



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

## Strategic Market Review

# Future Ex-Ante Market Regulation and Other Regulatory Measures to Foster a Dynamic Sector Development

### Final Report

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### Public Version

*(Confidential information has been replaced by [X])*

**Purpose:** To holistically review relevant markets currently susceptible to *ex-ante* regulation in Bahrain, and to propose changes when justified to the list of markets susceptible to *ex-ante* regulation, as well as to propose other regulatory measures that would foster a dynamic sector development.

# Strategic Market Review

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## Executive Summary

1. This strategic market review (hereinafter “SMR”) has been carried out in the context of the Telecommunications Regulatory Authority’s (hereinafter “TRA”) overall objectives for the sector, including to promote an effective and dynamic telecommunications market.
2. The draft SMR report was published on 15 December 2014 and was open to public consultation. Responses were received from Batelco, Mena, Viva and Zain. Their main comments have been addressed in the External Response document, available for download from the Authority’s website. The final SMR has been updated where deemed appropriate by the Authority to reflect these responses.
3. A lot of the sector developments in recent years have been positive and provided clear benefits to the end users. However, it has to be acknowledged that the regulatory framework, including market regulation, needs to be continuously reviewed to ensure that it reflects developments in what is generally a vibrant and rapidly changing sector. This review is focused on critically and holistically reviewing current ex-ante market regulations. Ex-ante regulation refers to remedies and obligations which are imposed upon operators with dominant / SMP positions in defined relevant markets.
4. The SMR is forward looking and identifies and proposes which parts of the overall telecoms market should remain susceptible to ex-ante regulation going forward, but also where current market regulation and remedies should be lifted or amended. Moreover, the SMR sets out recommendations on other regulatory market measures, which should assist in stimulating a more effective market for the benefit of end users. The SMR evaluates not only the market situation and technological developments in Bahrain in recent years but also implications to the Bahraini telecommunications sector of international trends and drivers for the future.
5. TRA proposes that, going forward, ex-ante regulation should be lifted in all retail markets. This is based on the standard principle that ex-ante regulation in retail markets should only be introduced (or retained) if ex-ante regulation of relevant (upstream) wholesale markets is not sufficient to correct a market failure (i.e. lack of effective and sustainable competition). Furthermore, ex-ante regulation should in any case only be introduced (or retained) if general competition law (i.e. ex-post regulation) is not sufficient to deal with market failures.
6. In putting forward this direction, however, TRA emphasises that the implementation is subject to the SMP operator first meeting, in practical operational and ‘market tested’ terms, prescribed terms and conditions for ‘fit-for-purpose’ wholesale products (i.e. terms and conditions which allow OLOs to, whenever relevant, a) replicate the retail products and services of the SMP/dominant operator in the relevant market(s) and b) have access to equivalent products as the wholesale provider has (e.g. broadband access and backhaul fibre for LTE operators).
7. TRA plans for a phased approach to lifting ex-ante regulations in all retail markets and an increased focus will hence be on ensuring that price and non-price wholesale conditions are indeed fair, reasonable and non-discriminatory.
8. In summary, according to TRA’s preliminary conclusions, there would only be four retail markets susceptible to ex-ante regulation going forward. As stated, however, TRA’s general direction is to also lift these retail markets from the list provided that ‘market

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tested' wholesale remedies are in place that allow for other operators to effectively compete in the retail markets.

<b>Withdrawn</b>	<ul style="list-style-type: none"> <li>• Retail market for dial-up internet access services from a fixed location</li> <li>• Retail market for fixed narrowband access services for residential customers</li> <li>• Retail market for fixed originated domestic calls for residential customers to either fixed or mobile subscribers within the Kingdom of Bahrain</li> <li>• Retail market for fixed originated international calls to Zone 1 countries</li> <li>• Retail market for fixed originated international calls to Zone 3 countries</li> </ul>
<b>Maintained<sup>1</sup></b>	<ul style="list-style-type: none"> <li>• Retail broadband internet access from a fixed location for business users</li> <li>• Retail domestic data connectivity services</li> <li>• Retail international leased lines (connectivity services)</li> </ul>
<b>Redefined</b>	<p><b>Currently:</b></p> <ul style="list-style-type: none"> <li>• Retail market for fixed narrowband access services for non-residential customers</li> <li>• Retail market for fixed originated domestic calls for non-residential customers to either fixed or mobile subscribers within the Kingdom of Bahrain</li> </ul> <hr/> <p><b>Proposed:</b></p> <ul style="list-style-type: none"> <li>• Retail market for premium<sup>2</sup> access to call services and domestic calls from a fixed location<sup>3</sup></li> </ul>

Source: TRA

<sup>1</sup> However, the stated retail markets should only be maintained on the list until such point where proportionate but effective (market-tested) wholesale remedies are available in the relevant upstream market(-s).

<sup>2</sup> Premium access includes current ISDN type products and IP-based solutions serving business users with demand for multiple channels and lines but excludes standard single line business subscriptions such as PSTN or fixed-wireless.

<sup>3</sup> Please refer to paragraph 16 below and associated footnote.

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9. The list of relevant wholesale markets that may be susceptible to ex-ante regulation going forward is presented below.

<b>Withdrawn</b>	<ul style="list-style-type: none"> <li>• “Freephone originating access” (wholesale call origination)<sup>4</sup></li> </ul>
<b>Maintained</b>	<ul style="list-style-type: none"> <li>• Wholesale domestic data connectivity services</li> <li>• Wholesale broadband access for business users</li> <li>• Wholesale physical infrastructure access for business users</li> </ul>
<b>Redefined</b>	<p><b>Currently:</b></p> <ul style="list-style-type: none"> <li>• Call termination on Batelco’s fixed network</li> <li>• Wholesale market for termination services on Batelco mobile network, on Zain mobile network and on Viva mobile network</li> </ul> <hr/> <p><b>Proposed:</b></p> <ul style="list-style-type: none"> <li>• Wholesale call termination on individual fixed networks</li> <li>• Wholesale call termination on individual mobile networks</li> </ul>

Source: TRA

10. The SMR recommends also a number of other measures that, in different ways, should promote market development and efficient competition:
- a. Where possible within the parameters of the Telecommunications Law, include, as an integrated part of future market reviews, the imposition of remedies based on the proportionality principle (i.e. the step to identify and impose remedies based on proportionality tests should be part of review and determination process, and based on public consultation as part of the market review);
  - b. Monitor and analyse the actual impact of imposed remedies in the relevant ex-ante markets, in order to, if necessary, amend the remedies if they are not effective in correcting identified market failure (i.e. this is an activity outside the scope of the market review) This should be done as part of the periodic reviews of the Reference Offers;
  - c. Subject to the policy direction set out in the forthcoming Fourth National Telecommunications Plan (‘NTP4’), introduce and implement new regulations or guidelines for infrastructure sharing and site deployments;
  - d. Subject to the policy direction set out in the forthcoming NTP4, consider MVNO licenses and agreements;

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<sup>4</sup> However, noting that this wholesale product was never based on a dominance determination and a remedy was never enforced by TRA.

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- e. Subject to the policy direction set out in the forthcoming NTP4, prepare the process for allocation of valuable frequency spectrum;
  - f. Subject to the policy direction set out in the forthcoming NTP4, adapt the regulatory framework to support the NBN, and subject to mandate given by the Government, develop a national Broadband Strategy for Bahrain, which should include both supply-side factors (e.g. the future model and supply conditions for the NBN) and demand-side factors.
11. The proposed activities stemming directly from the SMR are based on TRA's views and conclusions on relevant markets going forward.
- a. As a consequence of the finalisation of the SMR, TRA's intention is to issue a determination in relation to the list of markets susceptible to ex-ante regulation going forward, as well as reviews and determinations in relation to the markets that are proposed to be deregulated as per the SMR recommendations.
  - b. Subject to the effective implementation of 'fit-for-purpose wholesale remedies, TRA will undertake market reviews of the remaining retail markets on the list of markets susceptible to ex-ante regulation
  - c. TRA's plan is further to undertake market reviews of the wholesale markets for 'termination on fixed networks' and 'termination on mobile networks' respectively, taking into account the considerations made in the SMR, including e.g. the degree of substitution at the retail level, as well as the implications of increasing adoption of all IP-based networks.
12. As part of the review of the Retail Market for Mass-market Access to Calls Services, including Domestic Calls from a Fixed Location, the Authority will also consider whether there is a need to define a separate retail market for Premium Access to Calls Services.
13. TRA does not intend to review the markets for Retail Business Broadband Internet Access from a Fixed Location, Retail Domestic Data Connectivity Services and Retail International Data Connectivity Services in the determinations that will follow the SMR.
14. This is because these markets were reviewed as recently as 2014. TRA has since been monitoring the developments in these markets and has not seen evidence to suggest that the dynamics in these markets have changed since the time of the review. A review of these markets at this point is therefore not necessary.
15. However, NTP4 may lead to changes in policy that could have an impact on these markets in the future. If this is the case, TRA will re-visit these markets as necessary.
16. In summary, TRA will review the following retail markets after the publication of the final SMR:
- a. Retail Market for International Outgoing Calls from Bahrain;
  - b. Retail Market for Access to Calls Services, including Domestic Calls from a Fixed Location.<sup>5</sup>

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<sup>5</sup> Based on the available evidence, the Authority will determine whether the "Retail Market for Access to Calls Services, including Domestic Calls from a Fixed Location" should actually be defined as two distinct markets (i.e. one for Mass Market Access, and one for Premium Access) as is suggested in this SMR report.

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17. In addition, as per the Roadmap published in section 11, the Authority plans to review the wholesale market for the provision of termination services on individual fixed and mobile networks. Such markets reviews are expected to start at the end of 2015.
18. The way forward with respect to future ex-ante regulation, and other market facilitating measures, will lead to an even more deregulated telecommunications market in Bahrain. At least over some time, significant benefits should be expected, but TRA recognises that there may be risks that need to be mitigated.
19. The table below summarises the expected impact of the outcomes of the SMR.

Pros (+)	Cons (-)
A further deregulated and open telecommunications market – less dependency on TRA (ex-ante) intervention	Transitional implementation period, and associated costs, of enhanced wholesale regulatory interventions (but done to ensure that more effective & sustainable downstream competition can take place in business segment)
Overall - more customer choice (alternative providers of bundled and non-bundled services) and enhanced level of competition and innovation	Potential for increased anti-competitive conduct (if effective remedies are not put in place), e.g. undue cross-subsidisation and undue bundling offers
Economic efficiency gains and a transfer of producer surplus to consumer surplus through increased price competition, notably due to enhanced competitive pressures in the business segment	Potential lessening of competition in some deregulated retail markets in cases where smaller OLOs cannot respond to larger operators (MNOs) offers
Decreased regulatory costs and burden on both TRA and the affected operators (at least over time)	
Enhanced attractiveness to invest and operate in Bahrain through a regulatory framework at the forefront and in line with best practices	
Opportunity for additional (wholesale) revenue generation by the providers of wholesale products and services	

Source: TRA

## 1 Introduction

### 1.1 Background

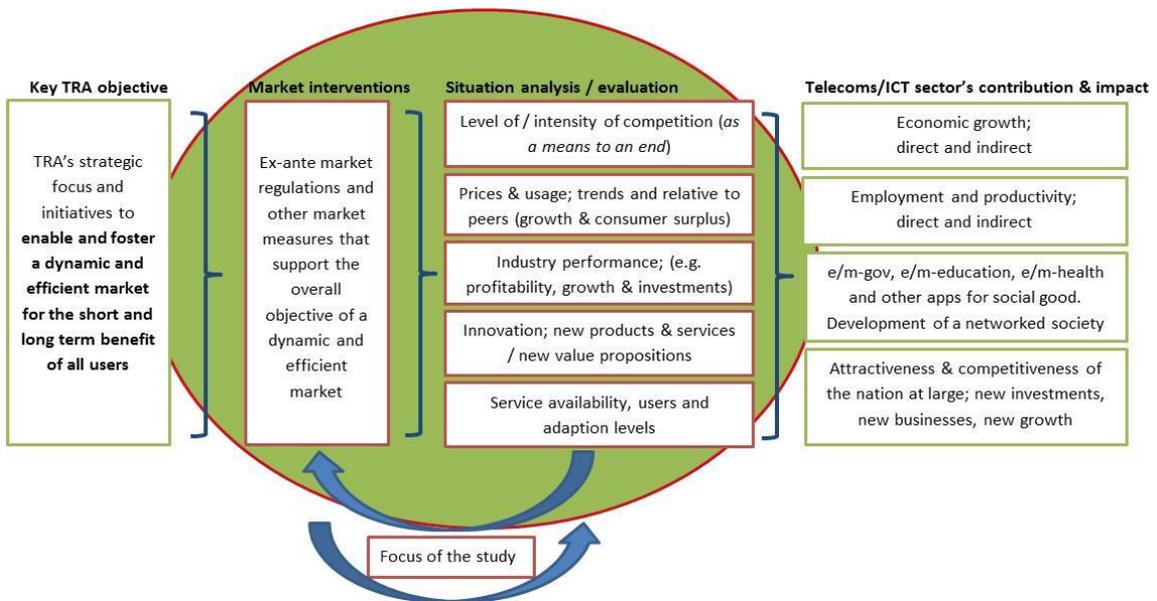
20. This strategic market review (hereinafter “SMR”) is carried out in the context of the Telecommunications Regulatory Authority’s (hereinafter “TRA”) overall objectives for the sector, including to promote an effective and dynamic telecommunications market, but also bearing in mind the important impact that the sector has on the economy and society at large in Bahrain.
21. The last time TRA undertook a similar SMR was in 2008. In 2008, a strategic and retail market review study was undertaken which culminated in a statement issued on June 3, 2008, which proposed a number of regulatory measures to be introduced. The majority of the therein proposed measures have indeed been effectively implemented, and have had a large impact on the market and its performance. This included e.g. the introduction of a third mobile operator, development of competition guidelines and introduction of number portability for both fixed and mobile services. Furthermore, a separate determination of Significant Market Power (‘SMP’) was issued on the same date (June 3, 2008) which included determinations on a number of defined *retail* markets.
22. In TRA’s view, it is timely to carry out a new strategic review of the market. Significant competition has developed in Bahrain in the last few years, not least for mobile and broadband services. Consumers have today, in most cases, a range of choice of suppliers for services. The development of effective competition has, in many but not all areas, led to substantial price reductions and new service innovations for both consumers and business users in Bahrain.
23. A lot of the sector developments have been positive and provided clear benefits to the end users. However, it has to be acknowledged that the regulatory framework, including market regulation, needs to be continuously reviewed to ensure that it reflects developments in what is generally a vibrant and rapidly changing sector.
24. This review is focused on critically and holistically reviewing current ex-ante market regulations. Ex-ante regulation refers to remedies and obligations which are imposed upon operators with dominant / SMP positions in defined relevant markets. Thus far effective competition has not developed in the entire telecommunications market, but as and where effective competition develops it is critical to make sure that the market interventions in place are relevant and proportionate to the prevailing situation in each relevant market.
25. The SMR is forward looking and identifies and proposes which parts of the overall telecoms market should remain susceptible to ex-ante regulation, but also where current market regulation and remedies should be lifted or amended, as a consequence of sustainable competition developing. Moreover, the review sets out recommendations on other regulatory market measures, which should assist in stimulating a more dynamic and effective market for the benefit of end users.
26. The SMR evaluates not only the market situation and technological developments in Bahrain in recent years but also implications to the Bahraini telecommunications sector of international trends and drivers for the future.

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## 1.2 Purpose and scope of the SMR

27. The purpose of the SMR is to strategically review the telecommunications market and propose changes to market regulations that would stimulate a more dynamic and efficient sector. This includes to:
  - a. holistically review the list of relevant markets currently subject to *ex-ante* regulation;
  - b. propose a revised list of markets which are susceptible to future *ex-ante* regulation; and
  - c. propose other regulatory measures that would foster a more dynamic market for the benefit of end users.
28. A key part of the SMR is to evaluate and analyse the development and level of competition in the different relevant markets, including to assessing whether there is justification to re-defined current defined markets. In this regard the performance of the market players ('suppliers') in terms of generating value (including pricing), choice and benefits to the users is evaluated.
29. It is widely accepted that the telecommunications, and the wider Information and Communications Technology ('ICT'), sector has a significant impact on the national economy; including growth, productivity, innovation as well as in attracting new businesses and capital. The scope of this SMR is not, however, to analyse the sector's impact on the wider economy, but to evaluate and analyse how the market is performing and what possible changes to market regulation would stimulate a more effective and dynamic sector. This is illustrated in the following Figure.

**Figure 1: Scope and context of the SMR**



Source: TRA

### 1.3 Overall approach for conducting the SMR

30. The SMR involves both primary and secondary research and analysis. A significant number of reports, regulations, recommendations, decisions and other documentation have been reviewed. This includes international studies, research and legislation, and relevant documentation for the Kingdom of Bahrain.
31. The study has also benefitted from detailed market statistics that TRA collects and analyses on a regular basis, e.g. development of subscribers, usage, pricing, revenues, investments and market shares.
32. Finally, an important part of the SMR has been the stakeholder discussions that the TRA held with 15 stakeholders, including eleven active licensees. This has allowed TRA to collect and consider various views and comments from different industry representatives. The contributions made by the stakeholders have been an important input to the SMR.

## 2 Current sector policy and strategic direction

33. TRA's roles, mandate and strategic focus are directed by the primary legislation (the Telecommunications Law) but also by Government policy formulation, notably the National Telecommunications Plans ('NTP').

### 2.1 TRA's mission and strategic focus

34. The mission of the TRA is *inter alia* to **develop a competition-led market** for the provision of **innovative** communications services, available to all,<sup>6</sup> which:
  - a. **encourages** sustainable, economically efficient investment;
  - b. **respects** the interests of consumers;
  - c. **fosters** ecologically friendly initiatives; and
  - d. **supports** the social and commercial welfare of the Kingdom of Bahrain.
35. Promoting effective and sustainable competition in the sector is a means to an end, and is built on the notion that effective competition is the best tool for generating efficient outcomes, innovation, and creating value and choice for consumers.
36. Therefore, the market interventions that TRA undertakes are built on the foundation of supporting competition that will generate real benefits to end users and the society at large. Importantly, TRA's fostering of effective competition as a key means does not and should not necessarily imply a support for individual competitors (suppliers) in the market.
37. TRA's strategic activities (as set out in the TRA three-year work plans) are guided by the Government's NTPs, the most recent of which being the Third NTP which was issued in 2012.

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<sup>6</sup> See TRA's "FOCUSED" Strategic Framework as stated in "Three Year Work Plan of the Telecommunications Regulatory Authority of the Kingdom of Bahrain (2013-2015)" 6 June, 2013, GDO/0613/048. Available at [www.tra.org.bh](http://www.tra.org.bh).

### 2.2 The Third National Telecommunications Plan (NTP3)

38. The following section refers largely to the statements made and the wording in the Third National Telecommunications Plan (“NTP3”).<sup>7</sup>

#### 2.2.1 Context of the NTP3

39. The NTP3 came into force in July 2012. The NTP3 is issued in compliance with Article 15 of the Telecommunications Law, which was promulgated by Legislative Decree No.48 of 2002. Article 15 requires that the Minister publishes, periodically, NTPs that have the approval of the Council of Ministers. Published NTPs must encompass both the strategic plan for the sector, and the general policy of Government towards the Telecommunications sector.
40. Article 3(e) of the Telecommunications Law requires the TRA to act in a manner that is consistent with the objectives of the National Plan for Telecommunications; provided that this shall not be construed to derogate from the independence of the Authority in accordance with the provisions of the Telecommunications Law.
41. Accordingly, statements within the NTP3 are described as Government Policy, together with those described as required actions, and have status under the Telecommunications Law. Government policy sets the course and direction of the economic sectors that are referenced within NTP3 for a period of three years from the date of its publication.

#### 2.2.2 Government’s vision for the telecommunications and related economic sectors

42. The NTP3 states that the vision for the telecommunications sector is that it should play an enhanced stimulation and enabling role in the development of Bahrain, both economically and socially. Government recognises that to fulfil that ambition, there must be investment in improved infrastructure and capabilities, the removal of remaining barriers to fully efficient supply markets, together with the modernisation of legal and regulatory environments.<sup>8</sup> Initiatives in telecommunications must be exploited in other areas of the economy through focused innovation and entrepreneurship, particularly in those areas that are most directly enabled by telecommunications, which together may comprise the ICT sector.
43. Furthermore, NTP3 envisages that a desired outcome is that new means and opportunities are created for employment and social cohesion, and that users enjoy a new era of multi-faceted services. Services can be expected to extend beyond communications and entertainment, to encompass education and personal development elements that together contribute to a knowledge economy and social advancement.
44. The NTP3 provides Government’s assessments, and policy and strategic measures that arise from these assessments, in a number of key areas that are critical to the sector

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<sup>7</sup> See Council of Minister Resolution No. (39) of the year 2012 – Promulgating the Third National Telecommunications Plan, and subsequent Resolution No. (76) of 2013 with respect to Amendment of the Third National Telecommunications Plan promulgated by Resolution No. (39) of 2012.

<sup>8</sup> See section 2 (p.4) of the NTP3.

development. The ones of most relevance to the SMR are stated below, even though the NTP3 entails also the policy direction in other areas that are inter-related.

### **2.2.3 Government's assessment of and measures related to the progress towards effective competition**

45. The assessment made by Government in the NTP3 is that recent progress toward the attainment of effective competition, within relevant markets, has been successful in several areas, but that more action has to be taken before the goal is reached.
46. NTP3 states moreover that the ultimate goal for the Government is advancement to a position where all relevant markets can be predominantly governed by the application of ex-post regulation, with a commensurate reduction in the reliance on ex-ante regulation. However, Government recognises that a number of imbalances need to be addressed in order to achieve this goal<sup>9</sup>.
47. It is recognised that imbalances, in some cases, arise from un-remedied historical ownership and asset control factors that distort certain markets and which may call for corrective or remedial action. To the extent that necessary corrective or remedial action can be taken through market regulation, the precise measures to be applied must be determined by the TRA as per the direction in the NTP3.

### **2.2.4 Government's assessment of and measures related to the mobile service disadvantages**

48. With respect to measures related to 'mobile service disadvantages' the Government recognises in the NTP3 that radio spectrum represents a scarce, and therefore valuable, national resource, and further, that withholding of appropriate frequencies within the radio spectrum was proven to be a hindrance to the efficient establishment of LTE infrastructure and the provision of services beyond trial levels. In addition the NTP3 identifies that LTE based systems may be implemented employing frequencies in various areas of the spectrum bands, but that the international norm emerged is implementation in the 2.6GHz, 2.3GHz and 800MHz bands.<sup>10</sup>
49. On a more general note, Government requires that all radio spectrum that has been designated within the national frequency plan for uses related to the supply of public telecommunications services, whether currently allocated to licensees or not, be subject to review. The NTP3 states that such review, and actions arising from it, must ensure that the further development of the telecommunications sector is not unduly prejudiced by the occupation of radio spectrum for uses other than those determined by the national frequency plan. Moreover, that overall the radio spectrum is appropriately utilised, managed and valued, to the benefit of Bahrain.<sup>11</sup>

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<sup>9</sup> See sections 6.5 (p.8 )and 7.5 (p.12) of the NTP3.

<sup>10</sup> NTP3 Section 7.1 (p. 8).

<sup>11</sup> NTP3 Section 7.1.4 (p. 9).

### 2.2.5 Government's assessment of and measures related to ultrafast broadband

50. The NTP3 recognises that advances in service functionality and capability, often associated with previously noted convergence trends, together with the functional imperatives for full participation in the global digital economy, mean that users must have access to devices and networks that support data throughput speeds that exceed those presently available in Bahrain, and at prices which are affordable.
51. It is also acknowledged in the NTP3 that Governments around the world have concluded that the provision of access to ultra-fast broadband services to substantially all premises is both a social and an economic imperative. NTP3 refers to the economic and social benefits that could accrue as a consequence of further broadband penetration.<sup>12</sup>
52. The assessment of the Government of Bahrain is that the country will be severely disadvantaged if it too is not provided with a secure ultra-fast broadband fibre optic infrastructure.
53. Government has determined that should market forces fail to provide the desired access to ultra-fast broadband services, it must intervene to ensure provision on a Kingdom-wide basis.
54. The issue for Government has been to determine how any intervention could be achieved without major distortion both to telecommunications markets, and to the investment and other incentives of suppliers within them.
55. The stated policy in the NTP3 is that Government requires that a fixed National Broadband Network ("NBN"), is created and moreover that it provides wholesale services to licensed operators on a non-discriminatory basis.<sup>13</sup> Where the NBN is created with Government financial support it must provide only wholesale services at Layers 1 & 2, (as described by the International Standards Organization model definitions) to all other licensed operators that wish to buy them for onward sale, within their own products, to end users. The NBN shall not directly supply the ultimate end users of telecommunications services. Users must only be supplied by licensees operating under fully competitive conditions.<sup>14</sup>
56. Moreover, the NTP3 states that Government requires that an NBN created with its support shall be governed by an entity that is wholly separate, and carries on no activities other than those directly related to the NBN. The entity shall deal with all Licensees equivalently and transparently according to trading and operational policies that are approved by Government, and thus act to minimize any competitive or investment distortions arising from Government intervention.<sup>15</sup>
57. Government requires in addition that affordable and appropriate ultra-fast broadband services, in addition to voice services, are made available to all that reasonably require them. Government shall determine, at a time when the extent of availability of ultra-fast broadband services may be reasonably assessed, whether the existing arrangements

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<sup>12</sup> See section 6.3 (p. 7) of the NTP3.

<sup>13</sup> See section 7.3.1 (p. 11).

<sup>14</sup> See section 7.3.4 (p. 11).

<sup>15</sup> See section 7.3.6 (p.11).

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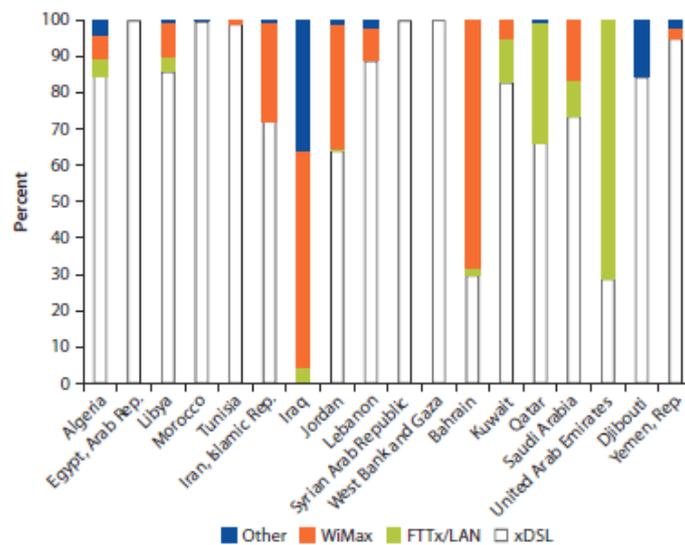
related to universal service provision and obligations should be withdrawn and replaced by arrangements that include ultra-fast broadband services.<sup>16</sup>

### 2.3 Implications of sector policy on TRA's market regulation

58. The NTP3 is clear in setting out a development path for the sector. One of the aims is to move away from ex-ante regulation, whenever effective competition prevails, and to instead rely on the ex-post competition provisions of the Telecommunications Law. However, it is recognized that there are still market failures in some segments and that ex-ante regulation should only be phased out once such failures are addressed.
59. Moreover, the policy direction on the NBN implies particular issues with respect to ex-ante regulations. Up to date, there has been limited progress in creating the neutral, wholesale only, entity envisaged in the NTP3.
60. In addition, the rollout of ultra-fast (fibre-based) infrastructure, based on commercial decisions only, has arguably been limited, and Bahrain lags behind many other countries in the deployment of fibre, both at a regional and global level. Though the comparison below with other MENA countries dates back end December 2012), it nevertheless shows the low penetration of FTTx (and LAN) connections in Bahrain compared to UAE and Qatar in particular. There has not been any significant increase in FTTx penetration in Bahrain in the last couple of years.

**Figure 2: Distribution of fixed broadband connections per technology in MENA**

**Figure 3.6 Distribution of Fixed Broadband Connections per Technology in MENA, December 2012**

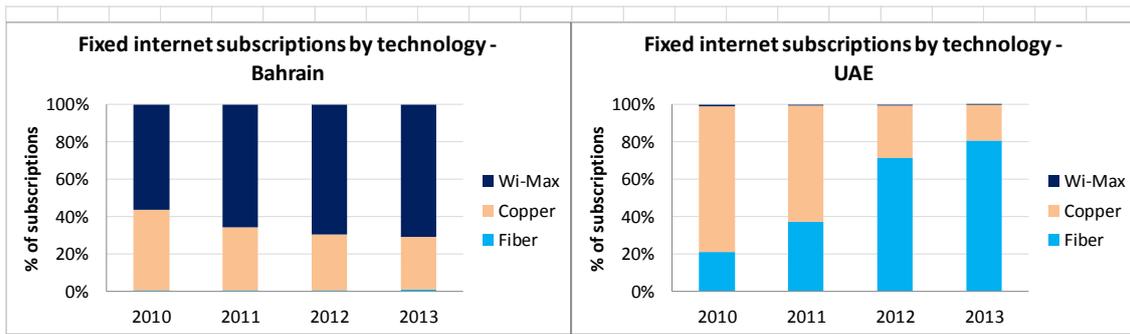


Source: TeleGeography's Global Comms database (Dec 2012)

61. A direct comparison with UAE on fixed broadband (internet) subscribers per technology confirms the picture that there is very limited deployment and adoption of fibre based access in Bahrain.

<sup>16</sup> See section 7.3.7 (p12) of the NTP3.

**Figure 3: Development of fixed (internet) broadband subscribers by technology in Bahrain compared to UAE**



Source: TRA analysis and Telecommunications Regulatory Authority, UAE

62. Based on feedback from different stakeholders, it is reasonable to assume that the uncertainties surrounding the details of a future NBN has had a hindering effect on the roll-out of fibre infrastructure in general.
63. There are a number of issues related with the future NBN model which could affect future market structure and competition, for example in relation to the ownership, operating model and wholesale product offerings of the NBN. In the current situation, however, Batelco's existing reference offer entails conditions for duct access, which allow other licensed operators (OLOs) to rent duct access and, via Batelco, deploy fibre infrastructure through Batelco's ducts. TRA is currently undertaking a review of the reference offer with the aim to ensure that the conditions for the wholesale products provided allow for effective competition to develop in the downstream retail markets..
64. Going forward, in the scenario of a wholesale only NBN entity, which operates on open access principles, would need to comply with terms and conditions that ensure certain key principles are met in practice (including e.g. transparency, non-discrimination, and fair (presumably cost based) pricing to interested parties). Therefore, it should be envisaged that even in the situation where a neutral and wholesale only NBN entity becomes a reality, there would be some need for prescribed ('ex-ante') wholesale regulation.
65. The scope for future ex-ante regulation would have to take the NBN model into account, but effectively the same principles for justifying ex-ante interventions should apply.

### 3 Considerations on the framework for market analysis & reviews

66. The framework in place in Bahrain to assess whether a relevant and defined market qualifies to be susceptible to ex-ante regulation follows a rather standard methodology which is largely used elsewhere, notably in the European Union (EU).
67. A number of market reviews and analyses have been carried out by TRA over the years. These review processes include public consultations whereby the stakeholders are provided with opportunities to comment on TRA's market analyses and findings.
68. There is no prescribed frequency with which the TRA has to conduct market reviews, but generally, market reviews are typically conducted by the TRA in time spans of 3-5 years, which is broadly in line with the frequency of conducting individual market reviews in most EU countries.<sup>17</sup> In some market segments (relevant markets), developments may happen quickly due to e.g. impact of new and disruptive technologies and/or market entrants. In such cases, there would be justification for an earlier review where the level of competition (and competitive constraint) has or is about to change significantly. Where such changes lead to sustainable competition, it may no longer be equitable, justifiable or indeed necessary that one or more operators have regulatory obligations that other comparable operators do not have.<sup>18</sup>
69. Moreover, in any market review exercise it is critical that a proper analysis is done on whether a failure in a relevant market is due to 'market failures' or 'regulatory failures', or a combination of the two<sup>19</sup>.

#### 3.1 Current analytical framework

70. The following describes the overall framework which currently underpins TRA's conduct of market reviews and determinations. It should be observed that only the first two steps (in green; number 1 and 2 in Figure 2 below), form part of the current market review process, whereas step three has, thus far, normally been only briefly elaborated on in the market review report. This is consistent with the approach spelled out in TRA's Competition Guidelines. In addition, the current Telecommunications Law prescribes, on a general level, the remedies and obligations that follow on operators who have been determined to be dominant / hold SMP in a relevant market.

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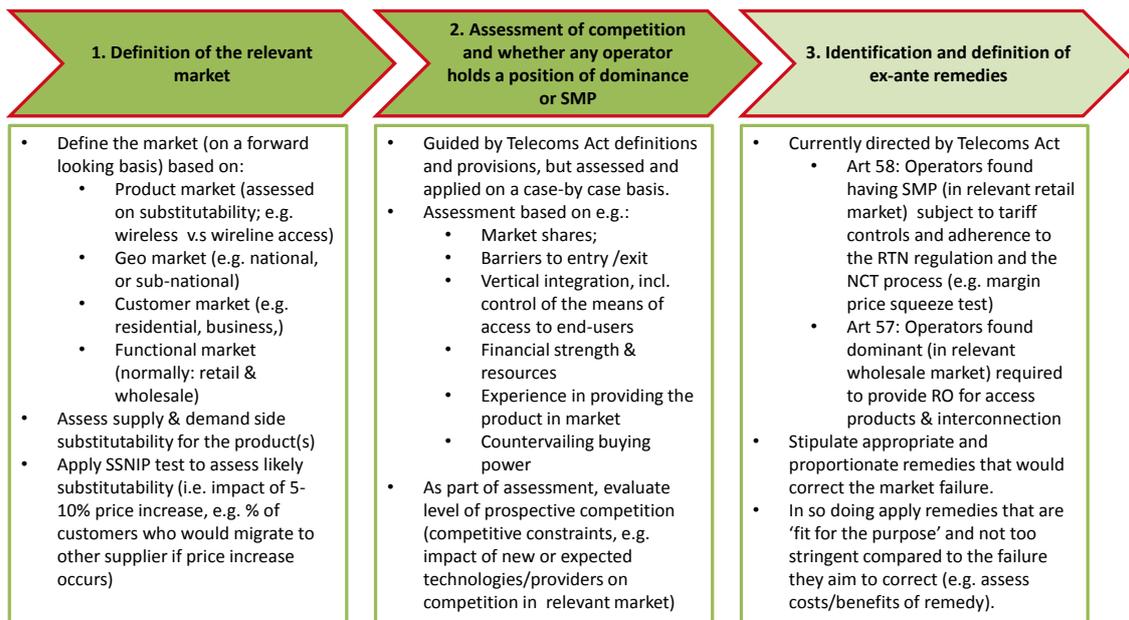
<sup>17</sup> EU member states normally undertake market reviews every three years

<sup>18</sup> It may also be the case that new technology may entrench existing market power, in which case it may be necessary to retain or strengthen ex-ante regulation.

<sup>19</sup> Such assessment is normally done by applying the so-called three-criteria test. See also section 3.2.1 which e.g. describes the three criteria.

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Figure 4: Analytical process for conducting market reviews<sup>20</sup>



Source: TRA

71. To determine whether a licensed operator or operators hold SMP or a Dominant Position in a relevant market, TRA adopts the following process:
- definition of the relevant market(s);
  - analysis of competition in the relevant market(s); and
  - identification of operator(s) who holds SMP or a have Dominant Position, if any.
72. At each step, TRA relies on well-established economic principles and tests to define markets, such as the hypothetical monopoly test,<sup>21</sup> to assess demand- and supply-side substitution.
73. 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.
74. Throughout the process, TRA applies an analytical framework that is consistent with the Telecommunications Law and TRA's Competition Guidelines<sup>22</sup>. The tools and principles

<sup>20</sup> Based on process steps defined and elaborated on in the TRA Competition Guidelines and directed by the provisions in the Telecommunications Law.

<sup>21</sup> As set out in the TRA's Competition Guidelines, (as of 18 February 2010 (Ref: MCD/02/10/019)), 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. If the monopolist is not able to maintain a SSNIP (due to customers switching to another service) the market boundary should be expanded to include that service.

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employed by the TRA are similar to those employed by other regulators and competition authorities, including the European Commission and national telecommunications regulatory authorities of the European Union member states.

75. Having identified the relevant markets, the TRA 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 wholesale services to act independently of its competitors or customers and exercise market power.
76. The Telecommunications Law refers to two concepts of market power, namely a Dominant Position and Significant Market Power (“SMP”). 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 provides that operators with SMP shall be subject to tariff controls as specified by the TRA by way of regulation or licence conditions.
77. The regulatory obligations set out in Article 57 apply at the wholesale level whilst Article 58 applies at the retail level.
78. 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.
79. 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 TRA<sup>23</sup>. However, in determining whether an operator has SMP, the TRA 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. TRA 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%.
80. 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.”

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<sup>22</sup> “Competition Guidelines: Guidelines issued by the Telecommunications Regulatory Authority”, 18 February 2010 (Ref: MCD/02/10/019).

<sup>23</sup> Telecommunications Law of the Kingdom of Bahrain, page 8.

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81. In practice, TRA considers that the concepts of SMP and dominance are similar and seek to capture similar types of behaviour,<sup>24</sup> 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 practice.<sup>25</sup> However, the legal definition of SMP in the Telecommunications Law places special emphasis on market shares while recognizing the need to carefully consider the ability of an operator to influence market conditions, i.e. to act independently.
82. TRA 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, TRA typically takes the following factors into account when undertaking such a forward-looking competition assessment<sup>26</sup>:
- 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.
83. When assessing level of competition for the purpose of regulation in a market where *ex-ante* regulation already is in place, TRA will conduct its analysis “as if” there was no SMP/dominance related regulation affecting the relevant market. If such regulation was in place in the relevant market and was generating competitive outcomes, then an inappropriate conclusion could be reached regarding the existence of market power. In other words, the approach aims to ensure absence of SMP is only found, and regulation is only rolled back, where markets have become sustainably competitive and not where the absence of SMP is precisely the result of the *ex-ante* regulation in place.<sup>27</sup> This approach is consistent with the so-called Modified Greenfield approach adopted by the European Commission.

### 3.2 Some observations on current analytical framework

84. A key feature of the Telecommunications Law is that it prescribes certain remedies upon designation of SMP/dominance. This means that whenever TRA has concluded that an operator holds SMP/dominance in the relevant market there provisions relating to retail tariff controls, including margin squeeze tests, and/or ‘cost based wholesale access’ remedies come into play.
85. Under the European Regulatory Framework, one of the key principles when assessing the appropriate level of regulatory intervention in a given market is the recognition that *ex-ante* regulation in retail markets should only be introduced (or retained) if *ex-ante* regulation of relevant (upstream) wholesale markets is not sufficient to correct a market

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<sup>24</sup> See the TRA, “Competition Guidelines”, 18 February 2010 (Ref: MCD/02/10/019), paragraph 92.

<sup>25</sup> For example, the regulatory framework governing the EU telecommunications sector considers the concept of SMP to be equivalent to that of dominance.

<sup>26</sup> See TRA, Competition Guidelines, paragraph 93.

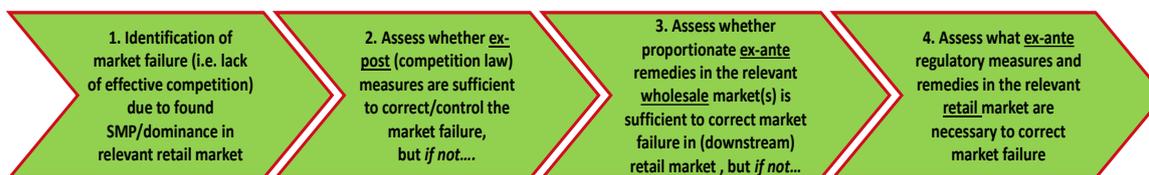
<sup>27</sup> See TRA, “Competition Guidelines”, Section 3.3

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failure (i.e. lack of effective and sustainable competition). Furthermore, ex-ante regulation should in any case only be introduced (or retained) if competition law (i.e. ex-post regulation) is not sufficient to deal with market failures (i.e. to prevent anti-competitive conduct due to abuse of a dominant position and/or collusive behaviour).

86. It is important to underline that from a competition law point of view it is not prohibited to hold SMP/dominance, but it is prohibited to abuse such power in the market as it ultimately has a detrimental effect on either competitors or consumers. Ex-ante regulatory measures, on the other hand, are introduced with the aim to correct market failures), but any such measures should be *proportionate* to the problem they try to resolve, i.e. the remedies imposed should not be more far reaching than necessary to rectify the failure, and the costs should not outweigh the benefits of the regulation in question. In other words, the intervention and remedies considered should stand a proportionality test.
87. According to the European Regulatory Framework, ex-ante regulatory measures in (downstream) retail markets are the 'last resort' of prescribed economic regulatory remedies, and should not be introduced or retained unless there are strong indications that ex-ante regulation in the relevant (upstream) wholesale market is not considered sufficient to correct the identified market failure.
88. The following figure illustrates the procedural steps that are followed.

**Figure 5: Process for assessing the appropriate level of regulatory market interventions**



Source: TRA

### 3.2.1 Lessons from the recent recommendation from the European Commission<sup>28</sup>

89. The recently adopted recommendation<sup>29</sup> from the European Commission (EC) and its supporting explanatory note on relevant markets susceptible to *ex-ante* regulation entails a number of important considerations of relevance to Bahrain.
90. The recommendation sets out the direction to move away from *ex-ante* regulation on any retail market currently on the list of relevant markets, i.e. the proposal is that only defined relevant wholesale markets should, in the future, be subject to ex-ante regulation on operators with designated SMP.
91. However, based on the views and inputs from BEREC (the body of the EU National Regulatory Authorities (NRAs)), individual NRA's would still have the possibility to retain

<sup>28</sup> See European Commission recommendation of 9. 10. 2014 on "relevant product and service markets within the electronic communications sector susceptible to *ex ante* regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common framework for electronic communications networks and services."

<sup>29</sup> Adopted on October 9, 2014

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defined retail markets on the list if justified, taking into account amongst others the actual degree of substitution from all-IP networks in individual member states.

92. The aim of the EC's regulatory framework is *inter alia* to reduce ex-ante sector-specific regulation progressively as competition in markets develops and ultimately for electronic communications to be governed by competition law only.
93. In the explanatory note to the EC recommendation on "relevant product and service markets within the electronic communications sector susceptible to *ex ante* regulation" it is recognized that the objective of any ex-ante regulatory intervention is ultimately to produce benefits for end-users by making retail markets effectively competitive on a sustainable basis, and that it is likely that NRA's will gradually be able to find retail markets to be competitive *even in the absence of wholesale regulation*, especially taking into account expected improvements in innovation and competition.
94. The starting point for the identification of markets susceptible for *ex-ante* regulation is the definition of retail markets. Both the definition and the assessment of the market should be done from a forward-looking perspective, starting from existing market conditions. The analysis should also assess whether the market is prospectively competitive and whether any lack of competition is durable, taking into account expected or foreseeable market developments. If the retail market concerned is not effectively competitive from a forward-looking perspective in the absence of *ex-ante* regulation, the corresponding wholesale market(s) susceptible to *ex-ante* regulation should be assessed.
95. Within the EU framework the so called 'three criteria test' is applied to assess whether a market should be susceptible to ex-ante regulation. The three criteria must *cumulatively* be met for a market to qualify. The three criteria are:
  - a. The presence of high and non-transitory structural, legal or regulatory barriers to entry;
  - b. A market structure which does not tend towards effective competition within the relevant time horizon, having regard to the state of infrastructure-based and other competition behind the barriers to entry; and
  - c. Competition law alone is insufficient to adequately address the identified market failure(s).
96. The recommendation moreover states that NRA's should consider all relevant competitive constraints irrespective of whether the sources of such constraints are deemed to be electronic communications networks, electronic communications services, or other types of services and applications which are comparable from the perspective of the end-user (i.e. demand-side substitutability).
97. The EU Commission's recommendation identifies the following markets susceptible to *ex-ante* regulation in the next period, and the markets which should be withdrawn:

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**Table 1: Changes to relevant markets susceptible to future ex-ante regulation in the EU**

<b>Withdrawn</b>	<ul style="list-style-type: none"> <li>• Retail fixed line access (market 1/2007)</li> <li>• Wholesale call origination from fixed location (market 2/2007)</li> </ul>
<b>Maintained</b>	<ul style="list-style-type: none"> <li>• Wholesale call termination on individual public telephone networks provided at fixed location (previously market 3/2007, new market 1)</li> <li>• Wholesale voice call termination on individual mobile networks (previously market 7/2007, new market 2)</li> </ul>
<b>Redefined</b>	<p><b>Previous:</b></p> <ul style="list-style-type: none"> <li>• Physical broadband access (previously market 4/2007)</li> <li>• Wholesale broadband access (previously market 5/2007)</li> <li>• Wholesale terminating segments of leased lines (previously market 6/2007)</li> </ul> <p><b>New:</b></p> <ul style="list-style-type: none"> <li>• Wholesale local access provided at a fixed location (new market 3a)</li> <li>• Wholesale central access provided at a fixed location for mass-market products (new market 3b)</li> <li>• Wholesale high-quality access provided at a fixed location (new market 4)<sup>30</sup></li> </ul>

Source: Cullen International

98. The recent direction taken by the EC provides some interesting input to this strategic review, notably that *ex-ante* regulation on retail markets is proposed to be lifted, and the limited number of relevant wholesale markets that remain on the list.
99. However, it must be emphasised that the move is based on the general assessment of the EU market characteristics that sustainable competition has been achieved or can be expected to be achieved without any reliance on ex-ante remedies in the retail markets. In particular, much of the competition that has emerged at the retail level in the EU is

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<sup>30</sup> The redefined wholesale markets are defined according to the functionality of modes of access rather than the technological means of deployment. Furthermore, they are defined to recognize the differences in the retail needs of consumers and SMEs compared with corporate (larger business) customers. Wholesale high-quality access would typically include leased lines as a wholesale product. Wholesale central access (WCA) would e.g. include bitstream, whereas wholesale local access (WLA) includes LLU. Typically the relative demand for the products in these defined markets will differ depending on the type of end-users served. In Bahrain, the broadband market review distinguished between mass-market and business segments. The relevant wholesale products available in Bahrain include LLU and bitstream, and wholesale leased lines (currently provided as a remedy in the relevant market: 'domestic data connectivity services')

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dependent upon regulated access at the wholesale level, for example with broadband competitors at the retail level relying on regulated access in the form of bitstream or unbundled local loops. In other words, the EC has concluded that ex-ante regulation in defined wholesale markets has been sufficient to drive the downstream market towards effective and sustainable competition. In addition, competition from alternative infrastructure access networks (notably cable networks) in some EU member states is considered providing a competitive constraint to the incumbents' networks.

100. Whether these conclusions and proposals could be also considered for the Bahrain telecommunications market will be addressed, but must in any case be made based on a thorough analysis of the specific situation in this territory.

### 3.2.2 Identification of 'fit-for-purpose' remedies and application of the proportionality principle

101. Where dominance/SMP has been found in a defined relevant market, the next logical step is to identify and determine what remedies would best address the problem with the market failure.
102. As previously noted, it is not *per se* prohibited to have significant market power/dominance. In fact, many companies in a wide range of sectors have strong market power and can to a large extent act independently of competitors (and consumers). It is the *abuse* of such market power that is prohibited under general principles of competition law which under the Telecommunications Law would be the ex post provisions specifically, Article 65.
103. *Ex-ante* (prescribed) remedies in the telecommunications sector are intended to prevent such anti-competitive behaviour from occurring in the first place, and to drive the market towards effective competition.
104. A critical part in this process is therefore to impose remedies on the holder(s) of SMP/dominance that help other competitors to compete effectively in the market, and generate efficient market outcomes.
105. However, the remedies should, where possible, be *proportionate* to address the problem at hand. For example, just because one company with SMP bundles fixed and mobile offers to its end-users, does not necessarily imply that there should be a structural separation between the mobile and fixed business divisions (even if the legislation in principle could allow for it). On the other hand, for a company with SMP/dominance, and which controls essential infrastructure that other providers cannot replicate but need access to in order to compete in the retail market, it might be insufficient to simply stipulate adherence to the principles of transparency and non-discrimination, and then expect the parties to negotiate commercially and agree on mutually acceptable terms and conditions.
106. The recognition that the remedies should be proportionate to the market failure at hand implies also that a fair assessment should be made on the respective 'costs and benefits' of imposing and enforcing alternative remedies. Too far reaching remedies could be very costly to implement, and possibly impede an efficient market development, whereas too loose remedies are not likely to assist in correcting a market failure and provide benefits to the end-users.

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107. The framework in the EU, for example, allows for a selection of different remedies, without necessarily imposing the strongest remedy available, when SMP is found in a given market. This has the advantage of, at least in principle, not overregulating and/or imposing too costly remedies *per se* but to choose the remedy that is 'fit for the purpose'.
108. An important part of this process is to involve other stakeholders, notably the entities that require for example access to a certain wholesale product, and to ensure that the features of the regulated product allow competitors to replicate the downstream service in an efficient way.
109. The current Telecommunications Law in Bahrain is quite prescriptive on the remedies that should apply when an entity is found to have SMP and when an entity is found to be dominant. For example, an entity found to have SMP in a defined retail market will be regulated under Article 58(a) (Tariffs Control).<sup>31</sup>
110. It is of course not sufficient to recognise that the chosen remedies should be proportionate to the identified market failure, but a critical aspect of the process is the enforcement and implementation of the remedies. Without effective enforcement, the purpose of implementing the remedy in the first place could be lost, and the identified market failure could be preserved.
111. Subject to the provisions of the Telecommunications Law, TRA intends to put increased emphasis and efforts on ensuring that the ex-ante remedies in place are effective, 'fit for the purpose' and work as intended to correct identified market failures. TRA is indeed currently reviewing the reference offer for regulated wholesale products and expects to, where justified, enhance the price and non-price terms for the remedies.
112. Going forward, therefore, TRA plans to make the following key revisions to the process for undertaking, and following-up on, market reviews and determinations:
  - a. Introduce identification and imposition of remedies as an integrated step of the review process. This implies also that stakeholders are involved in the process;
  - b. To the fullest extent possible, taking into account the relevant provisions of the Telecommunications Law, apply the proportionality principle when assessing and deciding on the most appropriate remedy/remedies to correct an identified market failure. This means that any intervention proposed should stand a proportionality test, where the expected benefits of regulation should outweigh the costs.
  - c. Introduce a monitoring mechanism, whereby TRA evaluates on a periodical basis (maximum annually) the impact and implications of enforced regulation and remedies in relevant markets. This task should be performed outside the normal market review and determination process.

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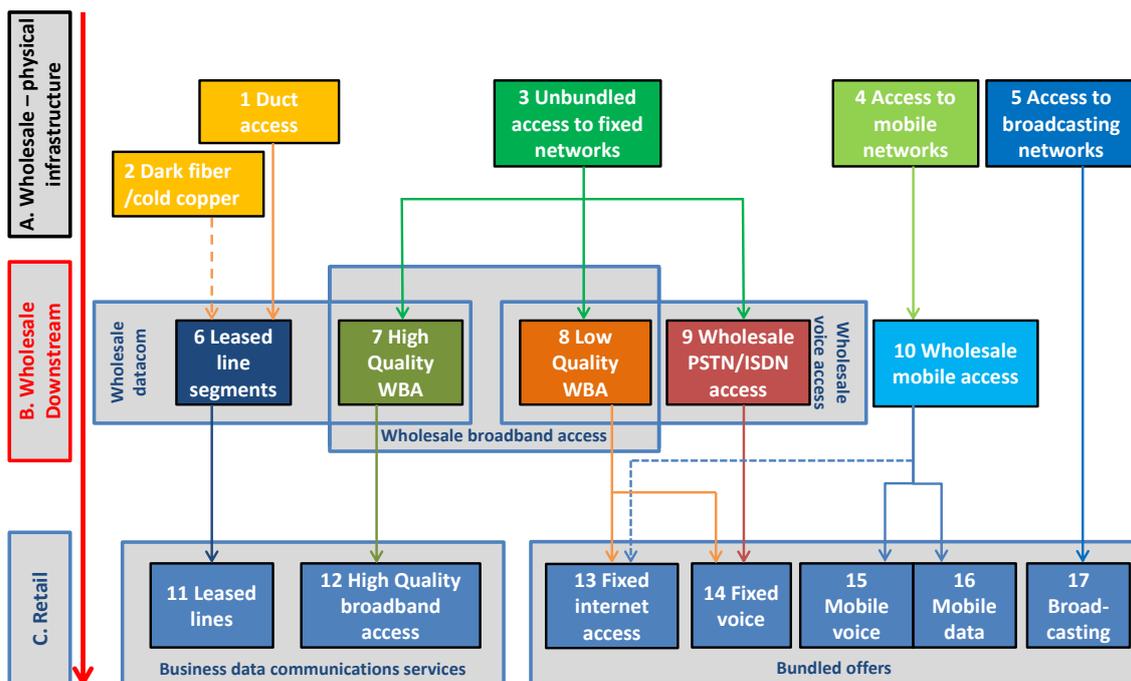
<sup>31</sup> Article 58(b) however, is not premised on a finding of SMP

## 4 Overview of the market

### 4.1 Description model – upstream and downstream markets

113. The total telecommunications market consists of a number of different market segments. As part of the market reviews, a critical part is defining the “relevant market(s)”.<sup>32</sup> Functionally, the relevant markets are typically made up of wholesale (upstream) and retail (downstream) markets.
114. There is naturally a level of inter-dependencies between the defined relevant markets; these inter-dependencies are normally vertical, but may also be horizontal<sup>33</sup>.
115. The following figure illustrates in detail the different upstream and downstream markets of relevance to a holistic market review and analysis.<sup>34</sup>

Figure 6: Description model of upstream and downstream markets



Source: Ecorys/iDate/icri and TRA analysis

116. The inter-dependencies and relationships between upstream and downstream markets are not always straightforward and are moreover likely to change with developments in technologies and competition. For example, access to ducts could be ultimately used as an upstream input product to deliver different types of both wholesale and retail services

<sup>32</sup> See section 4.2 of this Draft Report for the **current** relevant markets defined in Bahrain.

<sup>33</sup> For example with regards to bundled offers of different services which may, but do not have to, belong to the same relevant market.

<sup>34</sup> The figure has been adopted from the report “Future electronic communications markets subject to ex-ante regulation”, 18 September 2013, prepared for EU DG Connect, by Ecorys, Idate and Icri.

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(such as mobile backhaul, dedicated high-capacity links, as well as bundled retail services (e.g. triple play)

117. At the basic ('most upstream') level, there is access to physical infrastructure, which may be passive (such as duct access and dark fibre) or unbundled access to local loops (e.g. LLU). Duct access is currently a regulated wholesale product and part of Batelco's reference offer to other licenced operators.
118. Indeed, TRA has, as part of its recent market review determination on 'domestic data connectivity'<sup>35</sup> stated that it expects Batelco to provide a dark fibre service in the reference offer. This is part of the remedies imposed on Batelco's due to its dominant position in the relevant wholesale market (and based on its SMP in the corresponding retail market for domestic data connectivity).
119. In addition there are a number of other regulated wholesale services further downstream, which include Wholesale Broadband Access (WBA) services (e.g. the regulated bitstream access service and Wholesale DSL service), as well as active wholesale data connectivity services (such as the Wholesale Local Access (WLA) service, and the Customer Access Tail (CAT) and Local Leased Circuit for OLO (LLCO) services).
120. The most upstream regulated wholesale markets may either 'feed' directly into retail markets via a downstream product, such as leased lines, wholesale PSTN/ISDN access or WBA (low-quality or high-quality).<sup>36</sup>
121. Some markets may be grouped into one market because of substitutability or complementarity (this is indicated in the figure with the blue boxes). This may be determined on the basis of e.g. SSNIP test<sup>37</sup>. Such a test analyses whether end-users are likely to substitute one product for another in the case of a 5% to 10% increase in price. In the case of a bundle it analyses whether end-users will choose the bundle in response to a 5% to 10% increase in price.
122. The intention of the description model is not solely to illustrate the dependencies between the relevant markets, but also to analyse developments and growth of the different market segments. Moreover, an analysis can be made whether there are any significant differences between those markets defined by the TRA as susceptible to ex-ante regulation and others.

## 4.2 Current list of defined relevant markets in Bahrain

### 4.2.1 Retail markets

123. The current list of defined retail markets originates largely from SMP determinations that were made in parallel with the strategic retail market review carried out in 2008. Through the 2008 review and SMP determination, a number of retail markets were defined and assessed. Determinations were made that there was SMP in some of the defined markets, albeit not in all. In two recent market reviews (issued in March and April, 2014

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<sup>35</sup> "Determination of Significant Market Power and Determination of Dominant Position in the Markets for Domestic Data Connectivity Services";, 10 April 2014 (Ref: MCD/04/14/026).

<sup>36</sup> The links between wholesale and retail markets are indicated with arrows. Dotted lines indicate that there is an anticipated link between the markets even if it may not currently be the case.

<sup>37</sup> SSNIP = small but significant and non-transitory increase in price

## Strategic Market Review

respectively), new definitions of relevant markets and associated determinations were made on SMP in relation to broadband and domestic data connectivity services.

124. Batelco is the only operator currently designated with SMP and in the following defined retail markets:
- a. Fixed narrowband access services for residential customers;
  - b. Fixed narrowband access services for non-residential customers;
  - c. Fixed originated domestic calls for residential customers;
  - d. Fixed originated domestic calls for non-residential customers;
  - e. Fixed originated international calls to Zone 1 countries;<sup>38</sup>
  - f. Fixed originated international calls to Zone 3 countries;<sup>39</sup>
  - g. Dial-up internet access from a fixed location;
  - h. *Business* broadband internet access from a fixed location;
  - i. Domestic data connectivity services; and
  - j. International leased lines.
125. A number of other relevant retail markets have been defined, but in which *no* SMP has been found in the markets. These relevant markets currently include:
- a. Fixed originated international calls to Zone 2 countries;<sup>40</sup>
  - b. Fixed originated international calls to Zone 4 countries;<sup>41</sup>
  - c. Mobile originated international calls to Zone 1 countries;
  - d. Mobile originated international calls to Zone 2 countries;
  - e. Mobile originated international calls to Zone 3 countries;
  - f. Mobile originated international calls to Zone 4 countries;
  - g. Mobile services<sup>42</sup> (definition excludes mobile originated international calls); and
  - h. *Mass-market* broadband internet access from a fixed location.
126. The following table summarises the current situation, including, where relevant, the SMP designated operator, date of determination and remedies in place.

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<sup>38</sup> Zone 1 countries: GCC; Kuwait, Oman, Qatar, Saudi Arabia, the United Arab Emirates (UAE).

<sup>39</sup> Zone 3 countries: Australia, Canada, France, Germany, Greece, Italy, Iran, New Zealand, Thailand, the United Kingdom (UK), the United States of America (USA), Yemen.

<sup>40</sup> Zone 2 countries: South Asian countries; Bangladesh, India, Pakistan, the Philippines and Sri Lanka.

<sup>41</sup> Zone 4 countries: Rest of the world, i.e. all countries not in Zone 1-3.

<sup>42</sup> Note that no assessment has been made on market power in this market, so no SMP has been assumed, based on introduction of regulatory measures in the strategic market review of 2008, including third mobile operator and mobile number portability.

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**Table 2: Current defined relevant retail markets in Bahrain**

Current Defined Relevant Retail Markets	SMP	SMP Determination	Remedies (ex-ante obligations)
<b>Fixed narrowband access</b>			
Retail market for fixed narrowband access services for residential customers (Market 1a)	Batelco	3 June 2008	Retail Tariff Notification (“RTN”) <sup>43</sup>
Retail market for fixed narrowband access services for non-residential customers (Market 1b)	Batelco	3 June 2008	RTN
<b>Domestic calls</b>			
Retail market for fixed originated domestic calls for residential customers to either fixed or mobile subscribers within the Kingdom of Bahrain (Market 2a)	Batelco	3 June 2008	RTN
Retail market for fixed originated domestic calls for non-residential customers to either fixed or mobile subscribers within the Kingdom of Bahrain (Market 2b)	Batelco	3 June 2008	RTN
<b>International calls</b>			
Retail market for fixed originated international calls to Zone 1 countries (Market 3a)	Batelco	3 June 2008	RTN
Retail market for fixed originated international calls to Zone 2 countries (Market 3b)	<i>no SMP</i>	3 June 2008	N/A
Retail market for fixed originated international calls to Zone 3 countries (Market 3c)	Batelco	3 June 2008	RTN
Retail market for fixed originated international calls to Zone 4 countries (Market 3d)	<i>no SMP</i>	3 June 2008	N/A
Retail market for mobile originated international calls to Zone 1 countries (Market 3e)	<i>no SMP</i>	3 June 2008	N/A
Retail market for mobile originated international calls to Zone 2 countries (Market 3f)	<i>no SMP</i>	3 June 2008	N/A
Retail market for mobile originated international calls to Zone 3 countries (Market 3g)	<i>no SMP</i>	3 June 2008	N/A
Retail market for mobile originated international calls to Zone 4 countries (Market 3h)	<i>no SMP</i>	3 June 2008	N/A
<b>Mobile services</b>			
Retail market for mobile services (the market definition excludes mobile originated international calls) (Market 4)	N/A	N/A	N/A
<b>Internet access</b>			
Retail market for dial-up internet access services from a fixed location	Batelco	3 June 2008	RTN
Retail market for mass-market broadband internet access from a fixed location	<i>no SMP</i>	27 March 2014	N/A
Retail market for business broadband internet access from a fixed location	Batelco	27 March 2014	RTN
<b>Leased Lines</b>			
Retail market for domestic data connectivity services	Batelco	10 April 2014	RTN
Retail market for international leased lines (Market 6b)	Batelco	3 June 2008	RTN

Source: TRA

<sup>43</sup> The RTN Regulation sets out obligations for tariffs in regulated retail markets, including test of margin price squeeze & predatory pricing.

## Strategic Market Review

127. As a consequence of being found to hold SMP in the relevant market, the operator(s) has to comply with provision in Article 58 of the Telecommunications Law with respect to retail tariffs controls. The details are set out in the Retail Tariff Notification Regulation. A finding of SMP also has implications in terms of the Accounting Separation Regulation (i.e. the nature of the regulatory accounts to be prepared and submitted to TRA).

### 4.2.2 Wholesale markets

128. The current list of wholesale markets originates from a number of separate market reviews carried out by TRA over the years.
129. The defined relevant wholesale markets where dominant position(s) have been determined are:
- a. Freephone originating access (Batelco). However, Batelco has never been determined to be dominant in a TRA market review , but the Freephone originating access service is a part of Batelco's reference offer;
  - b. Call termination on fixed network (Batelco);
  - c. Call termination on mobile individual networks (Batelco, Zain, Viva);
  - d. Wholesale supply of domestic data connectivity services in Bahrain, except Amwaj Island (Batelco);
  - e. Wholesale broadband access for *business* broadband services (Batelco); and
  - f. Wholesale physical infrastructure access for *business* broadband services (Batelco).
130. A few other relevant wholesale markets have been defined, but *no dominance* has been found in the markets. These relevant wholesale markets currently include:
- a. Wholesale supply of international capacity from locations within Bahrain;
  - b. Wholesale supply of conveyance and termination of international outbound calls;
  - c. Wholesale broadband access for *mass-market* broadband services; and
  - d. Wholesale physical infrastructure access for *mass-market* broadband services.
131. The following table summarises the current situation for wholesale markets, including, where relevant, the operator designated to have dominance, the date of determination and remedies in place.

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**Table 3: Current defined relevant wholesale markets in Bahrain**

Defined Relevant Wholesale Markets	Dominance	Dominance Determination	Remedies (ex-ante obligations)
<b>Originating access</b>			
Freephone originating access	N/A	N/A *)	Reference offer: (non-discriminatory and cost based access to) wholesale originated calls. *) No TRA determination has been made to conclude DMP on Batelco but service is included among the regulated wholesale products in Batelco's RO
<b>Terminating access</b>			
Call termination on fixed networks	Batelco	9 August 2003	Reference offer: (non-discriminatory access and cost based) FTR
Wholesale market for termination services on Batelco mobile network; wholesale market for termination services on Zain mobile network	Batelco, Zain	1 Feb 2010	Reference offer: (non-discriminatory access and cost based) MTR
Wholesale market for termination services on VIVA's mobile network	Viva	16 May 2013	Reference offer: (non-discriminatory access and cost based) MTR
<b>Domestic data connectivity access</b>			
Wholesale market for supply of domestic data connectivity services in Bahrain (except Amwaj)	Batelco	10 April 2014	Reference offer: duct access, CAT, LLCO, WLA, (pot.) dark fiber. Accounting separation / RA
<b>International Services</b>			
Wholesale market for supply of international capacity from locations within Bahrain	no dominance	20 Feb 2013	N/A
Wholesale market for the conveyance and termination of international calls	no dominance	20 Feb 2013	N/A
<b>Broadband access</b>			
Wholesale broadband access market (for mass-market broadband)	no dominance	27 March 2014	N/A
Wholesale broadband access market (for business broadband)	Batelco	27 March 2014	Reference offer: duct access, LLCO, Bitstream access, wholesale ADSL, CAT. Accounting separation / RA
Wholesale physical infrastructure access market (for mass-market broadband)	no dominance	27 March 2014	N/A
Wholesale physical infrastructure access market (for business broadband)	Batelco	27 March 2014	Reference offer: duct access, LLCO, Bitstream access, wholesale ADSL, CAT. Accounting separation / RA

Source: TRA

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132. As a consequence of being found to hold a dominant position in the relevant market, the dominant operator has to comply with the provisions in Article 57 of the Telecommunications Law. Such an operator must provide access or interconnection by way of a reference offer. Separate regulatory accounts have to be prepared and approved by TRA (i.e. accounting separation and APM (Accounting Procedure Manual)).

### 4.3 General observations and views on the market development

133. Since the last strategic market review took place in 2008, the Bahrain telecommunications market has in TRA's view developed positively in a number of areas<sup>44</sup>, including:
- a. Mobile user penetration is one of the highest in the region;
  - b. Broadband penetration and usage are also amongst the highest in the region;
  - c. Price development trends are generally very positive, and prices are amongst the lowest in the region for most services and customer groups;
  - d. Significant investments have been made in new technologies, notably the roll-out of competitive LTE networks around the country;
  - e. International capacity and cable route diversity has improved and connectivity costs have decreased significantly (though there is a problem with effective access to the same – see below);
  - f. In most market segments, there is a variety of providers and therefore choice for the consumers;
  - g. The uptake of regulated wholesale products such as wholesale bitstream access has increased in the last 3-5 years.
134. However, TRA recognises that there are areas of concern expressed by various stakeholders, which could have an impact on the future development of the market in general and effective competition in particular. These stakeholder concerns include:
- a. So far there has been limited deployment of fibre based infrastructure to a wider population. New fibre deployments are controlled by a single entity which is argued to in some cases prevent service based competition to develop over the same fibre infrastructure networks ;
  - b. There is continued uncertainty regarding the future model for the NBN. Some parties claim that this uncertainty has stifled alternative infrastructure roll-outs and led to a situation where other licensed operators are very, and in some cases completely, dependent on access to Batelco's physical infrastructure to be able to compete on a level footing in downstream markets. This stakeholder concern relates also to access conditions to fibre routes required for backhaul purposes;

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<sup>44</sup> See subsequent sections for further data and support.

## Strategic Market Review

- c. There are no effective regulations or procedures in place that in practice govern the erection and roll-out of sites and antennae, which causes not only unnecessary delays but also poses business risks on the operators and potentially could lead to legal challenges. This problem is argued by some to be further enhanced by the current uncertainty regarding which entity(-ies) should be responsible for managing the issues;
- d. Some stakeholders argue that there has been only limited success in attracting new investments and value propositions in the wider ICT sector, which depend on reliable and cost efficient telecoms networks, and that such relevant examples include potential call centres, data centres, content creation and aggregation. Despite the fact that international capacity and route diversity have greatly improved over the last years, some state that the main reason for not being able to attract more new investments and new ICT businesses is the lack of cost efficient and diverse international connectivity compared to alternative regional destinations. There is, furthermore, according to some operators a continuous problem to get access to existing international cables due to e.g. lack of access to necessary domestic legs;
- e. A number of stakeholders mean there is too much uncertainty regarding the plans for spectrum management and allocation of critical frequency spectrum, and that in order to create a true level playing field, there is need for a transparent spectrum plan on how, when and under what conditions frequency allocation will be made. Currently the three mobile cellular operators have, it is argued, a clear competitive advantage over other players in the market through the frequency spectrum allocated to them so far. The view expressed by some other operators is that if the objective is indeed to ensure that there is effective and sustainable competition in the future between *more* players than the three holders of individual mobile licences , then there is also a need to ensure that critical frequency spectrum becomes available to other existing operators.. TRA acknowledges the importance of the issue and the concerns raised. However, any such initiative would need to take into account the wording of the prevailing NTP3, which amongst others state that *“Government requires that TRA allocate the required spectrum to the three existing operators holding individual mobile telecommunication service licenses to provide LTE services, and in the event that there are not at any time sufficient active suppliers of LTE based services, and at any other time it is determined, as a result of an assessment carried out by TRA, that the number of suppliers should be otherwise increased, initiatives be undertaken to attract additional entrants”*;
- f. A few operators point out there is a clear competition problem in the market evidenced by a high market concentration and/or a very high retained market share for the largest operator in certain market segments/relevant markets (notably in the wider business retail segment). Further that, even if competition develops in the mass-market segment, the business retail market is very different and the regulatory decisions taken on wholesale remedies that apply to the business segment are not effective to allow for effective competition to develop;

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- g. Most stakeholders recognise that the new competition from 'global Over The Top ('OTT') players' (such as Skype, Viber, WhatsApp) create clear benefits to the end-users. Some operators argue, however, that OTT players pose a threat to existing licensed operators' possibility and willingness to invest, since the impact of the OTT players lead to erosion of revenues and profit margins of the existing licensed operators. These operators argue further that there is a need to create more certainty and regulation on how the OTT players should be able to offer their services in the future.
135. TRA addresses the issues raised in further detail later in the report.

### 5 Market indicators & analysis

136. This chapter describes and analyses in detail the development of the telecommunications market in Bahrain in the last few years. It provides important inputs to the considerations and assessments made in Chapter 9 on 'Holistic review of the relevant markets', as it shows e.g. development trends in terms of volumes, values, prices, level of substitution and market shares in the different markets<sup>45</sup>.

#### 5.1 Operators in different retail market segments

137. There are currently about twenty-five active licensed operators which provide telecommunications services in Bahrain. The following table summarises the services that the licensees provide to end-users.

**Table 4: Licensed operators per market segment** <sup>46</sup>

Operator Name	National Fixed	International Calls	Mobile	Internet	Leased line	Other data service
2Connect	✓	✓		✓	✓	✓
Ascentech telecoms		✓		✓		
Batelco	✓	✓	✓	✓	✓	✓
Bahrain Internet Exchange						✓
BT Solutions LTD					✓	
EQUANT EGN BV						✓
Etisalcom	✓	✓		✓	✓	
GatewayGulf				✓		
Greenis (Bahrain Broadband)				✓		
Kalaam telecoms	✓	✓		✓	✓	
Light Speed	✓	✓		✓	✓	
Mena Telecom	✓	✓		✓	✓	✓
Moving Gulf		✓				
Northstar		✓		✓	✓	
Nuetel Communications	✓	✓		✓	✓	
Rapid telecoms	✓	✓		✓	✓	
Gulf Electronic Tawasul Company						✓
Viacloud		✓				
VIVA Bahrain		✓	✓	✓	✓	
Zain Bahrain	✓	✓	✓	✓	✓	

\*) Other data services include for example, international managed leased line services and international MPLS/IPVPN service.

Source: TRA

#### 5.2 Revenues – overall, retail and wholesale

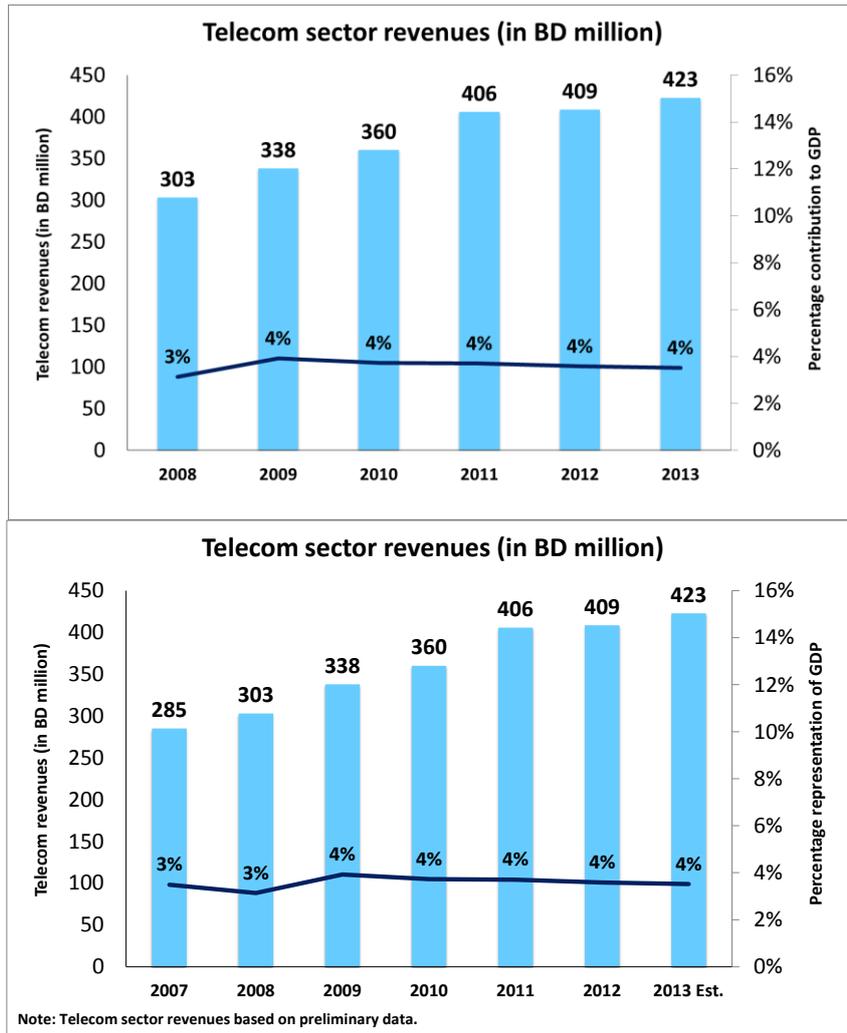
138. Total sector revenue in 2013 was about BD 423 million, compared to BD 409 million in 2012 (3.4% growth). The market has shown 7% compound annual growth rate between 2007 and 2013. Total telecoms revenues represent about 4% as a proportion of GDP.

<sup>45</sup> Due to confidentiality, some of the data cannot be released and shared in the public consultation document.

<sup>46</sup> The table contains licensees that respond to TRA periodic questionnaires on operating activities per segment

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Figure 7: Total telecoms sector revenues



Source: TRA analysis based on operator data

139. The market overall is rather concentrated, insofar that the three largest operators, Batelco, Viva and Zain, account for almost 90% of the total sector revenues. The three are currently also the only licensed operators for mobile cellular services in Bahrain.

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**Figure 8: Overall revenue market shares**



Source: TRA analysis based on operator data

- 140. Based on total sector revenue, Batelco holds a market share of 40-50%, Viva 25-35%, Zain 15-25%. Other licensed operators have a combined revenue market share of about 10%
- 141. Total sector revenues can however be broken down and analysed in different dimensions. For example, whereas the revenues from defined retail and wholesale markets make up for a substantial proportion of total sector revenues, at least BD 95m is generated from activities in non-defined markets.

**Table 5: Sector revenues split in total and as per defined retail and wholesale markets**

(in BD)	2011	2012	2013
Total sector revenue	405,773,855	408,523,040	422,765,694
Retail and wholesale revenues as per defined markets	339,981,265	330,645,432	328,063,193
Retail revenue	311,347,438	302,953,950	305,051,965
Wholesale revenue	28,633,827	27,691,482	23,011,228

Source: TRA analysis based on operator data

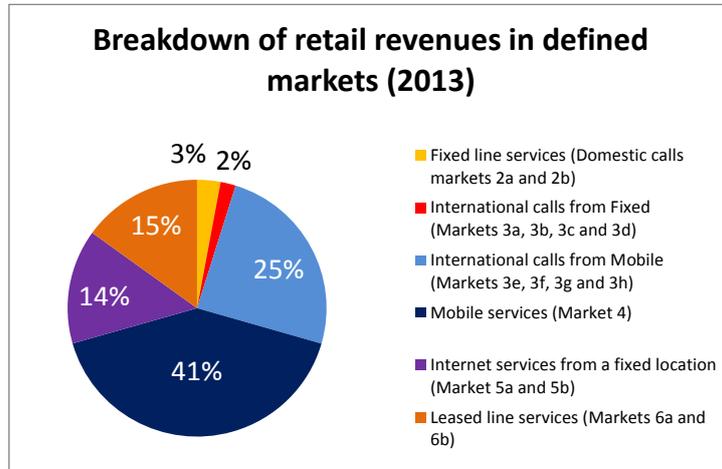
- 142. The revenue generated from activities in currently defined relevant markets was about BD 328 million in 2013, or about 77% of total sector revenue. Out of the BD 328 million, retail revenues accounted for 93%, and wholesale revenues 7%.

# Strategic Market Review

## 5.2.1 Revenues in defined relevant retail markets

143. Mobile service revenues, including revenues from mobile originated international calls, account for two thirds of the total *retail* revenue in the defined markets.<sup>47</sup>

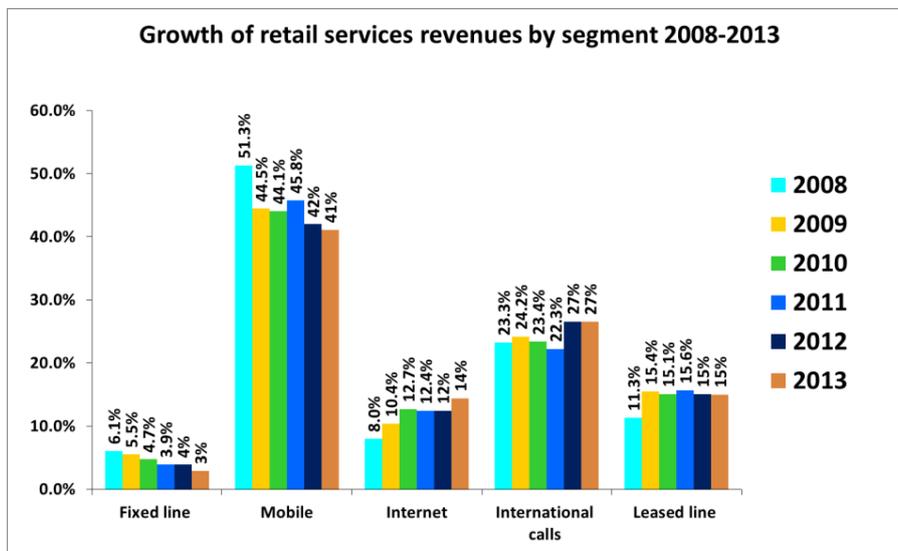
**Figure 9: Distribution of retail revenues in defined markets**



Source: TRA analysis based on operator data

144. In addition, the market segment “*internet services from a fixed location*” includes mobile operator revenues in terms of stand-alone mobile broadband dongles, as these are included in the recently defined retail market “*mass-market broadband from a fixed location*”. Therefore, the contribution from the mobile market overall, is effectively around 70%.

**Figure 10: Revenue growth in retail markets**



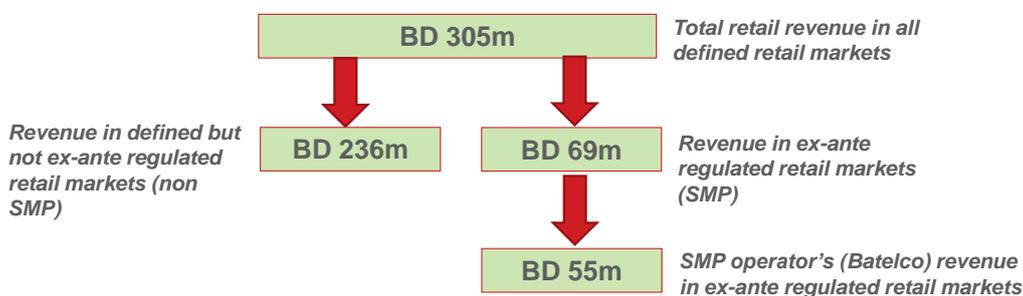
Source: TRA analysis based on operator data

<sup>47</sup> This figure excludes revenue from stand-alone mobile broadband (dongles etc.) which are included in internet services revenues

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145. Since 2009, the contribution (in %) of each market segment to the total retail revenues has been rather stable. The share of
- Mobile (excl. international calls) has decreased from 44.5% to 41%;
  - Fixed (excl. international calls) has decreased from 5.5% to 3%;
  - Leased lines has decreased from 15.4% to 15%; whereas
  - Internet (incl. stand-alone mobile) has increased from 10.4% to 14%, and
  - International calls revenue has increased from 24.2% to 27%.
146. So, even if the mobile market overall has driven sector subscriber and usage growth in recent years, its share of total retail revenues has not increased. This is largely explained by the degree of price competition that has been experienced.
147. Having noted the revenues and growth trends of the respective defined retail markets, the next step in the analysis is to isolate the ex-ante regulated retail markets, as a number of the defined retail markets have been determined to be effectively competitive, i.e. no operator has SMP.

**Figure 11: Revenue split between defined retail markets; ex-ante vs non-ex-ante regulated markets**



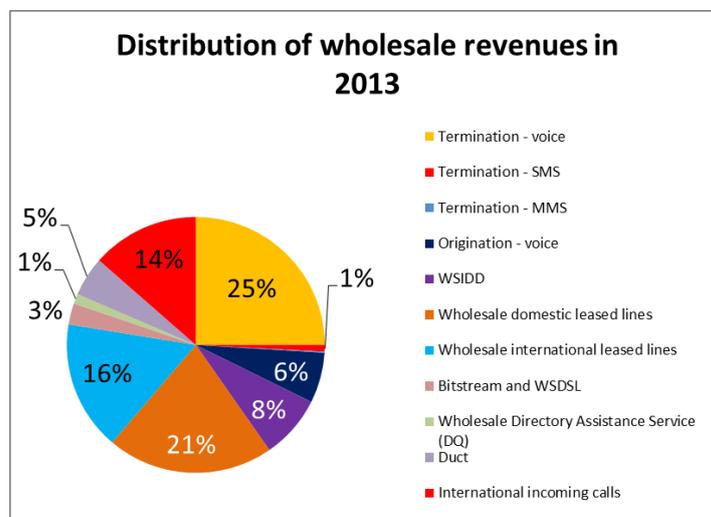
Source: TRA analysis based on operator data

148. Retail markets which are not subject to ex-ante regulation include the retail markets for mobile services, mobile originated international calls, fixed originated international calls to Zone 1 and Zone 3, and *mass-market* broadband services (which was deregulated through the March 2014 Determination on broadband access market). In total these relevant markets account for revenues of about BD 236 million in 2013, or about 77% of the revenues in all currently defined relevant retail markets.
149. The *ex-ante* regulated retail markets account for retail revenues of around BD69 million, or 23% of the total revenue in all defined retail markets. Moreover, the *ex-ante regulated revenue* in these retail markets (i.e. revenues of the SMP operator; Batelco) is estimated at about BD 55 million.
150. In other words, based on 2013 revenues, the ex-ante regulatory intervention, through the RTN (Retail Tariff Notification process), is applied on about 18% of the revenues in defined retail markets, or 13% of total sector revenues. Similarly, it represents about 32% of Batelco's total revenues earned in Bahrain in 2013.

### 5.2.2 Revenues from defined wholesale markets and services

151. The revenue from defined relevant wholesale markets was about BD 23 million in 2013. This represents about 7% of all revenues generated in 'defined markets', and about 5.5% of total sector revenues.

**Figure 12: Distribution of wholesale revenues in defined markets (2013)**



Source: TRA analysis based on operator data

152. The defined wholesale markets are mostly subject to ex-ante regulation, but there are exceptions, e.g. the recent lifting of the wholesale broadband access, and associated physical infrastructure, for *mass-market* broadband services, and the wholesale supply of international capacity from locations within Bahrain. The international incoming calls market was considered competitive provided there is non-discriminatory access to the local termination service in individual networks.
153. The relatively low revenue share of these ex-ante regulated wholesale markets must not, however, be confused with the impact that the wholesale products have on creating effective and sustainable competition in the downstream (retail) markets. Access to networks and facilities on fair terms and conditions is, to some licensed operators, a prerequisite to be able to compete in the downstream markets.
154. Nevertheless, the numbers give an indication on the relatively modest contribution of the 'wholesale business' revenues to total sector revenues. For example, wholesale revenues account for about 10% of Batelco's earned revenues in Bahrain<sup>48</sup>.
155. As a comparison, BT Openreach (BT's functionally separate entity which provides the last mile) is BT's biggest business unit, with 31,000 staff and annual revenues of £5.1bn (in 2013), of which £3.2bn was internal revenue and £1.8bn external revenue. BT's wholesale entity generated £2.4bn from external customers<sup>49</sup>. Together this represents more than 23% of BT Group's revenue generated from external customers, and more

<sup>48</sup> Batelco Annual Report 2013 and TRA analysis

<sup>49</sup> See BT Group Annual Report 2013

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than 19% of BT's total revenues<sup>50</sup>. Though it should of course be recognized that the UK market and regulations are in many ways different to Bahrain, it nevertheless gives an indication on the potential for higher wholesale revenues, and an improved wholesale business model, for Bahrain in general and Batelco in particular.

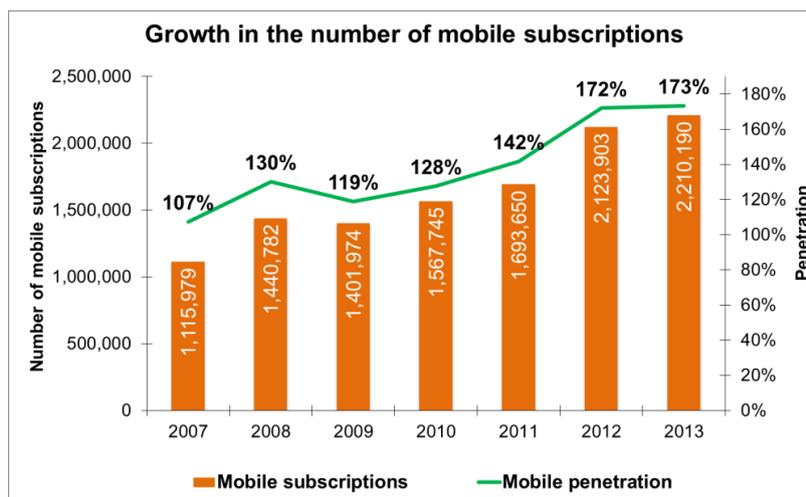
156. Wholesale revenues from terminated traffic originating on national networks amounts to 25% of total wholesale revenues, followed by wholesale domestic lines and international lines. The 25% revenue share for mobile and fixed termination services is relatively low in an international comparison and a result of the quite low wholesale rates for these particular regulated wholesale services.

### 5.3 Mobile market indicators

#### 5.3.1 Subscribers

157. The mobile subscriber penetration in Bahrain was 173% at end of 2013. With such high (Sim card) penetration rates there is naturally a significant portion of the users with multiple mobile subscriptions.
158. Even if the acquisition cost (i.e. cost to customer to buy a Sim-pack) is very low (currently about BD2), there is probably very limited scope for further increase in population penetration, unless there is a significant number of (net) additional people residing permanently in the country. However, the number of SIMs and subscriptions should still be expected to increase due to multiple devices and machine-to-machine ('M2M') technology.

**Figure 13: Overall mobile subscriber growth**



Source: TRA analysis based on operator data

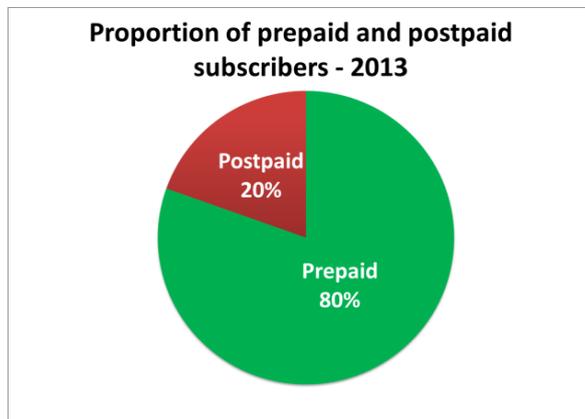
159. The proportion between postpaid and prepaid subscribers follows many other mobile markets which have a significant portion of (often temporary) expatriates and visitors.

<sup>50</sup> Note that BT Group entails revenues from BT Global services. BT Global services generate more than 55% of its revenues from overseas activities, which means that the contribution of BT Wholesale and Openreach to UK only generated revenues is even larger than the 23% of revenues from external customers.

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80% are on prepaid and 20% are on postpaid plans at end of 2013. Though there are mobile markets where prepaid subscriptions make up more than 95% of all subscriptions, in the EU member states the number postpaid subscriptions is normally significantly higher than prepaid.

**Figure 14: Split between postpaid and prepaid mobile subscribers**



Source: TRA analysis based on operator data

160. Postpaid and prepaid plans cater for different market segments and different demand, e.g. a significant portion of prepaid subscribers are expatriates from South Asian countries who make up a large share of the international outbound traffic minutes.

### 5.3.2 Mobile domestic voice traffic

161. The total outgoing domestic mobile traffic grew by about 8% between 2012 and 2013. Postpaid traffic grew by 18% and prepaid traffic by 6%. Postpaid segment's share of total outbound traffic is only 21%, i.e. only marginally higher than its share of total mobile subscriptions.

**Table 6: Outgoing domestic mobile voice traffic**

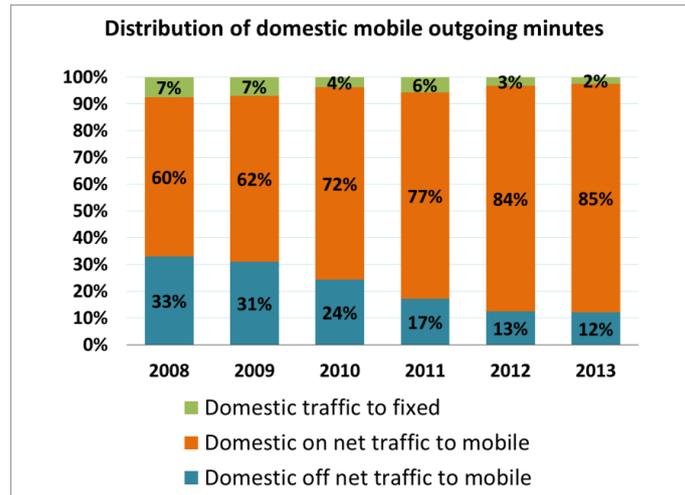
Mobile outgoing minutes (Domestic only, in millions)	2009	2010	2011	2012	2013	Growth 2012 - 2013
From prepaid	1,235	2,730	3,904	4,672	4,947	6%
From postpaid	783	1,015	1,152	1,128	1,333	18%
<b>Total</b>	<b>2,018</b>	<b>3,745</b>	<b>5,056</b>	<b>5,801</b>	<b>6,280</b>	<b>8%</b>

Source: TRA analysis based on operator data

162. The distribution of domestic mobile traffic is heavily dominated by on-net traffic; around 85% of all minutes are on-net. This is explained by various tariff offers with free on-net minutes. Only about 2% of mobile domestic calls terminate on fixed networks, and 12% on other mobile domestic networks.

## Strategic Market Review

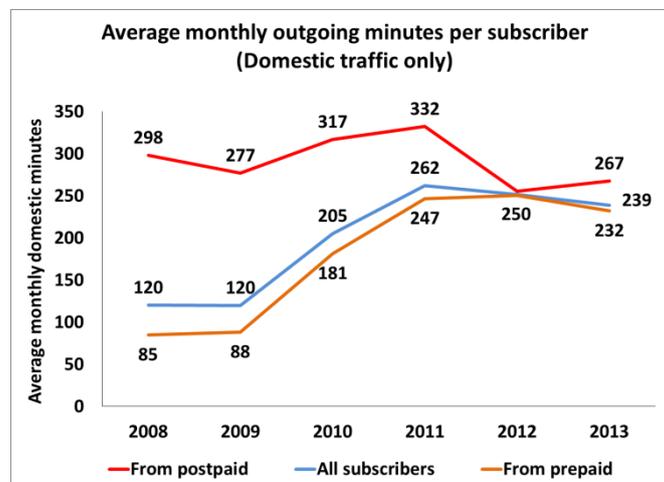
**Figure 15: Destination networks of domestic voice traffic – mobile**



Source: TRA analysis based on operator data

163. The relative increase of on-net traffic has been a steady trend since Viva launched their mobile network and services in 2010.
164. A similar trend since Viva's entry into the market is that the outgoing traffic minutes per mobile subscriber have been merging between postpaid and prepaid subscribers. In 2009, the average postpaid subscriber made more than three times the number of call minutes compared to the average prepaid subscriber. In 2012, the number of minutes was basically the same, whereas in 2013, through more aggressive on-net tariff plans on postpaid, the average postpaid subscriber made about 15% more call minutes than the average prepaid user. The strong uptake in prepaid traffic is closely correlated with Viva's entry to the market and its relative success in attracting prepaid customers.

**Figure 16: Outgoing voice traffic; average domestic and international minutes – mobile**



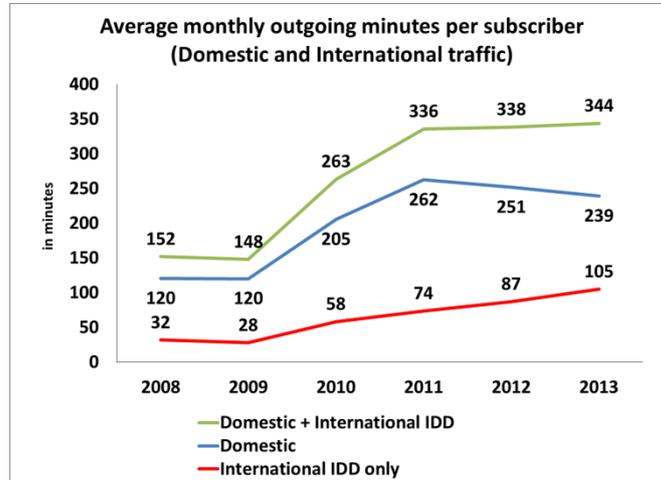
Source: TRA analysis based on operator data

## Strategic Market Review

### 5.3.3 Mobile total voice traffic

165. International call minutes made up close to 30% of the average outgoing traffic minutes per mobile subscriber in 2013. In 2009, it was about 20%.

**Figure 17: Outgoing voice traffic; average domestic and international minutes - mobile**



Source: TRA analysis based on operator data

166. Overall, the average call minutes per subscriber grew by almost 130% between 2009 and 2011 (from 148 to 336 minutes), and has since stayed rather stable.

### 5.3.4 SMS

167. SMS volumes have shown a different trend. The volume of prepaid SMSs sent in 2010 was 791 million, but despite an increasing subscriber base, the number of SMS decreased sharply to 256 million in 2012. In 2013 the volume increased however somewhat to 264 million.
168. SMSs sent by postpaid customers, on the other hand, have continued to decrease year-on-year from its peak in 2010. In 2013, only 69 million SMS were sent by postpaid customers, a decrease of 35% from 2012.

**Table 7: Total prepaid and postpaid SMS's**

Total SMS (millions)	2009	2010	2011	2012	2013	Growth 2012 - 2013
Prepaid	214.9	791.3	417.3	255.9	264.2	3%
Postpaid	146.6	202.5	155.9	107.5	69.4	-35%
<b>Total</b>	<b>361.5</b>	<b>993.8</b>	<b>573.2</b>	<b>363.4</b>	<b>333.6</b>	<b>-8%</b>

Source: TRA analysis based on operator data

169. Overall, SMS volumes appear to be in constant decline. This is partly explained by the aggressive on-net pricing for voiced calls that has been a part of the mobile market since Viva's entrance in 2010. However, another important reason for the decrease in SMS volumes is also likely to be increasing substitution towards OTT messaging services (notably Whats App).

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### 5.3.5 Mobile revenues

170. Overall revenues from mobile services, inclusive of international traffic revenues, have stayed rather stable in the last three years.

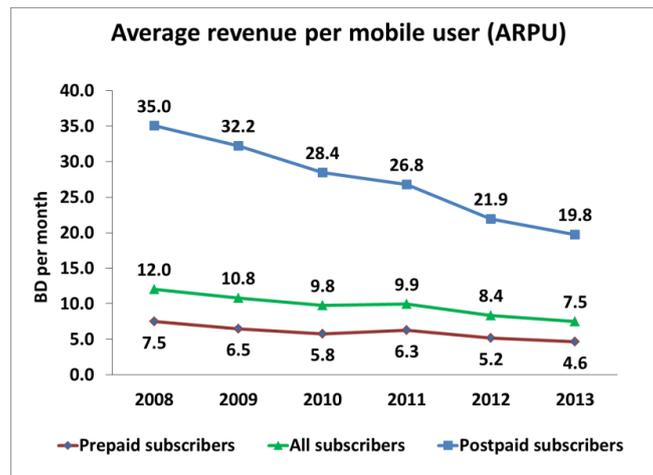
**Table 8: Total prepaid and postpaid revenues**

Revenue (BD in millions)	2008	2009	2010	2011	2012	2013	Growth 2012 – 2013
Prepaid	95.3	90.9	86.9	99	96.3	98.8	2.5%
Postpaid	88.4	91.2	91.2	92.9	96.8	98.4	1.7%
<b>Total</b>	<b>183.7</b>	<b>182.1</b>	<b>178.1</b>	<b>191.9</b>	<b>193.1</b>	<b>197.2</b>	<b>2.1%</b>

Source: TRA analysis based on operator data

171. Interestingly, revenues from prepaid and postpaid segments are rather balanced, and in addition show similar growth rates. Total mobile revenues grew by 2.1% between 2012 and 2013; prepaid revenues grew by 2.5% and postpaid revenues by 1.7%.
172. The trend is similar to other markets; i.e. as the market saturates in terms of net subscriber acquisitions, revenues tend to show modest growth rates (even decreasing revenues in some other countries). Volumes increase but are off-set by sharpening price competition, especially on traditional voice services.
173. In line with overall revenue trends, the average revenue per mobile user has shown a steady decrease.

**Figure 18: ARPU's in the mobile market**

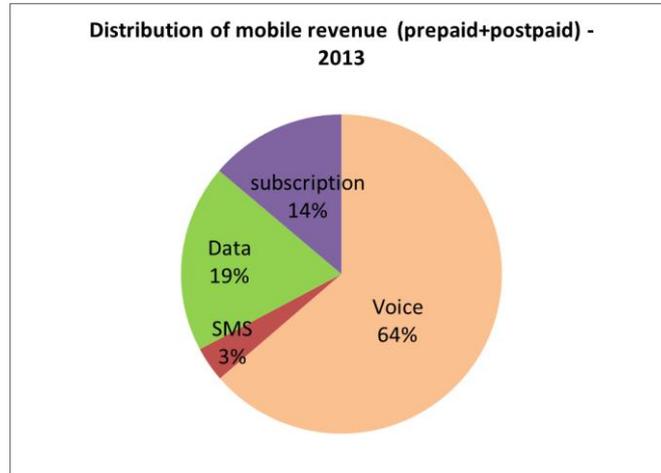


Source: TRA analysis based on operator data

## Strategic Market Review

174. The blended ARPU for mobile subscriber has decreased from BD12 in 2008 and BD 10.8 in 2009, to about BD 7.5 in 2013. In 2013, postpaid ARPU was BD 19.8 and prepaid ARPU was BD 4.6.
175. The picture of the blended (postpaid + prepaid) revenue distribution shows that voice revenues account for 64% of total mobile revenues.

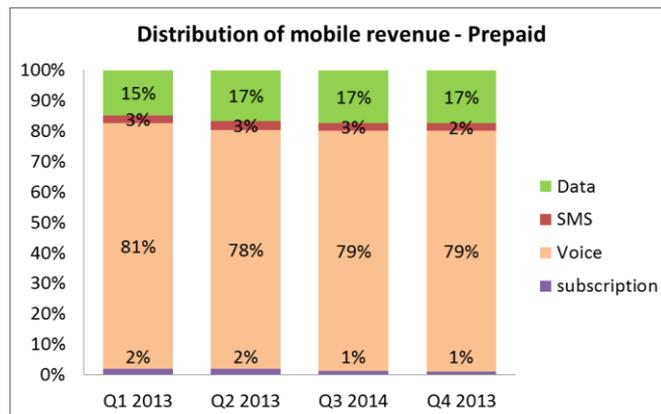
**Figure 19: Overall revenue split 2013 - mobile**



Source: TRA analysis based on operator data

176. The revenue share for SMS was only 3%, whereas stand-alone data (mobile broadband) accounted for 19%. Data revenues show the highest growth.
177. For prepaid revenues, voice represents 79% and data 17% of the total.

**Figure 20: Prepaid revenue split per quarter 2013**

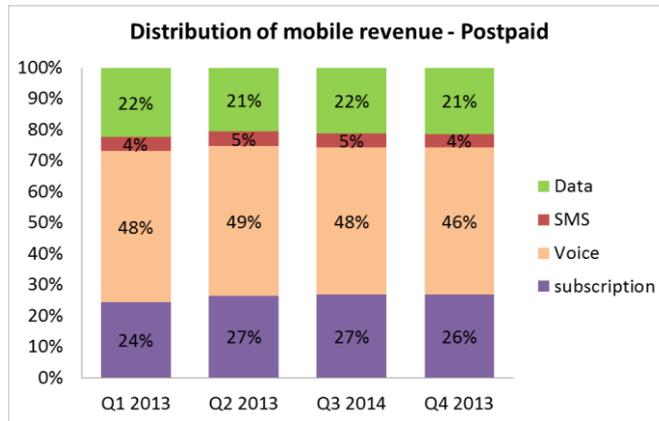


Source: TRA analysis based on operator data

178. For postpaid, voice revenues accounted for 46%, data 21% and subscriptions 26%.

# Strategic Market Review

**Figure 21: Postpaid revenue split per quarter 2013**



Source: TRA analysis based on operator data

## 5.3.6 Market shares - mobile

- 179. This section examines market shares in the mobile market.
- 180. Overall, Viva has, since it entered the market in 2010, reached a subscriber market share of 40-50% in 2013. Through its aggressive launch strategy Viva managed to rapidly establish itself, reaching a 20-30% share of active subscribers by the end of 2010.
- 181. Batelco and Zain each held a 25-35% subscriber market share by the end of 2013.

**Figure 22: Total mobile subscribers market share**

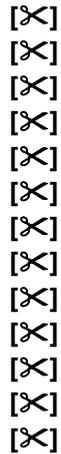


Source: TRA analysis based on operator data

- 182. The market share situation is however different for prepaid and postpaid segments.
- 183. In the prepaid segment Viva held 40-50%, Zain 25-35% and Batelco 25-35% market subscriber share at the end of 2013.

## Strategic Market Review

**Figure 23: Prepaid subscribers market share**



Source: TRA analysis based on operator data

184. In the postpaid segment on the other hand Batelco is the market leader with a 35-45% market subscriber share at the end of 2013. Zain has 30-40% and Viva has 25-35% subscriber share in the postpaid segment at the end of 2013.

**Figure 24: Postpaid subscribers market share**

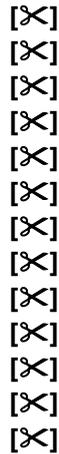


Source: TRA analysis based on operator data

185. An analysis of the *revenue* market shares shows that overall Viva holds 35-45% of the total mobile market value, Zain 25-35% and Batelco 25-35%.

## Strategic Market Review

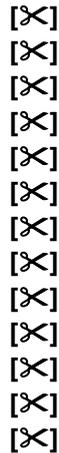
**Figure 25: Total mobile revenues market share**



Source: TRA analysis based on operator data

186. From the launch year in 2010, Viva has constantly increased its market share, largely at the expense of Batelco. After a significant market share loss % between 2009 and 2011, Zain has been able to slightly increase its revenue market share.
187. In the prepaid market segment, Viva held a high revenue share of 55-65% at the end of 2013 (compared to Viva's share of 40-50% of prepaid subscribers).

**Figure 26: Prepaid mobile revenues market share**

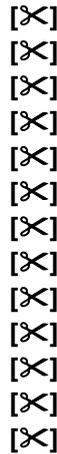


Source : TRA analysis based on operator data

188. In the postpaid segment, on the other hand, Batelco has the highest revenue market share at 40-50%. This can be compared to Batelco's subscriber share of 35-45%. Zain's and Viva's revenue share in the postpaid segment is 30-40% and 15-25% respectively.

## Strategic Market Review

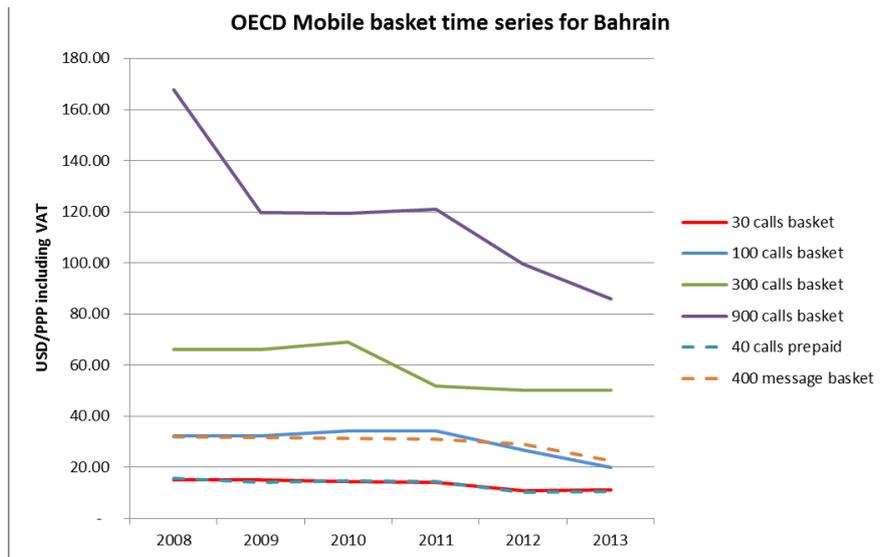
**Figure 27: Postpaid mobile revenues market share**



Source: TRA analysis based on operator data

189. In summary, the mobile market in Bahrain is very competitive and rather balanced in terms of market shares. Even if Viva has quickly taken a strong market position overall, Batelco and Zain hold sound market shares, especially in the postpaid segment.
190. The mobile market has in recent years been characterised by intense price competition, but also substantial investments in new technology and product offers (notably early roll-out of LTE networks and commercial offers by all three operators). With respect to pricing, mobile prices in Bahrain have fallen up to 25% between 2012 and 2013 and by almost 40% over the last five years (see below).

**Figure 28: Price trends for mobile usage in Bahrain**



Source: TRA analysis based on operator data

191. The mobile players are increasingly providing product value propositions that are arguably substitutes for many customers, albeit not for all types of customers. The level of substitution effects must be analysed on a case-by-case basis; however, TRA has

## Strategic Market Review

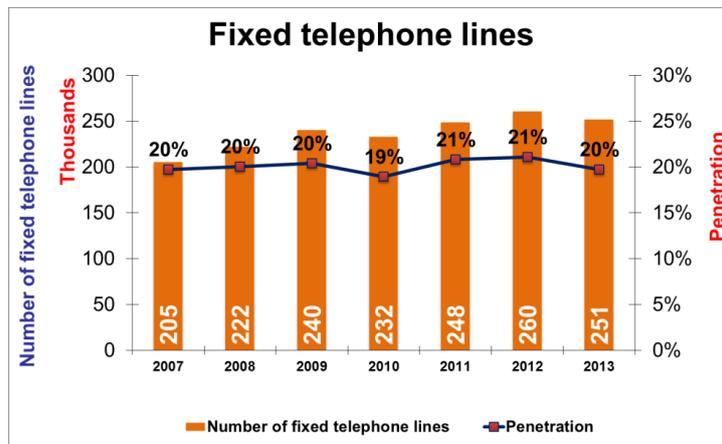
recently concluded<sup>51</sup> that mobile broadband represents a good economic substitute for fixed broadband for mass-market users, and belong to the same relevant market as fixed broadband services for these users. Furthermore, based on results from TRA's recent consumer survey, a large portion of residential subscribers to a fixed broadband service would switch to a mobile broadband service in response to a 10% increase in fixed broadband prices.

### 5.4 Fixed market indicators

#### 5.4.1 Fixed lines subscribers

192. In contrast to the mobile subscriber growth, the number of fixed telephone subscribers has been rather stable in recent years. By the end of 2013, there were 251,000 fixed line subscriptions in Bahrain, implying a fixed line penetration of about 20% (of the population).<sup>52</sup>

Figure 29: Fixed lines subscribers and penetration



Source: TRA analysis based on operator data

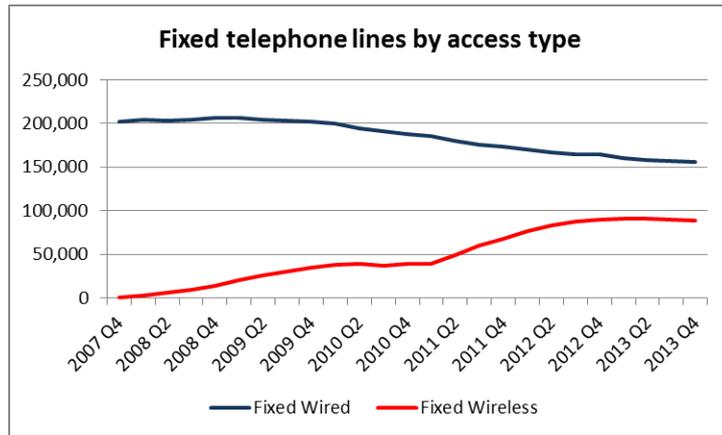
193. The fixed line market in Bahrain has an unusually high share of fixed wireless (Wimax) connections; almost 40% of all fixed lines are fixed wireless. The number of fixed wired telephone subscriptions has been constantly falling since 2008, which has coincided with the emergence and growth of fixed-wireless based services (and mobile).

<sup>51</sup> "Determination of Significant Market Power and determination of Dominant Position in the Markets for Provision of Broadband Internet Access Services from a Fixed Location", 27 March 2014 (Ref: MCD/03/14/018).

<sup>52</sup> The actual penetration of fixed lines per household is therefore significantly higher, however, 'households' in Bahrain tend to differ significantly in size and 'composition'. Furthermore, there is no official figure on actual number of 'households.'

## Strategic Market Review

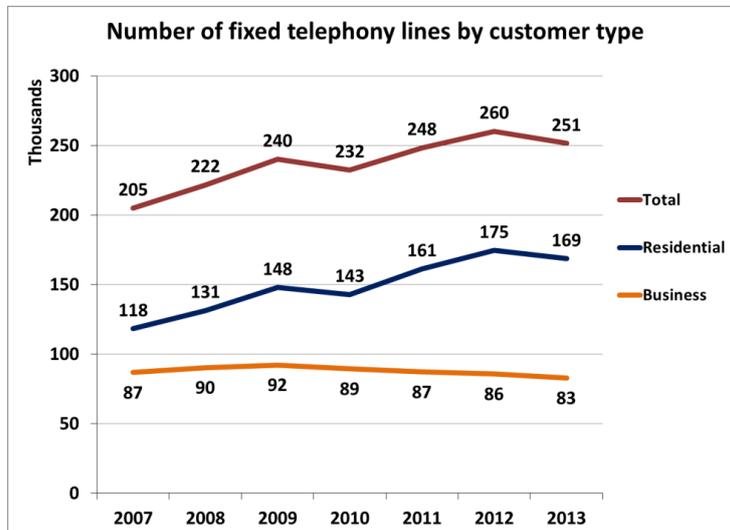
**Figure 30: Fixed lines per access type**



Source: TRA analysis based on operator data

194. The split between business and residential/private fixed lines is about 1/3 business and 2/3 residential. The majority of the 'business lines' relate to small businesses (Small Medium Enterprises, SME), as larger businesses/enterprises rely on other services for their telephony needs (notably ISDN lines, and, for larger enterprises, leased lines).

**Figure 31: Fixed lines per customer type**

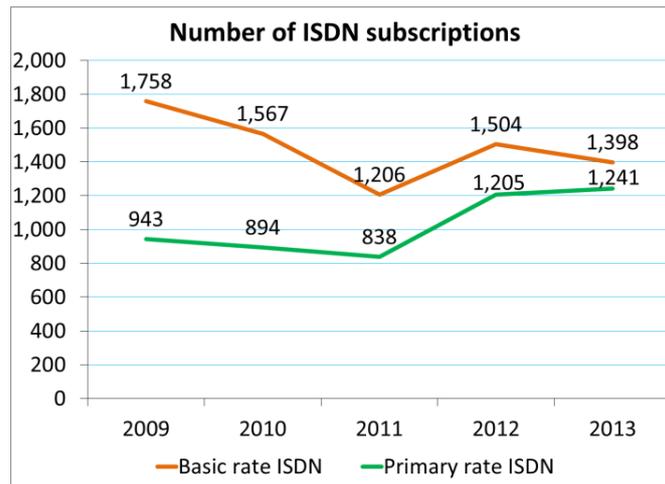


Source: TRA analysis based on operator data

195. Although the number of residential lines increased in consecutive years between 2010 and 2012, due to the growth in fixed wireless subscriptions, both residential and business lines decreased between 2012 and 2013.
196. The combined number of ISDN subscribers (basic and primary) have stayed rather stable in the last couple of years (at around 2,600-2,700 subscribers). Basic ISDN provides 2 channels and primary ISDN up to 30 channels.

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**Figure 32: Number of ISDN subscriptions**



Source: TRA analysis based on operator data

197. ISDN subscribers are typically companies but who are not larger enterprises (and not in need of enterprise solutions).

### 5.4.2 Fixed voice traffic

198. Voice traffic from fixed networks experienced a significant decrease between 2012 and 2013 (by 23%). Both fixed to fixed and fixed to mobile national traffic saw a large decrease.

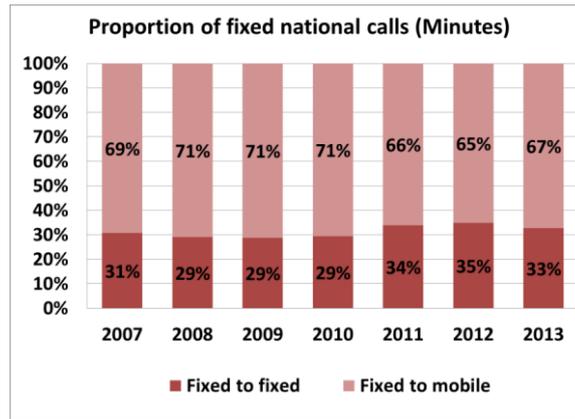
**Figure 33: National outgoing minutes (million)**

Yearly national outgoing minutes in million	2009	2010	2011	2012	2013	Growth 2012 - 2013
Fixed to fixed	291	267	224	223	162	-28%
Fixed to mobile	718	641	438	417	333	-20%
<b>Total</b>	<b>1,009</b>	<b>908</b>	<b>662</b>	<b>640</b>	<b>495</b>	<b>-23%</b>

Source: TRA analysis based on operator data

## Strategic Market Review

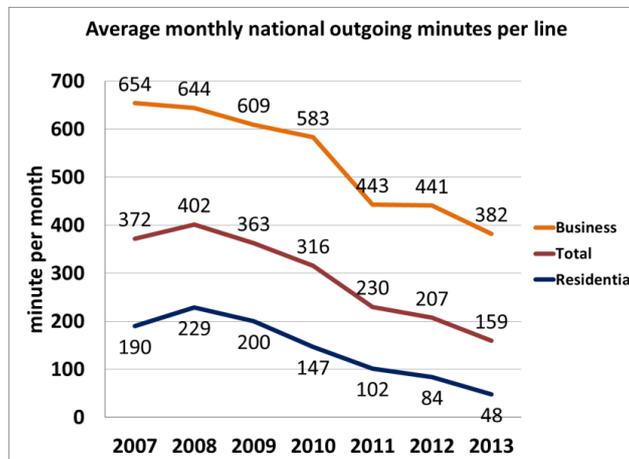
**Figure 34: Destination of national fixed calls**



Source: TRA analysis based on operator data

- 199. Roughly 2/3 of outgoing national calls from fixed lines terminate on mobile networks.
- 200. With respect to average minutes per user, both residential and business subscribers make significantly less national fixed calls than in previous years.

**Figure 35: Average national minutes on fixed networks per customer group**



Source: TRA analysis based on operator data

- 201. The declining call volumes from fixed lines (in total and per subscriber) are explained by the increasing traffic volumes from, and between, mobile phones.

### 5.4.3 Revenues - fixed

- 202. The revenues for fixed rental (including PSTN/ISDN, and Wimax/fixed-wireless) and domestic calls per customer group is presented in the table below.

## Strategic Market Review

**Table 9: Revenues per main customer group**

BD in million	2007	2008	2009	2010	2011	2012	Growth 2011-2012
Residential	10.8	10.5	10.7	7.6	4.7	3.7	-21%
Non-residential	6.6	6.6	6.8	7.0	7.5	8.1	8%
<b>Total</b>	<b>17.4</b>	<b>17.1</b>	<b>17.5</b>	<b>14.6</b>	<b>12.2</b>	<b>11.8</b>	<b>-4%</b>

Source: TRA analysis based on operator data

203. 2012 revenues have been adjusted (but not for previous years) and Table 10 below provides a like-for-like comparison of fixed revenues by customer group<sup>53</sup> between 2012 and 2013.

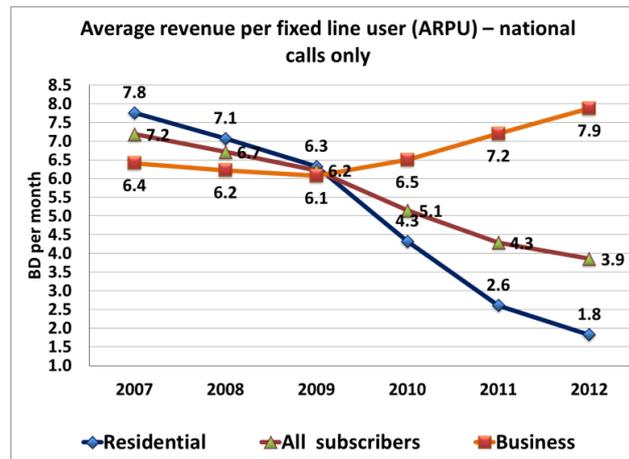
**Table 10: Updated 2012 and 2013 revenues per main customer group**

BD in million	2012	2013	Growth 2012-2013
Residential	3.7	2.8	-24%
Non-residential	11.3	10.0	-12%
<b>Total</b>	<b>15.0</b>	<b>12.8</b>	<b>-15%</b>

Source: TRA analysis based on operator data

204. Overall, there is a significant decline in ARPU for fixed national services. However, the ARPU for business users increased in the last few years until 2012.

**Figure 36: ARPU – per fixed line including domestic calls only (based on previous revenue reporting)**



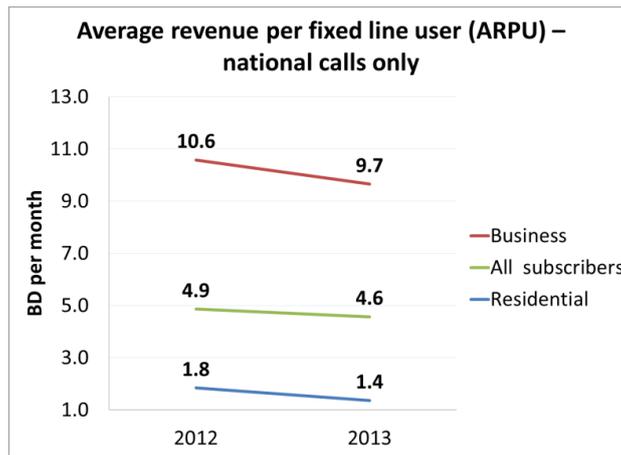
Source: TRA analysis based on operator data

205. Between 2012 and 2013 (based on adjusted and comparable revenues for 2012 and 2013) ARPU decreased for both business and residential subscribers.

<sup>53</sup> The adjustment made related to ISDN revenues which were in previous years not included in the 'non-residential line revenues'.

# Strategic Market Review

**Figure 37: ARPU in 2012 and 2013 (based on adjusted 2012 revenues)**



Source: TRA analysis based on operator data

206. The declining ARPU for fixed line users, especially for residential users, is arguably largely the effect of competition from and migration to mobile and IP based services, as seen from the strong increase in mobile users and usage over the same years.

## 5.4.4 Market shares - fixed

207. Batelco has the highest market share in terms of both the number of fixed lines and revenue. In terms of fixed line market shares, Batelco's subscriber share was about 55-65% by the end of 2013. Zain was the second largest with a market share of about 10-20%. The analysis includes both fixed and fixed wireless (Wimax) connections.

**Figure 38: Market shares – fixed telephony (fixed and fixed-wireless)**



Source: TRA analysis based on operator data

208. However, Batelco's market share of PSTN lines only (copper and fibre) was more than 90%.
209. Batelco's revenue market share (for fixed and fixed-wireless telephony lines) was 80-90% in 2013. Therefore, even though Batelco's share of fixed telephony subscribers has been constantly falling over the years, its revenue share remains very high. The market

## Strategic Market Review

share situation (notably the large difference between subscriber and revenue market share) is however substantially affected by the bundling of the fixed line with broadband services and free unlimited on-net calls offered by some OLOs, in particular Zain and Mena.

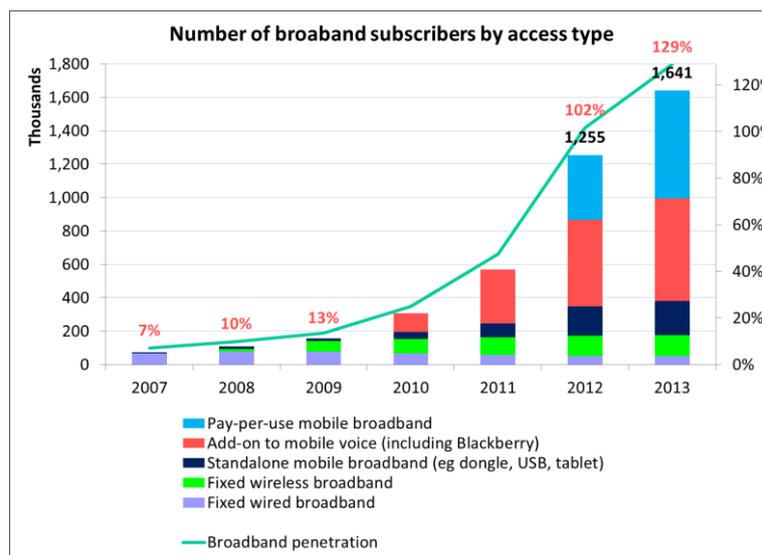
210. There is also increasing competitive pressure from mobile services, especially for access to residential (and small business) users. Of those residential users who have cancelled their fixed line connection 89% state that the main reason was that mobile access is sufficient for their needs. It should be noted that the monthly charge for fixed telephony access for residential users is very low in Bahrain (BD 1.16 per month). Therefore, it appears likely that a further rebalanced access charge, more in line with underlying costs or for that matter rentals charged in many other markets, would imply that an increasing number would consider giving up their fixed line for the purpose of voice calls.
211. A highly relevant question which is considered in later sections is therefore whether the dramatic increase and reliance of mobile services, coupled with managed IP services from fixed locations, motivate a redefinition of the relevant market for voice call services.

### 5.5 Broadband market indicators

#### 5.5.1 Subscribers

212. At the end of 2013, there were approximately 1.64 million broadband subscriptions, representing a broadband penetration of 129%, mainly driven by the strong growth and impact of mobile broadband.

**Figure 39: Broadband subscribers per access type**



Note that data on Pay-per-use mobile broadband subscribers was not available for 2011. Furthermore, the subscribers for pay-per-use mobile broadband are not double counted in the standalone mobile broadband subscribers.

Source: TRA analysis based on operator data

213. Mobile broadband subscriptions continue to grow rapidly (albeit at more moderate growth than during 2012) and represented 89% of the broadband customer base in 2013. The number of standalone mobile broadband subscriptions (based on dongles,

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USB, tablets) increased by 19% between 2012 and 2013. The number of data add-on subscriptions and smartphone plans also increased by 18% during 2013.

214. The number of fixed broadband subscriptions (i.e. ADSL, fibre, and WiMax) was about 176,000 at the end of 2013. In comparison, there were almost 200,000 active standalone mobile subscribers at the end of 2013.

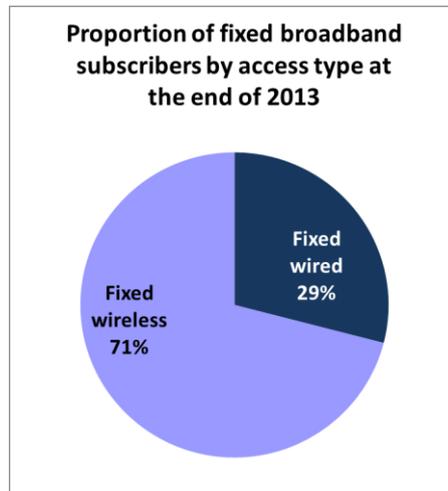
**Table 11: Fixed broadband subscribers (i.e. excluding standalone mobile broadband)**

Fixed broadband (e.g. ADSL, fiber, WiMax)	2010	2011	2012	2013
Residential	144,929	153,878	162,012	163,023
Non Residential	9,943	10,981	11,729	12,773
<b>Total</b>	<b>154,872</b>	<b>164,859</b>	<b>173,741</b>	<b>175,796</b>

Source: TRA analysis based on operator data

215. Of the total fixed broadband subscribers, more than 90% are residential subscribers.
216. The distribution between fixed wired (ADSL and fibre) and fixed-wireless broadband subscribers is 30% fixed and 70% fixed-wireless<sup>54</sup>.

**Figure 40: Split of fixed broadband subscribers between access type**



Source: TRA analysis based on operator data

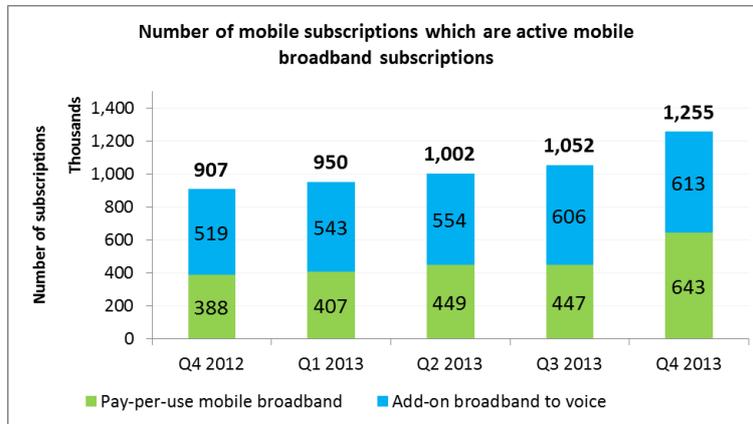
217. Mobile broadband has experienced a dramatic growth in the last few years; increasing from about 900,000 active mobile subscriptions in 2012 to over 1.25 million in 2013. In the last quarter of 2013 only, there was a growth of almost 20%. The rapid uptake is largely driven by aggressive data pricing offers coupled with the commercial launches of new 4G/LTE networks and data offers.

<sup>54</sup> The explanation for the large difference in the split between fixed and fixed-wireless for telephony service compared to for broadband access is that the offers

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218. The figure below shows only pay-per-use and add-on to voice mobile broadband users. Standalone mobile broadband (which as per the Broadband market review was determined to belong to same relevant market as fixed and fixed-wireless for mass-market users) is hence excluded but amounted to about 200,000 at the end of 2013 (see also Figure 40 above)

**Figure 41: Active mobile broadband (internet) subscribers**



Source: TRA analysis based on operator data

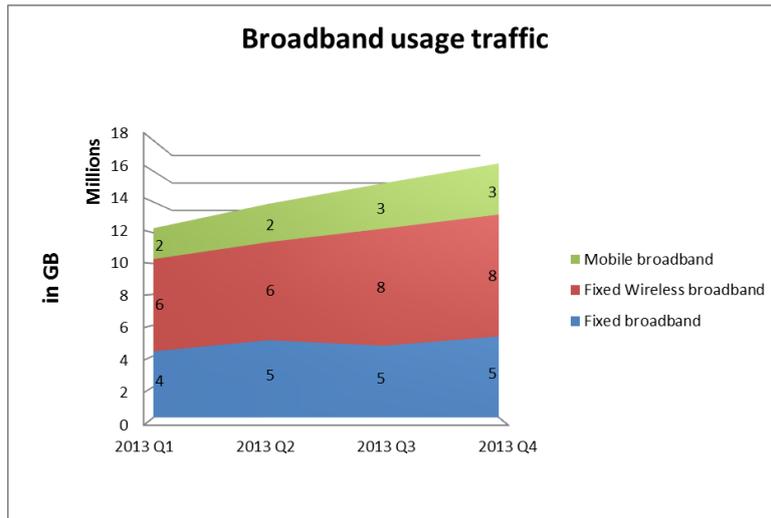
219. Out of the total mobile subscriptions in 2013, nearly 57% were also mobile broadband subscribers.

### 5.5.2 Broadband usage

220. The total broadband internet usage has been increasing steadily. In 2013 alone, there was a total usage increase from about 12 million Gigabytes in Q1 to about 16 million Gigabytes in Q4. This implies a volume increase of 33% combined for fixed, fixed-wireless and mobile broadband.

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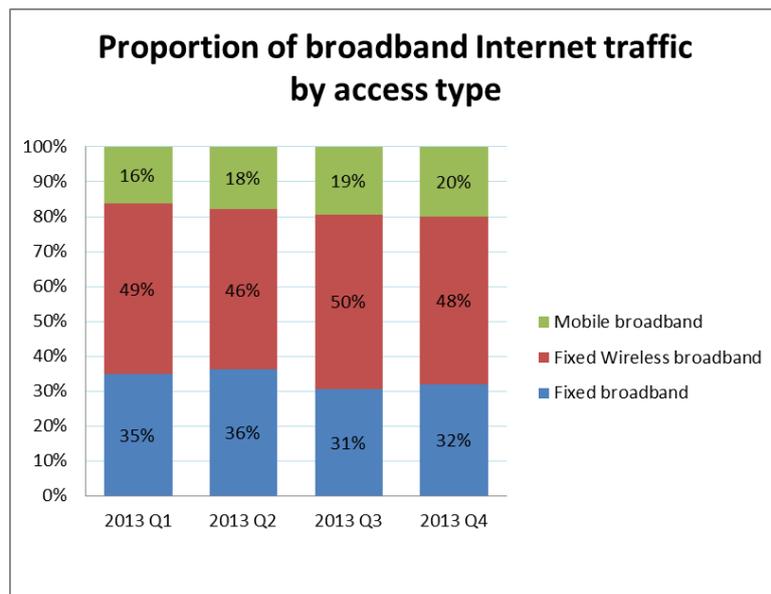
**Figure 42: Broadband volumes and usage**



Source: TRA analysis based on operator data

221. Out of the total broadband usage, usage from fixed-wireless users represents nearly 1/2, whereas fixed broadband (xDSL, fibre) accounts for about 1/3 and mobile broadband the remaining 20%. Hence, because of the large number of mobile broadband users compared with fixed and fixed-wireless, average usage per subscriber is significantly less on mobile broadband. It should however be noted that the usage profile differs significantly between stand-alone mobile broadband users (e.g. dongles) and add-on users (e.g. browsing directly from smartphone).

**Figure 43: Split of broadband traffic per access type**

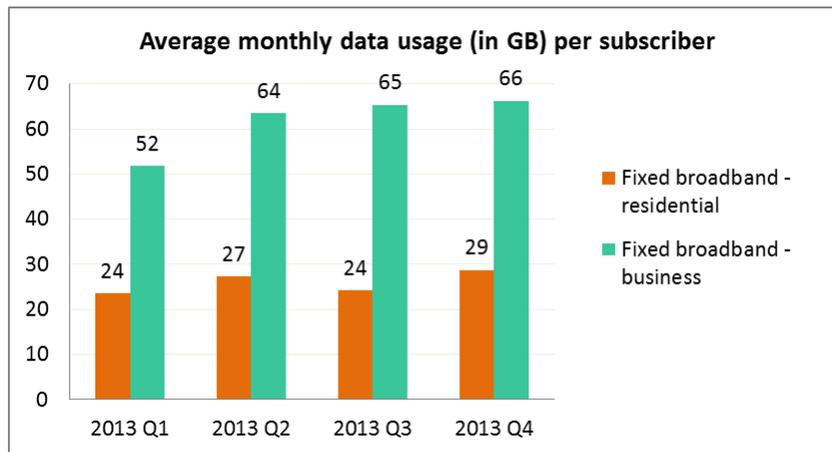


Source: TRA analysis based on operator data

222. The average monthly usage for fixed broadband business subscribers represent almost double of the average usage of fixed broadband residential subscribers.

## Strategic Market Review

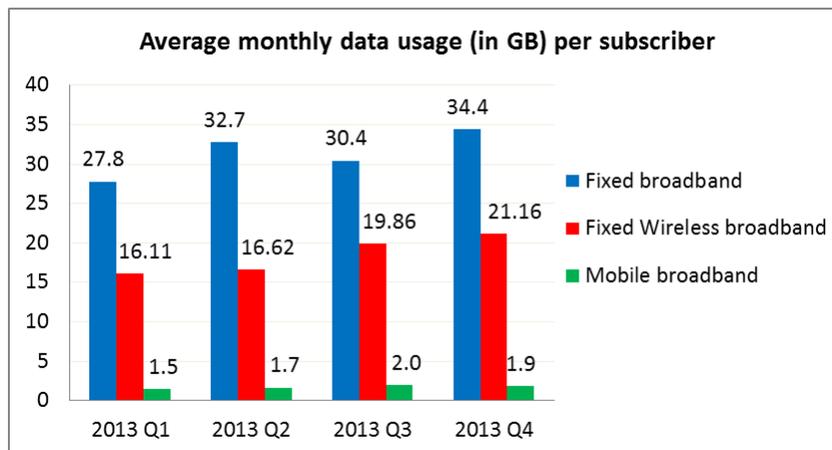
**Figure 44: Average data usage (GB) per month: residential and business**



Source: TRA analysis based on operator data

223. The average usage (in GB) per subscriber per month varies based on the broadband access type. Fixed broadband subscribers generate the highest average monthly usage followed by Wireless subscribers and lowest usage is generated by mobile broadband subscribers. However, the mobile broadband usage per subscriber is heavily influenced by low use pay-per-use subscribers.

**Figure 45: Average data usage per subscriber and month (GB)**



Source: TRA analysis based on operator data

### 5.5.3 Revenues

224. Revenues generated from broadband services reached almost BD 40m in 2013. The mass-market segment, as defined in the recent market determination, contributed about 83% and the 'business' segment about 17%.

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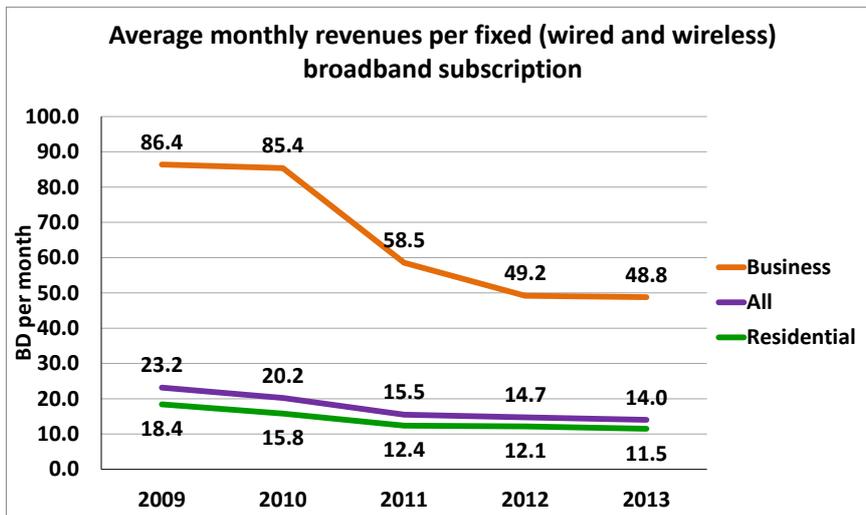
**Table 12: Broadband revenues – split between ‘residential’ and ‘business’**

Revenue (BD in million)	2009	2010	2011	2012	2013	Growth 2012 – 2013
Residential	24	28.97	30.5	30.8	32.9	7%
Business	8.5	9.95	8.1	6.9	6.6	-5%
<b>Total</b>	<b>32.5</b>	<b>38.92</b>	<b>38.6</b>	<b>37.7</b>	<b>39.5</b>	<b>5%</b>

Source: TRA analysis based on operator data

225. The monthly ARPU for business subscribers has decreased sharply in recent years; from a level of BD84 per subscriber in 2010 to BD 49 in 2013. This is partly due to the more competition from fixed-wireless broadband providers, but also the competition from bitstream based competitors. In fact, the bitstream based competitors supplies about 1/4 of the retail market.
226. The monthly ARPU for residential (‘mass-market’) subscribers, on the other hand, has not decreased to the same extent through 2013 (BD 11.5 in 2013), but more recent price competition in 2014 could suggest a significant drop also for the broadband mass-market subscribers.

**Figure 46: Broadband ARPU – split between business and residential**



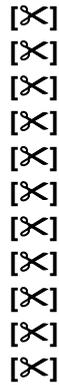
Source: TRA analysis based on operator data

### 5.5.4 Market shares

227. For mobile broadband subscribers only, Viva had a market share of 40-50% in 2013. Zain had 25-35%% and Batelco 20-30%.

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**Figure 47: Mobile broadband market shares**



Source: TRA analysis based on operator data

228. With respect to fixed (including fixed-wireless) market share, Mena held the highest share at 40-50% of broadband subscribers at the end of 2013.

**Figure 48: Broadband fixed and fixed-wireless – market shares**



Source: TRA analysis based on operator data

229. As mentioned earlier, TRA recently considered the relevant markets in which broadband services are supplied in Bahrain, and concluded that fixed broadband and standalone mobile broadband are included in the same market for the residential/SME “mass-market” segment. It should be noted that the 2014 residential consumer survey confirms the view that consumers view mobile broadband as a good substitute for fixed broadband; 52% of fixed broadband subscribers indicated they would switch to mobile broadband if fixed broadband prices increased by a SSNIP (10%). This proportion was 54% in 2011, which indicates a high degree of switching and substitution effect.
230. Based on this broader market definition, Figure 49 shows that Zain had the highest market share at the end of 2013; Zain’s market share was 30-40%, followed by Viva at 25-35%, Mena at 15-25% and Batelco at 15-25%.

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**Figure 49: Broadband, inclusive standalone mobile broadband – residential market shares**



Source: TRA analysis based on operator data

231. For the business market on the other hand, only fixed broadband subscribers are included. This follows also from the March 2014 broadband market review, in which TRA determined that the relevant business market for broadband *excludes* mobile standalone broadband product. The reasons are given in the market determination and include for example the higher quality of service demanded by businesses. It is also noteworthy that Batelco's revenue share typically is higher than its subscriber share for the business segment.

**Figure 50: Broadband (excluding standalone mobile broadband) – business market shares**



Source: TRA analysis based on operator data

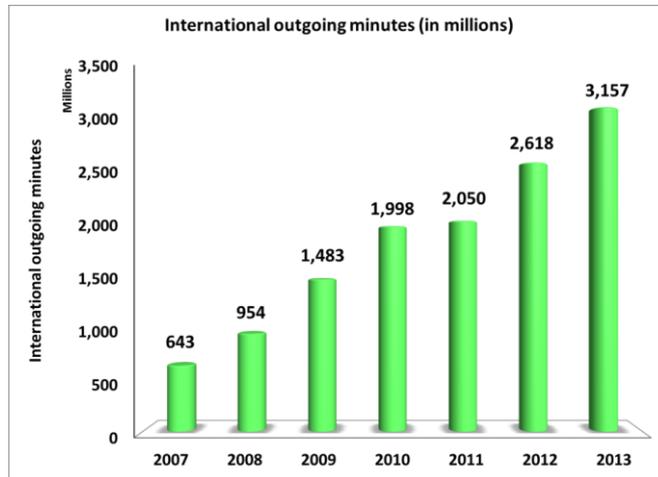
232. Based on the definition of the business market for retail broadband access, Batelco held the highest market share at 30-40%, followed by Mena at 15-25%, Zain at 10-20% and Lightspeed at 10-20%. It is noted that competitors supplying business broadband services using wholesale products purchased from Batelco (such as bitstream) represent a significant source of competition at the retail level.

5.6 International call market indicators

5.6.1 Traffic

233. The total international outbound traffic minutes generated in 2013 was 3.15 billion minutes. The volume of international outgoing minutes grew by 21% between 2012 and 2013.

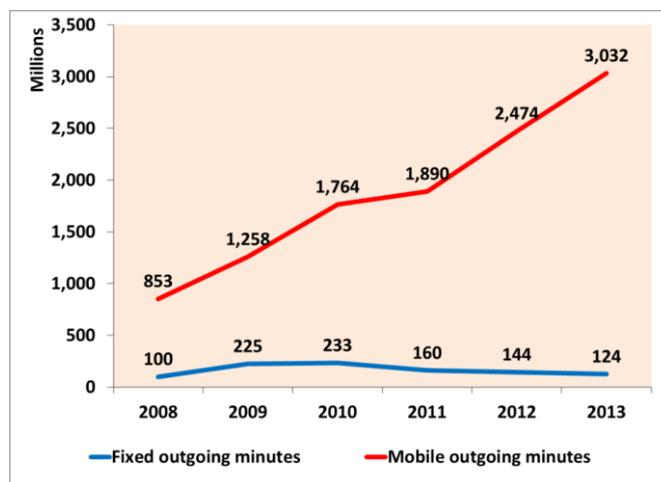
Figure 51: Total international outgoing minutes



Source: TRA analysis based on operator data

234. International outgoing minutes that originated on mobile represented 96% of the total international outgoing minutes in 2013.

Figure 52: Fixed and mobile international outgoing minutes



Source: TRA analysis based on operator data

235. In 2013, 88% of total international minutes were made to South Asian countries (Zone 2), (but only 61% of the revenues were generated from international calls to Zone 2).

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236. Overall, total outgoing traffic increased by 21% in 2013 compared to 2012. However, this increase was explained by the continued large traffic increase to Zone 2. International calls to GCC countries remained basically constant, whereas call minutes to Zone 3 countries decreased by 5%. Call minutes to Zone 4 increased by 9%<sup>55</sup>.

**Table 13: Total outgoing international per Zone (fixed and mobile)**

Minutes (in millions)	2009	2010	2011	2012	2013	Growth 2012 – 2013
GCC <sup>1</sup>	131.00	193.00	108.30	123.60	124.3	1%
Zone 2	1,128.00	1,570.00	1,713.80	2,236.0	2,763.0	24%
Zone 3	83.30	84.00	53.30	87.10	82.5	-5%
Zone 4	140.70	151.00	174.60	170.90	187.0	9%
<b>Total</b>	<b>1,483.00</b>	<b>1,998.00</b>	<b>2,050.00</b>	<b>2,617.60</b>	<b>3,156.8</b>	<b>21%</b>

Source: TRA analysis based on operator data

### 5.6.2 Revenues

237. International calls revenues increased by a modest 0.5% between 2012 and 2013; from BD 80.5 million to BD 80.9 million.
238. 61% of the total revenues (fixed and mobile) came from calls to Zone 2, whereas roughly 15% were generated from calls to GCC and Zone 4 respectively.

**Table 14: Revenue for international traffic per Zone (fixed and mobile)**

Revenues (BD in millions)	2008	2009	2010	2011	2012	2013	Growth 2012 – 2013
GCC	13.93	18.30	12.70	11.40	11.8	12.4	5%
Zone 2	31.56	36.50	38.80	38.80	46.5	49.2	6%
Zone 3	6.36	7.80	6.70	5.10	8.5	6.3	-26%
Zone 4	13.13	13.20	13.90	13.90	13.7	13.09	-5%
<b>Total</b>	<b>65.00</b>	<b>75.80</b>	<b>72.10</b>	<b>69.20</b>	<b>80.5</b>	<b>80.9</b>	<b>0.5%</b>

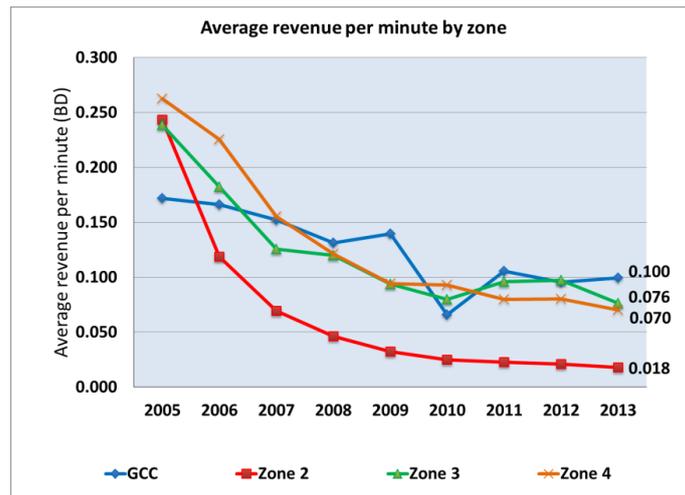
Source: TRA analysis based on operator data

239. Average revenue per international outgoing minute continued to drop; from 31 fils per minute in 2012 to 26 fils per minute in 2013. This should be compared to 226 fils per minute in 2005. Clearly the sharp decrease in average revenue per minute is driven by intense price competition mainly to South Asian countries.

<sup>55</sup> Zone 1 countries: GCC; Kuwait, Oman, Qatar, Saudi Arabia, the United Arab Emirates (UAE).  
 Zone 2 countries: South Asian countries; Bangladesh, India, Pakistan, the Philippines and Sri Lanka.  
 Zone 3 countries: Australia, Canada, France, Germany, Greece, Italy, Iran, New Zealand, Thailand, the United Kingdom (UK), the United States of America (USA), Yemen  
 Zone 4 countries: Rest of the world, i.e. all countries not in Zone 1-3.

## Strategic Market Review

Figure 53: ARPM for international traffic per Zone (fixed and international)



Source: TRA analysis based on operator data

240. Interestingly, however, the average revenue per minute to GCC destinations increased between 2012 and 2013 and has remained rather constant at 100 fils in the last three years.

### 5.6.3 Market shares – international outgoing

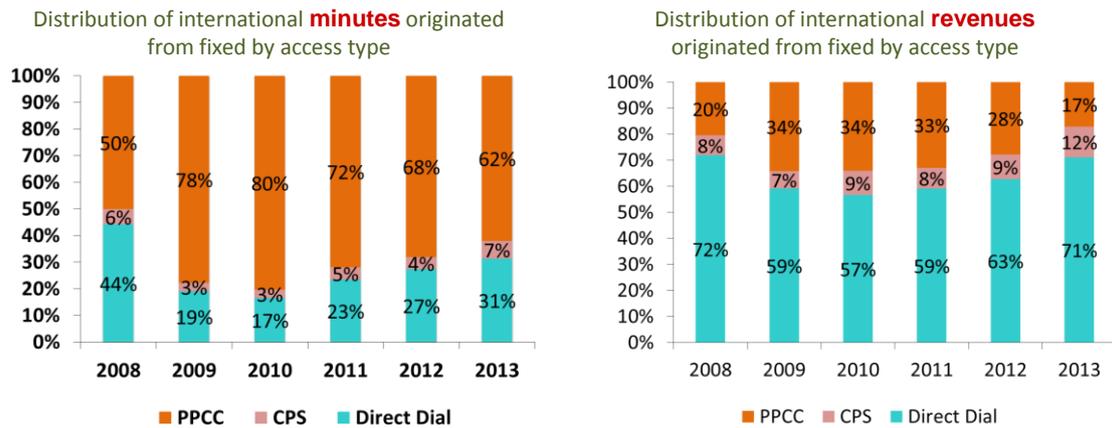
#### Fixed originated international calls

241. International calls can be made from fixed lines in Bahrain by a number of means, including direct-dial services (which in turn include using the fixed-line supplier of the calling party, or the use of an alternative supplier through Carrier Pre-Selection (CPS)), and prepaid calling cards. Although traffic originated from *fixed* lines using prepaid calling cards<sup>56</sup> represented 62% of international fixed line traffic in 2013, it represented only 17% of revenues, because a large portion of the outbound traffic from prepaid calling cards was made to Zone 2 destinations which generate substantially lower revenue per average minute than other destinations.
242. On the contrary, whilst direct dialling from fixed lines makes up less than 1/3 of all outgoing minutes, the revenues generated from direct dial accounts for more than 2/3 of total revenues from fixed lines.

<sup>56</sup> PPCC = Prepaid calling cards

## Strategic Market Review

**Figure 54: Distribution of international minutes and revenues *per fixed* access type**



Source: TRA analysis based on operator data

243. An analysis of the market shares of the operators gives some interesting results. Of the total fixed outgoing *minutes* to the four different Zones (i.e. as per current relevant retail markets), Batelco has a market share of more than 70% to GCC countries (Zone 1) and Zone 3 countries. Zone 1 and Zone 3 are currently the 'relevant markets' susceptible to ex-ante regulation but yet Zone 3 registered a decrease in number of minutes while Zone 1 registered a minimal increase. However Batelco has managed to rather increase its market share (i.e. even in volume terms) to these destinations. One must however bear in mind the impact that mobile has had overall on international outgoing traffic and revenues.
244. Batelco's volume-based market share of fixed international outgoing calls to Zone 4 (not ex-ante regulated) has also been retained at a high level (more than 50%). However, Batelco's volume market share to the price competitive Zone 2 countries is substantially lower (less than 10%)

## Strategic Market Review

**Figure 55: Fixed outgoing international traffic per current relevant market – minute market shares**



Source: TRA analysis based on operator data

245. The situation is quite different when revenue market shares are instead analysed; Batelco has an even higher market share to Zone 1 and Zone 3 (but not substantially higher). For fixed originated calls to Zone 2, Batelco's revenue market share (on fixed outgoing calls) is 40-50% as of the end of 2013, and 55-65% to Zone 4.

**Figure 56: Fixed outgoing international traffic per current relevant market – revenue market shares**



Source: TRA analysis based on operator data

## Strategic Market Review

246. Overall, Batelco's *volume* market share on all fixed outgoing international calls is 25-35%, which is in parity with Mena Telecom. Hence, from an overall (volume) perspective the market shares between the larger players are quite balanced.

**Figure 57: Total international fixed outgoing traffic – volume market shares**



Source: TRA analysis based on operator data

247. The picture is however very different when revenue market shares are instead analysed. Batelco has a market share of 60-70% of revenues earned from fixed originated international calls, and the nearest individual competitor has less than 10%. This situation is caused by Batelco preserving a high market share on *fixed* outgoing calls to especially Zone 1 and Zone 3 countries. For fixed international traffic originated from larger companies and the Government entities, Batelco retains a very strong market position.

**Figure 58: Total international fixed outgoing traffic – revenue market shares**



Source: TRA analysis based on operator data

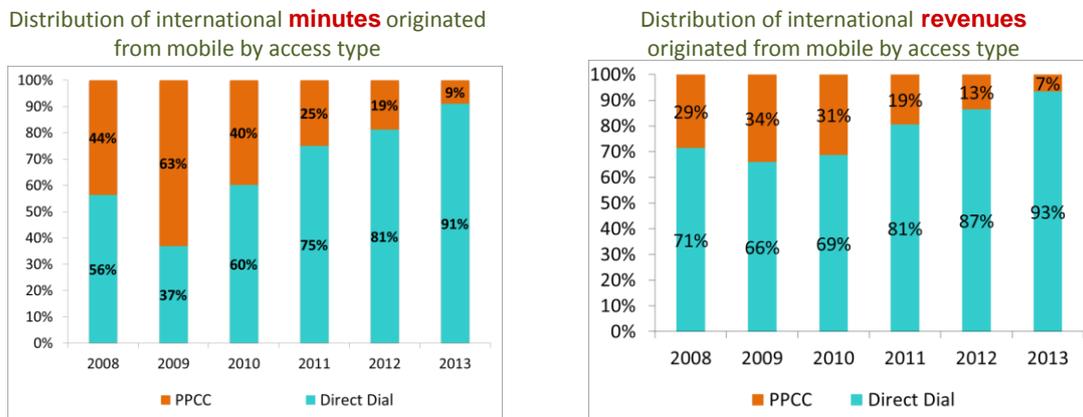
## Strategic Market Review

248. So, arguably, notwithstanding the determination made in 2008, ex-ante regulatory measures, such as CPS, that have been imposed on Batelco appear to have had little impact on increasing competition intensity overall with regards to fixed international outgoing traffic (calls to South Asian countries are the most competitive, which interestingly is not an ex-ante regulated retail market). Having said that mobile has had a tremendous impact on the market in general, and mobile provides a clear substitution for most customers who make international calls. Nevertheless, in line with current market definitions, mobile originated international calls are described separately below.

### Mobile originated international calls

249. Mobile originated international calls are made either through direct dial calling services supplied by the subscriber's mobile operator, or through prepaid calling cards. In 2013, international direct dial traffic originated from mobile represented 91% of the total traffic, up from 81% in 2012 and 75% in 2011. The proportion of PPCC mobile originated international traffic has dropped from 63% in 2009, to 19% in 2012 and to 9% in 2013. This is due to the increasing price competition from direct dial services supplied by mobile operators, in particular for international calls to the Zone 2 countries.

**Figure 59: Distribution of international minutes and revenues per mobile access type**



Source: TRA analysis based on operator data

250. Similar to fixed originated calls, an analysis of the market shares for mobile originated international calls give some interesting results and potential implications on the level and type of competition in the international calls market. Of the total *mobile outgoing minutes* to the four different Zones (i.e. as per current relevant retail markets), Viva has the highest market share to all four zones. Viva's volume market share ranges between 40 and 60% depending on the Zone in question.

## Strategic Market Review

**Figure 60: Mobile outgoing international traffic per current relevant market – minute market shares**



Source: TRA analysis based on operator data

251. A look at the revenue market shares per current zones for mobile originated calls gives a slightly different picture; Batelco has a relatively stronger position on calls to GCC countries, but Viva has still the highest market share in all cases.

**Figure 61: Mobile outgoing international traffic per current relevant market – revenue market shares**



Source: TRA analysis based on operator data

## Strategic Market Review

- 252. Viva's revenue market share ranges between roughly 35% and 55% depending on the Zone.
- 253. The overall market situation (i.e. total volume and revenue market shares for mobile originated international) confirms the picture that Viva has established itself as the current 'market leader' in terms of market shares.
- 254. In terms of overall volume market share, Viva has steadily increased its market share from 15-25% in 2012 to 45-55% in 2013 (despite losing 1p.p between 2012 and 2013). Zain has 25-35% of the market and Batelco only 10-20%; Viva's volume market share is, in this case, about 3 times higher than Batelco's.

**Figure 62: Total international mobile outgoing traffic – minute market shares**



Source: TRA analysis based on operator data

- 255. An analysis of the overall revenue market share (for total mobile originated international calls) shows that Viva has an equivalent share of 45-55%, and has a higher market share than Zain and Batelco combined. Other providers of mobile originated calls account for less than 5% of the value (revenues)

## Strategic Market Review

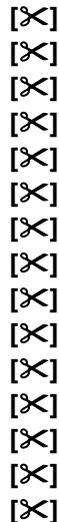
**Figure 63: Total international mobile outgoing traffic – revenue market shares**



Source: TRA analysis based on operator data

256. Having analysed and observed the market situation in the dimensions of current defined markets (i.e. the zones), and the differences between fixed and mobile volumes and share, it is relevant to analyse the international call market overall (i.e. independent of Zones and fixed and mobile originated calls combined). The fact that mobile originated calls account for 96% and fixed only 4% should be recognised.
257. Out of all originated international call minutes from Bahrain, Viva has a share of 45-55%. Viva's share was marginally higher in 2012. Batelco and Zain's combined overall market share is lower than Viva's. Other operators make up less than 10% of the total originated international traffic.

**Figure 64: Total international outgoing traffic – minute market shares (fixed and mobile)**



Source: TRA analysis based on operator data

## Strategic Market Review

258. In terms of total revenue market shares for international outgoing calls, Viva held 40-50% in 2013, slightly less than the combined market share of Batelco (and Zain. Other operators accounted for the remaining revenue share (about 5%).

**Figure 65: Total international outgoing traffic – revenue market shares (fixed and mobile)**



Source: TRA analysis based on operator data

259. In conclusion, an evaluation of key indicators and trends for outgoing international calls (by Bahrain licensed operators) shows very different results depending on what market is being analysed. If a narrow market definition is adopted, then Batelco would still hold a very strong position (for example on fixed originated calls to Zone 1 countries by business customers). However, the market overall, and perhaps the international call market in particular, has undergone tremendous changes in recent years. Mobile traffic, as stated, accounted for 96% of all outgoing international minutes in 2013.
260. In addition to the discussion above, the emergence of OTT (notably Skype, Viber and WhatsApp) has an impact on the international calls market, especially on the calling behaviour of private users (but arguably, also in terms of the competitive behaviour by local licensed operators and on the prices offered to some destinations).<sup>57</sup>

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<sup>57</sup> As an example of the changing call behaviour of end-users, one of the questions asked in the consumer survey from 2014 related to the most common ways in which (residential) consumers make international calls. While mobile direct dial remains the option used most often (57% of respondents in 2014, down from 66% in 2011), the use of mobile VOIP-based services to make international calls has increased significantly – in 2014, 34% of respondents used VOIP (eg Skype, Viber, Tango) over mobile broadband (up from 0% in 2011), and 21% used VOIP over WiFi (0% in 2011). These were the 2nd and 3rd most often used ways of making international calls in 2014.

## Strategic Market Review

### 5.7 Domestic leased lines ('connectivity') market indicators

#### 5.7.1 Number of domestic leased lines

261. The total number of domestic retail leased lines has remained rather constant between 2010 and 2013. However, the trend is that lower capacity leased lines are upgraded to higher capacity<sup>58</sup>.

**Table 15: Retail domestic leased lines and capacity**

Leased line speed	2010	2011	2012	2013
Analogue	1132	962	931	903
x < 64 kbps and less	110	114	86	72
64 kbps ≤ x < 512 kbps	954	707	666	607
512 kbps ≤ x < 1024 kbps	286	308	277	268
1024 kbps ≤ x < 2048 kbps	233	313	231	211
2 Mbps ≤ x < 45 Mbps	794	1,026	1,059	1,261
45 Mbps ≤ x < 155 Mbps	48	57	64	93
155 Mbps ≤ x < 622 Mbps	1	1	2	3
x ≥ 622 Mbps	2	2	1	1
<b>Total</b>	<b>3,560</b>	<b>3,490</b>	<b>3,317</b>	<b>3,419</b>

Source: TRA analysis based on operator data

#### 5.7.2 Revenues

262. The total retail revenues from domestic lines amounted to BD 17.4m in 2013. This was a slight drop from BD 18m in 2012. 'Other data' entails services such as MPLS (Ethernet based) and ATM and a portion is related to domestic supply. The supply of these services is typically based on leased lines used as an input.

**Table 16: Leased line revenues: domestic and international**

in BD million	2010	2011	2012	2013
<b>Domestic</b>	15.3	17.7	18.03	17.4
<b>International</b>	29.6	27.9	23.3	22
<b>Other data</b>	1.6	3.2	4.3	6.4
<b>Total</b>	<b>46.5</b>	<b>48.8</b>	<b>45.6</b>	<b>45.8</b>

Source: TRA analysis based on operator data

<sup>58</sup> Generally, the most important trend product trend is the migration of legacy leased line services (TDM-based) to NGN connectivity services (i.e. Ethernet over MPLS).

**5.7.3 Market shares**

- 263. An analysis of the trends in market shares during the same period shows that Batelco continues to have a very strong market position in the market. This was also recognised in the Authority’s recent determination on ‘Domestic data connectivity services’ published in April 2014.<sup>59</sup>
- 264. In terms of volume market share, Batelco’s market share has dropped from 80-90% in 2010 to 75-85% in 2013. However, Batelco’s share from 2011 is quite stable. The nearest competitor has less than 5% volume market share.

**Table 17: Retail domestic leased lines – volume market shares**

[X]

Source: TRA analysis based on operator data

- 265. The situation is slightly different when revenue market shares are analysed. Batelco still has a market share 65-75% and the nearest competitor has less than 10% (in 2013).

**Table 18: Retail domestic leased lines – revenue market shares**

[X]

Source: TRA analysis based on operator data

- 266. Overall, the retail domestic leased lines (data connectivity services) market remains a market dominated by Batelco, based on market share information. The fact that Batelco’s market share has remained quite stable (both volume and revenue shares) suggests there are limited competitive constraints on Batelco. This is consistent with the recent market review, where it was also determined that Batelco has SMP in the relevant market.

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<sup>59</sup> “Determination of Significant Market Power and Determination of Dominant Position in the Markets for Domestic Data Connectivity Services”, 10 April 2014 (Ref: MCD/04/14/026).

### 5.8 International leased lines ('connectivity') market indicators

#### 5.8.1 Number of international leased lines

With respect to international leased lines a similar trend can be observed as for domestic leased lines insofar that lower capacity leased lines are upgraded to much higher capacity services. The total number of retail international leased lines has decreased from 270 in 2010 to 144 in 2013 (i.e. a reduction of about 47%), but the number of higher capacity services (STM-1 and higher) has increased. Pricing for international connectivity has over the same period decreased significantly, especially on higher capacities.

**Table 19: Retail International leased lines and capacity**

Destinations	Speed	2010	2011	2012	2013
Zone 1	Analogue and Speeds lower than 64Kbps	6	0	0	0
	x < 1 Mbps	113	101	86	71
	1Mbps ≤ x < 2 Mbps	5	7	6	4
	2 Mbps ≤ x < 45 Mbps	35	31	22	15
	45 Mbps ≤ x < 155 Mbps	10	13	11	4
	155 Mbps ≤ x < 622 Mbps	6	9	7	8
	x ≥ 622 Mbps	4	4	3	8
	<b>Total</b>		<b>179</b>	<b>165</b>	<b>135</b>
Zone 2	Analogue and Speeds lower than 64Kbps	2	0	0	0
	x < 1 Mbps	13	13	10	9
	1Mbps ≤ x < 2 Mbps	0	1	1	0
	2 Mbps ≤ x < 45 Mbps	10	6	5	3
	45 Mbps ≤ x < 155 Mbps	0	0	0	0
	155 Mbps ≤ x < 622 Mbps	1	3	3	1
	x ≥ 622 Mbps	2	3	1	2
	<b>Total</b>		<b>28</b>	<b>26</b>	<b>20</b>
Zone 3	Analogue and Speeds lower than 64Kbps	1	0	0	0
	x < 1 Mbps	44	38	18	11
	1Mbps ≤ x < 2 Mbps	1	1	1	1
	2 Mbps ≤ x < 45 Mbps	10	9	6	3
	45 Mbps ≤ x < 155 Mbps	2	4	3	2
	155 Mbps ≤ x < 622 Mbps	3	3	5	1
	x ≥ 622 Mbps	2	1	2	1
	<b>Total</b>		<b>63</b>	<b>56</b>	<b>35</b>
<b>Grand total</b>		<b>270</b>	<b>247</b>	<b>190</b>	<b>144</b>

Source: TRA analysis based on operator data

#### 5.8.2 Revenues

267. The retail revenues from international leased lines were about BD 22m in 2013, a decrease by about BD 1.3m from the year before. Some of the revenues from 'other data services' are related to international supply where international circuits provide an input service.

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**Table 20: Leased lines revenues: domestic and international**

in BD million	2010	2011	2012	2013
<b>Domestic</b>	15.3	17.7	18.03	17.4
<b>International</b>	29.6	27.9	23.3	22
<b>Other data</b>	1.6	3.2	4.3	6.4
<b>Total</b>	<b>46.5</b>	<b>48.8</b>	<b>45.6</b>	<b>45.8</b>

Source: TRA analysis based on operator data

### 5.8.3 Market shares

268. An analysis of the market shares for retail international lines services gives a similar picture to the one for domestic leased lines. Batelco has in fact increased its volume market share from 70-80% in 2010 to 75-85% in 2013. The nearest competitor is 2Connect with a 10-20% volume share in 2013.

**Table 21: Retail international leased lines – volume market shares**

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

Source: TRA analysis based on operator data

269. In terms of revenue market shares, Batelco held a market share of 80-90% in 2013 which is line with its market share in previous years (save for 2011). So, despite the fact that there are today a number of alternative international cables landing in Bahrain, that other operators should be able to access on fair wholesale conditions, Batelco retains a very strong market position in the provision of international leased lines and connectivity services.

**Table 22: Retail revenue market share from international leased capacity**

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

Source: TRA analysis based on operator data

- 270. In conclusion, for both domestic and international leased lines (connectivity services), Batelco has managed to retain a very high market share.
- 271. Currently, Batelco is determined to have SMP in both the defined retail markets (through the 2014 determination for domestic data connectivity services and through the 2008

## Strategic Market Review

determination for international leased lines), and are hence subject to retail tariff controls based on the RTN regulation provisions.

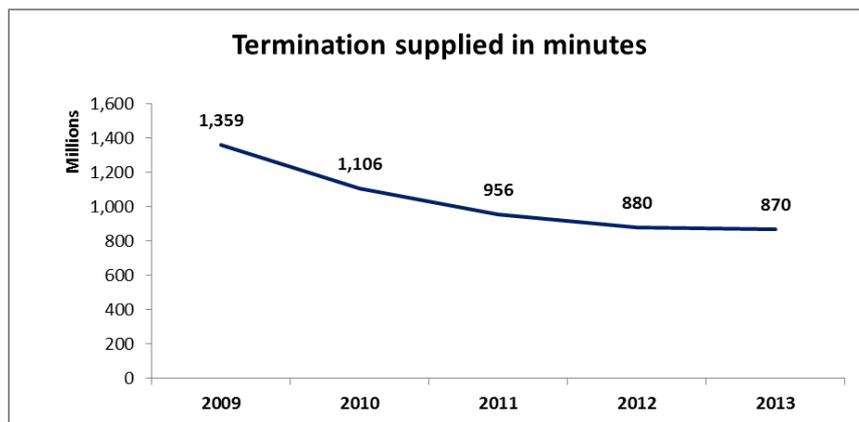
### 5.9 Wholesale market indicators

272. The total wholesale market revenue is, as previously stated, estimated at about 5% of the total sector generated revenue (this excludes any internal provision of 'wholesale services'). The wholesale market overall consists of a number of ex-ante regulated wholesale services which are described and analysed in the following sections.

#### 5.9.1 Interconnection - termination

273. Wholesale termination services refer here to the termination of both domestically and internationally originated calls.
274. The volume of wholesale termination minutes from domestically originated calls has constantly decreased every year since 2009. Although national mobile calls increased by 8% between 2012 and 2013, call termination minutes supplied to OLO's continued to fall in 2013 due to the increased volume of on-net calls (on-net calls represented 85% of national calls in 2013 compared to 77% in 2011).
275. Out of the total terminated minutes from domestically originated calls, mobile termination represents about 90% and fixed 10%.

**Figure 66: Interconnection - terminated minutes from domestically originated calls**

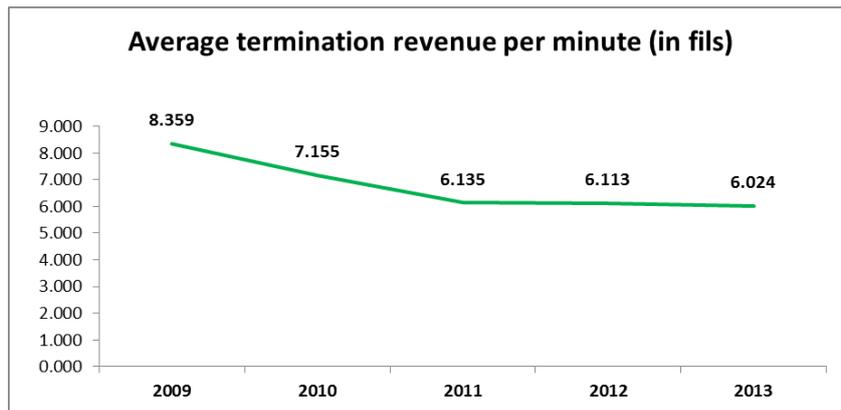


Source: TRA analysis based on operator data

276. The average revenue per minute (blended fixed and mobile termination for all networks) has remained at about 6 fils per minute in the last three years. The termination service is presently subject to cost-based regulation on operators who have been found dominant (DMP) in the relevant market. Effectively, symmetrical rates are applied between the interconnected DMP operators but based on Batelco's cost-based rate for the termination service.

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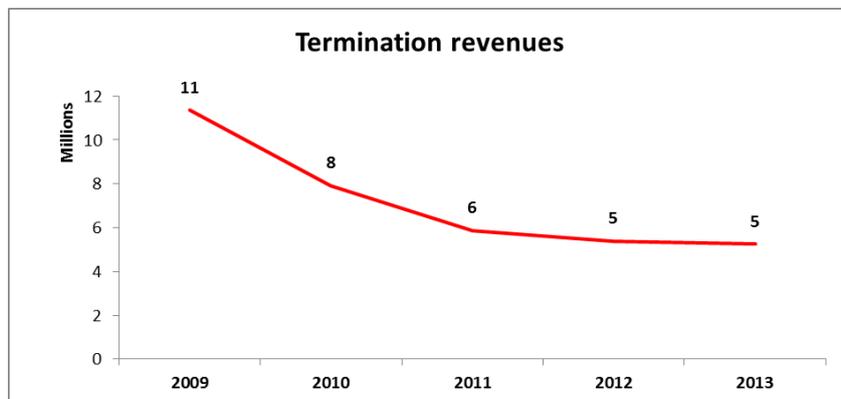
**Figure 67: Interconnection termination – revenue per minute**



Source: TRA analysis based on operator data

277. As a consequence of decreasing termination volumes and the reduction in average wholesale termination rates, the revenues generated from the termination services have decreased since 2009, although termination revenues were unchanged at around BD 5 million in 2012 and 2013.

**Figure 68: Interconnection – termination revenues**



Source: TRA analysis based on operator data

278. The market shares of termination minutes supplied by each of the mobile operators are in line with the market shares based on the number of mobile subscribers.
279. Viva's market share of all terminated minutes is about 40-50% whereas Zain's and Batelco's shares are 25-35% respectively.

# Strategic Market Review

Figure 69: Interconnection – minute market shares (mobile termination)

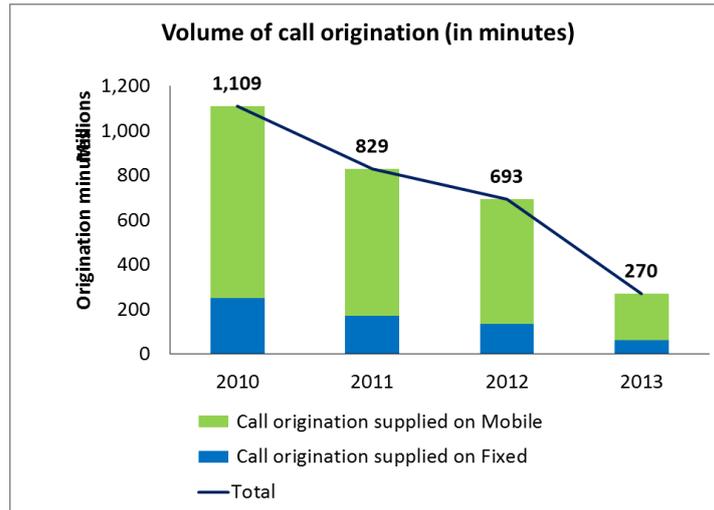


Source: TRA analysis based on operator data

## 5.9.2 Interconnection - origination

- 280. Interconnection *origination* refers to the wholesale service provided by a network operator (fixed and mobile) to other operators, i.e. the wholesale input required by other operators to offer a retail service on the network owner's network.
- 281. Wholesale call origination traffic has experienced a large decrease in the last years. In 2010, total originated interconnect traffic was more than 1.1 billion minutes, but in 2013 the volume was only 270 million.

Figure 70: Interconnection – originated minutes



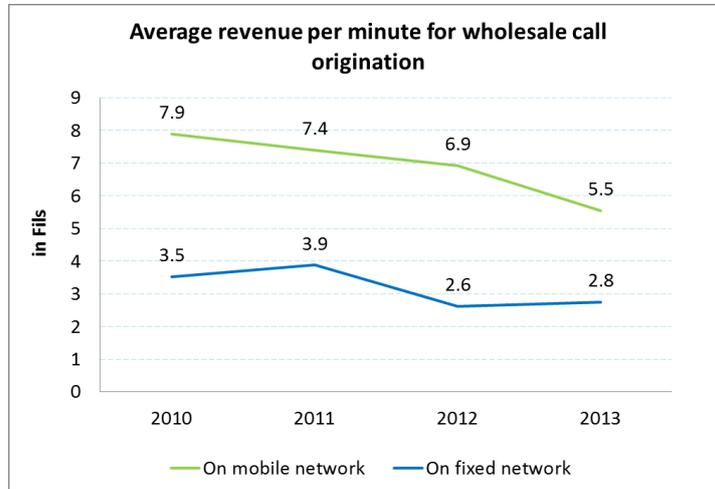
Source: TRA analysis based on operator data

- 282. This sharp decrease in interconnection originated volumes is explained by the decreasing demand for (and decreasing market share of) Prepaid Calling Card providers of international calls. This applies especially to mobile outgoing international calls. For example, in 2010 international originated traffic (fixed and mobile) from PPCC providers was about 763 million minutes. In 2013, this traffic had decreased to about 183 million minutes.

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283. The average revenue per minute from interconnect origination has stayed rather constant on fixed network but has constantly decreased on mobile networks. Competition between the three mobile operators appears to have driven the average price (and revenue) down for the mobile origination service, as well as leading to a convergence between the wholesale origination rates of each of the three mobile operators.

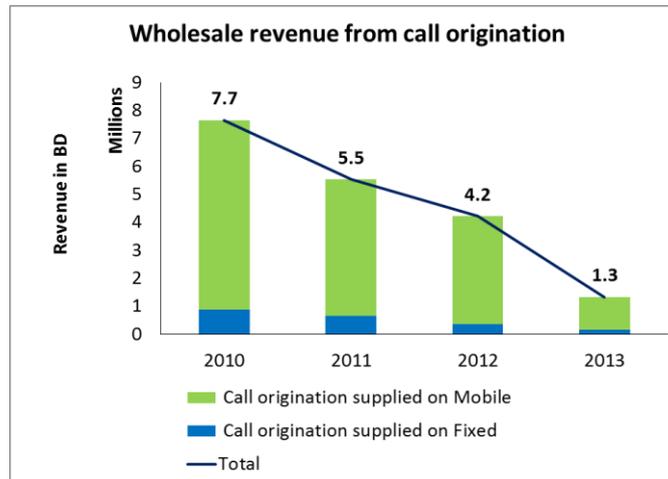
**Figure 71: Interconnection – revenue per minute for origination**



Source: TRA analysis based on operator data

284. Consequently, the wholesale revenue generated from interconnection origination has decreased from BD 7.7 million in 2010 to BD 1.3 million in 2013.

**Figure 72: Interconnection - revenue from call origination**



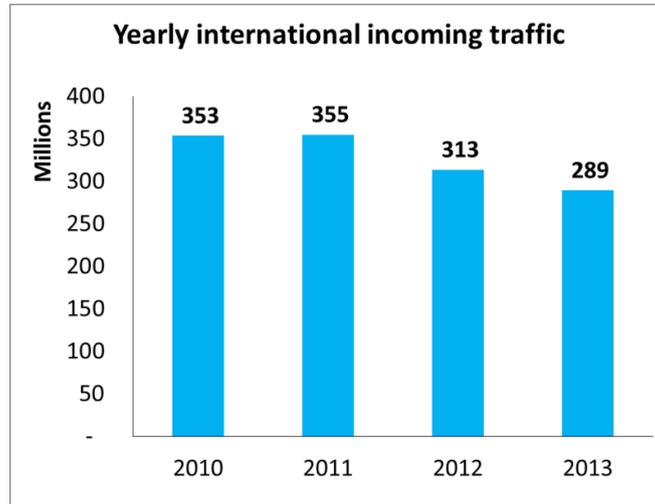
Source: TRA analysis based on operator data

285. TRA has not previously defined a wholesale market for origination services in an ex-ante regulatory context. However, Batelco includes the “free-phone origination service” in its reference offer on wholesale services, while both Zain and Viva offer, on a commercial basis, an equivalent wholesale service on their respective mobile networks.

### 5.9.3 Incoming international traffic

286. International incoming traffic refers to the wholesale international inbound service, whereby operators licensed in Bahrain bring in and terminate internationally originated traffic to the fixed and mobile networks in Bahrain. In 2013, the total volume of international incoming minutes was 289 million minutes, compared to 353 million minutes in 2010. Since 2011, the volume has decreased year-on-year, which is largely attributable to lower incoming international traffic to the mobile networks.

**Figure 73: International incoming traffic to destination networks**



Source: TRA analysis based on operator data

287. There is a relationship between the increasing international outbound traffic and the decreasing international inbound traffic; due to the intense price competition on international calls from Bahrain (and very low retail rates to certain destinations) in the last few years, traffic has increased dramatically. The other side is however that there is less propensity (at least for private users) to make outgoing calls from these countries to Bahrain if there is knowledge that the retail price from Bahrain is substantially lower; i.e. if the A customer in Bahrain is offered a much lower retail rate to call the B customer in another country relative to the retail price for a call in the opposite direction, then, in many cases, an outbound call from Bahrain will be generated instead of the international inbound call to Bahrain. Possibly, the relative prices have less an impact on the number of calls made in each direction, but have an impact on the traffic volume (minutes).
288. Due to the large number of mobile subscribers compared to fixed, about 90% of total international incoming traffic is made to the mobile networks.

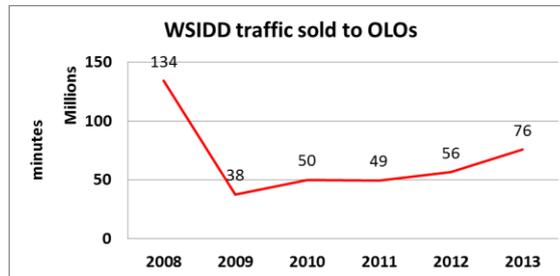
### 5.9.4 WSIDD (Wholesale International Direct Dialling)

289. WSIDD refers to the wholesale service offered by network operators to OLO's (most prepaid calling card providers) to convey and terminate international calls on foreign networks. PPCC providers who buy call origination and WSIDD from the network operator effectively buy an end-to-end international call (on wholesale basis).

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290. Notwithstanding that the total volume of WSIDD traffic supplied grew by 34% between 2012 and 2013, the volumes are fairly low after a significant decrease between 2008 and 2009. OLO's today tend to secure conveyance and termination legs of international calls through other alternatives (direct with IP carrier providers etc).

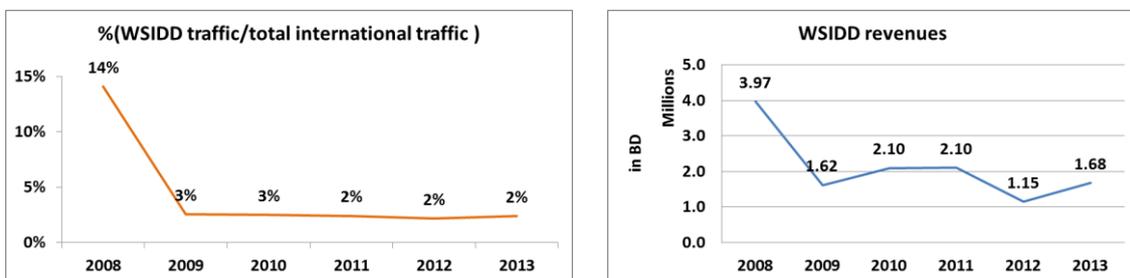
**Figure 74: Wholesale International Direct Dialling sold to OLO's**



Source: TRA analysis based on operator data

291. WSIDD traffic has represented a very low share (2%) of total international outgoing minutes in the last years. The wholesale revenue from the WSIDD was BD 1.68 million in 2013.

**Figure 75: WSIDD share of total international traffic and revenues from WSIDD**



Source: TRA analysis based on operator data

292. The WSIDD service is not an ex-ante regulated wholesale service.

### 5.9.5 Wholesale domestic and international leased lines

293. Wholesale leased lines are supplied by Batelco, but also by a few other operators on a limited basis, to other licensed operators. The supply of domestic leased lines (connectivity services) is ex-ante regulated through TRA's determination issued in April 2014. As per the determination, Batelco was found dominant in the relevant wholesale market and has to provide domestic data connectivity services through the RO.
294. The supply of wholesale international leased lines capacity, on the other hand, is currently not subject to ex-ante regulation, since TRA's review of the wholesale market for international services<sup>60</sup> of 20 February 2013, in which TRA concluded that *no* operator (including Batelco) was dominant in the wholesale market for the supply of international capacity from locations within Bahrain. The conclusion at the time that

<sup>60</sup> "Dominance Determination for Wholesale International Services", 20 February 2013 (Ref: MCD/02/13/016).

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Batelco was no longer dominant was however conditional upon OLOs having fair, reasonable, and non-discriminatory access to the necessary domestic links and facilities in order to be able to reach and access the international cable landing stations<sup>61</sup>.

295. From 2009 and through 2012 there was a steady increase in the provision of wholesale domestic leased lines. However, between 2012 and 2013 the number of provisioned domestic leased lines dropped by 11% to 443. This is largely explained by increased self-supply by other operators (than Batelco) where the operators have been increasingly deploying fibre through Batelco ducts.
296. For international leased lines the development is similar, notably that there was a significant drop by 20% between 2012 and 2013. This is also explained by an increased reliance on self-supply and that other operators connect directly with international cable capacity at available landing stations.

**Table 23: Number of wholesale domestic and international leased lines**

	2009	2010	2011	2012	2013	Growth 2011-2012
<b>Domestic</b>	344	401	439	488	443	-11%
<b>International</b>	35	60	48	61	49	-20%

Source: TRA analysis based on operator data

297. The wholesale revenue generated from the supply of domestic and international capacity follows a similar trend to the drop in number of lines between 2012 and 2013. In 2013, the wholesale revenue generated from domestic connectivity services was about BD 4.4m, whereas the wholesale revenue from international leased capacity was about BD 3.9m.

**Table 24: Wholesale revenues from domestic and international leased lines**

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

Source: TRA analysis based on operator data

### 5.9.6 Duct access

298. Access to ducts is provided by Batelco to operators under the current reference offer. There is an increasing demand to ducts as shown in Figure 76 below. In total, 519km of ducts were supplied by Batelco at end of 2013, compared to 32km of duct rental supplied in early 2011.

<sup>61</sup> This condition is further elaborated on in the chapter 9 on "Holistic review of relevant markets".

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**Figure 76: Rented duct access in metres**



Source: TRA analysis based on operator data

299. The billed revenue for the wholesale duct access product has consequently increased. The duct access product generated revenues of about BD 1.05m in 2013 compared to less than BD 0.2m in 2011.

**Figure 77: Wholesale revenue from duct access**



Source: TRA analysis based on operator data

300. The duct access product has, in the absence of self-provision of own fibre infrastructure, become a wholesale product with significant demand by a number of operators. The demand is derived from the use of duct as both a wholesale input to provide direct downstream services to end-users but also, especially for the mobile operators, as a key product to secure own back-haul fibre connectivity between base stations.

### **5.9.7 Bitstream and Wholesale DSL (WDSL)**

301. Wholesale bitstream and WDSL are both regulated wholesale products that Batelco provides as part of the reference offer.

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302. By the end of 2013, there were 4,304 bitstream and WDSL services purchased by OLOs from Batelco, an increase of only 0.7% compared to 2012.
303. In 2013, the number of Bitstream and WDSL services purchased from Batelco represented about 8.7% of Batelco's fixed broadband subscribers (retail and wholesale), and 2.7% of Batelco fixed lines subscribers (retail and wholesale).

**Figure 78: Number and the share of bitstream and WDSL services of total Batelco subscribers**



Source: TRA analysis based on operator data

304. The total wholesale revenue generated by Batelco from the bitstream and WDSL services amounted to about BD 560k in 2013 of which the bitstream generated BD 309k and the WDSL service BD 255k. The combined wholesale revenue has remained quite stable in the last three years.

**Table 25: Wholesale revenues from Bitstream and WDSL**

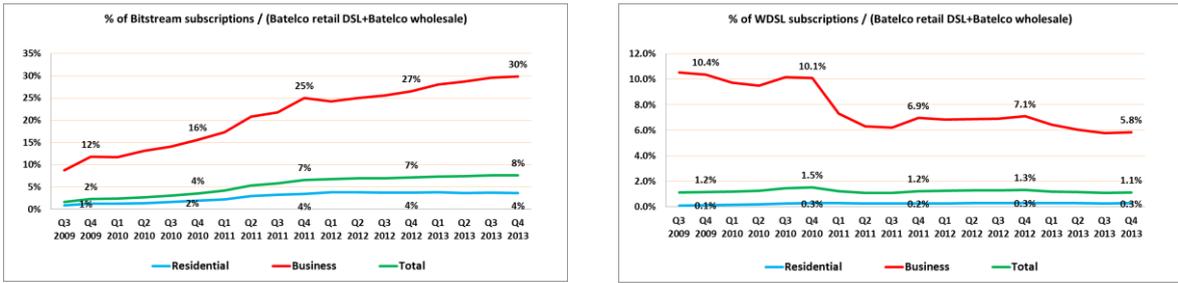


Source: TRA analysis based on operator data

305. In particular, the bitstream product remains important for OLOs serving business customers. The number of business broadband subscribers supplied using Batelco's bitstream services represented 30% of total Batelco's total retail and wholesale business subscribers in 2013 (up from 27% in 2012), while the number of business subscribers based on Batelco's WDSL services represented just under 6% at the end of 2013.
306. In contrast, the number of residential broadband subscribers supplied using Batelco's bitstream services represented 4% of Batelco's total retail and wholesale residential subscribers at the end of 2013, while the number of residential subscribers based on Batelco's WDSL services represented less than 0.5% at the end of 2013.

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**Figure 79: Percentage of bitstream and WDSL subscriptions as shares of total retail (Batelco)**



Source: TRA analysis based on operator data

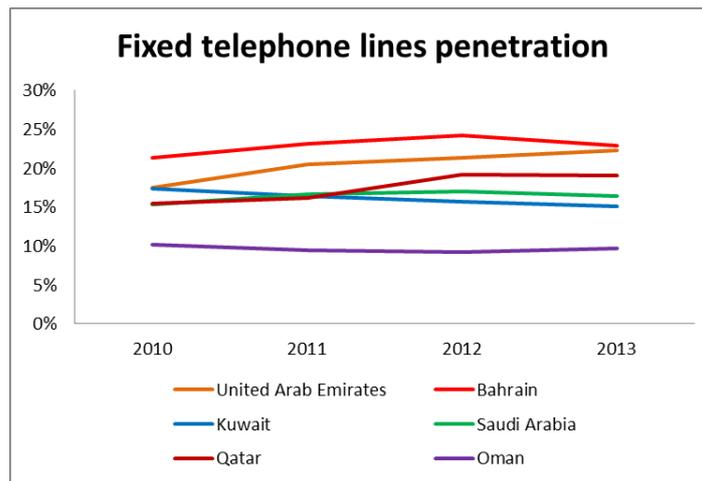
307. The total broadband subscribers based on Batelco's bitstream services represented 8% of total Batelco's total retail and wholesale broadband subscribers, while the number of subscribers based on Batelco's WDSL services represented 1.1% at the end of 2013.

## 5.10 Comparisons and benchmarking

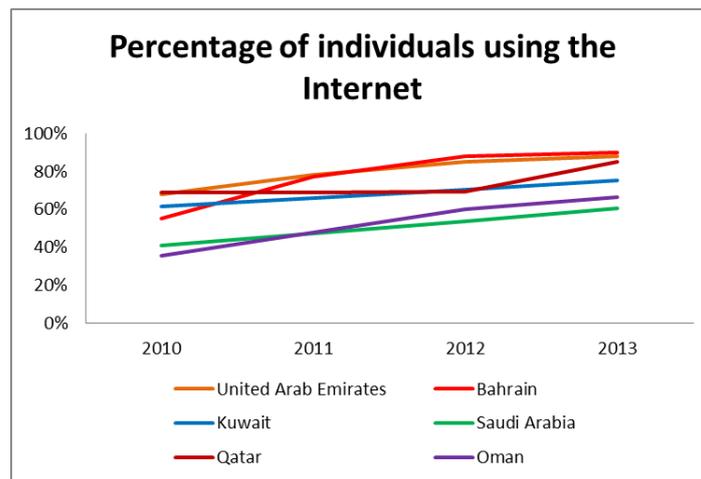
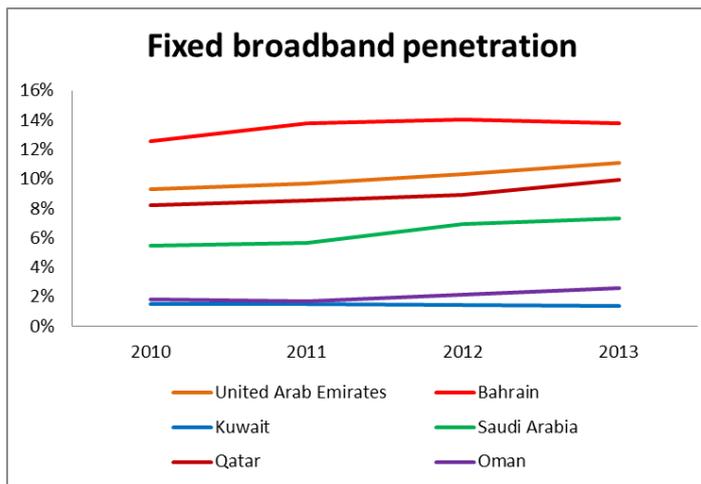
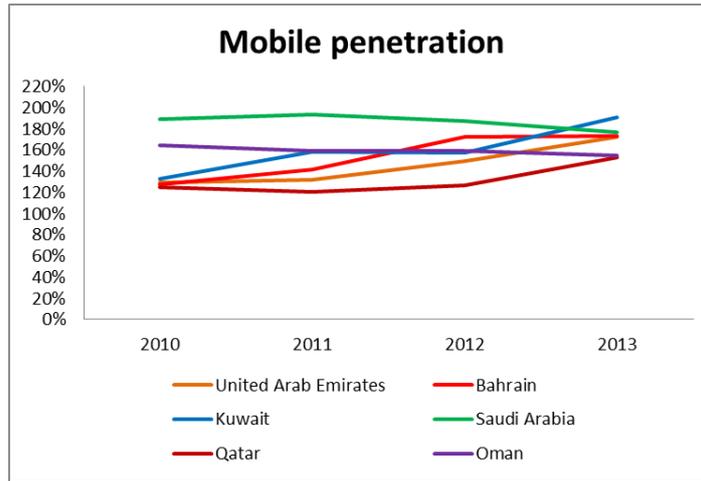
### 5.10.1 Penetration levels

308. Bahrain compares very well with other GCC countries in terms of telecom services penetration and usage. In particular for broadband penetration and adoption of broadband services (fixed and mobile), Bahrain ranks at the top in the GCC region.

**Figure 80: Comparisons of penetration levels with other GCC countries**



## Strategic Market Review



Source: International telecommunications Union (ITU)

### 5.10.2 Retail pricing

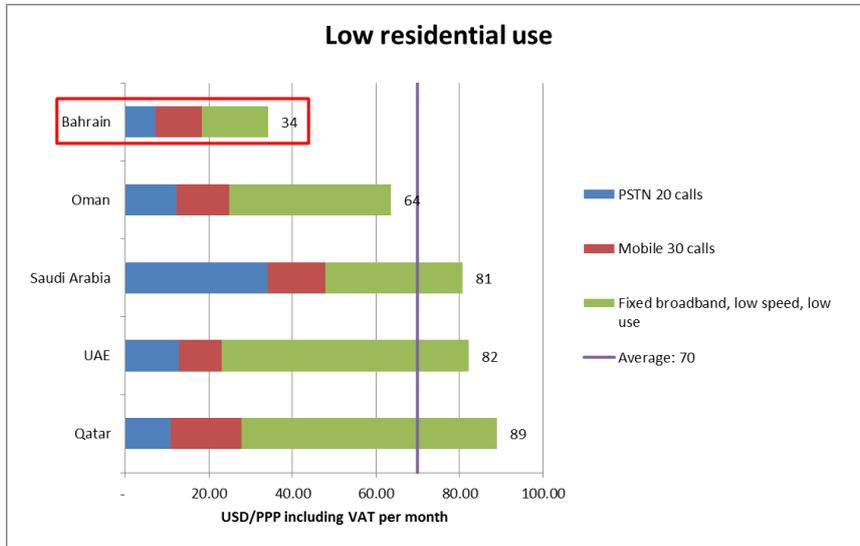
309. With respect to retail tariffs and rates, Bahrain ranks very well – both in a regional and international comparison. Bahraini operators offer highly competitive retail prices for residential consumers across all usage baskets. The usage baskets are an aggregation

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of services (fixed, mobile, fixed broadband and mobile broadband) for typical low, medium and high users.

- 310. For all categories of low, medium and high users, Bahrain compares very favourably to its GCC counterparts.
- 311. For the low-end residential basket, the Bahrain basket was less than half of the average in the GCC region, and almost half of the nearest market (Oman).

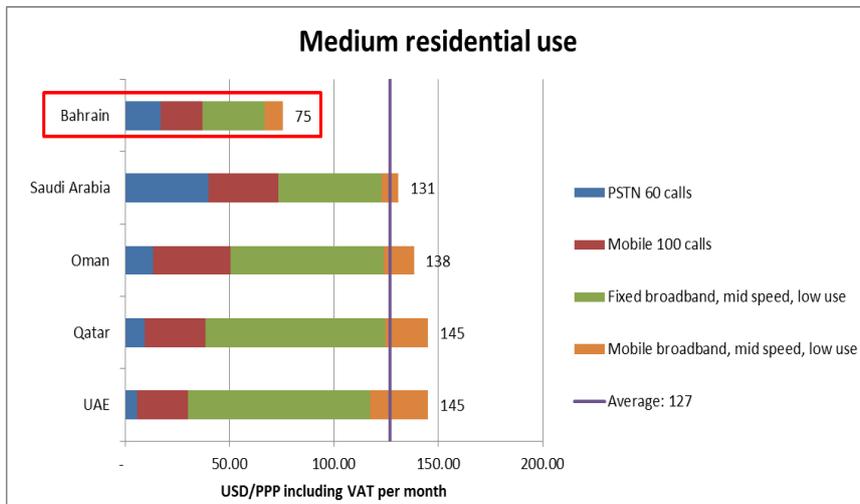
**Figure 81: Price basket – low residential use**



Source: Arab Price Benchmarking Report 2013

- 312. For the medium residential user the Bahrain price basket is more than 40% lower than the second cheapest basket (KSA).

**Figure 82: Price basket – medium residential use**

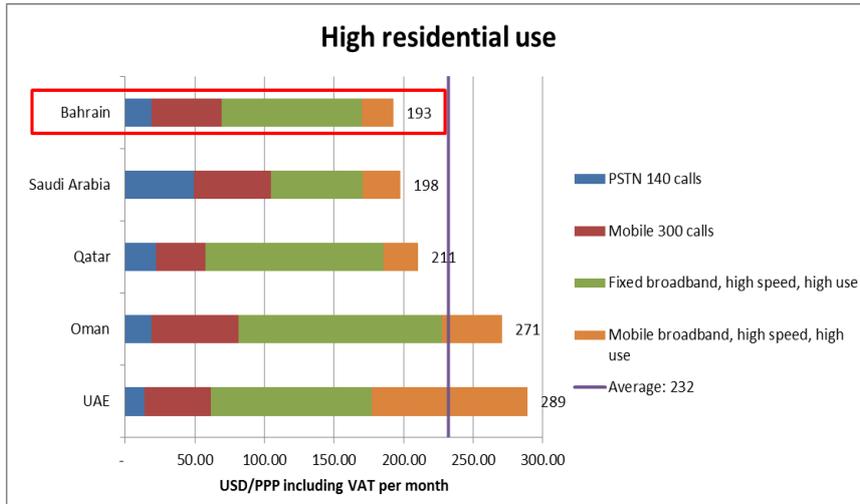


Source: Arab Price Benchmarking Report 2013

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313. As for the high residential users, Bahrain enjoyed the lowest retail prices in the GCC in 2013, which was an improvement compared to 2012, when Bahrain was the second most expensive GCC country.

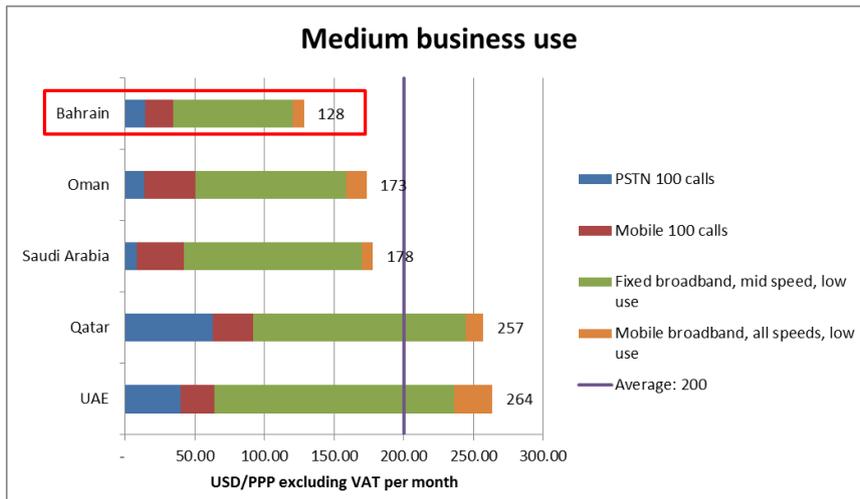
**Figure 83: Price basket – high residential use**



Source: Arab Price Benchmarking Report 2013

314. For the medium<sup>62</sup> business user, Bahrain is the cheapest GCC country and is significantly cheaper than the GCC average.

**Figure 84: Price basket – medium business use**



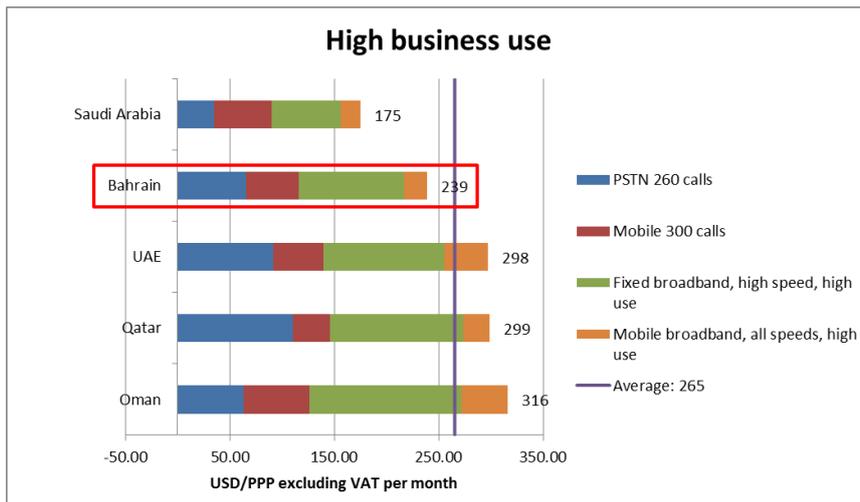
Source: Arab Price Benchmarking Report 2013

315. For the high business user, Bahrain is the second cheapest country in the GCC, behind Saudi Arabia, but more than 10% lower than the regional average.

<sup>62</sup> Note that the comparison for business users included only medium and high users (i.e. no low business user basket).

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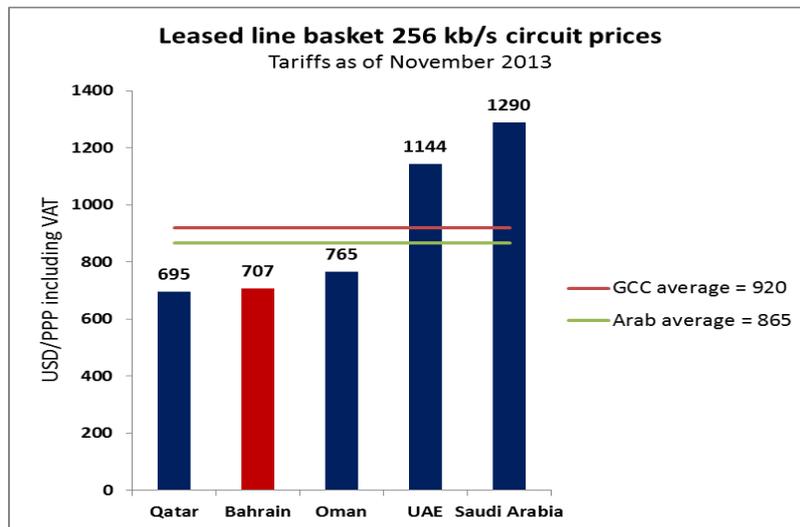
**Figure 85: Price basket – high business use**



Source: Arab Price Benchmarking Report 2013

316. With respect to tariffs for leased lines, the position of Bahrain among its peers varies, depending on the speed of the circuit. For the 256 kb/s basket, Bahrain is the second cheapest amongst the GCC countries, and below both the GCC and Arab average.

**Figure 86: Leased lines basket – 256 Kbit/s**

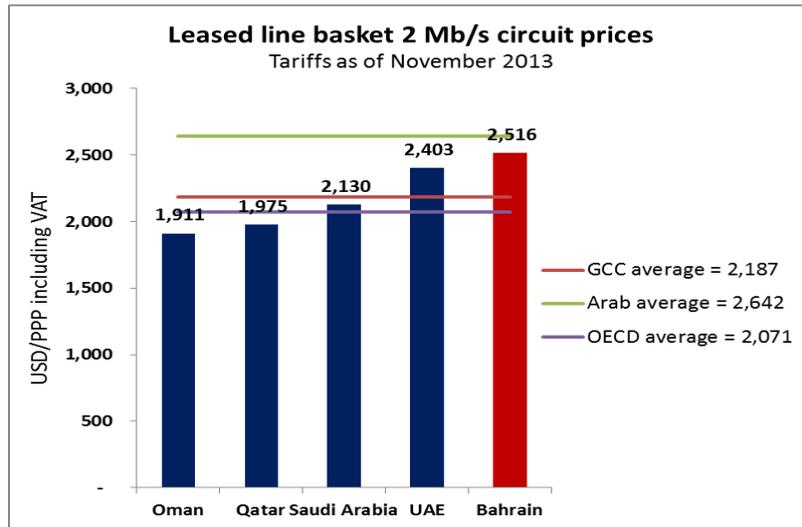


Source: Arab Price Benchmarking Report 2013

317. However, for the 2 Mb/s basket, Bahrain is the most expensive of the GCC countries, though all the countries in the benchmark are broadly on par.

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Figure 87: Leased lines basket – 2 Mbit/s



Source: Arab Price Benchmarking Report 2013

318. In summary, the benchmark exercise on usage and price baskets with regional and international peers indicate that the value propositions to end-users are very strong in Bahrain. The reasons for these favourable positions could of course be discussed, but a contributing factor is arguably a liberalised and competitive market, where there are alternative providers for most key end-user services.

Figure 88: Summary table – Bahrain performance compared with peers

	Bahrain results compared to GCC averages	Bahrain results compared to Arab averages	Bahrain results compared to OECD averages
PSTN (Low usage)	●	●	●
PSTN (High usage)	●	●	●
Mobile (Low usage)	●	●	●
Mobile (High usage)	●	●	●
Fixed broadband (Low speed)	●	●	●
Fixed broadband (High speed)	●	●	●
Mobile broadband (Low usage)	●	●	●
Mobile broadband (High usage)	●	●	●
Leased lines	●	●	●*

Better than ...	●
On par with ...	●
More expensive than ...	●

Source: Arab Price Benchmarking Report 2013

5.11 Financial & operational indicators

- 319. An important part of a 'full diagnosis' of the market situation and dynamics is to analyse the trend performance of the different industry players. The industry's relative performance can be analysed in terms of indicators such as revenues, subscribers and ARPU<sup>63</sup>, but should also consider investment levels and the profitability of individual players and the industry at large.
- 320. A market that shows very different financial results by the main players may indicate a high degree of market power, either generally or in particular key markets. It could however of course also be the result of varying efficiency levels by the respective operators, or be a consequence of late entrants having made substantial investments in order to roll-out network infrastructure to catch up with incumbents.
- 321. However, high and retained profits and net margins by one or more of the larger operators ('supernormal profits') over time are likely to indicate that competition is not working effectively. The consequence could well be loss in welfare and 'high producer surplus' at the expense of 'consumer surplus'. In other words, a market that shows very high and retained profits for a few suppliers would have a negative impact on economic efficiency in general.
- 322. The total annual investment level has been between BD 50m and BD 80m in each of the last six years with the exception of 2010 when Viva entered the market and made high incremental investments. The investments made relative to the overall revenues generated correspond rather well in international comparisons (i.e. capex/revenue ratios of about 15%).

Figure 89: Total annual investments made by operators



Source: TRA analysis based on operator financial statements and data

- 323. An analysis of the distribution of the investments made in the last couple of years shows that the investments are predominantly targeted at mobile network infrastructure and

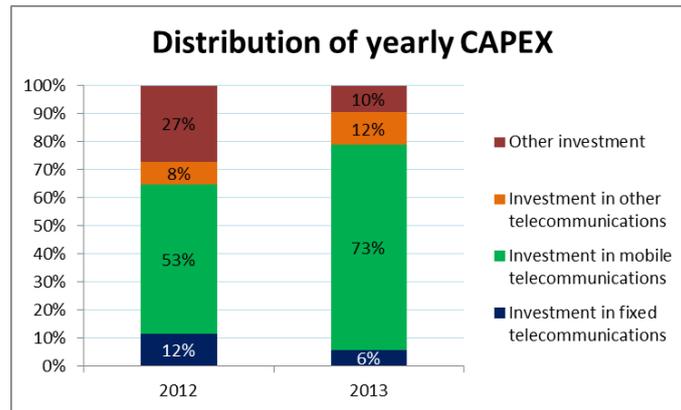
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<sup>63</sup> ARPU = Average Revenue Per User.

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services, and that investments in fixed (fibre-based) networks has been very limited compared to mobile.

**Figure 90: Distribution of investments made**



Source: TRA analysis based on operator financial statements and data

324. With regards to financial indicators, a comparison between the largest operators indicates quite divergent financial performance. Naturally, this is e.g. affected by degree of investments and expansion stage (including opex drivers). However, whilst Batelco's net profit margin has decreased, in particular between 2012 and 2013 (down from 40-50% to 25-35%), it is still significantly higher than that of the other operators.
325. Zain's net profit margin has consistently decreased (year-on-year) from 25-35% in 2009 to less than 10% in 2013. Viva has on the other hand been able to show positive margins (albeit modest) over the last couple of years, since it entered the market with large investments in 2010.
326. In conclusion, TRA's view is that neither the industry, nor any individual operator, *overall*, shows 'supernormal profits'. The telecommunications market overall, increasingly, appears to be driving towards an oligopoly situation (i.e. between three players), where smaller operators are only focusing on parts of the market/customer segments. Whilst the 'mobile market' should currently be considered effectively competitive (based on various indicators including relative market shares, price trends and investment levels), the telecommunications market is generally increasingly centred around the three operators that hold individual mobile service licenses.

**Table 26: Net profit margins in the last five years for the four largest operators**

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

Source: TRA analysis based on operator financial statements and data

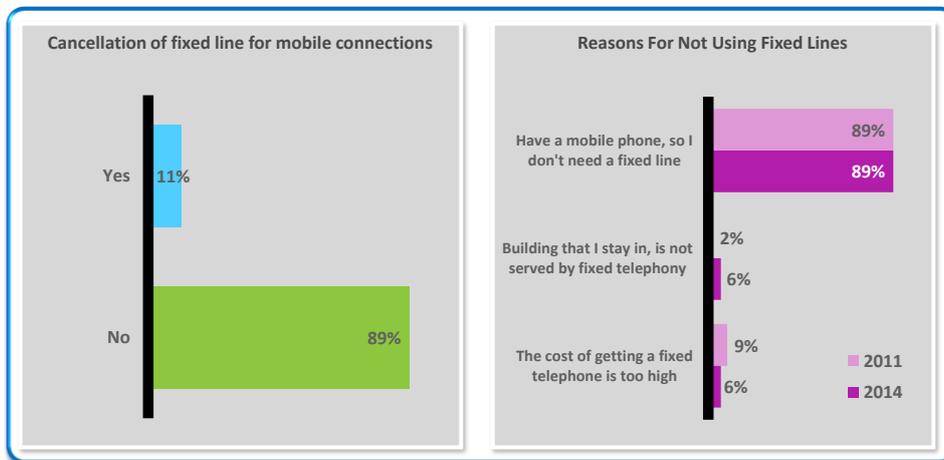
## 6 Consumer views and perceptions

327. On a regular basis, TRA conducts end-user ('consumer') surveys of both residential ('private') and business users of telecommunications services in Bahrain. The results from the survey conducted in 2014 give a number of important insights into end-users' behaviour and preferences in terms of services and providers. The surveys also generate valuable information which is relevant for the market reviews in that they give indications on demand substitutability and the likeliness of users to change provider and/or solutions for their communications needs. In the following paragraphs, some of the responses from the residential and business users are presented.

### 6.1 Residential ('private') users

328. With respect to fixed lines, the survey showed that only 24% of the respondents had access to a fixed line at home in 2014, compared with 66% in 2007. It should further be observed that 11% of the respondents stated that they have cancelled their fixed line service at home to rely solely on their mobile phone. The availability of a mobile phone is still the main reason for not having a fixed line at home (89% gave that as the reason).

Figure 91: Reasons for not using fixed line

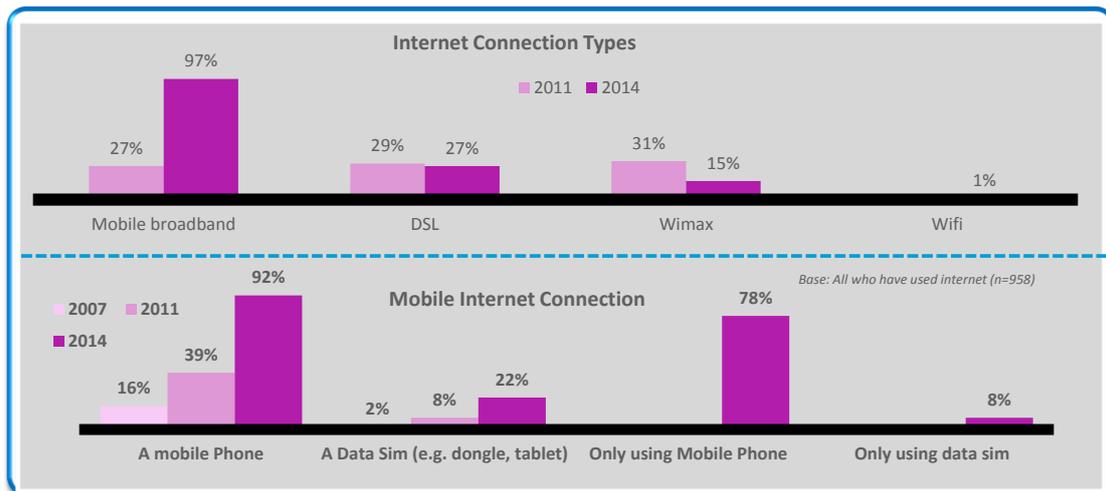


Source: Residential Survey 2014 - TRA

329. Mobile broadband has emerged as the primary platform for residential users' internet access. 97% of the respondents have used mobile broadband (up from 27% in 2011), whereas both WiMAX and DSL have experienced decreases between 2011 and 2014. Of those respondents with a mobile broadband connection, 78% state that they use only a mobile phone for their mobile internet access, while 22% use mobile dongles for mobile internet access.

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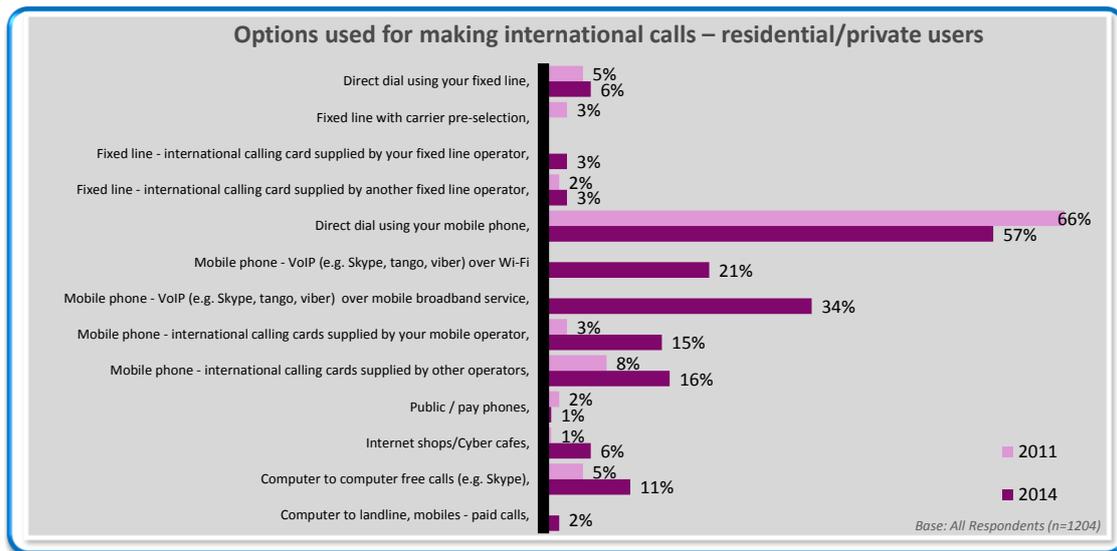
**Figure 92: Residential users' types of internet access: mobile, DSL and Wimax**



Source: Residential Survey 2014 – TRA

330. There are a couple of significant trends with regards to residential users' preferences for making international calls. Only 6% state that they use direct dial from their fixed lines. Though there has been a decline between 2011 and 2014, the majority of users make international calls using direct dialling from their mobile phones. There has been a large increase in the usage of OTT communications services amongst residential users; more than 1/3 state that they use OTTs from their mobile phones (notably Skype and Viber).

**Figure 93: Options for making international calls – residential/private users**

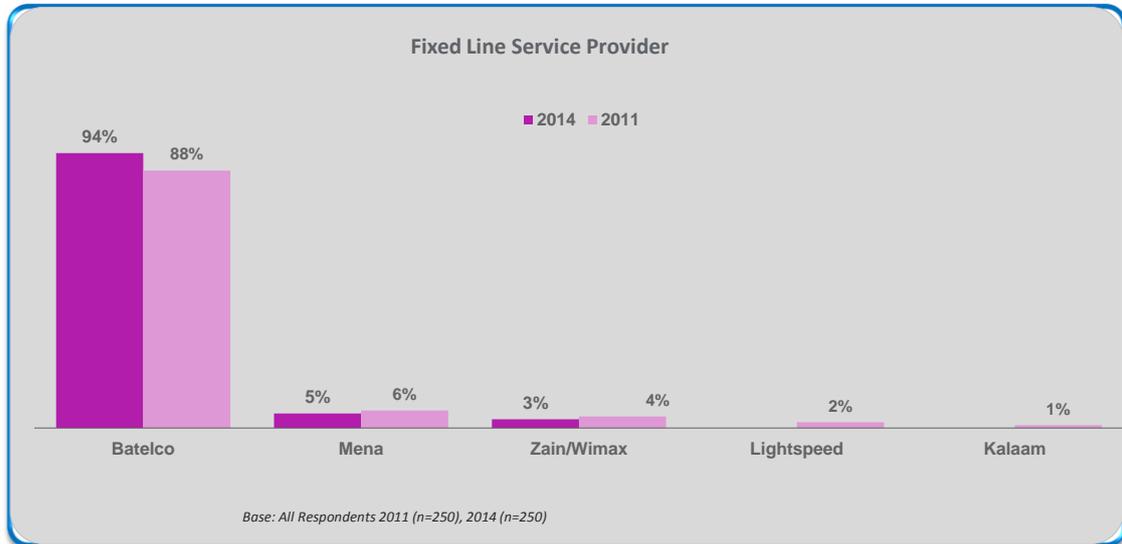


Source: Consumer Survey 2014 - TRA

## 6.2 Business users

- 331. The business survey gives, in many aspects, different results and conclusions to the residential survey.
- 332. 94% (or almost 19 of 20) of the business respondents state they use Batelco as their fixed line provider. This is an increase of 6 percentage points compared to 2011 and shows the very strong market position that Batelco holds in this particular segment of the market.

**Figure 94: Businesses fixed line provider**

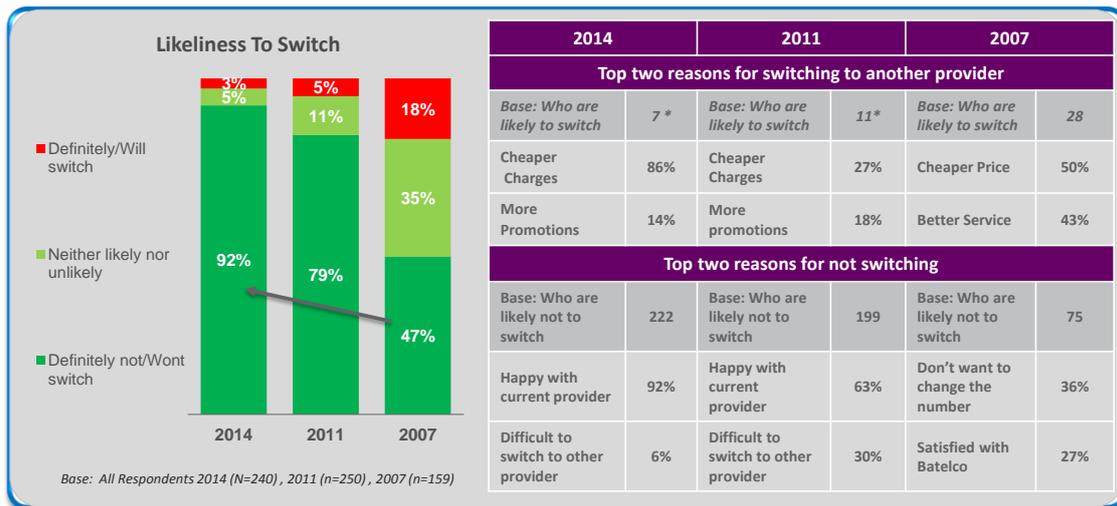


Source: Business Survey 2014 - TRA

- 333. In addition, there is an increased reluctance to change fixed line provider; with more than 9 out of 10 responding that they definitely would not change fixed lines provider. TRA notes that this reluctance to switch appears to be driven by ISDN subscribers – of the business respondents who have a fixed line service, the most common form of fixed line service subscribed to was ISDN services, with 66% of respondents subscribing to such a service (and only 26% of respondents subscribing to a business PSTN line).

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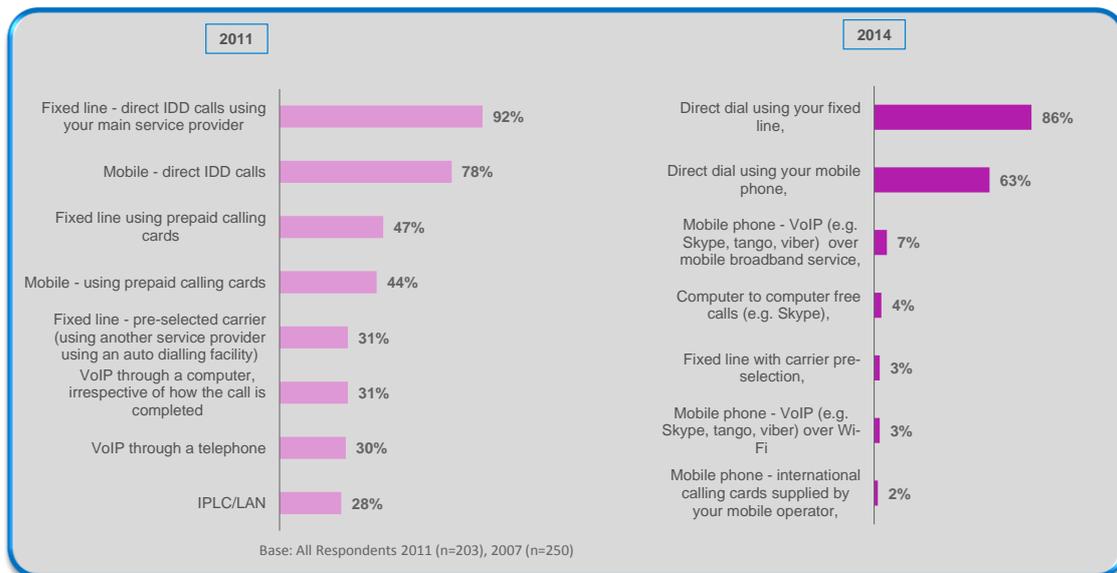
**Figure 95: Likeliness to switch fixed line provider**



Source: Business Survey 2014 - TRA

334. With respect to international calls, business users respond in quite different ways to residential users. Businesses predominantly used fixed line direct dialling (86%) and mobile direct dialling (63%) to make international calls. There has been a significant decline in the usage of prepaid calling cards from both fixed and mobile lines.
335. Using OTT communications (Skype and Viber) is very less common amongst the business users compared with residential users. For example, less than 1 in 10 of the business users state that they use mobile OTT apps for making international calls.

**Figure 96: Options used by businesses for making international calls**



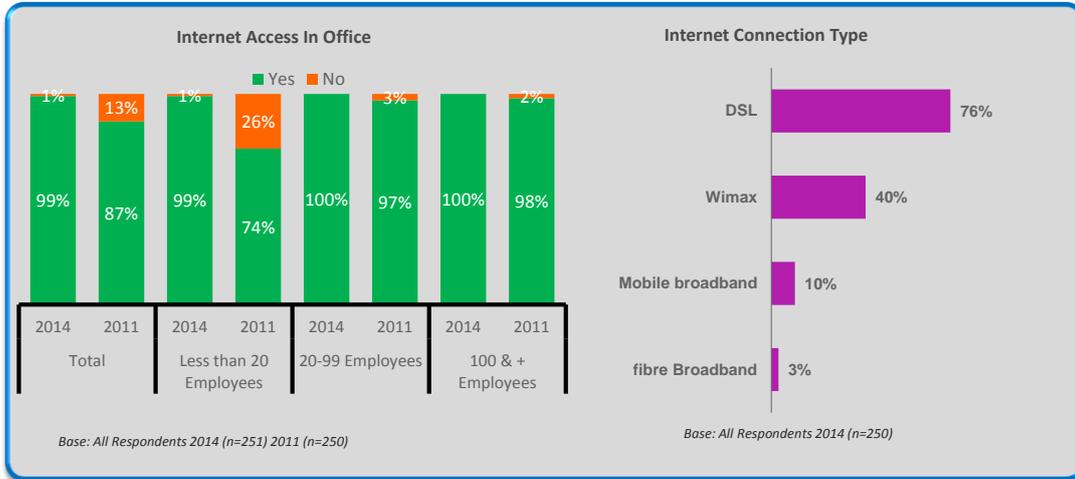
Source: Business Survey 2014 - TRA

336. Internet is clearly essential for the exchange of information in today's business environment. 99% of the businesses have internet access in their offices, which is an

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increase from 87% in 2011. All medium and large businesses have internet access. National data services are important to businesses with 76% of businesses having a DSL connection, 40% of businesses having a WiMax connection, and only 10% of business relying on access from mobile broadband (compared to 97% of residential respondents).

**Figure 97: Internet access for businesses**



Source: Business Survey 2014 - TRA

### 7 Trends and drivers

337. This chapter examines some of the key trends and drivers in the sector, and their likely implications on competition and future market regulation.
338. Since the last major market review took place in 2008, new technologies have emerged that have or are expected to have a considerable impact on the market.

#### 7.1 Broadband for all & all IP

339. Largely, recent developments have the common denominator of '*broadband*' which has facilitated more efficient provisioning of 'traditional telecoms services', but also a large number of new services and applications, often bundled together over the same platform.
340. The developments lead to new regulatory considerations, *inter alia* because they may have implications on the definition of relevant markets (currently or in a forward-looking perspective) and therefore on decisions on appropriate and proportionate regulation.
341. IP technology is taking over circuit switched networks, which has implications, in particular, for fixed telephony services. There has also been a substantial increase in 'inter-platform' competition, with the upgrades of fixed technologies and local fibre deployments, though fibre deployments in Bahrain have thus far been limited.
342. The use of broadband continues to increase significantly such that it has surpassed narrowband use. Amongst others it has resulted in an increase in the supply and demand of services and applications via the internet, including the significant increase of users of Over-the-Top (OTT) services.
343. The continuous deployment of broadband infrastructure (fixed and mobile) and the increasing usage of packet data services and applications (where voice calls are simply an integral part) have consequences in a number of other areas, as further elaborated on below.

#### 7.2 Bundling

344. Broadband developments in recent years have provided clear benefits to the end-users. The value they receive for their money has improved substantially. The speeds and data caps have increased continuously while prices have come down, sometimes by large magnitude. At the same time broadband operators have continuously upgraded the internet access service with add-ons, thereby bundling a number of components. The sequence of how such bundling was offered differs depending on the underlying infrastructure (e.g. xDSL or cable-TV), but internet service providers normally first added a voice service (dual play bundles), then TV to their bundles (triple play), and more recently some operators have added mobile services (quadruple play)<sup>64</sup>.

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<sup>64</sup> See Ecorys report (for DG Connect): "Future electronic communications markets subject to ex-ante regulation", 18 September 2013.

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345. The term 'bundle' refers to a combined offer that includes several different types of services. These packages of different services can come in a wide variety of combinations, but three main bundle formats are most common:
- a. Dual play (Internet + home phone), which has become the standard offering. Most offers of Internet access include a fixed voice service. This package can be extended with a bundle of calling minutes, possibly customized depending on what kind of home phone calls the subscriber usually makes (e.g., to include calls to mobile phones, calls to specific foreign countries, etc.) or what time the calls are made (e.g., off-peak hours only);
  - b. Triple play (Internet + home phone + television) includes a basic package of (mostly free) channels, and (in most cases) subscribers can add on premium channels; and
  - c. Quadruple play includes a mobile component. Most operators that offer bundled packages also offer a basic mobile plan (with one hour of talk time, for example). There are a number of possible combinations with quadruple play. For example, a subscriber can choose to sign up for mobile and Internet, but opt against TV.
346. A potential development that might counter the "bundling trend" is the increased adoption of OTT services by end-users. The adoption of OTT services breaks the link between network access and service provisioning. Users relying to a large extent on OTT voice, messaging or video services have no real incentive to subscribe to a bundled plan. On the other hand, operators' could well respond by including voice "for free" in their bundled offers.
347. Bundling provides both opportunities and threats to the operators. On the positive side, bundles can be produced at lower costs ('economies of scope') and hence operators can make more competitive offers. For this reason a voice service in a voice broadband bundle is typically based on voice over broadband (VoB) and not on PSTN. On the other hand, by bundling a highly competitive service (e.g. broadband) with a less competitive one (e.g. voice access), operators could risk exporting price competition to a presently less intensely competitive adjacent market.
348. In order to maintain overall competitiveness of a market, it could be essential to ensure that enough players have the ability to provide the bundles that the end-users demand. In telecoms markets this could be a problem if the provision of one or more services in the bundle requires access to one or more bottleneck infrastructures at the wholesale level, and it is therefore essential that other operators have access to 'fit-for-purpose' wholesale products that allow them to replicate bundled offers in the downstream markets
349. If such access is not guaranteed, the dominant operator is not only able to defend its position in an SMP market, but could potentially also leverage its market power into adjacent markets of the bundle's other components. Competitors therefore need to have access to wholesale products enabling them to compete with the SMP operator's bundles. Otherwise, subscribers to the SMP operator's bundles will be unwilling (or unable) to switch to a competitor, if the latter cannot replicate all components at competitive costs.
350. Defining a separate relevant retail 'bundle market' could resolve this issue, i.e. any competition problem within such a bundle market would require wholesale remedies that enable competitors to compete in the bundle market. A first step would be to determine

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the relevant market for the bundle. The starting point would be a SSNIP test analysing the following question: “*would end-users unbundle the bundle in response to a 5% to 10% increase of the bundle price relative to the sum of the prices of the respective stand-alone products*”? A next step would be to identify potential bottleneck infrastructures, if there are any at all. Such analysis could be done separately for residential (alternatively ‘mass-market’) demand and non-residential (alternatively ‘business market’) demand.

351. The increased demand for bundled packages of services offered by the same operator at a flat rate has largely been driven by the increased presence of broadband. Bundles offered may comprise of both regulated and unregulated inputs, such as TV subscription, internet access, mobile and fixed telephony.
352. Despite that bundling is arguably one of the dominant trends and affects competitiveness in the market, it does not imply that a separate retail market for “bundled services” should be defined for the purpose of potential ex-ante regulations<sup>65</sup>. From a regulatory point of view it is, however, important that the corresponding (wholesale) inputs are, whenever justified based on the state of competition, provided on non-discriminatory terms in order to foster competition at the downstream level (i.e. bundled retail products).
353. The bundling trend has of course possible implications on competition also in Bahrain. The current telecommunications market is, as shown in the “*Market Indicators & Analysis*” chapter, dominated by three operators (who are also the holders of individual mobile service licenses). These three operators are all, albeit not equally, able to bundle different services to the end users through their access networks. Batelco, for example, could already offer quadruple bundles (fixed/mobile/internet/(IP)TV offers). However, other licensed operators do not currently have the same opportunity to bundle services to end users, especially as they are not able to offer mobile cellular services.
354. Some of the existing (and potential new) OLOs would benefit from being able to offer bundled services to their target customer groups. A wider choice of providers who are capable of offering various bundled services could stimulate the market and potentially benefit the end-users.
355. One possibility to stimulate further competition on bundled offers to end-users in the future would be the introduction of mobile virtual network operators (‘MVNOs’) As in other markets, MVNO agreements would also provide incremental (wholesale) revenues to the MNOs and hence could be attractive to them as well.
356. It should be made clear that TRA’s view that MVNO access agreements should be considered is not driven by a current recognised lack of effective competition in the mobile sector in itself, but rather by the benefits that such agreements could bring in

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<sup>65</sup> See EC Explanatory Note regarding Recommendation on relevant product and service markets within the electronic communications sector susceptible to ex-ante regulation: “*Even if an NRA would define a retail market for triple play, for example, the wholesale inputs needed to compose this bundle would remain separate and non-substitutable, such as for example local access, higher-level access and termination. What is important in this respect is that NRAs are able to ensure that the vertically integrated SMP operator’s regulated elements of the bundle can be effectively replicated (in terms of both technical and economic replicability) at the retail level, without an implicit extension of regulation to other components which are available under competitive conditions. Moreover, it has been argued that, in cases of the provision of the fixed voice service with broadband access and/or IPTV, bundling at the retail level is rather a phenomenon of continued provision of a declining fixed voice service alongside broadband access and/or IPTV, rather than an economically significant offer that alters the competitive dynamics over a longer period*”.

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terms of more competition in a wider range of choice and services (i.e. bundling). In any case, the forthcoming NTP4 should provide further policy direction on what measures should be taken to foster sustainable and effective competition in the future.

### 7.3 LTE - and beyond

357. LTE is the new global standard for wireless communication of high-speed data, in particular for mobile phones and data terminals. It is the successor of 3G technology, and has already been deployed extensively by operators in Bahrain. Although, at this point, a relatively limited number of operators have rolled out extensive LTE networks world-wide, from a forward-looking perspective LTE is expected by most to have an appreciable impact in the market. The combination of LTE with additional spectrum, and possibly denser networks using a mix of macro cells and small cells, will in principle offer higher capacity (i.e. higher speed, less latency) at a lower unit cost. These developments make the monitoring of wireless-fixed competitive interactions especially important. LTE users may still experience different bottlenecks, for example video streaming transmission, due to shared use of mobile networks' limited capacity and the lack of ability to, in some circumstances, offload mobile traffic on to fixed networks.
358. Bahrain has a mobile centred telecommunications market with significant mobile-broadband deployment and usage, but currently limited 'ultrafast' (fibre) deployment and usage. It is expected that the situation will be further enhanced with more LTE based mobile broadband adaption. Such high-speed mobile broadband is at least a partial substitute for fixed line broadband (as concluded in e.g. TRA's determination of broadband internet access from fixed location). This will be a factor in the take up of ultrafast fixed (fibre-based) deployment, in particular where consumer needs can be satisfied by LTE speeds and performance.
359. The outcomes will ultimately depend on the relative prices/value propositions and performance of fixed-line and mobile based services. Plans for deploying ultrafast broadband and fibre will also benefit the deployment of LTE networks; in that sense there are synergies between the two. Mobile networks can use the same fibre and share the same core networks as used by fixed businesses. If the operator deploying the fibre also has an LTE network business, then this could create some asymmetric advantages, but this could be handled by regulatory requirements (for example requirements on equivalent supply to other service providers.)
360. One could easily argue that the evaluation of LTEs impact is "a moving target" implying that even if the speeds, throughputs and quality of service of LTE mobile broadband will improve (possibly even dramatically), so will most likely fixed fibre broadband. Hence one cannot assume that LTE will fully substitute xDSL and certainly not fibre<sup>66</sup>, as all active technologies develop continuously over time.
361. The further roll out of LTE networks will lead to greater economies of scope between fixed and mobile network infrastructures, due to the re-use of fixed backhaul infrastructure. For instance, traffic from LTE devices will be offloaded on the fixed network via femtocells. The cells of the mobile networks will also be smaller than in

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<sup>66</sup> In the broadband market review, TRA noted that it would need to review the substitutability between fixed and mobile broadband services once fibre becomes deployed on a more widespread basis (see paragraph 153 of the March 2014 determination).

previous generations of mobile standards, thus integrated operators have the benefit of the capillarity of their fixed networks to connect LTE base stations. Consequently, the incentive for operators to market quadruple play or other forms of fixed/mobile bundles rises. Pure play fixed or mobile operators are therefore likely to find themselves at a market disadvantage, even if they can secure some sort of wholesale access to the infrastructure type they are not running themselves<sup>67</sup>.

### 7.4 Convergence – what is it all about?

362. The past decade has seen a transition in the telecoms and IT fields that can best be described as ‘multiple convergence’, including a blurring of the boundaries (and increased competition) between fixed and mobile communications, but also convergence between the telecommunications and the IT and media domains, as well as convergence between the infrastructure layer and higher layers of all-IP networks. In some more detail, convergence takes place as follows:
363. Convergence between fixed and mobile telecommunications is becoming a reality. The use of femtocells and the higher speeds achieved on 4G networks suggest the substitutability between fixed and mobile broadband access will be on the increase going forward. TRA has in this respect already recognised the substitution effect (thus far for mass-market users) coming from higher speed mobile broadband in its 2014 market review and determination on broadband internet access from fixed locations.
364. Convergence between telecommunications and IT has largely already become a reality through the migration towards an all-IP infrastructure, which leads to new business models, the creation of multi-layered platforms where applications and services dominate user experience, and constantly changing competitive dynamics. Not only fixed broadband platforms are increasingly integrated into the Internet, but also cloud computing is shifting most of the computing capacity into centralized storage servers that will be made accessible from both fixed and mobile devices (but often not located in the same territory). In addition, the success of app-stores, e.g. created by Apple and Google Android promises to revolutionise the way in which not only smartphones are used but also computers. Moreover, this form of convergence is triggering *convergence between the infrastructure layer and higher layers of IP architectures*, such as the logical layer, the application layer and the content layer in the OSI mode.
365. Convergence between the (digital) media world and the Internet world disrupts traditional business models in the content industry, and leads to a growing unbundling and re-aggregation of content in different formats and in more online-user-friendly ways. This has led to a significant shift of users’ attention from traditional media to Internet-published news. This has moreover shifted advertising investment but also market power to online content aggregators. This is particularly important since control of advertising revenues is a key success factor for modern broadband platforms, and is also currently a very concentrated market.
366. With convergence, broadband platforms become much more than simple communications networks, and can be considered as ecosystems that comprise different elements that use high-speed connectivity to interact in different ways. The term

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<sup>67</sup> See Ecorys report (for DG Connect): “Future electronic communications markets subject to ex-ante regulation”, dated 18 September 2013

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'ecosystem' refers to the combined physical and biological components of an environment. When applied to the Internet, this term refers to all the hardware and software that composes the Internet, plus the various players that populate the Internet environment and the complex web of rules and relations that affect them. This also means that the Internet ecosystem includes both the physical architecture and cyberspace.

367. The convergence trend and drivers imply a shift from vertical to horizontal integration models. Ultimately this will have implications on the regulatory framework, and potentially on definitions of relevant markets and the issue of actual market power. Furthermore, the convergence drives a need to review the licensing framework and models. A great number of regulatory bodies worldwide have, partly as a consequence of convergence between sectors, received an increased regulatory mandate, and have also amended their licensing regimes to cater for the needs arising from convergence.
368. TRA is expected to get a wider scope and responsibilities to regulate the sector in the future. Evolution of the licensing framework is furthermore and identified strategic initiative by the TRA, but should be evaluated in the context of the mandate and responsibilities that 'TRA' will have in the future.

### **7.5 Net neutrality & Over The Top Applications (“OTTs”)**

369. The principle of 'net neutrality' has taken central importance in the wider ICT industry in the last few years. The advocates of net neutrality want to ensure that there is 'no discrimination' over the Internet, and the basic concept is that the Internet should remain free of any discrimination or barriers among different classes of users, or of information stored and transmitted on the Internet. The opponents to 'net neutrality' (normally larger telecoms operators who control access networks; fixed and mobile) argue that they have to be able to 'manage' their networks, to avoid abuse and congestion by data intensive content. The net neutrality issue relates directly to the treatment of OTT players (see also below section), and has evident competition implications.
370. If the network controlling operators are given full freedom to manage the priorities of services and applications in their networks, there would likely be limitations on the usage of (currently widely used) OTTs, not least the content rich applications.
371. One of the key considerations is whether 'net neutrality' obligations should apply on fixed and mobile networks. There are a number of features of mobile networks that are different to fixed high speed networks, and this has an impact on e.g. contention and quality of services. On the other hand, not least in Bahrain and many other mobile centric markets, mobile broadband networks are far more important to most users than fixed access networks, and shows much higher penetration and usage. Hence, any limitations that apply on the usage of applications on mobile networks will have a larger impact, at least in terms of affected number of users.

#### **7.5.1 OTTs - global players competing in local markets: what's new?**

372. The phenomenon that international/global firms compete with local firms in local markets is in itself hardly new. However, through the ever increasing day-to-day use of the internet and uptake of smartphones by consumers and companies, these globally available OTT services are offered to the end-users on conditions that challenge existing

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operators. In that regard, local operators claim that various global OTT players are beginning to impact the providers of telecommunications services in Bahrain.

373. OTT refers to retail communication and information exchange services that are based on Internet connectivity, but that are not specific to a certain operator or technology. There are two ways in which OTT could affect the traditional operators: first, it can be a substitute for voice, text or even video services, thus possibly cutting into the operators' revenues; and second, it creates large demand for bandwidth and can cause congestion problems.
374. The increase in the development and demand for OTT services is the result of the increased availability of broadband over both fixed and mobile platforms. Certain OTT services may grow to an extent to which they could be considered as an alternative to electronic communications services normally provided by operators, such as voice calls and SMS. In that sense the services might have disruptive effects on the current business models of infrastructure operators, since many of these services are offered for free. On the other hand, absent the presence of OTT, it is debatable whether penetration levels of mobile and broadband services would be so high. In other words, it is likely that individuals would not be willing to subscribe to mobile and/or broadband services if OTT was not available.
375. Although, currently, OTT services are not yet at a level in which they, by most regulators, are considered actual substitutes to the services provided by infrastructure operators, certain technological developments, e.g. the growing importance of smartphones and the forthcoming expansion of LTE will likely result in a continuous expansion of OTTs.
376. In some cases, infrastructure operators have developed their own OTT services to compete with other, often free, OTT services. However, some OTTs still face constraints, such as the requirement to have both users connected at the same time in order for the service to be used.
377. The importance of these services is expected to continue to grow and have a direct impact on the market, particularly at the retail level. The OTT service providers will still require an underlying infrastructure, either developed by themselves or provided by operators. OTT service providers may in the future be subject to regulation in terms of certain licensing requirements, where the OTT services meet some definition of telecommunications/electronic communications services. Whether OTT communications services should be considered belonging to the same product market as more traditional forms of telecommunications services requires however a separate analysis. .
378. A common opinion held by larger mobile and fixed operators, is that the current situation leads to "unfair competition" because the OTT service providers do not have the same obligations that the licensed operators have in individual markets. The effect of the large user adoption of OTT services leads to revenue losses for network operators, coupled with a continual need to upgrade network capacity to cope with increased usage of bandwidth-hungry OTT services. However, the OTT communications services which are argued to be competing with traditional voice and SMS services typically do not consume much bandwidth (such as Skype, WhatsApp), whereas the the OTT services that may generate congestion (or require upgrades of network capacity) are more complimentary, i.e. they do not target traditional revenues of the network operators. Therefore, the different effects on traditional licensed operators (i.e. potential revenue losses vs increased costs of network upgrades) tend to be generated by different groups of OTT services.

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379. The real impact that OTTs have on operators could be debated. To argue that OTT communications services lead to a revenue loss for all traffic minutes that otherwise would have been charged for by the operator is, in TRA's view, too simplistic. A significant portion of the users who purchase mobile data plans/packages do so based on the assumption that certain OTT services are available and are not compromised. In other words, at least part of the demand for mobile broadband services is derived from the ability to access and use OTT services over the broadband connection.
380. Therefore, any quantitative analysis of the impact of OTTs on operators should consider the *net* impact and not just the gross revenue loss on operators' international (or national) traffic minutes arising from the 'free OTTs', since data revenues are related to the users having access to the OTTs.
381. TRA acknowledges that the current market calls for the need of innovative business plans and pricing strategies, and that it poses challenges on existing licensed operators, as well as on regulators. However, it is crucial to appreciate the large benefits that internet applications in general have (and arguably OTT communication services in particular) on users and society at large.
382. When considering how to best manage the internet, policy makers need to recognize the manifold positive impacts it has had on everyday lives. It is imperative that any move towards regulation should serve as a catalyst to drive additional opportunities and create effective competition – rather than viewing the technology as a threat.
383. TRA's view is that widely used OTT services provide, in general, real and significant benefits and value to the consumers, and must not be restricted from a user availability point of view. Having said that, TRA acknowledges that they also pose challenges for existing licensed operators which could, at least over time, undermine their ability to continue to making significant re-investments in network and solutions, unless they can and are allowed to change their business models.
384. Changes to the business models could include closer cooperation with OTTs whenever possible (some larger international telecoms operators are indeed pursuing such cooperation) *and/or* a possibility to view OTTs as add-on (*'premium'*) services for the customers.
385. From a commercial point of view, TRA does not oppose that operators amend their retail tariff offers to the end-users, without seeking TRA's approval so long as they are not determined to hold SMP in the relevant market (which is not currently the case for the MNOs in the mobile market). However, the tariffs applied must be in accordance with Article 58 of the Telecommunications Law, i.e. the tariffs must at all times remain fair, equitable, non-discriminatory and based on forward looking costs. Possible revisions to the consumer value propositions (i.e. change to the tariff plans etc.) must not in TRA's view include to, in effect, discriminating against certain OTTs *nor* to limit the opportunities for all customers, who demand the applications/services, to access and make use of the OTT services.

### 7.6 Do key trends and drivers motivate a fundamental shift in TRA's approach to market regulation?

386. Clearly, the main trends and drivers as described in the previous sections pose both opportunities and challenges for the future. Importantly, however, these trends are overall positive in generating more efficient market outcomes, and providing more choice and benefits to the users.
387. TRA recognises the challenges that some of the trends lead to in terms of appropriate regulation going forward. However, TRA's current view is that the trends and drivers do not motivate a fundamental shift to the analytical framework used for assessing relevant markets susceptible to ex-ante market regulation and intervention. Adopting too rigid an approach towards emerging technologies and providers could rather be negative to the sector development and limit benefits to consumers.
388. TRA has thus far been considered one of the most innovative regulators in the region. TRA has, arguably more than any other regulator in the region, adopted and applied international best practices and frameworks for economic regulation, including how to adequately assess the impact of new technologies and trends in market regulation. TRA's opinion is that the market interventions made have generally greatly assisted in creating more effective competition and better outcomes to the users than a more 'conservative' approach. This is also evidenced by Bahrain's favourable position in international benchmarks on uptake and adoption of telecommunications services (e.g. mobile broadband), investments in new telecommunications technology and the pricing levels for telecommunications services<sup>68</sup>.
389. A significant part of TRA's approach to and framework for market regulation has been tailored around the one used in the EU. The EU framework is implemented in a way that aims to ensure a harmonised approach to e.g. market regulation. This means effectively that the 'rules of the game' cannot differ significantly between the different EU member states, i.e. no member state is allowed to adopt completely different regulations which could distort relative competitiveness of the market or give unfair protection of national incumbents.
390. The degree of harmonisation within the GCC region is currently different. An important consideration is whether there is justification for more regional harmonisation, taking into account *inter alia* the impact of key trends and drivers, and to potentially work on implementing a joint agenda also with regard to the models and practices for market regulation and interventions. TRA does support initiatives that aim to harmonise models and practices in the region, including to harmonising positions and regulations in relation to emerging technologies, treatment of OTTs and other important trends and drivers in the sector. However, the overarching objective for TRA is to create an efficient national market that provides choice and value to the users – businesses and private users alike. Creating effective and sustainable competition is a critical means in this regard but is not an end in itself. Fostering effective competition is not the same as protecting individual competitors.
391. TRA's approach to market regulation going forward will be to, as much as possible, rely on balanced and proportionate measures in wholesale markets, that create the best

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<sup>68</sup> See also section on 'Comparisons and benchmarking'.

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foundation for effective and sustainable retail market competition to develop in the country. Furthermore, to increasingly rely on ex-post measures whenever effective and sustainable competition can develop in the absence of ex-ante regulation. If there are issues related with potential 'unfair' market conditions between Bahrain and other markets in the region, TRA intends to address such on a specific basis.

### 8 Policy issues affecting the market which need further policy direction in the NTP4

392. This chapter elaborates on a few key policy issues which are expected to have a considerable impact on the development of the sector in general, but which are also likely to have implications on the shaping of market regulation in the next period. The aim of the TRA is not to provide recommendations or direction on such policy issues, but rather to address them and examine some of the important points that should be taken into consideration in the formulation of policy directions.

#### 8.1 Implementation of the NBN

393. The model to be used for making the envisaged NBN a reality is likely to have significant implications for competition in Bahrain. The expectation that the NBN will eventually become a reality, in line with the current Government direction, has arguably had an impact on the current market situation including the limited deployment of physical fibre infrastructure. This situation may in turn have had implications on competition development, insofar that many operators argue they have waited for the NBN entity to be established and have in the meantime continued to rely on (fixed) network infrastructure and the wholesale services offered by Batelco.

394. The NBN should be seen in the context of an overall broadband policy and strategy for the nation. To be relevant, such a broadband strategy must include and evaluate both supply *and* demand side factors. In that sense the NBN, together with other complementing, and partly substituting, broadband networks (including mobile broadband) is *necessary but not sufficient* to implement a robust broadband strategy for the benefit of Kingdom of Bahrain.

395. TRA has previously on a number of occasions emphasised the importance of ensuring that 'fit-for-purpose' wholesale products are available to other licensed operators to stimulate effective competition in the retail markets. It is critical for an effectively competitive market that the wholesale access products provided to OLOs give the needed flexibility and reasonable control in order to allow the OLOs to (economically and technically) replicate retail offers.

396. The current plan for the NBN is to create a *single* fibre-based ('ultrafast') infrastructure that is available to all licensed operators on open access principles. In the scenario where a 'neutral' wholesale-only entity operates the NBN there would arguably be less risk of anti-competitive behaviour compared to a scenario where a vertically integrated operator operates both the NBN and competes in the retail markets. Such a neutral entity would have improved incentives to offer attractive wholesale services on non-discriminatory terms, as it would by definition have no retail operation to discriminate in favour of<sup>69</sup>. By contrast, a vertically integrated operator, who owns or controls essential facilities and infrastructure, would have incentives to also protect its retail market shares, and, if given the opportunity, would gain from not offering wholesale products that allow competitors to compete in downstream markets on equal footing. If indeed other

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<sup>69</sup> However, even if a 'neutral wholesale only entity' were to operate the NBN and manage the provisioning to all operators, there would still be a need for stipulating commercial and non-commercial terms and conditions which, in practice, ensure non-discrimination between the different buyers of the provided wholesale services.

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operators are allowed to build their own infrastructure this is arguably less of a problem, and can work as an effective constraint on the vertically integrated incumbent (though unnecessary duplication of resources could be an economic problem, at least in the short term). If this is not the case, there could be severe implications on the market, at least from a competition point of view.

397. Therefore, if indeed, a vertically integrated operator, who also competes for the end-users, would build and operate also the 'NBN', there is arguably a stronger argument for more and stronger ex-ante regulatory interventions, provided that a key sector objective remains to ensure effective and sustainable competition in all market segments.
398. Currently Batelco is subject to an obligation to submit regulatory accounts for TRA approval. These accounts serve a number of purposes, including to ensuring that the wholesale prices charged by Batelco for regulated products are fair, reasonable and non-discriminatory. Regulatory accounting separation, is, in the current market structure, an important tool to minimise the risk of anti-competitive behaviour by operators with market power in one or more markets, but does not necessarily provide an absolute truth about the prevalent cost situation as 'apples need to be compared with apples'. An incumbent with significant market power who controls essential infrastructure and facilities, that others cannot replicate, will always be at a competitive advantage – hence it is crucial that regulatory mechanisms are in place to allow other operators to access an incumbent's infrastructure at equivalent conditions. Pricing of the regulated wholesale products is a key component in this respect. Going forward other forms of separation would be considered.
399. Functional separation has been implemented in other markets, notably in the UK where BT's access network unit (Openreach) has been functionally separated from the rest of BT. Functional separation implies that wholesale and retail business units are separated as distinct businesses. The wholesale business would provide the retail business (in the same 'business group') with services on economically and technically equivalent conditions to other operators. The advantage, once implemented, is that there is more transparency and less (though still existing) incentive to engage in anti-competitive behaviour. Furthermore, the new wholesale business will have greater incentive to run the business as a stand-alone business with sound business principles as a foundation (even if pricing is regulated). The drawback is the complexity of actually implementing functional separation in line with underlying objectives. Functional separation is clearly an option if the NBN were to be deployed and operated by Batelco.
400. Structural separation, on the other hand, would mean an entirely new company, separated from the other businesses of the incumbent. It would mean that all assets and resources, including human resources, related to infrastructure and facilities for the wholesale company are transferred to an independent wholesale entity. Structural separation has been implemented in a number of different market environments such as Australia, where the government-owned NBNC0 was established as a wholesale-only operator to deploy a nationwide fibre network; New Zealand, where Telecom New Zealand decided to structurally separate its access unit into a separate company ('Chorus') in order for Chorus to be able to participate in the government-supported national fibre deployment. Structural separation has also been enforced in very different environments, for example in Botswana where the incumbent's fiber backbone infrastructure and (Government financed) investments in international cable systems were structurally separated and a new entity, 'Bofinet', was established whose mandate is to provide wholesale services only on open access principles . Another relevant

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example for Bahrain is Singapore where a separate NBN entity was established but where the incumbent, Singtel, was not split up.

401. The advantage of structural separation is clearly a further distancing between the previous incumbent's wholesale activities and retail activities, and hence less room for any anti-competitive conduct. The downside is arguably a 'stripped' valuable company, as well as the complexity and costs of implementing structural separation in practice. Structural separation could, potentially, be a model if Batelco becomes vehicle for the NBN.
402. Whatever model that is chosen for the envisaged NBN it is paramount that a potentially lengthy implementation of the model does not hinder the market from developing in the short to medium term. Government's objectives for the NBN have been stated clearly,. Effectively this implies to ensure that critical wholesale products and facilities are available to all operators on equitable conditions. Therefore, even in the absence of the NBN, TRA's intention going forward is to put additional focus on ensuring that the regulation of wholesale products is effective and that 'fit-for-purpose' wholesale products are available.
403. The development and planning of the envisaged broadband strategy, and then the subsequent implementation requires many issues to be addressed and different stakeholders have to be included. The stakeholders include the TRA as well as government departments, private industry and possibly even parties outside Bahrain.
404. The NTP4 is now expected to come into force in the second half of 2015. It should provide further policy direction on the preparation and implementation of the NBN as well as the broadband strategy.

### **8.2 Infrastructure & facilities – how to best manage deployment & sharing?**

405. The magnitude of infrastructure sharing in Bahrain is quite limited compared to most other markets. The vast majority of all mobile sites, for example, are not shared but erected and operated by a single operator<sup>70</sup>. There has arguably to date been limited consideration on the environmental aspects of site erection. The majority of the mobile sites have not been formally approved to be erected. Going forward, the situation is unsatisfactory for a number of reasons.
406. The issue on infrastructure sharing and site deployments could be argued to lie outside the scope of the SMR, but has implications that directly relate to the SMR. Over and above the technical (including quality of service) and environmental implications, infrastructure sharing has also an impact on competition, market efficiency and the business risks of the operators. Provided that appropriate and relevant conditions are put in place, further infrastructure sharing should be in everyone's interest. Unnecessary duplication of infrastructure does not serve economic efficiency overall. TRA has already taken a number of initiatives in the area, including to developing a national mast database system.
407. Ideally, one body/entity should be in charge of the coordination and management of the issue and ensure prompt progress going forward. There is a need for a more coordinated and regulated approach to infrastructure (sites and antenna) deployment and sharing in

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<sup>70</sup> Currently, for example, less than 10% of all mobile sites (in total about 1400) are shared in Bahrain.

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Bahrain. The issues include not just commercial sharing arrangements but also compensation and fees to property owners, and a coherent approach towards environmental aspects. .

408. Without clear direction and regulations going forward, the problem should only be expected to become larger taking into account the further deployment of a great number of smaller LTE cell sites and antennae. There is also a need to allow for deployment of smaller sites and antennae that may also be connected to e.g. lamp posts, traffic lights etc., which is a model tried in many other larger cities including London.
409. TRA, as any sector regulator, should have a key role to play, including in the formulation of appropriate regulations and/or guidelines on sharing arrangements for the future.
410. In essence, TRA's view is there should be scope for a more coordinated and effective approach to infrastructure sharing and to establish clear conditions for new site deployments going forward. Once in place, this should assist to ensuring full compatibility between new deployments and, ultimately, market efficiency.
411. The TRA is in the process of introducing regulation on wireless infrastructure sharing. This should streamline the process of obtaining permits for site-sharing.
412. The NTP4 is also expected to provide further policy direction on future models for infrastructure sharing in Bahrain.

### 8.3 Spectrum: 'the new oil' – how should it best be managed and used?

413. Frequency spectrum is widely considered as one of the most valuable scarce resources for any nation/region. Considerable planning and coordination work is being carried out by a number of regional and international organisations (such as the ITU). TRA recognises and supports the need for further harmonisation on frequency spectrum issues within the GCC region, based on directions, resolutions or guidelines by the ITU.
414. Valuable and critical spectrum does not only provide substantial revenue contribution to Governments around the world (notably through auctions), but is also key to the development of effective and sustainable competition in the telecommunications, and for that matter the wider electronic communications and broadcasting sector.
415. Operators who do get access to key frequency spectrum normally get competitive advantages. From a policy and regulatory point of view it is therefore essential to ensure that principles and models for frequency allocation are in line with the general objectives for the sector. One of TRA's key objectives is to promote effective and sustainable competition. An important condition for achieving effective and sustainable market competition is to, as far as is feasible, create a level playing field.
416. Specifically, there is interest from a number of operators to get access to the existing and unallocated 2.6GHz spectrum. This spectrum was originally intended to be included in the competitive auction and award process for LTE spectrum<sup>71</sup> but was withheld from the final award process.
417. Ultimately the process for awarding the valuable frequency spectrum (including but not limited to the 2.6GHz band) has to be transparent with respect to who should be able to

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<sup>71</sup> See for example, TRA's Invitation to Tender, issued on 28 January 2013, at [http://216.25.41.102/en/pdf/ITT\\_2013.pdf](http://216.25.41.102/en/pdf/ITT_2013.pdf)

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participate in such process and based on what criteria. TRA appreciates that the issue is of utmost importance to the industry. The NTP4 should address this important issue for the sector and aim to set out a clear direction on the allocation of critical frequency spectrum.

### 8.4 Current regulatory framework – what is the need for change?

418. The current regulatory framework in Bahrain dates back to 2003 when the primary legislation (the Telecommunications Law) came into force. The Law has over the years been supported by various regulations, determinations and orders in different areas.
419. This Draft Report describes various trends and drivers that are expected to have an increasing impact on the sector and its development. Evidently, the regulatory framework has to be adapted to support (and not hinder) the positive developments.
420. The convergence between previously more separated sectors (such as telecoms and broadcasting/media) necessitates an adapted framework. TRA's role, mandate and priorities need to change accordingly. At the same time, the licensing framework has to evolve to accommodate both existing and emerging and often significant players (infrastructure/network owners, service providers, content providers and aggregators etc.). The current licensing framework was adopted based on a sector rather different to present, and certainly future, realities.
421. With the continuous 'any-to-any' connected society (and individuals) come other demands on appropriate legislation. There are a number of important pieces of legislation that have to be addressed in the next period by the TRA. This includes initiating legal preparatory work on: proposing changes to the current primary legislation ('Law'), draft data protection law specific to the telecommunications industry, consumer privacy & consumer protection law/regulations, which are all a part of the review of the entire regulatory framework. Such regulatory framework issues lie however largely outside the scope of this study.
422. Indeed, TRA has in its Three Work Plan (2013-2015) stated its plan to review the regulatory framework and the licensing regime.
423. Specifically related to market reviews and outcomes of determinations, there are areas which need to be addressed in a revised primary legislation. As previously elaborated on in this report, there is an issue with the "automatic" remedies that the Law seems to impose once an operator is found to have SMP (in a relevant retail market) and dominance (in a relevant wholesale market). These provisions may leave insufficient flexibility to determine whether ex-ante regulation is indeed justified and proportionate even if one or more companies have SMP/dominance, or if ex-post measures alone could be sufficient. Moreover, any balanced regulator has to be able to adopt proportionate remedies (i.e. to only impose remedies, where needed, and only such that are determined to be sufficient to rectify a market failure (and that provide anticipated benefits that outweigh the costs)

### 9 A holistic review of relevant markets going forward from here

#### 9.1 Introduction to the holistic market review

424. The following provides a holistic market review of the defined relevant markets. The review takes into account evaluation and analyses carried out in previous sections of the SMR report; both qualitative considerations and quantitative data. In particular, the chapter on “*Market indicators and analysis*” entails a great amount of tables and figures related with price, volume and market share trends which have all been considered in the following chapter. Though the numbers are not repeated in the following review of the relevant markets they form an integral part of the market definition and competition assessment analysis and conclusions made.
425. In the following market reviews, TRA has considered the analytical approach applied within the EU framework; i.e. the so called ‘three criteria test’ which is applied to assess whether a market should be susceptible to ex-ante regulation. The three criteria must be *cumulatively* met for a market to qualify. The three criteria are:
- a. The presence of high and non-transitory structural, legal or regulatory barriers to entry;
  - b. A market structure which does not tend towards effective competition within the relevant time horizon, having regard to the state of infrastructure-based and other competition behind the barriers to entry; and
  - c. Competition law alone is insufficient to adequately address the identified market failure(s).
426. Whereas the three criteria test is focused on analysing *markets* (to find out whether a market should indeed be susceptible to ex-ante regulation), the assessment of SMP (and dominance) is focused on *operator(s)*. The concepts clearly rely on similar factors and indicators for the analysis, but do have a different focus.
427. TRA has previously in this Draft Report recognised that there appears to an issue in that the Telecommunications Law ‘automatically’ impose ex-ante retail market remedies upon designation of SMP in a relevant retail market (notably obligations on Tariff Controls through the RTN process. One of the indicators to take into consideration when assessing market power in the relevant retail market is whether any operator has at least 25% market share. There are, however, other factors and indicators that should be taken into account in such market power assessment, including barriers to entry. The level of barriers to entry is clearly affected by the type of wholesale remedies enforced.
428. TRA’s opinion is that whether an operator should be considered to hold SMP in a relevant retail market, in a forward looking perspective, must take into account the ex-ante wholesale remedies applied and enforced in the relevant upstream wholesale market(s).<sup>72</sup> Hence, if there are indeed effective wholesale remedies available, the downstream market might be regarded as being effectively competitive, at least prospectively, as barriers to entry should be lowered as a result of ‘fit-for-purpose’

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<sup>72</sup> Such an approach appears also to be consistent with the practices in the EU where ex-ante retail remedies should only be considered if ex-ante wholesale remedies are not considered sufficient (to rectify the identified market failure).

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wholesale remedies. The other side of this argument is of course whether a retail market would be considered effectively competitive in the absence of the ex-ante wholesale remedies. Going forward TRA's principle direction is to rely on wholesale remedies only whenever justified and avoid imposing any ex-ante retail remedies unless there are clear indications that wholesale remedies only would be insufficient to rectify a market failure in a forward looking perspective.

429. Furthermore, TRA's view is that the identification and imposition of proportionate and justified remedies (to resolve the market problem at hand) should form an *integrated part of the market review process* in the future.
430. It should from the outset be recognised that this holistic and strategic review of the defined markets is not as detailed as is normally the case when TRA conducts a market review and an analysis of an individual relevant market.
431. The intention is to assess, based on available market indicators, trends, the reasoning in previous individual market reviews and other issues elaborated on, whether there is justification to propose amendments of any relevant market(s) on the current list of retail and wholesale markets in order to stimulate a more effective and dynamic market for the benefit of end-users.
432. Therefore, this holistic market review is *not conclusive* in the sense that it does not have the status of immediate new determinations (and, consequently, amendments of previous TRA determinations). However, it does provide TRA's preliminary assessment of the situation, and the direction that TRA proposes to take in the short to medium term with respect to changes to the relevant markets susceptible to future ex-ante economic regulation, as well as the deregulation of some relevant retail markets. The recommendations and the roadmap set out TRA's plan for the next steps and actions following the finalisation of the SMR.
433. TRA's general intention is to lift ex-ante regulation whenever effective competition has developed or can be expected to develop (prospective competition). Ex-ante regulation and remedies should, as a principle, only be introduced or retained, if ex-post measures (general competition law measures – i.e. Article 65 of the current Telecommunications Law) are not considered sufficient to deal with the competition problems and then only where those remedies are either automatically applicable under the provisions of the Telecommunications Law or proportionate.
434. TRA's overarching view is that some of the previously defined retail markets should be re-defined as a consequence of market developments, and the degree of demand- and supply-side substitutability - affected by new technologies and solutions. Notably, the implications and impact of mobile and broadband (including IP-based networks) lead TRA to conclude that some of the retail markets previously defined are either too narrow or obsolete.
435. The approach is to take the currently defined relevant markets (whether they are subject to ex-ante regulation or not) and the corresponding assessment of market power in these markets as the starting point. From there, the assessment of competition involves two broad steps.
436. First, an assessment is made whether the definition of the market is appropriate going forward. As part of identifying the boundaries of the relevant markets, TRA is interested in identifying the set of products or services across which competition occurs. The relevant economic market will include all products or services that are considered to be

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close substitutes for one another in the eyes of consumers (demand-side substitution) and of suppliers (supply-side substitution). The standard approach to defining the relevant market boundaries is the 'hypothetical monopolist' test, whereby a hypothetical monopoly supplier of a product is assumed to introduce a 'small but significant non-transitory increase in price' ("SSNIP"), which is typically a 5-10% increase in price. If the SSNIP can be profitably sustained, there are unlikely to be any close substitutes for the monopolist's product, and the market boundary should be defined narrowly around that product. If alternatively, customers do switch away from the monopolist's product in response to the SSNIP, such that the SSNIP is unprofitable, the market boundary should be defined more broadly to include those substitute products.<sup>73</sup>

437. Having defined the relevant markets, the second step is to assess the level of market power in the relevant market(s). This typically involves assessing the constraints from existing competitors (which involves consideration of market shares and the evolution of market shares over time, as well as of prices and in particular whether prices are likely to be moving towards cost over time), potential competitors and the threat of new entry (which will depend on entry conditions into the defined market, including the presence of sunk costs, economies of scale and scope, and access to key inputs), and the extent to which there may be countervailing power in the hands of consumers.
438. Consequently the assessment concludes a number of relevant retail (downstream markets). The subsequent step is to define the respective relevant (upstream) wholesale markets for each relevant retail market.
439. The key aim of the exercise is hence to assess which relevant markets should be susceptible to ex-ante regulations going forward. It could be argued that the defined relevant markets that are *not* meeting the criteria and conditions for ex-ante measures in the future are of less relevance, but they are nevertheless covered in the review.
440. In the following there are relevant markets that are considered effectively competitive (and hence should not be on the list for future ex-ante regulation). A couple of these markets are adjacent and a case could be made to include them into the same market, based on demand and supply-side substitutability. However, so long as the condition holds that the each individual defined market is indeed effectively competitive (currently or in a forward-looking perspective), it is arguably of less importance to combine two adjacent competitive markets into one, as it does not affect the outcome in terms of imposing or not imposing ex-ante measures.
441. The relevant geographical markets are not specifically reviewed and analysed on a 'market-by-market' basis in the following. TRA's overall view is that generally the relevant market for Bahrain should be the national territory, but save for instances and sub-national areas where an operator has exclusivity and control over essential network facilities that others cannot get access to on same conditions. Whether sub-national geographical markets should be considered would need to take into account e.g. competitive constraints from other technologies and solutions, for example the impact of mobile on fixed network deployments and services.

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<sup>73</sup> TRA's Competition Guidelines discuss the application of the SSNIP test, as well as the different dimensions involved in defining a relevant market, including the relevant product, geographic, functional, and customer dimensions of a market.

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### 9.2 Retail markets

442. The currently defined retail markets in Bahrain are repeated in the table below<sup>74</sup>. It should be noted that not all of the defined retail markets are currently subject to ex-ante regulation.

**Table 27: Current defined relevant retail markets**

<u>Current</u> Defined Relevant Retail Markets	Current SMP
<b>Fixed narrowband access</b>	
Retail market for fixed narrowband access services for residential customers (Market 1a)	Batelco
Retail market for fixed narrowband access services for non-residential customers (Market 1b)	Batelco
<b>Domestic calls</b>	
Retail market for fixed originated domestic calls for residential customers to either fixed or mobile subscribers within the Kingdom of Bahrain (Market 2a)	Batelco
Retail market for fixed originated domestic calls for non-residential customers to either fixed or mobile subscribers within the Kingdom of Bahrain (Market 2b)	Batelco
<b>International calls</b>	
Retail market for fixed originated international calls to Zone 1 countries (Market 3a)	Batelco
Retail market for fixed originated international calls to Zone 2 countries (Market 3b)	<i>no SMP</i>
Retail market for fixed originated international calls to Zone 3 countries (Market 3c)	Batelco
Retail market for fixed originated international calls to Zone 4 countries (Market 3d)	<i>no SMP</i>
Retail market for mobile originated international calls to Zone 1 countries (Market 3e)	<i>no SMP</i>
Retail market for mobile originated international calls to Zone 2 countries (Market 3f)	<i>no SMP</i>
Retail market for mobile originated international calls to Zone 3 countries (Market 3g)	<i>no SMP</i>
Retail market for mobile originated international calls to Zone 4 countries (Market 3h)	<i>no SMP</i>
<b>Mobile services</b>	
Retail market for mobile services (the market definition excludes mobile originated international calls) (Market 4)	N/A
<b>Internet access</b>	
Retail market for dial-up internet access services from a fixed location	Batelco
Retail market for mass-market broadband internet access from a fixed location	<i>no SMP</i>
Retail market for business broadband internet access from a fixed location	Batelco
<b>Leased Lines</b>	
Retail market for domestic data connectivity services	Batelco
Retail market for international leased lines (Market 6b)	Batelco

Source: TRA

443. An analysis of the 2013 revenue market shares in the *currently defined* retail markets (ex-ante regulated and not ex-ante regulated) shows some interesting results.

<sup>74</sup> See also section 4.2.1 for further details on when the determinations were made, and the TRA website [tra.org.bw](http://tra.org.bw) for further info on the determinations in question.

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**Table 28: Revenue market shares in currently defined relevant retail markets (ex-ante regulated and ‘deregulated’)**

[X]  
[X]

Source: TRA analysis based on operator data

444. The picture on revenue market shares (as per the *currently* defined retail markets) gives an indication on the level of concentration in each of the relevant markets. However, the market definitions were carried out in 2008 when the market in many ways was very different to today.
445. Furthermore, the relative size of each of the markets differs tremendously. For example, the combined market share of fixed narrowband (residential and non-residential) and domestic calls (residential and non-residential) represent less than 5% of the total value of all the above defined markets. On the other hand, the size of current ‘mobile services (excluding international calls) market’ represents more than 40% of the value.
446. It should be observed that, as discussed above, market share is only one, albeit important, of the indicators to analyse to assess whether there is SMP in a relevant market. Other important factors to consider include
- a. barriers to entry (and exit),
  - b. level of vertical integration of one or more operators, (and the possibility to control essential upstream facilities),
  - c. financial strength,
  - d. consumers’ countervailing buying power,
  - e. competition from players in adjacent/neighbouring markets (including providers not currently offering supply side substitutability, as well as prospective competition (that is, a forward-looking view should be taken)).
447. As general points, there have been significant developments in the last years since the last retail market review was carried out. These points have a bearing on the review of a number of the currently defined retail markets. Notably the developments include:

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- a. The dramatic increase in the number of mobile subscribers (the number of mobile subscribers is today more than *8 times* higher than the number of fixed subscribers (fixed and fixed wireless combined), (though it should of course be understood that a significant number of the mobile users carry two or more active SIM cards). The Bahrain market, arguably more than most European markets (as a reference point) is mobile-centric and shows signs of mobile-fixed substitution. Mobile penetration and usage (of calls (domestic *and* international) as well as data) is very high and fixed line penetration and usage is quite low.
- b. Responses from the recent consumer survey which indicate that a large percentage (89%) of the residential users who do not have a fixed line state that 'they have a mobile phone and do not need fixed line access'. In terms of actual fixed-mobile substitution, 11% of residential respondents without a fixed line stated they previously had a fixed line but had cancelled their fixed line to rely on mobile only. This indication on mobile-fixed substitution was also recognised in the recent market review of "broadband internet access from fixed location" where the conclusion was that stand-alone mobile broadband offers an effective substitute for fixed broadband solutions for the *mass-market* customers.
- c. The deployment and widespread adoption of 'broadband' access services – both for mobile and fixed/fixed wireless technologies. The increase of all-IP networks and solutions, and the recent rapid user adoption of OTT services over IP networks (i.e. voice over IP based networks – managed and un-managed VoIP).
- d. The bundling of offers for access and usage services by a number of operators (e.g. free on-net national voice minutes for customers who subscribe to a fixed-wireless internet access service or free on-net voice minutes (alternatively limited inclusive on- and off-net national minutes) for subscribers to a mobile service. This indicates there is at least some competitive constraint from alternative infrastructure platforms, as well as from the providers who rely on wholesale access to compete in the downstream market. It would further indicate that it is increasingly questionable to define a separate market for "access to call" services from the call services themselves, at least for domestic calls, as the two are increasingly bundled together.
- e. Furthermore, providers of broadband internet access often include free (on-net domestic) minutes in their tariff plans. The recognition that a fixed subscription is used to get internet access and additional services (including in some cases IP-TV) with fixed domestic calls often being provided in the bundle at a minor or no additional charge, may also mean that the customers who retain both fixed and mobile subscriptions emphasises the degree of complementarity (as opposed to substitutability) of the respective call services on those platforms/technologies.

### 9.2.1 "Fixed narrowband access"

#### ***Is the current definition of the relevant market appropriate and justified going forward?***

448. The current 'fixed narrowband access market should, for reasons elaborated later on, best be analysed together with the current defined 'fixed domestic calls' market. However, for the sake of going through all the current defined markets, on a market-by-market basis, TRA will describe them separately.

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449. The current definition of “fixed narrow-band access” entails two separate customer markets; ‘residential’ and ‘non-residential’. This appears to have been based on the recognition that these customer groups have different needs and requirements, and that the offers for fixed narrowband access to the two are also different in terms of e.g. price, quality and customer service. As part of the SMR, TRA has reviewed whether it is appropriate to maintain a distinction between customer segments. For the reasons given below, some segmentation has been maintained due to differing characteristics of the services demanded by end users, although the distinction between ‘residential’ and ‘non-residential’ fixed narrowband access services has been revised.
450. The current product definition of ‘fixed narrowband access’ dates back to the determination made in 2008 and does not include the impact of other (in recent years) deployed technologies e.g. fixed-wireless broadband access (WiMAX), fixed broadband access (ADSL2+, GPON) and mobile broadband access (HSDPA and LTE).
451. A distinctive feature of “fixed narrowband access” is that the ‘old’ circuit switched telephony access provides for functionalities and characteristics which cannot, or at least not easily, be replicated over other infrastructures (e.g. high level of quality, security and reliability). However, investments in all-IP networks allow the operator to increase efficiency and the on-going trend is that circuit switched networks are replaced by all-IP (packet switched) networks by the operators (and managed IP services).
452. Having noted general developments it is important to assess whether the points apply to different customer markets (e.g. ‘residential’ and ‘non-residential’). Batelco currently offers a number of fixed narrowband access services, including a residential PSTN service, a business PSTN service, and a suite of ISDN services. The PSTN service offered to residential and business customers provides single line access to Batelco’s fixed telephony network and telephony services. From a functional and technological perspective, the PSTN subscription service offered to residential and business customers is essentially the same service.<sup>75</sup> In terms of pricing, the residential PSTN subscription charge is BD1.16 per month, which is lower than the business PSTN subscription charge of BD2.16 per month. However, according to the latest regulatory cost information, Batelco has not rebalanced its PSTN subscription charges, which recover approximately 30% of the actual cost of providing access. It is therefore likely that access costs are being recovered through other services which can be accessed once the customer has a PSTN subscription, such as domestic and other calls. TRA notes that Batelco’s per minute prices for national fixed calls do not differentiate between residential and business customers, although Batelco does offer a number of flat rate call packages only to residential subscribers.
453. By contrast, Batelco’s ISDN service, which is typically used by larger businesses (but not the corporate segment, which tend to lease dedicated capacity for their communications needs), allows for the simultaneous conveyance of voice, video, and data traffic. In doing so, it provides a wider range of functionalities than a single PSTN service. According to Batelco, the features and benefits of ISDN services are more extensive than for its PSTN service, including supporting LAN connectivity, fast FTP utilisation, remote access to internal networks, and the ability to act as a back-up for leased line services. Batelco’s ISDN services are also priced at a significant premium to PSTN services, with higher

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<sup>75</sup> This can be seen by comparing the features of the residential PSTN service and the business PSTN service as listed on Batelco’s website.

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connection charges and a higher monthly rental charge of BD8.5 per month for the Basic Rate Access (BRA) option (providing two channels), and up to BD84 per month for the Primary Rate Access (PRA) option (providing up to 30 channels).

454. Given the premium features and pricing of the ISDN service, TRA is of the preliminary view that there may be grounds for distinguishing such services from the standard PSTN access that is acquired by both residential and business customers.
455. This will, however, be further considered as part of the review of the Retail Markets for Access to Calls Services, including Domestic Calls from a Fixed Location that will follow the SMR.
456. In terms of the number of subscription, as shown in the "Market Indicators" chapter, there are currently about 250,000 fixed lines in total (fixed and fixed-wireless). Approximately 170,000 of those are residential PSTN and fixed wireless lines and 80,000 are 'business' subscriptions. The vast majority of the business lines are however PSTN subscriptions by business customers. As noted above, these business PSTN services are very similar to residential PSTN services, providing single line access to Batelco's fixed telephony network. Mobile access for calls is at least to some degree a demand-side substitution for these business users, as discussed further below.
457. The number of ISDN subscriptions is considerably lower, at approximately 2,600 subscriptions by the end of 2013, of which roughly 55% are BRA ISDN (ISDN2) and 45% are PRA ISDN (ISDN30) subscribers. These ISDN subscribers have very different usage and call behaviour to single fixed line business users. In fact, the volume of call minutes generated by the 2,600 ISDN business subscribers exceeds the volume of call minutes generated by the approximately 80,000 business PSTN subscribers.
458. TRA has considered the extent to which mobile services are likely to represent an economic substitute for fixed narrowband access and calls. As noted above, the subscription rentals for Batelco's fixed PSTN subscriptions are quite similar between 'residential/private' and 'business' users (BD 1.16 for residential users and BD 2.16 for business users), and there are no material differences in service levels or features between the two. However, the lack of tariff rebalancing in respect of fixed services in Bahrain indicates that the below-cost PSTN subscription rentals will by themselves not reflect a competitive price for access. It would therefore not be appropriate to apply a SSNIP to the PSTN monthly subscription charge in isolation. In assessing the substitutability between fixed PSTN services and mobile services, TRA has therefore had regard to both the subscription cost and the cost of making fixed originated calls.
459. For residential customers, Batelco's retail price for fixed line subscriptions is currently BD1.16 per month, while fixed-to-fixed (FTF) calls are charged at 7 fils/minute (i.e. 21 fils/180 seconds) and fixed-to-mobile (FTM) calls are charged at 14 fils/minute (i.e. 21 fils/90 seconds). For business customers, Batelco's retail subscription is BD2.16 per month, and the retail prices for calls are 7 fils/minute for FTF and 14 fils/minute for fixed to mobile. By comparison, mobile prepaid domestic calls are typically higher at around 33-35 fils/minute, with no monthly subscription charge incurred for prepaid services. However, Batelco offers currently unlimited fixed-to-fixed and fixed-to-mobile on-net calls at BD8 per month<sup>76</sup>, which combined with the monthly access (BD1.16) gives a total monthly cost for fixed access and domestic on-net calls of BD9.16 per month. By

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<sup>76</sup> see <http://portal.batelco.com/personal-fixed-services/telephone-line/>

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comparison, Viva offers unlimited on-net calls, unlimited on-net SMS, plus 7GB data (LTE), and 400 minutes to any network, for BD10 per month. Viva's 4G LTE plan also offers unlimited on-net calls and 5GB data for BD7 per month<sup>77</sup>. Table 29 summarises the key features of Viva's mobile plans compared to Batelco residential fixed PSTN offers.

**Table 29: Access and calls: Residential fixed PSTN and mobile services**

	Batelco residential Fixed PSTN	Viva Postpaid Unlimited 10	Viva 4G LTE
Subscription (BD/month)	BD 1.16	BD 10.00	BD 7.00
Call costs (BD/month)	BD 8.00	n/a	n/a
Total costs (BD/month)	BD 9.16	BD 10.00	BD 7.00
Includes			
- on-net calls	Unlimited	unlimited	unlimited
- off-net calls	n/a	400	n/a
- data	n/a	7GB	5GB
- on-net SMS	n/a	unlimited	n/a

460. This suggests that if Batelco were to attempt to introduce a SSNIP on its fixed line access and domestic calls (a 10% SSNIP resulting in an increase in the monthly cost of fixed line and domestic calls from BD9.16 to BD10.08 per month), a significant number of Batelco's fixed line subscribers would switch to the mobile packages, some of which additionally include off-net minutes as well as mobile data. Furthermore, the mobile package also provides the benefit, by definition, of mobility. This indicates that mobile services are a close economic substitute for the fixed line services in the eyes of residential consumers.
461. In the case of residential customers, this is further supported by the results of the Residential Survey. As noted at paragraph 328 above, a significant proportion (76%) of residential respondents do not have access to a fixed line at home, and the main reason given for not having a fixed line at home is that they have a mobile phone and therefore do not need a fixed line.
462. As noted earlier in this section, there is no material difference between residential and business fixed PSTN services offered by Batelco. TRA notes that although the business PSTN monthly subscription is higher than the residential PSTN subscription, the per minute call charges are identical. Given these similarities, TRA is of the view that it is

<sup>77</sup> In addition, the AREGNET retail price benchmarking report includes access and calls although the call baskets tend to be different between fixed and mobile i.e. there is a 60 calls residential fixed PSTN basket, cost of US\$17 per month (this includes however an international calls component); the 140-calls fixed PSTN costs US\$35 per month; while the cost of a 100-calls mobile basket in Bahrain is US\$20 (again this includes international calls, as well as SMS) This suggests that mobile is priced competitively with fixed, at least for residential users..

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appropriate to include both residential and business PSTN services within the same market, and both residential and business PSTN services are likely to be subject to a similar competitive constraint arising from mobile services.

463. However, TRA considers that the premium fixed access services, such as ISDN, are unlikely to be as constrained by mobile services. The higher monthly subscription charge for such services<sup>78</sup>, as well as the significantly higher volume of traffic generated by such subscriptions, indicated that business customers subscribing to such services do not regard mobile as a close economic substitute. This is evident from an assessment of the recent trends in subscription numbers, both for ISDN services as well as for PSTN services.
464. The number of PSTN subscriptions has been declining in Bahrain in recent years, whereas the number of ISDN subscriptions has been increasing. Between 2010 and 2013, the number of Batelco's residential fixed PSTN subscriptions and business PSTN subscriptions declined by a total of -24% and -9% respectively, while the number of ISDN subscriptions increased by 7% (and in particular, the number of Primary rate ISDN subscriptions increased by 39%). At the same time, the total number of mobile subscriptions in Bahrain increased by 41% (prepaid by 38% and postpaid by 55%). This suggests a degree of substitution from fixed PSTN services towards mobile services, although this is not evident in the case of ISDN subscriptions. If mobile services were considered to be a close economic substitute for ISDN services, it would be unlikely that Batelco could maintain relatively high retail prices for ISDN services without losing such subscribers to the mobile alternative.
465. The growth in the number of ISDN subscriptions indicates that business customers acquiring these services are unwilling to switch away from their fixed line supplier. This is consistent with the results of TRA's business survey, which indicates that most business customers are unwilling to switch their fixed line supplier. According to the composition of the fixed line respondents to the business survey, the most common form of fixed line service are ISDN services (of those respondents subscribing to a fixed line services, 66% subscribed to ISDN).
466. On balance, TRA's view is that mass-market (i.e. standard PSTN and fixed-wireless subscription services) supplied to residential and business customers are supplied in the same retail market, which includes domestic calls. This market is increasingly likely to include mobile services, but at the very least it is constrained by the supply of mobile access and call services.
467. TRA considers that premium access and call services (including ISDN) are supplied in a distinct retail market. This market does not include, and is unconstrained by, mobile services.
468. In view of the above, TRA's view is that the relevant retail markets going forward are:<sup>79</sup>

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<sup>78</sup> The one-off connection charge and the recurring monthly rental charge for ISDN access are considerably higher than for standard PSTN business lines (for example, the monthly rental charge for primary ISDN is between about 15 and 40 times higher than for a single business PSTN line). See Batelco's website <http://portal.batelco.com/main-business/isdn-rates/> ISDN2 (BRI):BD8.5 and ISDN3 (PRI): BD35 to BD84, compared to BD2.16 for an individual business line.

<sup>79</sup> See also below section on 'Domestic calls'

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- a. the retail market for mass-market access to call services including domestic calls from fixed location;
- b. the retail market for premium access to call services including domestic calls from fixed location

### ***Is the current assessment of market power appropriate and justified going forward?***

469. Taking into account TRA's preliminary conclusion on a revision of the relevant retail markets, there are implications on the assessment of the market power situation.
470. The proposed '**retail market for mass-market access to call services including domestic calls from fixed location**' would include standard PSTN subscriptions (residential and business) and fixed-wireless subscriptions, but would also be constrained by mobile access and call services.
471. Batelco's market subscriber share in the redefined market (excluding mobile), is 60-70% at the end of 2013. Based on an assessment of market shares only this would indicate SMP. However, as elaborated in the previous section, mobile services are, at a minimum, an effective competitive constraint on fixed standard access to calls. There are limited barriers to entry that would prevent mobile operators from accessing fixed-line customers, and consumers have a degree of countervailing buying power arising from the availability of alternative choices (including mobile) and the ease of substituting a mobile service for their fixed-line service.
472. An analysis of subscriber market shares inclusive of mobile in the relevant market indicates that Batelco, Viva and Zain have market shares of, respectively, 30-40%, 35-45% and 25-35%. An analysis of revenue market shares would not considerably alter the picture, even though Batelco's and Zain's market shares would be slightly higher, and Viva's slightly lower.
473. Notwithstanding that each operator has a market share in excess of 25% there is no strong indication, based on other important indicators<sup>80</sup> to suggest that there is a market failure and that any of the three would hold SMP in the relevant retail market.
474. Furthermore, where market shares are in excess of 25%, this increase has typically happened over time and does not appear to stem from any inherent advantages that may come from being former incumbents.
475. With respect to the proposed '**retail market for premium access to call services including domestic calls from fixed location**' it would include ISDN subscriptions (multiple channels) and IP-based access solutions providing equivalent functionalities and features to ISDN. This market would not, at least not in the current situation, be constrained by mobile access and call services. One source of potential competition would come from providers who rely on available wholesale products (notably bitstream with VoIP functionality, wholesale leased lines, and potentially LLU). Hence, the assessment of relative market power would exclude mobile, but include other fixed access solutions which provide equivalent functionality to ISDN services.

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<sup>80</sup> These include indicators such as evolution of profits, prices, barriers to expansion which are also considered as per the competition guidelines.

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476. In the current situation, Batelco has very high market share in this retail market (Batelco's subscriber market on ISDN is well in excess of 90%). TRA recognises that ISDN as a business solution could be expected to be replaced by other access solutions, notably all IP access solutions, and that such transformation might also alter an assessment of market power at a later stage.
477. Currently, OLO's need to rely on wholesale bitstream<sup>81</sup> and wholesale leased lines to offer similar retail products to the end users, but there is currently limited evidence that this retail market is driving towards effective competition.
478. With a rapid migration to all IP networks and access solutions, it could moreover become important to ensure that IP-interconnection is available in the market.
479. TRA's view is that the relevant "premium access" market would not effectively be competitive, but that it could be prospectively competitive if the wholesale remedies available are 'fit-for-purpose'.

### ***Overall preliminary conclusions and way forward***

480. Based on the above, the current fixed narrowband access market should be redefined.
481. The relevant retail markets going forward should be:
- a. The retail market for mass-market access to call services including domestic calls from fixed location; and
  - b. The retail market for premium access to call services including domestic calls from fixed location.
482. TRA's preliminary conclusion is that the retail market for mass-market access (a) is effectively competitive due to the strong competitive constraint from mobile, whereas the retail market for premium access (b) is not constrained by mobile or by other alternative solutions, and should be on the list of relevant markets susceptible to ex-ante regulation. TRA recognises however that the latter may become prospectively competitive, and intends to undertake a review of this relevant market once the impact of strengthened wholesale remedies can be assessed.
483. As part of the review of the Retail Market for Access to Calls Services including Domestic Calls from a Fixed Location that will follow the SMR, the need for a separate retail market for Premium Access to Calls Services will be considered.

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<sup>81</sup> The wholesale bitstream remedy is available to OLOs to allow them to compete in the adjacent downstream business broadband access market, but is an important remedy also for the 'premium access to calls services' market.

### 9.2.2 “Domestic fixed calls”

#### *Is the current definition of the relevant market appropriate and justified going forward?*

484. The current “domestic fixed calls” market should, for reasons elaborated on above, be analysed together with the current defined ‘fixed narrowband access’ market. For the sake of going through all the current defined markets, on a market-by-market basis, TRA nevertheless addresses them separately. However, the reasoning and conclusions made in previous section on ‘fixed narrowband access’ market, apply on the ‘domestic fixed calls’ market. Therefore, there is no need to repeat the reasoning in this section,
485. The current retail market for ‘domestic fixed calls’ was defined in 2008 in a similar way to the current ‘fixed narrowband access market’, insofar that the definition entails two separate customer markets; “residential” and “non-residential” customers. The determination at the time appears to have been based on the recognition that the two customer groups have different characteristics (from demand side), and that the prevailing offers to the two groups were different in terms of value propositions.
486. The current product definition separates the retail domestic fixed originating calls from access to calls and from international originating calls. Furthermore, it separates fixed originating domestic calls from other technologies, e.g. mobile originating domestic calls.
487. As earlier stated, a number of important developments have occurred since the last review of the ‘retail domestic fixed call markets’. These developments have consequences for the definition of the relevant markets and the corresponding assessment of market power. Key developments include:
- a. The strong growth and increase in number of mobile subscribers and usage (call volumes). The Bahrain market shows arguably stronger signs of mobile-fixed substitution than many other countries (with historically much higher fixed penetration), as mobile penetration and call volumes are very high and fixed call volumes are low and has been constantly decreasing in the last years.
  - b. As mentioned earlier the consumer survey results indicate that a large number of the residential users with no fixed line service state that the mobile service is sufficient for their communications needs (implicitly also for making outgoing domestic voice calls).
  - c. There has been a rapid deployment and adoption of both fixed-wireless and mobile cellular services. For example, in the beginning of 2008 there were only about 1,000 fixed-wireless subscribers – at the beginning of 2014 there were about 90,000. Similarly, at end of start of 2008, there were 1.1m mobile subscriptions – in the beginning of 2014 there were 2.2m mobile subscriptions.
  - d. Bundling of access and usage services (including offers from both fixed-wireless and mobile operators) where domestic voice minutes in many cases are an embedded part of the value proposition, also from providers in the adjacent broadband internet access market. So even where the provision of internet access is the primary product offered by fixed-wireless OLOs, a large portion of the fixed-wireless subscribers (nearly 80%) are also subscribers to telephony services.

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- e. In addition, the increase of all-IP networks and solutions, and not least the dramatic increase in OTT traffic (over IP), contribute to the overall decline in circuit switched domestic fixed traffic.
488. For the reasons and based on the analysis provided in the previous section on “fixed narrowband access”, TRA view is that there should be two redefined relevant retail markets going forward namely:
- a. The retail market for mass-market access to call services including domestic calls from fixed location; and
  - b. The retail market for premium access to call services including domestic calls from fixed location.

### ***Is the current assessment of market power appropriate and justified going forward?***

489. Based on these redefined relevant retail markets, there are consequently important implications to the assessment of market power.
490. The very same reasoning and assessment of market power that was provided in the section “Fixed narrowband access”, applies here. The consequences of this assessment of market power is that the ‘retail market for mass-market access to call services including domestic calls from fixed location’ is effectively competitive due to the strong competitive constraint from mobile, whereas the ‘retail market for premium access to call services including domestic calls from fixed location’ is not effectively competitive (and that there hence is a market failure in this defined market)

### ***Overall preliminary conclusions and way forward***

491. The defined retail markets should be;
- a. ‘the retail market for mass-market access to call services including domestic calls from fixed location’.
  - b. ‘the retail market for premium access to call services including domestic calls from fixed location’.
492. There is effective competition in the ‘mass-market access to calls’ (a) due to strong competitive constraints from mobile. However, the retail market for ‘premium access to calls’ (b) is not constrained by mobile or by other alternative solutions, and should be on the list of relevant markets susceptible to ex-ante regulation. TRA recognises however that the latter may become prospectively competitive, and intends to undertake a review of this relevant market once the impact of strengthened wholesale remedies can be assessed.

### 9.2.3 “International outgoing calls from Bahrain”

#### ***Is the current definition of the relevant market appropriate and justified going forward?***

493. The retail markets for international outgoing calls were defined in 2008 when the overall market situation was different in a number of important areas, including the relatively limited impact of mobile call services at the time, and the minor impact of OTT services.
494. The separation into the four different Zones was done based on analysis of competitive constraints and demand and supply side substitution (between the calls), and the SMP designations were consequently made based on the relevant market definitions. In addition, a distinction was drawn between international calls originated on a fixed line, and mobile-originated international calls.
495. The conclusion at the time, based on the four distinct relevant retail markets (the Zones) was that no operator held SMP for *mobile* originated calls to any Zone, whereas Batelco was found to hold SMP on *fixed* originated calls to Zone 1 (GCC countries) and to Zone 3 countries.
496. The definition of distinct international call markets by different geographic zones is, at least in today’s market situation, a rather unusual approach.
497. The value of the international call market in Bahrain is overall very large in comparison to most other countries (markets). In 2013, it made up 27% of the total retail revenue in defined markets. Out of the 27%, mobile international outgoing calls represented 25% and fixed only 2%. Furthermore, out of the international outgoing volume of 3.157m minutes in 2013, mobile calls accounted for 3.032m and fixed calls 124m minutes. It is noteworthy that in 2008 (i.e. the year of previous determination on the relevant retail markets), mobile outgoing traffic was 853m minutes and fixed outgoing traffic was 100m minutes; i.e. fixed share of total outgoing international traffic has decreased from more than 10% to less about 4%.
498. There is intense price competition on international calls, but this applies almost entirely to a handful of destinations in South Asia (Zone 2). These destinations amount to almost 90% of all minutes and more than 60% of the revenues. Whilst calls to other Zones showed modest (or no) traffic growth, the volumes to the Zone 2 grew by 24% between 2012 and 2013.
499. On the other hand there was hardly any revenue growth overall between 2012 and 2013 (0.5%) which is explained by the price competition on some key destinations. The price structure and levels show clear signs that competition is very intense where the demand (volume) is high, which in turn increases demand further (through rather high price elasticity of demand from the customers). To other destinations, there is far less price competition. There are cases where the effective call rate per minute (as per published tariffs) to certain destinations is 30-40 times higher than to destinations where there is intense price competition, *despite* that the wholesale cost for conveyance and termination of the calls are similar. Furthermore, international call rates to some destinations are in many cases lower for mobile prepaid subscribers than they are for post-paid subscribers.
500. In TRA’s view, there is justifications to consider a revision to the current definition of the retail markets for international calls for a number of reasons:

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- a. The Zone definitions are, at least in today's market situation, in many cases artificial and do not reflect the features and characteristics of demand or supply in the international call market. Neighbouring countries in Europe, for example, can belong to different Zones and the implication is currently that a retail tariff to one European destination is ex-ante regulated but not the tariff to the other neighbouring country. While it is true that a call to one destination is not a substitute to another country, the same could be said about most calls (national or international), and should not be a contributing factor to define different retail markets.
  - b. Another reason for moving away from geographic ('Zone') markets is the strong supply-side substitution, since suppliers of outbound international calls from Bahrain will often use international carriers who aggregate traffic and offer conveyance services to many destinations. Bahrain licensed operators therefore do not need to have a large number of bilateral relationships with operators in destination markets, but only a smaller number of international aggregators. Once they have relationships with aggregators, they can relatively easily switch between supplying calls to different destinations.
  - c. The rapid increase in mobile originated international calls has led to a situation where fixed outgoing volumes constitute a minor share of total outgoing international switched traffic overall. While this fact does not necessarily say much about the competitive constraints in a more narrowly defined market, it shows that overall and for most customers, mobile services provide an effective substitute to most customers for making international outgoing calls. International calls are also provided by many other OLOs through e.g. prepaid calling cards.
  - d. In addition, mobile operators' focus on offering very attractive international call rates, at least to certain destinations, should be analysed in the context of what the subscriber means overall to the operator; the subscriber contributes to the overall subscriber base, and if the subscriber remains loyal to the operator in question, he will reduce churn and also use other services, hence generate incremental revenues.
  - e. The fact that the margins (effective rate minus cost) per outgoing international call minute are extremely different depending on destination shows the attractiveness to supply international service to some countries but not others, as the demand differs so profoundly. The large imbalances in volume and price trends to different destinations are arguably a consequence of demand, but could also be affected by 'customer inertia', i.e. some customers are very reluctant to change provider for some particular services (in this case international calls to certain destinations).
  - f. The strong consumer uptake and use of OTT services in the last few years (especially from smartphones) imply that existing operators increasingly compete with OTT players for the end-users' demand for international calls.
501. Noting the above, an analysis of volume and revenue market shares (but based on the current narrow Zone definitions) shows that Batelco retains a very high market share for some destinations. This is particularly the case when the international traffic from business users ('non-residential' users) is analysed. These customers tend to be much less price sensitive overall, and there is less tendency to change the telecommunications provider even where OLOs may offer an equitable product (or bundled package) at the same or better conditions than the current provider.

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502. However, this circumstance does not warrant that the market has to be defined narrowly (e.g. only define “international calls to Zone 1 for business customers”). Whilst there is arguably a competition issue for parts of the overall international call market, this has arguably less to do with lack of (ex-ante) market regulation and remedies, and more to do with certain user groups’ behaviour and preferences.
503. TRA recognises the high market share that Batelco continues to have on especially fixed outgoing calls from ‘business customers’ to GCC countries (Zone 1) and some other larger destinations (notably in current Zone 3). This customer group is, generally, price insensitive and has low propensity to change provider for the service in question.
504. However, it is also important to note that the volume of fixed outgoing calls to Zone 1 and Zone 3 has either declined (in the case of Zone 1) or grown at a substantially slower rate (Zone 3) than the volume of mobile outgoing calls to those zones. Table 30 shows that fixed calls to Zone 1 declined from 25.4 million minutes in 2011 to 22.7 million minutes in 2013, a reduction of 11%. By contrast, mobile calls to Zone 1 increased by 23%, from 83 million minutes in 2011 to 101.7 million minutes in 2013.

**Table 30: Fixed and Mobile Calls to Zone 1 and Zone 3 (million minutes)**

	2011	2012	2013	2011-2013 %Δ
Fixed to Zone 1	25.4	23.3	22.7	-11%
Mobile to Zone 1	83.0	100.4	101.7	23%
Fixed to Zone 3	8.6	9.5	9.0	5%
Mobile to Zone 3	44.8%	77.6%	73.5	64%

Source: TRA Market Indicators

505. This indicates that there may have been some substitution from fixed calls to mobile calls in the cases of both Zone 1 and Zone 3. This is supported by the results of TRA’s residential and business surveys. In the residential survey, residential end users showed a strong preference for mobile IDD calls, with 66% of respondents in 2014 using mobile IDD as the most often way of making international calls. According to the business survey, mobile IDD remains an important means by which businesses make international calls, with 63% of business respondents using mobile IDD. In addition, businesses made an average of 34 international calls per day using fixed, and 31 international calls using mobile, with UAE and KSA being the most common destinations of business calls.
506. This supports a conclusion that fixed and mobile outgoing international calls are likely to be viewed by end users as close substitutes.
507. TRA’s view is that the retail market for outgoing international calls should, going forward, be defined as one retail market, and that preliminarily, it is generally effectively competitive in the current market situation.
508. On balance, the view on the retail international call market is that:

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- a. The separation into Zones should be abolished, and there should be only one relevant retail market for international outgoing calls;
  - b. Fixed outgoing and mobile outgoing calls should belong to the same relevant market (as evidenced by both price and volume trends and levels)
509. Therefore, TRA's conclusion is that the market should be defined as "the retail market for international outgoing calls from Bahrain".
510. A case could possibly have been made that *all* outgoing calls should belong to the same retail market. However, there are important distinctions in the way domestic and international calls are currently offered to end-users respectively. International calls are offered separately by both fixed and mobile operators, whereas domestic calls (at least on-net calls) are largely bundled with access (rental charge) by both fixed line operators and broadband providers that offer on-net calls as an integrated part in the plan. Ultimately, where the refined markets are considered competitive and no operator holds SMP, there is no implication on imposition of ex-ante remedies.

### ***Is the current assessment of market power appropriate and justified going forward?***

511. The conclusion on the (re-)defined retail market for international calls has evident implications on the assessment of market power.
512. The largest operator in terms of both volume and revenue market share, based on the new definition, is Viva, with a 40-50% market share in both cases. However, there is significant competition in the market overall, and it is unlikely that Viva, or anyone else, has, in effect, sufficient market power to act independently to a significant extent from competitors or consumers. This is especially the case if the competitive constraint arising from OTT call services is considered, which would reduce Viva's effective share of the international calling market.
513. Furthermore, as was mentioned earlier, where market shares are in excess of 25%, this increase has typically happened over time and does not appear to stem from any inherent advantages that may come from being former incumbents.
514. TRA notes that the wholesale (upstream) services continue to be competitively offered by the network owners on a commercial basis, TRA acknowledges that the three large operators have a combined revenue market share of almost 95% of the billed revenue from international calls from Bahraini operators. However, the evaluation does not consider the substantial international call volumes generated by OTT communications providers, and the additional competitive constraint from OTTs.
515. Based on the above, TRA's preliminary conclusion is that the international calls market is currently effectively competitive and that no operator holds SMP in the relevant market.

### ***Overall preliminary conclusions and way forward***

516. The relevant retail market should be redefined as "the retail market for international outgoing calls from Bahrain".
517. TRA's view is that the market is effectively competitive and that no operator holds SMP in the re-defined retail market (i.e. the retail market for international outgoing calls from Bahrain).

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518. TRA will also carry out a detailed market review for this market following the issuance of this final SMR report.

### 9.2.4 “Mobile services (excluding international calls)”

#### *Is the current definition of the relevant market appropriate and justified going forward?*

519. The retail market for mobile services (excluding mobile originated international calls) is not currently subject to ex-ante regulation. The retail market for mobile services consists of mobile access and domestic calls and data services.
520. The corresponding wholesale markets and services (notably termination into the individual MNOs networks) are however ex-ante regulated.
521. The retail mobile services market is amongst the most competitive defined telecommunications markets in most countries, and Bahrain is no exception. The level and intensity of competition has increased substantially since the last strategic market review of retail markets was carried out, as Viva entered the market in 2010.
522. Fixed access and call services may provide some level of a substitution to some customers, but the strength of this substitution effect is likely to be substantially weaker than mobile services provide on fixed. Fixed services do not therefore generally provide any competitive constraint on mobile services.
523. There is, in TRA’s view, no need in this context to amend the definition of the “retail market for mobile services”.
524. TRA’s conclusion is that the currently defined “retail market for mobile services (excluding mobile originated international calls)” is appropriate.

#### *Is the current assessment of market power appropriate and justified going forward?*

525. The market shares in the defined market are (i.e. also in the case where international calls are excluded) rather equally balanced - both in volume and revenue terms. There are differences between the respective market shares in the prepaid and postpaid segments, but not to the extent that they raise any concerns regarding SMP.
526. The market is currently limited to the three licensed MNOs, but the customers have choices, and through mobile number portability customers can rather easily change provider, even those who are on contracts (post-paid).
527. Furthermore, there do not appear to exist any specific competition concerns related only to ‘business customers’ or ‘mass-market/private customers’ of mobile services respectively.
528. There is therefore, currently, no evidence that there are any specific competition issues in the relevant mobile services market, e.g. that price competition is not working in the post-paid segment or that there is ‘anti-competitive’ bundling of mobile, fixed and broadband services. If such issues were to occur in relation to an operator having market power, they could in any case be addressed either through potential enforcement of available remedies (in wholesale) or through general competition law (ex-post measures as per Article 65). TRA reserves the right to re-assess competition in the market at a later stage if market conditions were to change.

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529. As the retail mobile services market is, at least presently, in itself effectively competitive<sup>82</sup>, it may rather be the implications on competition that mobile services have in adjacent defined relevant markets that is of greater importance from a competition and market regulation point of view going forward. Mobile access and services increasingly provide a substitute to other services in other defined relevant markets, for example as recognised in the review of the broadband internet access market.
530. Based on the analysis of various market indicators, trends and taking into account relative and high investments in networks and new services by all the three operators, TRA's conclusion is that no operator holds SMP in the relevant retail market.

### ***Overall conclusions and way forward***

531. The definition of the relevant market (i.e. 'the retail market for mobile services' (excluding international calls) should be retained, and no operator should be designated to hold SMP in the relevant market.
532. Consequently, the defined retail market should *not* be on the list of markets susceptible to future ex-ante regulation.

### **9.2.5 Internet access ('broadband internet access')**

#### ***Is the current definition of the relevant market appropriate and justified going forward?***

533. The retail internet access market consists currently of three separately defined markets. The retail market for 'dial-up internet access from a fixed location' was defined in the determination of 2008. However, dial-up internet access services are not offered today since the service was discontinued a few years ago. Hence, this retail market should, by default, be removed from the list of relevant markets.
534. The two other relevant markets were defined in the recent market review of broadband services in Bahrain,<sup>83</sup> in which the TRA defined the following retail markets:
- a. The retail market for mass-market broadband services from a fixed location in the Kingdom of Bahrain, excluding Amwaj Island and Durrat al Bahrain, which comprises DSL, WiMax, fibre and mobile broadband technologies.
  - b. The retail market for business broadband services from a fixed location in the Kingdom of Bahrain, excluding Amwaj Island and Durrat al Bahrain, which comprises DSL, WiMax, and fibre.
535. In TRA's view, the recent market review of the broadband internet access market adequately defines the two distinct customer markets; "mass-market customers" and "business customers", and finds no reason to at this stage review its determination.
536. TRA's conclusion is that the current defined retail markets for broadband internet access from fixed location should remain in place namely:

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<sup>82</sup> The fact that the retail mobile services market is currently competitive is not to say that there is no room for alternative providers of mobile based services. Going forward TRA may consider it beneficial for the market development overall that OLOs have also the opportunity to bundle fixed and mobile services.

<sup>83</sup> See TRA Determination, dated 27 March 2014.

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- a. 'The retail market for mass-market broadband internet access'; and
- b. 'The retail market for business broadband internet access'.

### ***Is the current assessment of market power appropriate and justified going forward?***

537. In the recent market review of broadband services, determinations were made on SMP in the defined relevant retail markets.
538. In TRA's view, the determinations adequately assessed market power in the two defined customer markets, and find no reason to at this stage to review its determination on SMP, as updated market indicators support the determinations made to have two separate customer markets with different demand and supply side features and characteristics.
539. Based on the above TRA's conclusion is that:
- No operator holds SMP in the retail market for mass-market broadband internet access; and
  - Batelco holds SMP in the retail market for business broadband internet access.

### ***Overall conclusions and way forward***

540. TRA's conclusion is that the current (and recently) defined retail markets for broadband internet access from fixed locations remain valid and, furthermore, that the determinations made on SMP in the same markets continue to apply.
541. TRA has noted the reductions in broadband prices introduced by Batelco since the March 2014 market review which deregulated the supply of mass-market broadband services in Bahrain. From a consumer perspective, this trend is very positive, certainly in the short term, and reinforces the view that fixed broadband competes with mobile broadband services in the mass-market. As found in the March 2014 market review, the main sources of competitive constraint faced by Batelco in supplying residential fixed broadband services comes from WiMax and mobile broadband. Although Batelco continues to offer wholesale broadband access on a commercial basis, access-based competition accounts for a relatively small share of the retail market.
542. Having concluded that no operator has SMP in the defined retail mass-market implies that the tariff control provisions under Article 58(a) of the Telecommunications Law are not applicable for services offered under that defined market. Effectively this implies that, in that market, no operator is subject to apply to the TRA for its approval of its tariffs. However, this does not preclude the TRA from intervening under the ex post provisions of the Telecommunications Law, if an operator is suspected of behaving in an anti-competitive manner, through e.g. undue cross-subsidization from other adjacent markets in which the operator may or may not be ex-ante regulated. Neither does it imply that the operators are exempted from the obligations arising pursuant to Article 58(b) of the Telecommunications Law.

### 9.2.6 “Leased lines (domestic and international connectivity services)”

#### *Is the current definition of the relevant market appropriate and justified going forward?*

543. The currently defined retail market for leased lines (connectivity services) contains two separate markets:
- a. The retail market for *domestic* data connectivity services; and
  - b. The retail market for *international* leased lines.

#### **Domestic data connectivity services**

544. The market for domestic data connectivity services is based on a recent market review and determination which was finalised and published in April 2014.<sup>84</sup>
545. TRA previously described domestic data connectivity services using the term leased lines, defining these services as being fixed permanent connections providing predominantly business customers with dedicated or guaranteed capacity between two points. For example, in 2008 TRA defined the main distinguishing features of leased lines to include:
- 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.
546. In the latest market review of April 2014, TRA considered that the above features remain broadly relevant for the review of domestic data connectivity services. However, TRA noted 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, TRA noted 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. TRA therefore used the term ‘domestic data connectivity’ in the 2014 review to refer to services that provide guaranteed bandwidth between locations within Bahrain.
547. 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”) coupled with IP-PBX services.

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<sup>84</sup> See Determination of Significant Market Power and Determination of Dominant Position in the Markets for Domestic Data Connectivity Services, date 10 April 2014.

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548. The April 2014 market review did not concern directly with the downstream services which use data connectivity services as an input, but instead focused on competition in the supply of the underlying domestic connectivity.
549. Similarly, TRA did not include international retail leased lines in the review, although TRA noted that international leased lines use domestic connectivity as an input.
550. There are more than 10 licensed operators who were in 2013 actively supplying retail leased line services in Bahrain. Revenues earned from supplying these domestic data connectivity services at the retail level have been stable at between BD17-18 m in the last three years.
551. Some of the operators that supply retail data connectivity services in Bahrain use their own network infrastructure (including fibre and microwave links) but some rely solely on wholesale inputs (typically purchased from Batelco), or a combination.
552. The main supplier of domestic data connectivity at the retail level is Batelco. Other retail suppliers include Viva, 2Connect, BT, Lightspeed, and Mena Telecom. For example, Viva offers a number of domestic connectivity services to businesses 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.
553. TRA noted *inter alia* that there are large pricing differentials between domestic data connectivity services and broadband services, which supported the view that the 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 services.
554. TRA finds that recent review correctly defines the relevant market i.e. “the retail market for domestic data connectivity services”, and does not find any reason to at this point reconsider its recent Determination in this regard.

### **International leased lines ('international connectivity')**

555. The relevant market 'retail market for international leased lines' was defined in 2008, in conjunction with the reviews and determinations made on various retail markets.
556. The definition of the relevant retail market for international leased lines is similar to the one for domestic data connectivity services ('domestic leased lines'), with the difference that international leased lines from locations within Bahrain entail also the 'international legs' of the leased capacity, (i.e. the international landing station, international cable capacity, and in some cases the termination of the leased capacity in another territory (in terms of non-satellite capacity)).
557. There are two main types of routes over which international capacity is available into and out of Bahrain. The first type is where an international cable system lands in Bahrain, providing Bahraini Licensed Operators with access to global networks. The second type of route involves cross-border dark fibre from Bahrain to Saudi Arabia over the causeway, which then requires further arrangements for onward transmission through to international hubs such as those located at Jeddah or Riyadh. In addition, a small amount of international capacity is delivered using satellite-based systems.

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558. International private leased circuits ('IPLCs') may be leased as 'half circuits' (i.e. international connectivity is purchased from Bahrain only (the international connectivity from another country is being purchased separately)), or in 'one-stop shop' as full-circuits (i.e. from A point in Bahrain to B point in another country).
559. As stated for domestic leased lines, TRA previously described 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 TRA defined the main distinguishing features of leased lines to include:
- 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.
560. As stated above, in the market review on *domestic* data connectivity services of April 2014, TRA adopted the term 'domestic data connectivity' to refer to services that provide guaranteed bandwidth between locations within Bahrain<sup>85</sup>. In TRA's view, it is appropriate to align the definitions of the connectivity services (though international connectivity services may not include all retail services that are provided domestically).
561. Furthermore, it should also be noted that international retail leased lines may depend on domestic connectivity services as an input, though operators could and do rely on domestic duct access to reach landing stations and international cable capacity.
562. In fact, TRA concluded in its review and determination (February 2013) of the corresponding relevant upstream market (i.e. "the wholesale market for the supply of international capacity from locations in Bahrain") that "*the conclusion that no operator has a dominant position in these markets is based on the continued availability of access to key inputs that are used to supply services in these wholesale markets. .... In the event that these conditions were to no longer hold, and that as a result, competitors were no longer able to efficiently access the international cables landing in Bahrain, the Authority will reconsider whether the conclusions in this Final Determination remain valid*".<sup>86</sup>
563. Based on the above, TRA's conclusion is that the relevant retail markets are:
- a. 'The retail market for supply of *domestic* data connectivity services'; and
  - b. 'The retail market for supply of *international* data connectivity services'.

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<sup>85</sup> See section on Domestic data connectivity services.

<sup>86</sup> See TRA: "Dominance Determination for Wholesale International Services, Final Determination, 20 February 2013".

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### ***Is the current assessment of market power appropriate and justified going forward?***

#### **Domestic data connectivity services**

564. In the recent market review on domestic data connectivity services, TRA determined that “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”.
565. The conclusion was based on a number of indicators and factors, including Batelco's high and retained market share (in terms of number lines, capacity as well as revenues, Batelco held at least 70% market share in all cases).
566. It was recognised that “Batelco's persistently high share of retail domestic data connectivity services, 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”.
567. It was however considered that the retail market for domestic data connectivity services is 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.”*
568. TRA's current view is that the reasoning and conclusions made in the recent determination are still justified and valid, and find no reason to amend its Determination from April 2014.

#### **International data connectivity services**

569. The Determination of 2008 on international leased lines concluded that Batelco held a position of SMP in the relevant retail market. The conclusion at the time was based on a similar analysis of prevailing market shares, barriers to entry (and expansion) and countervailing buying power.
570. Since the 2008 review, there have been significant developments in the market overall. Notably there are today additional international routes (i.e. options for international cable capacity) and other operators have access to both international dark fibre as well as have, to a certain extent, been able to secure direct access to landing stations through the wholesale duct access product from Batelco.
571. It should be noted, however, that TRA determined in the review of February 2013 that Batelco is *not* dominant in the (corresponding upstream) wholesale market for the supply of international capacity from locations in Bahrain. The conclusion was reached based on an analysis of an increasingly competitive wholesale market on wholesale international capacity (and the availability of alternative international cable systems). However, it was recognised that access to domestic links and capacity for other operators on fair and non-discriminatory conditions was a pre-requisite to arrive at the conclusion that Batelco was not dominant in the relevant wholesale market.

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572. Therefore, the current regulatory situation is, arguably, a rather unusual one in that Batelco holds SMP in the downstream retail market but is not considered dominant in the corresponding upstream wholesale market. However, it is important in this context to recognise that retail international data connectivity services require two separate (wholesale) inputs namely; a local end connection (local access service), such as a wholesale leased line to the international cable capacity, and the international connectivity. Absent effective remedies at the wholesale level (notably the 'domestic legs' to access international capacity), the downstream (retail) market cannot be competitive because one of the necessary wholesale markets is not.
573. From an ex-ante regulation point of view, the current designations mean effectively that Batelco is currently obliged to comply with the RTN regulation (retail tariff controls) but does not have to provide wholesale international data connectivity services to OLOs as part of its RO. Batelco has to, however, provide the wholesale 'domestic' links needed to access to international cable capacity.
574. With respect to the market situation in the retail market, there have been positive trends in terms of price competition and compression on international leased capacity, and there are a number of players who provide international data connectivity services on a competitive basis to the business customers. However, in terms of market shares Batelco has retained a very high share of the market in terms of both lines and capacity, and in terms of revenues. Batelco's market share is at least 80% in all cases (i.e. volume or revenue), and has in fact been retained at that level in the last years.
575. The retail market for international data connectivity services is arguably prospectively competitive, and the barriers of entry are limited so long as access to domestic links is provided on fair conditions that allow OLOs to effectively compete in the downstream market. However, notwithstanding the prospect for more effective competition, Batelco maintains a stronghold in the market, and there is, in TRA's view, very limited support to conclude that Batelco does not have SMP in the relevant retail market.
576. Based on the above, TRA's conclusion is that there is little evidence to suggest that the two retail markets (i.e. domestic and international data connectivity services) are effectively competitive. TRA's view is therefore that:
- a. Batelco still holds a position of SMP in the retail market for supply of *domestic* connectivity services; and
  - b. Batelco still holds a position of SMP in the retail market for supply of *international* connectivity services.

### **Overall conclusions and way forward**

577. Two relevant retail markets are defined as;
- a. The retail market for supply of *domestic* data connectivity services; and
  - b. The retail market for supply of *international* data connectivity services.
578. There is currently no effective competition in two defined retail markets.
579. However, TRA's overall proposed direction and intention is to remove, whenever justified, ex-ante regulation in retail markets and focus on the effective enforcement of appropriate ex-ante remedies in the corresponding and relevant (upstream) wholesale markets.

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580. Therefore, TRA's view that the two defined retail markets for the supply of *domestic* and *international* data connectivity services respectively may later be lifted from the list of relevant markets susceptible to future ex-ante regulation, *but* only provided and at such time that there is evidence that enforced remedies in the relevant upstream wholesale markets ensure that competitors can effectively compete with the regulated wholesale provider. This includes to ensure that the cost for the wholesale leased lines required to be able to offer an equivalent retail data connectivity service is not prohibitive (i.e. needs to pass a margin squeeze test).<sup>87</sup>
581. An important consideration in this regard is the fact that, currently, the corresponding wholesale market for supply of international capacity is deregulated insofar that no operator is determined to be dominant. However, this determination was based on the precondition that the wholesale domestic links needed to access international capacity are provided on fair and non-discriminatory basis.
582. An area of concern for TRA is in this regard that there are a number of cases where other operators have experienced significant delays, or general SLA problems, in securing necessary domestic links or ducts needed to access the landing stations and international cable capacity. TRA is therefore adamant that the general direction to lift the retail market from ex-ante regulation does not lead to a situation that Batelco can further strengthen its already strong position in this market.
583. Batelco continues to hold a very strong position in the business customer market overall.<sup>88</sup> TRA recognises that the high retained market share for Batelco is arguably to a considerable extent related to long-term and maintained relationships with these type customers, but also that the customers are generally 'reluctant' to change provider, even in cases where other providers may provide better offers. These customers are much less price sensitive than the typical 'mass-market' customer and it is likely that Batelco has the ability to (to a considerable extent) price independently without risk losing customers to competition.
584. The relative reluctance of many larger business customers to change provider of retail services, such as access to domestic and international calls from fixed locations, and domestic/international leased lines is therefore a contributing factor to the preserved situation, where Batelco continues to hold market shares in excess of 70% and in some cases sometimes higher than 80%.
585. The view of TRA towards further deregulation of retail markets is indeed subject to finding market evidence that implemented ex-ante measures in the corresponding upstream wholesale markets are 'fit-for-purpose' for other operators and hence are likely to drive the market towards effective and sustainable competition.

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<sup>87</sup> The RTN Regulation provides arguably currently a safeguard in specific case of the retail market for the supply of domestic connectivity services. This is mainly due to the restrictions in the service configuration imposed by Batelco whereby all wholesale leased traffic shall be routes to the OLO's POP. In other words, the cost of one retail end-to-end leased line equals the cost of two end-to-end wholesale leased lines. Without any safeguards, the cost differential increases the likelihood of margin squeeze cases.

<sup>88</sup> Comprising larger companies, enterprises and the Government entities, but exclude all small companies that from a relevant retail market perspective belong to the 'mass-market' customer market.

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### Summary of conclusions and way forward for relevant retail markets

586. The following summarises TRA's views with respect to the relevant retail markets, susceptible to future ex-ante regulation.

**Table 31: Relevant retail markets susceptible to future ex-ante regulation**

Relevant retail Markets susceptible to future ex-ante regulation
Retail premium access to call services including domestic calls from fixed location
Retail business broadband internet access from fixed location
Retail domestic data connectivity services
Retail international data connectivity services

Source: TRA

587. In principle, TRA's conclusion is that, going forward, ex-ante regulation should be lifted in *all* retail markets, but only if 'fit-for-purpose' ex-ante regulatory remedies are implemented in the corresponding relevant wholesale market(s). These remedies must be market tested. Provided that fit-for-purpose wholesale remedies are indeed available to other operators, this should reduce the barriers to entry into the retail market. With effective regulated wholesale access in place, the incumbent's control of access to end users is reduced, and hence its market power, at least over time.
588. TRA recognises that this position has to be accommodated within the context of the current legislation (notably Article 58 of the Act, which assumes ex-ante retail tariff controls, through the Retail Tariff Notification regulation) when an operator is found to hold SMP in a relevant market.
589. In business market segments where there is still no effective competition, it becomes critical that proportionate remedies are enforced and 'market tested' in the upstream wholesale markets, *before* ex-ante regulation in the retail markets is lifted.
590. TRA therefore foresees a *phased approach* to lifting the ex-ante regulations in all retail markets, where increased focus should be on ensuring that the terms and conditions (price and non-price conditions) are fair and non-discriminatory for all regulated wholesale products and services. This means that other licensed operators must be allowed to effectively replicate the downstream retail service of the operator who holds SMP in the retail market (and is dominant in the corresponding wholesale market(s)).
591. TRA recognises that replicability is not always possible today, either for economical or technical reasons, as some remedies in place are not sufficiently effective to lead to the desired market outcomes.
592. The relevant geographical markets have not been specifically reviewed and analysed on a 'market-by-market' basis. TRA's view is, as stated in the introduction section to the chapter, that generally the relevant market for Bahrain should be the national (territory), but save for instances and sub-national areas where an operator has exclusivity and control over essential network facilities that others cannot get access to on same

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conditions<sup>89</sup>. Whether sub-national geographical markets should be considered would need to take into account e.g. competitive constraints from other technologies and solutions, for example the impact of mobile on fixed network deployments and services.

### 9.3 Wholesale markets

593. The currently defined relevant wholesale markets are repeated in table below.

**Table 32: Current definitions of relevant wholesale markets<sup>90</sup>**

<b>Current Defined Relevant Wholesale Markets</b>	<b>Current Dominance</b>
<b>Originating access</b>	
“Freephone originating access”	Batelco <sup>91</sup>
<b>Terminating access</b>	
Call termination on fixed networks	Batelco
Wholesale market for termination services on Batelco’s, Zain’s and Viva’s mobile network (individually)	Batelco, Zain, Viva
<b>Domestic data connectivity access</b>	
Wholesale market for supply of domestic data connectivity services in Bahrain (except Amwaj)	Batelco
<b>International Services</b>	
Wholesale market for supply of international capacity from locations within Bahrain	no dominance
Wholesale market for the conveyance and termination of international calls	no dominance
<b>Broadband access</b>	
Wholesale broadband access market (for mass-market broadband)	no dominance
Wholesale broadband access market (for business broadband)	Batelco
Wholesale physical infrastructure access market (for mass-market broadband)	no dominance
Wholesale physical infrastructure access market (for business broadband)	Batelco

Source: TRA analysis based on operator data

<sup>89</sup> One such example, which was also recognised in the Broadband market review, is Amwaj Islands. Similar considerations should, as a matter of principle, be adopted for other new development areas with similar conditions.

<sup>90</sup> See section 4.2.2. for further information on when the determinations were made and TRA’s website for further details on the reasoning (tra.org.bh)

<sup>91</sup> Batelco has never been determined by TRA to hold a dominant position in this market, but has introduced and retained a wholesale freephone origination service (on both its fixed and mobile networks) in its Reference Offer.

### 9.3.1 “Wholesale originating access”

#### *Is the current definition of the relevant market appropriate and justified going forward?*

594. The corresponding retail market is the market for outgoing calls (domestic and international calls). OLOs rely on the freephone access service in particular to offer international calls to subscribers on the mobile and fixed networks in Bahrain. The demand for the CPS service has decreased substantially in the last years.
595. The relevant market is “wholesale call origination”. The wholesale fixed origination service is offered by Batelco only, whereas the mobile call origination service is offered by all three MNOs.
596. Currently Batelco provides the freephone originating access service and CPS (Carrier pre-selection) as part of its Reference Offer (RO). These wholesale services are however not based on any specific determination by the TRA that Batelco is dominant and that as a result it has to provide the wholesale services. The services are offered by Batelco from fixed and mobile lines. The freephone access service is also provided by the other two MNOs (Viva and Zain), although on a commercial basis.
597. A key issue in relation to defining the relevant market for call origination services is whether there is a single market for call origination services (encompassing all networks), or whether there are network-specific markets. TRA has previously considered this issue in some detail within the context of its ex post investigation into the pricing of international calls and in particular whether there may have been an anti-competitive margin squeeze between the retail International Direct Dial (“IDD”) prices offered by Batelco and Viva, and their respective wholesale prices for freephone origination services. In its final determinations dated 28 November 2012<sup>92</sup>, TRA concluded that network-specific freephone origination markets were appropriate for that investigation, which related to conduct occurring in 2010 when there was a significant divergence between wholesale origination rates being offered by the different MNOs. In addition, at the time of Viva’s entry, Batelco was actually proposing to increase this margin rather than lower it. As a result, TRA concluded that the wholesale rates for freephone origination services on one mobile network were not being constrained by the wholesale rates for freephone origination services on the other mobile networks.
598. However, TRA also noted that during 2012, the case for network-specific wholesale markets for freephone call origination services had become less clear, with Batelco proposing to lower its wholesale rate for freephone call origination services towards Viva’s wholesale freephone origination rate. Such a convergence of wholesale rates is what would be expected in a wholesale market which encompassed freephone call origination services on different mobile networks, as competition between the MNOs is likely to erode any differential between wholesale rates.

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<sup>92</sup> TRA , “Determination issued by the Telecommunications Regulatory Authority to Batelco Telecommunications Company B.S.C. pursuant to Article 65(f) of the Telecommunications Law regarding Batelco’s pricing of mobile originated international calls”, 28 November 2012 (Ref: MCD/11/12/144); and “Determination issued by the Telecommunications Regulatory Authority VIVA Bahrain B.S.C pursuant to Article 65(f) of the Telecommunications Law regarding Viva’s pricing of mobile originated international calls”, 28 November 2012 (Ref: MCD/11/12/145).

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599. The current wholesale rates for freephone mobile origination services offered by each of the MNOs have now converged to similar levels, which is consistent with the Authority's expectations in 2012. Batelco's standard wholesale rate is 5.369 fils per minute, and Zain and Viva offer wholesale rates of between 5-5.5 fils per minute. In addition, TRA notes that Batelco discounted its wholesale price for freephone mobile origination during June 2014. Viva and Zain responded by offering lower wholesale rates for freephone mobile origination services on their respective networks.
600. This recent pattern of pricing is supportive of the view that wholesale freephone mobile origination on one mobile network is constrained by competition from other mobile networks.
601. The demand for mobile services has increased tremendously since the last strategic retail market review – for example, 96% of all international outgoing minutes in 2013 were from mobile lines. The three MNOs dominate the international calls market and the market share of prepaid calling card providers (who rely on the wholesale freephone service) has decreased sharply over the last years.
602. The bitstream (and LLU) service allows other operators to offer retail VoIP call services as part of their offers to end-users.
603. Wholesale fixed origination amounts only to a small percentage of all calls originated. In TRA's view, mobile origination provides a substitute to fixed in the retail market for outgoing calls. As the demand for the wholesale freephone service from fixed is very limited compared with the equivalent service from mobile, it is not in TRA's view justified to make the distinction that the fixed and mobile service are offered in separate markets.
604. TRA's conclusion is that the relevant market is "the wholesale market for call origination service" (comprising of fixed and mobile origination service).

### ***Is the current assessment of market power appropriate and justified going forward?***

605. Batelco has indeed never been found to be dominant in the supply of freephone services in an ex-ante market review.
606. Each of the three MNOs offers wholesale call origination services to PPCC providers (freephone call origination). As discussed above, there has been a downward price pressure between the three, and the wholesale rates offered by each MNO have converged. TRA's view is that the wholesale market for freephone call origination services is competitive. No operator is significantly larger than the others in this segment.
607. Furthermore, there are, as said, also other wholesale service alternatives for OLOs to be able to offer retail call services whether it is domestic or international calls (current remedies are bitstream and the LLU service, even though Wholesale Line Rental is not currently offered).
608. In TRA's view the wholesale call origination market does not pass the test for being considered to in the future be susceptible to ex-ante regulation as the market is and should be expected to remain competitive.

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609. TRA's conclusion is therefore that no operator is dominant in the wholesale call origination market<sup>93</sup>.

### ***Overall conclusions and way forward***

610. TRA's position is that "freephone originating access" should be removed from the list of markets susceptible to ex-ante regulation. There has been a general decrease in prices over the years (and alignment of prices between the three). There are sound indications that MNOs 'compete' in the supply of origination services to OLOs.
611. TRA's view that the market for call origination services overall is competitive due to the constraints from the mobile origination service, and the presence of especially the wholesale bitstream access service.

### **9.3.2 "Wholesale terminating access"**

#### ***Is the current definition of the relevant market appropriate and justified going forward?***

612. Termination is one of the three wholesale services (next to call origination and call transit) that are used to supply call services at retail level. The corresponding downstream retail markets are therefore the retail markets for access to calls and call services (domestic and international). The retail markets for call services are typically bundled with the retail market for access. It follows that if the wholesale termination market is not functioning properly and wholesale termination charges rise, this impacts on the subscription fees and the per-minute calling charges of the various operators and thereby (potentially) on the competitive position of an operator vis-à-vis other operators.
613. The wholesale termination service is therefore a prerequisite to be able to complete an off-net call i.e. a call originated from another network. The network operator of the calling party sets up the call (originates the call). The network operator of the receiving party completes the call (terminates the call). In Bahrain the calling party bears the costs of termination. Under the 'calling party pays principle' (CPP), the receiver's choice of provider is not directly affected by the price of calls that other customers pay, whereas the calling party has no choice at all when making a call.
614. Currently Batelco is ex-ante regulated on the termination service to its fixed network. All three MNO's are ex-ante regulated on the termination service on their respective mobile networks. The service is part of the respective reference offer and the rates have to be set based on forward-looking incremental cost. This is in line with current international best practices (under CPP regimes).
615. TRA's preliminary conclusion is that the relevant markets are:
- a. Wholesale call termination on individual fixed networks; and
  - b. Wholesale call termination on individual mobile networks
616. A case could however be made that the increasing retail mobile-fixed substitution may justify *one* joint call termination wholesale market. The analysis is basically the same

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<sup>93</sup> It should be noted that in most other developed markets, call origination is not regulated; and for example the EC has recently removed wholesale call origination from fixed networks from their list

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between the two and the possibility for ex-ante regulation would apply in the same way. However, the difference would be in the setting of cost based rates as the fixed and mobile networks have different cost structures. In that respect, TRA considers that the cost of providing call termination services is likely to be similar on individual fixed wireless networks and individual mobile networks.

617. Moreover, another important case could also be made that in markets where mobile penetration and usage is much larger than for fixed (such as in Bahrain), mobile provides an effective competitive constraint at retail level on fixed operators to the extent that fixed operators would not be able to raise (non-regulated) wholesale fixed termination rates without risk losing net revenue, i.e. there would then be a fixed to mobile substitution effect (assuming that the corresponding retail tariff for the mobile to fixed would increase as an effect of the increased FTR), and the calls would therefore migrate to mobile to mobile calls<sup>94</sup>. TRA does not at this stage propose a deregulation of the wholesale fixed termination market, but does view the arguments for a potential deregulation worthwhile to further analyse.
618. Another key development which, in TRA's view, needs further evaluation in the short to medium term is the rapid migration to all IP-based networks. This development requires attention also with respect to requirements on future interconnection arrangements.
619. Based on the above, and notwithstanding the preliminary conclusions on the relevant wholesale markets for termination services, TRA intends to undertake a market review of the two wholesale termination markets.

### ***Is the current assessment of market power appropriate and justified going forward?***

620. Every terminating network can be considered a separate relevant wholesale market in which the operator of that network is a monopolist. There is no alternative to terminating on the specific network and the network operator can therefore be considered dominant in the termination service to its own individual network<sup>95</sup>.
621. If an off-net call originates from a competing network, the terminating operator has an incentive to further increase its price in an attempt to persuade the calling party to switch to its own network. If he succeeds, the operator not only gains a customer, but also its existing customers will experience more incoming calls, which increases the value for money they attain in a subscription and thus also their willingness to pay (this is referred to as a call externality). A competing network may respond with a similar reaction and, if both networks start off with equal size, the strategy of the first operator would be neutralised, while leading to an inefficient cost structure for off-net calls and therefore lead to higher prices and lower welfare.

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<sup>94</sup> The Finnish regulator, FICORA, put indeed forward these arguments to the European Commission in its attempt to deregulate FTRs in the Finnish market. The Commission, however, raised concerns that there was insufficient evidence to support FICORA's conclusions and put its veto against FICORA's proposed deregulation

<sup>95</sup> While large operators do have considerable market power in the market for termination services on their own network (and thus are usually declared dominant), TRA acknowledges this may not automatically be the case for smaller operators. Under a calling party pays regime, the setting of termination rates by smaller operators could be constrained by larger operators through an increase of the on-net/off-net retail price differentials. This would ultimately make smaller operators less attractive to customers

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622. However, if the networks are not of equal size, the call externality creates an advantage for the larger network and allows for setting a higher off-net termination price and increasing its own subscription fee due to the network (call externality) effect.
623. TRA's preliminary conclusion on the designated dominance is that individual networks (fixed and mobile) shall be considered dominant individually and therefore subject to ex-ante regulation. In 2010, TRA issued a statement on the regulation of MTRs and stated that it expects symmetrical rates unless differences can be objectively justified. In principle TRA's position on this issue remains the same, meaning that TRA would expect symmetry and that the MTRs offered to each OLO should be symmetric.
624. A separate issue for mobile networks relates to SMS (and MMS) termination service. In Bahrain, these services are part of the reference offers and currently shall be provided on cost-based terms. The competition concern of SMS termination is basically similar to call termination where network externalities due to the CPP principle give rise to market power. The relevant wholesale markets are, by analogy with voice call termination, the markets for termination of SMS on individual networks. The arguments in favour of regulation are much the same as for voice regulation - there is a de facto termination monopoly. There are however two important differences with the case of voice termination. First, SMS traffic is always from mobile-to-mobile. The problem of fixed/mobile integrated operators is not present here, which reduces the asymmetry among market players. Second, the traffic is typically more balanced because an SMS is often replied with an SMS. Perhaps for this reason, termination rates tend to be reciprocal, in which case the level of the rate should be of no significance for the purposes of out/in-payments.
625. Given that there is a larger degree of symmetry between the operators, the mutual bargaining positions of operators are more balanced. Consequently, the need for ex-ante regulation to apply to rates for SMS is less obvious than for voice call termination. In addition, there is evidence of substitution between SMS and OTT offering instant messaging services which suggests that, at some point, there is a level of existing competition (which indeed declining SMS volume indicate).
626. In the EU, as a reference point, 25 out of 28 member states do not impose ex-ante regulation on the termination rates for SMS and MMS. There are exceptions however, notably ARCEP, the French NRA, who continue to maintain the position that SMS termination rates should continue being ex-ante regulated. The European Commission has expressed concerns over ARCEP's arguments, stating that maintaining SMS termination rates at a level not observed in competitive markets prevents alternative messaging services to develop thus hindering competition in the medium- to long-term.
627. In Bahrain, there is indeed widespread, and increasing use, of smartphones and instant messaging services, and for these users, instant messaging services offer an effective competitive constraint at retail level on SMS. .
628. On balance, based on the above, TRA's view is that SMS and MMS wholesale termination rates should no longer be subject to ex-ante regulation.

### ***Overall preliminary conclusions and way forward***

629. The relevant wholesale markets should be:
- a. Wholesale call termination on individual fixed networks; and

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- b. Wholesale call termination on individual mobile networks
630. All individual network operators shall, in principle, be considered dominant on the termination service and hence subject to ex-ante obligation to provide the termination services. TRA intends to however undertake a market review of the two wholesale markets, and will *inter alia* apply the proportionality principle in its assessment of relevant remedies.

### 9.3.3 “Wholesale domestic data connectivity services (leased lines)”

#### ***Is the current definition of the relevant market appropriate and justified going forward?***

631. The corresponding retail market is the market for domestic data connectivity services in Bahrain (including leased lines), except Amwaj Islands. The market was recently reviewed by TRA and a determination was made in April 2014 on relevant retail and wholesale markets, and designation of SMP/dominance.
632. In TRA's view the considerations and determinations made in this market review still hold and do not find any reason to amend its position.
633. Generally it can be said that, 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 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 fixed broadband services. Wholesale domestic data connectivity is also used for the domestic transmission component of international leased line services.
634. 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 potential 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.
635. The wholesale data connectivity services are essential to ensure competition can develop in the relevant retail markets.
636. The relevant defined wholesale market is the supply of domestic data connectivity services in Bahrain (with the exception of Amwaj Islands).

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### ***Is the current assessment of market power appropriate and justified going forward?***

637. The market review determined that Batelco is dominant in the relevant wholesale market.
638. TRA finds at this stage no reason to reconsider its position on dominance in the market as defined. Batelco maintains a very high market share and access to Batelco's network and facilities is essential for OLOs to compete for both retail domestic and, in some cases, international data connectivity services in the downstream business market.

### ***Overall conclusions and way forward***

639. Going forward, TRA intends to put extra focus on ensuring that the wholesale remedies (the regulated wholesale products) in place are effective in allowing OLOs to compete more effectively in the relevant downstream markets, including the supply of connectivity services to business users. TRA is currently reviewing Batelco's RO with the aim of strengthening price and non-price terms, including SLAs.

### **9.3.4 "Wholesale international services"**

#### ***Is the current definition of the relevant markets appropriate and justified going forward?***

640. In February 2013, TRA issued its determination with respect to relevant markets for wholesale international services.
641. TRA identified and defined the following relevant wholesale markets:
- a. the wholesale market for the supply of international capacity from locations within Bahrain; and
  - b. the wholesale market for the conveyance and termination of international outbound calls.
642. The two markets defined each encompass services to all international destinations.
643. The corresponding retail markets are the retail market for supply of international leased capacity (connectivity services), and the retail market for international outgoing calls.
644. In addition, though not explicitly defined as a separate wholesale market, the market review addressed 'the international inbound service', i.e. the wholesale service required for a foreign operator to terminate calls into Bahrain. TRA stated that the international inbound service is competitive insofar that there was no dominance, but provided that the ex-ante regulated local termination service to individual networks was provided.
645. TRA's view is that identification and definition of the relevant markets shall remain valid going forward. TRA does not at this stage see a need to redefine the relevant wholesale markets.

#### ***Is the current assessment of market power appropriate and justified going forward?***

646. The TRA, in arriving at its conclusion and determination on dominance, considered the availability of alternative international cables for OLOs, and that other operators had therefore alternatives to Batelco's wholesale international capacity in providing end-to-end international capacity services to the end-users.

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647. TRA made it clear that for as long as Batelco provides access to its ducts (and associated facilities required to utilise ducts for the purposes of providing international capacity), domestic wholesale leased lines, and the IFC service on fair, reasonable, and non-discriminatory terms, TRA determined that:
- a. Batelco is not dominant in the wholesale market for the supply of international capacity from locations within Bahrain;
  - b. Batelco is not dominant in the wholesale market for the conveyance and termination of international outbound calls; and
  - c. No operator is dominant in either of the wholesale markets defined.
648. TRA's determination that Batelco is not dominant in either of the two wholesale markets defined was therefore conditional upon access being available to Batelco's infrastructure, facilities and wholesale services, and that the conditions for such are fair, reasonable, and non-discriminatory terms. Furthermore, that absent access to these inputs the competitive constraint that international capacity not controlled by Batelco would give rise to would not operate effectively. TRA stated at the time that in the event that these conditions are not satisfied, it may review the determination at a later stage.

### ***Overall conclusions and way forward***

649. TRA's current view is that the determinations made in the February 2013 regarding relevant markets and designation of dominance review should still apply. However, TRA is aware that there have been a number of cases where OLOs have put forward complaints that there have been non-justified delays or conditions to be able to connect to alternative international cable capacity. If indeed the ex-ante regulation in the corresponding retail market for international capacity were to be lifted as intended going forward, TRA wants to first ensure that SLAs and other conditions for being able to access such cables are improved on for the OLOs.
650. With respect the wholesale **international inbound service**, TRA is separately reviewing the current regulation of the wholesale international inbound service (in the form of wholesale price floors). It is however still worthwhile and relevant to mention it in this SMR insofar that the issue was raised by all the three MNOs in SMR meetings.
651. The main options to consider going forward would be:
- a. Leave as is (i.e. no change to wholesale price floors or mechanism of the model);
  - b. Allow for network operators (network owners) to apply different termination rates depending on whether the call is domestically or internationally originated (this would effectively mean that TRA would no longer require cost-based termination for internationally originated traffic, and is likely to result in those OLOs with no fixed or mobile network being excluded from this market);
  - c. Increase the wholesale inbound price floors, for example to align with prevailing GCC rates (currently 8 and 10 US cents for fixed and mobile termination). This would allow for higher margins to be retained by licensed operators (holders of international service licences) within Bahrain.
  - d. A key issue to consider for TRA in its review will be to analyse the potential 'drivers' for any revision, i.e. if the aim should be to, if justified, increase revenues into Bahrain and/or if the impact on competition should be the key consideration, or whether both aims should

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and could be accommodated. Another important aspect could be whether TRA should and could have any position on how such potential extra revenues (earned and collected by the Bahraini operators) should be used and reinvested in the national market. As a principle, TRA would expect that any additional revenues earned would ultimately benefit the operators' customers in Bahrain, either directly or indirectly.

### 9.3.5 “Wholesale broadband access”

#### *Is the current definition of the relevant market appropriate and justified going forward?*

652. TRA conducted a market review of the broadband internet access market earlier in the year. TRA's does not at this stage find any reason to amend or reconsider the determinations made in this market review.
653. The corresponding relevant retail markets as per TRA's determination in March 2014 were defined as:
- a. the retail market for the supply of mass-market broadband internet access services from a fixed location; and
  - b. the retail market for the supply of business broadband internet access services from a fixed location.
654. In the review, TRA determined that no licensee has a position of SMP in the retail market for the supply of mass-market broadband internet access services from a fixed location; but that Batelco has a position of SMP in the retail market for the supply of business broadband internet access services from a fixed location
655. The corresponding wholesale markets identified and defined as part of the same broadband review are
- a. the wholesale physical network infrastructure access market for the supply of mass-market broadband internet access services from a fixed location;
  - b. the wholesale physical network infrastructure access market for the supply of business broadband internet access services from a fixed location;
  - c. the wholesale broadband access market for the supply of mass-market broadband internet access services from a fixed location; and
  - d. the wholesale broadband access market for the supply of business broadband internet access services from a fixed location.

#### *Is the current assessment of market power appropriate and justified going forward?*

656. As stated above, TRA's view is that the definitions and determinations made in the broadband review shall remain valid going forward.
657. Therefore, in analogy with the conclusions made in the relevant retail markets, TRA's position is that:
- a. no licensee holds a dominant position in the wholesale physical network infrastructure access market and in the wholesale broadband access market for the supply of mass-market broadband internet access services from a fixed location; and

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- b. Batelco holds a dominant position in the wholesale physical network infrastructure access market and in the wholesale broadband access market for the supply of business broadband internet access services from a fixed location.

### **Overall conclusions and way forward**

658. As in the case of wholesale domestic connectivity services, TRA intends to put more emphasis on ensuring that the wholesale services offered with respect to business broadband are indeed meeting the reasonable requirements of OLOs. This relates to both price and non-price conditions, including to ensuring that the service level agreements in place are sufficiently comprehensive, fair and non-discriminatory.
659. This becomes especially important in order to ensure that TRA's overall direction towards lifting all retail markets from ex-ante regulation can be implemented.

### **Summary of conclusions and way forward for relevant wholesale markets**

660. The following provides a summary of TRA's conclusions with respect to relevant wholesale markets susceptible to future ex-ante regulation, and associated proportionate wholesale remedies.

**Table 33: Relevant wholesale markets susceptible to future ex-ante regulation**

Relevant Wholesale Markets	Views on <i>ex-ante</i> regulation, and relevant & proportionate remedies (in case of dominance determination)
Wholesale call termination on individual fixed networks	Provide fair, reasonable, non-discriminatory & cost based termination service to OLOs as part of a RO
Wholesale call termination on individual mobile networks	Provide fair, reasonable and, non-discriminatory & cost based termination service to OLOs as part of a RO. The rate for the voice termination service shall be cost based  However, TRA's view is that both rates for SMS and MMS services could be removed from the ex-ante requirement
Wholesale domestic data connectivity services	Provide relevant wholesale services on fair, reasonable, non-discriminatory and cost based conditions as part of the RO.  Services should at a minimum include existing wholesale remedies e.g.: CAT; LLCO; WLA
Wholesale broadband access for business broadband	Provide relevant wholesale services on fair, reasonable, non-discriminatory and cost based conditions as part of the RO. Services should at a minimum include: Bitstream access and WDSL
Wholesale physical infrastructure access for business broadband	Provide relevant wholesale services on fair, reasonable, non-discriminatory and cost based conditions as part of the RO. Services should at a minimum should include: LLU (OLOs should be able to unbundle the copper line and use VDSL technology)

Source: TRA

### 9.4 Are there any potential new candidate markets?

661. Having reviewed the currently defined markets and set out conclusions on which markets should be susceptible to ex-ante regulation going forward, it is important to also consider whether there are new 'markets' that could also be candidates for ex-ante measures. Since there have been considerable market and technological developments in the last years, the competitive landscape has also changed in different ways.

#### 9.4.1 Access to physical and civil infrastructure

662. A separate "access to physical infrastructure market" would comprise the services of providing access to physical infrastructure (ducts, poles, exchange buildings, street furniture) for the purpose of delivering services.
663. There are a couple of reasons why such a market could possibly be considered. Firstly, the MNOs in particular rely, in some cases heavily, on microwave links to provide connectivity between base stations. However, operators foresee that the available spectrum could become exhausted and that they will need to make much heavier use of fibre connections, especially considering the increasing demand coming from LTE. Leased lines may not be cost efficient or at least not priced competitively. Hence the introduction of a (civil) infrastructure market would ensure more cost efficient supply, control of its own service specification, and provide better conditions to compete effectively. A number of MNOs in other markets have 'lobbied' for such market to be put on the list, especially operators who also migrate in to fixed (and bundled) offers.
664. Where SMP/dominance is found in such a market, remedies such as compulsory leasing of dark fibre (or a virtual equivalent product) or access to unused duct capacity (indeed currently provided by Batelco through its RO) could be provided. The market power of fixed line incumbents does ultimately derive largely from their ownership and control of physical infrastructure.
665. The question is however whether it would add any value to define a physical infrastructure market either instead of an existing regulated wholesale market or in addition.
666. It seems to be in line with regulatory policy, as it has been considered sound to analyse markets as far upstream as the source of the market power and to start by imposing any necessary remedies at that level. Only if remedies relating to that level cannot solve the identified competition problem effectively, should a regulator consider imposing remedies further downstream.
667. Where there is market power, the source would usually be at the physical layer. Regulators are required to make choices of remedies which will deal effectively with the competition problem identified (based on the proportionality principle). If in a particular case that requires multiple remedies (such as WBA, fibre backhaul service and/or access to duct), these should be imposed.
668. However, there appears to be limited arguments to adding such *market* to the list. If a conclusion is reached that access to physical infrastructure would be an effective and proportionate remedy to deal with an identified competition problem, it does not appear necessary to define a civil infrastructure market to achieve that outcome. For example, to deal with SMP/dominance in a defined market, loop unbundling, access to dark fibre and

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access to unused duct capacity are all potential *remedies* to consider based on current Telecoms Act and Access Regulations.

669. In summary, the conclusion is that it would add little value for such a “market” to be added to the list of relevant markets susceptible to ex-ante regulation. If there is a strong reason to grant access physical infrastructure (for example to landing station facilities to ensure OLOs can connect domestic backhaul links with international cable capacity on fair terms) this can be achieved as a remedy in the relevant ex-ante regulated market.

### 9.4.2 MVNO access

670. The mobile market is, when defined separately, considered to be effectively competitive in most markets including in Bahrain, albeit characterised by oligopoly. If anything there is rather a trend towards more consolidation than introducing additional mobile network operators. The Bahraini mobile operators are currently quite aggressive with their offers, especially on pricing of data and voice. At the same time all three MNOs have rolled out countrywide LTE networks. Two of the three also operate fixed or fixed-wireless networks, and offer very attractive on-net calling rates (to both fixed and mobile networks), as well as bundled offers (including broadband access).
671. The LTE networks lead to economies of scope between fixed and mobile network infrastructures. For instance, traffic from LTE devices can be offloaded on the fixed network. The cells of the mobile networks will also be smaller than in previous generations of mobile standards, thus integrated (fixed and mobile) operators have benefit of their fixed networks to connect LTE base stations.
672. Consumers are increasingly buying call services in bundles which include both fixed and mobile services (but also broadband internet access, and possibly (IP) TV). If that form of supply indeed were to dominate in future, any provider who does not have access to a mobile network would not be competitive and possibly have to withdraw from the market.
673. A large portion of consumers may increasingly prefer one stop shopping (that is, bundle buying of communications services). Already in the current market, there is a clear trend towards bundling, albeit not yet quadruple play offerings. If this indeed were to be consumers’ driving preference in the next period, the market addressable by ‘pure’ fixed/fixed-wireless service providers will decrease dramatically unless they are able to obtain mobile access on reasonable terms
674. The current Telecoms Law allows for MVNO type licenses, but there are no ex-ante regulatory obligations relating to MVNO access (enforced conditions, including cost-based rates, for MVNO access). TRA’s view is that the benefits of more players getting access to mobile networks could be expected to arise from the opportunity to offer more (and bundled) services to users.
675. TRA does not at this stage consider MVNO access as a separate market susceptible to any ex-ante measures, but may support the development of an MVNO licensing framework subject to the policy direction in the upcoming NTP4.

### 9.4.3 Over The Top services (OTTs)

676. Popular OTTs have made an impact already in the current market situation, but can be expected to have a significantly greater impact in the years to come (*see also separate*

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*section on OTTs in annex and report*). This section examines however specifically whether there could be a case for defining markets relating to the provision of retail services 'over the top' of a retail broadband data service (with the purpose of potentially imposing any ex-ante measures). The issue in this regard is related to market power by the network operator which could be exercised to block or degrade certain OTTs.

677. Currently widely used applications such as YouTube or Facebook are unlikely to experience such treatment. Too many consumers would want to switch network (provided any SMP problem at the retail access service level has been dealt) and the blockage would be unprofitable, unless the operators collectively decide and succeed to block the services. However, applications which were only of modest popularity might expect this experience, especially if they undermine the operators' revenues.
678. The relevant retail market may include a variety of different services. In such cases, the network operators have no strong incentive to degrade competition unless they provide an own-brand and competing service. The main exception is retail voice and messaging services where network operators may fear a significant loss of call revenue to over-the-top providers (notably Skype, Viber and WhatsApp).
679. The relevant wholesale markets are the markets for origination and termination of data (possibly restricted to data arising from over the top applications) and possibly segmented by individual networks.
680. Arguments could be made both for and against segmenting the wholesale market so that traffic is restricted to traffic generated by customers on an *individual* network (i.e. same as for ex-ante regulated termination call termination service into individual fixed or mobile networks). The argument for an individual network definition would be that, in order to be viable, the target customer base for the OTTs must be as large as possible. Customers may switch in response to non-availability of a popular application but will not switch in response to the non-availability of the great majority of (non-massively popular) applications.
681. However, the inability to serve customers of one single network is unlikely to have any material impact on the OTT provider, especially in smaller national markets, or if other customers (on other networks) can be served. There is an argument that only an individually dominant network or multiple collectively dominant networks could exert market power effectively. An individual network definition therefore is too narrow in this case. Furthermore, market power is unlikely to be exerted successfully against providers of the most popular over-the-top applications, such as YouTube or Facebook, which in addition do not erode the revenues of the operators but instead make internet broadband access services more attractive to subscribers.
682. Data is used for different purposes, notably including web browsing and email. The use of most OTTs accounts for only a proportion of the data traffic, though YouTube is an exception. The interest by some operators to block (or at least restrict some OTTs) is therefore more driven by the negative revenue impact they (such as Skype) have on the operators, than the data they consume in their networks.
683. In summary, the arguments for including this as a relevant market on this list of markets susceptible to future ex-ante regulation are at best weak. Even if there were to be a widespread blockage (based on some form of 'joint agreement' between operators), the issue should be possible to deal with effectively based on competition law (ex-post measures and remedies).

### 10 Conclusions and recommendations

#### 10.1 Key findings and conclusions

684. TRA's overall conclusions are summarised in the following. These conclusions are taken on board in the formulation of recommendations and proposed roadmap.
685. Generally, competition has developed well in most segments in the Bahrain telecommunications market in recent years. Competition, especially on mobile and broadband services, has generated significant benefits to most users as evidenced by a number of indicators and comparisons with peers. This positive development is shown by high growth in the uptake of new services, new product and service offerings, the level of price competition, as well as sound investment levels in new networks and technologies.
686. Batelco's ability to retain a strong position in the enterprise segment is however an area of competition concern for the future. As the market cannot currently be argued to be a 'true level playing field', due to un-even opportunities to roll-out and/or to get access essential facilities and infrastructure, more stringent and effective regulatory measures are needed in some areas to ensure a better functioning market.
687. The sector is clearly evolving quickly and the impact of convergence and OTTs can be expected to have an impact on the regulatory framework going forward, *but*, these trends and drivers do not *at this stage* motivate a fundamental change to market definitions and adoption of proportionate ex-ante market regulation.
688. Going forward, ex-ante regulation should be potentially lifted in *all* retail markets. This direction is based on the standard principle that ex-ante regulation in retail markets should only be introduced (or retained) if ex-ante regulation of relevant (upstream) wholesale markets is not sufficient to correct a market failure (i.e. lack of effective and sustainable competition). Furthermore, ex-ante regulation should in any case only be introduced (or retained) if general competition law (i.e. ex-post regulation) is not sufficient to deal with market failures (i.e. anti-competitive conduct).
689. In concluding this direction forward, however, TRA emphasises that the implementation is subject to the SMP operator first meeting, in practical operational and 'market tested' terms, prescribed terms and conditions for 'fit-for-purpose' wholesale products (i.e. terms and conditions which allow OLOs to, whenever relevant, a) replicate the retail products and services of the SMP/dominant operator in the relevant market(s) and b) have access to equivalent products as the wholesale provider has (e.g. broadband access and backhaul fibre for LTE operators).
690. In the business market segments, where there is still presence of significant market power it is therefore critical that proportionate remedies are enforced and tested *before* ex-ante regulation in the remaining retail markets are lifted.
691. The SMR sets out a *phased approach* to lifting ex-ante regulations in all retail markets and an increased focus will hence be on ensuring that price and non-price wholesale conditions are indeed fair, reasonable and non-discriminatory.
692. The way forward with respect to future ex-ante regulation, and other market facilitating measures, will lead to an even more deregulated telecoms market in Bahrain. At least

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over some time, significant benefits should be expected, but there may of course also be risks that need to be mitigated.

**Table 34: Expected impact of the proposed revised list of ex-ante markets and related market interventions**

Pros (+)	Cons (-)
A further deregulated and open telecommunications market – less dependency on TRA (ex-ante) intervention	Transitional implementation period, and associated costs, of enhanced wholesale regulatory interventions (but done to ensure that more effective & sustainable downstream competition can take place in business segment)
Overall - more customer choice (alternative providers of bundled and non-bundled services) and enhanced level of competition and innovation	Potential for increased anti-competitive conduct (if effective remedies are not put in place), e.g. undue cross-subsidisation and undue bundling offers
Economic efficiency gains and a transfer of producer surplus to consumer surplus through increased price competition, notably due to enhanced competitive pressures in the business segment	Potential lessening of competition in some deregulated retail markets in cases where smaller OLOs cannot respond to larger operators (MNOs) offers
Decreased regulatory costs and burden on both TRA and the affected operators (at least over time)	
Enhanced attractiveness to invest and operate in Bahrain through a regulatory framework at the forefront and in line with best practices	
Opportunity for additional (wholesale) revenue generation by the providers of wholesale products and services	

Source: TRA

### 10.2 Recommendations on retail markets susceptible to future ex-ante regulation

693. In summary, TRA recommends that there are only four retail markets potentially susceptible to ex-ante regulation going forward. As stated, however, TRA's general direction is to potentially lift these retail markets from the list provided that 'market tested' wholesale remedies are in place that allows OLOs to effectively compete in the retail markets.

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**Table 35: Relevant retail markets susceptible to future ex-ante regulation**

<b>Withdrawn</b>	<ul style="list-style-type: none"> <li>• Retail market for dial-up internet access services from a fixed location</li> <li>• Retail market for fixed narrowband access services for residential customers</li> <li>• Retail market for fixed originated domestic calls for residential customers to either fixed or mobile subscribers within the Kingdom of Bahrain</li> <li>• Retail market for fixed originated international calls to Zone 1 countries</li> <li>• Retail market for fixed originated international calls to Zone 3 countries</li> </ul>
<b>Maintained<sup>96</sup></b>	<ul style="list-style-type: none"> <li>• Retail broadband internet access from a fixed location for business users</li> <li>• Retail domestic data connectivity services</li> <li>• Retail international leased lines (connectivity services)</li> </ul>
<b>Redefined</b>	<p><b>Currently:</b></p> <ul style="list-style-type: none"> <li>• Retail market for fixed narrowband access services for non-residential customers</li> <li>• Retail market for fixed originated domestic calls for non-residential customers to either fixed or mobile subscribers within the Kingdom of Bahrain</li> </ul> <p><b>Proposed:</b></p> <ul style="list-style-type: none"> <li>• Retail market for premium<sup>97</sup> access to call services and domestic calls from a fixed location<sup>98</sup></li> </ul>

Source: TRA

<sup>96</sup> However, the stated retail markets should only be maintained on the list until such point where proportionate but effective (market-tested) wholesale remedies are available in the relevant upstream market(-s).

<sup>97</sup> Premium access includes current ISDN type products and IP-based solutions serving business users with demand for multiple channels and lines but excludes standard single line business subscriptions such as PSTN or fixed-wireless.

<sup>98</sup> Please refer to paragraph 706.b below and associated footnote.

### 10.3 Recommendation on wholesale markets susceptible to future ex-ante regulation

694. TRA recommends that the following relevant wholesale markets should be susceptible to ex-ante regulation going forward.

**Table 36: Relevant wholesale markets susceptible to future ex-ante regulation**

<b>Withdrawn</b>	<ul style="list-style-type: none"> <li>• “Freephone originating access” (wholesale call origination)<sup>99</sup></li> </ul>
<b>Maintained</b>	<ul style="list-style-type: none"> <li>• Wholesale domestic data connectivity services</li> <li>• Wholesale broadband access for business users</li> <li>• Wholesale physical infrastructure access for business users</li> </ul>
<b>Redefined</b>	<p><b>Currently:</b></p> <ul style="list-style-type: none"> <li>• Call termination on Batelco’s fixed network</li> <li>• Wholesale market for termination services on Batelco mobile network, on Zain mobile network and on Viva mobile network</li> </ul> <p><b>Proposed:</b></p> <ul style="list-style-type: none"> <li>• Wholesale call termination on individual fixed networks</li> <li>• Wholesale call termination on individual mobile networks</li> </ul>

Source: TRA

### 10.4 Recommendations on other measures to foster the market development

695. Other recommended measures that, in different ways, should promote market development and efficient competition are:

- a. Where possible within the parameters of the Telecommunications Law, include, as an integrated part of future market reviews, the imposition of remedies based on the proportionality principle (i.e. the step to identify and impose remedies based on proportionality tests should be part of review and determination process, and based on public consultation as part of the market review);
- b. Monitor and analyse the actual impact of imposed remedies in the relevant ex-ante markets, in order to, if necessary, amend the remedies if they are not effective in correcting identified market failure (i.e. this is an activity outside the scope of the market review) This should be done as part of the periodic reviews of the Reference Offers;

<sup>99</sup> However, noting that this wholesale product was never based on a dominance determination and a remedy was never enforced by TRA.

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- c. Subject to the policy direction set out in the forthcoming NTP4, introduce and implement new regulations or guidelines for infrastructure sharing and site deployments;
- d. Subject to the policy direction set out in the forthcoming NTP4, consider MVNO licenses and agreements;
- e. Subject to the policy direction set out in the forthcoming NTP4, prepare the process for allocation of valuable frequency spectrum;
- f. Subject to the policy direction set out in the forthcoming NTP4, adapt the regulatory framework to support the NBN, and subject to mandate given by the Government, develop a national Broadband Strategy for Bahrain, which should include both supply-side factors (e.g. the future model and supply conditions for the NBN) and demand-side factors.

### 11 Roadmap

696. Clearly, some of the activities/projects already included in the three year TRA work plan are directly related to the SMR conclusions and recommendations. These include:
- a. Review of Batelco' Reference Offer (including the strengthening of price and non-price conditions and the SLA – *activity on-going*);
  - b. Review of the Access Regulation;
  - c. Review of the Accounting Separation Regulation (*activity initiated*);
  - d. Review of the Retail Tariff Notification Regulation (including the NCT process);
  - e. Review of the Regulation of Wholesale International Inbound Telecommunications Services (*activity ongoing*);
  - f. Evolution of the licensing framework (taking into account convergence issues); and
  - g. Review of the regulatory framework (including the proposed revision to the market review and determination process to give licensees the opportunity to comment on proposed remedies, and a new primary legislation but based on Government instructions).
697. The TRA is currently in the process of reviewing Batelco's Reference Offer (RO) which could include:
- a. Revised charges for all wholesale access services (based on Batelco's 2012 regulatory accounts with adjustments derived from the core network bottom-up cost model);
  - b. Revised SLAs for the WLA service (Wholesale Ethernet connectivity service);
  - c. Introduction of SLAs for CAT/LLCO (Wholesale SDH connectivity service) and business bitstream; and
  - d. Introduction of a seamless wholesale data connectivity service (over Batelco's DWDM transmission network) to cater for the transmission needs of OLOs (for the provision of backhaul transmission and data connectivity services to large enterprises).
698. The RO will be open to public consultation and include time for responses and cross-responses from the operators.
699. Furthermore, the proposed SMR roadmap entails activities and projects over and above the strategic actions already stated in the TRA work plan for 2013-2015 (i.e. the TRA work plan from June 2013).
700. The roadmap is focused on activities stemming directly from TRA's views and conclusions on relevant markets going forward.
701. As a consequence of the finalisation of the SMR, TRA's intention is to issue a determination in relation to the list of markets susceptible to ex-ante regulation going forward, as well as reviews and determinations in relation to the markets that are proposed to be deregulated as per the SMR recommendations.

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702. As part of the review of the Retail Market for Access to Calls Services including Domestic Calls from a Fixed Location, the need for a separate retail market for Premium Access to Calls Services will also be considered.
703. The Authority does not intend to review the markets for Retail Business Broadband Internet Access from Fixed Location, Retail Domestic Data Connectivity Services and Retail International Data Connectivity Services in the determinations that will follow the SMR.
704. This is because these markets were reviewed as recently as 2014. The Authority has since been monitoring the developments in these markets and has not seen evidence to suggest that the dynamics in these markets have changed since the time of the review. A review of these markets at this point is therefore not necessary.
705. At the same time, the Authority recognizes that the review of these markets may be justified if there are significant market changes related to policy objectives set by NTP4 (such as the NBN implementation).
706. In summary, TRA will review the following markets after the publication of the final SMR:
- a. Retail Market for International Outgoing Calls from Bahrain;
  - b. Retail Market(s) for Access to Calls Services, including Domestic Calls from a Fixed Location.<sup>100</sup>
707. Subject to the effective implementation of 'fit-for-purpose wholesale remedies, TRA will undertake market reviews of the remaining retail markets on the list of markets susceptible to ex-ante regulation
708. TRA's plan is further to undertake market reviews of the wholesale markets for 'termination on fixed networks' and 'termination on mobile networks' respectively, taking into account the considerations made in the SMR, including e.g. the degree of substitution at the retail level, as well as the implications of increasing adoption of all IP-based networks.

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<sup>100</sup> As previously stated above, the Authority will determine, based on the available evidence, whether the "Retail Market for Access to Calls Services, including Domestic Calls from a Fixed Location" should actually be defined as two distinct markets (i.e. one for Mass Market Access, and one for Premium Access) as is suggested in this SMR report.

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709. The proposed roadmap for identified projects and activities stemming from the SMR are presented in the table below. The roadmap represents TRA's current plan but it might be amended if changing market conditions or other circumstances warrant it.

**Table 37: Roadmap**

	Projects & activities (based on proposed outcomes of the SMR)	Q1-15	Q2-15	Q3-15	Q4-15	Q1-16	Q2-16	Q3-16	Q4-16	Comments
<b>1</b>	Finalise and issue the Final Strategic Market Review report									Including responding to and taking into consideration the stakeholder submissions
<b>2</b>	Prepare and issue market determinations based on SMR									Carry-out market reviews for: <ul style="list-style-type: none"> <li>• Retail market for international outgoing calls from Bahrain; and</li> <li>• Retail market(s) for access to call services, including domestic calls from fixed location</li> </ul>
<b>3</b>	Finalise revision of ex-ante regulated wholesale products as part of the Reference Offer review									Including to identify, define and enforce proportionate and 'fit-for-purpose' wholesale remedies which meet the reasonable requirements of OLOs.
<b>4</b>	Carry-out market reviews of the wholesale markets: termination of call services on individual fixed and mobile networks									Carry-out a review of the wholesale termination markets (fixed and mobile), taking into account the impact of retail substitution on wholesale termination, and the impact of all IP networks, and the potential need for IP interconnection
<b>5</b>	Carry-out market reviews of the remaining retail markets on the list of markets susceptible to ex-ante regulation									Carry-out a simultaneous review of the remaining retail markets on the list (susceptible to ex-ante) taking into account the outcome and impact of revisions made to wholesale remedies

Source: TRA

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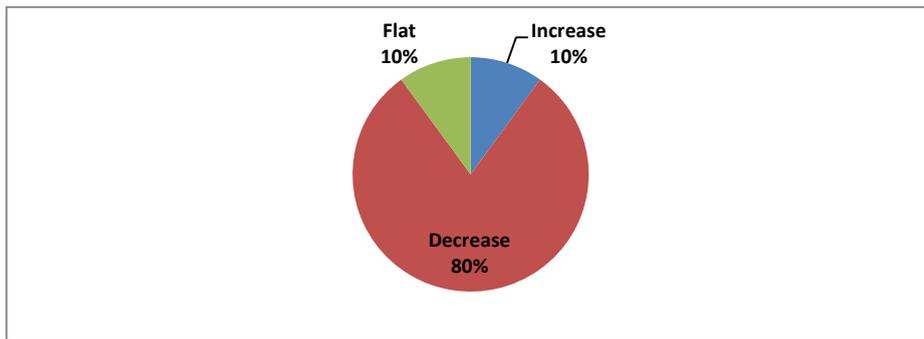
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**A3: Operators' views & perceptions on the future**

710. As part of the SMR, a number of stakeholders were interviewed, including eleven Bahraini operators. Part of the stakeholder questionnaire entailed (17) questions tailored at the operators (10 respondents).

711. The results of this 'mini-survey' must of course be interpreted with care as the base is low and some operators may have answered 'tactically' to some of the questions, i.e. provided answers that serve their agenda. Nevertheless, the results do give some interesting indications about the industry's views on the future direction of the sector and on important factors. Taken together, the responses provide interesting information on future market trends and, potentially, the appropriate direction for future market regulations.

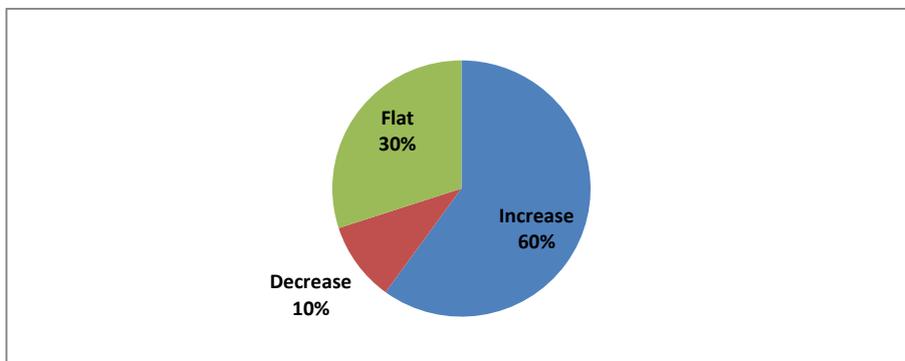
**Figure 98: Q1: Do you expect sector revenues from voice to increase, decrease or stay flat in the next few years?**



Source: TRA analysis based on operator responses

712. In line with international trends and forecasts, and e.g. due to impact of OTTs, a large majority (80% of respondents) expects voice revenues overall to decrease.

**Figure 99: Q2: Do you expect sector revenues from data to increase, decrease or stay flat in the next few years?**



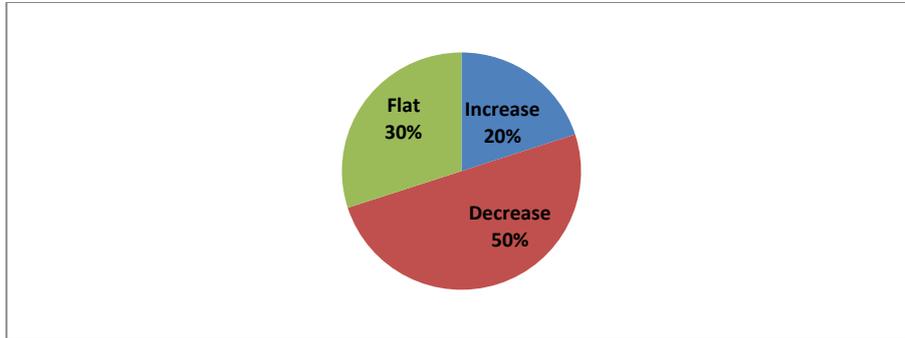
Source: TRA analysis based on operator responses

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713. Only 6 out of 10 respondents believe that data revenues will increase. Arguably this is surprising since data (big or small) is largely what is widely expected to drive industry growth in the next years.

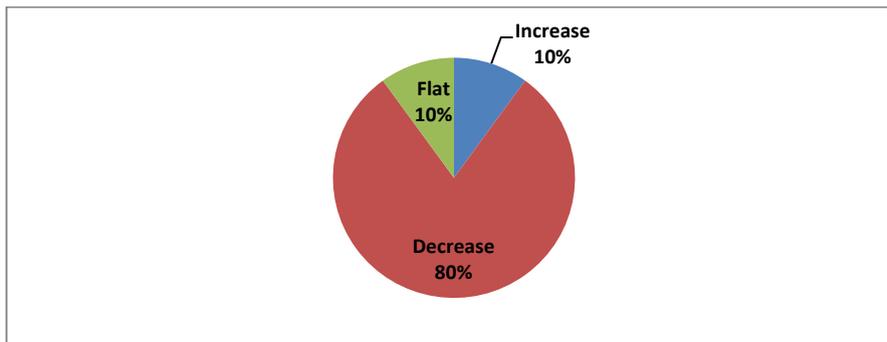
**Figure 100: Q3: Do you expect sector revenues overall to increase, decrease or stay flat in the next few years?**



Source: TRA analysis based on operator responses

714. Half of the respondents expect revenues overall to decrease. Whether this is partly a 'tactical' response could possibly be discussed. Nevertheless, it could be seen in the light of current intense competition between national players and the expected continued impact of OTTs.

**Figure 101: Q4: Do you expect sector revenues from mobile voice to increase, decrease or stay flat in the next few years?**

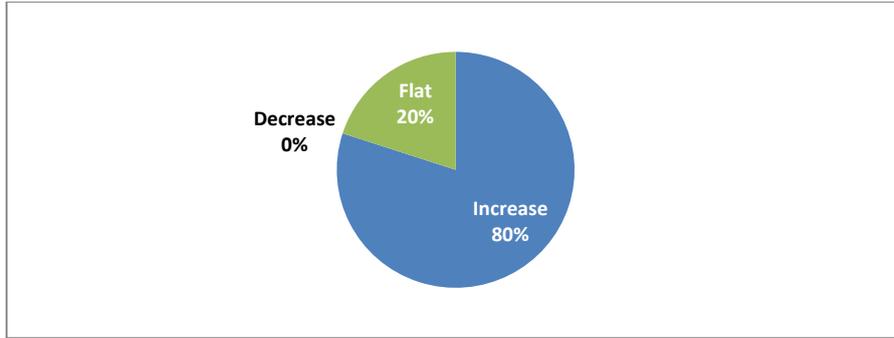


Source: TRA analysis based on operator responses

715. Voice is increasingly becoming an inclusive part of the (data) package deals, or priced very low, partly due to the impact of OTTs. Hence, the result is not too surprising, as the mobile subscriber penetration in Bahrain is largely saturated.

**Figure 102: Q5: Do you expect sector revenues from mobile data to increase, decrease or stay flat in the next few years?**

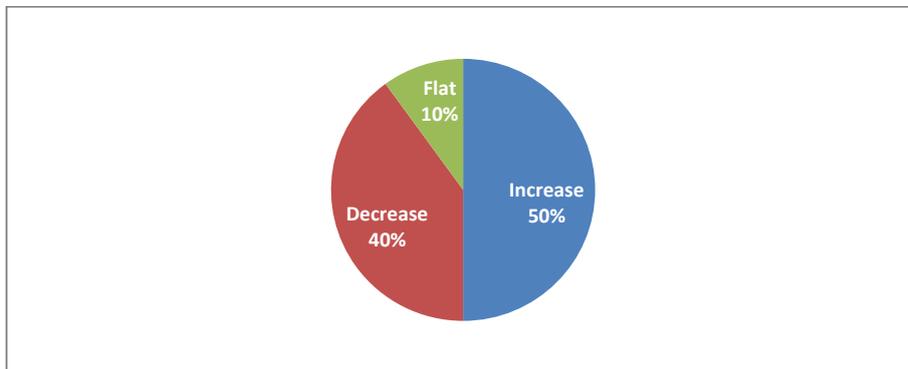
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Source: TRA analysis based on operator responses

716. Both the MNOs and other licensees either expect mobile data revenues to grow or stay flat in the next years. Whether the prediction will be correct will depend on future competitive intensity, coupled with the benefits that the mass-market users see in mobile data (e.g. new m-services, solutions and applications).

**Figure 103: Q6: Do you expect sector revenues from mobile overall to increase, decrease or stay flat in the next few years?**



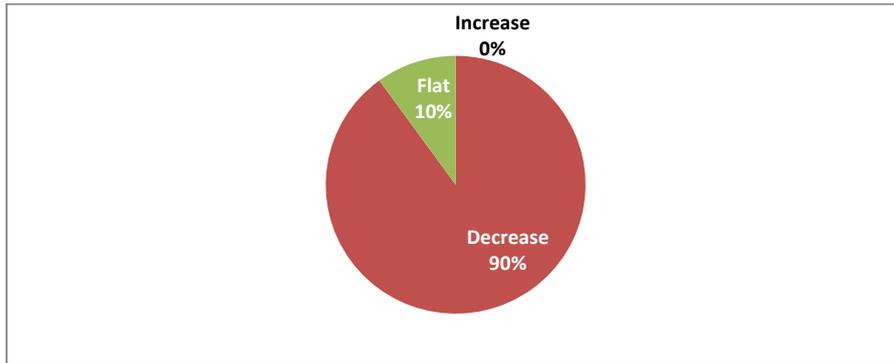
Source: TRA analysis based on operator responses

717. There is no clear direction on the forecast for mobile revenues overall. There is a balance between voice (on decline) and data (mostly expected to increase). At the end, again, level of price competition coupled with adoption of new services/applications, based on data, will determine the direction of mobile revenues.

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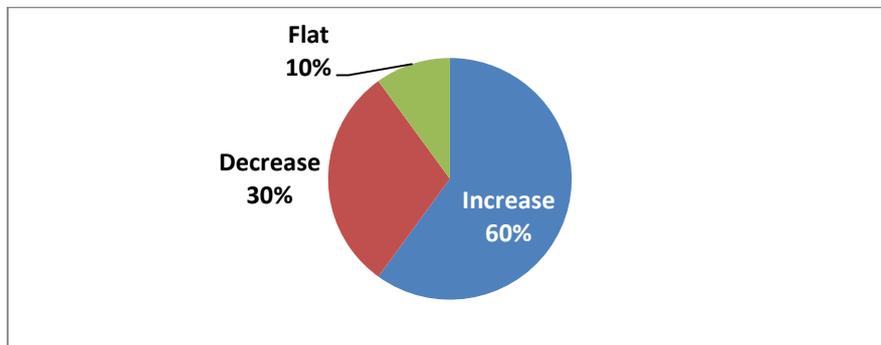
**Figure 104: Q7: Do you expect sector revenues from fixed voice to increase, decrease or stay flat in the next few years?**



Source: TRA analysis based on operator responses

718. As one could expect, a vast majority (9 out of 10) expect falling fixed voice revenues, fully in line with forecasts from other markets. The substitution towards mobile and the impact of ('free') OTTs are the key explanatory drivers.

**Figure 105: Q8: Do you expect sector revenues from fixed data to increase, decrease or stay flat in the next few years?**



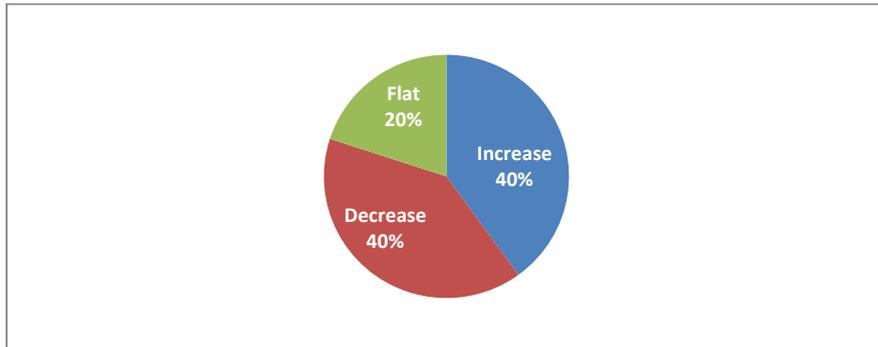
Source: TRA analysis based on operator responses

719. The forecast on fixed data revenues shows a rather balanced view. Clearly, fixed broadband will continue to have a reasonable market demand also in Bahrain, but to what extent, and at what pace, the rollout of 'ultrafast'/fibre is carried out is likely to determine the revenue growth potential. This should not be confused with the expected profitability of fixed broadband offers.

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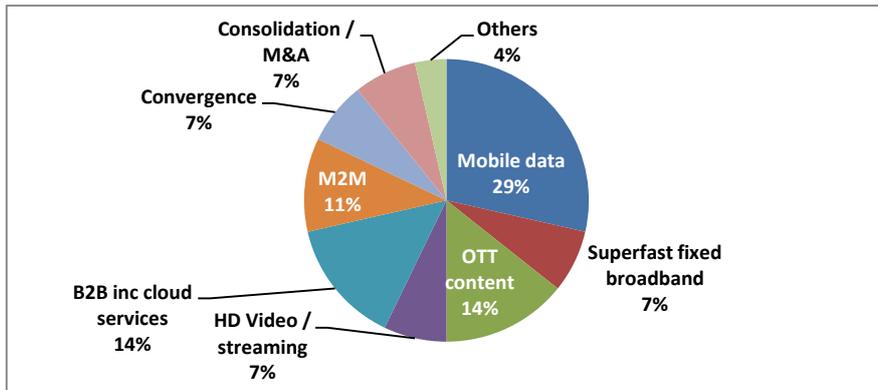
**Figure 106: Q9: Do you expect sector revenues from fixed overall to increase, decrease or stay flat in the next few years?**



Source: TRA analysis based on operator responses

720. The operators are not united in their views on the forecast on fixed revenues overall. Partly this is probably explained by the market segments they operate in. However, the future revenues overall for fixed is likely to be determined by firstly the level of substitution from mobile broadband (including impact of enhanced LTE) for data and secondly whether fibre will be deployed extensively (and if so, whether fibre-based bundles will be offered at reasonable price points for the wider market).

**Figure 107: Q10: What do you believe are the main drivers of revenue growth in the Bahraini telecoms industry in the next few years?**



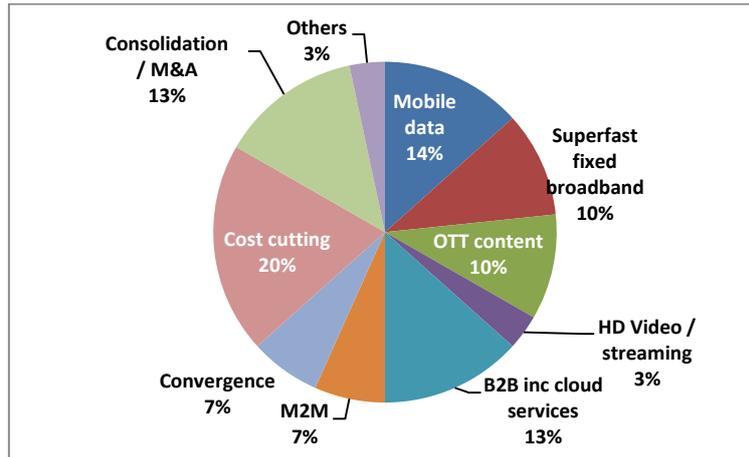
Source: TRA analysis based on operator responses

721. Interestingly, there is a very scattered picture on future revenue growth areas (even if mobile data gets most answers). Partly this could be explained by the segments in which the players operate, but also whether respondents looked at the absolute value growth or the relative growth rate.

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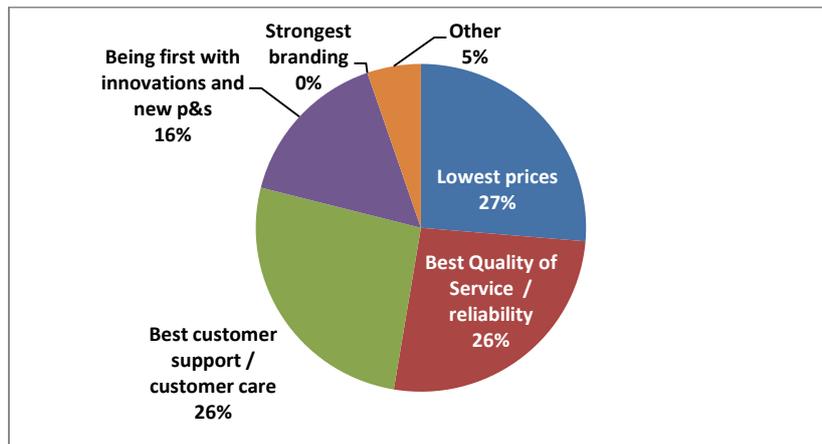
**Figure 108: Q11: What do you believe are the main drivers of profit growth in the Bahraini telecoms industry in the next few years?**



Source: TRA analysis based on operator responses

722. Profit growth is expected to come from a wide number of business areas and services. There is certainly no consistent view from the operators on what will be the future profit contributors in the years ahead.

**Figure 109: Q12: What will be the two main competitive advantages in the next few years in the Bahrain market?**



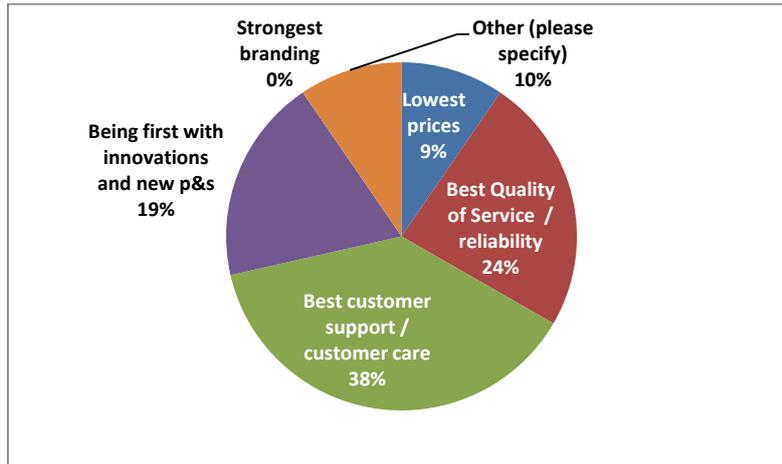
Source: TRA analysis based on operator responses

723. Generally, it is a rather equally spread picture on the key competitive advantages in the Bahrain sector. It is possibly a bit surprising, but arguably also satisfying, to note that no-one believes that 'strongest branding' will be one of the competitive advantages, despite the very aggressive branding currently seen in the market.

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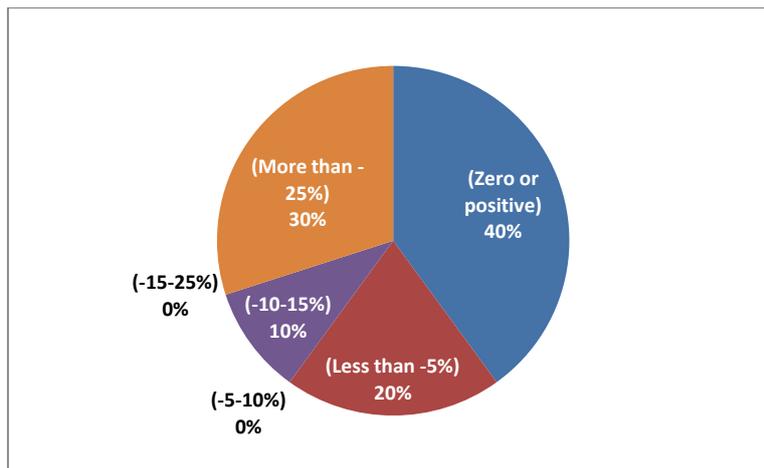
**Figure 110: Q13: What will be your company's competitive advantage(s) in the next few years?**



Source: TRA analysis based on operator responses

724. Whereas the respondents, generally, did not point to any single competitive advantage to dominate, the picture is slightly different when responding to their own perceived competitive advantages; 'best customer support / care' received most responses, followed by quality of service/reliability.

**Figure 111: Q14: What is your current best estimate on the annual net revenue impact on your business due to the availability of OTTs (i.e. the lost net revenue due to OTTs including but not limited to Skype, Viber, WhatsApp)?**



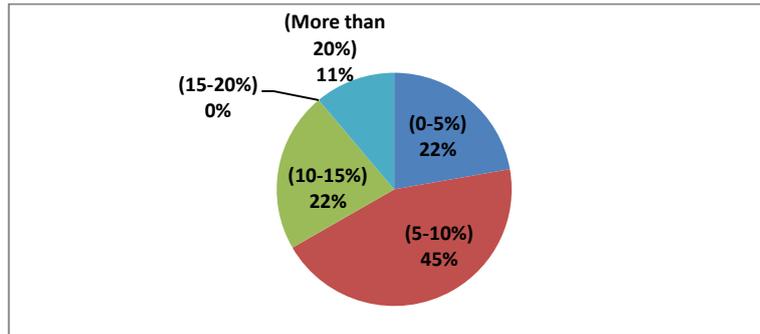
Source: TRA analysis based on operator responses

725. The currently very important issue regarding the impact of OTTs shows some interesting response results. Naturally, the answers should differ depending on the respective respondent's business focus and model, but 3 out of 10 respondents state that OTTs have a negative net revenue impact of more than 25%.

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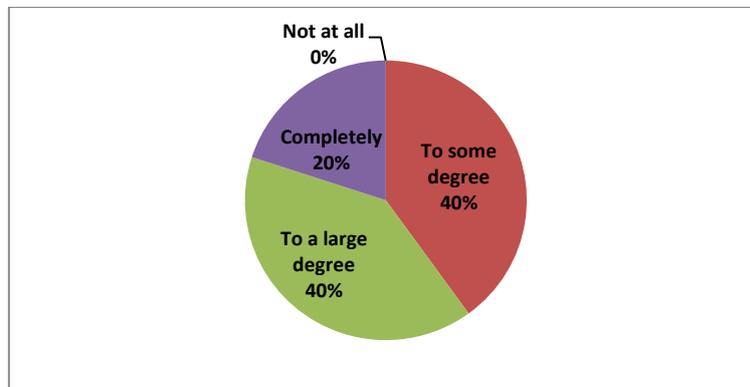
**Figure 112: Q15: What proportion (%) of your (Bahrain) revenues do you plan to invest (in Bahrain) on average per annum in the next 3-5 years (i.e. Capex / Revenue)?**



Source: TRA analysis based on operator responses

726. Half of the nine respondents forecast that their capex/revenue will be 5-10% per annum in the next 3-5 years. Though this is not necessarily worrying, one should have expected that a telecommunications industry in a good expansion stage would forecast a capex/revenue indicator of at least 10-15% (by majority of the players).

**Figure 113: Q16: To what extent is your retail service provision dependent on access to wholesale services from another party?**



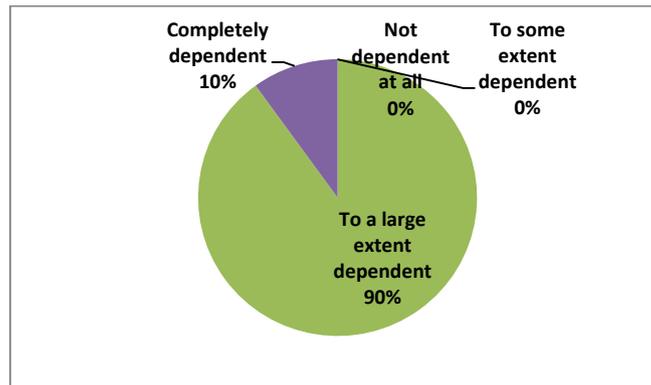
Source: TRA analysis based on operator responses

727. 6 out of 10 responded that the offers to their customers (end-users) are either largely or completely dependent on having access to wholesale services from other party.

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**Figure 114: Q17: To what extent is your future business success dependent on TRA's market interventions?**



Source: TRA analysis based on operator responses

728. All respondents stated that their future business success in the market is either largely or completely dependent on TRA's market interventions. Even if the responses to an extent may be tactical, they probably also indicate the large importance of how TRA intervenes, or not, in the market to for example stimulate new investments and innovations, and therefore how well TRA promotes a sustainable sector development overall.
729. In summary, the responses from the operators suggest that:
- The overall sector revenue growth in the next years will at best be modest;
  - Data, and especially mobile data, will be a key contributor to the growth;
  - Voice revenues are on the decline, partly affected by local price competition, but mostly by the impact from OTTs;
  - There is limited expectation on investment levels in the industry in the next few years;
  - Access to relevant wholesale products is a key component of most operators' business plans;
  - Operators believe that TRA's role and market interventions are fundamental to their business performance.

#### **A4: A classification of internet applications<sup>101</sup>**

730. In the following a description of different internet applications (including OTTs) is given together with a summary of relevant regulatory issues. Although some of the reasoning clearly falls outside the core topics of the strategic market review, it nevertheless provides some important insights on the features of the internet applications, and the impact they have and are likely to have on national markets and on market regulation going forward.
731. There is today a great variety of world-known internet applications, often with hundreds of million users. Some of these applications challenge telecoms operators' existing business models (albeit in different ways), whereas others arguably complement and support their businesses. Therefore, it is useful to classify and describe the main categories, and consider their likely implications on regulation.
732. There is no international agreement on the classification or taxonomy of the myriad services that the internet has to offer<sup>102</sup>. In this context the applications are segmented based on a broad set of use cases (see figure below) which cover a large majority of the internet applications available today. Although not exhaustive, it provides a blue-print for examining regulatory approaches towards internet applications. This lack of completeness is also symbolic of how the internet continues to grow – new applications and use cases develop as technologies and needs evolve. In addition typical applications (e.g. Facebook) can span over multiple use cases. Providers' business models initially focus on one or two use cases and begin horizontal expansion to include other cases later in their growth cycle.

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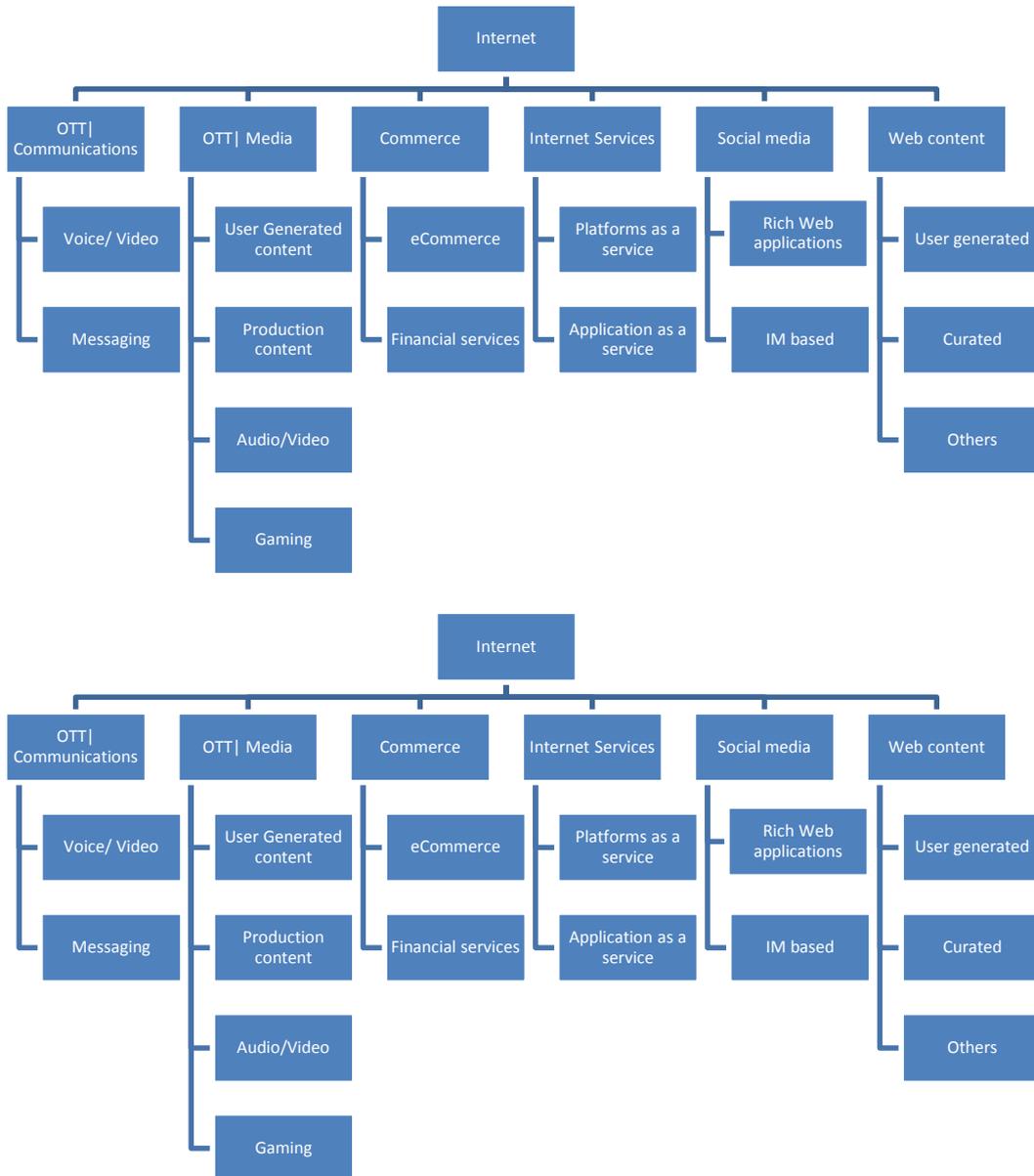
<sup>101</sup> See TRA Commissioned Report by Detecon: "Policy and Regulatory Framework for Governing Internet Applications" January 2014. All figures and tables are sourced from the same report.

<sup>102</sup> Even organizations such as the FCC summarily classify all internet services as "Title 1: information services", as distinct from "Title 2: telecommunication services"

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**Figure 115: Internet applications – use case classification**



### OTT Communications

733. OTT Communications refers to services whose primary applications lie in communications but use the internet as the transport medium rather than the legacy telephony infrastructure (PATS). This is especially relevant to telecom operators since these services operate in a similar space as traditional voice and messaging services.

### Voice / Video

734. Voice and video-based internet communication services are becoming increasingly popular facilitated by flat rate data plans, free options via WiFi and a host of features such as video calling which enhance user experience. This makes them a popular alternative to the traditional phone call – whether mobile or fixed.

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735. Typical examples include Skype, Facetime and Viber. These services have witnessed strong growth over the past few years which can be attributed to several factors:
- a. The business models (calls are typically free) make it an attractive proposition, especially for international calling;
  - b. Smartphone penetration has continued to increase - is expected to exceed 50% by 2016<sup>103</sup> globally - and lower cost models are entering the market, reducing barriers to entry. This trend is particularly apparent in countries with a large population of migrant blue collar workers;
  - c. Data prices (both mobile and fixed) have fallen on a \$/MB basis. Many of these services also work on WiFi networks, with no additional mobile data usage. Smartphones also work on WiFi and the proliferation of WiFi hotspots (often 'free') allows users to make and receive calls at no cost.
736. This is a departure from the hype and bust of Skype in the early part of the decade. At that time, although heralded to be the demise of telephony, it had limited impact since mobile networks were still evolving, data rates were slow and the smartphone was still in its infancy. Now, with the near ubiquitous presence of high speed broadband networks and the large number of mobile users, the shift from traditional telephony to OTT communications happens rapidly.
737. The total number of VoIP subscribers is more than 1 billion and is expected to reach almost 2 billion by end of 2017<sup>104</sup>.
738. OTT communication players' business models are different to those of traditional telecoms operators:
- a. Free services – often peer-to-peer services such as all Skype-to-Skype or Viber-to-Viber services;
  - b. Bundled – Facetime is a feature available to all iPhone users; users can opt to use either the mobile network (consuming billed data) or Wifi (for free);
  - c. Freemium – where basic features are free but advanced features (such as group video-conferencing on Skype) are charged for – either as a once off fee or on a subscription basis;
  - d. Paid for – especially where calls terminate on a 3<sup>rd</sup> party PSTN network, such as Skype-out.
739. Voice is becoming increasingly commoditized and is moving towards all IP. With the advent of LTE, voice itself will be transported as packet switched (IP) based traffic rather than circuit switched.
740. In effect, both traditional and OTT players will be offering Voice-over-IP. An important remaining distinction will be the QoS offered. It is possible that this will prove a more resilient classification feature for future regulation than technology-based options.

---

<sup>103</sup> Informa Telecoms and Media Report, 2013.

<sup>104</sup> Infonetics 2013 mVoIP subscribers.

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#### Messaging

741. Even more than OTT voice, IP messaging has shown very strong growth, simply because of the low bandwidth use and better feature set (sending text, audio and graphical content) at a very low (even zero) price-point. Growth is also driven by the younger generation, who prefer the rich text and graphic messaging options provided. Typical OTT messaging services are WhatsApp and Tencent (big in e.g. China). Although, the exponential growth cannot continue indefinitely, it is widely expected that IP messaging will replace SMS to a large extent.
742. The IP-based messaging services business models are aligned to those of the voice players. Backed by high valuations, the current focus seems to be in establishing market presence rather than monetization.
743. A few price examples include:
  - a. WhatsApp yearly subscription charge of \$0.99
  - b. Free service by WeChat (owned by Tencent)
744. This free(mium) trend is bound to change in time as pressures on monetization begin to grow. However the global nature of these services allows the players to achieve economies of scale far beyond those of legacy operators.
745. The general shift away from SMS is denying telecom operators of one of their previously most profitable lines of business. Cut-throat pricing in the short term and scale economies in the longer term make competition based on price look like an uphill battle for these legacy providers.

#### OTT Media

746. As fixed networks become more robust, and mobile devices (including larger forms such as tablets) continue to proliferate, an increasing amount of internet traffic is made up of video. OTT Media refers to video and audio content being streamed and/ or downloaded over the internet. This is not to be confused with IPTV, which uses dedicated IP channels for content and is not characterized as best effort. In a broad classification we can further categorize OTT media into
  - a. Video
    - i. User generated video;
    - ii. Produced (curated) content
  - b. Audio
747. Significant larger players in this category include YouTube, Netflix and Spotify, who are among the players who comprise the legal market space. However, there is also a significant amount of illegal – primarily unlicensed - content. These are either exchanged through peer-to-peer network applications or streamed directly online and although they significantly contribute to data traffic they have proven very difficult to police.
748. OTT media has shown some of the strongest growth over the past few years as high speed broadband (in excess of 10 Mbps on fixed and >1 Mbps on mobile) has become a reality in many countries. This has not only been simple user-generated content which continues to flourish, but also premium content being delivered over the internet from the

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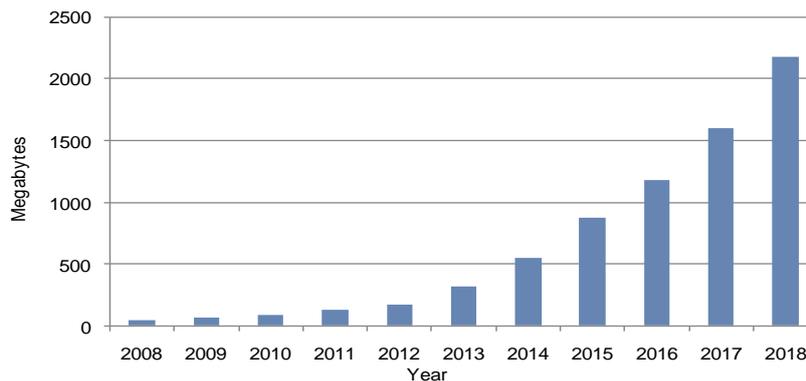
likes of Netflix and Hulu accompanied by the increasing adoption of larger screen devices (i.e tablets) and connected TVs. Over 30% of all internet traffic is now streaming media. In developed markets this is close to 50%.

749. The strong growth in the number of videos uploaded per minute on platforms such as YouTube has resulted in backend providers and operators investing heavily to be able to better carry this traffic.
750. The players in OTT media use several different business models depending upon the specific segment that is being targeted:
  - a. Advertising is the main revenue source for YouTube, Vimeo and other players. Automated advertising placements based upon the user's search history are common as well as sponsored advertisements.
  - b. A second and increasingly prominent source of revenue is through subscriptions – especially for premium content. A prominent example is NetFlix which provides the user with unlimited access to a large catalogue of content for a fixed monthly subscription fee.
  - c. Finally, there is transaction (or pay per view) content which is typically used for access to one-time content (e.g. sports events or première of a new movie).
751. For premium production content, the use of OTT serves as a means to reach an increasingly wide audience, which has a strong preference for an 'on-demand' experience, rather than a push experience as seen in traditional broadcasting. Some of these players (such as Hulu) have been established by production houses themselves as they seek a way to directly access and interact with customers.
752. User-generated content is not suitable for direct monetization, but it serves as a way to reach a broader audience and indirectly allows firms such as Google to capitalize and serve up advertisements.
753. The primary and largest impact that OTT media has had has been in the sizeable portion of internet traffic now solely concerned with streaming media. Infrastructure providers have to invest massively in higher and higher capacity infrastructure (both access and core) to meet this demand. It also has an impact on operators' business models including flat rate data plans.

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**Figure 116: Mobile network data traffic in the Middle East – Average Monthly per wireless subs (forecast) <sup>105</sup>**



754. One of the consequences to be expected is that operators will move away from unlimited (flat-rate) data plans. This is especially true for mobile operators. It is already common practice (although rarely openly stated) for operators to throttle bandwidth in case of extreme data transfer volumes, and tiered pricing is the logical next step.

### Internet Commerce

755. Internet Commerce (or e-Commerce as it is often called) is one of the most important elements underpinning the business models of different internet players and applications. Although more under the scrutiny of financial rather than telecom regulation it is a widely used and accepted internet application and thus its trends should be understood by both operators and regulators.
756. E-Commerce has seen strong and consistent growth as the internet facilitates easy and convenient transactions. The CAGR of 17% seen over the past years is expected to continue with strong growth coming from Asia and, to a certain extent, Africa as mobile commerce (e.g. m-Pesa in Kenya) offers a viable alternative in the absence of established and well defined financial institutions.
757. E-Commerce covers a myriad of business strategies ranging from direct peer-to-peer payment, payment via financial intermediaries (banks, credit cards etc) as well as pure electronic options like BitCoin.
758. Peer-to-peer payments and online shops typically fall under the aegis of the financial regulations of nation states. Cryptocurrency options such as BitCoin have emerged into prominence as niche and independent platforms since 2012. These occupy a grey area since they are purposely positioned beyond the reach of regulators. They have proven to be volatile and difficult to track. Although to date only occupying a miniscule niche in the marketplace, Ebay's announcement that they intend to accept BitCoins as a payment method has reduced its reputation as a currency for illegal activities and increased its value significantly.

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<sup>105</sup> ABI Research 2013

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### Internet Services

759. Internet services relate to different applications where the end user device behaves more as a user interface rather than a computation and/or storage medium. These have become increasingly popular with advances in computing power, declining prices for storage, and the rise of cloud computing. Third party companies function as service providers providing elements such as Platform as a Service (PaaS) or Software as a Service (SaaS) functionality, functions which in legacy systems were an integral part of the offline device itself.
760. The perceived advantages stem from the fact that functionalities such as storage capacity, applications, computing power etc can be provided on an “on-demand” basis rather than once-off. For example: rather than buying a 500 GB hard-drive today, you could use cloud-based storage which can dynamically offer you storage capacity from 10GB to 100TB instantaneously - depending upon the user needs.
761. Current widely used services in this category include Dropbox and Microsoft Office 365. The market for these services is expected to experience steady growth in both the private and public sectors over the next decade as (and only as long as) cloud-based services gain customer trust. This cloud services space consists of many sub-segments covering both B2B and B2C markets with differing growth rates per segment and market size. Within the big ticket areas of Infrastructure, Platform, Applications
762. The segment employs several different business models – the specific models depend on the addressed segment (e.g. B2C versus B2B) and the features being offered. A non-exhaustive list includes:
- a. Free(mium): aimed at capturing a large user base especially during the growth phase of the business. This offers basic functionality – however additional features (such as increased storage space) are offered at a price.
  - b. Subscription based: the user pays a regular subscription fee to use the full feature set.
  - c. Usage based: especially for dynamic computing applications where the users pay depending upon task (e.g. computing sources required, time required to complete the task etc).
763. The service providers are adept at integrating these cloud solutions into the normal user environment, making offline/ online interaction as seamless as possible. In many cases they also lower the barriers to entry for new players who would have otherwise not been able to afford the high upfront costs of investments. Here, subscription and usage based models offer users the opportunity to scale based upon the performance of the business.
764. From a sheer usage perspective, cloud based services are increasingly relevant within private and small businesses where they offer similar features to large IT enterprises at a fraction of the cost. However, this is not without its risks since data is stored in the cloud and the provider security<sup>106</sup> and reliability of data availability may be unknown quantities.
765. These have a huge impact – fear of data theft and the dependence on reliable and resilient networks are worries which need to be addressed with high priority. This is even

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<sup>106</sup> <http://www.businessinsider.com/researchers-prove-dropbox-can-be-hacked-2013-8>

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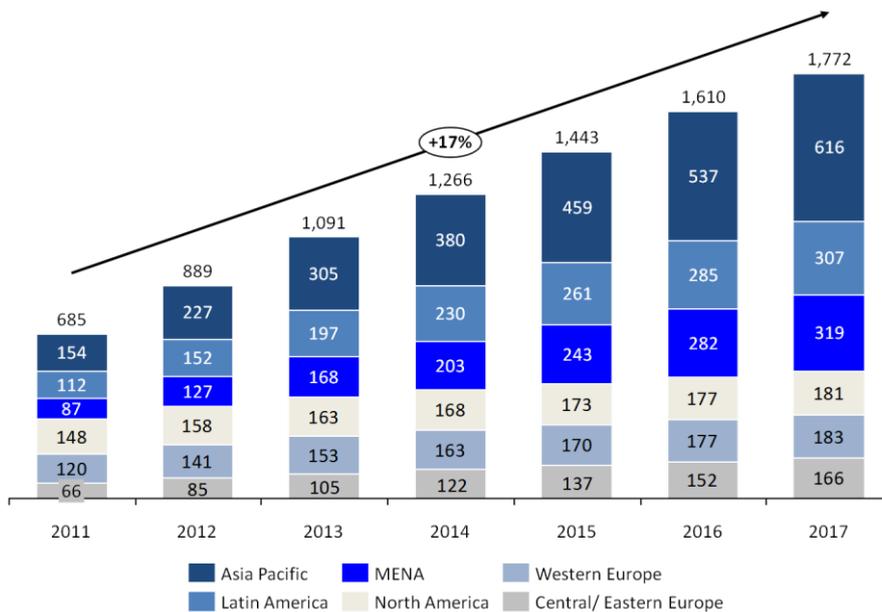
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more important for public enterprises which can reduce costs when data is stored in the cloud – but run the risk of having the systems infiltrated.

### Social Media

- 766. Social Media is perhaps the fastest growing consumer internet phenomenon today – led by Facebook, Twitter, LinkedIn and others who have secured a worldwide following within a relatively short time-span. Measured by the level of engagement (daily time spent online) and perceived from their sky-high valuations, social media is firmly established as a part of daily life.
- 767. A classification of these networks can be done on the basis of purpose and customer type (e.g. LinkedIn as a professional network, MySpace for music and content etc). It is important to note that this market is still evolving fast, with new players continuously emerging to challenge the market leaders.
- 768. Social Media is a global phenomenon which has emerged over the past decade. Asia Pacific is forecasted to have the highest growth rate (both in terms of user numbers and engagement) over the next decade. This is not surprising since China and India are being increasingly targeted. MENA and Africa also show strong growth.

**Figure 117: Facebook users – Global estimate<sup>107</sup>**



- 769. A majority of the Social Media firms use advertising as a major source of revenue. This is not surprising, since once users upload detailed profiles and use them as a basis for interaction, firms such as Facebook can engage in targeted advertisements. This has a greater dollar value from an advertiser’s perspective than conventional media (such as broadcast television). A minority of firms adopts alternative monetization routes such as

<sup>107</sup> www.eMarketer.com

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subscription based and a once-off fee – however, this remains the exception rather than the norm.

770. Another impact of Social Media is its use to gather people together for a common cause, enabling grass-roots movements to spawn within a very short time-span. While this is prevalent in most societies it also raises the possibility of manipulating public opinion through social media channels – for whatever purpose. This is very difficult to track and regulate given the relative anonymity of the channels.
771. Finally, there is the impact on the data traffic caused by these sites – and as data is becoming more and more graphic this is leading to a significant increase in bandwidth hungry data traffic around the world. It is important to note that not only is the amount of content increasing, the size per item (e.g. a photograph) is also increasing as new devices capture images or video in higher resolution.

### Other Internet applications

772. A broad range of internet applications exist outside the scope of what has already been addressed. Since the World Wide Web is so pervasive, it is impossible to categorize all the use cases. Those less easy to categorize include:
- Search engines such as Google and Yahoo;
  - News and information sources such as CNN and Al-Jazeera;
  - Crowd sourced content such as Wikipedia;
  - Gaming and gambling;
  - Adult sites and content.
773. If these sectors are considered together a few commonalities emerge
- Although the internet has numerous sites, the traffic is disproportionately distributed – a few big sites (e.g. Yahoo etc.) command a significant share of all traffic and links.
  - There is a large long tail catering to specific niches
  - An increasing number of sites carry video - which enriches the user experience but also significantly increases the bandwidth requirements at the backhaul.
774. The growth in the overall internet is commensurate with the number of users – which is now over a third of the world's population.
775. In many cases revenue from online sources has already bypassed those from traditional business – the internet simplifies international transactions.
776. The business models employed vary widely and depend heavily upon the market, customer segment and competition. Different approaches include
- Subscription based ( e.g. for online gaming platforms);
  - Transaction (e.g. for gambling);
  - Advertisements (e.g. for many news sites);
  - Donations (e.g. for many crowd funded platforms (such as Wikipedia));

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- Freemium (when basic feature sets are free and advanced functionalities have to be paid for).

#### Regulatory issues on Internet applications

777. IP technology separates the applications and services described in the use cases from the means of transport. At the transport level major changes have also taken place. The first stage of the internet revolution took place in the wireline environment – the web became available on laptops and PCs, applications such as OTT voice and eCommerce entered the home and the office.
778. The second stage is wireless, and is being driven by the emergence and increasing domination of smart phones. Previously inconceivable capabilities are offered by the internet and its applications to users wherever they are, and there is no end in sight. Market boundaries are breaking down and new players are entering the playing field with innovative business models that were technologically unthinkable until very recently.
779. The main regulatory *challenge is to provide a future-proof framework which maintains its relevance no matter how the market develops*. Key words here are technology-neutrality and ex-post rather than ex-ante regulation. Competitive imbalances between traditional providers and new market players must be evaluated and, as far as necessary and possible, be reflected in new regulation. Further, the effects of the convergence of the ICT and broadcasting markets must be examined. A further regulatory trend is towards simplification – the maxime of regulation is that it should only be applied where necessary, and as the markets develop this is less often the case.
780. Alongside facilitating the development of the communications market to the benefit of the country, the basic rights of individuals and society must also be protected by legal and regulatory measures. Finally, a vital aspect of regulation is that it should provide the market players with business security – they must be able to understand and trust the framework in which they work.

#### Issues related to the application use cases

##### OTT Communications

781. Generally, regulators have put increased focus on OTT communications. The main reason for this is that the operators are demanding a regulatory solution to their revenue difficulties and the policy makers are searching for the reason behind the lack of investment in broadband. The big regulatory question has been whether OTT communications are to be defined as telecom services (voice or data) or telecom infrastructure, and thus whether they should be subject to licencing and regulatory obligations (such as legal intercept and emergency call access) or not.
782. Generally, OTT communications make regulators concerned because they are perceived to be out of their control. As long as they are not regarded as telecoms services, the OTT communication providers also raise a security concern as they are not obliged to facilitate legal intercept. This has led to them being outright banned in a number of countries and to attempts to force the service providers to manage and maintain data traffic in other countries. These tactics have however met with limited success.

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783. Recent revelations that firms such as Microsoft (who now owns Skype) gave US governmental authorities access to their applications and data traffic have raised further security issues. Countries see their data sovereignty endangered, but have little leverage over the OTT providers which are registered abroad and thus out of jurisdictional reach.

#### OTT Media

784. This use case is mainly concerned with the distribution of videos and audio data. This is not a traditional subject for ICT regulation and illustrates a further issue concerning the organization of regulation - the need for a converged regulatory framework for converged service offerings.
785. In terms of the content being transmitted, copyright issues play an important role. Legacy laws regarding ownership, where content (e.g. DVD, CD) was bought once and then owned (and could be resold), are inappropriate for digital content. While a sizeable share of distributed content is still unauthorized (illegal uploads etc) the percentage of legal content is increasing – thanks in part to simpler, cost effective options offered by the OTT players, and available across multiple devices. Implementation of digital watermarks and limited distribution options have had limited impact. France has introduced tough legislation to try and deal with online transgressions concerning intellectual property rights – content providers are given two warnings and then their internet connection is blocked.
786. OTT media has also led to a well-publicised consumer protection problem: Most flat rate data plans have a limit on the maximum volume of data allowed, after which a (generally high) volume tariff or throttled transmission speed applies. As improved HD capable devices come on the market and better content is available the streaming of data means that these limits are quickly reached. This has led to cases of “bill-shock” – where users receive astronomical bills as a result of streaming data. How best to resolve this issue is presently an open debate.

#### eCommerce

787. In order to be able to participate in online commerce, individuals and organizations have to submit personal data online, which can be of great value to criminal elements. The number and methods of illegally accessing this data are growing rapidly, and the protection of consumer information is an important regulatory issue. Availability is also of great relevance here – interruptions in commercial transactions, or delays in time-relevant transactions, can be costly.
788. These issues can, on a larger scale, also become issues of national security. If hackers access the database of large enterprises, or the availability of the net for commerce is prevented for a significant length of time by a denial of service attack, the very stability of the economy may be endangered.
789. The convergence of communications and financial services lead here to the question of how to ensure that the requirements of the different regulatory authorities are combined into one joint path of action.
790. As not just honest citizens can benefit from eCommerce, a further national security issue here is that of surveillance (legal intercept). Where law enforcement agencies previously

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had warrants to examine the bank accounts of suspects, now access to online financial transactions is vital.

#### Cloud Services

791. The outsourcing of data storage and/or the use of Software/Infrastructure as a Service expose users to risks as they no longer have physical control of their assets. The resilience of the network is absolutely vital – loss of access to data, or its deletion, can endanger the survival of an enterprise. Where software or infrastructure is purchased as a cloud service this means that network down time is equivalent to down time for the entire company. These aspects represent most significant consumer protection issues.
792. Data protection is a further issue in this regard; access to the cloud by third parties must be prevented, and the regulator needs to assess whether this is an issue for them or for more general consumer protection legislation. Here again the convergence of different areas of responsibility (communications and data protection), may lead to the need of heightened coordination between different regulatory authorities.
793. Cloud services are often offered by providers which are located in another country. This may raise sovereignty questions which require adaptations in commercial law. Coordination between the different authorities may also be an issue here.

#### Social Media

794. Social media is playing a significant role in defining social interactions. Users are voluntarily disclosing personal data (photographs, preferences etc) which are then mined to serve targeted advertisements. This presents opportunities for new enterprises but at the same time raises concerns about privacy, ownership of data and longevity of data among others. Recent changes by Facebook and Google are examples of such issues – e.g. Google with its notification indicates that it would have the right to use an individual's photograph to endorse a product in advertising to others if the user has recommended a product elsewhere in their search.<sup>108</sup> Additional complexity arises from social media players' ever-changing terms of use in tandem with their lock-in effect – which forces many users to continue usage and give up ownership of their content. This issue of data portability must be given regulatory attention.
795. Social media sites have also been the target of sophisticated hacking attacks where personal details including credit card numbers have been stolen. Although hacking is a phenomenon not exclusive to social media, the large amount of personal data stored makes the trend here an especially worrying phenomenon.

#### Other applications

796. The proliferation of internet services is part of a large trend moving towards an online world. Many of these services are used for entertainment, information and commerce and have been subject to little or no regulation. Where regulatory concerns about the service providers simply host the site in “friendly” nations e.g. most gambling websites are hosted in small European and Asian countries with less stringent regulations. The

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<sup>108</sup> <http://www.onenewspage.com/n/Business/74w2qvnnf/Google-to-include-user-photos-in-web-advertising.htm>

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same is applicable for adult content. Due to the absence of any consistent world-wide standards, anyone with access to a VPN tunnel and an international credit card is able to access the website of his/ her choice – irrespective of the existing laws in their country of residence.

797. Three main regulatory issues. These will be looked at in detail to provide the basis for recommendations concerning regulatory action to be taken in the area of internet applications in the GCC region:
- a. Consumer security (covering privacy, information security, intellectual property rights, data portability);
  - b. Sustainable business models for telecommunications operators (covering liberalized trade rules, availability of the necessary IT infrastructure);
  - c. National security (covering information security, cybercrime measures).
798. These issues may have more or less relevance for the individual defined use cases. An overview is given in the table below.

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**Table 38: Summary of the major issues related to each internet application use case.**

	<b>Consumer security issues</b>	<b>Operator business model issues</b>	<b>National security issues</b>
<b>OTT Communications:</b> <ul style="list-style-type: none"> <li>▪ Voice: Skype, Viber</li> <li>▪ Messaging: WhatsApp</li> </ul>	<ul style="list-style-type: none"> <li>▪ Reconnaissance</li> <li>▪ Denial of Service</li> <li>▪ Loss of Privacy</li> <li>▪ Malware/Exploits</li> <li>▪ Social Engineering</li> </ul>	<ul style="list-style-type: none"> <li>▪ Uneven regulatory playing field</li> <li>▪ Revenue loss</li> </ul>	<ul style="list-style-type: none"> <li>▪ Online Surveillance/ LI</li> <li>▪ Content Regulation (e.g. Apps/Service Blocking)</li> </ul>
<b>OTT media</b> <ul style="list-style-type: none"> <li>▪ Video: Youtube, Vimeo, BBC iPlayer</li> <li>▪ Audio: Spotify, Pandora</li> </ul>		<ul style="list-style-type: none"> <li>▪ Uneven regulatory playing field</li> <li>▪ Investment insecurity</li> </ul>	<ul style="list-style-type: none"> <li>▪ Online Surveillance/ LI</li> <li>▪ Content Regulation (e.g. Service Blocking, Content Protection)</li> </ul>
<b>Content</b> <ul style="list-style-type: none"> <li>▪ Search</li> <li>▪ News/ articles</li> <li>▪ Crowd-sourced content</li> <li>▪ Informative content: regular websites</li> <li>▪ Gaming</li> <li>▪ User-generated content</li> </ul>	<ul style="list-style-type: none"> <li>▪ (Privacy)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Revenue loss</li> <li>▪ Investment insecurity</li> <li>▪ Loss of customer contact</li> </ul>	<ul style="list-style-type: none"> <li>▪ Online Surveillance/ LI</li> <li>▪ Content Regulation (e.g. Site and Content Filtering, Blocking)</li> </ul>
<b>Commerce</b> <ul style="list-style-type: none"> <li>▪ eCommerce</li> <li>▪ financial systems</li> </ul>	<ul style="list-style-type: none"> <li>▪ Data protection</li> <li>▪ Data security</li> <li>▪ Availability</li> </ul>		<ul style="list-style-type: none"> <li>▪ Online Surveillance/ LI</li> </ul>
<b>Services</b> <ul style="list-style-type: none"> <li>▪ Platforms: Dropbox, BOX</li> <li>▪ Applications: Office 365</li> </ul>	<ul style="list-style-type: none"> <li>▪ Data Protection</li> <li>▪ Data security</li> <li>▪ Availability</li> <li>▪ Data portability/kill functions</li> </ul>	<ul style="list-style-type: none"> <li>▪ Uneven regulatory playing field</li> <li>▪ Revenue loss;</li> <li>▪ Investment uncertainty</li> </ul>	<ul style="list-style-type: none"> <li>▪ Online Surveillance/ LI</li> <li>▪ Content Regulation (e.g. Content Filtering)</li> </ul>
<b>Social media</b> <ul style="list-style-type: none"> <li>▪ Web/ mobile: Facebook</li> <li>▪ Mobile/ IM: Twitter</li> </ul>	<ul style="list-style-type: none"> <li>▪ Loss of Privacy</li> <li>▪ Malware/Exploits</li> <li>▪ Social Engineering</li> </ul>	<ul style="list-style-type: none"> <li>▪ (Revenue loss)</li> <li>▪ (Investment uncertainty).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Online Surveillance/ LI</li> <li>▪ Content Regulation (e.g. Content Filtering, Blocking)</li> </ul>

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#### A5: List of acronyms

APN	Access Point Name
ARPU	Average Revenue Per User
Batelco	Bahrain Telecommunications Company B.S.C
BD	Bahraini Dinar
CR	Commercial Registration
DSL	Digital Subscriber Line
EC	European Commission
EU	European Union
FTTx	Fibre to the x (home, cabinet, node etc.)
Gbps	Gigabits per second
GCC countries	Gulf Cooperation Council countries
IP	Internet Protocol
ISL	International Service Licence
Kbps	Kilobits per second
LAN	Local Area Network
LLU	Local Loop Unbundling
LTE	Long Term Evolution
Mbps	Megabits per second
MVNO	Mobile Virtual Network Operator
NBN	National Broadband Network
NFWS	National Fixed Wireless Service
NGA	Next Generation Access
NGN	Next Generation Network
NRA	National Regulatory Authority
NTP	National Telecommunications Plan
Ofcom	Office of Communications (UK communications regulator)
OLO	Other Licensed Operator
PSTN	Public Switched Telephony Network
OTTs	Over The Top services
QoS	Quality of Service
RIO	Reference Interconnection Offer
RO	Reference Offer
RTN	Retail Tariff Notification
SLA	Service Level Agreements
SMP	Significant Market Power
SSNIP	Small but Significant Non-transitory Increase in Price
TRA	Telecommunications Regulatory Authority of the Kingdom of Bahrain
UK	United Kingdom
WDSL	Wholesale Digital Subscriber Line

#### **A6: List of stakeholder meetings**

799. The following stakeholders were interviewed as part of the strategic market review study:

- Batelco Bahrain;
- Viva Bahrain;
- Zain Bahrain;
- Mena Telecom;
- 2Connect;
- Viacloud;
- Kalaam;
- Lightspeed;
- Nuetel;
- Greenisis (Bahrain Broadband);
- Equant (Orange Business);
- e-Gov Authority;
- Economic Development Board ('EDB');
- Ericsson (Government & Industrial Relations); and
- Huawei