هيئة تنظيم الاتصالات
Telecommunications Regulatory Authority

The Regulation of Mobile Termination Services

Position Paper

1 February 2010

Ref: MCD/02/10/011

Public Version [✂ Redacted]

Purpose: To define the position of TRA on the regulation of mobile termination services.

Table of contents

List of Acronyms

BD	Bahraini Dinar
EC	European Commission
ERG	European Regulators Group
FTM	Fixed-to-Mobile
MNO	Mobile Network Operator
MMS	Multimedia Messaging Service
MTM	Mobile-to-mobile
MTRs	Mobile termination rates
OLO	Other licensed operator
SMS	Short Message Service
TRA	Telecommunications Regulatory Authority of the Kingdom of Bahrain

1. Introduction

1. This Position Paper defines the position of the Telecommunications Regulatory Authority ("TRA") on the regulation of termination services on mobile networks. More specifically, this Position Paper:

   - outlines the legal framework applicable for operators designated dominant in the provision of termination services on mobile networks;
   - discusses the rationale for regulating termination services;
   - describes the interconnection arrangements currently in place;
   - discusses how termination rates can be set to comply with the requirement of the Telecommunications Law promulgated by the Legislative Decree No.48 of 2002 ("Telecommunications Law") and the decision by TRA to develop its own bottom-up cost model;
   - sets out the position of TRA on symmetry; and
   - outlines how TRA intends to deal with the third mobile network operator ("MNO").

2. This Position Paper is issued at the same time as the Dominance Designation for termination services on individual mobile networks ("Dominance Determination") in which TRA has defined relevant termination markets, analysed competition therein and concluded that Batelco and Zain are dominant in their respective termination markets.

3. The Position Paper has three Annexes: the first one contains a benchmark of termination rates; the second one an empirical analysis of asymmetry of termination rates in Europe and the third one summarizes and addresses the comments received on the Draft Position Paper.

Consultative process

4. TRA issued for consultation a draft version of this Position Paper on 25 November 2008 (Ref MCD/11/08/094). TRA received responses from Batelco, Lightspeed Communications W.L.L. ("Lightspeed") and Zain. These submissions are available on the TRA website.

5. Annex 3 of this Position Paper summarizes and addresses the comments received.

What are wholesale termination services on mobile networks?

6. In order to provide retail mobile services, MNOs need various inputs. One such input is termination services. Wholesale call termination on mobile network is the service that allows the customer of a mobile network to call a customer of another mobile network. It is a wholesale service because it is sold and purchased by MNOs rather than retail customers. Without termination, customers of an operator would only be able to reach customers of the same network. In other words, wholesale termination is necessary for a communication between two customers of different networks (i.e. an "off-net" communication) but not for a communication between subscribers that belong to the same mobile operator (i.e. an "on-net" communication) in which case the input is self-supplied.

7. Wholesale termination on mobile networks is also relevant for customers of fixed networks calling customers of mobile networks as well as for off-net Short Message Services ("SMS") and Multimedia Messaging Services ("MMS"). Hence, it is also purchased by fixed operators for terminating fixed originated calls on mobile networks.

Why care about mobile termination rates?

8. TRA has the duty to promote effective and fair competition between new and existing operators and the protection of the interests of users in respect to pricing, availability, and quality of services offered[1].

9. MTRs constitute a significant element of the total cost of communications to mobile subscribers.[2] It is therefore important for TRA to address any market failure that can arise in the supply of mobile termination services and to ensure that the interests of consumers are protected.

10. The significance of mobile termination rates should not be underestimated. Mobile services represent approximately 50% of the total revenues of the telecommunications sector in Bahrain; total revenues stood at BD303M in 2008.[3]

11. Termination rates may also affect competitive dynamics between MNOs via their impact on Mobile-to-Mobile ("MTM") rates and on the retail pricing strategies deployed (e.g. high off-net rates or bundled free on-net minutes in post-paid packages) by MNOs.

2. Legal framework

12. According to the Telecommunications Law, operator(s) declared dominant in interconnection markets are imposed specific regulatory obligations, including the publication of an approved reference offer and the obligation to offer tariffs based on forward-looking incremental cost.

13. More specifically, Article 57(b) of the Telecommunications Law, which deals with interconnection, states:

> "A Public Telecommunications Operator determined by the Authority to have a Dominant Position in a particular Telecommunications market shall, within three months of such determination and every six months thereafter, publicise a reference Interconnection offer after obtaining the Authority's approval to such offer. Such offer shall include a full list of basic Interconnection services, conditions of Interconnection and the tariff for every service.
>
> The Authority may issue an order specifying the terms and conditions and the tariffs if it does not approve the contents of such offer in this respect, which order shall be effective from the date of issue, unless the Authority specifies another date.
>
> Such terms and conditions and **tariffs shall be fair, reasonable and non-discriminatory and the tariffs shall be based on forward-looking incremental costs** or by benchmarking such tariffs against tariffs in comparable Telecommunications markets." [emphasis added]

14. Until now, only Batelco was designated dominant for termination services and consequently had the obligation to prepare a reference interconnection offer setting rates for termination services on its mobile network.[4]

15. This contrasts with the situation for Zain, which, until the issuance of this Dominance Determination had no specific obligations with regards to its termination rates. According to Article 57(b) of the Telecommunications Law, within three months of the entry into

---

1 See Article 3 of the Telecommunications Law.

2 For example, in 2008, the termination rate of Batelco represented about 47% of the price of a 3 minute fixed-to-mobile ("FTM") call from the Batelco fixed network. Hence, other things being equal, high termination rates translate into higher retail prices to consumers for off-net mobile communications and for FTM calls.

3 See TRA, Telecommunications Services Indicators, June 2009, available at http://www.tra.org.bh/en/pdf/Telecommunications%20Markets%20Indicators%20Report%202008.pdf.

4 The relevant determination is the *Determination of Dominance in Interconnection Markets* issued by TRA the 9 August 2003. The latest tariffs are applicable since 1 October 2009.

force of the Dominance Determination, Zain will be required to submit for approval a reference interconnection offer.

16. Once Zain's reference interconnection offer is in place, the tariffs included therein will be available to all licensed operators.

3. Rationale for the regulation of termination rates

17. Whilst the legal framework in place is clear with regard to the obligations that flow from a dominance designation, it is useful to outline the reasons for regulating termination rates.

18. The rationale for regulating termination rates is to ensure that they are set at an efficient level, consistent with economic efficiency brought about by competition. In the absence of regulation, MNOs face no pressures on termination rates. They have the ability and incentive to set high termination rates. They also have no incentives to keep cost down. If left unregulated, MTRs would most likely be set above cost and this would lead to excessive prices overall. Termination rates set at levels in excess of cost would lead to distortions of competition and be detrimental to consumers. This is consistent with the economic literature on MTRs discussed below.

19. Until recently (see below), the economic literature was somewhat inconclusive with regard to the level of MTRs at equilibrium between competing MNOs. A series of papers concluded that high MTRs could be an instrument to foster a collusive outcome.[5] As this would lead to charges being set at the monopoly level, it would be detrimental to consumers. By contrast, Gans and King (2001), demonstrated that by negotiating low MTRs (i.e. below cost), competing MNOs could soften competition at the retail level.[6] By reducing the benefits of attracting new subscribers, below cost MTRs would reduce the intensity of competition for retail customers. Those contrasting findings rest on two main assumptions: whether there is on-net / off-net price discrimination and whether consumers face linear prices on a per call or per minute basis.

20. However, a recent paper by Armstrong and Wright (2008), which build on and expand previous models, demonstrates that MNOs of similar sizes will set MTRs above cost, but below the monopoly level.[7] The model takes into account both network and call externalities. The intuition is that by setting MTRs below the monopoly level, competing operators avoid the intensification of competition through network effects (or more precisely restricted club effects), which are themselves generated by on-net / off-net price discrimination. However, where MNOs have asymmetric sizes, the larger MNOs may prefer to reinforce network effects by increasing MTRs with a view to make it harder for the small MNO to compete. This may also be true when faced with the threat of new market entry.

21. Competition issues and distortions may also arise as a result of high MTRs. With regards to off-net / on-net price discrimination, since operators seek to minimise interconnection payments, the greater the MTRs are relative to costs, the larger the incentives to price discriminate between off-net and on-net tariffs. Large off-net / on-net price discounting may raise competition issues, especially at a time when a new entrant is about to enter the market as off-net / on-net discounting tends to favour operators with large customer bases.[8]

---

5 See, Laffont, Rey and Tirole,1998, "Network Competition: I. Overview and Nondiscriminatory Pricing," Rand Journal of Economics, 29(1), 1—37; Armstrong, 1998, "Network Interconnection in Telecommunications," Economic Journal, 108(448), 545—564; and Carter, M. and J. Wright (1999), "Interconnection in Network Industries," *Review of Industrial Organization*, 14 (1), pp.1-25.

6 Gans and King, 2001, "Using 'Bill and Keep' Interconnect Agreements to Soften Network Competition," Economics Letters, 71(3), 413—420.

7 Armstrong, and Wright, 2008, Mobile Call Termination, MPRA Paper No. 9866, July, available at: http://mpra.ub.uni-muenchen.de/9866. They also show that with a large number of MNOs, MTRs will be set at the monopoly level.

8 See TRA, Draft Competition Guidelines, 4 November 2008, Section 4.9.

22. Incumbent MNOs could also set discriminatory MTRs (i.e. higher MTRs) to a new entrant, though TRA appreciates that the possibility for the new entrant to transit through Batelco fixed network for terminating traffic on existing MNOs would reduce the extent to which MNOs can price discriminate.

23. Too high termination rates can also lead to distortions and hence to an inefficient allocation of resources. It distorts consumer choices and affects competition between fixed and mobile networks as higher than necessary termination rates inflate the cost base of fixed networks.

24. The effect of regulation on MTRs can be seen in Figure 1. Between 2004 and 2009, termination charges for voice and SMS on the Batelco mobile network have declined by 48% and 89% respectively. This represents a decrease of respectively 12% and 35% on average per annum. By international standards, the level of MTRs in Bahrain compares well (See Annexe 1 below for a benchmark with European countries and Australia and New Zealand).

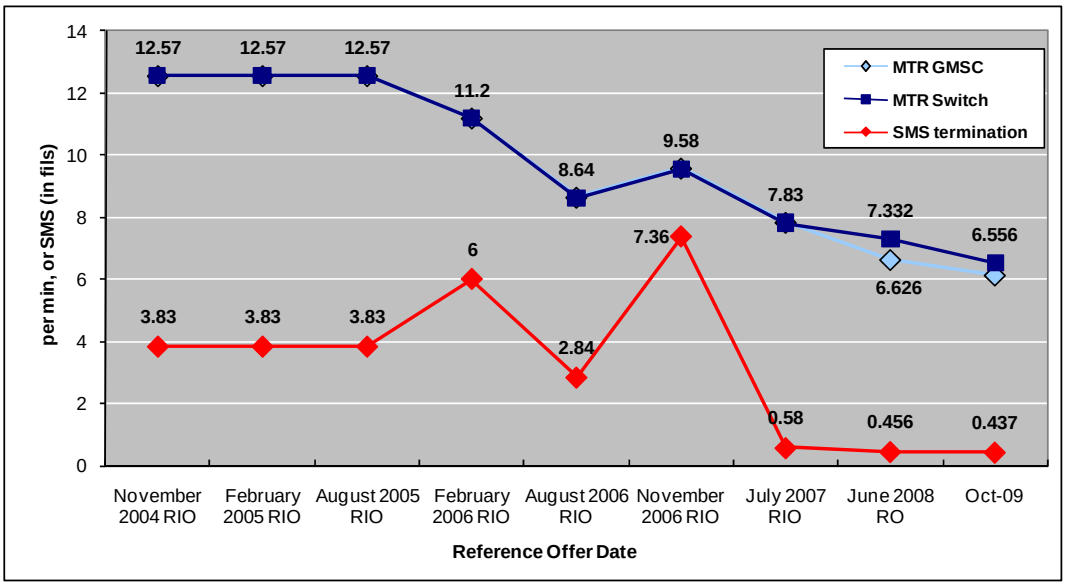

Figure 1: The evolution of regulated termination rates on Batelco's mobile network

25. The decision by TRA to regulate the MTRs of incumbent MNOs is consistent with the regulatory treatment of MTRs in Europe, where voice call termination on individual mobile networks is included in the list of relevant markets susceptible to ex-ante regulation.[9]

4. Interconnection arrangements in place

26. In terms of interconnection arrangements in place, TRA understands that Batelco and Zain interconnect directly and that a few Other Licensed Operators ("OLOs") also interconnect directly with Zain. OLOs have direct interconnection agreements with

[9] EC, Commission Recommendation on relevant product and service markets within the electronic communications sector susceptible to ex-ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services, C(2007) 5406 rev 1. MTRs met the three cumulative criteria set used by the EC. The three criteria are: high and non-transitory barriers to entry; no tendency towards effective competition; and insufficiency of competition law to address market failure identified.

Batelco. OLOs, which do not have direct interconnection with Zain, use Batelco as a transit operator to terminate traffic on Zain's network, whereby Batelco pays Zain for termination and charges OLOs a transit and termination charge.

27. Interconnection agreements with Zain are governed by commercial terms. In January 2005, TRA issued a Determination settling an interconnection dispute between Batelco and Zain.[10] This Determination set out, inter alia, the termination rate on Zain's network applicable to Batelco until 31 December 2005 and discussed the issue of asymmetric rate.[11] On 29 January 2006 Batelco and Zain signed a supply agreement which, inter alia, set interconnections rates. **[✂]**

28. Whilst STC has yet to enter the market, it has already signed an interconnection agreement with Zain according to which **[✂]**. STC and Batelco signed a **[✂]**.

5. Setting termination rates

29. In accordance with the Telecommunications Law, the interconnection products of dominant operators must be based on forward-looking incremental costs. Article 57(b) of the Telecommunications Law states:

> "Such terms and conditions and **tariffs shall be fair, reasonable and non-discriminatory and the tariffs shall be based on forward-looking incremental costs** or by benchmarking such tariffs against tariffs in comparable Telecommunications markets." [emphasis added]

30. The rationale for including this pricing principle in the Telecommunications Law is that cost-based pricing is welfare enhancing, promotes efficient investment decisions and the development of competition.[12] It gives efficient price signals to the market and leads to an efficient allocation of resources as buyers only pay for the cost they cause. Excessive profits and monopoly rents are not passed on to consumers and hence there are no distortions of consumption. Cost-based prices are consistent with what can be expected in a competitive market.

31. Setting cost based termination rates necessitates the development of cost models. Two main types of models can be used to derive incremental costs.[13] Top-down models use cost accounting data of the operator under consideration, expressed typically in current cost terms, and allocate only costs incremental to the relevant services. Top-down models reflect existing networks, which may or may not reflect efficient network operations.

---

10 TRA, 2005, Determination issued by the Telecommunications Regulatory Authority to Bahrain Telecommunications Company B.S.C and MTC Vodafone (Bahrain) B.S.C pursuant to Article 57(g) of the Telecommunications Law, 3 January 2005.

11 The period applicable for the rate set in the January 2005 was amended by the Determination of 4 of 2005 issued by the Telecommunications Regulatory Authority Amending Determination 1 of 2005 issued on 3 January 2005 to Bahrain Telecommunications Company B.S.C and MTC Vodafone (Bahrain) B.S.C pursuant to Article 57(g) of the Telecommunications Law, 21 November.

12 This holds when there are no externalities (See Armstrong, 1998, and Laffont, Rey, Tirole, 1998, reference in footnote 5 at page 3). Departure from cost orientation may be warranted where there are externalities, and when these are significant. In the case of MTRs, network externalities, may warrant a mark-up above cost, in recognition for the social benefits that a large diffusion of mobiles services give rise to. Network externalities are significant where mobile penetration is increasing rapidly but are much less so in saturated markets. Conversely, the presence of call externality (i.e. the fact that the called party may derive a benefit from receiving a call but is not charged for receiving a call under the calling party pay principle) may justify below cost MTRs in order to internalise this externality. Combined together, the relative magnitude of these two externalities may warrant above or below cost MTRs. The implementation of any departure from the competitive benchmark, i.e. cost based MTRs, is complex and requires detailed information.

13 For an overview of cost modeling issues for setting MTRs and the relative advantages and disadvantages of the various modeling approaches, see e.g. GSMA/PWC, The setting of mobile termination rates: Best practice in cost modeling, London.

32. By contrast, bottom-up models are engineering models which use network dimensioning rules and actual demand to estimate the costs of an efficient modern equivalent network. Thus, a bottom-up model involves a greater degree of optimization than achievable with top-down models. These two types of models are often used in conjunction. Top-down models tend to produce higher unit cost than bottom-up models.

33. As a dominant MNO, Batelco has developed a top-down cost model which calculates the long-run incremental cost of termination services (inclusive of a contribution for common costs) based on current costs. The results of this model are used by TRA during the approval/ordering process for the Batelco reference interconnection offer. Operators typically prefer to develop top-down cost models using their accounting cost information as these models are more easily reconcilable with their statutory accounts and reflect closely the cost associated with their network topologies.

34. TRA intends to develop its own bottom-up cost model of a generic efficient MNO in Bahrain in 2010 to set the level of termination rates applicable to the two regulated MNOs going forward. Other sources of information available (i.e. the output of Batelco and Zain cost models) will also be considered.

35. TRA's decision to use a bottom-up model to set termination rates is fully consistent with the Telecommunications Law and TRA's duties to promote competition and to protect consumers. The Telecommunications Law requires interconnection rates to be based on forward-looking incremental cost and to be fair, reasonable and non-discriminatory. In other words, purchasers of termination services, and ultimately consumers should face MTRs which are based on efficient costs. If legacy costs and other inefficiencies could be recovered from purchasers of termination, operators would have little, if any, incentive to be more efficient and reduce cost. MTRs would neither be fair nor reasonable.

36. Top-down and bottom-up models have each their relative strengths and weaknesses. However Batelco's top-down model, like any other such models, suffers from a lack of transparency which makes the identification and correction of potential inefficiencies particularly challenging. It also reflects actual cost incurred and the network of Batelco which may or may not represent efficient cost. In comparison bottom-up models are specifically built to calculate costs based on an efficient network and hence to enable the setting of fair and reasonable termination rates. Where the rate of technological change is rapid, estimating forward-looking costs require valuing assets at current costs, using modern equivalent technologies and network design rules, and considering expected demand. The costs estimated in this way through bottom-up models are consistent with the costs that a new entrant would incur today. This ensures that historical inefficiencies are not passed on to consumers in the form of higher prices.

37. It is important that rates are based on efficient costs in so far as all other things being equal, higher than necessary termination rates lead to welfare loss. Termination rates based on efficient cost facilitate the development of competition for fixed to mobile and mobile to mobile calls, which in turn would benefit consumers. They also facilitate the emergence of converged offers.

38. TRA's decision to construct a bottom-up cost model is consistent with the practice of regulators and the general move towards greater reliance on bottom-up models in Europe for instance.[14] Bottom-up models are generally preferred by regulators because they rely less extensively on confidential information of incumbent operators; are more transparent; and more importantly allow the cost of an efficient operator to be modelled.

---

[14] For example, in its latest "Recommendation on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EU", 7 May 2009, the EC indicates that termination rates should be based on forward looking cost estimated using bottom-up cost models. The EC also specifies the definition of the relevant increment to be used in calculating long run incremental cost. The increment is defined as wholesale terminating traffic. The question of the relevant increment would be consulted upon at a later stage as part of the consultation on the model specification.

Bottom-up models are also more flexible and amenable to sensitivity analysis. They give regulators a better understanding of cost and cost drivers

39. TRA's bottom-up cost model will be developed in consultation with the industry through a consultative process.

6. The position of TRA on symmetry

40. Termination rates can be symmetric or asymmetric. As explained above and in line with Article 57(b) of the Telecommunications Law, TRA considers that MTRs should be based on the forward-looking costs of an efficient network operator. It follows that MTRs should be symmetrical unless there are objective and material cost differences which are outside the control of operators. Further TRA considers that asymmetry can only be considered for a transitory period in two specific cases (see below).

41. Without prejudging the reference interconnection offer submission of Zain, TRA is of the view that Zain will not qualify for asymmetric rates. There are a priori no compelling justifications for asymmetric rates between Batelco and Zain. The rationale for this position is explained below.

42. In its 2005 Determination settling the dispute between Batelco and Zain referred to above, TRA based Zain termination rate on Batelco's approved rate of the time to which an uplift factor was added.[15] TRA justified this asymmetry on the basis of the incumbency advantages enjoyed by Batelco at that time. TRA also made it clear that asymmetry was only justified so long as Batelco enjoyed such advantages.

43. Consistent with international practice, TRA considers that there are two configurations that could justify asymmetric rates on a transitory basis.[16] First, differences in spectrum allocation may justify asymmetric rates. Typically, the use of 1800 MHz spectrum is more expensive since more base stations are required to achieve the same geographical coverage - although this depends on the characteristics of the territory covered. Hence it may give rise to differences in unit cost beyond the control of operators. However, this issue does not justify any differential of termination rates between Zain and Batelco since both operators have broadly a similar mixture of 900 MHz and 1800MHz.

44. Second, incumbency advantages may warrant a transitory asymmetry. The argument is that differences between MNOs in entry date give established MNOs incumbency advantages over new entrants. Entry into the mobile market involves large fixed costs, especially as a new entrant needs sufficient coverage to attract customers. However, a new entrant has initially a smaller customer base over which to spread its fixed costs. This results in higher unit cost and lower economies of scale achievable, at least initially. A new entrant may also command a higher cost of capital initially. In the case of Zain, TRA considers that a late market entry type of argument can no longer justify higher termination rates. Zain entered the market as a second MNO in late 2003 and has a market share of [40%-50%]. Asymmetric rates based on incumbency advantages can only be temporary as otherwise operators would have incentives to remain small. The inability to gain market share could only be admissible if due to exogenous factors.

45. The position of TRA on symmetry is consistent with the provisions of the Telecommunications Law included Article 57(b) which states that different termination rates may be acceptable only "where objectively justifiable **on the basis of the type of Interconnection provided**"[Emphasis added]. Differences in the type of interconnection include for example fixed vs. mobile interconnection; single vs. double tandem

---

15 See reference in footnote 10 page 3.

16 See EC, Commission Recommendation of 7 May 2009 on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EU and ERG, ERG's Common Position on symmetry of fixed call termination rates and symmetry of mobile call termination rates, 2008

interconnection for fixed networks. Differences in the type interconnection reflect differences in the service provided which may impact the relevant cost stack and may therefore have to be reflected in termination rates.

46. The position of TRA on symmetry is also consistent with developments in Europe where asymmetry of MTRs is in the process of being phased out. Annexe 2 below provides an empirical analysis of the level of asymmetry of MTRs in Europe.

47. Asymmetric rates can be problematic as large asymmetries heighten the incentives for on-net off-net price discrimination which is likely to result in large differentials in retail prices. In turn, those large differentials adversely impact the ability of smaller operators to compete with on-net plans of the larger networks. This may create competition issues and hinder the growth of the new entrant. By contrast, cost based symmetrical rate are more prone to facilitate competition between MNOs.

7. Third mobile network operator

48. On 16 September 2008, TRA launched a process to issue a third mobile license which resulted in the award of a third mobile license to STC in early 2009. TRA considers that the MTRs of the 3rd MNO should be subject to commercial negotiations (based upon the principles outlined in article 57 of the Telecommunications Law) in the first instance. If commercial negotiations fail, the parties could request TRA to resolve an interconnection dispute pursuant to Article 57(g) and other general provisions of the Telecommunications Law.

49. TRA considers that its position on setting termination rates and asymmetry articulated above offers adequate guidance to negotiating parties regarding what TRA may view as appropriate MTRs.

50. Whilst the approach of TRA to market definition for termination services and the analysis of competition therein could lead to a conclusion that the forthcoming 3rd MNO should be declared dominant for termination services on its own network and its MTRs should be regulated, TRA is of the view that doing so would be premature and unjustified. TRA considers that STC should remain outside the scope of the Dominance Determination for the time being. This approach is consistent with the treatment of Zain in 2003. Subsequent to the initial Interconnection Dominance Determination of 2003 Zain[17] remained unregulated for a certain period until an adjustment to the regulatory framework was necessary. TRA is of the view that a similar approach is appropriate for STC. TRA notably notes that since STC has yet to launch services there is no wholesale market for termination on its network. Consequently STC cannot be designated as a dominant operator.

[17] TRA, *Determination of Dominance in Interconnection Markets*, 9 August 2003

Annexe 1: Benchmark of MTRs

51. MTRs in Bahrain are low compared to MTRs in other countries (See Figure 2 below). There are several potential explanations for this favourable comparison.

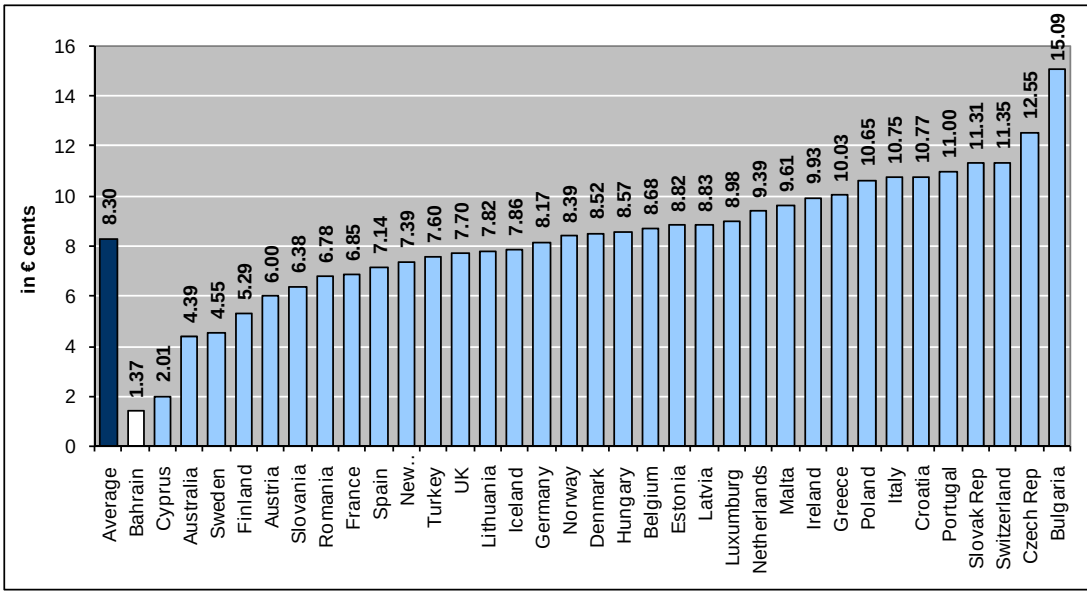

Figure 2 MTRs Benchmark (in € cents)[18]

52. First, since the opening of the mobile market to competition with the entry of Zain in late 2003, Batelco's MTRs have been set based on the cost of the Batelco top-down model. This contrasts with MTRs in European countries which historically had not been regulated and were well above cost. They are now progressively being brought in line with underlying costs through the use of glide paths. The implementation of the EC recommendation on the regulatory treatment of mobile and fixed termination rates will accelerate drastically this process.

53. Second, the low rates suggest that MNOs are able to realise very substantial economies of density, given the relative small size, the high density and concentration of population in Bahrain. Thus, Bahraini MNOs appear to have intrinsically low unit cost thanks to the characteristics of the geography of the country.

54. Similarly, SMS termination rates compares favourably with other European countries (See Figure 3below).

[18] Source: See table below.

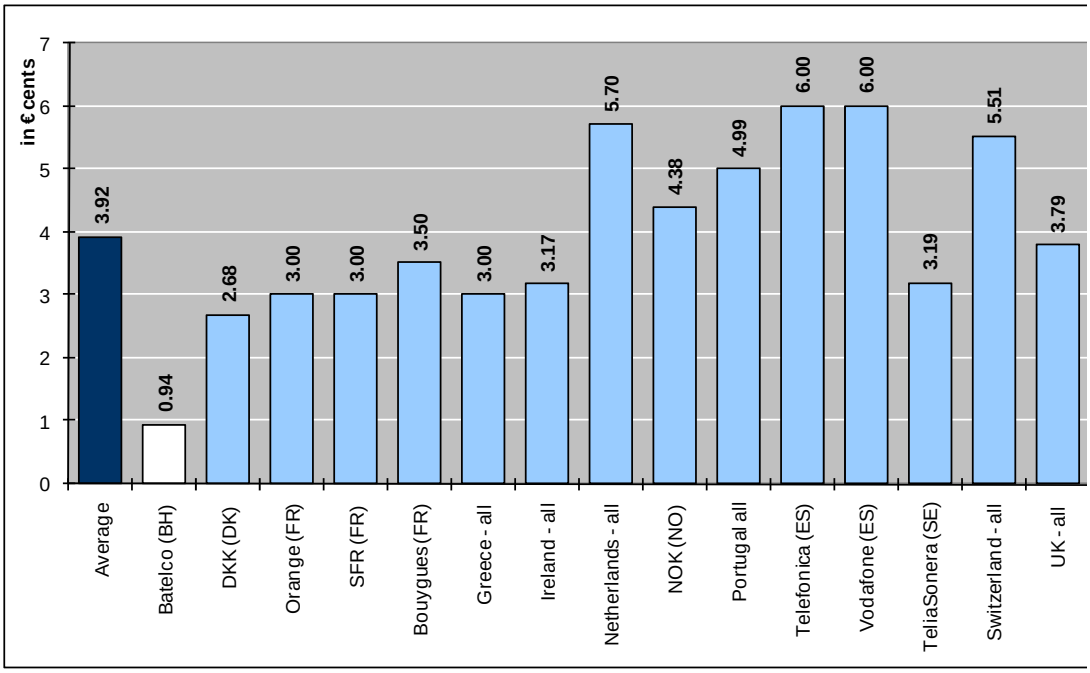

Figure 3 SMS termination rates Benchmark (in € cents)[19]

Country	Operator	SMS termination € cent per SMS	Date	SMS termination per SMS	Currency	Forex
Bahrain	Batelco (BH)	0.94	Jul-08	0.456	Fils BD	2.07
Denmark	DKK (DK)	2.68	Sep-08	2.68	€ cents	1
France	Orange (FR)	3.00	Sep-08	3	€ cents	1
France	SFR (FR)	3.00	Sep-08	3	€ cents	1
France	Bouygues (FR)	3.50	Sep-08	3.5	€ cents	1
Greece	Greece - all	3.00	Sep-08	3	€ cents	1
Ireland	Ireland - all	3.17	Sep-08	3.17	€ cents	1
Netherlands	Netherlands - all	5.70	Sep-08	5.7	€ cents	1
Norway	NOK (NO)	4.38	Sep-08	4.38	€ cents	1
Portugal	Portugal all	4.99	Sep-08	4.99	€ cents	1
Spain	Telefonica (ES)	6.00	Sep-08	6	€ cents	1
Spain	Vodafone (ES)	6.00	Sep-08	6	€ cents	1
Sweden	TeliaSonera (SE)	3.19	Sep-08	3.19	€ cents	1
Switzerland	Switzerland - all	5.51	Sep-08	5.51	€ cents	1
UK	UK - all	3.79	Sep-08	3.79	€ cents	1
Average		3.92				
Median		3.50				

Source: Cullen International September 2008 for SMS termination rates and www.oanda.com for Forex

Table 1: Benchmark data for SMS termination rates

[19] Source: see table below.

Country	Average MTR in € cent/min	Average MTR per min	Currency	Source	Date	Forex use
Bahrain	1.37	0.006626	BD	Reference Offer	Jul-08	2.0
Cyprus	2.01	0.0201	€	ERG (08) 41 final MTR Snapshot 081020	Jul-08	1
Australia	4.39	0.09	AUS$	ACCC MTAS Pricing Principles Determination Nov 200	Jul-07	0.4880
Sweden	4.55	0.0455	€	ERG (08) 41 final MTR Snapshot 081020	Jul-08	1
Finland	5.29	0.0529	€	ERG (08) 41 final MTR Snapshot 081020	Jul-08	1
Austria	6.00	0.06	€	ERG (08) 41 final MTR Snapshot 081020	Jul-08	1
Slovenia	6.38	0.0638	€	ERG (08) 41 final MTR Snapshot 081020	Jul-08	1
Romania	6.78	0.0678	€	ERG (08) 41 final MTR Snapshot 081020	Jul-08	1
France	6.85	0.0685	€	ERG (08) 41 final MTR Snapshot 081020	Jul-08	1
Spain	7.14	0.0714	€	ERG (08) 41 final MTR Snapshot 081020	Jul-08	1
New Zealand	7.39	0.16	NZ$	NZCC MTR issues paper 8 August 2008	Aug-08	0.46
Turkey	7.60	0.076	€	ERG (08) 17 MTR update snapshot final 080604	Jan-08	1
UK	7.70	0.077	€	ERG (08) 41 final MTR Snapshot 081020	Jul-08	1
Lithuania	7.82	0.0782	€	ERG (08) 41 final MTR Snapshot 081020	Jul-08	1
Iceland	7.86	0.0786	€	ERG (08) 41 final MTR Snapshot 081020	Jul-08	1
Germany	8.17	0.0817	€	ERG (08) 41 final MTR Snapshot 081020	Jul-08	1
Norway	8.39	0.0839	€	ERG (08) 41 final MTR Snapshot 081020	Jul-08	1
Denmark	8.52	0.0852	€	ERG (08) 41 final MTR Snapshot 081020	Jul-08	1
Hungary	8.57	0.0857	€	ERG (08) 41 final MTR Snapshot 081020	Jul-08	1
Belgium	8.68	0.0868	€	ERG (08) 41 final MTR Snapshot 081020	Jul-08	1
Estonia	8.82	0.0882	€	ERG (08) 41 final MTR Snapshot 081020	Jul-08	1
Latvia	8.83	0.0883	€	ERG (08) 41 final MTR Snapshot 081020	Jul-08	1
Luxemburg	8.98	0.0898	€	ERG (08) 41 final MTR Snapshot 081020	Jul-08	1
Netherlands	9.39	0.0939	€	ERG (08) 41 final MTR Snapshot 081020	Jul-08	1
Malta	9.61	0.0961	€	ERG (08) 41 final MTR Snapshot 081020	Jul-08	1
Ireland	9.93	0.0993	€	ERG (08) 41 final MTR Snapshot 081020	Jul-08	1
Greece	10.03	0.1003	€	ERG (08) 41 final MTR Snapshot 081020	Jul-08	1
Poland	10.65	0.1065	€	ERG (08) 41 final MTR Snapshot 081020	Jul-08	1
Italy	10.75	0.1075	€	ERG (08) 41 final MTR Snapshot 081020	Jul-08	1
Croatia	10.77	0.1077	€	ERG (08) 41 final MTR Snapshot 081020	Jul-08	1
Portugal	11.00	0.11	€	ERG (08) 41 final MTR Snapshot 081020	Jul-08	1
Slovak Rep	11.31	0.1131	€	ERG (08) 41 final MTR Snapshot 081020	Jul-08	1
Switzerland	11.35	0.1135	€	ERG (08) 41 final MTR Snapshot 081020	Jul-08	1
Czech Rep	12.55	0.1255	€	ERG (08) 41 final MTR Snapshot 081020	Jul-08	1
Bulgaria	15.09	0.1509	€	ERG (08) 41 final MTR Snapshot 081020	Jul-08	1
Median	8.46					
Average	8.30					

Note: Exchange rates were sourced from www.oanda.com; ERG rates are weighted average rate by market share based on 3 minutes calls.

Table 2: Benchmark data for MTRs

Annexe 2: Analysis of symmetry of MTRs in Europe

55. The move towards symmetrical rates have been strongly advocated by the European Commission ("EC") which issued a Recommendation in May 2009 whose aim is to remove any asymmetry and have symmetrical MTRS based on efficient LRIC of wholesale termination estimated by bottom-up models by end 2012.[20] Similarly, the European Regulator Group ("ERG"), in its Common Position on MTRs concluded that "termination rates should normally be symmetric and asymmetry, acceptable in some cases, requires an adequate justification".[21]

56. According to the ERG, out of a total of 84 MNOs, 47% had asymmetric rates in 2004. By January 2007, this proportion had dropped to 39%. In the same period, the average asymmetry dropped from €c1.4 to €c0.9. MNOs that entered the market with a three to five year delay had MTRs which were on average 17% higher. For MNOs with a six to eleven year market entry delay, the asymmetry was 35% on average.

57. Those findings are consistent with the empirical analysis of TRA of MTRs applicable in 2008 (Table 3). On average the asymmetry between the largest and second largest MNO in Europe is €c0.36 in absolute terms and 4.55% in relative terms. The asymmetry between the market leader and the third MNO is €c1.57 in absolute terms and 20.59% in relative terms while the asymmetry between the market leader and the fourth MNO is €c3.97 and 43.11% respectively.

Asymmetry	Between 1st and 2nd MNO			Between 1st and 3rd MNO			Between 1st and 4th MNO		
Country	Absolute in € cent	Relative in %	Combined market share	Absolute in € cent	Relative in %	Combined market share	Absolute in € cent	Relative in %	Combined market share
Austria	0.08	1.4%	74%	0.70	12.2%	95%	2.04	36%	100%
Belgium	1.82	25.3%	77%	4.23	58.8%	100%			
Denmark	0	0%	75%	0	0%	96%	4.02	48%	100%
Finland	0	0%	79%	0.90	17.6%	100%			
France	0	0%	83%	2.00	30.8%	100%			
Germany	0	0%	71%	0.98	12.5%	86%	0.98	13%	100%
Greece	0.52	5.3%	71%	0.02	0.2%	100%			
Ireland	-0.66	-5.6%	77%	3.71	31.2%	96%	5.89	50%	100%
Italy	0	0	73%	0.66	7.5%	91%	7.41	84%	100%
Luxembourg	0	0	89%	2.50	28.4%	100%			
Netherlands	1.40	15.6%	79%	0	0%	100%			
Norway	1.11	17.4%	100%	6.61	103.4%	100%			
Portugal	0	0%	83%	1.60	20.0%	100%			
Spain	-1.28	-14.1%	77%	0.32	3.5%	99%	3.75	41%	100%
Sweden	0	0%	76%	0	0%	94%	0	0%	100%
Switzerland	2.53	25.0%	81%	2.53	25.0%	100%	11.33	112%	100%
UK	0.53	7.2%	51%	-0.08	-1.1%	73%	0.35	5%	95%
Average	**0.36**	**4.55%**		**1.57**	**20.59%**		**3.97**	**43.11%**	
Median	**0**	**0%**		**0.90**	**13%**		**3.75**	**41%**	

Source: TRA analysis based on Cullen International September 2008 for MTRs and Mobile Communications Europe for market shares 15 April 2008

Table 3 Analysis of asymmetry of MTRs in Europe

20 See reference above in footnote 14 page 10.

21 ERG, 2008, ERG's Common Position on symmetry of fixed call termination rates and symmetry of mobile call termination rate, page 82.

Annex 3: Summary of responses received and TRA's conclusions

58. This Annex summarizes and addresses the comments received. It also highlights the changes made by TRA to the final Position Paper based on the submissions received. TRA received submission from Batelco, Lightspeed and Zain.

59. Based on the submissions received, TRA has not modified its position on the key elements contained in the Draft Position Paper. However, as a result of the comments, TRA has amended slightly the text of the Position Paper to better articulate its position regarding: the necessity for termination rates to be based on the cost of an efficient network in line with Article 57 of the Telecommunications Law; the vital role of bottom-up models to achieve this objective; and symmetry of MTRs.

Respondent	Comments received	TRA's view & position
Batelco		
	Supports appropriate regulation of MTRs based on dominance determination as proposed by TRA.	Noted
	<u>MTRs and cost standard</u> Does not support TRA's proposed additional intervention of imposing a bottom-up LRIC cost standard which would equates, according to Batelco, to a further reduction in MTRs. Approach proposed in the Position Paper is unsound because, according to Batelco, TRA is proposing to adopt the cost standard advocated by the EC (the so-called "pure incremental cost") which would lead to below cost pricing for MTRs since it does not include a contribution for common costs. TRA is also proposing an unrealistic efficiency standard. Batelco contends that rate will decrease by 30% Batelco does not agree that a bottom-up model should be used given the existence of the Batelco top-down-LRIC model, the level of MTRs, and the relative advantages and disadvantages of each type of cost model.	In the Draft Position Paper TRA made no reference to the cost standard that may be used going forward to set MTRs. This issue will be consulted upon in a subsequent consultation on the TRA's bottom-up cost model specification. TRA notes that the definition of the relevant increment is subject to interpretation as the Telecommunications Law does not provide a definition of incremental cost. Article 57 of the Telecommunications Law requires interconnection rates to be based on forward-looking incremental cost and to be fair, reasonable and non-discriminatory. In other words, purchasers of termination services, and ultimately consumers should face MTRs which are based on efficient costs. This is because if legacy costs and other inefficiencies could be recovered from purchasers of termination, operators would have little, if any, incentive to be more efficient and reduce cost. MTRs would not be fair. Other

	Batelco argues that TRA has not justified the use of a bottom-up model given that the current top-down model of Batelco is achieving regulatory objectives. Batelco argues that TRA "needs to demonstrate against a set of transparent and economically sound criteria, why a bottom-up LRIC approach coupled with the MEA asset valuation would be more efficient than what Batelco's top-down LRIC current cost-based model". TRA has not provided any arguments or evidence that could logically or theoretically justify switching to a bottom-up LRIC model. Batelco discusses in great length detailed cost modelling issues, such as the relevant MEA technology. Batelco contends that MTRs are already set at the efficient level because: (i) they are based on Batelco's top-down model; (ii) they have been accepted as "efficient" by Zain through commercial negotiations. Batelco argues that TRA has not provided any evidence that bottom-up LRIC models would lead to further customer welfare improvements or more efficient rates. Batelco claims that a pure LRIC approach would lead to lower consumer welfare and higher retail prices.	things being equal, higher than necessary termination rates lead to welfare loss. Termination rates based on efficient cost facilitate the development of competition for fixed to mobile and mobile to mobile calls as well as the emergence of converged offers. Overall they lead to consumer welfare improvements. As Batelco points out top-down and bottom-up models have each their relative strengths and weaknesses. However Batelco's top-down model, like any other such models, suffers from a lack of transparency which make the identification and correction of potential inefficiencies particularly challenging. By contrast bottom-up models are specifically built to calculate costs based on an efficient network. TRA's bottom-up model will reduce the asymmetry of information with the operator and give TRA a better understanding of cost and cost drivers. A discussion of the other detailed cost modelling issues raised by Batelco does not have its place in this Position Paper and will be covered in a subsequent consultation on the model specification. TRA has not decided which cost standard it may use to set MTRs going forward at this point in time although TRA notes that the so-called pure LRIC cost standard is now officially recommended by the EC following an extensive consultation. With regards to Batelco's point that TRA is introducing a new regulation, TRA would also like to clarify it is not introducing a new regulation but simply applying the existing regulation and considering the best way to implement it.
	According to Batelco, TRA identified the need for further MTRs cut to achieve lower retail tariffs. Batelco further submits that retail rates are competitive. Given this context and the already low MTRs relative to other countries, Batelco finds it unclear why TRA proposes to introduce further MTRs cuts. TRA fails to provide evidence to substantiate the need for further MTRs cuts	The Telecommunications Law requires tariffs, such as termination rates, to be set based on forward-looking incremental cost. Termination rates should reflect the efficient cost of providing services so that wholesale users and retail consumers face charges consistent with cost. Inefficiencies which are passed on to users lead to lower welfare. In that context, the development of a bottom-up cost model is critical since it enables the setting of termination rates based on efficient costs and hence consistent with Article 57.

		Termination rates based on efficient cost support the development of competition for fixed to mobile and mobile to mobile calls as well as the emergence of converged offers. At present, termination rates are based on Batelco's top-down model which may incorporate inefficiencies whose identification and correction is severely hindered in top-down models.
	Waterbed effect TRA has not provided any evidence and analysis of the impact the proposed additional intervention is likely to have on consumer welfare, given that the market is predominantly prepaid. TRA should also examine the externalities of two-sided markets as a determining factor for setting MTRs at the appropriate level. It argues that TRA should consider the so-called waterbed effect, i.e. the proposition according to which a reduction in MTRs may result in an increase in retail mobile services prices as MNOs seeks to compensate the loss of revenues from termination and thereby maintain the level of revenues per subscribers that were obtained prior to the reduction of MTRs. Batelco contends that the relatively stable mobile headline tariffs for outgoing calls that have prevailed since 2004 might be an indication that the reductions in MTRs since 2004 have not in fact resulted in lower retail rates. It also contends that the waterbed effect is stronger where competition at the retail level is strong (Batelco argues that the retail rates from mobile services in Bahrain are competitive). It also argues that where markets are not saturated and still growing, great care needs to be taken when setting optimal MTRs (Batelco contends that the Bahraini market is not saturated).	TRA is not proposing to introduce an additional regulatory intervention. TRA intends to develop its own bottom-up cost model to set termination rates. This is consistent with the Telecommunications Law which requires termination rates to be based on forward-looking incremental cost. In a competitive environment, operators can expect to recover efficiently incurred costs. Operators are not compensated for actual costs incurred, as otherwise they would have limited, if any, incentive to increase efficiency. To model efficient costs, a bottom-up model models an efficient network, based on modern equivalent technologies, which is designed to meet actual and expected demand and is valued based on current costs. Bottom-up models also enable the comparison of the efficiency of existing networks through the comparison of the results of top-down models. At this point in time, it is not clear what would be the level of MTRs based on the bottom-up model of TRA. This model has yet to be specified and constructed following public consultation. Notwithstanding this point, TRA acknowledges the theoretical possibility of a waterbed effect. However, Batelco has not provided Bahraini-specific evidence of the potential waterbed effect in Bahrain. TRA notes in particular that the decline in MTRs between 2005 and 2009 (about 50%) has not resulted in increase in retail prices and other supposedly effects referred to by Batelco (see below "Impact on the Bahrain market and consumer welfare"). TRA also notes that for the waterbed effect to operate, economic profits (i.e. profits beyond the recovery of the cost of capital and the relevant costs of providing the service) at the retail level need to be

		equal to zero. Otherwise an increase in MTRs can be absorbed in the form a reduction of economic profits. The regulatory accounts of Batelco are instructive in that regard. They show that Batelco earns a rate return on its capital employed for its mobile operations well in excess of its cost of capital, i.e. Batelco earns positive economic profits. Thus a reduction in MTRs is unlikely to lead Batelco to increase its retail prices although it may reduce its margins and bring them in line with its cost of capital and thereby increase consumer welfare. TRA also reminds Batelco that the chief reasons for its decision to introduce a third MNO was to remove the duopoly between Batelco and Zain and to boost competitive dynamics for the benefit of consumers. Finally TRA is of the view that given the level of mobile penetration in Bahrain (above 130%), the classical argument put forward by Batelco which may justify high MTRs in the expansion phase of mobile telephony does not apply.
	<u>Treatment of the third MNO and TRA's position on symmetry</u> Supports symmetrical MTRs for all MNOs which should apply from the point of market entry. TRA has not provided sufficient justification that the third MNO should be exempted from regulation. Batelco refers to the EC position on symmetry which states that asymmetry requires adequate justification. Batelco goes on to refer to an Arbitration case from Trinidad and Tobago which put forward three circumstances when asymmetrical rates may be justified. Batelco considers that none of them apply in the present case as "Batelco's MTRs are approved, efficient and cost-based", "STC is	TRA remains of the view that its position on symmetry is appropriate and in line with international best practice, and notably the EC[22] and ERG[23] according to which asymmetrical rates can only be justified in limited circumstances such as differences in spectrum allocation and for new entrants on a transitory basis. The question as to whether the conditions which might justify asymmetrical rates are met in the case of STC does not need to be addressed as STC is excluded from the dominance determination. However as pointed out in the Position Paper, asymmetrical rates can be problematic as large asymmetries heighten the incentives for on-net off-net price discrimination which is likely to create competition issues and hinder the growth of the new entrant.

[22] See EC, Commission Recommendation of 7 May 2009 on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EU.

[23] See ERG, ERG's Common Position on symmetry of fixed call termination rates and symmetry of mobile call termination rates, 2008.

	acquiring a mobile license to provide the same type of services based on a similar type of mobile network as Batelco and Zain"; and as the "third condition is not fulfilled" (the third condition refers to the effect of reciprocal charging on competition). Further Batelco considers that the two potential reasons identified by TRA that may justify asymmetric rates are not verified. Batelco submits that any differences in frequency allocation in Bahrain will not have an impact on unit costs that may justify asymmetric rates. Batelco also submits that incumbency advantages will not apply given than the new entrant is STC which will, among other things, have access to a large customer base of commuters from Saudi. Batelco concluded that cost differences have to be exogenous and sustainable. Batelco also mentioned the wireless facilities sharing initiative of TRA.	
	<u>Additional regulatory burden in a small market</u> Batelco contends that TRA should refrain from developing its own cost model because it creates an additional regulatory burden. It considers that there is no justification to add further pressures on Batelco's resources and on prices given other regulatory initiatives, such as number portability. Batelco argues that the cost of developing a bottom-up appears unreasonable given the fact that MTRs compare well by international standard. It also considers that the requirement contained in the Position Paper that operators would possibly have to develop their own bottom-up model in addition to their top-down model would be very expensive in relation to expected benefits and likely negative market effects.	TRA considers that the development of a bottom-up cost model is essential to set termination rates based on efficient cost; to enable a better understanding of costs and cost drivers; to identify potential inefficiencies; and to reduce the asymmetry of information between TRA and operators. It will provide TRA with its own cost model to ensure that termination rates are set in line with the requirement of the Telecommunications Law, i.e. based on forward-looking incremental cost. It is up to the operator to develop their own bottom-up model, should they wish so.
	<u>Impact on the Bahraini market and consumer welfare</u> TRA should consider whether the proposed intervention is suitable to be applied in Bahrain and prevailing market conditions.	The setting of termination rates based on forward looking incremental costs is a requirement of the Telecommunications Law. MTRs based on efficient cost support to the development of competition for mobile to mobile calls, fixed to mobile calls, which in

	Batelco contends that introducing a bottom-up model, coupled with a pure LRIC standard, would lead to further cut in MTRs, which, in turn, could lead: - to a restriction of options for prepaid customers by the generalisation of flat rate propositions at a relatively expensive price and the degradation of propositions and reduction of options for low usage prepaid customers; - to an increase in outgoing call prices to compensate the loss revenues from termination; - to the introduction of a charge for incoming calls; - to the migration of certain customers to specific plans which will generate minimum revenue to the operator; - to a change in the current rules for disconnection for customers who do not make a sufficient number of calls; - to an increase mobile handset prices for prepaid customers by reducing subsidies which will hamper the development of 3G services.	turn would benefit consumers. They also facilitate the emergence of converged offers. It is not clear from Batelco why a potential further reduction of MTRs could lead to the consequences identified by Batelco in Bahrain. For example, the cut in MTRs in the last few years has not lead to any of the consequences identified by Batelco. Also as explained above, it is highly unlikely that any waterbed effect (or similar) would be strong.
Lightspeed	Supports the work of TRA on the regulation of MTRs and cost oriented and fair and reasonable MTRs	Noted
Zain	TRA has not provided evidence on the merits of modifying and/or extending existing dominance-related regulation in the wholesale termination market. In light of the favourable benchmarking results of MTRs relative to other countries, Zain submits that the costs to Zain in terms of compliance for example and disadvantages of imposing the proposed dominance obligation do not justify regulating Zain's MTRs.	As explained above the Telecommunications Law requires operators which have been declared dominant to have cost-based termination rates. Accordingly TRA undertook a dominance determination in 2003 which was completed in August 2003, shortly before the entry of Zain into the market. This dominance determination has enabled the setting of cost-based termination rates and contributed to the results highlighted by Zain. TRA considers that this market review is necessary to ensure that the scope of regulation is appropriate and mobile termination services of dominant operators are available at cost-based rate to *all* licensed operators. At present, the MTRs of Zain applicable to

		OLOs are between **[✂]** higher than those applicable to Batelco. Additional visibility to the market regarding the treatment of MTRs is also necessary at a time when a new operator is about to enter. Finally TRA notes that the mobile market has changed dramatically since the 2003 Dominance Determination. Batelco then had a 100% market share whereas the two MNOs are now of roughly equal size. Those changes need to be reflected in the regulatory framework.
	If TRA decides to impose additional regulation, then symmetrical rates should apply to all three MNOs. It refers to the EC recommendation on symmetry. It contends that the view expressed by TRA on symmetry in the Draft Position Paper should apply equally to the three MNOs. Zain contends that there are no reasons to justify asymmetric rates for STC. Zain considers that STC enjoys numerous advantages that would obviate any perceived need for higher MTRs for STC based on its new entrant status (e.g. possibility of sharing infrastructure which would reduce costs, STC's size). At the same time Zain argues that MTRs applicable for Zain should in effect be asymmetrical. It contends that the cost of microwave links used in its network and the cost of using Batelco's leased lines for international connectivity result in higher termination costs than those of Batelco. It also argues that "these should be considered as objective and material cost differences which are outside the control of Zain Bahrain." Zain also requires the use of glide paths to cushion the effect on revenues of a potential decline MTRs	TRA remains of the view that STC cannot be included in the Dominance Determination as it has yet to start providing services. TRA notes that it treated Zain (at that time MTC-Vodafone) similarly in 2003. TRA remains of the view that its position on symmetry is appropriate and in line with international best practice, and notably the EC[24] and ERG[25] according to which asymmetrical rates can only be justified in limited circumstances and transitory basis when there are objective cost differences beyond the control of operators. There are two such sources of objective cost differences: differences in spectrum allocation and new entrant status which may cause an operator to have higher unit cost. Zain's position on symmetry is unclear and contradictory. On the one hand it supports symmetry and the EC and ERG positions. On the other hand it contends that there are no reasons which could justify asymmetrical rates for STC (even its forthcoming new entrant status) on a transitory basis. It also argues that asymmetrical rates should apply to Zain because its use of microwave links in its network lead to higher unit costs and this is beyond its control. TRA does not accept these unsubstantiated justifications. TRA is of the view that MTRs should be based on an efficient network operator. As explained in the Position Paper, TRA considers that

[24] See EC, Commission Recommendation of 7 May 2009 on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EU.

[25] See ERG, ERG's Common Position on symmetry of fixed call termination rates and symmetry of mobile call termination rates, 2008.

	any asymmetry can only be transitory. The Position Paper also set out that differences in spectrum allocation and incumbency advantages could support asymmetric rates. In the case of incumbency advantages (within which microwave links would fall) which could only be justified on a transitory basis, TRA is of the view that they cannot apply to Zain. Zain entered the market about six years ago and is now of a similar size to Batelco. The other example of cost category put forward by Zain is not applicable as international connectivity is not relevant for termination rates. The question as to whether the conditions which might justify asymmetrical rates are met in the case of STC does not need to be addressed as STC is excluded from the dominance determination. However as pointed out in the Position Paper, asymmetrical rates can be problematic as large asymmetries heighten the incentives for on-net off-net price discrimination which is likely to create competition issues and hinder the growth of the new entrant.