Europe

GSMA Europe response to the ERG Consultation Document on Regulatory Principles of IP-IC/ NGN Core

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GSMA Europe (GSMA) welcomes the opportunity to comment on the ERG's Consultation Document on Regulatory Principles of IP-IC/NGN Core (ERG (08) 26 rev1).

Main conclusions

- Markets are functioning well during the migration to NGNs. The different interconnect models of the public Internet and circuit switched networks continue to co-exist, with operators undertaking significant investments to implement IP-based Next Generation Networks (NGNs).
- There are no major problems with current regulatory arrangements and the consequences of highly interventionist regulation at this time would be difficult to predict. At this early stage in the migration to NGNs, regulators should not be seeking to impose radical changes.
- The migration to IP networks calls for a regulatory approach that is sufficiently flexible to support the introduction of new services. Further, existing regulation should be reviewed so that it does not distort the development of the market. Redundant regulation should be removed and regulation that is retained should be made competitively neutral so that it is applied equally to existing operators and new IP-based service providers. In this regard, the ERG could usefully examine how a process could be implemented that ensures regulation adapts, and regulatory objectives are reviewed, as and when the need for change arises going forward.
- The Consultation Document also raises proposals to regulate service interconnection and Quality of Service (QoS). Economic theory and established competition case law show that problems of vertical foreclosure (including deliberately degraded QoS to rivals) arise only where a firm has significant market power and where the market circumstances lead the firm to have the ability and incentive to engage in such a strategy. Accordingly, regulation of service interconnection and intervention to mandate a particular QoS are likely to be warranted in only a limited number of cases dependent on specific market circumstances. More generally, such regulation would carry significant risks including harming operators' ability to manage their network capacity to ensure acceptable QoS for consumers as well as potentially imposing unnecessary costs.

- The Consultation Document suggests that it is addressing issues raised in the migration to NGNs. However, its proposed radical change in interconnection charging models is at least partly driven by a mistaken view of the impact of current voice termination charges. In particular, the ERG presents a flawed comparison suggesting that consumer outcomes in mobile markets that use Bill and Keep (BAK) are superior to outcomes in Calling Party Pays (CPP) markets. An improved comparison (Annex A) suggests that mobile retail prices are not noticeably cheaper in North America than in Europe, particularly for low usage customers. Furthermore, Minutes of Use (MOU) in Canada – an RPP/BAK market - is below the European average. Overall, the GSMA analysis suggests that it is unwise to use a simple international comparison based on a single metric, such as minutes of usage or price per minute, as a basis for suggesting a major change in interconnection policy in Europe. It is difficult to construct reliable international comparisons, in particular across such diverse markets. Further, even if the comparisons are reasonable, this does not infer that similar results might be expected in other countries, simply on the basis of a change in the interconnection system. The radically different outcomes in Canada compared to the United States (that have similar interconnect systems) suggest that other important market-specific factors are at play. The ERG should not base major policy recommendations on the basis of superficial international comparisons.

- BAK would threaten the sustainability of pre-paid tariffs, which have been the tariff of choice for the majority of European mobile customers (the ERG's apparent fondness for contract tariffs is inconsistent with what European consumers actually want). Low-income households in particular rely on pre-paid tariffs, increasingly as their only form of telecommunications access.[1] In CPP markets, operators are prepared to support low usage pre-paid customers on their networks because some of the cost from doing so can be recovered from termination charges. Under a BAK regime, operators will only retain customers who can provide sufficient revenues themselves. In the US, so called "pre-paid" tariffs require a significant minimum spend. Further, the charges for receiving calls and messages undermine the key attraction of pre-paid tariffs for low income households in terms of the ability to control expenditure.

- The vast majority of countries that were not already using the CPP system, have decided to change to CPP in the last few years, including China, India and Russia. The ERG's proposals would force Europe to adopt a pricing model abandoned by most of the rest of the world.

[1] For instance, UK consumers in low income groups are three times more likely to be mobile-only communications users than high income consumers, reflecting the attractiveness of pre-paid tariffs for people with significant budget constraints. Ofcom, The Communications Market 2007, Figure 4.59,

Introduction and Overview

Several of the issues raised in this consultation have already been discussed last year in the context of the ongoing public policy debate over IP Interconnection. In response, the GSMA commissioned a comprehensive study of the issues. This study is publicly available on the GSMA's website, and includes a short form summary Whitepaper.[2] This response should be read in conjunction with that study.

The rest of the document is structured as follows. First, we provide the GSMA's overall assessment of the major issues raised in the document in relation to the implications of changes in technologies, interconnection charging models, regulation of quality of service, and the impact of NGNs for regulation of bottlenecks as well as service interconnection. We then provide responses to each of the specific questions set out in the Consultation.

Regulation should take account of key differences between mobile and fixed technology

Many of the arguments presented in the Consultation Document are based on technological assumptions that may be appropriate for fixed networks, but do not reflect Next Generation Mobile Networks. Following are key features of mobile markets and their implications.

- Mobile markets in Europe are competitive, so that operators will have every incentive to interconnect and meet requests for particular QoS, where they will receive revenues to cover the cost in doing so. The evidence confirms that many of the issues raised in the Consultation Document are not being experienced in mobile markets. Indeed, initiatives of the industry, such as the IPX, facilitate interoperability on a basis open to all operators and service providers.
- Mobile operators face distinct capacity management issues in the access network because of limited spectrum, changing traffic patterns and untethered user locations. Network management is therefore critical for mobile operators to ensure appropriate QoS for customers of mobile services, whether those customers are final consumers or wholesale partners. Intervention that limits operators' ability to manage their network resources would risk a significant degradation in QoS for customers.

[2] Reynolds, P. et al. (2007): Economic Study on IP Interworking: White Paper Prepared for the GSM Association, London, 2007. At http://www.gsmworld.com/ipinterconnection.

- Next generation fixed networks are expected to deliver substantial cost savings due to core network improvements. In the case of mobile networks, however, the main driver of the migration to IP-based networks is instead the ability to offer new services. Per call cost savings in mobile networks are expected to be limited. In particular, the mobile access network accounts for a much larger share of mobile call costs, because the spectrum and other components of the access networks are shared between users (i.e. spectrum being used for one caller is not available for another caller). This contrasts with fixed networks, where the cost of the fixed access network is predominantly recovered from monthly line rentals, and hence per call costs in fixed networks are likely to be reduced significantly from NGN savings in the core network. Fixed NGNs are also expected to lead to significant savings from the reduction in the number of local exchanges, such as operating expenditure savings due to lower maintenance costs from removing copper-based networks and real estate savings. In mobile networks, interconnection already occurs at a relatively high level in the network so that similar savings are not available.

Mandating a single interconnection model could prevent new services being launched

What interconnection charging models will be best suited to future markets is difficult to predict at present. As NGNs are implemented and new services are launched, interconnection charging models may need to change in line with the services that will be carried.

The GSMA considers that each of the main charging models may be appropriate for particular circumstances. Economic theory indicates that the efficient interconnection charging model for a particular interconnection arrangement should be determined taking into account the distribution of costs between operators and the distribution of service benefits between end customers. It follows that mandating a single model for all interconnection arrangements at this time risks significant inefficiency. As such it is unclear why the ERG should prefer to mandate a single model when clear grounds for such a change have not been demonstrated.

The GSMA emphasises that the choice for a commercial or partially regulated interconnection system in NGNs is not limited to copying either the PSTN or forms of interconnection currently applied in the Internet. Switched telephony networks as well as the current Internet based on best efforts quality are characterised by technical limitations which have driven the choice of single service based interconnection agreements. These limitations will be overcome in NGNs. At the same time, new challenges arise in the migration to NGNs, as it becomes clear that the demand for data services is requiring much more differentiation of quality-of-service. Interconnection arrangements need to be able to provide the right incentives for differentiated guaranteed service levels.

BAK is not the dominant model in the Internet world

Even in relation to current models, the discussion in the Consultation Document tends to oversimplify. For instances, it is not the case that "*The Bill & Keep mechanism is widely applied for Internet traffic worldwide*."[3] If BAK is taken to mean the absence of interconnection charges then BAK cannot be said to characterise today's Internet. Interconnection charges are determined on the basis of a hierarchy, with tier 2 and 3 providers paying for both upstream and downstream traffic and settlement based interconnection applying between the major (i.e. tier 1) peers.[4]

CPP vs. RPP comparison in consultation is flawed

The Consultation Document advances arguments for the adoption of BAK. The document suggests that BAK overcomes regulatory concerns over the level of termination charges and that outcomes in mobile markets with BAK appear to show lower prices and higher minutes of use.

The GSMA notes that the comparison of BAK and CPP presented by the ERG is misleading. In the Annex, we explain problems with the data used and show that outcomes are much more similar than suggested. Indeed, prices in the US are relatively expensive for acquiring a standard 'basket' of mobile services that are typical of the usage of European customers. That said, flat-rate plans and large bucket plans – minutes, messages, data (including free long distance and unlimited on-net and weekend and evening call minutes as part of the monthly charge) offered by US operators on their standard tariffs do appear to support higher minutes of use compared with European minutes of use. However, this is not the case in Canada (which is also a RPP market) so it is clear that the interconnect model alone is not driving the current market outcomes in the US. Regardless of the interconnection charging model, it is doubtful that most European operators could sustainably support unlimited calling on their standard tariffs given their current spectrum assignments, relatively high subscriber density, as well as constraints in obtaining new cell sites in congested areas. European regulators could support plans that stimulate higher mobile usage through enabling early refarming of spectrum, as well as supporting a significant proportion of the Digital Dividend spectrum being available for mobile services.

3 Consultation Document, p.45.

4 Effectively, traffic between two tier 1 providers is offset against each other and a payment is made where the traffic is out of balance by more than a specified amount. Note that Tier 2 carriers may peer with each other.

Overall however, the key point from the GSMA analysis is that it is unwise to use a simple international comparison based on a single metric such as minutes of usage or price per minute as a basis for suggesting that there should be a major change in interconnection policy in Europe. Further, even if the comparisons are reasonable, this does not infer that similar results might be expected in other countries simply on the basis of a change in the interconnection system. The radically different outcomes in Canada and the United States (that have similar interconnect systems) suggest that other important market-specific factors are at play.

BAK leads to a range of practical implementation and migration issues

BAK does give rise to significant number of issues. For instance, the European Commission comments:

> "Nevertheless, one should note that setting the price of any service at zero may cause distortionary behaviour, bring arbitrage opportunities, lead to inefficient traffic routing and inefficient network utilisation. For instance, a potentially problematic issue might be inefficient routing of traffic from operators not participating in the Bill and Keep scheme. When assessing the possible introduction of the Bill and Keep system, potential merits and drawbacks of such an approach would have to be carefully considered. Given the high current level of termination rates under the prevailing CPP system in the EU, the full effects of switching to a Bill and Keep system may not be reliably foreseen."[5]

We expand on these problems in the response to Question 11. The Consultation Document notes that BAK may lead to more nuisance calls such as 'SPIT' from telemarketers but argues (P.92) that "*However, the costs of voice traffic for engaging in such activities seems negligible compared with the cost of labour. Furthermore, receiving customers can hang up and will do so more when they are charged for the call*". However, telemarketers increasingly use automatic pre-recorded calls to limit the cost of labour. Further, even were regulators to disregard the annoyance to customers from needing to answer unwanted calls, there can be additional problems. For instance, in North America, most operators charge customers for receiving text messages and customers have to work with their carrier to stop being charged for unwanted messages. Charges for receiving unwanted messages have led to significant customer dissatisfaction with some customers choosing to disable their text messaging capability.[6] The Internet is notoriously plagued by SPAM.

[5] European Commission, Draft Explanatory Note – Accompanying Document to the Commission Recommendation on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EU, p. 25.

[6] In some cases, this has led to litigation (for instance, see RCR Wireless News, *Class action nails T-Mobile USA over texting service*, 30 January 2008).

BAK or COBAK would shift regulatory burden from cost modelling to detailed technical intervention

While the Consultation Document sees BAK as avoiding the need for regulators to estimate the cost of termination, the proposed COBAK model of Bill & Keep in the access network and charging for transit would replace price regulation with the need for extensive technical regulation and potential quality regulation. The ERG appears to recognise this, at least to some extent, as it points out that the regulators may have to determine the number and location of the PoIs – and thus the network topology. Requiring regulators to essentially determine questions of network design risks errors that may carry significant costs. Moreover, minimising regulatory effort by imposing a single interconnection fee equal to zero (as implied by BAK) for all termination in NGN access networks, instead of thoroughly evaluated interconnection fees in those instances where material market failure has been demonstrated, should not be the overriding consideration.

Finally, if BAK were to be applied universally, it will require significant analysis and considerable regulatory rule making and monitoring effort to avoid the risk of free-rider problems emerging. Defining which operators should be allowed to claim the right to use BAK would be key. Without adequate control on who can access free interconnect, there may be incentives for small networks (including for example corporate private systems) to interconnect with public networks in order to be able to deliver calls outside of their private systems for free.

A net interconnect deficit would inevitably arise from European countries moving to BAK

A further issue is that any countries that moved to BAK would likely suffer a loss in termination revenues received from other countries. This requires a greater proportion of costs to be recovered from domestic customers. On the other hand, customers in the European countries would still need to pay termination in the prices for calling customers outside the BAK region. Thus there is a clear disadvantage to customers in countries that migrate to BAK.

The ERG raises the question of the appropriate migration to a new model. There is no evidence of a problem to warrant the imposition of a new model by regulation. To the extent that circuit switched interconnection is retained alongside IP-based interconnection, customers will be able to choose to use IP-based services where these are more cost-efficient and this process will only hasten the migration to IP-based services. A glide-path towards a particular destination should therefore not be introduced at this time.

Further, operators' incentives to continue to undertake investments to reduce the cost of supplying services will be harmed if operators are unable to gain a return on these investments including the risks that they incur that the investments will be unsuccessful.

There is no history of QoS degradation by mobile networks and hence no basis for additional QoS regulation

The ERG argues that QoS is of increased importance in the interconnection of NGN and could enable new forms of discrimination between a larger operator's services and those provided by interconnecting competitors (including by providing poorer best efforts QoS to push service providers to buy premium QoS). The ERG argues that existing tools can prevent SMP operators from discriminating and that non-SMP operators could be regulated using Art. 5 of the Access Directive. The ERG also argues that, as a last resort, NRAs should have the possibility (under proposed provision in Art. 22 para 3 UD) to recommend or set minimum levels of quality of service if necessary to achieve sufficient end user service quality.

The GSMA considers that regulation to prevent discrimination with respect to QoS may only be relevant in relation to operators that have SMP in the downstream market and where a specific problem has been identified (i.e. taking into account the likely ability and incentive of those operators). In many cases, competition law will be sufficient to guard against attempts to foreclose markets by firms with SMP in the same way that competition law works effectively for the rest of the economy.

In mobile networks, quality of service is critical to an operator's competitiveness. Reducing quality (even only on selected services or for selected interconnect partners) would harm the terminating network's reputation with its own customers. It is notable that while regulators have had issues with the level of termination charges, there is no equivalent history of quality degradation as an issue in mobile networks. The migration to NGNs will not change this. Operators have incentives to provide commercially acceptable quality to their customers regardless of whether or not the communication is originated on or off net.

Traffic management and QoS differentiation enhances competition and range of services available

Operators will need their own network management rules - not having rules would limit the range of services that can be provided at acceptable quality levels applicable to each service, and result in some customers benefiting at the expense of others. A blanket requirement for non-discrimination could also result in QoS offerings being inefficiently standardised. The problem occurs when regulation purporting to set a 'minimum' standard, ends up setting the de facto industry standard. That standard may not necessarily be as efficient as a standard negotiated amongst industry participants, or necessarily efficient for all services to which it is applied. If the QoS is too high, it will consume an inefficient amount of network resources, and cost interconnecting parties more than they would otherwise pay.

Standardised interconnect offers in the IP world may also have a 'chilling' effect on competition. It is precisely the ability of a firm to distinguish its products by their QoS that is the advantage of IP-based competition. If a standardised offer means that all parties end up offering homogenous services, then the incentive to develop innovative services offering higher QoS may be diminished. Operators may anticipate that a higher QoS will simply be imposed across the industry, thereby removing the competitive incentive to offer the higher QoS in the first place.

The key issue should be that operators' rules are transparent. Only where a clear problem emerges in relation to an SMP operator should QoS regulation be considered and the regulation should be carefully designed to avoid perverse effects harmful to consumers.

Enforcement of a division between service and transport interconnection negatively impacts on quality

The GSMA believes that, in the absence of SMP, there is no justification for the enforcement of a division between service and transport interconnection.

The ERG argues that the division between transport and service may lead to new markets being subject to regulation. These could include markets for transport interconnection (without relation to specific services) and additional interconnection markets on the service level - although it is noted that such markets might not be susceptible to ex ante regulation**.**

At the access level, there will be essential functions that are integral to the access offering. Whether or not the integrated offers represent a bottleneck would depend on (i) whether the offer and its elements can be replicated by the access seeker and (ii) whether access to those elements is essential for competition.

Avoiding network congestion and supporting differentiated, and guaranteed service levels requires that operators not only provide network resources, but also manage the traffic that they carry over their network, including service quality. The role for operators in managing traffic and supporting guaranteed quality of service is ultimately in the interests of *consumers* in terms of receiving a QoS that matches their needs.

While the Consultation Document raises a concern that independent service providers will be foreclosed, such anti-competitive foreclosure is likely in only a limited range of circumstances and in particular only when significant market power is present in the market.

There is no evidence of new potential bottlenecks and NGN migration should increase competition

The GSMA considers that the nature of any new bottlenecks is unclear at this stage, and that there are no reasons to believe that there will be market failure.

It is equally the case that technological changes and the development of new services and business models may reduce or eliminate 'bottleneck' problems. There are at least two reasons that bottlenecks may not reappear. First, the change in the nature of the services themselves and in particular the demand for those services, and second the likely increase in the degree of substitutability between services – both between the services themselves, and the way in which the services are accessed.

In current networks the demand for a service (voice or messaging) is clearly driven by a particular party that is willing to pay for the service. Under CPP, regulators have assumed that the receiving party is not greatly concerned about the price charged to the initiating party and that this will lead to excessive termination charges (hence the current interconnect regulation). However it is not clear that such an issue will exist with data services. Services of this type (e.g. voice calls) will of course still exist, but within the context of an overall demand for broadband communications, that is driven by different factors. VOIP is an example of this and is unlikely to give rise to similar concerns of excessive pricing.

Increasing substitutability between services may also reduce or eliminate bottleneck issues. As a simple example, VOIP services are likely to offer substitutes to higher quality NGN voice services, suggesting that an attempt to increase price to high quality services would suffer from difficulties with migration to the alternative of VOIP. Further, there is and will be increasing substitutability in the options available for accessing services. For example, the ability to switch between fixed network broadband, mobile network cellular broadband and local short range broadband connections (e.g. WiFi links) suggests that consumers may have a significant ability to switch between methods of connectivity. This suggests that owners of a particular type of infrastructure are likely to face greater competition and such competition may extend to reduce or eliminate access bottlenecks.

Given the uncertainty over whether new bottleneck issues will arise, regulators should maintain a monitoring role, but should not intervene prematurely, which would risk inefficiently distorting the development of the market. Regulation should also be removed where the migration to IP-based access eliminates bottlenecks.

NGNs call for a review of existing regulation

The Consultation Document focuses largely on seeking potential areas for new regulation. In the view of the GSMA, the Consultation Document misses the main regulatory challenge posed by the migration to IP networks. In particular, there is a need for a more fundamental review of what the objectives of regulation should be going forward. With greater competition between networks and service providers, supplemented by existing ex ante regulation of SMP operators under the European regulatory framework, there appears little basis for the host of other regulatory obligations that are now imposed on the sector. For example, it is highly doubtful that the USO introduced in the 1990s, remains necessary when many of the consumers targeted by the USO have instead opted for competitively provided mobile services. While the European regulatory framework establishes a process of frequent market reviews to determine where SMP-based regulation should be maintained, whether other regulation should be maintained also requires review.

The GSMA considers that the major principles of the European regulatory framework remain sound, i.e. to intervene only where there is evidence of likely SMP and with intervention based on general competition law or ex ante regulation that is proportionate to the problem. The industry is in a period of significant change above and beyond a move to IP-based networks and services, with both network technology and topology changes in process as the industry evolves to new platforms. This makes it impossible to predict exact outcomes at this stage. Regulators should continue to monitor the development of the migration to NGNs. NGNs may require significant changes to regulation, however, any changes should be based on evidence of specific problems. Moreover, it should not be assumed that the migration to NGNs warrants a significant expansion in regulation. NGNs may lead to some regulation no longer being warranted (such as current USO regulation) or needing to be changed to take into account the different circumstances of all broadband networks and ubiquitous high speed wireless access.

Response to Specific Consultation questions

1) A.4.1 Separation of transport and service

Considering that according to the ITU definition of NGNs where service-related functions are independent from underlying transport-related technologies, how do you evaluate the concepts of transport interconnection and service interconnection as defined in the document?

The GSMA believes that, in the absence of SMP, there is no justification for the enforcement of a division between service and transport interconnection.

It is unclear at this stage whether it will be efficient to treat transport and service interconnection separately in mobile NGN networks. A key benefit of the migration to IP-based Next Generation Networks is the ability to go beyond the limited best-efforts quality of today's Internet by enabling multiple services to be carried at differentiated, guaranteed service levels. In particular, QoS features will be able to be provided which match the particular requirements of each service (whether the service be voice, video, email, web surfing etc) and which efficiently utilise network capacity. In order to achieve this level of predictability, interconnected IP networks will need to agree QoS parameters and agree on the way in which they will respect the labelling of packets.

Individual operators will also need to be able to manage their network capacity so that individual services can receive the appropriate QoS. This is particularly important in relation to mobile networks, where limited spectrum, changing traffic patterns and user locations create significant capacity management issues in the mobile access network. Even today, mobile customers experience problems due to localised congestion problems and the take-up of new services can be expected to increase network management challenges going forward.

Avoiding network congestion and supporting differentiated, guaranteed service levels requires that operators not only provide network resources but also manage the traffic that they carry over their network including the service quality of that traffic. The role for operators in managing traffic and supporting guaranteed quality of service is ultimately in the interests of *consumers* in terms of receiving a QoS that matches their needs.

While the Consultation Document raises a concern that independent service providers will be foreclosed, such anti-competitive foreclosure is likely in only a limited range of circumstances and in particular only when significant market power is present in the market. More generally, operators can be expected to efficiently provide interconnection services so as to boost their network traffic and improve the experience for their customers. This is discussed more fully in later in the response to question 8) C.3 *Bottlenecks and SMP positions*, where we note that issues such as service interconnection and quality of service have vertical dimensions to the relationships. An important pre-condition is that the interconnection charging regime should provide the right incentives for operators to offer higher QoS interconnection where demanded.

The IPX being developed by the GSM Association shows that operators can be expected to support interoperability in a managed environment that enables good quality, high reliability and secure carriage.[7] To achieve universal interoperability, the IPX is open to all operators and service providers. Operators and service providers are also free to use bilateral arrangements or other networks for their interworking. The IPX supports end-to-end QoS for all IP services enabling consistent and predictable service delivery between end customers.

In 2007, the GSMA initiated trials to verify SIP-I interworking between GSM service providers across the IPX. The trials have continued into 2008 and have successfully demonstrated basic interworking between fixed service providers and mobile service providers, using different IPX providers with core network platforms from different vendors.

The trials demonstrate the ability of the IPX architecture to provide an open, secure IP-based platform for interconnecting operators with value-added services and support for a circuit-switched video application between two service providers. Critical to the operation of the IPX is the cascading payment model under which operators will be compensated for providing higher quality of service across interconnected IP networks as required. The IPX initiative is one example that demonstrates that industry can develop non-discriminatory solutions that cover the migration from circuit to packet switched networks.

2) A.6 Structure of the document

Do you see other issues regarding regulatory principles of IP-interconnection/NGN core that should be dealt with?

The GSMA is concerned that much of the discussion of the document is at relatively abstract level, which carries the risk that approaches developed with fixed technology in mind, may be inappropriately applied to mobile networks (see response to question 10 for further detail). In addition, the document largely identifies potential concerns rather than providing a robust basis for determining when intervention is likely to be appropriate. The GSMA believes that the existing frameworks and processes are still relevant although changing market conditions do need to be considered, and the changes may mean that the existing framework produces different regulatory outcomes in the future. Further in this regard, the document provides little consideration of how regulation that is currently in place, such as USO regulation or the manner in which lawful intercept requirements are imposed, may need to be removed or modified in light of the migration to NGNs. Considering the differences between fixed and mobile networks and how these impact the optimal approach to regulation should be an important part of this process.

[7] Full information on the IPX solution is available at www.gsmworld.com/ipi

3) ***B.3.3.1 Number of network nodes and points of interconnection (PoI))***

Can you make more precise statements on the number of network nodes and/or points of interconnection in NGNs?

The number of network nodes and/or points of interconnection will depend on specific network plans of operators which in turn will reflect underlying technological and market factors such as number and distribution of customers, traffic mix of voice and high speed data services, quality of interconnection, the location of content servers and, potentially, the interconnection charging regime. As the ERG recognises, compared with a regime in which interconnection costs can be recovered in interconnection charges, a risk of Bill and Keep is that it encourages operators to determine their network design so as to shift costs on to other operators. Hence, it is not possible to make more precise statements on the number of network nodes.

4) ***B.3.3.2 Definition of local interconnection***

a) ***Is there an equivalent in NGNs to the concept of local interconnection as known from PSTNs?***

b) ***What do you consider to be the locations for the lowest level of interconnection (physical and/or service), e.g. the broadband remote access servers (BRAS)?***

c) ***Could the maximum number of PoI offered be considered equivalent to local interconnection?***

These questions are focused on fixed networks. Interconnection for mobile networks already occurs at a relatively high level in the network through gateway call servers. In contrast, the reduction in the number of local points of interconnection in fixed networks is a key source of cost savings to them (such as maintenance and real estate costs). This cost saving is not available to mobile operators.

5) ***C.1 Existing and proposed Framework***

How do you assess the proposed Framework in the light of the migration process towards NGNs, their technical characteristics and economic implications? Are the proposals suited to address the specific challenges that these present?

The comments in the Consultation Document seem to indicate a desire by national regulators to be able to intervene more generally, rather than only in relation to operators that have been found to have SMP. The GSMA considers that such intervention would be ill-conceived. In a competitive environment and in the absence of SMP, it is highly unlikely that an operator would be able to limit interoperability or interconnection QoS for anti-competitive reasons, as such an action would mainly end up harming the operator itself. The risk of general intervention is that regulation is imposed that creates costs to operators that exceed any public interest benefit from the regulation.

Indeed, the migration to IP networks does warrant a more general review of existing regulatory obligations to determine to what extent they will remain relevant and whether they risk giving rise to distortions in the all IP world. For example, where USO industry funds are imposed, levies may need to be extended to VoIP and other providers to avoid competitively advantaging them relative to traditional providers. Lawful intercept, emergency calling and providing location information to emergency services may also need to be adapted to the IP world.

6) C.3.1 Interoperability issues

What type of interoperability requirement do you consider necessary?

Interconnection delivers mutual commercial benefits to operators particular in terms of supporting services demanded by customers including communication with customers on other networks. Accordingly, operators can generally be expected to support interoperability. As noted above, the mobile industry has promoted the adoption of open standards and the IPX architecture to support interoperability.

Regulatory intervention should be limited to SMP operators where demonstrated problems exist and where the costs of complying with the regulation are proportionate to the problem.

7) C.3.2 Impact of charging mechanism on transport bottlenecks

How do you assess different wholesale charging mechanisms in the light of the transport-related bottlenecks?

Whether there exists a bottleneck that would warrant regulatory intervention cannot be determined in the abstract, but requires an examination of the specific market evidence.

In relation to voice termination, key empirical questions are (i) to what extent will alternatives to calling someone on a particular number become closer substitutes (such as the fixed, mobile and VoIP services); and (ii) given the range of substitutes, how close are prices likely to be to efficient levels.

In relation to the Internet backbone market, competition appears generally strong and has been supported by investment in backbone infrastructure and providers by European operators, the development of Internet exchange points (for more direct interconnection between ISPs) and exchanges for the trading of bandwidth and more distributed content (compared with the early days of the Internet dominated by US-based content). In this context, the role for the regulator should be to continue to monitor the development of the market and in particular whether SMP emerges in relation to a market segment.

8) C.3 Bottlenecks and SMP positions

Do you see other areas (potential bottlenecks) for regulatory intervention?

A number of the issues raised in the Consultation relate to what will generally be a *vertical* business relationship. That is, a complementary relationship between parties that work together to achieve a collective goal, such as the relationship between a manufacturer and its retailers, rather than the horizontal relationship that exists between competitors. This is particularly the case when considering the possibility of service or application based interconnection. However, it also relates to quality of service concerns as well. Accordingly, it is important that the regulators apply a robust framework to the analysis of these issues.

In the discussion below we outline why there is less likely to be a need for intervention in vertical relationships. The discussion is presented within the context of service interconnection, as it is easiest to see the parallels in the context of this issue. However, the general principles also apply when considering quality of service degradation, and the fact that many interconnect partners will be in a vertical rather than horizontal relationship with each other.[8]

Although it is unclear how the market will develop, it seems most likely that if service interconnection is required it will involve businesses in content, software and services of various kinds. This suggests that most providers of services and applications will often be regional or global firms that are unlikely to be dependant upon any single network provider. It is far from clear that in general a counterparty looking for service interconnection will be a horizontal competitor to a mobile operator.

[8] Note too that not all interconnect partners need to be in a vertical relationship for the presence of such relationships to limit or remove horizontal concerns. This is because of the reality of interconnect arbitrage. If quality of service discrimination was applied against some networks only, they would normally be able to seek interconnection via another interconnected party that was not being discriminated against for relatively little extra cost.

Recognising service based interconnect as an issue that has vertical aspects to it, it is reasonable to expect that if interconnection of this type is required it will most often come about on a co-operative commercial basis. The interconnection seeker will generally be in a business that is complementary to the operations of a network operator. The VOIP/Skype access issues are an exception in that it is an arbitrage product. This is however likely to be the exception, albeit an important one today, rather than the rule looking forward.[9] A regulated requirement for service-based interconnection may have the effect of distorting commercial negotiations (if parties are able to fall back to regulatory arbitration). It would also risk inefficient interconnect, where benefits flowed to the party able to exercise a mandatory interconnect right rather than value to consumers. It may also result in significant practical problems such as where customers demand that operators support them in downloading any application from the Internet or rectifying quality problems from third party applications.

Generally, vertical relationships do not give rise to competition concerns requiring intervention. The conditions where intervention could be required should be similar to those limited cases encountered in general competition law where vertical issues arise. With this in mind, it is useful to consider the established competition law principles applied to dealing with vertical issues. These are typically as follows:

- It is normally explicitly recognised that vertical issues are less likely to lead to harm to competition as they do not involve direct horizontal competitors, and that vertical deals tend to lead to efficiencies.[10] This leads to a presumption in favour of the market.
- An initial market power screen is applied. This avoids the possibility of inefficient interventions in markets where significant competition problems are unlikely. Particularly with vertical arrangements, it is reasonable to assume that in competitive markets pro-competitive (efficiency and welfare enhancing) deals will take place without intervention, whereas actions sometimes claimed to be anticompetitive (e.g. denial of access) may reflect efficient market outcomes.[11]

Service interconnection issues, if they to arise, would be cases that would be classified as relating to potential foreclosure. General competition law recognises that theories of competitive harm via foreclosure come in two basic forms – input foreclosure ('raising rivals costs' theories) and customer foreclosure (denying access to sufficient volume to support the rivals business).

Where there are several competing networks, there is unlikely to be a customer foreclosure issue. No single network operator would be large enough to prevent a viable downstream value added product from reaching the market.

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9 In relation to Skype, customers have had the choice of operators who have pre-installed Skype and others where they would need to install the service themselves.

10 See for example: Commission Notice, Guidelines on the assessment of non-horizontal mergers under the Council Regulation on the control of concentrations between undertakings at 11 - 13.

11 Ibid, paras 23 – 27.

Most cases would therefore be likely to be about *input* foreclosure – the price of access, or claims of denial of access at the interconnect level. As noted, it is recognised in general competition law that efficiency enhancing deals will take place in competitive markets without intervention, particularly where the relationship is vertical in nature, whereas denial of access (to the extent that it occurs) is more likely to reflect efficient market outcomes. This is because a downstream access seeker (e.g. a firm looking for access to a retail distribution chain) will get access on commercial terms when they offer some benefit that the access provider can not already provide to their customers. Therefore competition law does not assume that a refusal of access implies harm to either competition or consumers, and access providers are in general free to choose which products they sell.

For the reasons outlined, the GSMA does not think that the ERG should be considering mandated service interconnection at this time. Regulators should allow the markets to develop. Most particularly in mobile, where markets are effectively competitive, there is no reason to assume or presume that denying a particular access seeker service based interconnection is likely to harm competition or consumers. Intervention should only be limited to situations where SMP is present, the market has not provided an efficient solution, and there are clear benefits to consumers.

9) C.4.2 Measures based on USO directive

a) Do you consider sufficient to potentially regulate minimum quality (Art. 22 USD new para 3)?

b) Does this require additional regulation at the wholesale level?

The GSMA notes that there are no current problems in this area that would justify additional wholesale regulation. Further, if minimum QoS standards are to be designed, they should be developed by the industry and be specific to individual services. QoS requirements at a network level are appropriately dealt with by standards bodies under well established processes.

There is no justification for regulated minimum QoS in competitive markets where customers can exercise choice – indeed such regulation may end up harming customers through limiting the price/ quality choices available to them. Concerns about discrimination in the form of differential quality of service should only arise in relation to operators with SMP in a downstream market. In particular, a strategy to degrade interconnection QoS so as to discourage customers from joining the other network would only make sense for SMP operators. An operator that provided poor QoS, without SMP in a downstream market, would simply risk harming itself more than any of its competitors, particularly if its competitors maintain higher QoS for interconnection between themselves. These commercial incentives have meant that QoS discrimination has not been an issue in interconnection in competitive markets.

The current initiatives by the mobile industry to establish a choice of IP transport services, which would sit alongside the Internet and other methods of interconnection between networks, is based on the fact that customers and content providers will pay for different levels of service quality.[12] The Internet represents a "best efforts" network with no guarantee of security or service quality. Some customers and content providers are willing to pay for a defined service level and would therefore choose a network option that better meets their needs. However if regulators set minimum quality levels, how will those levels be chosen? If they are set to ensure most services will work, then this would effectively remove incentives to invest in higher quality network infrastructure. It would also mean that third party service providers would obtain a guaranteed level of service without having any responsibility for the associated costs in the different provision of those services.

GSMA notes that the ERG appears to have in mind that networks could be required to match each other in service quality. This appears to be an option short of specifying quality levels through the regulator. For example, the ERG states:

> "Providers of ECNS can be obliged to symmetric obligation to negotiate interconnection according to Art. 5 AD. This applied to both PSTN and IP-networks. The provisions have been rarely used. As QoS mechanisms are not yet widely deployed at interconnection points and due to the interdependence between each network involved in the session, one operator could be unwilling to invest in QoS mechanisms if the interconnected networks have no intention to do so. Thus, NRAs can also use symmetric regulation tools in order to enhance QoS development between different networks." (p.18)

However, it is unclear what the implications of such a requirement might be. For example, it could create a scenario where a small operator could specialise on super-gold plated services in some high-tech end user segments and build a small network engineered to this standard. A symmetry requirement might then force other networks (including those who serve more average customers or that have some USO obligation) to upgrade their networks. This could enhance the transition to differentiation and could lead to higher overall service quality, but the price may be paid in terms of highly inefficiently gold-plated networks.

[12] As evidenced by the slow take up of VoIP until recent times due, in part, to the lower quality of the service.

c) What is your opinion on ERG's consideration that the power to set minimum quality of service requirements (both, on end-user and network level) should be entrusted directly to NRAs?

As stated earlier, GSMA believes that there is no basis for a general power to set minimum quality of service and that such regulation would carry significant risks. General competition law works effectively to address situations in which a dominant operator might seek to degrade QoS for anti-competitive reasons. In exceptional circumstances where additional ex ante regulation is contemplated, this should be justified by specific market evidence and should be designed taking into account the market situation. As many communications markets will remain national for the foreseeable future, it would seem appropriate for powers of this type to remain with NRAs.

10) C.5 Costing and Pricing

a) Do you agree with the description of the relevant change regarding the cost level, the cost drivers and the cost structure?

The implementation of Next Generation Networks involves substantial investments by network operators and significant risk. While NGNs may result in lower variable costs in supplying services, very significant fixed costs are incurred in NGN construction and operators also need to recover their fixed and common costs. This is particularly the case in mobile networks where significant additional investment has been required in the radio layer to support 3G services.

It is also important to recognise the distinctive features of mobile networks to avoid approaches developed for fixed networks being inappropriately applied to mobile services. In particular, the use of spectrum creates a significant per unit opportunity cost and distinguishes mobile networks from the "*relatively low incremental cost impact*" suggested by the Consultation Paper. Further, mobile networks do not have the same layers currently as fixed networks (frame relay, ATM, other data, IP), nor do they have the many switching centres that can be vacated and sold, so there is not the same level of benefit from rationalising existing legacy systems.

Fixed and mobile networks have both very different costs and benefits associated with migration to NGNs, and as such they should not be aggregated and treated as if the underlying economics were in fact the same.

b) For a pricing regime under CPP, which of the wholesale pricing regimes (EBC or CBC) do you consider more appropriate for IP interconnection?

GSMA notes that capacity based charging and element based charging are likely to meet the needs of different access seekers. Capacity based charging can provide the guarantee of available bandwidth and potentially be available at a lower cost through the access seeker effectively bearing some of the investment risk. A drawback of capacity based charging is that some capacity may be left idle unless the access seeker is able to resell the capacity. Element based charging may be more appropriate for access seekers with uncertainty over demand for their services.

The Consultation Document appears to overstate the differences in the impact of the charging approaches on retail pricing. It is true that a single capacity based charge could be set regardless of traffic volumes to be carried, however, this would risk excluding smaller access seekers. In practice, different charges can be expected for different capacity levels. As such, in the long run, wholesale costs would still vary with volumes even when CBC is used.

Moreover, in an NGN context, there is a risk of inefficiency if CBC was inappropriately mandated, as quality of service differentiation systems will provide a substitute to bandwidth guaranteed through a lease.[13] At this point, regulators should avoid imposing one model on the market and allow access providers and seekers to determine which arrangements best meet their needs.

11) C.6 Charging mechanisms

a) How do you assess the arguments with regard to the properties of the charging mechanisms CPP and Bill & Keep raised in the sections C.6.2 – C.6.10?

The GSMA is concerned that the ERG's discussion of charging mechanisms is overly simplified and ignores a number of key market factors.

It remains unclear what charging models applied to particular interconnection arrangements will best support the delivery of the emerging services. Intervention now would potentially close off the development of some innovative services that could be supported by flexibility in interconnection charging arrangements.

[13] Reynolds, P. et al. (2007): Economic Study on IP Interworking: White Paper Prepared for the GSM Association, London, 2007.

On the basis of economic theory, efficient termination charges should take into account marginal costs, whilst ensuring fixed and common costs are also recovered. Charges of this type will produce the pricing signals needed to ensure efficient network use. In two-sided markets (the type of market faced by telecommunications networks) the efficient allocation of costs between the buyers/sellers operating in the two different sides of the market also depends on the respective elasticities of demand, and the value obtained by the group of buyers-sellers on one side of the market by the participation of the other group of buyers/sellers.

The ERG is misleading in its treatment of the academic literature dealing with efficient wholesale pricing in telecommunications market. While the ERG paper refers to a very limited selection of the academic literature to support its COBAK proposal, there is in fact no universal support for the adoption of BAK wholesale regime in telecommunications. The only common conclusion that can be derived from the academic literature is that the efficient wholesale charging regime depends on the specifics of the market and the service studied. Indeed there is academic support for regimes that impose above cost charging, cost charging and below cost charging.[14]

It should also be noted the DeGraba's paper recommended Bill and Keep in a specific market context in which costs in the access network are not traffic sensitive. In particular, DrGraba states:

"*If the underlying network costs are not traffic sensitive, however, then these traffic-sensitive retail rates will reduce usage of the network to inefficient levels… More specifically, because carriers will view traffic-sensitive interconnection charges as raising their marginal costs, they will tend to raise their traffic-sensitive retail prices, even though the underlying cost structure of the networks may be non-traffic-sensitive.* [15]

[14] The determination of the welfare-maximising and equilibrium wholesale charging levels is dependent on the assumptions used in the modelling –notably whether more benefits are gained by the additional and retention of subscribers or from receiving calls. Literature that conclude above-cost wholesale pricing is welfare-maximising include M. Armstrong, "The theory of access pricing and interconnection," chap. 8, in M. Cave, et al., *Handbook of Telecommunications Economics*, vol. 1, North Holland Elsevier (2002) J. Wright, "Access Pricing under Competition: An Application to Cellular Networks," *J. Industrial Econ.*, vol. 50 (2002); J. Gans and S. King, "Mobile Network Competition, Consumer Ignorance and Fixed-to-mobile Call Prices," *Information Econ. & Policy*, vol. 12 (2000); and J. Hausman and J. Wright, "Two Sided Markets with Substitution: Mobile Termination Revisited," ms (2006). It should also be noted that the existence of a call externality reduces the extent to which the welfare-maximising cost is above costs. For example, Armstrong, *supra*, and Wright, *supra*, show that allowing for call externalities lowers the welfare maximizing MTR. Literature that concludes below-cost pricing is the efficient outcome include E. Baranes and L. Flochel, "Competition in Networks with Call Externalities," *J. regulatory Economics* vol.34 (2008). See also, B. E. Hermalin and M. L. Katz, "Customer or Complementor? Intercarrier Compensation with Two-Sided Benefits," ms (2006), who model benefits to both callers and calling parties in a one-way access setting.

[15] DeGraba, P. "Bill and Keep at the Central Office as the Efficient Interconnection Regime", 2000, p.19.

The assumptions underlying DeGraba's COBAK may be a reasonable approximation for the fixed access network. However, they clearly do not apply for the mobile access network where a large element of costs are traffic sensitive, given the opportunity cost of using spectrum and other network resources, and where mobile network technology remains more expensive than fixed technology on a per unit basis.

The ERG's comparison of CPP and RPP markets is flawed. As Annex A highlights, mobile retail prices are not noticeably cheaper in North America than in Europe, particularly for low usage customers. MOU in Canada – an RPP/BAK market - is below the European average. While MOU is higher in the US (although the difference that ERG presents is overstated), the higher MOU appears to reflect standard tariffs that offer unlimited on-net calling as well as unlimited night-time and weekend calling. It is doubtful that most European operators would be able to sustainably offer such tariffs given current spectrum assignments.

The ERG consultation document also refers to an unpublished paper by Dewenter and Kruse (2005) implying that the paper provides evidence that CPP does not create better conditions for the growth of the mobile customer base than RPP. An inspection of this study reveals several serious methodological weaknesses and the results appear to lack robustness due to data limitations.[16] Furthermore, in a number of the econometric models proposed in the article, and in particular for the studies of countries that switched from RPP to CPP, the authors find that CPP performs better than RPP. This finding is in line with evidence from the OECD.[17]

Bill and Keep, if imposed across all interconnection arrangements, can be expected to lead to substantial changes in retail pricing models. For instance, it may threaten the sustainability of pre-paid tariffs, which have been the tariff of choice for around two-thirds of European mobile customers (despite the Consultation Document's emphasis on contract tariffs). Under a Bill and Keep regime, operators would be forced to introduce receiving charges to recover the costs of calls and messages being received. However, pre-paid tariffs as they exist today in most CPP markets, offer consumers significant advantages that are difficult to replicate with BAK interconnection. In particular cost control (callers are not liable for the cost of calls initiated by another party), which has led to the popularity of pre-paid services amongst low-income households in Europe. CPP also gives operators an incentive to maintain low value subscribers on their network in the expectation of revenues from inbound calls. This produces significant social value for European consumers, as the option to contact friends, family and colleagues is in itself highly valuable. In North American markets on the other hand, pre-paid tariffs typically require a significant minimum spend and receiving charges as operators must rely on revenue

16 For example the authors predict an unreasonably low saturation threshold and this estimate is used throughout the study.

17 OECD *Cellular Mobile Pricing Structures and Trends*, 2000.

from the customers themselves. These considerations seem to be part of the reason that the uptake of pre-paid has been much lower in North America.[18]

Other implementation issues associated with Bill and Keep are set out in the section on page 6, entitled 'BAK leads to a range of practical implementation and migration issues'.

b) How can the migration process towards all-IP infrastructures be alleviated for the following options: 1) long term goal CPP, 2) long term goal Bill & Keep? How do you evaluate the measures and options discussed here? Please also consider problems of practical implementation.

The GSMA considers that different charging models are likely to continue to co-exist, and does not currently see the need for a regulated migration process. The existence of a variety of charging models can be pro-competitive and support a greater variety of services to end-customers. There is no evidence that the present of a multiple system model is causing any significant inefficiency. Further, to the extent that termination charges are retained for circuit-switched interconnection this will hasten, rather than impede, customer demand switching to IP networks. Imposing a new charging model on existing interconnection arrangements and services risks significant transaction costs and implementation problems without leading to any clear benefits.

[18] Prepaid as a share of mobile subscriptions in Canada is reported as 22.5% while in the US it is 15.3%. Merrill Lynch Global Wireless Matrix 3Q07.

c) Assuming that different charging mechanisms would apply in different Member States: would this imply specific problems (e.g. arbitrage)? If so, how could they be addressed?

The history of interconnection regulation demonstrates that where significant differences are created between the charges for essentially the same service (i.e. termination to the same network), arbitrage will emerge. For instance, in the later 1990s, domestic fixed-to-mobile traffic was sent via international routes to avoid the termination rates applying to domestically originated calls (a phenomenon known as tromboning). Were a region to introduce Bill and Keep between operators within that region, then it is likely that operators outside the region would develop arrangements to route traffic via service providers within the region to also avoid paying termination charges. The consequence of an EU move to Bill and Keep could thus be that European operators lose their current termination revenues earned from non-European operators, whilst at the same time European consumers are forced to continue to pay termination charges on calls to customers in other regions.

It seems likely that there will be significant scope for technical means to achieve arbitrage where there is a significant economic incentive. Traditionally, the way to avoid (or at least limit) such problems has been to rely on cost based charging mechanisms, as these remove arbitrage opportunities. One of the benefits of the cost based approach is it avoids the need to try and 'second guess' exactly how arbitrage plays would be implemented.

d) Do you consider that the issues mentioned here are comprehensive with regard to the application of Bill & Keep for IP-interconnection?

Given the very high level of uncertainty as to how IP and NGN networks will develop and the services that will be offered, it is highly unlikely that all the issues that would result from the blanket application of Bill & Keep in IP interconnection have been considered and covered.

A specific example of this is that insufficient consideration has been given to the way in which mobile markets operate, and how consumer preferences impact optimal retail charging models and underlying wholesale relationships. In competitive mobile markets, pay as you go charging models are still far more popular with consumers than 'bucket' plans. It is unclear whether or why this would change for mobile broadband services. Different mobile operators have different views on this and the GSMA expects active and aggressive competition within mobile markets as operators test consumer reactions to different business models. It seems reasonable to assume that in mobile markets consumer preferences will be a key determinant of the winning business models. It is important that regulatory intervention does not distort this process.

Annex A - Comparing Outcomes in CPP and BAK Markets

The ERG report claims that retail prices are higher in CPP countries, and usage is lower, than in RPP/BAK countries, although the report does recognise that there are problems with this data.[19] The purpose of this Annex is to analyse the impact of the data problems, as well as to present adjusted OECD pricing comparisons that avoid problems with the average revenue per minute figures presented by the ERG.

The key findings are:

- North American penetration remains significantly below European penetration.
- Minutes of Use (MOU) comparisons are distorted by factors such as the double-counting of on-net minutes in BAK countries and common use of per minute billing in North American BAK countries that also overstates actual minutes of usage. Correcting for these data problems shows that MOU are similar between comparable CPP and BAK markets.
- The ERG's revenue per minute figures also suffer from a number of key flaws that imply they are an unreliable basis for comparing prices between BAK and CPP markets. The OECD's established price comparisons avoid many of the flaws identified and show mobile prices for many users in North America as being above many European countries.

Overall, the analysis suggests that it is unwise to use a simple international comparison based on a single metric, such as minutes of usage or price per minute, as a basis for suggesting that there should be a major change in interconnection policy in Europe. It is difficult to construct reliable comparisons, and even if the comparisons are reasonable, this does not infer that similar results might be expected in other countries, simply on the basis of a change in the interconnection system. The radically different outcomes in Canada and the United States (that have similar interconnect systems) suggests that other market-specific factors are at play, and that those other factors are more important to market performance. The ERG should not base major policy recommendations on the basis of superficial international comparisons.

Usage comparisons

First, we note that North American penetration remains substantially below European penetration (e.g. Merrill Lynch reports average mobile subscriptions for 3Q2007 as 79.6% in North America[20] compared with 114.3% in Europe). Assuming that the number of people with multiple mobile devices is similar in both countries (such as people with a mobile phone for personal use and a blackberry for business purposes), the data suggest that many potential low value subscribers are unable to afford mobile phones in North America. The exclusion of these low value customers

19 The Consultation Document, p.88 and p.93.

20 58.8% in Canada; 81.9% in the United States

implies that the statistical average for MOU per subscription will be higher in North America - but this is not a reason for viewing BAK as superior. From a public policy perspective, a more useful comparative measure is likely to be overall MOU per capita (which Merrill Lynch also reports) as this gives an indication of the extent to which mobile services are being used overall. As Table 1 shows, the differences between Europe and Canada and the US in terms of reported MOU per capita are significantly smaller than the differences in terms of MOU per subscriber, although a substantial gap remains with the US.[21]

Second, as the ERG itself notes (footnote 179) the Merrill Lynch data source double-counts on-net call minutes in BAK countries because both the caller and the receiving party are charged under the BAK system, whereas in CPP markets on-net calls are only charged to the caller and hence only recorded once. To understand the significance of this problem for the comparison of market outcomes, it is useful to consider the magnitude of on-net call volumes in the US.

Many US operators commenced offering unlimited on-net calls in the last few years as part of their plans (i.e. on-net calls are not counted towards the bundled minutes in the plan) and 'free' on-net calls are now available on even some of their cheapest tariffs, in addition to unlimited evening and weekend calls.[22] Once the marginal price of a call becomes zero and when there is no opportunity cost of use for the subscriber (i.e. where the on-net call does not reduce the number of available minutes remaining on a customer's plan), on-net call volumes would be expected to increase substantially, particularly when customers are able to take advantage of such plans by switching to be on the same network as their most frequent calling parties. Data on the average share of on-net calls in call volumes on mobile networks in the US are not readily available. It is noteworthy that the Canadian operators do not offer comparable on-net call plans (i.e. the Canadian operators tend to restrict unlimited calls to only higher priced tariffs or to call between a few 'friends') and Canadian MOU per subscription are about half those of the US operators, despite Canada also having a BAK system.[23]

21 Merrill Lynch Global Wireless Matrix 3Q07, Chart 28.

22 For instance, see FCC 9th Annual CMRS Competition Report, para.114. All Verizon Wireless's Nationwide Plans provide for calls to other Verizon Wireless customers at any time without using the plan's minutes.

23 See Merrill Lynch, Global Wireless Matrix 3Q07, Table 30.

To try to quantify the likely impact of the double-counting of on-net minutes in BAK countries, we note that on-net calls account for around 30% of UK mobile minutes, 52.5% of French outbound calls and 69% of mobile minutes in Portugal.[24] All of these shares may understate the share of on-net call minutes in the US given the presence of tariffs with unlimited on-net call minutes in the US. A conservative assumption is to assume that 30% of North American calls are on-net, which would suggest that reported minutes of use in both Canada and the US are overstated by 30%. The actual level of overstatement is likely to be much higher in the US where 'free' on-net calls can be expected to have resulted in a higher share of calls being on-net. In Table 1, we have applied only the conservative 30% adjustment to remove the impact of double-counting of on-net minutes to the figures for the RPP markets shown – Canada, the US, Hong Kong and Singapore.

We also understand that mobile billing in North America is commonly on a per minute basis, whereas in Europe it is more commonly per second. This means that on an average US call of three minutes duration, the usage will overstate its European equivalent by a factor of approximately 20%.[25] We have also corrected the data for this factor.

Table 1: Mobile usage and price comparisons between Europe and North America, 2007

	MOU	MOU per capita	MOU per capita (Adjusted)
North American Average	**619**	**471**	**275**
Canada	424	258	151*
US	814	684	399*
Asian Average	**417**	**555**	**388**
Hong Kong	495	685	480*
Singapore	339	424	297*
European Average	**181**	**213**	**213**
Austria	184	220	220
Belgium	156	151	151
Denmark	177	211	211
Finland	308	377	377
France	247	219	219
Germany	99	117	117
Greece	149	217	217

[24] Ofcom, The Communications Market 2007, Figure 4.62; ARCEP 'Analyse des marchés pertinents' (July 2007), p.21-22 ; and ANACOM. Statistics for Mobile Telephone Service - 4th quarter 2007, table 4 available at http://www.anacom.eu/template12.jsp?categoryId=238482.

[25] This is estimated by assuming that call durations are equally distributed over time, so that on average a call in the US that is recorded as three minutes in duration would in fact run for two and a half minutes, implying a correction factor of 1.2. Average call length in the United States for 2002 was 3.03 minutes; source: U.S. Census Bureau, 2008 Statistical Abstract, Table 1120. This estimate accords with the ERG's own 20% estimate of the necessary correction: ERG, International Roaming: ERG Benchmark data report for April to September 2007, p.2.

	MOU	MOU per capita	MOU per capita (Adjusted)
Ireland	235	271	271
Italy	133	204	204
Netherlands	151	166	166
Norway	226	268	268
Portugal	119	160	160
Spain	163	182	182
Sweden	184	212	212
UK	184	224	224

Source: Merrill Lynch, *Global Wireless Matrix Model* (updated 21/12/2007). Averages shown are simple averages of the countries listed. * All four RPP markets adjusted for on-net double counting, per minute billing correction for US and Canada only.

This adjusted data suggests that actual MOU per capita in Canada is well below the European average. MOU for the US remains higher than the Europe average even after the adjustment (although part of this difference may be due to the need for a greater adjustment to remove all the impact of the double-counting). Hong Kong, and to a lesser extent Singapore, have relatively high usage, but it is unclear that any meaningful conclusions can be drawn from these examples. Both are city-states with high population densities that could support lower unit costs and have relatively high visitor numbers to the local population, which will tend to inflate usage per capita. It is also notable that Finland, a CPP country, has much higher MOU that Canada or Singapore.

Other factors that can be expected to be impacting usage (and prices) are income levels[26], demographic and geographic factors, service quality (including calls successfully made and received indoors, outdoors and while driving in city, suburban and rural areas), market size and structure, use of substitute services (such as fixed calls and SMS) and land, labour and capital costs. Without controlling for the impact of potentially significant differences between countries in these factors, it is difficult to draw conclusive findings from international comparisons. The relatively low MOU per capita of Canada (after correcting for double counting) does not suggest that BAK is a significant driver of usage. It seems likely that the relatively high MOU per capita in the US may instead reflect the impact of a range of other factors including on-net call pricing, still developing use of text messaging, the restricted subscriber base and relatively high income per capita

[26] In this regard, it is noteworthy that the US had a GDP per capita based on purchasing power parity in 2007 that was over 50% greater than the EU average and over 30% greater than the UK's (Eurostat, GDP per capita in Purchasing Power Standards available at http://epp.eurostat.ec.europa.eu/portal/page?_pageid=1996,39140985&_dad=portal&_schema=PORTAL&product=_STRIND&root=theme0/strind/ecobac/eb011&zone=detail).

Revenue comparisons

Comparing the average revenue per minute is even more problematic than the comparison of MOU. First, the average service revenue per minute in the Merrill Lynch data is not based on retail revenue, but on retail and termination revenues. Termination revenues on mobile-to-mobile calls are effectively double-counted as Merrill Lynch's measure includes both termination revenues directly received by operators, as well as the full retail revenues on off-net calls - even though a proportion of those revenues are used to pay the termination charges levied (and recorded) by other operators. This factor will tend to make the CPP markets appear more expensive. In addition, as the Merrill Lynch data overstates minutes in BAK markets, it will correspondingly understate average revenue per minute in those markets (i.e. as minutes form the denominator of the measure) and thus make the BAK markets appear cheaper. The precise extent to which average revenue per minute is understated will depend on the extent to which minutes are overstated in BAK. This cannot be calculated in the absence of on-net call minutes for the BAK markets, although minutes are likely to be overstated by at least 30% and potentially by a much higher amount.

There is an even more fundamental problem with the use of average revenue per minute figures as a proxy for prices, in that they are highly sensitive to differences in the mix of calls between operators and countries. For instance, Merrill Lynch reports differences in average revenue per minute of 50% between the different UK operators. There is no reason to believe that operators' general pricing would actually differ so dramatically within the same market.[27] Countries in which customers use large volumes of relatively cheap services, such as on-net calls, can be expected to report significantly lower average revenue per minute compared with other countries.

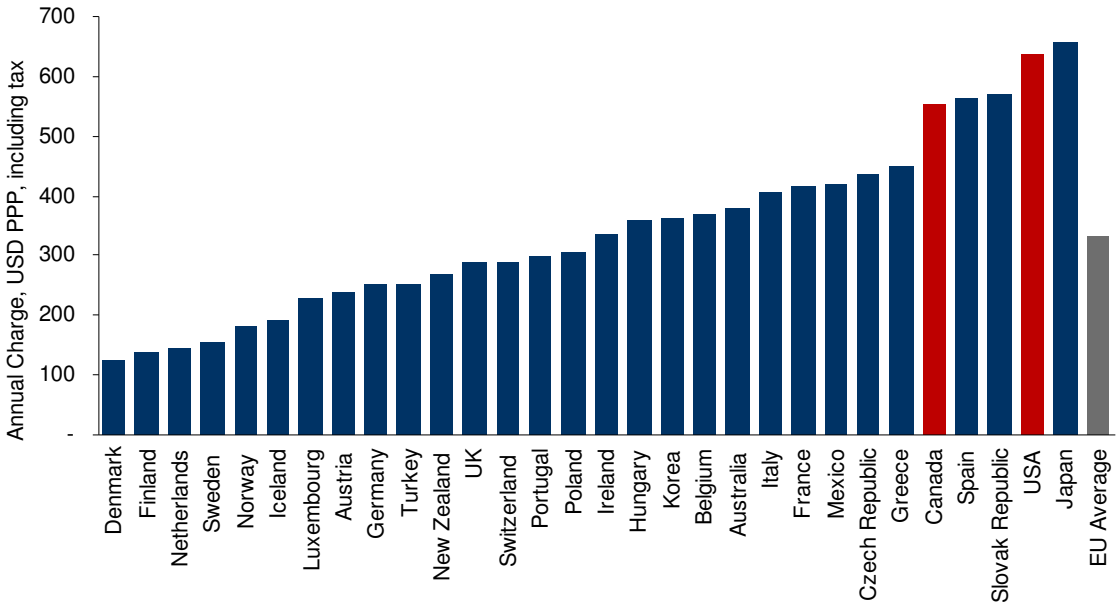
The standard approach to remove the impact of differences in mix between countries is to examine how much it would cost to purchase a representative bundle or 'basket' of services in each country. The OECD notes that the use of a standard consumption basket "…*is the most efficient and meaningful way to do cross-country comparisons of such telecommunications prices*."[28] The OECD has a well-established methodology for undertaking international comparisons of telecommunications prices, which calculates the costs for selected operator's plans for a given number of outgoing minutes and messages. However, this leads to a problem when using the reported prices from this methodology to compare CPP and RPP. Since the methodology calculates prices only for *outgoing* minutes, it is not an accurate reflection of the price paid in RPP countries. In order to facilitate a more meaningful comparison between the two different pricing regimes, the basket of minutes for RPP countries has been doubled.

27 See Merrill Lynch, Global Wireless Matrix 3Q07, Table 139.

28 OECD Communications Outlook 2007, p.211.

The results of the adjusted OECD comparison for a representative basket of mobile services bought by a medium user is presented in Figure 1. This comparison suggests that the US has amongst the most expensive mobile prices in the OECD for low and medium user groups.

Figure 1: - Adjusted OECD basket of medium user mobile telephone charges, May 2008



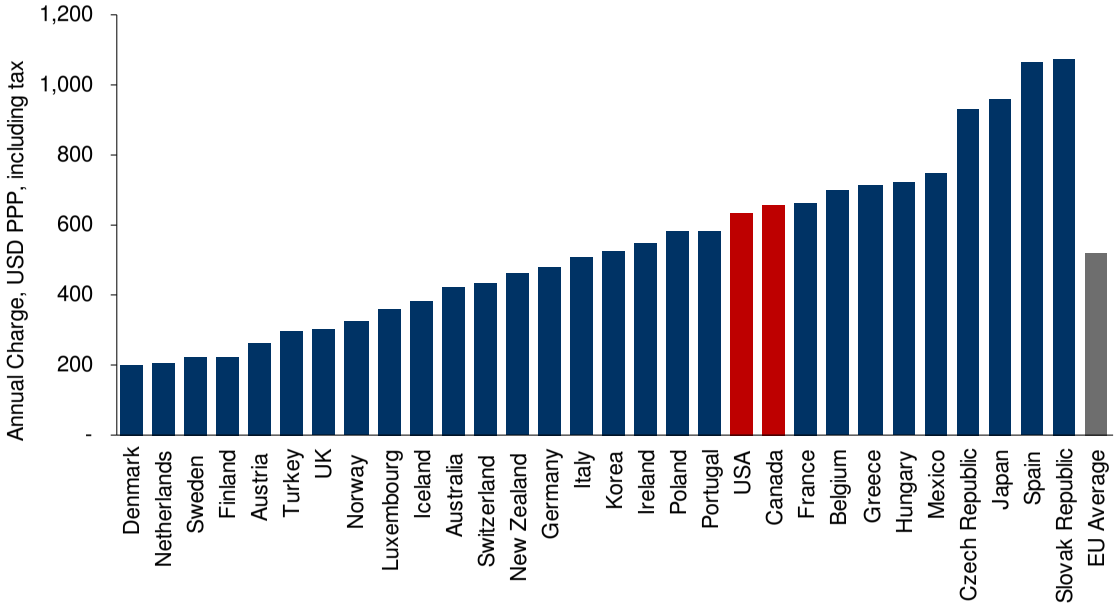
Source: Adjusted Teligen data.

Comparisons of representative baskets show that the US is somewhat below the OECD average for the high user basket (i.e. more expensive than average), while it is expensive for the low and medium user baskets.[29] Notably, for all three usage baskets it is the Nordic (CPP) countries that are the cheapest.[30]

29 Note that the OECD high usage basket is below the average level of US usage. It seems reasonable to conclude that the US is likely to be cheaper for (by European standards) very high volume users.

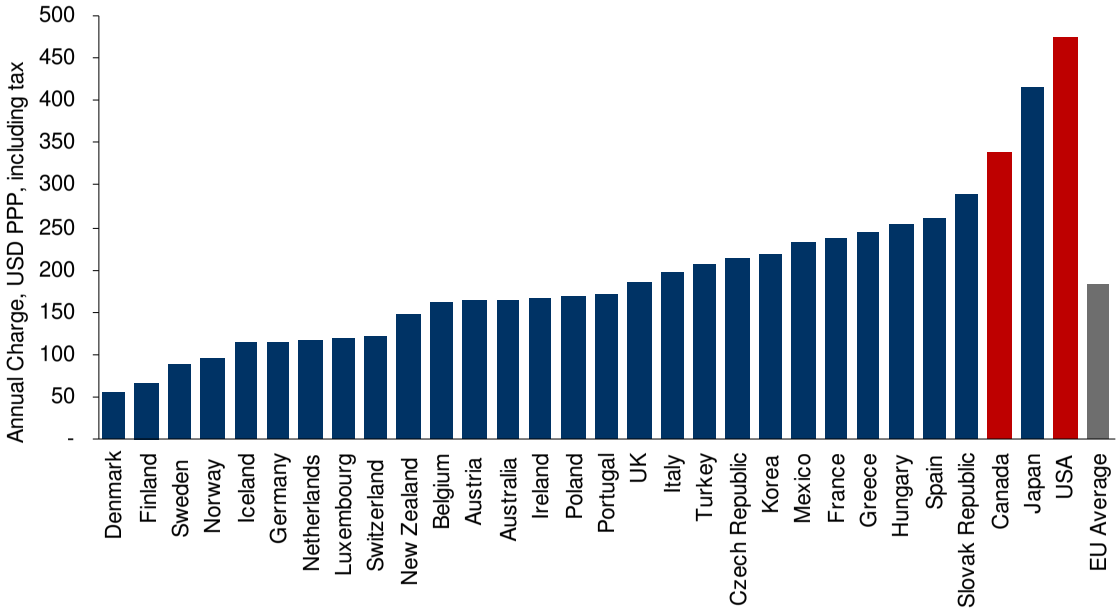
30 OECD Communications Outlook 2007, p.217-218. However, the latest available OECD comparison for low users suggests that the USA is now also amongst the most expensive countries for this basket (OECD Science, Technology and Industry Scoreboard 2007, p.127).

Figure 2: - Adjusted OECD basket of high user mobile telephone charges, May 2008



Source: Adjusted Teligen data.

Figure 3: - Adjusted OECD basket of low user mobile telephone charges, May 2008



Source: Adjusted Teligen data.

The substantially different conclusions from the adjusted OECD pricing comparison to that based on the average revenue per minute figures presented by the ERG, is likely to reflect a number of factors. As discussed, differences in the mix of calls made in different countries are likely to be a key part of the explanation. In addition, there are also the various technical flaws with the actual average revenue per minute figures as discussed above. A further key difference is that the OECD figures are presented on a Purchasing Power Parity (PPP) basis, i.e. the figures are adjusted for differences in general price levels between countries. This adjustment helps to reveal what factors are driving the level of mobile prices in particular countries. For instance, if a country has relatively high mobile prices compared with mobile prices in other countries, PPP adjusted prices can reveal whether this is a specific problem with the mobile sector (say because of the interconnection charging regime) or rather reflects that the country has high overall prices and costs (say, because of high labour or land costs). The OECD pricing comparisons provide no support for the ERG's argument that BAK systems with no (or low) mobile termination charges contribute to low mobile retail prices.