CONFIDENTIAL MATERIAL: [✂]

Development, implementation and use of bottom-up fixed and mobile network cost models in the Kingdom of Bahrain

VIVA's response to the Telecommunications Regulatory Authority's

Draft Position Paper

Non-confidential unless marked otherwise

19 July 2011 • 20065-282

1 Introduction

Viva Bahrain BCS (VIVA) is pleased to submit this response to the draft position paper "Development, implementation and use of bottom-up fixed and mobile network cost models in the Kingdom of Bahrain" (consultation document) issued by the Telecommunication Regulatory Authority (TRA) on 19 May 2011.

Figure 1 provides details of the primary contact within VIVA regarding this document.

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Figure 1: Administrative details

This document is structured as follows:

- Section 2 includes VIVA's responses to the TRA's draft position and follow the same structure as set out in the TRA's consultation document
- Section 3 presents additional points that VIVA would like to raise in the context of this consultation (**VIVA requests TRA to treat Section 3 as <u>confidential</u>**)

2 VIVA's responses to the questions raised by the TRA

VIVA's response to Q1: Do respondents agree with the Authority's preliminary view to implement both pure LRIC and LRIC+ approaches for services handled by the fixed core and the mobile networks? Please elaborate.

VIVA agrees with TRA's preliminary view[1] that a pure LRIC approach may be appropriate for the bottom-up cost modelling of two-way services as recommended by the European Commission because the approach will help to "facilitate a more efficient distribution of financial transfers between operators and thereby contribute to a level playing field between all fixed and mobile operators."[2]

Further, VIVA is of the opinion that Ofcom's view, that using a pure LRIC approach for call termination services "reduces significantly any present or future concerns about on-net/off-net price discrimination"[3] by mobile operators, could also be relevant in case of possible abuse of dominant mobile operator positions in Bahrain.

It is important though that adopting a pure LRIC approach for the cost calculation is applied consistently for both mobile and fixed call termination rates. Thus, in VIVA's opinion, such a calculation based on pure LRIC needs to, therefore, be implemented in TRA's bottom-up cost models for, at least, fixed and mobile call termination services.

The TRA states that it is of the preliminary opinion that "it is not appropriate to calculate pure LRIC for services which account for a considerable proportion of traffic (e.g. leased lines, broadband access) as pure LRIC for such services could lead to cost recovery difficulties".[4] VIVA appreciates that common costs have to be fully recovered across all services provided over the respective network, but that, nevertheless, the pure LRIC principle could be tested for other cost-based regulated wholesale services. Including the calculation of pure LRIC in TRA's bottom-up LRIC models could be informative for other fixed wholesale services.

1 TRA Draft Position Paper at paragraph 77

2 European Commission Recommendation on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EU, dated 7.5.2009, Section 4.1, at page 18

3 Ofcom Wholesale mobile voice call termination, Market Review, Volume 2 – Main consultation, dated 1 April 2010, at paragraph 7.123

4 TRA Draft Position Paper at paragraph 78

VIVA's response to Q2: Do respondents agree with the Authority's preliminary view to implement both the required capacity and the Shapley-Shubik allocation methods for joint and common network costs in the bottom-up models? Please elaborate.

We understand TRA's Q2 to only refer to the envisaged bottom-up calculations based on LRIC+, since a pure LRIC calculation would by definition exclude such costs.[5]

The TRA's planned implementation of what it refers to as required capacity allocation method[6] is not clear. We understand it as a method for allocation of common network costs according to capacity based traffic routing factors.[7] VIVA agrees that this is the appropriate method for allocating common network costs, but expects the routeing factors used in the bottom-up models to be based on consultation with the sector.

The Shapley-Shubik cost allocation method[8] would appear to only have very few precedents in other jurisdictions, in the case of both fixed core and mobile bottom-up LRIC+ models.[9] Therefore, VIVA is of the opinion that introducing such a cost allocation methodology in Bahrain is probably not advisable as it would lead to unnecessary complications in the cost modelling process and would reduce the transparency of the models. Hence, in VIVA's opinion, only capacity based allocation should be used in the models.

VIVA's response to Q3: Do respondents agree with the Authority's preliminary view to allocate un-attributable costs (non-network common costs) on the basis of the EPMU approach? Please elaborate.

In line with our reply to Q2 above we equally understand TRA's Q3 to only refer to the envisaged bottom-up calculations based on LRIC+ as the calculations based on pure LRIC by definition exclude corporate overhead costs.[10]

5 TRA Draft Position Paper at paragraph 68

6 TRA Draft Position Paper at paragraph 89 and Annex 8

7 Which is the cost allocation method applied in the bottom-up models in Denmark, Sweden and the UK, which TRA refers to in its Draft Position Paper on page 121.

8 TRA Draft Position Paper at paragraph 90 and Annex 8

9 TRA in its Draft Position Paper on page 118 refers to fixed core models in only Ireland (where it is not used to set prices) and France (where it could have been used in an out-dated implementation of an NGN model, but is not used in ARCEP's current bottom-up fixed core LRIC model, see http://www.arcep.fr/uploads/tx_gspublication/modele-finalise-070111.pdf).

10 TRA Draft Position Paper at paragraph 68

VIVA notes that the selection of the different corporate overhead costs and their respective allocation to the different increments is of particular importance. These need to be relevant to the respective increments. Other than a few examples[11], a detailed discussion does not seem to have been included in TRA's Draft Position Paper. VIVA would expect the relevance and magnitude of each any such potential overhead cost to be discussed in detail during the later phases of this bottom-up LRIC modelling process.

VIVA agrees with the TRA's preliminary view[12] to allocate relevant corporate overheads to the respective increments based on the Equi-Proportionate Mark-Up (EPMU) method as this is the approach which is universally taken by regulators internationally.

VIVA's response to Q4: Do respondents agree with the choice of the scorched node approach for bottom-up cost models? Please elaborate.

VIVA agrees to apply a scorched-node principle to the bottom-up modelling of fixed and mobile networks, subject to any potentially identified inefficiencies being indeed eliminated. TRA refers to the recommendation by the European Regulators Group which requests such eliminations of inefficiencies.[13] VIVA expects all efficiency adjustments to be described in detail in documentation accompanying the draft model.

Regarding future deployment of mobile network sites, VIVA notes, however, that the network design assumptions in the mobile bottom-up LRIC model need to take into account the expected increase in site deployment restrictions and associated difficulties in obtaining planning permissions for new sites. This will limit the operators' ability for efficient network deployment and increase the deployment costs for future sites due to exogenous reasons outside the control of the operators.

VIVA is of the opinion that the modelled network design needs be modern and reasonably efficient, reflecting for example the modern approach to deploying equipment of different functionality at different nodes in the network. The modified scorched-node principle might need to be applied in order to replicate a more efficient network topology than is currently in place. By way of example, VIVA is thinking of adjustments to simplify switching hierarchies or centralising particular network functionality (e.g. switching) to fewer node locations.

The above ERG recommendation that TRA refers to in its Draft Position Paper points out that "when a modified scorched node approach is not applicable because elimination of inefficiencies

11 Such as the cost of the wholesale department that TRA mentions in paragraph 219 and the CEO and car fleet cost that TRA mentions in paragraph 64d of its Draft Position Paper.

12 TRA Draft Position Paper at paragraph 98

13 TRA Draft Position Paper, at paragraph 107

is not practical, it could be more appropriate to use a scorched earth approach".[14] In line with our discussion above, VIVA is in agreement with this recommendation.

VIVA's response to Q5: Do respondents agree with proposed approach for mobile network cost modelling, and in particular the generic operator? Please elaborate.

VIVA agrees with the TRA's proposed approach to model the mobile networks of each Batelco, Zain and VIVA in order to establish whether the operators face potentially different costs.[15]

VIVA also agrees with implementing a profile for a "generic" mobile operator and with the 33% market share, market average demand profile and most efficient backhaul deployment that TRA envisages for such a "generic operator" profile.[16]

TRA outlines that it considers basing the network topology of the "generic operator" on "VIVA's mobile network as determined by the scorched node approach".[17] VIVA requests explanation from TRA how TRA would ensure that no confidential information regarding VIVA's network topology would be provided to other operators, in case such an approach would indeed be taken.

VIVA is also of the opinion that consideration needs to be given to the fact that building-up VIVA's mobile radio site portfolio has been subject to considerably more restrictions and limitations than Batelco and Zain have been experiencing historically when acquiring their respective radio site locations. In the significant period that has passed since Batelco and Zain acquired most of their site portfolios, planning authority permissions have become more difficult and time-consuming to obtain. VIVA's network topology is, therefore, likely to be more costly than the site portfolio that Batelco and Zain were able to acquire historically, especially considering the potential cost of compliance or ratifying the status of existing sites which could require camouflaging or other cost adjustments.

A less optimal network topology results in unavoidable higher deployment costs for VIVA due to exogenous factors which are outside of VIVA's control. Using VIVA's network topology as the basis for the "generic operator" bottom-up model profile would then be likely to overstate the actual cost base of Batelco and Zain. Therefore, the definition of the "generic operator" profile must be adjustable in the model in order to allow for a differentiated consideration with regard to the applied network topology.

14 TRA Draft Position Paper, at paragraph 107

15 TRA Draft Position Paper, at paragraph 120

16 TRA Draft Position Paper, at paragraph 120

17 TRA Draft Position Paper, at paragraph 120

VIVA has further reservations regarding the technologies deployed that TRA envisages in general (and for the "generic operator") as well as the spectrum assignment and spectrum licence costs that it plans to implement for the "generic operator" profile. These reservations are outlined in our response to TRA's Q6, Q7 and Q8 below.

VIVA's response to Q6: Do respondents agree with the Authority preliminary position regarding the type of technologies (2G + 3G) to be modelled? Please elaborate.

VIVA is in agreement with TRA's preliminary view to, at a minimum, consider a combination of 2G and 3G technologies for radio access and an NGN-based mobile core network in the mobile bottom-up LRIC models.[18],[19]

As TRA points out, technological change for Bahrain's mobile networks is still ongoing[20] and commercial launch of Long Term Evolution (LTE) mobile services is currently looking to fall well inside the TRA's contemplated 2011 to 2015 period considered by the mobile bottom-up LRIC models.[21]

VIVA, therefore, suggests that inclusion of LTE mobile technology should be considered explicitly in the bottom-up model (including the associated network costs, any possible spectrum fees and network details). While explicit modelling is preferable, if data availability does not allow this, LTE could be considered implicitly through, for example, changes in model inputs based on appropriate assumptions related to spectrum efficiency, technological capabilities, site sharing, etc.

VIVA's response to Q7: Do respondents agree with the Authority preliminary position regarding the spectrum to be considered when modelling the costs of mobile networks? Please elaborate.

18 TRA Draft Position Paper, at paragraph 123

19 Based on the EC's Recommendation from more than 2 years ago (dated 7 May 2009)

20 TRA Draft Position Paper, at paragraph 122

21 TRA Draft Position Paper, at paragraph 216

As TRA outlines, the amount and mix of spectrum assigned to the mobile operators in the 900MHz, 1800MHz and 2100MHz bands varies considerably.[22] In particular, VIVA has significantly less 900MHz and 1800MHz spectrum than Batelco and Zain and also has a lower overall amount of frequencies assigned across all relevant spectrum bands.[23] As TRA points out, this difference in spectrum allocation has implications for VIVA's deployment costs relative to the deployment costs of Batelco and Zain.[24]

VIVA agrees with TRA that the mobile operator specific bottom-up models can be used to establish whether the differences in spectrum assignments generate cost differences for the mobile operators which are outside of their control.[25]

If such cost differences due to different spectrum assignment are identified, the average spectrum assignment proposed by TRA for the "generic operator" model[26] might not be appropriate. In such a case, the impact of spectrum assignment assumed for the "generic operator" needs to be, as a minimum, sensitivity tested. The definition of the "generic operator" profile must be adjustable in the model to allow for a differentiated consideration of spectrum allocations.

VIVA points out that in line with our response to TRA's Q6 above, TRA's mobile bottom-up models also need to take into account relevant future frequencies for the deployment of LTE.

VIVA's response to Q8: Do respondents agree with the Authority preliminary position regarding the treatment of license costs and frequency usage fees? Please elaborate.

TRA outlines that it intends to take into account spectrum licence costs in its bottom-up LRIC modelling and that these should be categorized as network costs. [27]

VIVA notes that the implementation in the LRIC model in the UK results in no spectrum costs being included in the pure LRIC of mobile termination. [28] The same is true in LRIC models built in other jurisdictions, such as, for example, for the mobile LRIC model used by ARCEP in France.[29]

22 TRA Draft Position Paper, at paragraph 125 (Table 2)

23 TRA Draft Position Paper, at paragraph 125 (Table 2)

24 TRA Draft Position Paper, at paragraph 124

25 TRA Draft Position Paper, at paragraph 126

26 TRA Draft Position Paper, at paragraph 127 (Table 3)

27 TRA Draft Position Paper, at paragraph 128

28 http://stakeholders.ofcom.org.uk/binaries/consultations/mtr/statement/MCT_statement_Annex_6-10.pdf, Annex 9

29 http://www.arcep.fr/uploads/tx_gspublication/model-cout-tamobile-230311.zip

VIVA expects that the mobile LRIC model constructed by the TRA will also exclude spectrum costs in the pure LRIC of termination.

TRA is planning to base the licence costs of the "generic operator" on the licence fee of VIVA as the latest mobile entrant in Bahrain "since it is supposed to better reflect the real value of such a licence in a competitive environment with 3 operators".[30] As TRA indicates, there is a large variance in historic licence fee costs paid by the three mobile operators (from nil to BHD87 million). While the actual licence fee payments made by a particular operator should be accurately reflected in the dedicated mobile bottom-up LRIC model for that particular operator, the diversity in licence fees paid implies that the highest fee (i.e. VIVA's model) should not be used for the "generic operator".

Using VIVA's licence fee payment as common network costs for the "generic operator" bottom-up model profile is likely to significantly overstate the actual cost base of Batelco and Zain. Effectively, the mobile termination rate calculated by the "generic operator" profile would, if this profile was applied to Batelco and Zain, result in VIVA having to reimburse Batelco and Zain for the licence fees that (only) VIVA incurred previously. Therefore, the definition of the "generic operator" profile must be adjustable in the model in order to allow for differentiated licence fee cost to be applied.

The above mentioned differentiated spectrum cost is the most appropriate approach to spectrum cost considerations for "generic operator" profiles. VIVA would like to note that, in case, however, TRA considers only a single spectrum cost for the "generic mobile operator", VIVA would expect TRA to exclude the licence costs.

Alternatively, and only in case TRA still insists on using an inappropriate application of a single spectrum input for the "generic operator" profile, in order to reflect the current value of the spectrum,[31] VIVA would expect TRA to benchmark the spectrum payments made in Bahrain with spectrum costs incurred by operators internationally. Such a benchmark would then need to consider the most recent developments internationally over the last 2 years. VIVA notes that, for example, in the UK mobile LRIC model the 3G spectrum fees paid by operators were not included in the model of the hypothetical operator.[32] Alternative values, derived through consideration of an international benchmark of auction results, were used instead.

30 TRA Draft Position Paper, at paragraph 128

31 TRA Draft Position Paper, at paragraph 128

32 http://stakeholders.ofcom.org.uk/binaries/consultations/mtr/statement/MCT_statement_Annex_6-10.pdf, Annex 9

VIVA's response to Q9: Do respondents agree with the Authority preliminary view regarding the type of technologies to be considered when modelling the costs of the fixed core network? Please elaborate

VIVA agrees with TRA's preliminary view to reflect the two types of fixed core NGN networks (with and without Media Gateway).[33]

VIVA further agrees that the fixed core bottom-up LRIC model needs to reflect Batelco's actual plans for migration to a full NGN network over the period considered by the model.[34] The fixed core network model needs to reflect Batelco's planned technology migration (such as the mentioned possible removal of SDH transmission)[35] as well as any necessary adjustments to modify the scorched node approach that TRA plans to use.[36]

It is unclear from TRA's Draft Position Paper precisely what type of fixed core network will be relevant for assessing the cost of services provided in the standalone scenario which TRA plans for the fixed access network bottom-up LRIC model.[37] This issue would become relevant for services provided in such a standalone scenario which require a combination of elements from the fixed access and core models (e.g. bitstream access).

VIVA's response to Q10: What is the respondents' view on the type of fibre architecture and technology that should be modelled for the NGA? Please elaborate and formulate substantiated alternative proposal if necessary.

VIVA agrees with TRA that the type of fibre topology modelled in TRA's bottom up model for the fixed access network should reflect the topology that is likely to be deployed in the medium term.[38]

The fact that a point-to-point (PTP) fibre architecture may be better suited to accommodate any growth in future bandwidth demand and allows for more options in terms of wholesale access does

33 TRA Draft Position Paper, at paragraph 132

34 TRA Draft Position Paper, at paragraph 133

35 TRA Draft Position Paper, at paragraph 133

36 TRA Draft Position Paper, at paragraph 107. Considerations for modifying the scorched node fixed core model architecture include fewer locations because of centralised equipment using more efficient technology.

37 TRA Draft Position Paper, at paragraph 139

38 TRA Draft Position Paper, at paragraph 138

not seem relevant, in case this does not reflect the NGA fibre technology that will (or is most likely to) be deployed over the period which is considered by the fixed access bottom-up model.[39] The model needs to be capable to reflect the general international practice to deploy a combination of GPON and PTP technologies should this be relevant for Bahrain.

VIVA, therefore, suggests taking into account Batelco's actual and planned FTTx deployment (both in terms of topology and technology)[40] as well as the technology, or technology combinations, which is/are envisioned for a future National Broadband Network.[41]

VIVA's response to Q11: Do respondents agree with the Authority's preliminary view on proposed „yearly approach" to network dimensioning optimisation? Please elaborate

VIVA agrees with TRA's preliminary view to use a "yearly approach" to network dimensioning, in particular, that given Bahrain is still a market where traffic demand is increasing.[42]

VIVA's response to Q12: Do respondents agree with the list of services to be considered in the bottom-up cost models? If there is any service requiring significant capacity that is not listed above, please specify it.

As TRA points out, the respective fixed access, fixed core and mobile network bottom-up LRIC models need to consider the specific services for which the respective model is built to calculate the service provisioning costs. Traffic from all other services provided by the respective network needs to be included in order to ensure correct cost allocation to those wholesale services which are subject of the model. Inclusion of traffic from other services is also necessary in order to capture economies of scope.

Services further need to be considered in the appropriate granularity in case there is a meaningful difference in the network assets that they consume because of network elements involved in

39 i.e. 2011 to 2015 as outlined in TRA Draft Position Paper, at paragraph 216

40 There are planned or actual FTTH deployments in the Riffa Views development and as TRA points out, in paragraph 135 of its Draft Position Paper, in Amwaj Islands

41 TRA Draft Position Paper, at paragraph 135

42 TRA Draft Position Paper, at paragraph 147

providing the service and the loading that a particular service puts onto a network element. This becomes especially relevant for services which represent a meaningful amount of network traffic or consume a significant proportion of network assets for which the costs are included in the respective bottom-up LRIC models. Otherwise appropriate cost allocation between the various services would not be possible.[43]

On this basis, TRA's preliminary list of services to be considered in the bottom-up cost models[44] would need to be extended.

For the fixed bottom-up LRIC modelling the list of services to be considered should also include:

- dark or wavelength fibre access services.
- linear and on-demand video and TV services (unicast services), and
- other typical NGN services in case market introduction of these is likely to occur within the forecasting period of the bottom-up LRIC model forecast (e.g. multicast)

For the mobile bottom-up LRIC models the list of services or the granularity of services modelled should be extended to, at least, also reflect:

- a service labelled "subscriber" to appropriately allocate a portion of network asset costs which are driven either wholly or partially by subscribers (e.g. HLR, network management system)
- GPRS data
- EDGE data
- Release 99/UMTS data
- HSDPA data
- HSUPA data

It is, however, not appropriate to model service granularity to an extent where services of similar nature which do not have a meaningful difference in asset consumption are differentiated out. Therefore, it is not appropriate to, for example, explicitly model mobile voice, SMS or MMS origination services in the mobile bottom-up LRIC models.

VIVA's response to Q13: Do respondents agree with the Authority's preliminary view on the treatment of OPEX in the bottom-up cost models? Please elaborate

43 TRA Draft Position Paper, at paragraph 148

44 TRA Draft Position Paper, at paragraph 150 (Table 4)

VIVA agrees with TRA's preliminary view that operating costs should be calculated based on top-down data provided that any necessary adjustments are made to reflect the costs levels incurred by reasonably efficient operation.[45] The resulting adjusted top-down based operating costs need to be benchmarked to further ensure the appropriateness of the operating costs which is in line with TRA's proposed approach.[46]

VIVA's response to Q14: Do respondents agree with the Authority's preliminary view to implement tilted annuities or adjusted tilted annuities in the bottom-up cost models? Please elaborate

VIVA appreciates TRA's concerns that economic depreciation is difficult to calculate because of the requirements to estimating future demand, operating costs and asset prices.[47]

However, VIVA is of the opinion that proxies for economic depreciation such as the adjusted tilted annuity method contemplated by TRA [48] will not yield sufficiently accurate results. This is likely to be the case, in particular, in situations where demand is growing.[49]

Furthermore, the economic depreciation method (rather than adjusted tilted annuities) is widely used in bottom-up LRIC models internationally[50] and the multi-year modelling approach envisaged by TRA[51] requires estimation of future costs and demand in any case.

We note that, for example, in Denmark, a multi-year calculation was recently undertaken for the pricing of wholesale fibre products, given that fibre demand was expected to increase significantly. The accompanying documentation to this calculation can be found on NITA's website.[52] Section 2.1 outlines the merits of economic deprecation. In particular, the methodology is described as a highly appropriate method for regulatory costing since it takes into account all the underlying factors influencing the economic value of an asset:

45 TRA Draft Position Paper, at paragraph 156

46 TRA Draft Position Paper, at paragraph 157

47 TRA Draft Position Paper, at paragraph 171

48 TRA Draft Position Paper, at paragraph 177

49 Which is TRA's expectation based on, e.g. TRA's discussion in paragraph 147 of its Draft Position Paper

50 Including, for example, the mobile LRIC models that TRA lists for Denmark, Sweden and UK in page 121 of its Draft Position Paper, fixed LRIC models in Norway and the Netherlands, to name a few

51 E.g. TRA Draft Position Paper, at paragraph 216

52 http://www.itst.dk/tele-og-internetregulering/smp-regulering/engrospriser/filarkiv-engrospriser/lraic/lraic-processer/lraic-pa-fiber-og-kabel-tv/horing-over-udkast-til-lraic-model-og-prisafgorelse-for-fiber-kabel-tv-og-multicast/ED_Documentation.pdf

- projected trends in operating expenditures associated with the asset (MEA opex trends)
- projected trends in replacing the asset with its MEA (MEA investment trends)
- the economic output that can be generated by the network asset over time.

It is this third factor that specifically differentiates economic depreciation from other methods that take into account the MEA cost trends (e.g. both current cost accounting and tilted annuity depreciation can do this, albeit in different ways; historic cost accounting does not).

VIVA's response to Q15: Do respondents agree with the Authority's view that economic asset lives should be used in bottom-up models? Please elaborate.

VIVA agrees with TRA that economic asset lives should be used in the bottom-up models.[53]

VIVA also agrees that accounting lives are generally not good proxies for economic lifetimes of assets and TRA mentions that it is planning to make adjustments to accounting lives when it thinks these are necessary.[54] VIVA would like to note that simple adjustments to accounting lives risk resulting model inputs not reflecting the true economic life of assets. VIVA would, therefore, expect TRA to involve operators in the validation of the lifetimes and to benchmark economic lives with international best practice LRIC models.

VIVA's response to Q16: Do respondents agree with the Authority's preliminary view to exclude the working capital which is not related to the network activities or the provision of services?

VIVA shares the TRA's view that non-network related working capital should be excluded from the bottom-up LRIC models.[55]

53 TRA Draft Position Paper, at paragraph 186

54 Ibid.

55 TRA Draft Position Paper, at paragraph 192

VIVA's response to Q17: Do respondents agree with the Authority's preliminary view that, except for working capital generated by CAPEX which is taken into account through depreciation formulas, the cost of working capital related to network OPEX should be excluded from the cost model unless operators can provide evidence of a significant and efficient level of such working capital? Please elaborate.

VIVA agrees with the TRA's planned approach to take into account the working capital requirements for network capex through an appropriate reflection in the cost of capital/depreciation formula in line with time-to-build requirements.[56]

VIVA agrees with TRA's preliminary view to use an approach to working capital related to network opex which is consistent with overseas approaches[57] and to, therefore, not including in the bottom-up LRIC models any working capital which may be required for network opex.[58]

VIVA's response to Q18: Do respondents agree with the Authority's preliminary view that it may be appropriate in some cases to use gradients for the setting of regulated prices based on bottom-up models? Please elaborate.

VIVA agrees with TRA's preliminary view that may be appropriate in some cases to use gradients for regulated wholesale prices.[59] This includes transmission products that are provided with different speeds and with different levels of quality of service.

Notwithstanding this, VIVA is of the opinion that the bottom-up LRIC models that TRA intends to develop need to capture, at a reasonable level of detail, any relevant cost implications of providing such services at different speeds or service quality levels. As TRA points out, it is important to ensure that the wholesale revenue generated for such services is cost oriented.[60] Simplifying the cost implications in the bottom-up LRIC models to too large an extent with the help of gradients would not ensure such cost orientation.

56 TRA Draft Position Paper, at paragraph 194

57 TRA Draft Position Paper, at paragraph 196

58 TRA Draft Position Paper, at paragraph 198

59 TRA Draft Position Paper, at paragraph 212

60 TRA Draft Position Paper, at paragraph208

VIVA's response to Q19: Do you agree with the Authority's preliminary view to model annual costs over a 4 to 5 year period notably to give visibility to operators and to enable the setting of regulated charges for multi-year periods? Please elaborate.

VIVA agrees with the TRA's approach to model annual cost over a period of several years in order to provide regulatory certainty and to give the relevant parties involved confidence to plan their businesses and make investments.

Whether the period of 4 to 5 years as suggested by TRA[61] is the appropriate term over which the setting of regulated charges can reasonable be done is dependent on the meaningfulness of the forecasts of demand and technologies considered in the actual bottom-up models.[62]

As noted in our reply to TRA's Q6 above, for the mobile bottom-up LRIC models this includes, for example, the consideration of LTE mobile technology. Comprehensive commercial launch of LTE services can be expected for all operators to fall well into the first half of TRA's proposed modelling period. Making available LTE services to the Bahraini consumer (a) will require significant investment by operators and (b) will very likely result in significant growth in mobile data traffic. The impact of both of these dynamics needs to be tested and reflected in the mobile bottom-up models in case TRA is indeed planning to draw any conclusions beyond 2011from the models.

VIVA's response to Q20: Do respondents have any comments and suggestions regarding the overall potential structure of bottom-up models that the Authority intends to develop?

VIVA shares the TRA's view that the developed bottom-up LRIC models have to be fully auditable and that, therefore, it has to be feasible to trace all the calculations performed by all models and that, therefore, an implementation in Microsoft Excel (and if necessary for the fixed access model in Microsoft Access) is the most appropriate solution. [63]

The spreadsheet types and their functionality which TRA is planning to use for structuring each model appear reasonable and supportive of allowing auditability of the models.[64]

61 TRA Draft Position Paper, at paragraph 216

62 See e.g. the discussion above on technologies to be considered in the bottom-up models in relation to Q6

63 TRA Position Paper, at paragraph 229

64 TRA Position Paper, at paragraph 231

Undertaking this bottom-up LRIC modelling process using three types of model depending on the relevant network (fixed access, fixed core, mobile) appears appropriate.[65]

However, the 9-step approach that TRA outlines for each of the 3 model types[66] is not sufficient for appreciating the actual model structures that TRA intends to implement. Terminologies, such as "street's segment level"[67], are ambiguous and the granularity of, for example, demand and resulting increment modelling cannot be understood from the information provided.

In order to comply with a fully transparent process and to ensure confidence in TRA's bottom-up LRIC models, VIVA expects to be provided with all 3 model types (fixed access, fixed core and mobile LRIC model) for review as early on in the process as feasible. To avoid any confidentiality issues, these model versions can be populated with reasonable dummy inputs (with dummy inputs being marked as such), so that the calculations generate relatively meaningful outputs.

We note that, while TRA outlines the issuing of four versions of the bottom-up LRIC model for the mobile network (Batelco, Zain, Viva and "generic" operator)[68], the previously mentioned scenario functionality of the fixed models[69] is not further detailed in section 5 of TRA's Draft Position Paper.

VIVA's response to Q21: Do respondents agree with the anticipated timeline for the development and implementation of the bottom-up cost models? Please elaborate.

VIVA encourages the TRA to communicate a clear and detailed timetable to the relevant parties involved. In general, VIVA is in support of a speedy timeline to undertake this bottom-up LRIC modelling exercise.

However, the timeline outlined by TRA (data collection during 3rd quarter 2011; model development, implementation and validation during 4th quarter of 2011) [70] does not appear to allow for sufficient time for validation of the various bottom-up LRIC models. Further, TRA's envisaged timeline for data collection also does not allow for a full 3 months, which is required in VIVA's view, because of Ramadan during August 2011 and the decrease in productivity during that period.

65 TRA Position Paper, at paragraph 218

66 TRA Position Paper, at paragraphs 225 (mobile), 227 (fixed access) and 228 (fixed core)

67 TRA Position Paper, at paragraph 227 (fixed access model)

68 TRA Position Paper, at paragraph 222

69 TRA Position Paper, at paragraph 139

70 TRA Draft Position Paper, at paragraph 234

In particular, the timetable needs give the operators the opportunity to review TRA's draft models and associated documentation in detail and to provide comments as well as to allow for sufficient time for TRA to then actually consider and implement the appropriate changes. Therefore, undertaking the activities of model development, implementation and validation all during a single quarter in the 4th quarter of this year seems too ambitious. VIVA would expect the activity of model review alone to require a period of 3 months. In order to achieve a review of the various models within this period, a staggered release of the consultations (e.g. by mobile, fixed core and fixed access models and by technology inputs and costs inputs) could be appropriate.

VIVA also requests that, for any inputs from the operators, TRA takes into account and is sensitive to the burden related to financial and planning activities that the operators have to undertake annually during the 4th quarter in preparation of year-end. These activities leave very limited resources to respond to inputs and requests from TRA and, therefore, should be taken into account in TRA's planning of time critical activities that require operator input.

VIVA's response to Q22: Do respondents agree with the key steps described in sections 6.1, 6.2, and 6.3 anticipated by the Authority for the development, implementation and validation of bottom-up cost models? Please elaborate.

A three-step approach of (a) data collection, (b) model development and implementation and (c) model testing as set out by TRA[71] appears appropriate.

VIVA would request that the following tasks be explicitly undertaken within the three steps above:

- the data collection phase (a) needs to consider
    - data requests which allow for the necessary granularity for the bottom-up models that are to be developed. Rather than limiting potential model considerations with a data collection that is too high-level, it is better to narrow model granularity at a later stage, depending on level of detail in the data that will then be actually gathered from the operators.
    - the opportunity for the operators to discuss TRA's various data requests in all necessary detail
- the model testing step (c) needs to include
    - detailed presentations and discussions of the reconciliation process between the developed bottom-up models with the available data from the top-down models.

[71] TRA Draft Position Paper, at paragraph 233

VIVA notes that this aspect, while mentioned a few times[72], is not explained clearly enough in TRA's Draft Position Paper

- detailed presentation and discussion of the reconciliation process between the outputs for the bottom-up mobile LRIC models for the "generic mobile operator" and the outputs of the 3 specific mobile operator models which are to be populated. VIVA notes that this aspect, while mentioned a few times[73], is not explained clearly enough in TRA's Draft Position Paper.

VIVA's response to Q23: Do respondents agree with the proposed strategy to involve relevant operators (Batelco, Zain and Viva) in the development and validation of the models? Please elaborate.

The full transparency[74] of TRA's bottom-up LRIC cost modelling process is of particular importance in order to ensure sufficient confidence in the analysis that TRA is performing during this process as well as in any conclusions that TRA might draw from this process.

As TRA rightly points out, undertaking this process will require "detailed information concerning the operators' costs and a sound understanding of the operators' business"[75] and that in order to achieve this involvement of the industry is critical.[76]

In this context, VIVA, of course, welcomes that TRA is planning to undertake this process in a "cooperative way and through a consultative process"[77] and that TRA envisages "many interactions"[78] with the relevant parties concerned.

VIVA would like to point out that TRA's envisaged strategy of involving relevant operators in the bottom-up modelling process[79] is missing critical detail and additional detail would be required in order to comment comprehensively. Such additional detail includes, for example:

- whether operators will get to review, comment and provide input regarding the bottom-up LRIC model specification or other key documents

72 TRA Draft Position Paper, e.g. at paragraph 260

73 TRA Draft Position Paper, e.g. at paragraph 222

74 which TRA points out that it is committed to ensure, e.g. in paragraphs 229 and 241 of its Draft Position Paper

75 TRA Draft Position Paper, at paragraph 37

76 TRA Draft Position Paper, at paragraph 19

77 TRA Draft Position Paper, at paragraph 37

78 TRA Draft Position Paper, at paragraph 232

79 As outlined in TRA's Draft Position Paper, in Section 6.3

- whether and how TRA intends to respond to specific operator comments
- how the TRA intends to demonstrate to operators that specific comments have been taken into account

As pointed out in our response to TRA's Q20 above, the structure of the various bottom-up LRIC models outlined in TRA's Draft Position Paper is not sufficiently detailed and open to ambiguities. Therefore, VIVA would request that all operators can also review redacted versions of fixed access and core bottom-up LRIC models.[80] Redaction of the models will ensure the necessary respect for confidential information. Confidential data needs to be replaced with reasonably disguised inputs that mimic the actual models, so that the redacted versions still produce reasonable results.

VIVA's response to Q24: Do respondents have any comments regarding the above discussion? Please elaborate.

While any bottom-up LRIC models might well give insight into areas other than supporting the pricing of wholesale services, their primary, internationally accepted, purpose is to support the assessment of specific cost-based wholesale services.

VIVA is, therefore, of the opinion that the application of the bottom-up LRIC models to any other issues[81], requires very careful examination and consultation on a case by case basis.

VIVA's response to Q25: Do respondents agree that consideration should be given to setting access and interconnection prices over a medium-term time horizon such as 3 years? Please elaborate.

In principle, VIVA agrees with TRA that consideration should be given to setting access and interconnection prices over a multiple year horizon in order to provide regulatory certainty and to give the relevant parties involved confidence to plan their businesses and make investments.[82]

80 Rather than just sharing and reviewing it with Batelco in isolation, as TRA suggests in paragraph 240 of its Draft Position Paper

81 Such as any potential ex-post regulatory questions, which the TRA mentions in paragraph 245 of its Draft Position Paper, and such as the review of retail tariffing, which the TRA mentions in paragraph 246 of its Draft Position Paper

82 TRA Draft Position Paper, at paragraph 262

As TRA points out, price adjustments may be necessary in certain circumstances, such as when multi-year prices turn out to not be reflecting the anticipated market development. [83]

VIVA's response to Q26: Do respondents agree that in some cases, when there is a significant gap between service costs calculated today and before (due for example to the move from a top-down cost model to a bottom-up cost model), the use of a glide path might be appropriate to move from existing prices to the appropriate cost-based level? Please elaborate.

VIVA appreciates the appropriateness of a glide path for a transition period in case that the use of bottom-up LRIC calculations results in considerably different cost results compared to TRA's previous calculations.[84]

As TRA points out, in case such a cost-base difference indeed occurs and is indeed significant enough to merit consideration of a glide path, such a mechanism should be implemented in a timely manner, as any delay removes incentives for cost-effective operation.[85] VIVA agrees with TRA that use of a glide path extends the period over which services are reimbursed above costs.[86] Therefore, in case the significance in cost base difference makes consideration of a glide path appropriate, the aim should be to keep it to a minimum period.

3 Additional points that VIVA would like to raise (VIVA requests TRA to consider this Section 3 as confidential)

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83 TRA Draft Position Paper, at paragraph 265

84 TRA Draft Position Paper, at paragraph 266

85 TRA Draft Position Paper, at paragraph 270

86 TRA Draft Position Paper, at paragraph 273

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