

**TELKOM'S SUBMISSION ON DRAFT SPECTRUM ASSIGNMENT PLAN
AND DRAFT INVITATION TO APPLY AS PUBLISHED 15 DECEMBER
2011 IN GOVERNMENT GAZETTE No. 34872 (NOTICES 911 AND 912 OF
2011)**

1. INTRODUCTION

On 15th December 2011 the Authority published the "*Draft Spectrum Assignment Plan for the combined licensing of the 800 MHz and 2.6 GHz bands*" ("**draft SAP**") and the "*Draft Invitation to Apply for Radio Frequency Spectrum licence to provide mobile broadband wireless access services for urban and rural areas using the complimentary bands, 800 MHz and 2.6 GHz*" ("**draft ITA**") in Government Gazette No. 34872 (Notices 911 and 912 of 2011 respectively). On 23rd January 2012 the Authority published an erratum ("**ITA erratum**") to the draft ITA (Government Gazette No. 34961) regarding the proposed time lines and to specify the rollout targets associated with the two frequency bands in question. Furthermore, the presentation made by the Authority at the media briefing held on 14th December 2011 on "*ITA and Spectrum Assignment Plan for 2.6 GHz and 800 MHz bands*" is also relevant to this matter and will be addressed in Telkom's written submissions.

In considering the draft SAP and draft ITA, it is imperative to also consider the draft Policy Directions on "*Electronic Communications Services in High demand Spectrum*" and the draft Policy Directions on "*Exploiting the Digital Dividend*" as published by the Department of Communications ("**DoC**") in Government Gazette No. 34848 on 14th December 2011. Since the policy directions will guide the Authority's processes of drafting regulations and frequency assignments, references will be made to the draft Policy Directions where relevant. Telkom trusts that the Authority will delay their processes to allow the finalisation of the proposed policy directions, including the proposed public hearings. We would also highlight to the Authority Telkom's separate but inter-related submission on the two draft Policy Directions.

An executive summary of Telkom's submission is contained in section 2. This is followed by general and specific comments on the draft SAP in sections 3 and 4 respectively. General and specific comments on the draft ITA are contained in sections 5 and 6 respectively. It should be noted that specific comments are presented according to the numbering as contained in the draft SAP and ITA. For ease of reference, all paragraphs throughout Telkom's submission have been numbered sequentially.

Telkom SA Limited ("**Telkom**") welcomes the opportunity to provide comments on the draft SAP and ITA. Telkom trusts that these inputs will facilitate the successful completion of this process in the interest of national spectrum management in general and the development of national broadband specifically.

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2. EXECUTIVE SUMMARY

Telkom's submission on the draft SAP and the ITA is a comprehensive document which addresses a number of broader policy issues as well as addressing the spectrum specific issues.

2.1 National broadband policy and spectrum policy

Telkom is of the firm view that ***spectrum policy should be informed by Government's national broadband policy and/or strategy and not the other way around – as currently seems to be the case.*** Consequently, Telkom regards the Authority's proposed regulatory processes to be premature. We are strongly of the view that the Authority should delay the current processes until, as a minimum, the final spectrum policy directions have been published and thoroughly considered. Ideally they should be delayed until South Africa's National Broadband Plan ('Master Plan') has been promulgated

Telkom notes that in parallel to this spectrum ITA process, the Authority has been conducting a process to define underserved areas. In parallel it has approached Telkom for information regarding broadband coverage. None of these processes appear to be interrelated in any way at present. This may raise questions as to the relevance of the underserved areas and broadband mapping process. ***Telkom is of the view that these processes are strongly related and that ideally one must cascade into the other i.e. 1) broadband coverage review 2) list of underserved areas and 3) spectrum ITA/ with obligations in under serviced areas.***

2.2 Linkage to the digital television migration process

As a fourth inter-related process, ***Telkom would like to highlight that 800 MHz spectrum will become available only after the completion of the Digital Television Migration process.*** The Authority is, inter alia, responsible for the critical step of detailing the post migration broadcast spectrum band plan such that the 790 – 862 MHz is fully vacated. We believe that the Authority's efforts in this regard need to be accelerated, and that the process ought to dovetail with the spectrum ITA.

Telkom is of the view that any obligations attached to licensees in the 800 MHz band should come into effect only upon vacation of the band.

2.3 Unworkable geographic coverage obligations and the suitability of satellite technologies

Telkom notes the 70 percent land area coverage obligation attached to 800 MHz spectrum. Although Telkom is supportive of Government's aspirations with respect to universal broadband, we are also of the view that broadband roll-out should be achieved using the most cost effective technologies. In this regard, ***Telkom would like to point out that satellite is the optimal technology for achieving land coverage or reaching communities in isolated areas.*** The National Broadband Plan should indicate those areas of the country that would best be served by satellite vis-à-vis those best served by mobile technologies. This illustrates why the spectrum ITA should follow the National Broadband Plan. ***The current 70 percent geographic coverage obligation for 800 MHz is not workable, and if pursued would result in significantly higher capex, which would need to be reflected in higher retail prices for the very South Africans whom it was originally designed to assist. This obligation is inconsistent with global best practice and any appropriate economic analysis.***

2.4 Moves to introduce more competition

Telkom notes the Authority's intention to introduce more competition into the market through this process. The Authority ought to specify whether, in their view, there is a market failure and whether infrastructure competition or service based competition is the preferred remedy. Telkom considers this question to be particularly important given the capital limitations in South Africa. Capital should hence be used in the domain that will make the most difference. ***Telkom's view is that with four (4) mobile operators in the South African market, there are a sufficient number of infrastructure players. The authority should hence not seek to introduce more infrastructure players into the mobile market, however rather strengthen the competitive dynamics therein – especially the new entrant 8ta who with 1% market share is struggling to gain traction in the market due to its higher cost***

and spectrum limitations. There is probably scope for new entrants to enter the market using the 2600MHz band; however, the Authority would have to consider the likelihood that such operators would firstly not be able to offer the full product suite of voice and broadband, and secondly be essentially regional/ urban players – as per the fixed line SNO.

2.5 Splitting 800 MHz and 2600 MHz

The Authority has labelled this process as a 4G or LTE spectrum assignment process. The reality is that, given the principle of technology neutrality, LTE can be used in several bands. Several operators in South Africa have already started or signalled their intention to refarm 900 MHz and/or 1800 MHz for LTE, as per international trends. Telkom hence is of the view that there is no rational basis to group 800 MHz and 2600 MHz. We agree that 800 MHz is good for coverage in rural areas; however, for an operator who has no spectrum below 1 GHz it also provides capacity and coverage in urban areas, which will improve quality of service (better in-building penetration).

2.6 Equivalence between 800 and 900 MHz spectrum licences

There is scope for the Authority to introduce more serviced based competition through mandated wireless access network unbundling (i.e. national data roaming, APN), under the umbrella of open access policies as applied to the industry. It is highly prejudicial to apply open access policies to only those new entrants in the market, whereas the incumbent operators with 900 MHz spectrum are not subject to such remedies. Telkom notes open access, as an ex-ante remedy, is usually applied only in instances where Government provides public funding; under the justification that benefit of public funding should not be limited to the benefiting operators only.

2.7 Making the optimal use of key spectrum in the national interest

Telkom asserts that of prime concern should not be whom acquires the spectrum (and whether they are a new or established operator) but whether that operator will make optimal use of that spectrum. The situation in South Africa is that there are several smaller operators in South Africa who, on any objective measure, do not

optimally utilize their spectrum. ***Following a deliberate strategy of assigning spectrum to new operators (in the name of introducing more competition into the market) there is a high probability of “regulatory failure”. In this process there is an assumption that, if operators do not make use of the spectrum it will be taken back or handed back. History would suggest otherwise. Even if the underutilised spectrum is at some point returned, the process would be lengthy and the opportunity cost to South Africa would be significant.*** Although 8ta's network is still being rolled-out, Telkom asserts that 8ta is making efficient and effective use of the spectrum and has thus proved its credentials, should it be assigned 800 MHz spectrum.

2.8 Ensuring a level playing field

Telkom notes that the ultimate objective in assigning spectrum should be to create a “level playing field” so as to strengthen the competitive dynamics of the mobile industry. This however does not mean that all operators need to be treated equally. 8ta is at a severe spectrum disadvantage relative to the more established mobile operators. Telkom contends that there is a critical need to rebalance spectrum assignments and create a level playing field for national mobile operators in relation to spectrum assignments below 1 GHz.

2.9 Preferred licensing allocation process

Telkom's submission proposes first that the 2x30 MHz in the 800 MHz band should be split into two assignments of 2x10 MHz and 2x20 MHz, where it would be reasonable to impose wholesale open access conditions on the latter only where there is Government funding. Secondly Telkom proposes that Telkom/8.ta be assigned 2x20 MHz in the 800 MHz band directly by the Authority. This approach is very reasonable and mirrors Ofcom's treatment of 3UK in the UK 4G spectrum assignment process.

If such an approach is not favoured by the Authority, then Telkom would advocate that the current hybrid beauty contest in combination with an auction be followed; subject to the condition that those operators with 900 MHz spectrum

have a spectrum cap imposed on them that may preclude them from obtaining 800 MHz spectrum. Those operators would however, still be free to pursue 2600 MHz spectrum assignments to supplement their capacity needs.

Telkom's least preferred, however still acceptable, approach would be that all three 2x10 MHz spectrum blocks be assigned based on the results of a "pure" auction i.e. no beauty contest; where the conditions attached to each licensee must be equal.

3. GENERAL COMMENTS ON THE DRAFT SPECTRUM ASSIGNMENT PLAN (SAP)

While Telkom supports many elements of the Authority's draft SAP, we are strongly of the view that a significant number of changes are needed in order to create a quality SAP (to be read with the ITA) in order for it to be consistent with the draft policy Directions and broader Government policy. Addressing these issues will ensure that high demand spectrum becomes an enabler to efficiently delivering broadband services in South Africa and addressing the country's 'digital divide'.

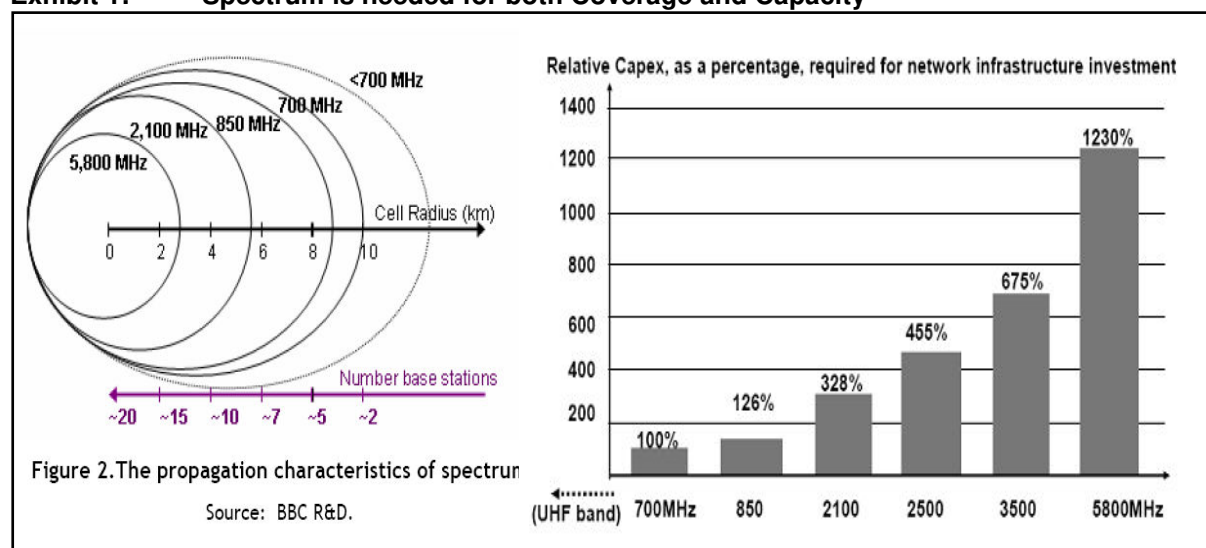
In this context, Telkom's general comments on the draft SAP provide our considered thoughts on the key issues. In highlighting these issues Telkom proposes clear and implementable solutions. Telkom's four (4) general comments on the draft SAP highlight:

- a. The need to rebalance spectrum and creating a level playing field for national mobile operators in relation to assignments below 1 GHz;
- b. The optimal processes for the assignment of high demand spectrum in South Africa;
- c. The suitability of wholesale open access network environments for South Africa; and
- d. Other important general comments concerning the migration of broadcasting services, spectrum fees, technology and service neutrality and spectrum management reform.

3.1 Rebalancing spectrum holdings below 1 GHz and creating a level playing field for national mobile operators

Going forward, it is Telkom's view that the available spectrum bandwidth in South Africa must increase significantly in order to improve mobile and wireless broadband penetration in a cost-efficient manner and to make it affordable to consumers. The key challenge is to ensure that operators have the right combinations of coverage spectrum and capacity spectrum as shown in [Exhibit 1](#) below. This is because the type of spectrum, or the frequency band, affects an operator's ability to achieve ubiquitous population coverage¹ in a cost-effective manner, especially in more rural and regional areas of South Africa. In [Appendix A](#) we provide further detailed analysis on this issue.

Exhibit 1: Spectrum is needed for both Coverage and Capacity



For the efficient delivery of mobile communication services (voice and data), it is necessary to use those frequency bands which have been harmonised internationally or, as a minimum, regionally, in order to achieve economies of scale and to ensure global roaming. The importance of harmonised spectrum has been quantified in numerous international papers. It is this requirement which drives the demand for some frequency bands and creates the concept of “high demand” spectrum.

¹As well as quality in-building coverage due to the propagation characteristics of sub-1 GHz spectrum.

For spectrum below 1 GHz there are currently only three (3) frequency bands which are considered to be “harmonised” namely 700 MHz (allocated in Asia and likely in Africa post 2015), 800 MHz and 900 MHz. It is important to note that the technical characteristics of these bands are very similar and this must be considered when spectrum assignments are done. A further advantage of the 900 MHz band is the fact that it can be used for both GSM (voice) and W-CDMA (data), a strategic decision taken by Cell-C, which provides them with a competitive advantage over those using the higher bands for 3G services (e.g. 2100 MHz).

When we examine the current assignments of key mobile spectrum below 1 GHz (see [Exhibit 2](#) below), it must be highlighted to the Authority that Telkom/8ta is at a significant disadvantage compared with other major South African operators because it has no spectrum assignment below 1 GHz.

Exhibit 2: Current assignment of key mobile (IMT) bands below 1 GHz in South Africa

Band	Vodacom	MTN	Cell-C	Neotel	Telkom/8ta	Total
800 MHz	0	0	0	~10	0	10
900 MHz	22	22	22	0	0	66
Total	22	22	22	10	0	76
Percentage	29%	29%	29%	13%	0%	100%

In considering the above, we consider that Telkom/8ta should receive preferential treatment when spectrum is assigned in the 800 MHz band. A minimum of 2x10 MHz in this band is required in order for 8ta to become more competitive in the South African mobile market.

Telkom would furthermore also note that the 900 MHz band (880-960 MHz) provides 2x35 MHz of usable spectrum and currently has been assigned solely to Vodacom, MTN and Cell-C to provide GSM (mainly voice) services. This band was used by Vodacom and MTN during the initial roll-out of GSM services in South Africa. As demand for voice services grew the band was complemented with assignments in the 1800 MHz band. 3G data services were deployed at a later stage in the 2100 MHz band. Cell-C, as the third mobile operator, also received spectrum in the 900 MHz and 1800 MHz bands and later also in 2100 MHz. ICASA has indicated

that that there would be a refarming process for the 900 MHz band but this has not yet occurred.

Telkom's primary contention is that neither Vodacom, nor MTN and nor Cell-C should be permitted to secure 800 MHz spectrum ahead of any spectrum rebalancing, which would include refarming of the 900 MHz band. However, in the event that such a position is not adopted and 800 MHz spectrum is assigned to any existing 900 MHz licensee (whether to themselves or a member of a consortium) then the relevant 900 MHz licensee should be required to return some spectrum in that band. Since a minimum of 5 MHz is required for 3G services, the returned spectrum plus any possible savings through band-optimisation (reducing the number of guard bands) should equal 5 MHz. Through the band-optimisation or refarming process those operators not receiving spectrum in 800 MHz could also be required to forfeit a small amount of their 900 MHz holdings (say 1 MHz each) in order to achieve the minimum 5 MHz requirement.

To the extent that there are four (4) national mobile operators in South Africa (as evidenced through the Authority's market review on mobile termination rates and the scope of the Authority's mobile QoS regulatory process), and to the extent that 8.ta is the only such operator without spectrum below 1 GHz, it is only fitting that Telkom/8ta should have the first right of refusal on such 900 MHz spectrum.

Such a pre-assignment will improve the market competition to the benefit of South African consumers. It would be prudent for the Authority to seek to strengthen the competitive position of 8ta, in order to provide increased competitive intensity in the South African mobile sector rather than to introduce more competition in a market where the fourth operator only has approximately 1 percent market share. Such move by the Authority would be in keeping with best practise as evidenced by Ofcom's pre-assignment of 800 MHz spectrum to 3UK as part of the 4G process in the UK.

ICASA has essentially two choices:

- a. Strengthen the competitive dynamics of the current mobile industry through a “leg-up” to the nascent operations of 8.ta (who has 1% market share after 17 months); or
- b. Introduce new mobile operators to the national market.

Telkom’s research has shown that an operator in the South African market requires approximately 15% minimum market share to achieve a critical mass in order to be financially sustainable. The calculation underpins 8ta’s public declaration of a 15 percent market share target. However, it is important to note that the third mobile operator (Cell-C) has taken approximately 10 years to achieve this level (and then at a mobile termination rate of R1,25 and using 900 MHz spectrum). From these figures Telkom asserts that it is likely that only four (4) mobile operators are sustainable in the South African mobile market. An attempt by the Authority to introduce new entrants is therefore unlikely to strengthen the competitive dynamics of the industry, however instead have the most devastating impact on the smallest operator who would now have to compete with not only incumbents but also with new entrants. We would submit that option (i) is the only reasonable strategy available to the Authority.

Telkom is hence of the view that the SAP should therefore provide for a more level playing field between the four incumbent mobile operators by ensuring equal spectrum holdings in the mobile bands below 1 GHz. This principle is supported in the National Development Plan: Vision for 2030 (“**NDP**”) prepared by the National Planning Commission: “*Spectrum policy should favour competition, but incumbents should not be excluded from gaining access to bands they need to build networks using new technologies*”. This NPC statement is also relevant to the 2.6 GHz band.

3.2 The optimal processes for the assignment of high demand spectrum in South Africa

Examining the draft SAP, Telkom's view on combined award is that, although 800 MHz and 2600 MHz should be assigned during roughly the same period i.e. concurrently they should not necessarily be coupled as a "package". Telkom highlight that 800 MHz and 2600 MHz are not the only LTE bands, as 900 MHz and 1800 MHz could similarly be used for this purpose. It hence makes no more sense to couple 800 MHz with 2600 MHz than it does to couple 800 MHz with any other frequency band where LTE could be deployed.

Furthermore, to the extent that certain operators seek to acquire 2600 MHz spectrum for capacity purposes (i.e. their 2100 MHz bands are filling up) while others may seek 800 MHz for rural coverage, splitting of the bands will allow different operators to tender for each band according to their respective needs. In addition, it is important to remain mindful of the fact that whereas 2600 MHz is immediately available, the 800 MHz spectrum will become available only after the digital television migration process is completed circa 2015.

Having said this, Telkom would like to assert that, given that 8ta is still in the process of rolling out its network, that we have no immediate need for 2600 MHz and seek only 800 MHz in assistance of the Government's aspirations for rural broadband. To this extent we request that the Authority's final SAP should consider the bands conjointly, however should not to group the bands into integrated packages. This would be the best approach from a national interest perspective.

In assigning 800 MHz spectrum, the SAP should promote a level playing field and sustainable competition between the four national mobile operators. Specifically, Telkom considers that the spectrum holdings of those mobile operators who currently have no spectrum in either the 800 MHz, 850 MHz or the 900 MHz band ought to be strengthened.

This may be practically achieved by the Authority either directly pre-assigning spectrum to operators (as is Telkom's preference) and/or imposing a cap on the total sub-1 GHz spectrum holdings of licensees. The Authority should strengthen fledgling

operators to the market, by imposing a cap of 2x10 MHz per operator's total holdings below 1 GHz for the purposes of this process. See [Appendix B](#) for a summary of the spectrum caps which apply in other global and emerging markets.

Telkom would suggest changes to the draft SAP to the effect of:

3.2.1 Allocating all of the 800 MHz digital dividend by way of a competitive process

Having detailed the qualifying criteria, Telkom is supportive of a beauty contest to be followed by auction. However, unduly burdening the new 800 MHz operators with auction fees and/or obligations above those costs imposed on operators in 900 MHz, will not serve to level the playing field. In fact, it is likely to further disadvantage those operators with no spectrum assignments in the 900 MHz band. In fact, there is an argument based on the approach in other markets (including emerging markets such as Indonesia and India) that operators that are assigned spectrum without having to compete in high demand markets must pay the same price as the auction price for their spectrum.

Telkom agrees that, as a method of last resort, a "pure" auction process (i.e. no beauty contest) may be followed – although Telkom would presume that the entire 800 MHz band (i.e. 30 MHz of paired spectrum) is available in this event (to the extent that pre-assignments in such case would be grossly prejudicial to those operators who have to compete for the band versus spectrum being pre-assigned to a particular operator or operators).

There is no compelling rationale to reserve spectrum for certain players who do not have the management or financial capability to deploy wireless broadband networks to facilitate national economic growth and inclusion. As spectrum not used today is lost forever to the national economy, consideration must be given to assigning spectrum to be best possible use and to those entities who are best placed to use and exploit it for the nation. The only caveat to that is that, similar to other markets, South Africa should impose spectrum caps on operators who have reached the critical mass of 15% market share (i.e. Vodacom, MTN & Cell-C).

3.2.2 Adopting a combinational assignment process only if an auction is employed

From Telkom's perspective, a combined assignment process may be utilised to assign spectrum only where an auction is to be employed.² The use of the word 'may' is important, this is because it is not optimal to assign all spectrum in this way, for example there could be some combined spectrum packages and some standalone spectrum assignments in any one auction. Where auctions are used, a simultaneous auction of the two bands is important for bidders as it allows for the assessment of the economic value of spectrum.

Combined spectrum awards have been used and are planned for use in a number of countries. For example, Ofcom in the United Kingdom is in the process of establishing the rules for their upcoming 800 MHz and 2.6 GHz auctions. ARCEP in France awarded licenses in 2.6 GHz followed by 800 MHz approximately three months later. It should be noted that the Ofcom auction does not apply combined 800 MHz and 2.6 GHz packages; these two bands can still be obtained individually.

As highlighted above, the combination of low and high frequency bands is the preferred approach in delivering a national mobile network. But the combination of low and high frequency bands is however not necessarily limited to the 800 MHz and 2.6 GHz as other bands may also be used to achieve this goal, which such a combined spectrum award presupposes. As indicated above, there are several higher frequency bands that could be used in this regard, bands already assigned to the incumbent licensees. In terms of bands below 1 GHz the 900 MHz band could also be used, as demonstrated by Cell-C in using this band for 3G/WCDMA services.

Telkom would also highlight that regional or localised operators need spectrum mainly in the higher frequency bands only (e.g. 2.6 GHz) in order to provide service in urban and peri-urban areas. Whereas such operators could also effectively use

² For the record, Telkom does not consider a combined spectrum assignment process to be optimal for the assignment of spectrum via a beauty contest. In fact, we are unable to find any recent global examples which follow this approach. There are, obviously earlier example, where new entrants bid for both 900 and 1800 MHz in order to secure a new national GSM licence.

spectrum in sub-1 GHz in urban areas, by not extending services into the rural areas will lead to immense inefficiencies in the use of this scarce resource and will hamstring delivery of public good. The proposal in the draft Policy Direction (section 2.1.3) to set aside spectrum in the 2.6 GHz band for at least one new licensee is in principle supported.

3.2.3 Bringing forward the 2600 MHz assignment in order to maximise the public benefit

It is important to note that while 2.6 GHz band is available for possible immediate assignment, taking into account the incumbent operators Sentech and WBS, the 800 MHz spectrum band on the other hand is not yet available. This is due to the fact that analogue broadcasting services must first be migrated from the 800 MHz band and it is expected that this process will take several years to be completed. The further postponement in the launch of the Digital Terrestrial Television (“**DTT**”) services to the 3rd quarter 2012 is evidence of the risks in this regard.

While Telkom is strongly of the view that the 800 MHz band should be made available as soon as practicable, and it would be pleased to discuss how it could work with the Authority and Sentech (the terrestrial broadcast signal distributor) in this regard, there should not be a delay in allocating the 2.6 GHz band while this process takes place.

3.3 South Africa's competitive market structure for mobile services

Telkom believes that the Authority focuses too much on introducing new competitors into the market, and with insufficient discussion on how operators would utilise that spectrum. Telkom is of the view that those operators who use spectrum the most efficiently and effectively achieve the greatest public good through the use of that spectrum. In this regard we are of the view that the Authority should be indifferent as to whether the person acquiring the spectrum is a new entrant or otherwise. Telkom would like to remind the Authority that their mandate is not to introduce competition for competition's sake, but rather to ultimately regulate in the consumer's best interest.

Furthermore, Telkom notes that the Authority has not conducted a broadband market review, and consequently has not identified whether South Africa should follow a strategy of infrastructure based competition versus serviced based competition. It is accepted generally that in areas without coverage, serviced based competition is the suitable approach – although the authority has yet to determine where this boundary is as neither sub geo-graphic market nor a list of under serviced areas is utilised in this process. The authority may advocate both infrastructure and service based competition in served areas, however this approach often ignores the reality that national operators (i.e. both served and underserved areas) utilise the profits made in the former to internally subsidise the latter. Without this internal cross subsidy, universal broadband will never be achievable through the private sector alone. Hence the Authority's intention to introduce new competitors into the urban markets perversely undermines the objective of universal service.

Telkom is essentially advocating that 4 mobile operators represent sufficient infrastructure based competition, and that more retail competition can be introduced by enforcing mandatory voice and or data roaming on all such operators, and/or through unbundled wireless access networks i.e. APN/Bitstream – as per the Authority's commitment to investigate this approach in 2013. Both of the above represent the different forms of open access as applied to mobile networks, with Telkom only advocating the former.

If lowering the cost of telecommunications services is also an objective of the Authority, then the process should be strictly driven towards that goal – regardless of which operators achieve that goal. One way of lowering the cost of telecommunications is the introduction of new entrants who bring disruptive pricing to the market. Such operators however can only be sustainable if their costs are actually lower than the incumbent operators. Conventional economics suggests this is not likely to be the case, especially if such operators are prohibited from cherry picking through population roll-out obligations. More general accepted economics would indicate that acquiring more spectrum is an incremental cost to an established operator, as opposed to a start-up cost to a new entrant. It therefore stands to reason that established operators would enjoy economies of scope (across product lines) and scale (shared networks), that a new entrant would not enjoy, and hence be best placed to lower the cost of telecommunications.

3.4 The suitability of wholesale open access model for South Africa

Telkom notes the proposal contained in the draft SAP (see section 5.3) that the licensing of 800 and 2600 MHz bands should be based on a wholesale open access model. Furthermore, section 5.9 goes on to state that a proportion of the 2.6 GHz band should be set-aside for entities that so not have access to the IMT bands.

While superficially, such proposals sound attractive and Telkom is supportive, prohibiting retail competition is firstly not within generally accepted definition of open access and more to the point will cause such damage to the business case of wholesale only operator, that it is doubtful such operators would ever be able to break-even. It is because of this that wholesale open access with a retail prohibition e.g. the NGN in Australia, is often conditional upon substantive government funding of the venture. Telkom notes that open access is usually negotiated and conditional upon the awarding of government subsidies,³ and is not often an ex-ante condition set by the national regulator upon the awarding of spectrum.

Furthermore, Telkom is of the view that wholesale open access would only be justifiable in instances where an operator is assigned the majority of the 800 MHz band i.e. 2x20 MHz. Enforcing wholesale open access upon a operator with only 10 MHz (as proposed in the SAP) does not appear fair nor rational to the extent that:

- a. Such an obligation should in that case be applied to all operators with assignments in the 800 MHz band;
- b. The adjacent 900 MHz operators do not have such an obligation, and thus have substantial strategic and commercial advantages.

Telkom considers that a wholesale national data roaming product to be a sufficient fulfilment of the requirement for wholesale open access.

³ For example, the HSBB network in Malaysia in 2007 where the Malaysian Government contributed approximately USD800 million to a PPP with Telekom Malaysia, open access a condition of receiving that Government financial support.

Telkom would seriously question the competitive advantage given to the high demand spectrum operator compared with both Vodacom and MTN. Being required to wholesale its network with only say, 10 MHz of paired 800 MHz means that it is at a material disadvantage against these operators and given the large blocks of 900 MHz spectrum being retained by Vodacom, MTN, etc (i.e. 11 MHz paired) they are fully able to utilise the latest HSPA+ Release 9 and maybe future releases.

3.4.1 The commercial viability of a standalone 800/2600 MHz business case

Specifically, Telkom would highlight that a standalone 800/2600 MHz business in South Africa, whether wholesale or retail is not viable today, nor may it be viable in any form until 2014 or even much later.⁴

Telkom notes for instance that Clearwire, a US wholesale WiMAX wireless operator is in the process of an implosion with Google recently selling its investment at a significant loss given that its key resellers TimeWarner and Comcast have withdrawn their support in favour of Verizon Wireless.

Telkom would like to highlight the following two key reasons why a wholesale only business may not be commercially viable:

3.4.1.1. For a small spectrum assignment LTE does not pose a significant speed advantage over HSPA+

While LTE has a series of performance benefits over 3G, given that its architecture has been optimised for packet services, there is unlikely to be a comparative speed difference between LTE and HSPA+ networks in South Africa at least in the early stages. While the selling proposition maybe more compelling in the 2.6 GHz band where higher speeds are possible (due to a larger assignment), from Telkom's perspective, both consumers and operators are unlikely to be driven to use the LTE network which uses the high demand spectrum unless its bandwidth speeds are

⁴ For the record, wholesale mobile services also have a chequered past in South Africa with Vodacom's original business model in the mid 1990s supporting independent retail service providers. This was quickly changed, to great success, to today's more traditional model.

higher. A HSPA+ operator such as Vodacom, MTN and Cell-C is only going to acquire wholesale services for resale if the speed of offer is such that it provides a much higher bandwidth demanded by customers or it is considerably cheaper. The latter is unlikely compared with the economies of scale and scope that Vodacom, MTN, etc. can generate. Thus, it is unlikely that such a deployment will be successful unless it is offered at least 20 MHz of spectrum in 800 MHz. This would provide the new licensee with a noticeable advantage and is consistent with any requirement to wholesale.

Telkom would note that such an approach is consistent with global markets such as Russia which has mandated a wholesale LTE network. In that case Yota, has been allocated more than 50 MHz of spectrum across a number of bands and nearly national coverage with the ability to provide both FDD and TDD LTE services. Such a spectrum assignment will mean it is able to offer the highest speeds to a range of wholesale customers as described in Exhibit 3 below.

Exhibit 3: Case Study: Yota's wholesale LTE network in Russia

In March 2011, it was announced that Russian mobile operator **Yota** (www.yota.ru/en) announced an agreement with Russia's leading mobile operators to roll out a LTE network. On 14 April 2012, Yota will migrate all of its current 350,000+ WIMAX services to LTE.⁵ Its network is expected to cover 180 cities with a combined population of more than 70 million by 2014.

Backed by the Russian government, the agreement will see Yota roll out a wholesale LTE network, on which the mobile operators Megafon, MTS, Vimpelcom and Rostelecom will provide services. Under the deal, the four Russian telecoms operators, which will buy traffic from Yota and lease its LTE facilities, will each be given an option to take a 20 percent stake in Yota at market prices in 2014. Telconet Capital Fund, which currently owns 74.9 percent of Scartel, the company of which Yota is the operating brand, will be required to sell all of its shares, while co-owner Russian Technologies will reduce its 25.1 percent stake to 20 percent at that point.⁶

Yota has stated that the arrangement is a major boost to the Russian economy, avoiding costly duplication of infrastructure investment and providing Russian consumers with faster access to 4G services and lower prices. The plans are also supported by Russian Technologies, a shareholder in Yota and major player in the Russian military-industrial sector. Yota CEO Denis Sverdlov said the company plans to borrow USD 2 billion in bank loans to finance the network roll-out.

⁵ See www.dailywireless.org/2012/02/22/yota-plans-overnight-swap-from-wimax-to-lte/

⁶ See www.globaltelecomsbusiness.com/Article/2791398/Interviews/25239/CEO-tells-how-Yota-will-bring-Russian-LTE-operators-together.html

3.4.1.2. Cross subsidising data through voice revenues

It is common knowledge in the industry that the broadband products of the leading operators are being cross-subsidised by their voice profits. Analysts have gone so far to describe South Africa as a “voice market” i.e. the profits are in voice, not broadband. It is on this basis that Telkom contends that a standalone data only service is not as viable, i.e. those operators who offer HSPA+ and voice not only have a superior product offering, however also a more robust business model.

As per elsewhere in this submission, Telkom has advocated the concept of service neutrality. Practically what this means is that, although we expect the various LTE spectrum to be used primarily for broadband, operators should also be allowed to deploy voice services where appropriate.

Voice over LTE (VoLTE) in that case would be the technology used to deploy such voice services. Technically the technology has just passed its testing phase, and is not yet commercially ready for launch – although Telkom expects it to start being made available by vendors in 2013.

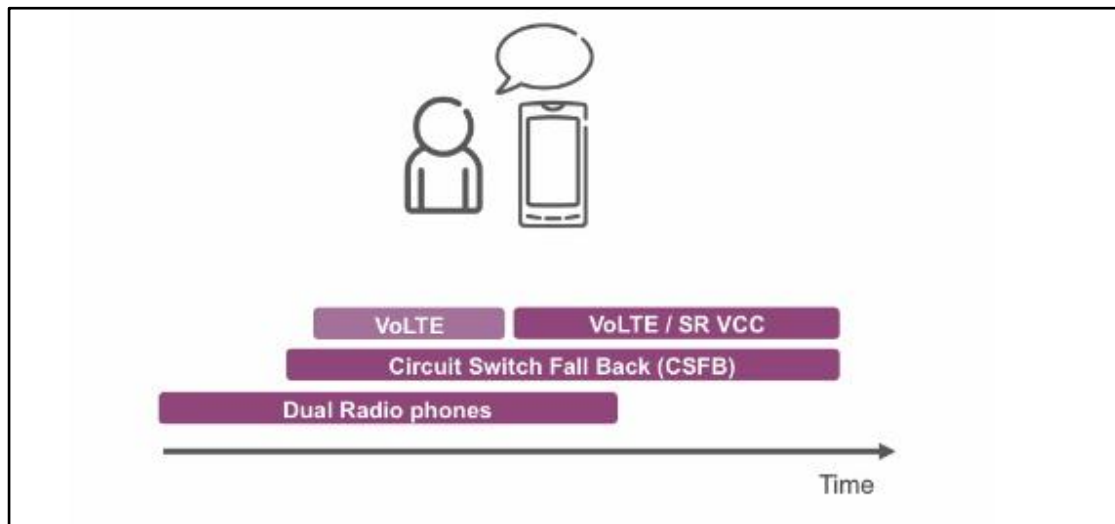
The difficulty is that whereas operators can upgrade their access and core networks, consumer handsets would need to be able to support the technology likewise. When VoLTE is introduced it is also likely to be more expensive than circuit switched voice, and only be available on higher-end feature phone & smart phones. As currently there remains a high proportion of 2G only handsets (possibly as high as 85% of all handsets), the ability to see a high penetration of 4G capable handsets with VoLTE is a number of years off.

There are several technology paths in this regards as per Exhibit 4.

Firstly, the current approach is to use dual radio phones which utilise the 2G networks for all voice calls. Secondly, voice calls will be provided over LTE with “circuit switch fall back” (‘CSFB’) to the 2G networks where necessary (e.g. where there is no coverage). Lastly, the ultimate approach will be to adopt “Single Radio

Voice Call Continuity” (‘SRVCC’) for VoLTE, which uses an IP Multimedia Subsystem (‘IMS’) for call anchoring and handover and is based on a third party call control mechanism. This allows a mobile phone with an ongoing voice call to transition to the circuit-switch domain in the event of loss of LTE coverage. An IMS-based SRVCC provides QoS control, flexible charging, and better user experience.⁷

Exhibit 4: Options for Addressing Voice on LTE



Source: Informa Telecoms & Media and Ericsson, *LTE Early Launch Strategies: Who and Why?* Webinar, 21 June 2011

3.4.1.3. High risk dependency on retail service providers

Given the substantial size of the investment required to deploy a 800/2600 MHz nationwide LTE network, Telkom considers that it is inappropriate and arguably too risky from an investment perspective to rely only on third party retail service providers to market, distribute, sell and secure revenues from any deployment of an LTE network utilising high demand spectrum. The attempt by the Authority to mandate “no retail” fails to appreciate the business model for such services.

As indicated above, given most of the potential retail service providers are major operators with their own competing HSPA+ networks, it would be necessary to have a retail service provider who was solely focused on selling LTE services otherwise, larger operators may ‘game’ the process in order that the LTE operator either faces

financial losses and/or is required to sell out to a consortium of operators.

In circumstances where the Authority decides that wholesale services are required rather than being left to commercial negotiations, then the SAP (and ITA) such a retail service is possible and that it need only be provided on fair and non-discriminatory terms.⁸ Any pricing requirement should not be worse than that required in France in the December 2011 800 MHz auctions namely that access to MVNOs shall be provided on "economically reasonable conditions."

⁸ Telkom also considers that legally, as it holds an ECS licence that does not restrict its retail activities, then it ought be able to provide retail services on 800/2600 MHz were it to be allocated spectrum. It takes this view notwithstanding that a spectrum licence may be attached to an ECNS license, which in itself does not allow retail. A licence condition imposed on one licence cannot curtail the rights issued under another separate licence.

3.5 Additional matters for consideration

Telkom has four (4) additional matters for consideration pertaining to the draft SAP as follows:

3.5.1 Migration of broadcasting services

In order to deliver on Government's broadband objectives to be detailed in the Policy Directions it is critical that all broadcasting services be migrated from the 800 MHz band as soon as possible. To this extent that it is able the Authority - in conjunction with the DoC - should action the following:

- a. In the migration of analogue to digital television give high priority to the migration of broadcasting services from the 800 MHz band;
- b. The deployment of digital transmitters in the 800 MHz band during the dual illumination period should be avoided at all cost;
- c. Switching off of analogue transmitters operating in the 800 MHz band should be given high priority;
- d. Digital television transmitters deployed in the 800 MHz band during dual illumination should be moved to spectrum below 790 MHz as a matter of priority; and
- e. Any community broadcasting stations operating in the 800 MHz band should be addressed as a matter of priority.

In broader terms, Telkom also considers that the complex task of deploying digital broadcasting and migration from analogue broadcasting in South Africa would be best undertaken by an organisation who is well resourced and whose sole focus is on activities. This may also be the view of the Authority who should communicate same to the Government.

3.5.2 Spectrum fees

As was previously indicated, Telkom considers that the 800 MHz band is comparable with the 900 MHz band in terms of capacity and propagation characteristics.

Spectrum licence fees in the 900 MHz band is determined in accordance with the new Administrative Incentive Pricing (“**AIP**”) rules determined by the Authority⁹. The new prices will apply from 1 April 2012.

A 2x10 MHz spectrum assignment in the 900 MHz band will cost R9 million per annum (if the band is considered congested, i.e. there are waiting applicants). When considering also the obligations that will be attached to the 800 MHz band, the Authority must ensure that the spectrum fee for 800 MHz is comparable with the fee for 900 MHz, even if auctions are used to assign the spectrum.

Moreover, in many countries, auction values are considered an indication of market spectrum value and therefore the auction results of 800 MHz in particular are used to determine the value of the 900 MHz band.

All licensees with new assignments obtained in the 800 MHz and 2.6 GHz band should pay the full amount for their total assignment determined in accordance with the AIP formula.

In order to expedite the migration of broadcasting services from the 800 MHz band, Telkom considers that the Authority should impose AIP spectrum fees on this band on the broadcasters with immediate effect until the band has been vacated. This is aligned with the principles for spectrum fees as contained in *Radio Frequency Spectrum Policy for South Africa (Government Gazette No. 33119 dated 16 April 2010)*.

3.5.3 Technology and service neutrality

In order to ensure efficient and effective use of all radio frequency bands, it is important to ensure that the Authority allows technology and service neutrality in all frequency bands, both existing assignments and those to be assigned in 800 MHz and 2.6 GHz. This will ensure that operators could utilise existing spectrum holdings

⁹ Government Gazette No. 33495, dated 27 August 2010

to deploy broadband networks, which will facilitate the delivery of advanced services, in particular broadband services. It should be noted that Telkom's initial spectrum licences have not yet been converted in terms of section 93 of the ECA, which may impede Telkom's ability to fully exploit advancements in technology.

It is noted that Cell-C is already using their 900 MHz GSM assignment to deploy 3G/WCDMA data services and Vodacom and MTN indicated the same intent. The 1800 MHz band is also a prime example of an existing assignment that could be used to provide, not only GSM voice services but also, for example, LTE data services.

According to the NDP, *"in line with global trends, spectrum licences should be technology neutral, so they can be adapted to meet rapidly changing technological developments within the sector without high regulatory costs"*.

Internationally, technology neutral licences were pioneered in New Zealand with the system of management rights and then were furthered developed in Australia, with the introduction of spectrum licences in that country. Since then:

- a. ***In the United Kingdom***, Ofcom has developed a technology neutral licensing approach called Spectrum Usage Rights;¹⁰
- b. ***In the United States***, some types of licences have conditions that allow considerable flexibility over spectrum use;¹¹
- c. ***In Europe***, the Radio Spectrum Policy Group has developed the Wireless Access Policy for Electronic Communications Services concept in an attempt to move towards greater flexibility. It provides a framework for the provision of electronic communications services within a given set of bands, where the services may be offered on a technology and service

¹⁰ The new 4G licences for 250 MHz of new bandwidth to be auctioned by Ofcom in the first half of 2012 will be technology neutral.

¹¹ For example, the Personal communications Services licences whereby the licensee is free for the most part to provide any service - fixed, mobile, private, common carrier, etc and is free to use any technology to do so.

neutral basis. In fact, policy in the European Union embraces the principles of technology neutrality and service neutrality.¹²

Telkom would urge the Authority to ensure that all existing spectrum licences are made technology and service neutral, as a matter of urgency and to the extent possible. The key elements of technology neutral spectrum licences are as follows:

- a. The licensee can use any technology to provide any service in any frequency band, and the use of the radio frequency spectrum can be changed at any time;
- b. The licensee must observe emission limits; and
- c. The licensee must manage interference (both in-band interference¹³ and out-of-band interference¹⁴) between radiocommunications devices and services operating under other licences in the radio frequency spectrum bands.

3.5.4 Spectrum management reform

In order to further increase spectrum efficiency, it is proposed that spectrum market reforms be implemented through national policy. For example, spectrum trading and leasing will go a long way in improving the use of the radio frequency spectrum.

The objective of such reforms is to enable spectrum rights to be allocated to users that value it the most, to optimise the use made of spectrum on an ongoing dynamic basis for the benefit of South Africa and to allow operators to respond faster to changes in the technology and market.

¹² "Technological neutrality" means applying no constraints or prescriptions on choices of technology or equipment, within the bounds of compatibility and interference avoidance. "Service neutrality" means the spectrum holder can choose what service to offer using its spectrum rights.

¹³ In-band interference can be caused over large distance by co-channel (same frequency) emissions from transmitters operated under area-adjacent apparatus or radio frequency spectrum licences.

¹⁴ Out-of-band interference occurs when transmitters and receivers operate close together in terms of the two main variables that determine their degree of isolation from each other: distance and/or frequency separation.

As demand for finite spectrum increases, opportunities for sharing and leasing of spectrum among users are an emerging solution to supply shortfalls. Spectrum leasing involves the use of particular spectrum among multiple users. In essence, a holder of the radio frequency spectrum licence's rights is partially or wholly transferred either for a limited period of time and/or for a portion of the radio frequency spectrum encompassed in the licence. Spectrum may be leased on a spatial, temporal or geographic basis or by using technology solutions to enable multiple services to co-exist.

The flexibility afforded by spectrum leasing arrangements is ideal for situations where a lessee's requirements are temporary. In addition, it enables a holder of radio frequency spectrum licence to benefit by enabling them to lease portions of their radio frequency bands for which they have no present need. In return, this creates an incentive for licensees to adopt more efficient ways to utilise their existing spectrum.

Improved use in spectrum translates to more services becoming available to the public, which will benefit society at large. Spectrum trading is also supported by the NDP (*"spectrum should be fully tradable once allocated"*)

4. SPECIFIC COMMENTS ON THE DRAFT SPECTRUM ASSIGNMENT PLAN (SAP)

4.1 SECTION 5 OF THE DRAFT SAP (LICENSING PHILOSOPHY)

4.1.1 Sub-section 5.3 of the draft SAP

5.3. Wholesale Open Access model refers to a sharing model where a licenced entity allows other entities to offer services using its network. The Authority defines open access in terms of “no locking”, “no blocking” and “no retail”. Open Access is a special case of Managed Spectrum Park model described in item 5.8 below.

Telkom strongly opposes the range of “no retail” restrictions as discussed in section 3.4 above. This restriction is also not consistent with the draft Policy Direction on High Demand Spectrum. Hence, it is recommended that the definition of a wholesale open access model be revised such that the “no retail” limitation is removed in accordance with Telkom’s General Comments so as to create a workable model in the South African context.

From Telkom’s perspective, the statement: “*Open access is a special case of Managed Spectrum Park model*” could be misleading in the context of the draft ITA and should be deleted. Whereas open access as used in the draft ITA relates to the provisioning of wholesale network services to retail services providers, open access as used in, for example, the New Zealand Spectrum Park model relates more to spectrum commons or spectrum license exemption. It is also noted that the “open access” option in the New Zealand Spectrum Park model was not the preferred methodology and was eliminated from the process. Furthermore, since the spectrum park model will be considered as a separate process in future this statement could be deleted since it does not add value to this process.

4.1.2 Sub-section 5.6 of the draft SAP

5.6. "No retail" means that the licensee will not offer any retail services to end users but will provide basic transport capacity to unaffiliated retail service providers on a non-discriminatory basis. The disassociation of transport from retail services will promote competition and benefit consumers.

Telkom strongly opposes the "no retail" restriction as discussed in section 3.3 above. We consider that such a restriction is unworkable in South Africa as it essentially means that the licensee will be depending on large competitors to retail their wholesale services whilst concurrently offering their own vertically integrated high speed wireless broadband offerings.

4.1.3 Sub-section 5.7 of the draft SAP

5.7. The Authority proposes that any entity licenced for both 800 MHz band and 2.6 GHz band should be obliged to build an Open Access network.

As discussed also in section 3.3, Telkom believes it to be optimal that open access obligations be limited to areas where it is uneconomical to duplicate network infrastructure. Also, open access is generally applied – especially in foreign markets - where public funding is involved (for example, Sentech must therefore have an open access obligation, if they are assigned spectrum). Furthermore, open access should be applied to all licensees, in particular those receiving assignments in the 800 MHz band. Also, there is no reason to suggest why all sub-1 GHz band licensees including the existing 900 MHz licensees should not be subject to similar open access obligations especially given the discussion in the draft SAP.

4.1.4 Sub-section 5.12 of the draft SAP

5.12. Entities in 3.5 GHz band who wish to apply and have access to 2.6 GHz band in the current process must undertake to surrender their spectrum in 3.5 GHz band to the Authority if they are successful unless they present a compelling case why they should be allowed to keep it.

It is not clear from sub-section 5.12 of the SAP whether Sentech will have to return their 3.5 GHz assignment after receiving 2.6 GHz. Telkom is of the strong view, that in the interests of fairness and transparency that Sentech should return their 3.5 GHz assignments if they receive an assignment in the 2.6 GHz band.

4.1.5 Sub-section 5.13 of the draft SAP

5.13. The bands 450-470 MHz and 2300 – 2400 MHz (2.3 GHz) are specifically excluded in the designated IMT bands due to the fact that there are no permanently licenced entities for IMT services in these bands.

Telkom supports the exclusion of these bands from this process since these bands are used extensively by Telkom and others.

4.2 SECTION 6 OF THE DRAFT SAP (FREQUENCY CHANELLING ARRANGEMENTS)

4.2.1 Sub-section 6.1.1 of the draft SAP

6.1.1. The 800 MHz band has been allocated to the mobile, except aeronautical mobile, service in accordance with Article 5 provision of the ITU radio regulations. The band is identified for IMT and is allocated in terms of Resolution 224 and 749 as revised in the World Radiocommunications Conference 2007 (WRC-07).

Both Resolutions 224 and 749 have been revised at WRC-12 and this ought be reflected in the final ITA.

4.2.2 Sub-section 6.2.1 of the draft SAP

6.2.1. The frequency band 2 500-2 690 MHz (2.6 GHz) has been allocated to the mobile, except aeronautical mobile, service in accordance with the provision 5.384A, 5.384B of the ITU radio regulations. The band is identified for IMT in terms of Resolution 223 as revised in WRC-07.

Reference to ITU footnote 5.384B is incorrect and should be verified since it does not exist in the ITU Radio Regulations.

Resolution 223 was also amended at WRC-12 and this ought to be reflected in the final ITA.

4.3 SECTION 8 OF THE DRAFT SAP (IN-BAND MIGRATION IN 800 MHz AND 2.6 GHz BANDS)

4.3.1 Sub-section 8.7 of the draft SAP

8.7. The following is proposed for Sentech in-band migration:

8.7.1. Sentech should retain 30 MHz as 2 x 15 MHz FDD in the 2.6 GHz band made up of 2500 to 2515 MHz paired with 2620 to 2635 MHz

8.7.2. In addition Sentech should be assigned 20 MHz as 2 x 10 MHz FDD in the 800 MHz band in lieu of 20 MHz in 2.6 GHz band.

8.7.3. The advantage of the above arrangement for Sentech is that it will be possible to retain the preferred harmonised frequency plan and Sentech would be able to address both capacity and coverage driven scenarios and, hence, fulfil its mandate for broadband coverage in rural areas.

8.7.4. Sentech expressed a view that they would like to keep 2 x 25 MHz FDD in the 2.6 GHz with an option to switch 2 x 10 MHz to the 800 MHz band in the future.

8.7.5. Given this process underway, the Authority is of the view that the proposal by Sentech is unattainable.

The principle of “*use-it-or-lose-it*” as it applies to spectrum assignments has been voiced on numerous occasions by both ICASA and the DoC in both public forums and in official publications (e.g. Radio Frequency Spectrum Regulations, 2011 and the National Spectrum Policy). Notwithstanding this, the Authority continues to allow Sentech to, not only keep their spectrum assignment in 2.6 GHz but is also proposing that they receive access to an additional frequency band (i.e. 800 MHz). Furthermore, as indicated in paragraph 0 above, Sentech may retain their 3.5 GHz spectrum whereas other licensees must return same when receiving a 2.6 GHz assignment. This special treatment of Sentech and its possible roll in delivering broadband services has not been explained apart from stating that it is to “*fulfill its mandate for broadband coverage in rural areas*”.

The role of Sentech in delivering ICT services, in particular broadband services, ought to be clarified and substantiated as it raises many concerns:

- a. The obligation to provide 70% geographical coverage is placed solely on the winner of Package 1 according to the ITA erratum. This is notwithstanding the fact that, according to the Authority’s presentation at the media briefing held 14 December 2011 winners of both 800 MHz and 2.6 GHz will have this obligation. Although it is indicated that Sentech has

- a mandate to deliver broadband coverage in rural areas, we do not appreciate that they have no obligation to rollout in the rural areas. This ought to be clarified.
- b. According to the latest State of the Nation Address by the President, as well as the budget vote speech from the Minister of Finance, no funding has been made available to Sentech for providing broadband services. Where it could be argued that rural broadband (in 800 MHz) will not be possible during the next financial year due to the unavailability of spectrum (depending on the migration of analog television), then Sentech has no ability to use the 2.6 GHz band. This lack of funding reflects a continuation of the status quo of the last few years. Telkom does not believe that, in the national interest such spectrum should remain fallow.
 - c. Sentech has publicly intimated that they may not necessarily need 800 MHz and it may be considered a future requirement (see sub-section 8.7.4). Sentech's view that 800 MHz may be an "option" in the future contradicts their current "mandate" to provide coverage in rural areas. Telkom on the other hand have an immediate requirement for 800 MHz spectrum and will utilise 2x10 MHz more effectively and efficiently than Sentech and thus the recommendation that 2x10 MHz be made available to Telkom by means of a pre-assignment.
 - d. Considering that Sentech's resources will be constrained in the next three years by a complex, testing and expensive digital television migration process, it is far from certain where Sentech will find the necessary resources to deliver any broadband services. In such circumstances, in Telkom's view it would be an inefficient use and run contrary to the national interest to allocate additional spectrum to Sentech.
 - e. If Sentech has a mandate to provide rural coverage and assuming that public funding will be provided, the winner of Package 1 will have to compete directly with Sentech in both the urban and rural areas. It is almost impossible for bidders to submit a business case for Package 1 under these circumstances. This is for the following reasons:
 - i. Private bidders must use private funding, which is more expensive than Sentech's public funding (assuming it is forthcoming).

- ii. There are no details pertaining to Sentech's mandate publically available and as such therefore not be factored into any business case and/or competitive assessment.
- iii. The proposal of "no retail" creates further uncertainty for commercial service providers, which is not necessarily the case for Sentech as a government entity using public funding.
- iv. Since Sentech also controls the digital television migration process, it is possible that they obtain access to 800 MHz prior to the winner of Package 1, further diluting the business case for the commercial service provider. What safeguards can be put in place so that they are unable to favour their own spectrum during the clearing process.
- v. Using public funding would allow Sentech the possibility of applying a smaller wholesale margin (as they need less returns to exceed the SA Government bond rate) thereby further undermining the commercial business case of the successful Package 1 bidder.

Whereas the relocation of Sentech's 2.6 GHz TDD assignment to a 2.6 GHz FDD assignment is defensible only in the context of harmonisation of the band, the proposal to assign Sentech spectrum in the 800 MHz cannot be considered as "*in-band migration*". This proposed new assignment to Sentech, outside the process underway, should therefore be clarified in detail. Telkom notes that if this assignment was to be made, then it along with the proposed Neotel assignment would mean that 66 percent of the high demand 800 MHz band is proposed to be assigned even before the process starts! This is unparalleled in global terms and is not global best practice. See also Telkom's comments in section 3.2 on the need for sub-1 GHz spectrum.

4.3.2 Sub-section 8.8.1 of the draft SAP

8.8.1. WBS should be migrated to occupy the upper 20 MHz of the sub-band 2570 to 2620 MHz as unrestricted spectrum.

According to the draft ITA it is proposed that WBS uses the band 2595-2615 MHz (Block F2 in Figure 1 of the draft ITA) as an unrestricted assignment and not the

upper 20 MHz of the TDD allocation as indicated in sub-section 8.8.1. This should be corrected.

4.3.3 Sub-section 8.8.5 of the draft SAP

8.8.5. In terms of the requirements the upper 5 MHz block of the TDD sub-band (i.e. 2615 to 2620 MHz) should be restricted and the power level should be below that of standard blocks in order to protect FDD receiving terminal stations. There is no required protection to TDD terminal stations in this block other than standard out-of-band emissions protection criteria.

It is assumed that the reference to “*In terms of the requirements...*” (Telkom’s emphasis) refers to those requirements stipulated in EC decision 2008/477/EC and ECC Report 131 as referenced in sub-section 8.4.4. Although it seems that the intention is for the BEM values in the upper 5 MHz block to be in line with those stipulated in the referenced documents, this is not clearly indicated as such and should be corrected.

Furthermore, with regard to the last sentence in sub-section 8.8.5, it is seemingly proposed that there is no protection to TDD terminal stations in this upper 5 MHz block from FDD systems operating in the band above 2620 MHz. Also, it is not clear what protection will be afforded, if any, to the TDD base station, which operates in the same 5 MHz frequency band. The necessary amendments must be made to clarify these issues.

4.3.4 Sub-section 8.8.6 of the draft SAP

8.8.6. Further, in a TDD to TDD frequency boundary, the first 5 MHz block of the upper TDD spectrum is designated as a restricted block and the power level should be below that of standard blocks in order to protect TDD operation below the boundary. On the other hand the restricted block is not afforded the same level of protection other than standard out-of-band emissions protection criteria.

Telkom recommends that the band limits of the first 5 MHz block (i.e. 2590-2595 MHz) be added to sub-section 8.8.6 for clarity and to align with format used in sub-section 8.8.5.

The comments made in paragraph 0 above are also relevant to sub-section 8.8.6.

Furthermore, it is recommended that the Authority uses specific frequency values rather than terms such as “*below the boundary*”; “*first 5 MHz block*”, “*upper TDD spectrum*”, etc. since these introduce a level of uncertainty and will create disputes between licensees when implementing the BEM’s. It is also recommended that the specific BEM values be added to the final ITA rather than a mere reference to the European documents.

4.3.5 Sub-section 8.8.10 of the draft SAP

8.8.10. Alternatively, the Authority seeks comments on the proposal that the 5 MHz guard bands be reserved for future use for low power devices and technologies.

It is difficult to provide comments on the use of the guard bands for “*low power devices and technologies*” without more information. For example, “*low power devices*” could refer to radio apparatus exempted from radio frequency spectrum licenses as also contained in Annexure B of the RFS Regulations. In this case the feasibility of using the guard bands will depend on the technical and operational requirements of the proposed low power devices and detailed sharing analysis will be required. On the other hand, low power devices could also be seen in the context of the Spectrum Park model. In this regard, OFCOM is proposing the use of devices operating at lower power in order to facilitate sharing, similar to the Spectrum Park model.

4.3.6 Sub-section 8.9.1 of the draft SAP

8.9.1. The Authority proposes that Neotel should be migrated to occupy the first 2 x 10 MHz in the 800 MHz band.

Telkom is strongly opposed to the assignment of 2x10 MHz of spectrum to Neotel without any evaluation process for such an assignment.

Telkom notes that that there is no proposed rollout obligation in the draft SAP attached to the proposed assignment for Neotel notwithstanding the following:

- a. Neotel would double their current CDMA-2000 holdings;
- b. Neotel’s current assignment is on a secondary basis (see section 2.5.5 of Government Gazette No. 29345 dated 31 October 2006) whereas the proposed new assignment will be on a primary basis;

- c. In addition to the 2x10 MHz assignment in the new 800 MHz band they also retain part of the currently assigned CDMA-2000 spectrum (in the 850 MHz band);
- d. Although Neotel received their CDMA-2000 assignment in 2006, their service offering is hitherto limited to the prime main metropolitan areas or Gauteng, Cape Town, Durban and Port Elizabeth. Without any rollout obligation there remains no incentive for Neotel to move into the economically challenging areas and to invest in South Africa's growth;
- e. Neotel was also been granted access to 1800 MHz band, which is seemingly until now not being used;
- f. In addition to seemingly not having any rollout obligations there is not even an open access obligation as applied to Sentech and the proposed Package 1. This is incongruous and not global best practice so to ensure competitive neutrality;
- g. It is proposed that Neotel is to pay only the prescribed annual spectrum fee whereas the winner of Package 1 could potentially also pay a substantial auction fee for acquiring the same spectrum assignment creating a substantial competitive advantage for Neotel. Similar to the practice in other markets, we would expect that Neotel would be required to pay the same sum of money in order to achieve competitive neutrality.
- h. Neotel's service offering is limited to fixed and nomadic services although it uses prime mobile spectrum and, after six years in operation, it still has less than 60,000 customers. The business case for Neotel to become the 5th national mobile operator, using the prime IMT spectrum in the 1800 MHz and 800 MHz bands, seems lacking.

In contrast to the above, given the substantial investment made by Telkom in 8ta over the past two years without any sub-1 GHz spectrum, we are strongly of the view that Telkom is better positioned and resourced to utilise the 800 MHz spectrum more effectively and efficiently in the national interest than Neotel. Moreover, the 800 MHz band could be used in conjunction with Telkom's current 1800 MHz and 2100 MHz mobile network, to provide national mobile broadband services. See also Telkom's comments in section 3.1 in this regard.

4.3.7 Sub-section 8.9.4 of the draft SAP

8.9.4. For this reason the Authority proposes that Neotel is allowed to keep 2 x 1.2 MHz for CDMA200 in the band.

Telkom would like to understand the analysis that considers that Neotel should be permitted to keep 2 x 1.2 MHz to continue their CDMA-2000 operations. Given the small size of the allocation and the small number of customers, consistent with other global markets which such networks are being turned off and customers migrated, consideration ought to have been given to refarming this spectrum and closing down this network.

In sub-section 9.4.8 it is indicated that the band 830.8-832 MHz paired with 875.8-877 MHz will be licensed to Neotel in this regard. However, this 2x1.2 MHz channel is not a standard CDMA-2000 channel and it is therefore not clear how Neotel will use this channel for their CDMA-2000 operations. Furthermore, a standard CDMA-2000 carrier is generally 1.23 MHz and not 1.2 MHz.

It is also understood that Neotel is currently using at least four CDMA-2000 carriers (channels 3, 5, 6 and 7), which are all, except for channel 7, below 832 MHz (start of the return leg of 800 MHz band) and therefore within the centre gap of the 800 MHz channel plan. The requirement for four CDMA-2000 carriers was, amongst others, due to the existence of analogue broadcasting transmissions. Considering that Neotel will continue with their CDMA-2000 services, it is not clear how they will be able to provide the CDMA-2000 service going forward using only one carrier. The current and future use of all Neotel's CDMA-2000 spectrum assignments should be clearly specified.

A typographical error exists, "*CDMA 200*" should be re-written as "CDMA-2000".

4.4 SECTION 9 OF THE DRAFT SAP (THE SPECTRUM ASSIGNMENT PLAN AND LICENSING FRAMEWORK)

4.4.1 Sub-section 9.1.6 of the draft SAP

9.1.6. Block F is 30 MHz unpaired spectrum made up of 20 MHz spectrum in 2590 to 2615 MHz and spectrum in the guard bands made up of 2590 to 2595 MHz and 2615 to 2620 MHz

The frequency ranges specified in sub-section 9.1.6 are incorrect and should be revised as follows: “*Block F is 30 MHz unpaired spectrum made up of 20 MHz spectrum in ~~2590-2595~~ to 2615 and spectrum in the guard bands made up of 2590 to 2595 MHz and 2615 to 2620 MHz*”.

4.4.2 Sub-section 9.4.1 of the draft SAP

9.4.1. The Authority proposes to licence **Package 1** to an individual ECNS licence holder on Wholesale Open Access conditions described in 5.3 of this document.

Package is to be licensed to an “*individual*” ECNS licence holder. It is however noted that a consortium of individual ECNS licence holders may also apply for Package 1 in accordance with section 6 of the draft ITA (prequalification phase). These sections must be aligned.

In addition, it is recommended that “*ECNS*” be changed to “*I-ECNS*” as also addressed in paragraph 0.

See also Telkom’s comments in sections 3.2 and 3.3.

4.4.3 Sub-section 9.4.8 of the draft SAP

9.4.8. Further, the Authority proposes to allow Neotel to keep and be licensed for 1.2 MHz in the 830.8–832 MHz paired with 1.2 MHz in 875.8–877 MHz band for CDMA operations.

The comments made in section 4.3.7 apply.

4.4.4 Sub-section 9.7 of the draft SAP

9.7. The bands should be used in accordance with terms set out in the section about apportioning of the spectrum blocks and in accordance with other terms and conditions set out in the ITA.

In order to avoid possible uncertainty it is recommended that the reference to “...set out in the section about apportioning...” be changed by referencing the actual section or sub-section number. It seems to be referring to sub-section 9.4 although this is not clear.

4.4.5 Table 2 of the draft SAP

F1	2590 to 2615 Unpaired	20 MHz	Guard band to be used by WBS
F2	2590 to 2595 guard band	5 MHz	WBS

The errors in Table 2 with regard to the frequency limits for channel blocks F1 and F2 should be corrected as follows:

F1	2590 to <u>2595</u> <u>guard band</u>	<u>5 MHz</u>	Guard band to be used by WBS
F2	<u>2595 to 2615</u> <u>unpaired</u>	<u>20 MHz</u>	WBS

4.4.6 Figure 2 of the draft SAP

The 1.2 MHz assignment for Neotel is misleading since it is in fact directly adjacent to the Block X and should be indicated as such (830.8-832 MHz).

5. GENERAL COMMENTS ON DRAFT ITA

Telkom has two important general comments to make to the Authority in relation to the draft ITA. These are namely in relation to the proposed selection criteria (section 6 of the ITA) and the proposed rollout targets (section 8). Telkom's proposals for change are detailed below.

5.1 Changes to the Selection Criteria – Section 6 of the draft ITA (Comparative Criteria for the Award)

With respect to Schedule A, Section 6 of the Government's draft Spectrum Assignment Plan, Telkom notes the proposed comparative criteria for the award of high demand spectrum is to proceed on the basis detailed in Exhibit 5 below.

Exhibit 5: Comparative criteria for award

Description	Criteria	Weighting
Beauty Contest	Business Plan	20%
	Technical Plan	15%
	Market Innovation and Stimulation	15%
	Network Rollout Plan	50%

Telkom is strongly of the view that changes are needed to the proposed comparative criteria in the ITA. In our view such draft criteria ought to be amended by augmenting the number of categories and secondly by reweighting the existing criteria in order to provide a proper and considered basis of evaluation.

Telkom's rationale to the Authority for such moves is as follows.

- a. Firstly, there is a need for the selection criteria to include expected 'national economic benefit' provided by an applicant's proposal. This would be consistent with the Government's overarching policy objectives to achieve an increase in broadband penetration – especially wireless broadband penetration and the release of high demand spectrum. This is ultimately an endeavour of significant national importance and as a result, the selection criteria should be amended to reflect this. This criteria could

be assessed on the likely value of the bid, in net present value terms to the national economy and increase in job creation.

- b. Secondly, it is submitted that an additional criterion concerning the 'financial strength and viability' of the applicant should be included. The importance of such a criterion is arguably self-explanatory. This is because all the planning and technical expertise is moot if an operator does not have sufficient capital to undertake a substantial project of national scope and bear its inherent risks.

Given the need for 'deep pockets' to fund the rollout of 4G networks and systems to secure a 4G spectrum assignment, Telkom considers that a greater emphasis needs to be placed on financial considerations in coming to a decision on whom should be selected as South Africa's key 4G spectrum assignment holders, including the financial strength of the bidder or bidding consortium. This is because ultimately the licence would be awarded to the operator most likely to be able to fund the development and promotion of service offerings and the necessary network rollout. The greatest promises of prospective bidders, if they are unable to fulfilled, do not benefit consumers and act to undermine South Africa's country competitiveness by delaying the rollout of world class services.

In this context, Telkom supports a substantial increase in the weighting accorded to financial considerations.

Exhibit 6 presents Telkom's suggested revised selection criteria.

Exhibit 6: Suggested criteria for award

Description		Criteria
Beauty Contest	• Business Plan	20%
	• Technical Plan	15%
	• Market Innovation and Stimulation	15%
	• Network Rollout Plan	20%
	• National Economic Benefit	20%
	• Financial Strength & Viability	10%

5.2 Changes to the Proposed Rollout Obligations – Section 8 of the draft ITA

Telkom notes ICASA's proposed rollout obligations in section 8 of the ITA relation to both combinational and stand-alone licences, which are, *inter alia*:

- Package 1: (including 800 MHz and 2.6 GHz allocations): 70 percent geographic coverage in five years of which 50 percent must exclude Gauteng, Cape Town and Durban metros; and
- Package 2: (2.6 GHz only): 50 percent population coverage in four years.

With respect to the Package 1 rollout obligations, Telkom does not support ICASA's proposals and submits that such lofty targets are unrealistic and unlikely to be achieved. For reasons that will be elaborated below, these proposals are contrary to international precedent, are not practical given cellular propagation characteristics in the 2.6 GHz band. They are also too onerous given South Africa's relatively sparse population density and emerging economy status.

In comparison to its 2.6 GHz band, the 800 MHz frequency range provides wider geographical coverage and greater penetration in dense, urban areas

We would highlight a 2010 report¹⁵ into the 2.6 GHz band and prepared for the GSMA notes that the shorter wavelengths in this band 'are not very suitable for providing coverage in rural areas' and have 'relatively short propagation ranges and inferior in-building penetration characteristics compared to lower frequencies.' The Report goes on to say that in many markets, the 2.6 GHz band is better suited to augment the capacity of existing mobile broadband networks, thereby making the attachment of coverage obligations unsuitable.

While smart antenna devices and MIMO can raise the efficacy of 2.6 GHz wavelengths to a greater degree than its lower band counterparts¹⁶, ***this would entail the outlay of capital expenditure in addition to the significant***

¹⁵ See www.gsma.com/go/download/?file=gvpgsma26ghzreportfinal9dec09-1.pdf

¹⁶ *Ibid*

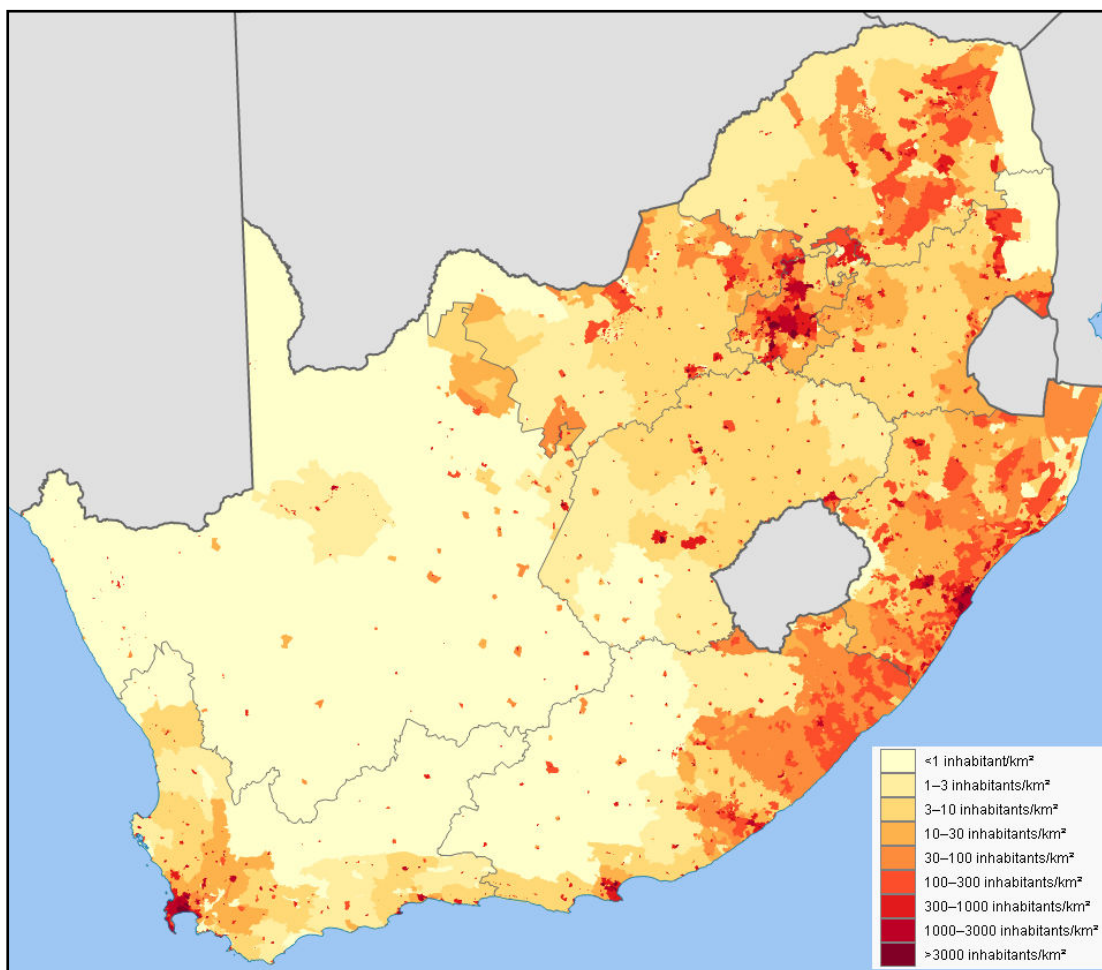
expenditure that would be required to install the numerous additional towers and other infrastructure that would be needed to meet the rollout obligations.

Taking into account the technical characteristics of the 2.6 GHz band as discussed above, Telkom argues that the 70 percent geographic requirement to be achieved over five years is unreasonable. This is compounded by the 50 percent exclusion of Gauteng Metro area. This is because of the following:

- South Africa has a total surface area of 1,223,630.526 km²;
- The main metros of Gauteng, Cape Town and Durban constitute less than 2 percent of total; and
- 77.2 percent of South Africa's population resides within an area of 535,092 km², or approximately 43 percent of total surface area.

The vast majority (94%) of the South African population lives in the 6 metropolitan municipalities. This is evident when considering a graphical illustration of population density in South Africa, as per Exhibit 7 below.

Exhibit 7: Population distribution in South African



Source: Wikipedia

Telkom SA Ltd

Submission date: 29 February 2012

Consequently, the successful licensee would be required to deploy a significant volume of network infrastructure in sparsely populated rural areas over a relatively short time frame. It is difficult to envisage operators making these substantial undertakings ***without some form of financial assistance from Government and/or later on seeking relaxation of these conditions.***

Furthermore, 50 percent population coverage within four years obligation for 2.6 GHz spectrum is also ***inconsistent with international precedent.*** As the following tables show, only several countries (all of which for various reasons are more advantageously placed than South Africa) have attached similar rollout obligations to what ICASA is proposing.

Exhibit 9: 2.6 GHz coverage obligations and relevant country data

Country	Pop. density (km ²)	GDP per capita	Coverage obligation	Year allocated
France	116	\$44,400	At least 75 per cent of population within 12 years	2011
Germany	229	\$44,555	At least 25 per cent of population by 2014, and at least 50 per cent of population by 2016	2010
Hong Kong	6,480	\$31,590	At least 50 per cent of population within five years	2.5 and 2.6 GHz auctioned in 2009
Italy	201.2	\$37,046	At least 20 per cent of population within two years and at least 40 per cent within four years, with an extra year allowed for new entrants ¹⁷	2011
India	367.6	\$1,527	At least 90 per cent of	2.3 GHz

¹⁷ RSPG Report on Improving Broadband Coverage', Annex, 16 November 2011, http://rspg.groups.eu.int/_documents/documents/meeting/rspg26/rspg11_393_report_imp_broad_cov.pdf

			metropolitan areas and at least 50 per cent of rural areas within five years	auctioned in 2010
Norway	12.5	\$84,443	No coverage obligations	2007
Singapore	7,315	\$50,714	Currently considering coverage obligations for 2.3 and 2.5 GHz ranges after 2015	Currently plan to allocate in 2012
Sweden	20.6	\$47,934	No coverage obligations	2008
United Kingdom	255.6	\$39,459	No coverage obligations	Currently plan to allocate in 2012

6. Specific comments on the draft ITA

6.1 Title page

The title of the draft ITA indicates that the licence will be issued to provide “*mobile broadband wireless access services*” (own emphasis). At the end of paragraph one it is indicated that the two frequency bands will be used for purposes of “*broadband wireless access services*”. According to the ITU definition broadband wireless access or BWA includes fixed, nomadic and mobile services. It is therefore suggested that the generic term BWA be used and not the more specific MBWA, which is then limited to mobile.

The combination of the 2.6 GHz and the 800 MHz is to be licensed as a complement to ensure capacity and coverage for the purposes of providing mobile broadband wireless access services nationally

Although it is agreed that the 800 MHz and 2.6 GHz bands are complementary in terms of coverage and capacity, the proposed ITA in effect offers only one package that includes both frequency bands namely the proposed Package 1. The issue of a combinational award is addressed in section 3.3.

6.2 SCHEDULE A: SECTION 1 (APPLICATION) OF THE DRAFT ITA

6.2.1 Sub-section 1.1 of the draft ITA

1.1. Only applicants with ECNS licenses are eligible to apply

Considering that the spectrum will be assigned on a national basis, Telkom recommends that the word “Individual” be added to sub-section 1.1 as follows: “*Only applicants with I-ECNS licences are eligible to apply*”.

6.2.2 Sub-section 1.6 of the draft ITA

1.6. All applications submitted to the Authority pursuant to this ITA will be made available for inspection upon request by interested persons

While Telkom supports this principle, it is not clear at which stage in the process, the said inspection will be allowed. For example, will this be allowed the day after the applications have been submitted or, only after the granting of licences (Phase 4)?

Telkom suggests that the Authority should clearly indicate that applications will become available for inspection the day after it has been submitted.

6.2.3 Sub-section 1.7 of the draft ITA

1.7. Where the applicant requires that the application or part thereof be treated confidential, then an application in terms of section 4(d) of the ICASA Act, 2000 (Act No. 13 of 2000) must be lodged during the submission of the application.

It is stated that the section 4D application "...must be lodged during the submission of the application" [own emphasis]. Telkom recommends this be changed to "...must be lodged during at the time of the submission of the application".

Telkom also recommends that the reference to "section 4(d)" be changed to "section 4D" in order to align with the naming/numbering convention used in the ICASA Act.

6.2.4 Sub-section 1.9 of the draft ITA

1.9. The Authority may determine that an application or portion(s) thereof are confidential and the Authority will inform applicants of the determination within seven (7) days of receiving a request for confidentiality.

In terms of sub-section (4)(e) of section 4D of the ICASA Act, the Authority must treat a business plan of a licensee as confidential information when considering a section 4D application. Therefore, all information submitted as part of Phase 2 (Beauty contest) must be considered confidential if a request for confidentiality is lodged.

6.2.5 Sub-sections 1.11 and 1.12 of the draft ITA

- 1.11. Each application must have a cover page with the name of the applicant, the licence being applied for and date of application on it.
- 1.12. Each application must have a cover page with the name of the applicant, the package being applied for and date of application on it.

Telkom recommends that these two sections be merged since they both address the same requirement; the only difference being that sub-section 1.11 specifies, amongst others, the licence being applied for whereas sub-section 1.12 specifies the package being applied for.

6.2.6 Sub-section 1.18 of the draft ITA

- 1.18. Applications must be submitted by no later than 16H00 on 23 March 2012 (Central African Time).

It is not clear why reference is made to “Central African Time” since the proposed applications have no relevance to parties outside of South Africa; in all cases I-ECNS licensees must apply. Telkom therefore recommends that reference be made to local South African time.

6.2.7 Table 1 of the draft ITA

Table 1: Packages for licencing of 2.6 GHz and 800 MHz bands			
Packages	2.6 GHz Block	800 MHz Block	Proposed Assignments
1	B	Z	To be assigned to an individual ECNS licence holder on Wholesale Open Access conditions described in this document
2	C	N/A	To be assigned to an individual ECNS licence holder that have no spectrum assigned in any of the designated IMT bands
3	D	N/A	To be assigned to an individual ECNS licence holder that have no spectrum assigned in any of the designated IMT bands

According to the “Proposed Assignments” column, Package 1 is “To be assigned to an individual ECNS licence holder on Wholesale Open Access conditions described

in this document” (own emphasis). The conditions for wholesale open access are in fact described in the draft SAP and not in the draft ITA and this should be corrected.

6.2.8 Sub-section 1.31 of the draft ITA

1.31. The requirements for prequalification are 30% ownership by Historically Disadvantaged Individuals (HDI), ECNS licene and Financial credibility.

Telkom notes that the draft ITA requires “30% ownership by Historically Disadvantage Individuals (HDI)”. However, the Radio Frequency Spectrum Regulations, 2011 (Government Gazette No. 34172, dated 31 March 2011) (“RFS Regulations”) specifies “30% direct ownership by Historically Disadvantage Persons (HDP)” (own emphasis). Telkom recommends that these disparities be corrected. Similar changes to “HDI” in sub-section 1.32 are also required.

Telkom recommends changing “ECNS licene” to “I-ECNS licence”. A similar change to “ECNS” in subsection 1.32 is also required.

6.2.9 Sub-section 1.33 of the draft ITA

1.33. An applicant who does not meet any of the prequalification criteria at the time of application deadline will be disqualified.

Telkom considers that it is fair and reasonable that applicants that are disqualified during Phase 1 should be informed immediately. This will facilitate the successful completion of the 4 stage licensing process. In principle, applicants will not submit an application if they do not meet the prequalification criteria; it is therefore plausible that a disqualification by the Authority will be objected by the applicant, this disagreement must be addressed before the Authority proceeds to Phase 2. Telkom therefore recommends the addition of the following sentence to sub-section 1.33: “Applicants disqualified during Phase 1 will be informed immediately in writing as to the reasons for disqualification before the Authority proceeds to Phase 2. Applicants will have an opportunity to respond within seven (7) days”. Telkom would furthermore also recommend that the Authority consider adding an arbitration process for the disqualified bidders that wish to appeal their disqualification, which will help in ensuring that the process proceeds with certainty after this phase.

6.2.10 Sub-section 1.35 of the draft ITA

1.35. Applicants who score 65 % or more and have not scored less than 50% on any of the criteria as set out for evaluation phase will move to the sealed bid phase

One of the foremost reasons why comparative hearings or beauty contests have been replaced by alternative market based assignment methodologies (e.g. auctions) by many Regulators Internationally is the subjectivity of the evaluation of bids as well as the lack of transparency. This is compounded by the complexity of the bids in that no two business cases will be the same; different technologies could even be proposed.

Although the criteria for Phase 2 assessment (beauty contest) is clear in terms of the components to be evaluated (i.e. business plan, technical plan, market innovation & stimulation and network rollout plan) there is no information pertaining to the assessment or scoring of the bids. Neither the draft ITA nor the RFS Regulations provide any information in this regard. In order to minimise the possibility of legal challenge, it is imperative that the Authority clearly specify this criteria beforehand in order to be as objective and transparent as possible. Evaluation criteria and scoring principles should be clearly stipulated as part of the ITA.

6.2.11 Sub-section 1.36 of the draft ITA

1.36. In the event that more than one applicant meets the criteria set in phase 2 for a package, the applicants will move to the sealed bid phase.

The application of sub-section 1.36 in concurrence with submissions in terms of priorities (see sub-section 1.28) is not clear and needs further clarification.

6.2.12 Sub-section 1.37 of the draft ITA

1.37.	The Sealed bid phase will be conducted in accordance with the following manner and procedure:
1.37.1.	Sealed bids must be submitted together with the applications in a separate envelope clearly marked "Private and Confidential sealed bid" and the name of the bidder, outside.
1.37.2.	The highest bidder wins
1.37.3.	The winning bidder pays their bid
1.37.4.	The Authority will announce bid prices, announce the winning bidder and publish the winners in the government gazette.

The use of a sealed bid auction format, also known as first-priced sealed bid auction is of concern to Telkom. Although this auction format is simple and quick to implement, its main disadvantage is that there is no price discovery. Hence, two winners obtaining similar spectrum assignments could pay vastly different amounts. In particular price discovery is critical in the South African context considering that this will be the first auction ever to be held in the country.

It would seem that the Authority selected this method due to the ease of its implementation as it does not require the appointment of an auctioneer. Telkom would advise that the Authority use a more suitable auction format where an auction is required as the use of auctions are supported by the *National Spectrum Policy* (see section 7.6 of Government Gazette No. 33116 dated 16 April 2010), RFS Regulations (see section 7) and the draft Policy Direction for ECS in High demand spectrum (see section 2.1.5).

A more suitable auction format is, for example, a simultaneous ascending auction where bidders submit their bids in multiple rounds until the highest bidder is determined. This is ideal for price discovery. Although this format will be used when the sealed bid results in more than one bid having the same value this is highly unlikely and therefore the sealed bid auction format will in effect be applied. Furthermore, as a minimum, a second-priced sealed bid could be adopted in place of the proposed first-price sealed bid auction. In the second-priced sealed bid the highest bidder wins the spectrum lot but pays an amount equivalent to the second highest bid, thereby avoiding the so-called "winners curse".

6.2.13 Sub-sections 1.38.5 to 1.38.7 of the draft ITA

- 1.38.5. It is the responsibility of the participants to arrange their own finances,
- 1.38.6. The first payment of thirty percent (30%) of the bid is to be made within thirty (30) working days by the successful bidder, calculated from the day the letter of award is issued,
- 1.38.7. The last payment of seventy percent (70%) must be made within sixty working days, calculated from the day after the first payment (30%) was due and payable.

Sub-sections 1.38.5 to 1.38.7 should be renumbered as sub-sections 1.39 to 1.41, since these sub-sections do not relate to the process of further bids as addressed in sub-section 1.38. Consequential changes to sub-sections 1.39 to 1.40 should therefore be made.

Whereas the first payment of 30% within 30 working days is acceptable, the payment of the remaining 70% within 60 working days after the due date of the first payment should be reconsidered. In particular, for the 800 MHz band this should be reconsidered in lieu of the fact that 800 MHz spectrum will not be available nationally from the time of award. It is recommended that the availability (on a national basis) of the 800 MHz assignment should be taken into account in determining the date for payment of the remaining 70%. If there is no incentive for the spectrum to be cleared and handed over for use then there could be significant delays.

6.2.14 Sub-section 1.40 of the draft ITA

- 1.40. Information on the initiatives and creativity on the part of the applicant to enable an early release of the 800 MHz bands by providing an incentive and or mechanism will form part of the license condition.

Telkom recommends that this information (initiatives and creativity on the part of the applicant to enable early release of the 800 MHz) be added to Schedule B (Application procedure).

6.3 SCHEDULE A: SECTION 3 OF THE DRAFT ITA (WITHDRAWAL OF THE SPECTRUM LICENCE)

6.3.1 Sub-section 3.2 of the draft ITA

3.2. Failure to meet the rollout targets as per the network rollout plan and as set out as part of licence conditions will be considered under-utilization and appropriate penalties may apply, including withdrawal of the licence.

Whereas Telkom could support the principle of penalties in case of non-performance, these “appropriate penalties” must be stipulated as part of the final ITA (and licence). It is inconceivable that licensees should accept a penalty clause in a license without this being specified in advance; this cannot be left undefined for future implementation based on the discretion of the Authority.

6.3.2 Sub-section 3.4 of the draft ITA

3.4. To assist the Authority with its determination, the Licensee must submit to the Authority, prior to the second anniversary of the launch of the service , a declaration:

The declaration requested under sub-section 3.4 relates to the review process stipulated in sub-section 3.1. According to sub-section 3.1 the review will take place after two years of the “licence being granted”. According to sub-section 3.4, the declaration is required two years from the “launch of the service”. These two periods could vary substantially and must be aligned. Telkom recommends that sub-section 3.4 be amended as follows: “...prior to the second anniversary of the launch of the service issuing of the licence...”.

In the case of 800 MHz it is possible that services will not be deployed within two years of issuing the licence, since the use of this band is subject to the migration of broadcasting services. This must be taken into account during the determination.

6.3.3 Sub-section 3.4.2 of the draft ITA

3.4.2. Detailing the extent of service provision including the period of use, the percentage of population covered by the service in the License Area and how that is calculated.

It is assumed that the request for “percentage of population covered” relates to the proposed rollout targets for Packages 2 and 3 as stipulated in section 8.1.2 of the ITA erratum. Therefore, it is suggested that the rollout targets for Package 1, which relates to geographic coverage, also be added to sub-section 3.4.2, as required. If the intention is that sub-section 3.4.2 addresses only the population coverage issues as required for the 2.6 GHz packages, the necessary amendments should be made.

With reference to the methodology for calculating population coverage, and in particular the methodology for calculating geographic coverage, it is recommended that this be addressed upfront as part of the ITA in order to avoid disputes and to ensure fair treatment between licensees. By using the propagation conditions of radio signals and technical capabilities of technology it is possible to manipulate geographic coverage calculations resulting in vastly different outcomes. It is therefore recommended that geographic coverage calculations be associated with quality of service levels.

6.3.4 Sub-sections 3.4.3 and 3.4.4 of the draft ITA

3.4.3. The degree of rural geographic coverage
3.4.4. The split between the urban and rural

As addressed in paragraph 00 above, the request for information under sub-sections 3.4.3 to 3.4.4 as it relates to the 800 MHz and/or 2.6 GHz frequency bands, must also be addressed and clarified.

It is assumed that the request for the “degree of rural coverage” as stipulated in sub-section 3.4.3 relates to the rollout targets for Package 1 as specified in section 8.1.1 of the ITA erratum. It is however not clear how “rural geographic coverage” relates to the rollout targets, which specifies only that 50% of the rollout must exclude Gauteng, Cape Town and Durban metros. It is therefore not clear what constitutes

“rural geographic area” and this must be explained. To the same issue, the “split between urban and rural” as requested in sub-section 3.4.4 must also be clarified.

6.4 SCHEDULE A: SECTION 4 OF THE DRAFT ITA (DURATION OF THE RADIO SPECTRUM LICENCE)

6.4.1 Sub-section 4.1 of the draft ITA

4.1. The radio frequency spectrum licence will remain valid from 01 April until 31 March of the following year and is thereafter renewable by payment of the prescribed annual licence fee for the period of fifteen (15) years or the duration of the ECNS license or whichever comes first.

It is evident from the unfolding of events that the spectrum licences will be awarded after 1 April (according to the ITA erratum the finalisation of the licensing process is 31 March 2012). The licence must therefore be valid from the date of issue until 31 March of the following year and thereafter it will remain valid from 1 April until 31 March.

Regarding the prescribed annual licence fee, it is not clear from the draft ITA whether the prescribed licence fee, which is calculated in accordance with the *Radio Frequency Spectrum Licence Fees Regulations* (Government Gazette No. 33495 dated 27 August 2010), will continue to apply in the case where the sealed bid phase was used to award the spectrum. In general, where spectrum is assigned through an auction, there is no annual spectrum fees payable. This needs to be clarified.

Pertaining to the licence duration, Telkom supports the duration of 15 years as a minimum licence period to provide the necessary confidence in network build investment. Such a licence length is consistent with global practice as highlighted in Exhibit 10 below.. However, linking the spectrum licence duration with the ECNS licence duration has a potential problem in terms of the sealed bid. If, for example, the bidder's ECNS licence is valid for a remaining 10 years, spectrum valuation for the sealed bid will be done accordingly and this could be substantially lower than a bid assessed on a 15 year licence term. It is however paramount that all bidders submit their sealed bids based on the same underlying assumptions, of which spectrum licence term is a crucial element.

Exhibit 10: Licence Duration in Selected Markets

COUNTRY	INITIAL LICENCE PERIOD
Australia	Carrier licences – indefinitely
Bahrain	Fixed Licence – 15 years Mobile licence – 15 years
Hong Kong	Unified Licence– 15 years
India	Unified Access Licence – 20 years
Iran	Mobile Licence – 15 years
Korea	Mobile Licence – 15 years
Malaysia	Network Facilities Individual Licence - 10 years Network Services Individual Licence – 10 years
Maldives	Mobile licence – 15 years
Myanmar	Mobile Licence - 15 years
Pakistan	Fixed Licence – 20 years Mobile licence – 15 years
Singapore	Facilities Based Individual Licence – 10-20 years depending on scope of licensee's operations. Services Based Individual Licence – 5 years.
Sri Lanka	Fixed Licence – 20 years Mobile Licence – 20 years
Taiwan	Mobile Licence – 16 years
UK	Typically granted for initial fixed period of 10 – 15 years. 3G Mobile Licence – 20 years
Vietnam	Service Licence – 20 years

Source: WPC Analysis, 2010

6.4.2 Sub-section 5.1 of the draft ITA (as amended by ITA erratum)

5. SPECTRUM LICENSING TIME TABLE
5.1 The authority will endeavor to license the Spectrum in terms of the following timelines
5.1.1 Publication of the Spectrum Plan by 15 December 2011
5.1.2 Closing date for Comments by 29 February 2012
5.1.3 Public Hearings from 07 to 09 March 2012
5.1.4 Final Publication of the ITA on 21 March 2012
5.1.5 Closing date for applications on 26 April 2012
5.1.6 Finalize the Licensing Process on 31 May 2012

With reference to the statement by the ICASA Chairperson on 8th February 2012 regarding licensing of 800 MHz and 2.6 GHz, Telkom welcomes the Authority's

commitment to finalise its licensing process only after the Minister's policy process has been concluded. Although, according to the statement, the Authority will advise shortly as to the new time lines to its licensing process, Telkom recommends that the Authority wait for the conclusion of the policy process before revised dates are published. Furthermore, it is proposed that the public hearings scheduled for 7 to 9 March 2012 be postponed until there is more certainty as to the final Policy Directions from the Minister; it is plausible that the draft ITA will need revision requiring a new round of public consultations considering the current differences between the draft Policy Directions and the draft SAP/ITA:

- a. In terms of the draft Policy Direction it is proposed that the 800 MHz band be assigned to only one network provider whereas the Authority is proposing three operators;
- b. Whereas the draft Policy Direction relates rollout obligations to sparsely populated, rural and remotes areas with the rollout based on priority stages the Authority has a simplistic 70% geographical area coverage obligation;
- c. Whereas the draft policy direction considers the provisioning of wholesale open access to include retail services (functional separation) the Authority defines wholesale open access as "no retail" allowed (structural separation).

Regarding the period between the publication of the final ITA and the submission of applications, Telkom requests that the Authority allow sufficient time for applicants to submit comprehensive bids. Although this process has been on-going and work has been done in this regard, there are still many issues of substance that have major implications on the business case, making it very difficult to work on the actual business case until the final ITA has been published. For example, the issue of wholesale open access, in particular noting the difference between the draft Policy Direction and the draft ITA, has a major impact on the business case. It is furthermore also noted that the ITA for broadcasting licences published 2nd February 2012 (Government Gazettes No. 34998, 34999 and 35000) allows more than five (5) months for submission of applications.

6.5 SCHEDULE A: SECTION 6 OF THE DRAFT ITA (COMPARATIVE CRITERIA FOR THE AWARD)

6. COMPARATIVE CRITERIA FOR THE AWARD			
Phases	Description	Score	Criteria
Phase 1.	Prequalification criteria		– HDI component – An individual ECNS licence holder or a consortium of a combination individual ECS and individual ECNS licence holders on Wholesale Open Access conditions – Financial Credibility such as proof of funding or audited financial statements
Phase 2.	Beauty Contest		– Business Plan (20%) – Technical plan (15%) – Market Innovation and stimulation (15%) – Network rollout plan (50%),
Phase 3.	Sealed Bids		– Highest Price prioritised available package.
Phase 4.	Granting of licences		– Highest Bidder

6.5.1 Phase 1 of the draft ITA

According to the criteria for Phase 1, either an individual ECNS licence holder or a combination of individual ECS and ECNS licence holders could apply for spectrum. This is the only place in both the draft SAP and draft ITA that it is indicated that a consortium of licence holders may apply for spectrum. Throughout the draft SAP and ITA reference is made to “*an individual licence holder*”. Furthermore, nowhere in the draft SAP and ITA are there guiding rules or principles in terms of how a consortium should apply, to whom the spectrum licence will be assigned and what rules, if any will apply. It is therefore not clear if only an individual licence holder may apply or in fact if a consortium may also apply.

6.5.2 Phase 2 of the draft ITA

In section 5.1, Telkom details its view on the how the comparative criteria ought to be amended in order to be align with the public interest. The comparative criteria for the award is stipulated in section 6 of the draft ITA (Comparative criteria for the award), as replicated above. The substance of the bid is however contained in Phase 2, which is the beauty contest. The criteria for the beauty contest have also been indicated as the requirement for a Business Plan (20%), Technical Plan (15%), Market innovation and stimulation (15%) and Network rollout plan (50%).

However, when considering Schedule B, which is the information required from the applicant, there is no clear linkage between the Phase 2 criteria stipulated in section 6 and the information required under Schedule B. The following examples will highlight these concerns:

- a. In Schedule B, Part A.4 the applicant must submit the extent of beneficial ownership by HDI. This information is not addressed under section 6 so it is not clear how this will be assessed and what weighting will be assigned to beneficial ownership.
- b. In Schedule B, Part C, the applicant must provide, amongst others, information pertaining to its ability and experience in planning and project management as well as plans to acquire resources such as access to sites, property, technology, personnel and capital. Is it currently proposed? this information be assessed as part of the Network rollout plan the technical plan or one of the other criteria or even separately? If separately what weighting will be assigned to this element?
- c. Schedule B, Part E deals with Technical Information (Radio System Design) information. Furthermore, the table is titled: “*Information Required – for the Network Rollout Plan*” (own emphasis). Based on foregoing information it is not clear if all information under Part E would form part of the Technical Plan or if some of the information will form part of the Network Rollout Plan.

6.5.3 Phase 4 of the draft ITA

In the event that the sealed bid (Phase 3) is not required, the licence will be awarded to the winner of the beauty contest (Phase 2) and this eventuality should also be reflected in the table.

6.6 SCHEDULE A: SECTION 8 OF THE DRAFT ITA (ROLLOUT TARGETS) – as published in ITA erratum

6.6.1 Sub-section 8.1 of the draft ITA

8.	ROLLOUT TARGETS
8.1	The rollout target and obligation on successful licensees are as follows;
8.1.1	Package 1 will be 70% geographic coverage in 5 years of which 50% must exclude Gauteng, Cape Town and Durban metros.
8.1.2	Package 2 and 3 will be 50% population coverage in four years.

In Section 5.2, Telkom details its extensive views on the required changes to the rollout targets.

We would also highlight that the rollout obligation for Package 1 is not clear. Whereas 70% geographical coverage must be achieved in 5 years, 50% of this must exclude Gauteng, Cape Town and Durban metros. When considering the total geographical area of the three listed areas, it equals to less than 2% of South Africa's geographical area. It is therefore not 100% clear how to interpret the phrase “*of which 50% must exclude Gauteng, Cape Town and Durban metros*”? This must be clarified.

It is also not clear how the 70% figure was determined. It is furthermore also not clear how the 70% geographic coverage relates to the under services areas recently defined by the Authority and this needs further explanation.

The draft policy direction on high demand spectrum speaks to “*sparsely populated, areas rural and remote areas*” (see sub-section 2.1.6). Furthermore, the draft policy direction mandates the Authority to establish obligations on priority stages for network rollout based on the number of inhabitants per area. This is different from a plain geographic coverage obligation, where the discretion for rollout is left to the licensee. Rollout obligations will have to be determined by the Authority in line with the final Policy Directions and will require further public consultation before its implementation.

6.7 SCHEDULE B, PART D OF THE DRAFT ITA (BUSINESS PLAN)

D BUSINESS PLAN

Should a Radio Frequency Spectrum License be issued, the information contained in the business plan may be incorporated as licence conditions including the rollout indications.

It is stated in Part D that the rollout indications (or obligations), amongst others, “*may*” be incorporated as licence conditions. However, according to sub-section 1.39 of the draft ITA, “*...information pertaining to network rollout schedule will form part of the licence terms and conditions*” (own emphasis). This discrepancy must be corrected. Considering the importance of the rollout obligations (counts 50% of the beauty contest) this must be included in the licence terms and conditions.

6.8 SCHEDULE B, PART E OF THE DRAFT ITA (TECHNICAL INFORMATION)

20	Critical Efficiency Factors Technical (spectral efficiency) defined in terms of maximum volume of traffic (voice/ data) within a given spectrum resource
	(erlangs/MHz/km² or Mbits/MHz/km²) for voice and data respectively. Technical efficiency indicators include the following: - Bandwidth efficiency (expressed in bits/ Hz) defined as the amount of information contained in a finite spectrum . - Reuse which dictates to what extent the spectrum can be simultaneously used at multiple locations (reuse factor of 1 is the highest). - Time; since applications do not typically use information on a continuous basis and can share resources by time multiplexing. Functional efficiency defined in terms of extent to which the use of spectrum meets the users needs (<i>evaluated by defined key performance indicators (KPI)</i>) Economic efficiency defines the monetary gain in terms of revenue, profit and value which the licensee <i>derives from that portion of spectrum</i>.

In terms of sub-section 2, Functional efficiency will be “*evaluated by defined key performance indicators (KPI)*”. According to the RFS Regulations, the Authority will define the KPI for the particular band in the ITA. These KPI’s are however not

defined in the draft ITA. For the record, these efficiency criteria were added to the final RFS Regulations although it was not part of the consultation process.

It is also noted that, in accordance to the RFS Regulations, the weighting for technical efficiency, functional efficiency and economic efficiency will be 40%, 30% and 30% respectively. However, in the draft ITA this is not indicated although it will be assumed that this weighting will apply.

END

APPENDIX A

A.1 COVERAGE AND COST ADVANTAGES OF SPECTRUM ASSIGNMENTS BELOW 1 GHZ

Spectrum below 1 GHz is a key requirement for the delivery of mobile communication services. This spectrum is considered a prime resource due to the following reasons:

- a. Favourable propagation characteristics that allow for larger radio cells in rural less densely populated areas resulting in substantial cost savings;
- b. Better in-building penetration thus providing enhanced radio coverage and service levels within buildings and improved quality of service of the network by ensuring 100% geographical area coverage (no dead-spots), even in urban environments.

In general, lower frequency bands (sub 1 GHz) facilitate the rapid deployment of networks over large geographical areas and then, as demand increases in particular areas or hot-spots, these areas could be enhanced with networks using the higher frequency bands. This creates tremendous flexibility for operators and benefits for consumers.

A.2 Global Acceptance of the importance of below 1 Ghz spectrum

The importance of spectrum below 1 GHz has been promulgated both internationally and nationally. Specifically:

International organisations: At the recent WRC-12 in Geneva it has either been recognised or resolved that *inter alia*:

- a. “That where cost considerations warrant the installation of fewer base stations, such as in rural and/or sparsely populated areas, bands below 1 GHz are generally suitable for implementing mobile systems including IMT and that bands below 1 GHz are important, especially for some

developing countries and countries with large areas where economic solutions for low population density areas are necessary;”¹⁸ and

- b. “That the need for cost-effective implementation of IMT, particularly in many developing countries and countries with large areas of low population density, and the particular advantages of lower frequency bands for these purposes and that the advantages of the frequency bands below 1 GHz for wide coverage and those above 1 GHz for higher data rates with respect to use of IMT systems are noted in Resolutions **224 (Rev.WRC-12)** and **223 (Rev.WRC-12)**, respectively.”¹⁹

Global Regulators: To highlight just the opinions of two global regulators:

- a. In the **United Kingdom**, In Ofcom assessment of competition between national wholesale providers, they determined that there should be at least four holders of a minimum spectrum portfolio to ensure effective competition on a national level²⁰. All these portfolios include sub-1 GHz spectrum. In OFCOM's second consultation²¹ the minimum sub-1 GHz spectrum holdings was set at 2x10 MHz (Ofcom concluded that 2x5 MHz was not sufficient to provide higher speed broadband services); and
- b. In **Germany**, the **Bundesnetzagentur's** Final decision frequency distribution analysis released on 22 November 2011 found that “all network operators have been assigned spectrum which enables them to offer low-cost basic services. The spectrum even allows the rapidly growing demand for broadband data services in conurbations to be met”. Consequently, they did not need to undertake a redistribution of existing frequency usage rights – by way of revocation and reassignment.²² This is shown in Exhibit A.1. In Germany, all four operators in Germany have either 800 or 900 MHz spectrum or E-Plus who has the lowest proportion

¹⁸ See Resolution COM5/10 (WRC-12) considering (f) and (g)

¹⁹ See Resolution COM6/8 (WRC-12) (Recognising (c) and (d))

²⁰ Consultation on assessment of future mobile competition and proposals for the award of 800 MHz and 2.6 GHz spectrum and related issues (22 March 2011)

²¹ Second consultation on assessment of future mobile competition and proposals for the award of 800 MHz and 2.6 GHz spectrum and related issues (12 January 2012)

of 800/900 MHz spectrum has a significantly larger 1800 MHz assignment.

Exhibit A.1 Current Spectrum Assignments in Germany

Spectrum range	Telekom	Vodafone	E-Plus	Telefónica
450 MHz paired	2 × 1.25	-	-	-
800 MHz paired	2 × 10	2 × 10	-	2 × 10
900 MHz paired	2 × 12.4	2 × 12.4	2 × 5	2 × 5
1800 MHz paired	2 × 20	2 × 5.4	2 × 27.4	2 × 17.4
2000 MHz paired	2 × 9.9	2 × 14.85	2 × 19.8	2 × 14.85
2600 MHz paired	2 × 20	2 × 20	2 × 10	2 × 20
Total paired spectrum	2 × 73.55	2 × 62.65	2 × 62.2	2 × 67.25
2000 MHz unpaired	5	5	5	19.2
2600 MHz unpaired	5	25	10	10
Total entire spectrum	157.1	155.3	139.4	163.7

Nationally in South Africa: The draft Policy Direction recognises the importance of the band 790-862 MHz (**“800 MHz”**) band as *“...ideally suited for achieving broadband nationwide coverage, in building penetration and indoor coverage”* (section 1.2 of the draft Policy Direction). In section 1.3 of the draft Policy Direction it is furthermore stated that: *“...With the use of 800 MHz, the goal of delivering mass market broadband comes at a lower cost, because wireless broadband coverage of a given area could be achieved with fewer base stations than a roll out of the same coverage at a 2000 MHz range”*.

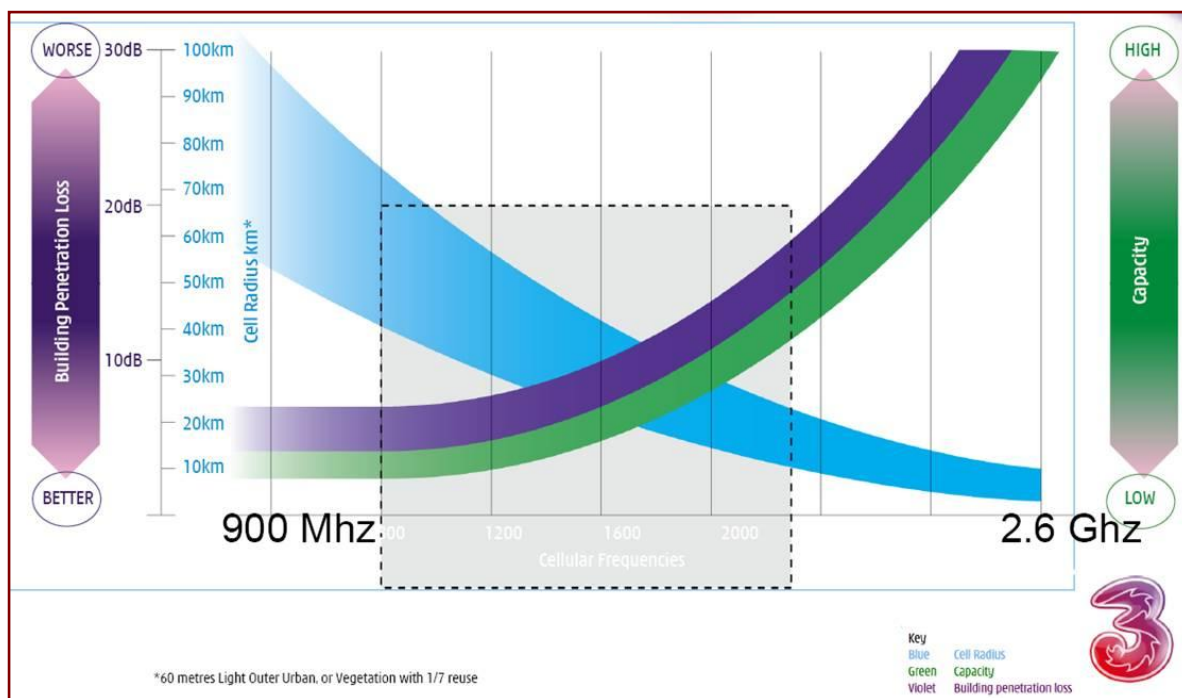
A.3 Cost implications of not having below 1 GHz spectrum

Various studies have been done both nationally and internationally to indicate the cost-benefit of deploying networks operating in spectrum below 1 GHz compared to a network using only higher frequency bands, e.g. 1800 MHz, 2100 MHz or 3.5 GHz. These include:

- a. In one study conducted for Telkom by McKinsey, it was shown that the change to a lower frequency band (in this case from 2100 MHz to

- 700 MHz) could result in a 40 to 50 percent reduction in the cost of delivering services;
- b. In another study also performed by McKinsey, it was determined that the number of sites required to cover a 2000 m² geographical area will increase 3.4 times if only 1800 MHz band is used compared to utilising the 900 MHz band. To cover this area in 1800 MHz will result in an additional approximately R2.4 billion CAPEX and result in an additional OPEX of R460million per annum); and
 - c. Other analysis show similar outcomes, including analysis published by T-Mobile, which indicates that the use of 2.6 GHz requires up-to 10 times the site density to be comparable with a network deployed in the 800 MHz band.

The relationship between frequency band, capacity, in-building penetration and cell sizes are graphically depicted in Exhibit B.2 below. Although there are many factors impacting the specifics, this schematic does illustrate the advantages of using lower frequency bands pertaining to in-building penetration and cell radius versus those of higher frequency bands to satisfy the need for capacity.

Exhibit A.1 Trade-off between spectrum assignments

Source: Prof Ed Candy, 3 Group (Cambridge Wireless June 2011presentation)

A.4 Conclusions

The importance of spectrum of being allocated spectrum below 1 GHz to enable a national provider to be competitive is compelling based on the above arguments. Consequently, in South Africa national providers of mobile communication require spectrum packages that include at least 2x10 MHz spectrum below 1 GHz in order to be cost and coverage competitive.

B.1 SPECTRUM CAPS IN KEY GLOBAL DEVELOPED AND EMERGING MARKETS (as at February 2012)

Country	Spectrum Caps?	Details
Australia	Yes	While Australia, previously had spectrum capping rules, they were relaxed for a number of years but given the important of wireless broadband services have now been recently reinstituted. On 9 February 2012, the Minister for Broadband, Communications and the Digital Economy, announced the imposition of spectrum caps in relation to the auction of 126 MHz of digital dividend spectrum in the 700 MHz and 2.6 GHz bands. According to the Minister, '[The] limits are designed to ensure there is a choice of providers in the mobile sector for the advanced services that will be provided over the digital dividend spectrum...' Bidders are limited to maximum of 20 MHz out of the 45 MHz of paired 700 MHz and 40 MHz of 70 MHz of the 2.6 GHz band being offered by auction later in 2012. The caps were enacted in the <i>Radiocommunications (Spectrum License Limits) Direction No 1 & 2 of 2012</i> .
Belgium	Yes (for 2.6 GHz)	Belgium adopted a different approach to freeing spectrum in the 2.6 GHz band for wireless broadband services than its European counterparts. The Regulator, BIPT, opted to issue blocks of 2x 15 MHz with 2x 5 MHz blocks at the end of the paired bands. BIPT has imposed a paired spectrum cap of 2x 20 MHz, but the cap does not extend to the unpaired spectrum.
Canada	Being re-considered	In 2010, the Regulator, Industry Canada, released two Consultation Papers on the reassignment of the 700 MHz and 2.6 GHz bands. The 700 MHz paper raised the possibility of introducing spectrum caps to prevent 'excessive concentration' (i.e. hoarding of spectrum). The Regulator recognised that 'setting the right cap is essential.' Three options were canvassed: (a) spectrum to be auctioned in individual bands (700 MHz separately from 2500 MHz); (b) a combination of spectrum to be auctioned in both bands (700 MHz and 2500 MHz); and (c) a combination of spectrum to be auctioned as well as existing spectrum holdings in all or a subset of bands available for commercial mobile systems (Cellular, PCS, AWS, BRS), e.g. spectrum holdings below 1 GHz. In their responses, larger operators were largely opposed to the imposition of spectrum caps. Bell Mobility submitted that, inter alia, spectrum caps were not required given the developed state of Canada's mobile market and the absence of a cap in other mobile broadband bands (they were previously rescinded in 2004).
France	Yes (for 800 MHz and 2.6 GHz)	In May 2011 the French Government auctioned the 800 MHz digital dividend band. Four lots of a total of 30 MHz were allocated for 4G services. Operators were limited to a maximum of 2x 15 MHz. The move was criticised by some industry analysts because the cap effectively meant that a leading operator was able to corner 50 percent of the best spectrum in one auction.

Country	Spectrum Caps?	Details
		In September 2011, the 2.6 GHz band was auctioned via sealed bid. The cap in this band was 2x 30 MHz. The remaining spectrum in the 800 MHz band will be auctioned next year following the end of analogue services. French operators generally supported the spectrum caps. Smaller operators have been wary of FT Orange further increasing their mobile market dominance and believed that caps were the best way of reducing its market share.
Germany	Yes (for 800 MHz)	In 2010-11, the German Government completed the reassignment of Digital Dividend spectrum. In the 800 MHz band, 2x 30 MHz of bandwidth was auctioned. A spectrum cap of 2x 10 MHz was implemented. Caps were not mandated for concurrent auctions in the 1800 MHz and 2.6 GHz bands
Hong Kong (China)	Yes (for 2.3, 2.5/2.6 GHz)	The auction of wireless broadband spectrum in Hong Kong has been occurring on a staggered basis. In 2009, 195 MHz of spectrum was auctioned from the 2.3 GHz and 2.5/2.6 GHz bands. The Regulator, OFTA, imposed a spectrum cap of 30 MHz. The cap was imposed because OFTA would not accept the prospect of only having one operator that was capable of operating wireless broadband services. A 30 MHz cap was believed to be sufficient for an operator to provide a territory-wide service of acceptable quality. In March 2011, OFTA, announced the upcoming auction of three residual unpaired 30 MHz blocks in the 2.3 GHz band for wireless broadband services following a number of expressions of interest from operators. A cap of 30 MHz was re-implemented. OFTA announced auctions of the 850 MHz, 900 MHz and 2 GHz bands for wireless broadband would occur in February 2011. There were no spectrum cap requirements in this auction.
Netherlands	Yes (for 2.6 GHz) being considered for 800 MHz	The Ministry for Economic Affairs opted to impose differential caps on entrants and incumbents during the 2.6 GHz band auctions. Bidders were subject to caps of between 5 – 40 MHz, which was dependent on their spectrum portfolios in other bands (e.g 900 MHz, 1800 MHz & 2.1 GHz). The Dutch Parliament directed the implementation of these differential caps with the intention of promoting new market entrants. The Ministry sought advice on this issue of spectrum caps for the 800 MHz band. They are considering at the very least the suitability of spectrum caps (possible 2x 20 MHz) on sub 1 GHz spectrum. Such a cap was said to be appropriate in circumstances where there was a risk of asymmetric spectrum assignments that would have the effect of threatening competition. The auction will occur in late 2011 – early 2012.
Singapore	Yes (for 2100 MHz)	In 2010, the Regulator, IDA, auctioned 3G spectrum in the 2100 MHz band. The Auction Rules specified that 'no bidder which is a member of the SingTel Group, StarHub Group or M1 Group may bid for or be granted a 3G Spectrum Right (2010) in respect of more than two...lots in this Auction'. Three lots of 2x 5 MHz were up for auction.

Country	Spectrum Caps?	Details
		An auction for 4G spectrum in the 1800 MHz band for 2x 5 MHz lots was conducted in March 2011. There were no caps imposed on this spectrum.
South Korea	Yes	The rules of the auction in Q3, 2011 dictated that no mobile network operator could acquire spectrum in more than one band. The results were Korea Telecom (KT) won 10MHz in the 800MHz band for KRW261 billion (USD245 million), SK Telecom (SKT) won 20MHz in the 1800MHz band for KRW995 billion (USD933 million) and LG Uplus won 20MHz in the 2100MHz band for KRW445.5 billion (USD412 million). Basically the two dominant mobile operators were barred from competing for spectrum in the 800MHz and 1800MHz band for competitive reasons. It is also possible that in a future digital dividend auction the Korean regulator (KCC) may lay down spectrum cap rules to prevent any operator from acquiring relatively inequitable spectrum holdings.
Spain	Yes (for 800 MHz)	Like most EU nations, Spain has been progressing with the reassignment of spectrum following the move from analogue television services. In June 2010, the Government announced that it intended to reallocate the 800, 900 1800 and 2600 MHz band for wireless broadband. The Ministry for Industry, Tourism and Communications ('MITYC') held the auction for 4G spectrum in August 2011. The cap for the 800 MHz band was set at 2x 20 MHz.
Sweden	Yes (for 800 MHz)	Sweden concluded its reassignment of digital dividend spectrum in the 800 MHz band between February and March 2011. Successful bidders were bound by a demanding obligations intended to aid in the achievement of the 'Broadband Strategy for Sweden'. Caps of 2x 10 MHz were imposed and a total of 2x 60 MHz was allocated to wireless broadband.
United Kingdom	Proposed for 800 MHz and 2.6 GHz	Ofcom is finalising its plan for the auction of the digital dividend 800 MHz and the 2.6 GHz bands, following its recent announced delay. In its May 2011 Consultation Paper, Ofcom proposed a cap of 2x 27.5 MHz for sub-1 GHz spectrum and a total limit of 2x 105 MHz mobile spectrum. The decision as a plus for Three UK, which had lobbied hard for the imposition of spectrum caps. They argued that January 2011 re-assignment of 2G spectrum was highly advantageous for Vodafone, O2 and Everything Everywhere.
United States	Yes, (until 2003, now screening threshold applies)	Until 2003 the FCC mandated spectrum caps as a means of ensuring effective competition during the developing phase of the mobile market. Operators were capped at 2x 45 MHz spectrum within a designated geographic area. At the time, total mobile spectrum was 180 MHz. Other limitations on spectrum ownership enforced by the FCC were: The aggregation of broadband PCS spectrum (40 MHz cap); Cellular / PCS cross ownership – a cap of 10 MHz PCS spectrum for an operator within its service area; and

Country	Spectrum Caps?	Details
		Cellular cross-interest rules on the ownership interest of cellular operators in overlapping geographic areas. Spectrum caps were rescinded in 2003. Auctions since then have seen the FCC follow a 'screening guideline' of 70 MHz (later raised to 95 MHz following the 700 MHz band auction) where an operator may be subject to review if they exceed that threshold. Controversy arose following the 700 MHz wireless broadband spectrum auctions in late 2010. Smaller rural operators claimed that incumbents like AT&T were positioned to exercise their dominant market power and effectively exclude them from the mobile market. In January 2011, the Rural Telecommunications Group sought an injunction from AT&T from acquiring 700 MHz assets from a small Pennsylvanian provider and Qualcomm. They have asked the FCC to limit licensees from controlling more than 110 MHz below the 2.3 GHz band. The result of this action is pending. This issue of wireless competition and control over spectrum was examined as part of the review of the proposed AT&T and T-Mobile merger which ultimately resulted in AT&T declining to proceed with the merger.

Source; Windsor Place Consulting analysis February 2012