



Ref. VEL/01

November 12, 2009

Telecom Regulatory Authority of India  
Mahanagar Doorsanchar Bhawan  
Jawahar Lal Nehru Marg  
New Delhi – 11 00 02

Kind attn : **Dr. J.S. Sarma (Chairman, TRAI)**

Subject : Response to TRAI consultation paper on overall spectrum management and review of licence terms and conditions

Reference : TRAI consultation no. 6/2009 dated 16th October 2009

Respected Sir,

We are pleased to attach Vodafone Essar and its Group companies' response to the above-referred Consultation Paper. We appreciate the Authority's efforts in bringing out a comprehensive yet exhaustive consultation paper that raises many of the most critical issues governing telecom operations in the country viz. spectrum allocation, licensing, merger & acquisitions, etc.

Today, the industry is poised for a paradigm shift in approach towards telecom operations that can propel a sustained growth of the economy while ensuring world class services to consumers, provided a conducive regulatory framework is enabled. This consultation could represent the launch-pad of fundamental spectrum reforms for the country and pave the way for a more efficient and effective model of spectrum usage.

As part of a leading global communications group, Vodafone Essar is able to draw upon deep and broad experience of the challenges of spectrum policy, the approaches taken by key regulators in other jurisdictions and is well placed to provide international comparisons and insights into the reform of Indian spectrum policy. The approach suggested in our response to policy and regulation is driven by evidence, comparative experience, and by the identification of policies and principles which can be consistently applied across the industry to maximize the economic benefits of the industry to economies and consumers.

We have also sought the views of one of world's leading regulatory economists and spectrum experts, Professor Martin Cave OBE. He has separately submitted his views to the Authority, but for convenience, we also attach his submission.

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**A Vodafone Essar Company**

We hope that the Authority will consider our views while making its recommendations on this subject.

Thanking you,

Yours sincerely

For Vodafone Essar Limited & its group companies



T.V. Ramachandran  
Resident Director  
Regulatory Affairs and Government Relations

Encl : As above

CC:

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# VODAFONE ESSAR LIMITED, RESPONSE TO TRAI CONSULTATION ON "OVERALL SPECTRUM MANAGEMENT AND REVIEW OF LICENSE TERMS & CONDITIONS"

Dan Lloyd, Head of Regulatory, VEL

## Other Issues and Executive Summary

Vodafone Essar Limited (VEL) is a joint initiative between Essar Group and Vodafone Group and is therefore part of the world's leading mobile telecommunications company, which has over 323 million proportionate customers in 31 countries. Vodafone Group has been for many years a leading player in global spectrum reforms, including the landmark UK and EU reviews of spectrum policy, through Verizon Wireless in spectrum reforms which have been implemented in the USA, and ITU standards definition, including as a leading contributor to the definition of the Long Term Evolution (LTE) of mobile standards.

The following comments are of course provided without prejudice to any and all current regulatory and legal proceedings in relation to the issues covered by the present consultation.

We complement the Authority on launching this consultation which raises issues of the highest importance for the Indian communications industry, the Indian economy and Indian end-users. The Authority is rightly concerned to ensure the industry operates in a manner to enhance spectral efficiency.

We are delighted that the Authority has noted that stakeholders are free to raise any other issue that they feel is germane to the issues under discussion or any issue relating to Spectrum policy and management and give their comments thereon. Asking stakeholders for open input is a very valuable part of such a process. We consider that the most important questions to address are "What are the overall implications of spectrum and licensing policy for the Indian industry, economy and end-users?" And "What are the core objectives, principles and policy trade-offs that need to be pursued in order to maximise the benefit to the economy and end-users?". We set out first of all our views in relation to these questions.

The critical importance of sound spectrum policy-making has been identified many times:

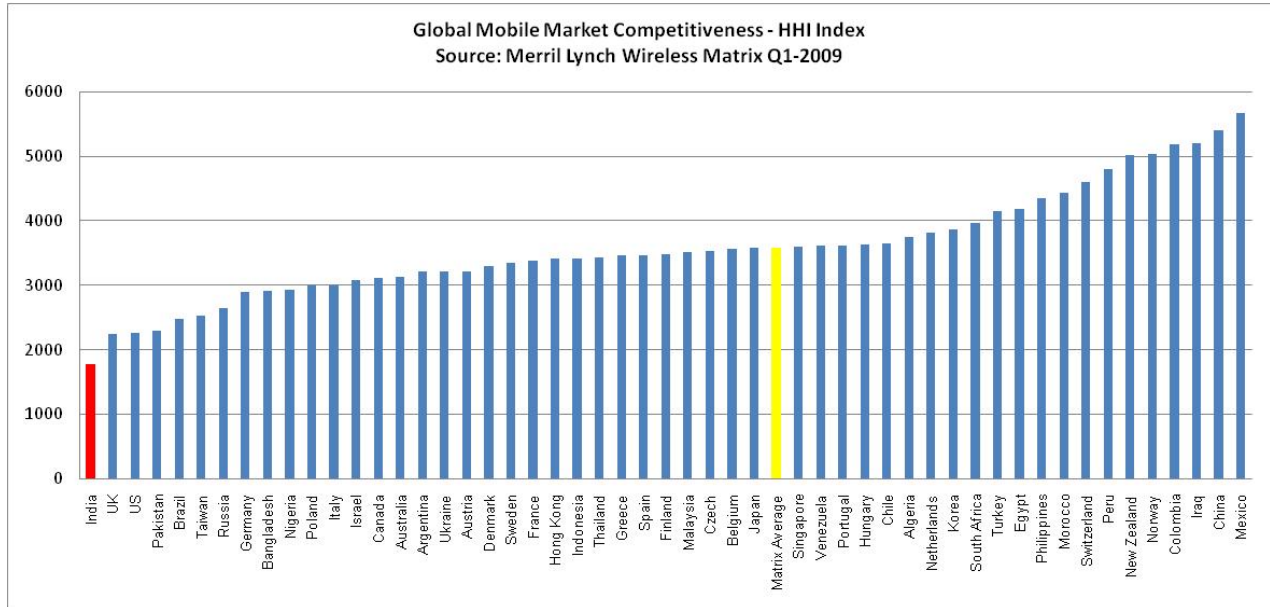
*"Failure to make the best possible use of the spectrum resource can impose substantial costs, including loss of international competitiveness. These could amount to billions of pounds. Effective management of the spectrum resource is therefore of great importance to building the knowledge driven economy."* (Spectrum Valuation and Pricing, The UK Approach to Spectrum Pricing and Auctions, 1999)

It is critical to understand the current Indian spectrum debate in its comparative international context, as this greatly assists in identifying critical policy issues which have a very real potential to "make or break" the Indian mobile industry. This assists in identifying the balance of cost and benefit which should guide the broad trajectory of decision-making. In this context, the following factors are essential to understand:

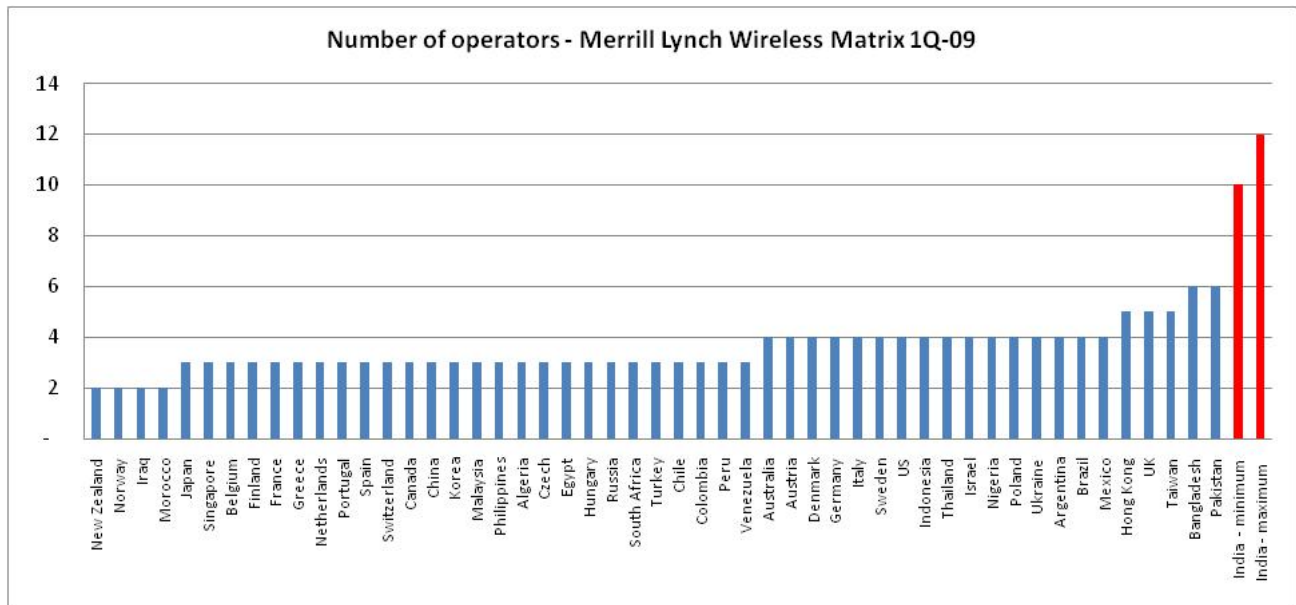
1. The mobile communications industry is well understood to be an industry in which operators need to reach a threshold scale to be sustainable (see Attachment 1). This is an economic fundamental which must be taken into account in policy making. In this context, excessive fragmentation of the industry and piecemeal approach

towards spectrum allocations, and has led to the presence of sub-scale operators which is in the long run harmful to the industry, the economy and consumers;

2. The Indian mobile communications market is probably the least concentrated (most competitive) mobile market in the world, and is certainly the most competitive market of which we are aware. Based on the independent data compiled by one of the most authoritative sources for market data, the Merrill Lynch Wireless Matrix, in Q1 2009, the Indian market was the only market out of the 52 largest markets in the world which had an HHI of less than 1,800, which is less than half of the 52-market global average of 3,583:



3. The Indian market has far more operators (up to 12 in each circle, and 3-4 more if CDMA is included) than any market of which we are aware, which is 3-4 times the average number of operators in the 52 market Merrill Lynch dataset (which has an average of 3.5 operators), and far more than the number of operators which international regulators have deemed sufficient to safeguard competition (eg 2 in New Zealand and Norway, 3 in each of France, Greece, Spain, South Africa, China and Japan, 4 in Australia and Italy (and as is likely, the UK)



4. The total spectrum made available to the mobile industry is then far lower than any other market of which we are aware (between ~2x50 and 2x70 MHz in most circles compared to 2x90-2x110 in most international markets (GSM only));
5. This has resulted in highly fragmented spectrum allocations to individual operators (an average of 2x5.7 post spectrum assignment to new licensees in 2008 vs a global average of ~2x22MHz – see Aegis/Plum, An Assessment of Spectrum Management Policy in India, December 2008). This policy is certain to have left many operators sub-scale, and increased the costs of network deployment and operations for all operators well above the costs of efficient scale operators in other markets. This imposes very significant costs on the Indian economy and Indian end-users;
6. The long-term consequences of this situation are beginning to emerge with listed telecoms company market capitalizations falling rapidly, market and operator revenues stagnating/declining, and profit whether measured by EBITDA or operating profit falling. The number of operators currently in the market is clearly unsustainable.
7. We are of the opinion that there are significant benefits from consolidation in terms of improving overall spectral efficiency and ensuring that the operators in the market have the opportunity to achieve economic scale. The competitive health of a communications market cannot be measured just by the number of competitors – rather it is the extent to which competition delivers sustainable long-term economic and social benefit. The health of competitors, the degree of investment in infrastructure and innovation, and the sustainability of competitors in the long-term are all critical factors. Competition between 4 or 5 healthy competitors of efficient scale is likely to be more effective and sustainable than 10-13 sub-scale operators. Sub-scale operators will by definition struggle to build a sustainable business, and will choose instead to “cream-skim” by investing only in profitable urban areas, and will perennially call upon the regulator to cross-subsidise their businesses through “special” deals that may cause market distortions. Consolidation in the Indian market will decrease the number of operators, but will

improve the competitive environment. We believe that this point is now widely accepted (even in the context of mergers which result in a market with only 3, 4 or 5 operators). Therefore, ensuring that barriers to consolidation are as low as possible should be a priority of the highest order for a policy-maker faced with the current Indian market situation so as to allow operators to reach to efficient economies of scale thereby ensuring optimal utilization of scarce spectrum;

8. However, the rules which currently apply and are under consideration for spectrum and M&A reform would still leave India with probably the most restrictive M&A rules of any global mobile market. These rules will inevitably prevent the market from dynamically finding the optimal scale for operators. While most markets impose only a single national market share threshold (which is in any case not a "bright line" or absolute restriction, but merely a trigger for a competition inquiry), Indian operators currently cannot merge unless they can cross at least 6 complex hurdles on a circle by circle (rather than national) basis:
  - a) that their market share by subscribers does not cross 40%;
  - b) that their market share by AGR does not cross 40%;
  - c) they return any spectrum in excess of the spectrum that would ordinarily be allocated under the Subscriber Linked Criteria (SLC);
  - d) they are not deterred by bearing the additional incremental taxes imposed by the slab charges for additional spectrum;
  - e) they are merging with another established operator (since the lock-in prevents mergers with new entrants – which therefore is likely to be counter-productive since it excludes the operators most likely to be sub-scale and therefore inefficient from exiting the market through M&A transactions); and
  - f) they are willing to compromise on the reduction in the license duration post merger (since lesser of the durations of the merging entities is considered)..
9. Furthermore, proposals have been made which could put in place additional barriers to M&A under the various proposals currently under consideration, additional barriers would be imposed in the form of:
  - a) an absolute cap on the amount of spectrum any operator could hold; and/or
  - b) a series of windfall taxes, transfer and other charges which would inevitably act as a further disincentive to M&A activity.

VEL therefore urges the Authority to fully consider significant changes to the spectrum and M&A rules, and in particular to consider the level of windfall taxes in the context of the substantial long term gains which would accrue to the industry, the economy and end-users through substantial reform of the spectrum and M&A landscape. The Authority would need to be absolutely certain that the benefits of applying significant windfall taxes would be enormous – otherwise they would not offset the fundamental long term gains that flow from broad spectrum and M&A policy reform which enables rationalization of the industry for sustainable operations of mobile services in the country.

We have considered this key trade-off between spectral efficiency and deterring windfall gains in great detail, and sought the views of international spectrum experts in this regard. While we offer our views below as to how an acceptable balance between these two goals could be struck, we find ourselves seriously questioning whether some degree of short-term windfall gains must be accepted as the price for long term efficiency and stability for a key

industry. It is very difficult to conceive of ways to tax or deter windfall gains without fundamentally jeopardizing the move to a market-based system of spectrum allocation and trading.

There are other aspects of the policy-landscape which need to be addressed in order to allow the industry to achieve efficient economies of scale which include:

- separation of the license to operate from the license to use particular spectrum (since the market cannot find an optimal efficient spectrum allocation without tradeable spectrum);
- a move to a uniform spectrum and license fee system which removes competitive distortions between firms which compete in the same retail market;
- finding a mechanism which minimizes any distortions to 2G spectrum pricing by “reading across” benchmark rates from 3G auctions;
- ensuring that existing license terms regarding 10 year renewals for existing operators are respected, thus ensuring operators have a continuing incentive to invest in the lead up to the expiry of their initial license terms, and that consumers do not face substantial uncertainties and risks;

These are urgent questions which will have long term implications for the sustainability of the industry and which should be addressed as the highest priority for Indian communications policy.

We respectfully suggest to the Authority that a revolution in spectral efficiency could be achieved through two related objectives:

- Reversing the current excessive fragmentation that destroys spectral efficiency through wasteful use of frequencies for signaling and loss of trunking efficiency; and
- Ensuring operators who need spectrum can secure it from operators who have an inefficient allocation (particularly operators who are likely to remain sub-scale). Although there are understandable concerns with windfall gains, these should be addressed separately, and not allowed to prevent the industry from reaching an efficient and sustainable equilibrium.

In summary, international best practice and our experience suggests that a liberal spectrum and M&A policy is the best way for the Authority to achieve these objectives. This would ensure that a positive long term framework defining a core regulatory vision and future roadmap for the sector is put in place. Sound long-term decision-making on spectrum and M&A policy is a priority of the highest order. Rationalisation of spectrum and the market can double the capacity produced from India’s spectrum without harming competition. Multiple complex barriers to M&A and spectrum trading should be removed. Measures which attempt to deal with windfall gains, but place the long term gains from spectrum consolidation at risk should be approached cautiously, and other mechanisms should be found to impose a reasonable tax on windfall gains. We consider that the DOT Committee Report of May 2009 identified a broad trajectory for spectrum reform which is sound and consistent with international practice. We offer in this submission not only answers to the specific questions raised by TRAI, but also suggestions and refinements which would assist in refining and operationalising the thrust of the Committee’s recommendations. As part of its consideration of its approach to Indian spectrum reform, VEL also requested Professor Martin Cave OBE, one of the

pre-eminent global communications economists and spectrum experts, who has been requested by several governments to lead their landmark reviews of spectrum policy (including the UK, Australia and the EU) to provide his independent views of the best path forward for India. His views are valued as a compelling and independent analysis of the policy priorities facing the industry, and therefore provides great insight into how the learnings of international spectrum reform could be applied in India. Professor Cave has submitted his paper separately, but for convenience, we attached a copy as Attachment 1.

As a member of the COAI we also participated in the COAI submission process, but we provide the following comments to place the questions currently before the Authority in an international context which is supported by data, evidence, and a principled economic approach.



## Chapter 1 Spectrum requirement and availability

### 1. Do you agree with the subscriber base projections? If not, please provide the reasons for disagreement and your projection estimates along with their basis?

We generally agree with the projections, but question how direct the linkage would be to spectrum needs. It is difficult to consider subscriber projections without first considering the spectrum and M&A context in which the industry will develop. The extrapolations necessarily assume continued extension of the subscriber base into more and more rural areas where costs are likely to be higher and revenues are likely to be lower. This is by no means assured unless an enabling policy environment is put in place which allows operators to reach sufficient scale including through spectral efficiency.

Without significant reforms to the spectrum and M&A rules, the industry is likely to significantly under-perform. Spectrum allocation by SLC is now outdated (especially with the widespread use of data services) and is not a method which is used in any other jurisdiction of which we are aware. In any case, usage is a better indicator of spectrum needs, and spectrum allocations within the country are extremely limited by global standards. Therefore, regardless of subscriber projections, more spectrum needs to be made available to the industry, and market mechanisms need to be introduced which allow the industry to reach a sustainable equilibrium. In summary, without significant reforms to the spectrum and M&A rules, there is a real risk that the industry will significantly under-perform these extrapolations.

Projections of subscriber base also are not particularly useful in determining spectrum requirements – although larger subscriber numbers would require more spectrum to support them if usage was constant, usage is far more important. For example, Indian subscribers use over 400 minutes a month, twice the level of usage of Vodafone's subscribers in Australia, 4 times as much as Germany, and 8 times as much as Moroccan users (Merrill Lynch Wireless Matrix 1Q-2009). Moroccan mobile networks would therefore need, on average, 1/8<sup>th</sup> of the capacity of Indian mobile networks.

### 2. Do you agree with the spectrum requirement projected in ¶ 1.7 to ¶1.12? Please give your assessment (service-area wise).

In our experience, a total allocation of 2x8MHz would be one of the smallest allocations made available to mobile operators, and is clearly much less than the global average. We are not sure on what basis the 2x8MHz is calculated and we respectfully submit that in our experience, and all international markets of which we are aware, significantly more than 2x8MHz is required for operators to achieve an efficient scale. Splitting the available spectrum into 2x8MHz blocks introduces substantial inefficiency through multiplication of guard bands and is therefore likely to impose significant costs on the industry and end-users, and is likely to cause economic harm to the country if used as a basis for policy-making.

We note that the DOT Committee report of May 2009 also considered a much higher allocation (2x12MHz), and it should also be noted that MTNL has already been awarded 2x12.4MHz, and that the global average allocation is 2x22MHz. These findings are entirely consistent with the consistent finding of international economic and regulatory analysis that the communications industry is driven by economies of scale, including in spectrum.

While voice and text continue to remain on average the most prevalent applications for mobile users, usage is now shifting to more data intensive applications, including email and data access, mobile internet (both on handsets and

datacards), social networking, exchange of pictures, graphics and video, audio downloads and streaming video. The quantum of spectrum required over the years to come will be determined by a combination of these factors. Spectrum requirements for broadband data networks and applications are significant higher than for voice. Long term decision-making which aims to encourage the deployment of broadband wireless networks should therefore ensure that operators are allowed to build sufficient scale to allow them to efficiently deploy such networks and services.

**3. How can the spectrum required for Telecommunication purposes and currently available with the Government agencies be re-farmed?**

The process of moving government agencies from spectrum which has been identified internationally as suitable for commercial services is a high priority, especially keeping in mind the exponential demand for spectrum for commercial use, and the direct relationship between increasing penetration of commercial communication services and national economic growth. Greater availability of spectrum would facilitate meeting the objectives of rural connectivity, broadband service delivery to remote areas and overall digital inclusion of larger sections of society.

Many countries have significant national security concerns but this has not prevented the clearance of much larger amounts of spectrum. In several countries, the government has conducted an economic review of the value of various demands for critical parts of spectrum. These reviews have invariably concluded that significant economic value for the country can be created by clearing harmonized international bands for mobile usage.

Given the significance of this economic value, agencies could be given compensation to assist in clearing spectrum which funds could be diverted from fees, charges and taxes levied on the industry. This process should be undertaken in a time-bound manner with clear communication to potential users of the quantum of spectrum and timing of clearance so that they may plan their businesses in the long term. All such spectrum should be offered to interested operators on a market driven model (auction) so that allocations may be efficient.

**4. In view of the policy of technology and service neutrality licences, should any restriction be placed on these bands (800,900 and 1800 MHz) for providing a specific service and secondly, after the expiry of present licences, how will the spectrum in the 800/900 MHz band be assigned to the operators?**

International practice is clearly to progressively remove barriers to deployment of efficient technologies in various spectrum bands. In principle, India has already moved away from the concept of a service specific license ever since the Unified Access Service licenses were introduced. Our current UAS licenses do not place any restriction on providing a specific type of service and this should continue. In this context, it would make little sense to tightly restrict the services that could be offered over particular spectrum bands as long as consumers are benefited and spectrum is efficiently used.

Therefore, the allocation of spectrum in any specific band is independent of the kind of services that can be provided using that spectrum.

Existing license terms regarding 10 year renewals should be respected. Any alternative approach is likely to impose unreasonable costs and uncertainties on the industry and consumers.

We respectfully point out that it is not necessary for the regulator (and would be difficult for the regulator) to ensure spectrum allocations are equal or similar for all operators. Spectrum allocations are the result of numerous past decisions made by operators at different times, in different circumstances, and with different economic and competitive consequences. It is not the role of the regulator to seek to “equalize” the consequences of past decisions made by firms. The role of the regulator is to ensure that at any point in time the rules governing the opportunities to acquire spectrum are the same for all operators. For example, operators who do not have 900 MHz today are in that position because they elected not to participate in the initial license rounds. The Authority should feel under no pressure to provide opportunities for operators to “make up for”/change past decision-making by changing the rules today. If the Authority did so, this would kill the incentives for risk-taking and innovation in the Indian market. Incentives to participate in auction process for example would be fundamentally undermined because operators would never be sure if they could retain the competitive advantage that they seek through participation in such processes and paying premiums relative to other bidders.

#### **5. How and when should spectrum in 700 MHz band be allocated between competitive services?**

Auctions are clearly the preferred international method of allocation as they ensure fair competition for spectrum, and that market prices are discovered. As noted by the Authority, the 700 MHz band in India is largely unused. This is a potentially significant source of competitive advantage compared to most other countries where a time-consuming and complex process of re-assignment from highly penetrated analogue broadcasting was required. The few allocations to some users in this band should be cleared and the entire band freed up for commercial use. Further, given the immense potential of this band for enabling rural connectivity, support for higher data speeds and a great variety of applications, it would be attractive to service providers. Therefore it would make sense to offer this band for commercial use at the earliest.

#### **6. What is the impact of digital dividend on 3G and BWA?**

Given the extremely limited availability of spectrum in the 900, 1800, 2.1 and 2.3GHz ranges, and the significant spectrum requirements of the industry, especially for broadband networks and applications, making available as much digital dividend spectrum as possible should remain a priority. It is not in keeping with the trend of liberalized markets for the regulator to try to determine a priori which technologies are likely to or should succeed or fail – rather it should endeavour to make spectrum available for commercial use.

### **Chapter 2 Licensing issues**

#### **6. Should the spectrum be delinked from the UAS Licence? Please provide the reasons for your response.**

Yes. This would bring India in line with international best practice, and this is a fundamental requirement for moving to a market based regime for spectrum allocation and trading as has been recommended earlier by the Authority and recognized in the DoT Committee Report. The key priority is finding a workable mechanism to price spectrum at market prices as this would ensure that spectrum finds its way to operators who can deliver the highest economic value with it.

#### **7. In case it is decided not to delink spectrum from UAS license, then should there be a limit on minimum and maximum number of access service providers in a service area? If yes, what should be the number of operators?**

Going forward, keeping in mind the rapid expansion of the Indian telecom sector, delinking of the license and spectrum allocation would be the best policy approach. We believe that the focus should be on removing barriers to consolidation and putting in place a regime which allows the competitive Indian mobile market to find an efficient number of operators and allow remaining operators to achieve a reasonable degree of scale. It is difficult to administratively decide the optimal number of operators a priori, and there are significant costs and risks in attempting to impose an arbitrary number of operators upon consumers. Further, this approach is consistent with international practice which puts in place guidelines as to the maximum market share that an operator can hold without triggering a competition inquiry. However, the Indian market currently has far more operators than any market of which VEL is aware, so this should be accorded low priority in terms of focus for policy-making at the present time. In our view, it would be more appropriate to consider the maximum market share for an operator rather than to determine the number of operators.

If spectrum licenses are not de-linked from operating licenses, then the number of licenses is the principal means by which the Licensor can control spectrum fragmentation and competition in mobile services. As explained above, given that there are 10-13 operators in each circle, no more licenses should be granted. We would refer in this regard to the statement of the TDSAT which noted that: *"It is therefore puzzling as to why TRAI recommended a no cap policy on the number of service providers. In our view, DOT would be well advised to review this policy keeping in view the various relevant parameters and take an appropriate decision."* In the current market structure, India already has 2-3 times as many operators as any other major market. The DoT Committee's analysis of the HHI index (as below) clearly shows that the relative impact of additional operators diminishes as more operators are added, and that incremental benefit over more than 4 or 5 operators in a market is negligible. This analysis is supported by many international reviews.

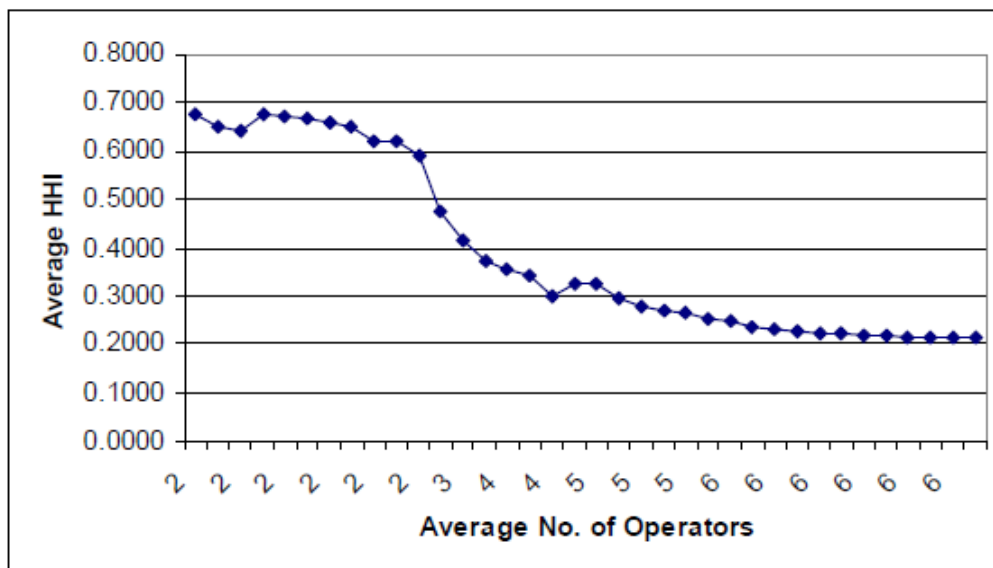
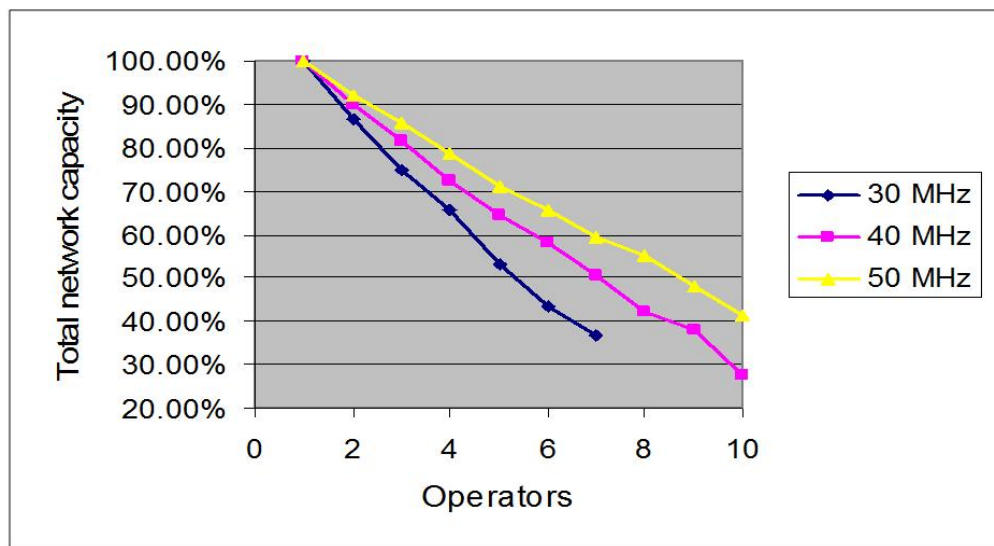


Figure II-1. Number of Operators versus. Competition

Vodafone Group, based on its international experience of operating 30 mobile networks internationally, has calculated the detriment to total network capacity caused by fragmentation of spectrum amongst operators. As the following chart shows, if a total of 50MHz of spectrum is available, the total network capacity provided using that spectrum by 10 operators is half the capacity that can be provided if it is assigned to only 4 operators, and the

capacity provided by 6 operators (with 2x8 MHz each) will be in aggregate almost 30% lower than would be provided by 2 operators (with 2x 25 MHz each):



**- 50 MHz, 10 operators -> 4 operators DOUBLES efficiency**  
**- 50 MHz, 9 operators -> 5 operators adds 50% efficiency**

Fragmentation of spectrum amongst too many operators is therefore inefficient and contrary to the public interest.

### 8. What should be the considerations to determine maximum spectrum per entity?

International practice is to closely observe the state of competition in the market, and only intervene when there are demonstrated competition concerns (eg significant market power allowing an operator to raise prices). Regulators and competition authorities are generally extremely cautious in attempting to regulate the precise mix of inputs that firms should be allowed (such as spectrum) in order to produce the outputs that they sell in the market (such as mobile voice and data services). International spectrum caps have therefore only been imposed rarely, and regulators have taken a cautious approach and set generous caps which apply to all potentially substitutable spectrum – eg in the UK, the government has proposed a cap of 2x65MHz for spectrum below 3GHz, applicable only for 1 year following the allocation of digital dividend spectrum. Spectrum caps have also largely been removed (including the US spectrum cap of 55MHz which was removed in 2003, which was quickly followed by a series of market consolidations which were approved by the US regulatory and competition authorities).

There is a real benefit to competition to allow operators the freedom to choose the type and quality of service they wish to offer, which they cannot do unless they are able to optimize the mix of spectrum and other resources they procure in order to compete. For example, an interventionist policy on spectrum holding which artificially caps the spectrum available to an operator could prevent an operator from differentiating by providing high-quality high-speed data services to high intensity users, or rural broadband services – that would not be in the interests of competition, economic development or end users.

- 9. Is there a need to put a limit on the maximum spectrum one licensee can hold? If yes, then what should be the limit? Should operators having more than the maximum limit, if determined, be assigned any more spectrum?**

As submitted in response to Question 8 above, spectrum caps should only be considered with great caution. If any hard tests are to be imposed, tests related to market share are to be preferred to spectrum caps. Any spectrum caps should apply in a technologically-neutral manner to all spectrum holdings which could be used for access services (ie the total of all spectrum available in 450, 700, 800, 900, 1800, 1900, 2100, and 2300 MHz). Any caps would need to apply to all operators (whether privately owned or government owned).

- 10. If an existing licensee has more spectrum than the specified limit, then how should this spectrum be treated? Should such spectrum be taken back or should it be subjected to higher charging regime?**

Since no operator has anywhere close to even the international *average* of spectrum allocations, we do not see how any issue could arise which would require any action.

- 11. In the event fresh licences are to be granted, what should be the Entry fee for the license?**

International practice is to set fees for operating licenses at a level that reflects the administrative costs of granting and administering the licenses.

- 12. In case it is decided that the spectrum is to be delinked from the license then what should be the entry fee for such a Licence and should there be any roll out condition?**

International practice is to set fees for operating licenses at a level that reflects the administrative costs of granting and administering the licenses. Rollout conditions should be imposed under spectrum licenses rather than the operating license. A fee cannot be justified on the basis of economic rent or scarcity because there is absolutely no scarcity value in a license without spectrum.

- 13. Is there a need to do spectrum audit? If it is found in the audit that an operator is not using the spectrum efficiently what is the suggested course of action? Can penalties be imposed?**

We are not aware of any government that has sought to audit operators and impose technology choices upon them. Indian operators are operating in the most competitive market in the world, with the smallest spectrum allocations in the world. To support such high growth of subscribers who have high average usage, Indian operators have no choice but to use spectrum efficiently. Indian operators have generally already deployed all of the feasible technologies listed by the Authority which enhance network efficiency.

We also note that in view of the rapid technological advancements, the Government may not be strongly placed to decide for operators which technology advancement should be deployed, and hence it will be appropriate that an extremely cautious approach is relied upon when mandating technologies across the industry, since requiring all operators to deploy the same technology would undermine rather than enhance competition

**14. Can spectrum be assigned based on metro, urban and rural areas separately? If yes, what issues do you foresee in this method?**

This would be extremely damaging and costly for the industry, economy and end-users. International practice is to assign spectrum on either a national basis, or, if a sub-national approach is taken, by broad blocks. For example, while the USA used to assign spectrum in a fragmented manner (544 license areas), in the recent 700MHz auction, only 5 national licenses were assigned. Assigning spectrum by geographic areas smaller than states would be exceedingly difficult to implement and would vastly increase rather than reduce the complexity of the Indian spectrum environment. As outlined above, the core challenge is to create the conditions for a sustainable scale industry, not to consider options which have substantial transaction and transitional costs and uncertainties and are likely to further fragment the industry. It would also substantially increase the cost of network planning and deployment as different allocations would need to be taken into account in each and every area.

In fact, we would suggest a re-look by the Authority and the Government towards alignment of the 23/22 telecom circle definitions so as to reduce the burden of various compliance requirements for each circle thereby ensuring standardization and operational efficiencies from being derived, percolating in benefits to end consumers.

**15. Since the amount of spectrum and the investment required for its utilisation in metro and large cities is higher than in rural areas, can asymmetric pricing of telecom services be a feasible proposition?**

It is not our experience that rural areas are generally cheaper to serve than metro areas. Thus it may not be a safe assumption on which to build long-term policy decisions. Spectrum pricing should be determined by market forces. Retail pricing should be determined by the conditions of competition in the retail market – as would be consistent with the TRAI's policy of forbearance.

In light of the intensely competitive retail market, before considering any additional interventions relating to tariffs, such as whether asymmetric prices should be offered, we look forward to working with the industry and the TRAI to first conduct a consultation of the extent of competition in the retail market, and therefore whether any interventions into the retail market are therefore necessary. By international comparison, the extent of regulatory intervention into retail tariffs, charging structures etc is already far higher than would ordinarily be imposed by international regulators (who have imposed very few rules upon competitive retail markets). The first question is therefore whether any current regulations are unnecessary in light of hyper-competitive market, rather than whether additional prescriptions on retail pricing should be considered. However, we also note that the market is delivering through competition – many operators already offer tariff packages to suit customers in rural areas.

**M&A issues**

**16. Whether the existing licence conditions and guidelines related to M&A restrict consolidation in the telecom sector? If yes, what should be the alternative framework for M&A in the telecom sector?**

Yes – each of the current and the proposed M&A rules present barriers to consolidation which are higher than any other market of which we are aware. In addition, the combined effect of multiple rules imposed at circle level creates a set of very significant barriers to M&A in the Indian market – an approach that is likely to impose significant costs on end-users given the hyper-competitive nature of the current market. By way of comparison, the following are the broad rules applicable to M&A transactions in the EU, USA and India (current and proposed):

	USA	EU	India - current	India – proposed
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Competition/dominance tests	Merger prohibited only if it would "substantially lessen competition"	Merger prohibited only if it would "significantly impede effective competition in the common market or in a substantial part of it in particular as a result of the creation or strengthening of a dominant position."	Merger prohibited if it would result in a customer market share of >40% circle by circle.	
			Merger prohibited if it would result in a share of AGR >40% circle by circle.	
			Mergers cannot reduce number of operators below 4 in any circle.	
			Competition act prohibition on a merger which "causes or is likely to cause an appreciable adverse effect on competition within the relevant market in India"	
Other	None	None	Spectrum to be handed back if in excess of SLC entitlement.	
			Step up in slab spectrum charges a deterrent to mergers through raising costs of M&A.	
			Lock in prevents M&A involving new operators for 3 years.	
			License terms shorten to shortest of the license terms of the merged firm.	
				Trading charges designed to impose heavy taxes on windfall gains from M&A.
Spectrum	Previous cap (of	Only 5 of 17 markets have		Merger prohibited if



caps	55MHz) abolished in 2003.	spectrum caps. Those that do tend to be short term (eg UK for 1 year following digital dividend auction), apply to a broad range of potentially substitutable spectrum (eg below 3GHz in UK).	would result in >25% of spectrum circle by circle.
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It is important to note that many of these tests are inherently more restrictive in India since they are applied circle by circle, rather than international tests which tend to be applied nationally. The restrictive impact of the above tests in India is borne out in practice as the following list of significant mergers approved by regulators in recent years in the USA, EU and India:

USA	EU
<ul style="list-style-type: none"> <li>o Sprint/Nextel – 2004</li> <li>o AT&amp;T/Cingular – 2005</li> <li>o Verizon/Alltel – 2008 (resulting in a reduction from 5 to 4 operators in many regional markets)</li> </ul>	<ul style="list-style-type: none"> <li>o Italy Infostrada/Wind (5 to 4 operators).</li> <li>o Netherlands – KPN/Telfort (5 to 4 operators), Orange/T-Mobile (4 to 3 operators).</li> <li>o UK - Orange/T-Mobile merger currently awaiting approval (5 to 4 operators).</li> <li>o (Note also in Australia under similar merger rules the Vodafone/3 merger was recently approved – 4 to 3 operators.)</li> </ul>

In all of the international mergers, in markets with fewer operators and more spectrum than India, mergers were explicitly allowed because they recognized the economies of scale required for efficiency in the communications industry. They allowed mergers, even when this reduced the number of competitors to 4 or 3 operators because mergers resolved the issues of sub-scale operators who would not be able to make sustainable and efficient investments. They recognized that fewer, healthy competitors are likely to be better for consumers than numerous operators who are unable to build sufficient scale to compete in the long run. Eg in the most recent of these mergers, the Australian Competition and Consumer Commission (ACCC) stated:

The ACCC had regard to the changing nature of the mobile telecommunications industry and the increasing need for mobile network operators to have sufficient scale to be able to continue to make significant investments in their network capabilities. In reaching its decision the ACCC considered evidence which showed that absent the merger, the parties are unlikely to sustain the significant investment in their mobile networks to provide competitive high speed data services, such as mobile broadband.

"Ongoing investments are needed to meet the increased customer demand for bandwidth-hungry data services, including mobile broadband. In this respect, the ACCC considers that mobile voice and data services will continue to converge in the future," ACCC Chairman, Mr Graeme Samuel said.

The ACCC is required to balance its concerns against the likely competitive position if the proposed merger were not to proceed. A key consideration in the ACCC's investigation was whether increased concentration in the mobile sector would result in reduced pricing pressure for retail mobile telecommunications services. It considered evidence which suggested that, individually, without this merger, the parties would not sustain vigorous price competition in the longer term. " Accordingly, the ACCC concluded that the proposed merger would not result in a substantial lessening of competition in the retail mobile telecommunications market. (ACCC Press Release 29 May 2009)

An alternative framework which would bring India into line with international practice would be one which recognised the importance of economies of scale, and rationalized the multiple layers of rules into one or two rules which were focused on ensuring that effective competition and therefore consumers' interests were protected. Any rules which deal with other concerns (eg windfall gains) should not prevent/discourage M&A, but be dealt with separately. Ideally, in the longer term, India should consider moving to a more flexible economic test (eg a market share of 40% nationally acting as a trigger to a competition inquiry which only prevents mergers which are likely to result in a "substantial lessening of competition"). However, since such rules are complex to implement, we presume that "bright line" or absolute tests will be used. The following would therefore be a short-medium term framework which would bring India closer into line with international practice:

- a) The primary filter for M&A transactions should be a rule related to market share (as this is an indicator which is more reflective of the state of competition than tests which measure only inputs into production – eg spectrum, or towers or preferential access to sites).
- b) If this is to be a hard or absolute test (rather than a flexible trigger for further inquiry), then a cautious approach should be taken, especially in light of the hyper-competitive state of the Indian market which means that a lack of competition is not a realistic concern for the foreseeable future ; i.e a higher specified market share should be used for a "bright line" test than for a test which is only a trigger to further inquiry. If thresholds are to be applied on a circle by circle basis, they should be higher than tests applied on a national basis. Eg mergers to be prevented only if they result in a market share of 40% nationally or the previous cap of 67% in a circle.
- c) Spectrum caps should be avoided as spectrum represents an *input* into the competitive environment, not an *indicator* of the competitive environment. If any spectrum caps are to be applied, they should not be applied circle by circle, but nationally. If any circle spectrum cap is to be applied, it should be conservative (eg 25% nationally, 40% in a circle). In any case, any spectrum cap must apply to all spectrum which can be used to provide substitutable services in the retail market – eg all spectrum below 3GHz.
- d) Provided there is a rule relating to market share, there is no reason to maintain a rule regarding the number of competitors. If there is such a rule, again it should apply nationally rather than circle by circle. However, since there are likely to be far more competitors than 4 in the foreseeable future, this is not a priority.
- e) Rules which reduce the license term to the shortest of the two firms raise significant and arbitrary barriers to M&A – they also encourage mergers between firms with similar license lengths and discourage mergers between firms with licenses of different lengths – an idiosyncratic objective for a regulatory regime. The debate risks being bogged down in a discussion of shortest license term vs longest license, but since spectrum blocks are clearly identifiable, a reasonable option would be that the term of the license to each block of spectrum should continue for its specified term regardless of any merger.
- f) Since moving from the SLC system of spectrum allocation is a fundamental priority, rules requiring the surrender of spectrum in excess of SLC entitlements should be abandoned.
- g) Since moving to a uniform spectrum charging regime is similarly an urgent priority, we assume that increased slab charges will not be payable (both to remove competitive distortions between operators and to facilitate spectrum consolidation with viable charges).
- h) Any rules should not prevent mergers in their entirety if subsequent action (eg a sale of a license or spectrum in one circle) within a reasonable period of time could bring the merger within the M&A rules.
- i) The lock in on new operators should be removed and replaced with a mechanism that addresses the real issue – windfall gains. These gains should be dealt with directly (by taxing a proportion of windfall gains) rather than indirectly (by preventing M&A activity which would otherwise deliver long-term value to the economy and end-users by facilitating an efficient market). Taxes on windfall gains should be reasonable so as to not raise a barrier to M&A. The starting reference point should be to treat windfall gains as capital gains on which the seller of an asset would ordinarily be taxed, perhaps at the higher end of the range of capital gains tax rates applicable to sellers of assets at a gain in India eg 30%.

In summary, therefore, international practice is to regulate M&A by criteria related to competition – ie market share. If this is done, it is not necessary, and is likely to be harmful to competition, to impose other tests or conditions related to the number of competitors, spectrum caps, shortening of license terms etc.

**17. Whether lock-in clause in UASL agreement is a barrier to consolidation in telecom sector? If yes, what modifications may be considered in the clause to facilitate consolidation?**

Yes. As outlined above, the lock-in inevitably raises barriers to M&A and therefore consolidation and efficiency. While Indian operators have spectrum allocations which are generally less than half the international average, the lock in prevents consolidation of significant amounts of spectrum. Currently, the lock-in period merely ensures the waste of considerable amounts of spectrum that are trapped in the hands of operators who are unlikely to have a sustainable business model (judging by the fact that no more than 5 operators have proved sustainable in any major international market).

If the objective is to deter operators from seeking arbitrage gains in the future, then instead of a lock in, a windfall tax should be considered. This tax should be clearly defined (in terms of the licensees to which it applies) but it must be set at a level to ensure that the tax does not present a significant barrier to consolidation of the industry (eg 30%). The benefits of consolidation to the country will greatly outweigh the issues of promoters retaining a portion of windfall gains.

**18. Whether market share in terms of subscriber base/AGR should continue to regulate M&A activity in addition to the restriction on spectrum holding?**

Multiple restrictions on M&A, especially if applied at circle-level, and as “hard” or “brightline” tests (as opposed to triggers for further inquiry) will raise significant barriers to rationalization of the industry and therefore impose costs on consumers. If a test based on market share is to be used at all, there should not be separate/additional tests on the basis of spectrum or number of competitors. A test related to market share is to be preferred as market share is more closely indicative of market power than spectrum which is merely one input into the mobile business. If hard tests are used, caution should be taken and test should be applied nationally rather than by circle, or at least applied at a more conservative level than 25% (for spectrum) or 40% (for market share).

**19. Whether there should be a transfer charge on spectrum upon merger and acquisition? If yes, whether such charges should be same in case of M&A/transfer/sharing of spectrum?**

This is an important question which goes to the heart of the trade-off between long-term spectral/economic efficiency and shorter term concerns regarding windfall gains – if charges for M&A/transfer/sharing of spectrum are set too high, they will form a fundamental barrier to consolidation of the market and therefore spectrum efficiency regardless of whether other barriers contained in the regulatory environment (such as M&A rules) are lowered. Overall, we consider that the benefits of consolidation to the country will greatly outweigh the issues of promoters retaining a portion of windfall gains.

However, it is not possible to sensibly answer this question without first differentiating between the different possible objectives which government might have in mind in imposing transfer charges on spectrum. Government may, for example, simply want to recover the costs of allocating and administering spectrum – which would lead to one specific answer as to how charges might be applied or determined. The concern in India, however, appears to be very different – windfall gains – ie, that some operators may have not paid an upfront charge for spectrum, and therefore may have received spectrum at below market rates, which would realize a windfall gain if that spectrum is sold.

However, it is critical to recall that different spectrum blocks may have already attracted substantial fees – some or all of: upfront license/spectrum acquisition fees, spectrum usage charges as a significant % of AGR and/or license fees as a % of AGR. In effect, the Indian government has already been levying significant charges on the basis of a combination of auctions and “administrative incentive pricing” (administratively determined charges designed to incentivize efficient use of spectrum through the escalating “slab” charges). As the World Bank’s ICT Regulation Toolkit describes: “This method [of spectrum pricing] is referred to as ‘administered incentive pricing’: ‘administered’ because prices are set by the regulator reflecting the opportunity cost of spectrum while incorporating potential ‘incentive’ properties: prices are set at a level to encourage efficient use reflecting spectrum scarcity. (ICT Regulation Toolkit, 5.1 Spectrum Pricing).

These fees represent a substantial proportion of revenues. It must not therefore be presumed therefore that all spectrum blocks have been received for free or below market rate and therefore that all operators will realize windfall gains on M&A or transfers. Operators who have paid not only upfront acquisition fees, but also invested in network and operations in order to generate revenue streams and thereby paid, over many years, substantial license and spectrum fees *may well have paid cumulative amounts which are roughly equal to, or even significantly above the market price of the spectrum.* If windfall gains are the concern, a mechanism must therefore be found that distinguishes between spectrum which has already attracted a price at or above market prices, and spectrum for which virtually no price has been paid. This would effectively target transfer pricing at the issue it is intended to address rather than risk deterring any and all efficient spectrum trading to address a “windfall gains” concern which arises only in relation to some spectrum.

We would recommend therefore that:

- a baseline is established for the market price of spectrum. The DOT proposal to “read across” from 3G auction prices could be an acceptable point of reference, provided that a mechanism is found to eliminate prices which result from extreme artificial scarcity (ie circles where only 2 slots are to be auctioned) or distortions in bidding;
- transfer charges should then only be levied on the difference between the market price, and the cumulative amounts already paid for the relevant block of spectrum in those circles. Ie the transfer charge should be set at market price less cumulative payments already made; and
- since transfer charges are effectively taxes on windfall gains, they should be set at a level which ensures that the

tax does not present a significant barrier to consolidation of the industry eg 30% which is reasonable by reference to Indian capital gains tax rates. The benefits of consolidation are very likely to outweigh any short term losses through promoters retaining a portion of windfall gains.

The DOT proposal for a discount on transfer charges for a period of time to “kick-start” consolidation is sound and 20% should represent a reasonable incentive, but a slightly longer period of time should be considered due to the long timelines involved in M&A activity – 2 years rather than 1.

Any transfer charges should be applied in a competitively-neutral manner.

It is not clear why charges would be levied on spectrum sharing as spectrum is not transferred – we are not aware of any jurisdiction which has applied a charge for spectrum sharing.

**20. Whether the transfer charges should be one-time only for first such M&A or should they be levied each time an M&A takes place?**

If the charges are designed to address windfall gains and as a one-off adjustment to bring spectrum which has been acquired at “below market rates” into the market system, it inevitably follows that transfer charges should be one-time only.

**21. Whether transfer charges should be levied on the lesser or higher of the 2G spectrum holdings of the merging entities?**

To ensure barriers to consolidation and spectral efficiency are not unreasonably high, any transfer charges should be levied on the smaller of the holdings. At worst, charges should be levied on the average of the two holdings.

**22. Whether the spectrum held consequent upon M&A be subjected to a maximum limit?**

See response to Q18. If a hard cap is to be imposed, this should not prevent M&A, but instead give rise to a condition that spectrum in excess of the cap must be disposed of within a reasonable period of time – eg 12-24 months. Any cap must be set in the context of the spectrum holdings of efficient international operators.

### **Spectrum Trading**

**24. Is spectrum trading required to encourage spectrum consolidation and improve spectrum utilization efficiency?**

Yes. The current small allocations to operators and the uncertainties over the availability of further spectrum mean that trading is essential to allow operators to find efficient scale. Spectrum trading allows much more specific and targeted reallocations of spectrum than can be achieved through M&A activity.

**25. Who all should be permitted to trade the spectrum ?**

All holders of spectrum should be permitted to trade.

**26. Should the original allottee who has failed to fulfill “Roll out obligations” be allowed to do spectrum trading?**

If licensees who fail to meet rollout obligations are prevented from trading spectrum, this excludes very significant blocks of scarce spectrum from market rationalization. It is precisely these operators who are currently holding a significant amount of spectrum between them, but are unlikely to be sustainable in the long term. This is precisely the spectrum which is needed for redistribution to allow other operators to achieve efficient scale.

**27. Should transfer charges be levied in case of spectrum trading?**

See the answer to question 19 – if the concern is windfall gains, transfer charges should be levied on spectrum as a result of both merger and trading.

These should be distinguished however from spectrum swaps (where operators trade “like for like” blocks of spectrum in order to harness efficiencies through contiguous spectrum and eliminating guard bands) should be exempt from any transfer charges – these are pure efficiencies which ensure that similar spectrum similar still remains in the hands of the operators.

**28. What should be the parameters and methodology to determine first time spectrum transfer charges payable to Government for trading of the spectrum? How should these charges be determined year after year?**

We suggest three parameters:

- The spectrum that is subject to first time spectrum charges must be clearly identifiable;
- The gain on which the windfall tax is levied should be clearly identifiable; and
- The effective rate of tax should not be so high as to distort the operation of the market. In our view any transfer charges should not exceed 30%.

However, even within these parameters, we remain concerned that the spectrum charging mechanism could be so cumbersome that it could inhibit the achievement of the prime objective to reallocate spectrum to its optimal user. A windfall tax at a high rate would push operators seeking to acquire more spectrum towards acquiring it from companies who did not face the one-time charge. This may prevent the most efficient form of spectrum consolidation – the transfer of spectrum from operators who have no sustainable long-term business model. In the extreme, it could lead to entirely the wrong companies exiting the market, which would damage competition.

There are practical issues. Any tax that is based on the value of the transaction is prone to difficulties. A clearly identified value of spectrum may not be observable in the transaction. For example, a transferring operator may have invested in sites and radio equipment that would also be likely to be included in the package (and value) of any assets. In the case of M&A, other complications, such as debt and working capital, would arise which would affect the value of the overall transaction in ways which may be difficult to disaggregate to arrive at a value for the transfer of spectrum alone.

This may suggest that an administrative windfall tax in the form of a transfer fee should be applied. However, the risk then is that the basis for calculating the fee becomes disconnected from the real market value of the traded spectrum. Particular care must be exercised in extrapolating results from spectrum auctions where supply is artificially constrained. The important point is that the worst outcome would be a windfall tax so high that efficient trading and consolidation is prevented.

**29. Should such capping be limited to 2G spectrum only or consider other bands of spectrum also? Give your suggestions with justification.**

Spectrum caps should be avoided as spectrum represents an *input* into the competitive environment, not an *indicator* of the competitive environment. If any spectrum caps are to be applied, they should not be applied circle by circle, but nationally. If any cap is to be applied, it should be conservative (eg 25% nationally, 40% in a circle). In any case, any spectrum cap must apply to all spectrum which can be used to provide substitutable services in the retail market – eg all spectrum below 3GHz. We see no reason to apply a technology specific approach to the issue of the cap when the overall stance of the Licensor is to move towards a technology neutral regime. The approach should therefore be technologically-neutral across all bands.

**30. Should size of minimum tradable block of spectrum be defined or left to the market forces?**

This should be left to the market. Commercial interests will ensure that excessive fragmentation is avoided.

**31. Should the cost of spectrum trading be more than the spectrum assignment cost?**

We are not sure of the concern that may lie behind this question – there does not appear to be a reason to restrict the price at which spectrum is traded in a market driven environment .i.e neither a floor nor a ceiling should be imposed on the price at which spectrum is traded.

**Spectrum sharing**

**32. Should Spectrum sharing be allowed? If yes, what should be the regulatory framework for allowing spectrum sharing among the service providers?**

Spectrum sharing can be considered within the framework of infrastructure sharing, intra-circle roaming and MVNOs. We consider it to be a pro-competitive measure that could significantly improve overall spectral efficiency. Spectrum sharing should be allowed as it is a potentially efficient arrangement which may deliver significant benefit to consumers. The precise amendments to licenses to permit spectrum sharing should be the subject of a (short) consultation.

**33. What should be criteria to permit spectrum sharing?**

There should be no prohibitions on spectrum sharing.

**34. Should spectrum sharing charges be regulated? If yes then what parameters should be considered to derive spectrum sharing charges? Should such charges be prescribed per MHz or for total allocated spectrum to the entity in LSA?**

The commercial arrangements between operators for spectrum sharing should not be regulated – they should be left to operator as there are complex considerations which would affect the cost and benefits of spectrum sharing in each and every sharing initiative. Spectrum sharing should not attract charges/taxes. The gains from spectrum sharing are efficiency gains (which regulators should encourage) not windfall gains which raise political concerns. The spectrum is not being transferred, and the sharing licensees are still subject to the existing license terms. Imposing charges on arrangements which are likely to be experimental and potentially unwound would raise a very significant barrier to a potentially efficient set of arrangements.

**35. Should there be any preconditions that rollout obligation be fulfilled by one or both service provider before allowing the sharing of spectrum?**

No, it is precisely the spectrum controlled by these operators that offer most scope for efficiency benefits.

**36. In case of spectrum sharing, who will have the rollout obligations? Giver or receiver?**

Since ownership of spectrum does not change when spectrum is shared between operators, rollout obligations should remain unaffected – ie should continue to apply to both operators.

### **Perpetuity of licences**

**37. Should there be a time limit on licence or should it be perpetual?**

Consistent with international practice, India should move towards a regime of perpetual licenses (such as in the UK and USA) ; i.e, if separate operating licenses are introduced, these licenses should be perpetual and should only be rescinded in the event of a serious and un-remedied breach.

In the short term, however, existing license conditions regarding 10 year renewals must be respected. License renewals can represent periods of significant uncertainty for operators, government and consumers. As a major recent study of licensing for the World Bank concluded *“If trading and liberalization are introduced, the main purpose of imposing expiry dates –and therefore the concept of license renewal—fades away. Except in cases of market failure, the secondary market may facilitate efficient reallocation and reassignment of usage rights without the need for regulatory intervention. Indeed, the presence of an expiry date may distort the market, as it creates investment uncertainty that may unduly reduce the value of usage rights towards the end of their duration. Indeterminate or vague durations are particularly inappropriate with spectrum trading, because the risk of the usage rights being terminated (or not renewed) can severely depress the value of the tradable right throughout its lifetime.”* (Mobile License Renewal, World Bank, June 2005).

The desirable approach is that the terms of which the license is extended should be known well in advance. The current timetable envisaged in the license is adequate for the automatic 10 year extension although clarity on the extension terms should be made at least 3 years in advance of the expiry of the initial 20 year term. At the end of the 30 year license period, it is critically important that the uncertainty is removed at the earliest opportunity – we would suggest at least 5 years before the end of the period. This would avoid any serious hiatus in the investment plans of operators. Any uncertainty relating to license renewal would seriously undermine the ability of the industry to raise equity and debt finance. Confirming license extensions well in advance of the expiration date is the only way to avoid any serious hiatus in the investment and financing plans of operators.

**38. What should be the validity period of assigned spectrum in case it is delinked from the licence? 20 years, as it exists, or any other period**

See our answer to question 37. The validity of assigned spectrum once it is delinked from the license should under no circumstances be less than the duration of the current bundled operating/spectrum license (20 years plus 10 year renewal).

**39. What should be the validity period of spectrum if spectrum is allocated for a different technology under the same license midway during the life of the license?**



The validity period of spectrum licenses should remain unaffected by changes in technology deployed over the spectrum.

**40. If the spectrum assignment is for a defined period, then for what period and at what price should the extension of assigned spectrum be done?**

Current licenses provide for 10 year renewal. In any case, attempting to re-assign spectrum which is being used by operators to sustain a very substantial customer base would impose a high degree of uncertainty on operators and end-users. Therefore, it would be iniquitous to consider unreasonably high fees.

**41. If the spectrum assignment is for a defined period, then after the expiry of the period should the same holder/licensee be given the first priority?**

Yes. Current licenses provide for 10 year renewal. In any case, attempting to re-assign spectrum which is being used by operators to sustain a very substantial customer base would impose a high degree of uncertainty on operators and end-users.

We note that international reviews of this question have invariably concluded that the costs and uncertainties of re-assignment are far outweighed by the benefits of certainty. As a recent landmark study for the World Bank concluded: *"most legal and regulatory frameworks adopted a regime based on the "presumption of renewal" or "renewal expectancy"... Providing details for license renewal or reissue is an important guarantee for regulatory certainty, which is a prerequisite for attracting potential investors entering the market of developing and emerging economies... For the sake of regulatory certainty, the discretion offered to the licensing body should be curtailed by conditions set in the regulatory framework or in the license itself, and be subject to checks and balances. The conditions requested for renewal and the methods for specifying them become minimum guarantees to ease investors concerns over arbitrary refusal to renew. They give a positive signal for operators to continue to invest in their networks and to fulfill their obligations, at least until the end of the license term. Prospects for license renewal also offer needed assurance to operators to engage long-term financing for their network."* (Mobile License Renewal, World Bank, June 2005)

## **Uniform License Fee**

**42. What are the advantages and disadvantages of a uniform license fee?**

Uniform license fees remove competitive distortions and are a pre-condition to the success of auction-based allocation mechanisms.

**43. Whether there should be a uniform License Fee across all telecom licenses and service areas including services covered under registrations?**

Given convergence, and the need for a level playing field between operators, there should be a uniform fee across all services and licences. This would also reduce opportunities for arbitrage and consequent losses to government. Since infrastructure providers are not licenced, these may be kept out of the ambit of licensing.

**44. If introduced, what should be the rate of uniform License Fee?**

India's fees and taxes are already amongst the highest in the world and are dominated by contributions to a Universal Service Fund which has accumulated to extraordinary levels. It is a curious approach indeed to tax operators who are delivering the majority of coverage and services for poorer and rural customers in order to cross-

subsidise services for poorer and rural customers, especially when there is no clarity over how and when funds will be allocated from the USO fund. The license fee should be disaggregated from the USO fee and considered separately, under which approach a license fee of 1% would be appropriate.

### Chapter 3 Spectrum assignment

**45. If the initial spectrum is de-linked from the licence, then what should be the method for subsequent assignment?**

Auctions have proved to be the most transparent and efficient method of assignment and have been widely and successfully used in many jurisdictions.

**46. If the initial spectrum continues to be linked with licence then is there any need to change from SLC based assignment?**

If spectrum and licenses continue to be linked, the combined operating/spectrum licenses should be auctioned.

**47. In case a two-tier mechanism is adopted, then what should be the alternate method and the threshold beyond which it will be implemented?**

In light of the answers given above, this question does not apply.

**48. Should the spectrum be assigned in tranches of 1 MHz for GSM technology? What is the optimum tranche for assignment?**

1 MHz would be acceptable provided that operators are allowed to bid for more than 1 block in any auction process (or else the process of building sufficient scale would be greatly complicated/delayed), and that operators are able to bid for particular blocks of spectrum (so as to maximize contiguous spectrum and minimise inefficiencies through unnecessary guard bands).

**49. In case a market based mechanism (i.e. auction) is decided to be adopted, would there be the issue of level playing field amongst licensees who have different amount of spectrum holding? How should this be addressed?**

It should not be presumed that all operators need to have identical spectrum assignments in order for them to compete effectively with each other in the retail market. We are not aware of any market in which spectrum allocations are identical between operators, nor of any cases in which regulators have sought to ensure that operators do not have different holdings. Spectrum holdings are the result of specific choices made by operators over the past 15 years. The regulator should not attempt to reward or compensate operators if they change their mind after choosing not to participate in past license/spectrum assignments.

**50. In case continuation of SLC criteria is considered appropriate then, what should be the subscriber numbers for assignment of additional spectrum?**

The SLC criterion is not an optimum approach for determining spectrum allocations and is not used in any other market of which we are aware.

**51. In your opinion, what should be the method of assigning spectrum in bands other than 800, 900 and 1800 MHz for use other than commercial?**

In the long term, non-commercial users should participate in auctions on a level playing field with commercial users to ensure that spectrum is allocated to the most efficient user. In the short term, however, non-commercial users should at least pay a commercial price derived by reference to auctions.

### **Spectrum pricing**

**52. Should the service providers having spectrum above the committed threshold be charged a one time charge for the additional spectrum?**

See answers above which outline the reasons for which spectrum caps or thresholds should not be applied - they are likely to impose significant costs on the economy and subscribers. In any case, given small current allocations, this is unlikely to present an issue. If any charges are to apply, they should apply to all operators – commercial and non-commercial.

**53. In case it is decided to levy one time charge beyond a certain amount then what in your opinion should be the date from which the charge should be calculated and why?**

See answers above which outline the reasons for which spectrum caps or thresholds should not be applied - they are likely to impose significant costs on the economy and subscribers.

**54. On what basis, this upfront charge be decided? Should it be benchmarked to the auction price of 3G spectrum or some other benchmark?**

See answers above – caps and thresholds would not produce benefits for the economy or subscribers.

**55. Should the annual spectrum charges be uniform irrespective of quantum of spectrum and technology?**

Once a block of spectrum is auctioned at a price that is determined by the market, there should not be any further spectrum charges for use of that spectrum for the specified tenure. However, if any minimal spectrum charge is to be levied at all, it should be a fixed uniform charge irrespective of quantum because the initial price for the block has already been paid for the spectrum in any case. Most importantly, any annual spectrum charges must be clearly specified in advance of auctions or trades as the buyers of spectrum will need to discount the price that they are prepared to pay for the spectrum according to the ongoing usage costs of the spectrum for the duration of the spectrum licenses. A uniform spectrum charge regime has also been recommended by the DoT Committee.

**56. Should there be regular review of spectrum charges? If so, at what interval and what should be the methodology?**

See our answers to the questions above – once the industry has moved to market based allocation and spectrum fees based on recovery of administrative costs, there should be little need to review charges regularly.

### **Structure for spectrum management**

**57. What in your opinion is the desired structure for efficient management of spectrum?**

Under a market driven approach, spectrum would be allocated and largely priced by the market, and the role of government naturally reduces to essential functions of monitoring compliance and management of interference.

## ATTACHMENT 1 – THE IMPORTANCE OF ECONOMIES OF SCALE TO EFFICIENCY AND CONSUMER BENEFIT IN MOBILE COMMUNICATIONS MARKETS

### Efficient scale and spectrum allocation

The first over-arching issue which needs to be recognised by the TRAI – before it addresses the specific questions in the Discussion Paper – is the existence of economies of scale in telecommunications markets. Economies of scale – and the existence of minimum efficient scale of production – means that the optimal number of networks in the industry is not infinite nor typically a large number.

VEL notes that the Discussion Paper makes no reference to these accepted economic principles. We further note that the Authority may be relying on economic theoretical outcomes arising from the basic economic model of perfect competition (such as more competitors are always beneficial). However, it must be recognised that perfect competition model is a theoretical construct, and is not appropriate to base public policy for the telecommunications industry. For example, Nobel Laureates Prof. Ronald Coase<sup>1</sup> and Prof. George Stigler<sup>2</sup> describe the perfect competitive market assumption as akin to the frictionless assumption in Physics – a theoretical nicety that helps with analysis, but not an assumption which exists in the real world. Basing public policy on the outcomes of the perfect competition model is inappropriate as the model “is quite incapable of handling many of the problems to which it purports to give answers.”<sup>3</sup>

Real world markets fall in between the theoretical world of perfect competition and perfect monopoly. It is these types of markets on which efficient and effective policies must be based. Real world economics, as applied to telecommunications markets, acknowledges the existence of fixed costs, large stranded investments, and declining average costs.

What does all this mean? Economics is clear that for each type of market there are an optimal number of firms. The extreme markets of perfect competition and natural monopoly predict the optimal number to be infinite and one respectively. However, as noted above, real world markets and real world policy will lie some where in between. The optimal number of firms is determined by the minimum efficient scale of production and the size of the market. Minimum efficient scale is defined as the scale at which the average cost of production is minimised. And this is determined by the technology of production and is a factor which cannot be influenced by policy.

Prof. Hal Varian concludes:

“Thus the shape of the average cost curve, which in turn is determined by the underlying technology, is therefore one important aspect that determines whether a market will operate competitively or monopolistically. If the minimum efficient scale of production—the level of output that minimises average costs—is small relative to the size of the market, we might expect that competitive conditions prevail.

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<sup>1</sup> Coase, 1988, *The Firm, The Market, And The Law*, Chicago Press, p.14.

<sup>2</sup> Stigler, 1966, *The Theory of Price*, 3<sup>rd</sup> ed., p.113.

<sup>3</sup> Coase, 1998, p.15.

Note this is a *relative* statement: what matters is the scale relative to market size."<sup>4</sup>

For example, let's assume that the average costs of firms in market A is minimised when output is equal to 100 widgets. Firms which produce below 100 widgets will see costs decrease as production expands; while firms producing more than 100 widgets will see costs increase as it moves beyond 100. If total demand in the market is only 100, then the efficient outcome (least cost) will be a monopoly. If total demand in the market was 500, the optimal number of firms would be 5.

Dr Gruber in *The Economics of Mobile Telecommunications*<sup>5</sup> highlights that the optimal number of mobile firms increases with market size and decreased with fixed costs. Gruber concludes that absence of any regulatory barriers to entry and exit, the market will evolve into one with the optimal number of firms and with non-excessive level of profits. However, Gruber highlights two specific regulatory failures: the first is limits on entry, so that the number of firms is below the optimal level. The second [of more direct relevance to India] is a case of excessive entry. Excessive entry occurs when firms are allowed to enter so that the total number of firms is above the optimal. In such a case, competitive is unstable and destructive – and is damaging to consumers and to level of investment and coverage.

VEL recommends that there needs to be a discussion over what the efficient number of networks are for each circle (given the relevant technology and the availability of spectrum). VEL is not suggesting what the minimum efficient scale of production is for each circle within India. Rather, we are highlighting an important issue which *should* influence the policy settings of the Authority.

What we do know, however, is that it is not correct to assume that the industry [and consumers] will benefit from the addition of a large number of network operators given then limited availability of spectrum and the minimum efficient scale of production.

VEL submits that the Authority must recognise this economic reality when assessing the optimal spectrum policy.

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<sup>4</sup> Varian, 1987, *Intermediate Microeconomics: A Modern Approach*, p.428

<sup>5</sup> Gruber, 2005, *The Economics of Mobile Telecommunications*, Cambridge University Press, pp.268-70.

## ATTACHMENT 2 – THE ROLE OF MARKET CONSOLIDATION IN ACHIEVING SUSTAINABLE SCALE AND INTERNATIONAL EXPERIENCE IN MOBILE M&A

We note consolidation has occurred in many national markets and across several regions. Consolidation across these markets occurs for the same reason: to achieve scale in spectrum holdings, scale in network utilisation, and the resulting reduction in costs. In the markets and regions where consolidation has not yet occurred, there is legitimate expectation from investors and analysts that it will occur in the future.

We provide below real world examples of such consolidation, including European-wide consolidation, with specific recent examples from the UK and Australian markets. We also provide historical background on the USA telecommunications market, which in our view, provides an ideal template for how consolidation is likely to occur in the fragmented Indian market.

First, let's look at European consolidation. VEL highlights the Authority to recent comments by international telecommunications experts, Ovum Consulting. Ovum note regional consolidation enables operators to gain economies and scale, and that the resulting cost savings enable the operators to expand coverage and provide prepaid packages to low income consumers:

"In recent years many regions have seen a great deal of activity from a limited number of players. Large operators with multiple operations in one continent or region benefit from extensive economies of scale to reduce unit costs, while at the same time generating greater cash flow. As a result, they have deeper pockets and are more prone to take the risk of quickly expanding coverage and implementing micro-recharge policies." [Ovum, *Telco Merger & Acquisition Strategies*, 2008, p.4]

Examples of such consolidation can be seen across Europe, where consolidation has occurred in the past, and is expected to increase in intensity as new technologies are deployed. Ovum Consulting [*Telco Merger & Acquisition Strategies*, 2008] states that the top ten telecoms firm conducted over 100 merger and acquisitions in 2007, with total value of €40 billion: with 65% of all worldwide mergers in 2006-07 occurring within the EU. We note that the experience of pan-EU consolidation could be of direct relevance to the Indian market, given the similarities between the EU structure and size of the Indian industry structure and size (state-based licensing and the developing national nature of the market).

Not only has Europe seen the growth of regional pan-EU consolidation, in recent years many in-market mergers have occurred. This demonstrates that achieving scale is both a national and regional imperative. PriceWaterhouse Coopers states in its *M&A Insights 2007: An analysis and opinions on European merger activity in the telecommunications industry*.

"Creating scale through in-country consolidation has been at the heart of several other headline deals of the last couple of years. In 2005, 23 percent of deals by value would be classed as consolidation, although this percentage dropped with only 13 percent of deals in 2006 representing some form of in-country acquisition. As markets mature, consolidation will increase as smaller operators find themselves struggling to compete, with most markets leaving room for only two or three major players. This is

particularly the case as we move into next generation networks and services that will require significant investment.” [p.5]

The PwC insight emphasises that small networks do not struggle because of any anti-competitive actions in the retail mobile market (note that **all** EU retail markets are declared competitive and not subject to regulation). Rather, small networks struggle because they cannot achieve the scale necessary to reach minimum efficient scale, and as such have a higher cost base than network that have reached efficient scale. Mergers allow such networks to achieve this scale, and as such, enable lower costs and thus lower prices to consumers.

This is akin to gaining scale necessary to compete in the pan-India market.

Ovum Consulting, in another report notes that it expects EU merger activity to continue as new technology and converged services make it even more imperative that networks achieve scale:

If we look at the consolidation in Europe so far, our view has not really changed over the past couple of years. So far, we have seen only the first phase of consolidation through M&A – the tidying up stage. Phase 2 is all about building converged businesses, meaning integrated fixed/mobile businesses (as outlined by France Telecom in their NExT strategy, or AT&T in the US). M&A will be part of the mix as converged businesses will only make money if they have scale. Without it they will be vulnerable to more nimble niche competitors. Building scale requires more consolidation, and so M&A. (Ovum, 2007, *An End to M&A?*, p.1)

VEL further draws the attention of the Authority to recently announced and completed mergers in the UK and Australia. The recently announced UK merger [we note that the UK has a HHI only slightly higher than India, and is the next most competitive industry besides India] between Orange and T-Mobile is currently undergoing regulatory approval. The two companies expect benefits of the around €4 billion in net present value terms. The companies expect to reduce annual opex by €455 million per year and to save around €620 million in capital expenditure between 2010-2014. The companies state that:

This combination will bring substantial benefits to UK consumers. It will result in expanded network coverage and enhanced indoor and outdoor network quality for 2G and 3G services, as well as better customer proximity through a larger network of own shops and improved customer services. The combination will place the joint venture in a better position to invest in innovative new services and to exploit new technologies. The new enlarged business will also be able to compete more effectively with the other two large mobile operators in the market. [Orange Press Release, *Deutsche Telekom and France Telecom plan to merge T-Mobile UK and Orange UK to create a new mobile champion*, 8 September 2009, available at: <http://newsroom.orange.co.uk/2009/09/08/deutsche-telekom-and-france-telecom-plan-to-merge-t-mobile-uk-and-orange-uk-to-create-a-new-mobile-champion-2>]

A merger between the third and fourth operators in Australia has recently been approved. VEL notes that the Australian market has similar rural coverage problems as experienced in India – making population coverage quite expensive. The merger between Vodafone and Three is expected to realise the following cost benefits:



The in-market nature of the transaction is expected to create significant value. Economies of scale across procurement, product development, IT, network, commercial operations and administrative expenses are expected to deliver significant cost savings. The net present value of operating expense and capital expenditure synergies is currently expected to be in excess of A\$2 billion, net of integration costs. [Vodafone Press Release, *Hutchison and Vodafone agree to Merge Australian Telecom Operations to form a 50:50 Joint Venture*, 9 February 2009. Available at: [http://www.vodafone.com/start/media\\_relations/news/group\\_press\\_releases/2009/hutchison\\_and\\_vodafone.html](http://www.vodafone.com/start/media_relations/news/group_press_releases/2009/hutchison_and_vodafone.html)]

This merger has been completed as has been approved by the Australian telecommunications and competition regulator, the Australian Competition and Consumer Commission (ACCC). In its final approval document, the ACCC made the following observations and conclusions:

With the merger, the merged entity has an increased incentive to make the investments in its network given it will have the ability to spread its fixed costs over a larger subscriber base. Indeed, for this segment, the ACCC considered that the proposed merger may have a pro-competitive effect over the longer term. [Para. 78, ACCC, *Public Competition Assessment*, June 2009<sup>6</sup>]

Perhaps of more relevance to this Discussion Paper, the ACCC concluded that the aggregation of the two companies' spectrum holdings did not pose a problem, as it would not likely lead to any decline in the level of competition. Vodafone Australia has 2x30.8MHz in the 900 and 2.1 bands, while Hutchison has 2x42.5 Mhz in the 850, 900 & 2.1 bands. The merged entity will have in total 2x73.3 MHz across the three bands. The ACCC also noted that more spectrum would needed in the future for LTE deployment. [See Section N, ACCC, *Public Competition Assessment*, June 2009.]

VEL has provided examples above of recent market consolidation across Europe and within UK and Australia. We further wish to provide greater information relating to the development of the USA market. The American market has experienced significant consolidation starting with a highly fragmented market due to licence allocation process. Operators utilised a functioning spectrum trading and mergers market which enables consolidation of the innumerable small holdings across the vast continent. VEL believes this process could provide guidance to the Authority as to the efficiency of allowing secondary markets to overcome the inefficiencies associated with fragmented licensing and spectrum regimes.

The United State mobile market had many features which are seen in the current Indian industry. The US industry grew up from localised spectrum allotments with fragmented market structure, and many competing networks (based on 544 licence areas, typically much smaller than the 22 licence areas in India). A feature of this localised approach was the presence of local and long distance pricing, and national roaming between networks in other licence areas.

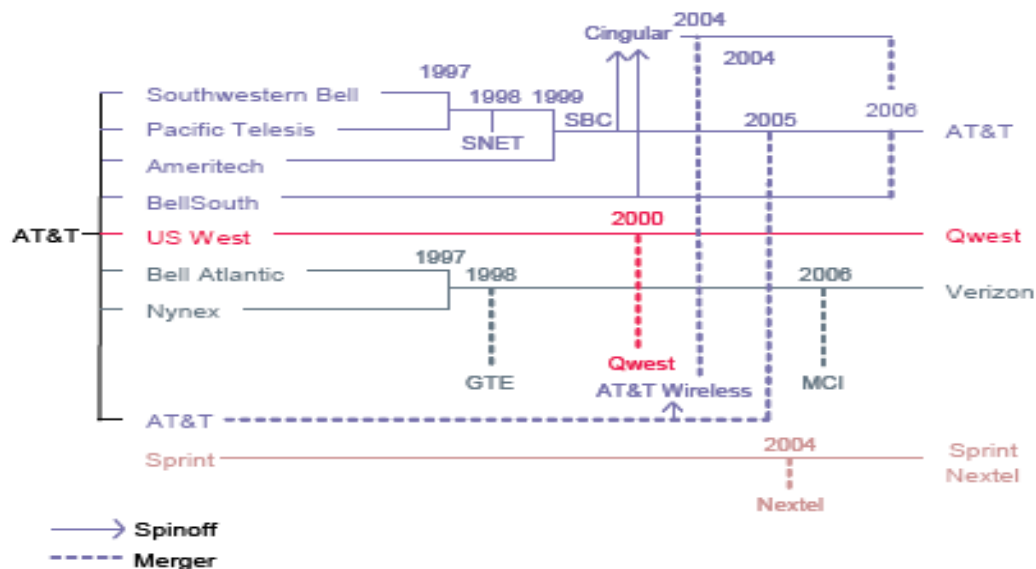
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<sup>6</sup> Available at:

<http://www.accc.gov.au/content/item.phtml?itemId=880151&nodeId=994d095e220cff866a20ff06b12932e1&fn=Vodafone%20Group%20plc%20and%20Hutchison%203G%20Australia%20Pty%20Limited%20-%20proposed%20merger%20of%20Australian%20mobile%20operations%20-%2024%20June%202009%20-%20mobile%20operations.pdf>

The United States, in our opinion, is a very good example of how a fragmented, state-based licensing regime, developed into a national network through mergers and acquisitions. Since the break-up of the Bell Companies, there has been significant industry reorganisation in both wireline and wireless markets. As can be seen below, nine fixed networks have merged into four, all of which have significant mobile arms [Qwest has an agreement with Verizon Wireless in its areas in the west of American].

**Figure 1 M&A activity since the 1984 breakup of AT&T**



Source: Ovum

The history of the US wireless industry is one containing even greater fragmentation than observed in the wireline market. The US regulator FCC had until recently issued its licences and spectrum allocation across 544 different areas [493 Basic Trading Areas and 51 Major Trading Areas].

Following the initial fragmentation, with some 500-odd licence holders, there was extensive consolidation. This has resulted in an American market which now has four national operators (Verizon Wireless, AT&T, T-Mobile, Sprint). In addition to the national carriers there are over 100 regional carriers, ranging in size from around 6 million down to 100, 000. The process of consolidation has moved from the creation of the four national operators, to the national operators extending their scale through acquisition of the regional players [Verizon Wireless acquired AllTel, the largest regional player in 2008]. Even for the second largest operator in the US, Verizon Wireless, the benefits of scale were significant:

For Verizon Wireless the deal would make sense due to the sheer scale that the enlarged company would provide. As the US economy struggles so scale becomes increasingly important, and this deal would certainly provide that for Verizon Wireless. Verizon expects total synergies to reach \$9 billion after integration costs. (Ovum, 2008, *Verizon Wireless Acquires AllTel*, p.2)

While consolidation has occurred [and continues to occur], there is still significant competition across all of the 544 different licence areas (as noted by the FCC). No market has only one operator. The FCC estimates that over 97% of the population have access to three or more mobile networks.

Ovum Consulting highlights that the continual acquisition of the smaller regional players occurs due to the inefficiency of the FCC licensing system:

While none of these acquisitions have made big headlines, they are nevertheless changing the face of the US wireless marketplace and place a question mark on the FCC auctioning process. The FCC insists on dividing the US into several hundred local licences instead of auctioning nationwide licences or at least making Major Trading Areas (MTAs) the standard licence size. This leads to unnecessary fragmentation with subsequent reconsolidation into larger coverage areas, which only benefits the financial interest of bidders that either never had the necessary requirements to launch a viable wireless competitor or that only acquired the licences for financial gain. (Ovum, 2006, *US Wireless Market: A Fragmented Market*, pp.6-7)

VEL wishes to highlight several key conclusions from these observations:

First, the American wireless industry has, through an effective secondary market, overcome the inefficiencies created through a highly fragmented licensing system. This is very similar to the problem being discussed in the current Discussion Paper. VEL suggests that TRAI may find it useful to consider the acceptance of secondary trading to allow the market to consolidate and achieve the economies of scale necessary to ensure low-cost services.

Second, VEL also draws attention to the recent policy change of the FCC with regards to its licensing approach and spectrum allocation – acknowledging the efficiency gains from allocating spectrum in larger blocks and having fewer competing networks. See for example the approach taken to the 2008 700MHz auction which significantly reducing the number of licences from 544 to 5.

Third, the US has experienced problems rising from unnecessary windfall gains arising from license speculators – a by-product of allocating many small-area licences. We note that problems with unfair windfall gains did not make the FCC to ban or influence the secondary market and the trading of spectrum rights (including mergers with the aim of consolidating spectrum holdings). VEL refers the TRAI to the US Department of Justice prosecution of individual and companies that bought licences with no intention of operating a wireless network. [For more detail see Ovum, 2006, *US Wireless Market: A Fragmented Market*, p.7]

Finally, we note that the trend for consolidation is forecasted to continue. Strategy Analytics, commenting on the future of the tier 2 and 3 mobile operators, states:

We anticipate that market valuations will mean the trend in market consolidation continues, with the top carriers potentially picking up some of the remaining smaller regional carriers in areas where they need to strengthen market position or spectrum holdings. There may also be more mergers/acquisitions among the smaller carriers as they seek to survive in the competitive marketplace. [Strategy Analytics, *US Wireless Market Outlook; 2009 Key Trends*, p.19]

VEL submits that the history of the US wireline and wireless markets provides several key learnings which would be of assistance to the Authority in its deliberation of the issues raised in the Discussion Paper. These lessons are: market consolidation can occur naturally through secondary trading of spectrum; initial allocation of licences and spectrum has moved from a fragmented to a national basis; and potential windfall gains have not prevented spectrum trading nor have been prohibited by the regulator.

# **VODAFONE ESSAR LIMITED, CLARIFICATIONS FOLLOWING OPEN HOUSE SESSIONS REGARDING TRAI CONSULTATION ON "OVERALL SPECTRUM MANAGEMENT AND REVIEW OF LICENSE TERMS & CONDITIONS"**

**Dan Lloyd, Head of Regulatory, VEL**

We thank the Authority for the invitation to submit clarifications following the open house hearings. This is an important discipline in regulatory proceedings which provides the industry an opportunity to verify (or question) the submissions put before the Authority, especially the veracity of the facts and evidence submitted.

We note that these clarifications do not attempt to respond to each and every issue given the significant volume of written and verbal submissions already submitted during the open house. We rely on our previous submissions to address all other matters which are not addressed below.

The following comments are of course provided without prejudice to any and all current regulatory and legal proceedings in relation to the issues covered by the present consultation, and we reserve the right to make further submissions given the importance of the consultation to the industry.

## **1. CLAIMS THAT 800MHZ SPECTRUM CANNOT BE USED FOR GSM SERVICES ARE UNTRUE**

Vodafone's global technology team has confirmed that the Indian CDMA 800 frequency band (824-844 paired with 869-889 MHz) is used in the USA and South and Central America by numerous operators to deploy "GSM 850" equipment.

GSM-850 is used in these markets with paired frequency at almost exactly the same frequency band (Uplink: 824-849MHz, Downlink: 869-894MHz). Network equipment is readily available, as are triband (850,900, 1800) and quadband (including 2.1GHz) handsets.

Once W-CDMA services are licensed, W-CDMA could also be deployed in this band – equipment is available and services have been deployed in the 850 MHz band, particularly by Telstra in Australia.

This seriously undermines the claims of some parties that GSM cannot be deployed in the "CDMA spectrum", and that no dual-technology operator can harness efficiencies by holding both 800 MHz and 900 or 1800 MHz spectrum. This therefore seriously questions the basis on which dual-technology operators argue that they should be charged separately for their holdings of 900/1800 and 800 Mhz spectrum holdings. In light of this, we respectfully suggest that the Authority revisit this question.

## **2. TTSL'S 6.2 MHZ CALCULATIONS ARE FLAWED AND HIGHLY UNREALISTIC**

We re-iterate that we reject TTSL's calculations that GSM networks can provide sufficient capacity for scale deployment with 6.2 MHz of spectrum. TTSL's calculations contain basic technical errors, would require the deployment of a network which is simply not practical or possible in reality, and would result in massive inefficiencies through fragmenting spectrum across multiple operators, vastly reducing the overall capacity of Indian mobile networks, and thereby placing at risk the capacity to serve such substantial customer bases as are already present in the market.

TTSL's calculations were seriously questioned during the open house, and have not been tested by any independent parties. We therefore assume that the Authority will not rely upon them in its decision-making process. However, in the interests of completeness on such a substantial issue, we set out additional views from VEL and Vodafone Group's technical experts.

The key flaws in the TTSL calculation are:

- a) TTSL greatly over-estimates the capacity per site which can be made available on 6.2MHz of GSM spectrum. Our technical experts calculate as follows a capacity of 10 erlangs per site (approximately 1/8<sup>th</sup> of TTSL's claim of 79.3):
  - To deploy GSM the absolute minimum requirement is to have available sufficient spectrum for the BCCH broadcast control channels. This requires a frequency reuse of around 15 which for 200kHz/channel requires 3MHz of spectrum and enables one transceiver to be deployed on each cell.
  - The capacity on one transceiver would be as follows:
    - o Total number of time slots available on the BCCH transceiver = 8
    - o Less number of time slots for control (BCCH/SDCCH)= - 2
    - o Less number of time slots for EDGE/GRPS= - 2
    - o Available time slots for voice = 4
    - o Available voice circuits (assuming 100% half-rate = 2x4)= 8
    - o Erlang capacity at 2% blocking for 8 circuits = 3.4 Erlangs
    - o Site capacity at 2% blocking = 10 Erlangs
  - The inefficiencies created by fragmented spectrum allocations become all too apparent: the minimum GSM BCCH deployment consumes 3MHz and would only leave 3.2MHz of spectrum (from a 6.2MHz allocation). Over half of the spectrum allocation would be consumed with the "fixed costs" of BCCH deployment, while other substantial inefficiency would occur due to the need for guard bands between each and every operator's allocation

- b) The site density required to deploy a network on the basis of TTSL's own calculations is clearly impossible to achieve in practice. 17 sites per operator per each sq km is an extraordinary assumption even for 1 operator, let alone for up to 12 operators per circle. A realistic tenancy ratio per site is 2 by reference to the experience of Indian and international tower companies. This would require 102 sites for each 100m by 100m area. Even if a tenancy ratio of 3 could be achieved, this would require 57 sites per sq km. Neither of these are achievable in practice. This is simply not a realistic set of assumptions for network deployment. Even if it were achievable, it would not be desirable given public concern over the environment impact of sites in urban centres.
- c) An allocation of 6.2MHz would undermine the deployment of broadband services in India since it would render deployment of 3G services in 900MHz spectrum impossible. The minimum GSM BCCH deployment consumes 3MHz and would only leave 3.2MHz of spectrum (from a 6.2MHz allocation). This minimum level of coverage for GSM would have to be maintained for roaming users (from different circles) or for users that have not yet been migrated to a 3G or LTE voice handset. The remaining 3.2MHz would be insufficient to support a single 3G channel. TTSL's approach therefore severely undermines the possibility of deploying broadband services, especially in rural areas.
- d) TTSL's calculations contain basic technical errors (eg it is impossible to have 32 channels in 6.2MHz allocation).

We re-iterate our submission that the Authority should prefer the estimations of eminent independent experts which have recommended that 2x12 MHz is a more realistic allocation which strikes an appropriate balance between scale and trunking efficiency on the one hand and competition on the other. We note that this is still approximately half of the global average allocation of 2x22MHz.

### **3. THE FULL IMPLICATIONS OF SPECTRUM CAPS WOULD BE SERIOUS**

It was asserted during the open house that Vodafone's own calculation of 15,000 additional sites was an admission that Indian operators could manage with 6.2MHz of spectrum by merely spending additional capex.

Those assertions could only be made by ignoring critical components of the specific submission, and ignoring broader, obvious considerations:

- a) The assessment is clearly stated to be for "at least" 15,000 additional sites – the actual requirement is likely to be substantially higher. It would take serious effort to investigate and confirm the full requirements which we do not consider justified given the fanciful nature of the claim that a network could support a substantial subscriber base with such limited spectrum, and the fact that no international network has managed to do so;
- b) As the second half of the relevant sentence in Vodafone's counter-comments clearly states, even 15,000 additional sites "are unlikely to be possible given that many parts of the VEL network already operate at minimum intersite distances". This is true even if the

cap were applied to only one operator. The problem would grow exponentially were it applied to multiple operators. The imposition of a spectrum cap would not simply drive additional capex, but would make it impossible to provide current coverage and quality of service.

- c) We re-iterate the broader considerations regarding the detrimental impact that such caps would have on spectral efficiency and overall reduction of the combined capacity of the Indian mobile networks, not to mention the fact that such a regulatory intrusion would be clearly unprecedented. No submissions have managed to point to any operation of any scale international networks at this level of spectrum, nor any precedent for such a radical regulatory intervention.

#### **4. OPERATORS DO NOT HAVE A “CONTRACTUAL RIGHT” TO 6.2 MHZ OF SPECTRUM.**

We re-iterate our previous submissions on this issue as some parties continually asserted a “contractual right” to 6.2MHz of spectrum. We re-iterate that the questions of whether there is any such thing as a “contracted right” to 6.2MHz of spectrum under the UASL license, and/or whether there is any implied cap on spectrum allocation under the UASL licenses are currently before the Supreme Court. We dispute both of these assertions as being inconsistent with the plain terms of the licence, as well as clear government policy in force at the time of allocation. It is inadvisable and inappropriate to rely on the assertion of one party to that continuing litigation as any basis for policy-making in this area.

#### **5. ASYMMETRIC RETAIL PRICE REGULATION IS LIKELY TO PROVE UNECESSARY AND DIFFICULT TO IMPLEMENT**

We have given further thought to question 16 - possible regulation designed to achieve asymmetric retail pricing, including international experience which may be useful to illustrate the opportunities and costs of different policy approaches.

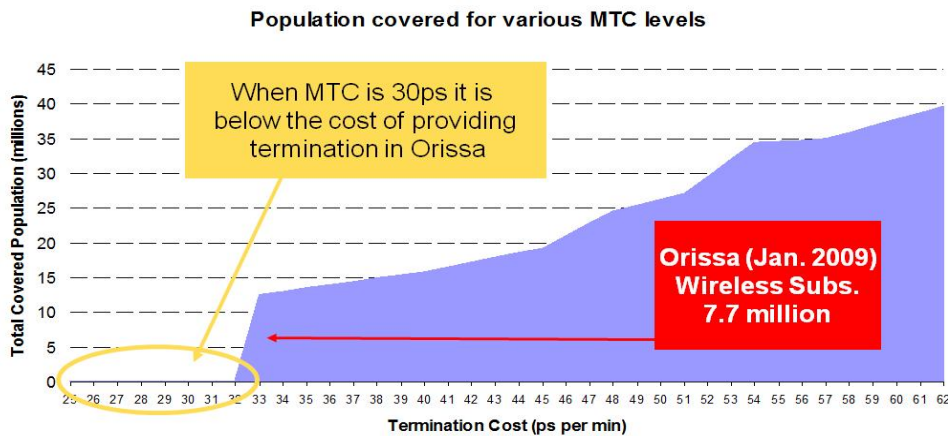
Firstly it is worth noting that the question asked by the Authority seems to assume that symmetric pricing of retail tariffs creates an undesirable cross-subsidy from rural customers to metro customers. This must be driven by an implicit assumption that the costs of service per customer in rural areas is *lower* than the cost of service per customer in metro areas.

In our experience, this is not a safe assumption. The absolute cost of providing service in rural areas is often higher, especially due to the higher costs of provision of energy, and because there are far more customers per sq km in urban areas, the cost per customer is usually lower in metro areas than rural areas. Therefore, we do not believe that it is safe to assume for the purpose of policy making, without a detailed analysis of these factors, that the costs of serving rural customers is lower.

This has been demonstrated in many contexts, including the IUC open houses in which the cost of termination was shown to increase in more rural areas. Overall costs will follow the same pattern:



## Relationship of MTC to the economics of rural customers – Typical circle C (Orissa) example



Every extra paise means about 1 million citizens in Orissa

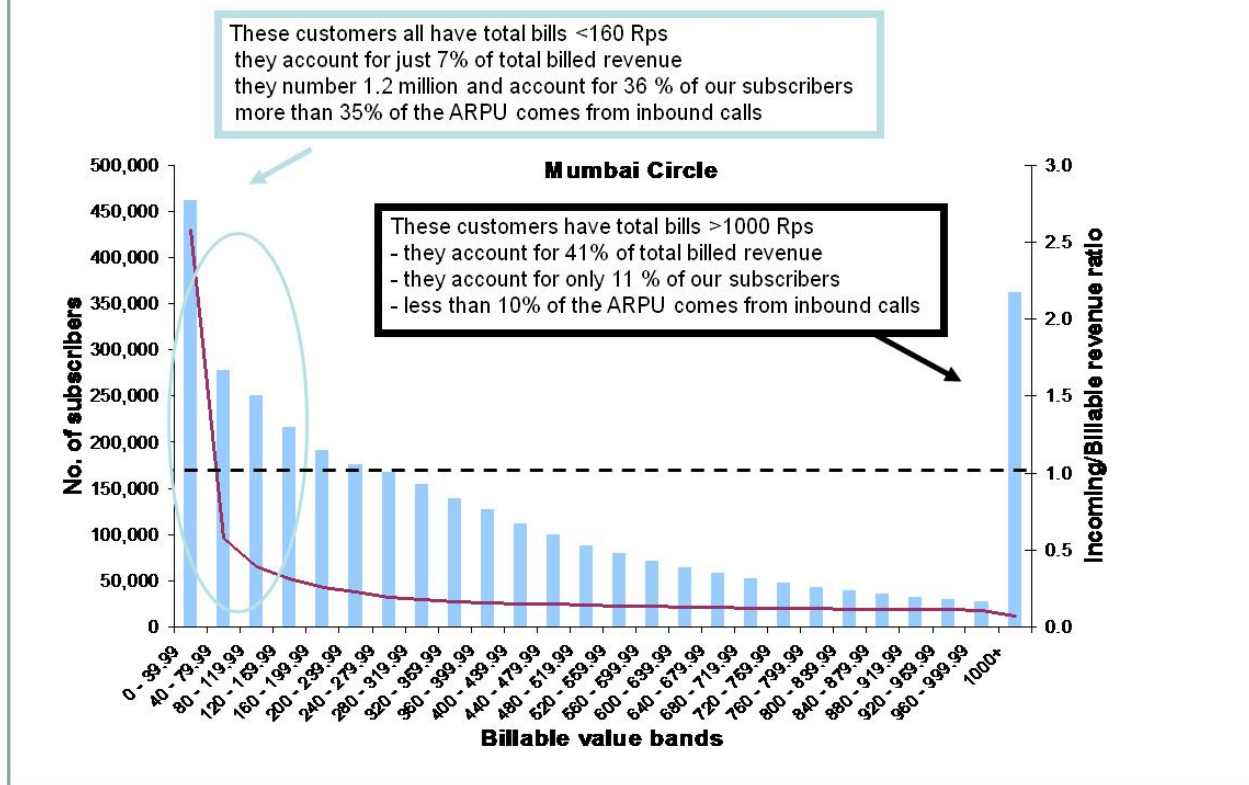
Every extra paise will connect about 5 million citizens in all Circle Cs

We note that if the costs of rural service are higher, then *symmetrical* pricing actually already provides a subsidy from metro customers to rural customers.

It is also important to understand the additional mechanisms that consumers have available to them, and use, to create additional subsidies between wealthier and poorer subscribers including from metro to rural areas. Most importantly, subscribers can and do use the direction of traffic to distribute the costs of calling. Customers naturally generate cross-subsidy in a CPP system through adjusting the direction of traffic. Richer customers make more outgoing calls, while poorer customers receive more calls than they make. Customers use SMS, and short outgoing calls to request the richer customer to call them back. Customers can and do also ensure that no charges are paid by the poorest consumers by dialing, sending the CLI to another subscriber, then hanging up before the call is answered to signal to the other subscriber that they should call back. All of these give poorer customers natural and widely used mechanisms to reverse call direction and minimize the overall price that they pay for mobile services regardless of the retail price for outbound calls in rural areas.

VEL's network data indicates that these factors all combine to deliver strong subsidies from richer customers to poorer customers and urban customers to rural customers. Eg network data in Mumbai reveals the vast difference in the ratio of outbound to incoming revenue of customers with different levels of outbound ARPU, showing that richer customers account for a far higher proportion of outbound calls and revenues, while poorer customers tend to receive far more call than they make:

## Call direction on mobile networks – Mumbai example



We therefore believe that mobile networks already generate substantial subsidies from richer customers to poorer, and from metro to rural areas.

In any case, we note that international regulatory regimes tend not to regulate mobile retail prices in any case. The retail price concern in most jurisdictions has solely been in relation to the fixed network, and only to ensure that rural customers do not pay *all of the higher costs of connection/coverage in rural areas*. The only regulation that tends to be applied in other jurisdictions therefore are applied in the fixed market to cap the amount of connection cost which could be recovered from subscribers – ie to prevent too high an asymmetry between low urban rates and higher rural rates!

Mobile networks never had this concern as they have always applied the same charges to rural as urban - symmetric tariffs already cross-subsidise from urban to rural.

We note that the ICT Regulation Toolkit also identifies the risks of regulating prices, particularly when regulating prices to a lower level may undermine the incentives for investment in rural areas. We believe that this case would apply equally to retail tariffs, and to regulation of mobile termination rates given that a disproportionate amount of the incentive to invest in rural areas arises from the incentives set by incoming rather than outbound revenues:

<http://www.ictregulationtoolkit.org/en/Section.3217.html>

#### **“2.4.5 Tariff flexibility**

Many policymakers prefer keeping tariffs low, especially in rural areas, as they know affordability is lower in rural than in urban areas. This follows common practice and policy in many industrialized countries but it is not always transferable to developing countries where operator revenues are smaller and the task to build-out the network to the entire country still lies ahead.

To the contrary, this often has the opposite effect of what is desired. If operators are not allowed to charge commercial tariffs in the more costly rural areas, they have little chance of recovering their cost and making a profit. In consequence, they tend to avoid serving rural areas. If they are forced to serve rural areas by obligations, they try to minimize their attention, effort and resources as this is a loss-making operation for them. This results in either very poor services or no service at all.

The ultimate objective of universal access and service (UAS) policy is affordable services for all, including rural areas. However, in some countries with very high-cost areas it might be beneficial for an interim period, of three to five years depending on the situation, to allow operators to charge slightly above urban tariffs, as a reflection of their costs. This would motivate providers to build out infrastructure in rural areas. Again, the best evidence that this scenario works, are the many mobile operators in Africa that were free to charge higher tariffs; the combination of tariff freedom (or at least greater tariff flexibility) and competition has allowed mobile operators to grow more rapidly and venture into rural areas.

Furthermore, the rural customer often develops innovative cost-minimizing ways of using the network to their advantage once it arrives, e.g., through sharing phones, use of SMS and of call-back or beeping their urban contacts who are willing to pay for the calls.

Despite regulators' statutory independences, regulators are sometimes under pressure from politicians and special interest groups to regulate or control prices in competitive markets. Prices for service typically begin higher than many people would like, but this enables operators to achieve their early investment targets and develop the market. Almost without exception, where competition is strong, the need to drive penetration to higher levels (i.e., to ever-lower income users) has led to price reductions with tariff package innovation and low-user options that, as noted previously, are beyond even the expectation of regulators and policy makers. Experience has shown that market efficiency is achieved with a light hand in regulation, with the regulator's main task to ensure a competitive environment where players who are dominant do not abuse their power.

#### ***Calling Party Pays***

World experience shows that Calling Party Pays (CPP), combined with tariff innovation at the low end of the affordability curve, enables low-income users to be able to afford service and to use the network creatively and to have access to communications. Many developing countries have changed from Receiving Party Pays (RPP)/ Mobile Party Pays (MPP) to CPP and seen penetration rates rise significantly [1].

CPP also has benefits for the operator because, with low-end users' propensity to use SMS and incoming calls as their means of access, they are creating calls in the network that would otherwise not be made at all. CPP also encourages more users to use mobiles for business purposes since they are not burdened with any cost levied on incoming business enquiry calls [2]. This probably explains the relatively slow business user take-up of mobile communications in North America (which does not use CPP) as compared to Europe.

## End notes

1. See for example Mobile termination charges: Calling Party Pays versus Receiving Party Pays by Stephen Littlechild, Telecommunications Policy 30 (2006) 242-277; Calling Party Pays or Receiving Party Pays? The diffusion of mobile telephony with endogenous regulation, by R. Dewenter and J. Kruse, Department of Economics Discussion Paper 43, Helmut Schmidt University, Hamburg, November 2005. On the other hand, Scott Marcus argues in ITU Trends in Telecommunications Reform 2007: The Road to NGNs (Interconnection) that RPP prepares regulators better for the transition to all IP networks and NGN networks which are expected to use the Internet based peering and transit model.
2. New technology is on the way which can improve tariff transparency to users (in particular, by displaying call charges on the phone screen both while a call is being set up and during the course of the call). If successful in the marketplace, we expect that this technology will provide new flexibility for charging and interconnection arrangements. It could allow real-time call price changes in response to changing loads, permitting a much more efficient usage of installed traffic capacity."

There are also substantial practical difficulties in targeting regulation to ensure that asymmetric tariffs achieve their desired effect in a mobile network. SIMs are portable. This creates the opportunity for the connection of SIMs in rural area to gain cheaper tariffs which are then actually used in urban areas.

The incentive for operators to provide coverage and connect customers in rural areas is therefore largely the IUCs since most calls are incoming rather than outgoing. IUCs in India are so low as to deter investment in rural areas. The outcome is therefore likely to be lower penetration in India – a much more significant problem to worry about that cross-subsidies rural to urban.

No market that we know of has asymmetric retail tariffs in mobile and we are not aware of any regulator who has sought to impose such tariffs.

In general, we consider that the hyper-competitive state of the Indian mobile market, and the extremely low levels of tariffs and mobile termination rates raises concerns regarding the sustainability of the industry, rather than cause for concern with cross-subsidies from urban to rural customers.

## CONCLUDING COMMENTS

As stated during the open house hearings, we submit that regulatory decisions should be governed to the extent possible by objective, transparent and consistent criteria. Without a move to a market-based system of spectrum allocation and pricing, the Authority will face constant pressure from operators to make subjective decisions which favour that operator's limited commercial interests (at the risk of the interests of Indian consumers and the Indian economy), and continually face the risk of legal challenges from other operators.

A market based system, however, would provide the Authority with a transparent and objective set of principles which would drive fair competition and greatly lower the risk of challenges to decisions. It is also a tried and tested path that has been implemented in multiple international jurisdictions and which continues to deliver strong and sustainable growth and consumer benefit in those markets.

As such, we believe that the Authority should move towards a system under which:

- Future spectrum is allocated by auction;
- Spectrum is therefore priced according to the market; and
- Operating licenses are de-linked from spectrum and made freely available only for the cost of issuance, administration, compliance.

If any attempt is made to charge one off fees to bring spectrum awarded in the past into line with market based pricing, account must be taken of the fees paid for particular blocks of spectrum in the past (as some blocks of spectrum have already paid very substantial fees which may be at or above the market price of spectrum as revealed by the auction mechanisms).

We are sure that the Authority will remain focused on the key issues in this consultation:

- total spectrum made available to the mobile industry in India is half to two-thirds of the spectrum made available to the industry globally. More spectrum should be made available as a matter of the highest priority;
- India has more than twice as many operators than have ever proved sustainable in any other market regardless of geographic scale, population or wealth;
- this situation has already driven the industry to the brink, with roughly one quarter of the average spectrum allocation of international operators despite higher customer bases;
- benchmarking shows that Indian spectral efficiency is probably the best in the world, and that spectrum fees are already amongst the highest in the world, especially for additional spectrum above 6.2MHz.

Consistent with international approaches, the focus should remain on clearing more spectrum for distribution to the industry through open auctions, aligning M&A rules with international practice to recognise that no more than 5 national operators are likely to be sustainable in the

long run, introducing spectrum trading in order to allow market forces to determine optimal spectrum allocations and market prices for spectrum.

Proposals targeting differences between operators' spectrum allocations are no basis for regulatory intervention. Consequently, measures such as mandatory redistribution of spectrum are fundamentally misconceived, unprecedented and destructive; they will do much harm and no good. The Authority can summarily dismiss the proposals since no case has been made as to why consumers and the country would benefit.