June 2010, page 18.

¹²³ see 3rd NTP, Section 7.5.