Response to the ERG Public Consultation

on IP Interconnection

November 2006

GENERAL COMMENTS

Telefónica welcomes the opportunity given by ERG to comment on IP interconnection and NGN which will, indeed, become a relevant issue in the **context of NGN (*Next Generation Networks*) development already in progress (although in an early stage) by main European telecommunications operators** (multimedia IP core network, broadband access technologies deployment, VoIP progress as first move-forward towards the all-IP services paradigm, fixed-mobile convergence process, ...).

As a general comment, Telefónica would like to highlight the importance of taking into account one of the current EU regulatory framework´ main principles, which establishes that **the imposition of ex ante economic obligations should be limited to those cases where after a process of market definition and analysis, it is demonstrated that effective competition does not exist.** In these cases, appropriate obligations might only be imposed to those market agents with a SMP position in such a market which should be defined based upon service functionalities and not on specific technical characteristics. Based on this, **there is no reason to believe / there is no evidence at such an early stage of development of IP interconnection that this specific issue requires any specific ex ante regulatory measure.**

It is important to understand the important differences that exist in an NGN context and the open public Internet, both being the base for the provision of different types of services/applications, and, hence, business models with a differentiated role played by agents across the value chain.

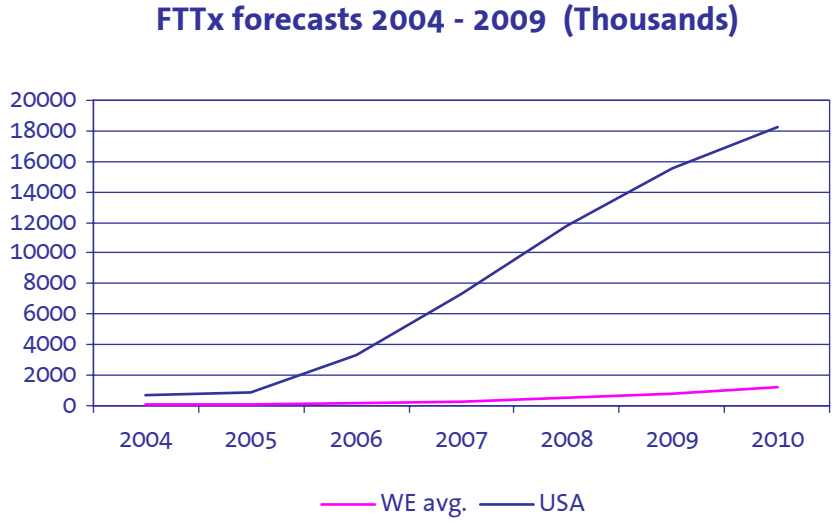
Additionally, Telefónica considers that regulation applied in a NGN environment should take into account the very different technological, business and competitive context in which these new infrastructures and systems develop, compared with the traditional circuit-based ones. Indeed, **it is of utmost importance to be taken into account by regulators that these new network architectures are deployed in a liberalised market environment with any agent being capable of deploying their own infrastructures**. Therefore, it should be considered that these are, in principle, replicable by competitors notwithstanding that investment of significant scale is surely needed. For this reason, **regulatory focus and aim should be rebalanced in order to adapt to this new context, while avoiding being contaminated by the legacy infrastructure issues**. It must be taken into account the entry possibilities that NGN offers to any network operator / service provider. Most bottlenecks identified in former telecom networks should be revisited to analyse if they remain when considering the new NGN scenario and the entrants' capabilities to build their own networks.

In line with the previous comment, **Telefónica considers that the success of the development of these NGN depends on whether policy makers and regulators really recognise that investment and innovation should be promoted as a major goal in order to reach the high level political goals included in i2010 EC**

Initiative. In this sense, Telefónica believes that **if regulation in Europe prescribes and pre-empts the developments and the structure of this new competitive and technological environment, there is a clear risk to affect negatively the investment climate and, thus, to slow the deployment of these new infrastructures**. It would certainly impact on productivity and European living standards, deepen the lag that Europe suffers with respect to other world leading economies. Telefónica would like to highlight the impact of FCC decision in 2002 to follow a deregulation policy in the broadband market with the direct consequence of leading to higher expectations of FTTx deployment (see figure below). Additionally, this opinion is shared by numerous market analysts, i.e.:

- "*Although we expect some fibre build, particularly…for VDSL in European countries with cable competition, we still see the regulatory backdrop as unsupportive of a sustained increase in capital intensity*" Merrill Lunch, June 2006 (Telecom Markets, 13 June 2006)
- "*We see little incentive from a regulatory perspective for incumbents in Europe to pursue FTTP [Fibre to the Premises]*"

  Credit Suisse First Boston. July 2005.



Source: IDATE, DigiWorld 2006

Besides all the above, Telefónica understands that **NGN context development constitutes itself an opportunity to broaden competition among different services and infrastructure operators** and, hence, the regulatory principle should focus on the removal of any *ex ante* regulation (unless clearly justified). Telefónica foresees from the ERG consultation document a possible implicit need for NRAs to move towards a possible ex ante regulatory regime on various issues that, in principle, should be managed by market players on a commercial basis.

Finally, it is important to note that **most of NRAs that have answered to a previous questionnaire on this issue have stated that IP interconnection is not a problem today,** which emphasizes the importance of no regulation at this stage (page 8 of the consultation document).

SPECIFIC COMMENTS ON THE ERG CONSULTATION DOCUMENT

From the document itself, **Telefónica agrees in principle with the assertion that IP services development (both at retail and wholesale level) might have many implications on various issues traditionally linked with the interconnection regime** (number of interconnection points, pricing principles, ...), although it considers that the early stage of development of these services is a sufficient reason to try not to impose any preliminary regulatory intervention that could hamper its development.

- ***On the role of NRAs on ensuring IP interoperability under Article 5 (Access Directive)***

  Telefónica is very concerned when ERG highlights that, in order for regulators to safeguard interoperability and quality of service at all levels of the value chain, "A more ubiquitous application of Art. 5 Access Directive may be needed to ensure end-to-end connectivity and accessibility for end-users (including disabled users) as well as allowing users to access services provided by another undertaking" (page 22). In particular, Telefónica believes that this is contradictory with one of EU main regulatory principles of limiting ex ante regulation to exceptional and clearly justified cases, and always when an operator has been designated as SMP. Additionally, commercial freedom should be given to operators as a "rule", so this assertion is considered not appropriate at this early stage of development of these services and maybe (to some extent) contradictory with the proposals regarding amendment of Article 5 of the Access Directive under the 2006 Review process.

  Article 5 was included in the Access Directive to allow for a smooth transition from the previous regulatory regime. To date it has been barely used. The ERG's proposal effectively promotes the usage of this back-stop measure as an important tool to micro-manage the introduction of a new technology. This cannot be acceptable in the context of a competition law based regime. Regulators can only "step-in" in the context of market failure and after SMP has been demonstrated. To do otherwise, or suggest that intervention in NGNs in the absence of SMP might become the norm rather than the exception, sends the wrong investment signals to the market and might set unwarranted expectations of regulated access to competitive infrastructures.

- ***On the implications of NGN architecture for IP-interconnection***

  Firstly, **Telefónica wants to show its disagreement with some (very) relevant assertions contained in the ERG consultation document, particularly due to the fact that they seem to lead to the need of greater amount of regulatory intervention in the market** (thus, modulating its development). **Special concerns arise, for example, when the document states that "NRAs may have to ensure that all types of interconnection are possible, ensuring end-to-end connectivity and allowing for full interoperability of IP based services offered to the customers of the interconnecting networks; for this reason, operators should be encouraged to give access to the technical interfaces, protocols and all other technologies necessary for the interoperability of IP based services, and to use standard interfaces and protocols"**. Telefónica would rather prefer for ERG to soften this assertion in the sense of leaving this extreme possibility to a deeper competition analysis according to the regulatory framework: market definition, assessment of competition, identification of competition failures, identification of SMP operators and, finally, imposition of adequate and proportional obligations at wholesale level. Hence, the different levels where operators should guarantee the access to their networks will depend on the analysis mentioned above, and it should be carried once these new infrastructure and business models are developed. In addition, it is important to emphasize that NRAs should trust on commercial agreements between market agents. A major feature of NGN will be "generalized mobility", which will allow a consistent provision of services to a user, i.e. the user will be regarded as a unique entity when utilizing different access technologies, regardless of their types and possible in networks of different service providers. This fact, i.e., mobility as a key ingredient of NGNs, will increase the interconnection requirements and the need to support mobility in visited network through the right interconnection agreements. This kind of agreement either do not exist today or are limited to simpler roaming schemes.

  In line with the previous, Telefónica would like to highlight that network operators (incumbents and/or new entrants –i.e. cable or wireless) do not consider the NGN environment as a direct opportunity for the translation of the traditional integrated service provision model into the all-IP environment[1], but rather as an opportunity to launch innovative business models to satisfy new communications need of end users. These innovative provision models could either be based on a vertical provisioning model making use of infrastructure and services facilities of a particular network operator or on a horizontal provisioning model approach in which additional facilities of other service providers use the network operators´ infrastructure facilities to provide retail services. **This diversity should, in principle, be understood as an opportunity to enhance users´ communications possibilities and to broaden the competitive**

[1] In this sense, the ERG consultation document states that "of the view that a horizontal separation of transport, service and control levels is neither appropriate nor in their interest, particularly if they want to guarantee quality of service (see IMS, adaptation of IMS to fixed networks etc). Their understanding of NGN seems to imply a continuation of vertically integrated provision of transport and services as has been the case in legacy "telco" networks".

environment ("net diversity" versus "net neutrality"). A NGN scenario will indeed facilitate that the technological evolution as well as the progressive deployment of different broadband network accesses (by means of different technologies) foster a greater degree of inter-modal competition among these different platforms. This fact should lead to greater benefits for the end users and the regulatory regime should take this into account.

With regards to QoS management, **Telefónica would prefer for ERG to recognise that QoS is increasingly viewed among market players as a marketing/commercial tool to differentiate their commercial offers. Therefore, there is no need for ERG to show the possibility for NRA to somehow have some kind of regulatory control over it**, moreover considering that new/innovative services developed in a NGN environment will progressively lead to differentiated offers in terms of prices and quality (as a direct consequence of competition among them). This is undoubtedly in favour of end users.

At NGN there will be applications with specific QoS parameters to work properly. Some will require guaranteed throughput, other limits on jitter and/or delay and finally other even both types of parameters (throughput and delay/jitter).

The fact that today's internet traffic is exchanged using a model without differentiation between types of services, does not mean than it is the only or the right model applicable to an NGN IP service environment.

The introduction of quality of services brings value for customers as well as makes business sense for operators. Premium services with higher packets prioritisation and other classification criteria allow price differentiation and a better service for customer willing to pay for it. The implementation of QoS mechanism will be achieved at a cost, with additional investments and specific features embedded in the network elements.

On another token, emergency calls is a topic that will be subject to debate, particularly in nomadic or general mobility situations. It is essential to balance the cost of implementing any technical solution regardless of user location versus making user awareness a key element in order to avoid costly developments.

Finally, the ERG proposes that NRAs should develop an active role in the standardization process to define IP interoperability. **Telefónica considers that NRAs´ role in the process of establishing national technical standards should only be limited to follow-up theses processes since operators and manufacturers themselves as well as other specialised bodies are better positioned to deal with this standardisation process.**

- ***On the implications for interconnection products and network/service provision***

  As it has been stated above, **Telefónica is convinced that the NGN scenario means an opportunity to enhance competition between the different market agents across the value chain and to broaden users´ communication**

possibilities. This fact lead us to question the assertion included in the ERG document which states that "[...] but the use of more efficient technology to provide existing regulated services does not alter the justification for that regulation; the move to NGNs does not provide an opportunity to roll back regulation on existing services if the competitive conditions have not changed", since ERG should acknowledge that NGN will, precisely, bring to the marker a very different competitive and technological scenario. In relation with this issue, it is important to note that in an scenario where greater importance is given to the service/application layer, SMP positions might become more important in this layer which might be controlled by other agents besides traditional telecommunications operators that are already well positioned (i.e. -content aggregators, DRM providers, ...). This issue brings the opportunity to remind Article 13 of the Access and Interconnection Directive which points out that "*National regulatory authorities shall take into account the investment made by the operator and allow him a reasonable rate of return on adequate capital employed, taking into account the risks involved*.". That means that is admitted that the role of regulation will be critical in achieving the level of investments that are currently required in order to get the maximum benefit for consumers as well as to follow the right network and services evolutionary scenario.

Regarding the number of interconnection points in NGNs, it is early to know how this will finally look like, and particularly, considering the different technical requirements that will be need in order to manage different types of IP traffic (real- time, streaming, best effort, ...). Therefore, pricing issues should be firstly negotiated among the various operators taking into account these important considerations. Additionally, different types of interconnection schemes, traditionally linked with the fixed circuit-switched context (i.e. local interconnection), might be affected due to the specific nature of nomadic services which will become progressively more relevant within this all-IP environment (i.e. single price structures per type of service similar to those applied today in mobile networks could appear). However, it must be recognized that NGN all IP networks will show different hierarchical levels than existing PSTN networks. Technically speaking IP networks tend to reach its economical and service optimum managing higher traffic volumes than existing PSTN networks and therefore, the number point of interconnection with economic and businesses sense may tend to diminish.

With regards the possible impact of NGN development on market definition, Telefónica agrees with the fact that it will probably lead to some modifications in the Relevant markets identified in the EC Recommendation, although it is early for ERG to think which changes it will entail, It is not clear whether it will result in a broadening of markets 8-10 to include IP interconnection, as ERG suggests, or, perhaps, it leads to the elimination of some markets. **Telefónica considers that this type of issues should be dealt with along the Relevant Markets Recommendation review processes** with no additional necessity to bring up this issue in the context of this consultation document. Particularly taking into account some NGN characteristics such as "general mobility" which additionally leads to a broader number of possibilities/means for users to access communications services (and, as a consequence, to lower regulatory pressure on operators).

Additionally, Telefónica does not agree with the assertion made that among NRAs´ needs, they have to address with the definition of appropriate areas for regulatory intervention, based on the existing list of relevant markets and identify, if needs so require, further markets for regulation and de-regulation. Instead, Telefónica believes appropriate to leave the market itself to develop and, in a later stage and considering the new competitive scenario, follow the market definition and analysis process in order to clarify this issue, being ex-post regulation a safeguard to competition.

Finally, **regarding NRAs´ need to determine the cost of regulated interconnection products in a multi-service environment, Telefónica considers that there is no need to do so at this stage of development since there is no need to regulate them (as stated previously)**. Moreover, any type of cost-orientation would be considered as a very extreme regulatory condition, not proper of a fully liberalised environment. In this sense, this assertion implicitly leads us to consider that ERG is trying to redefine a new "regulatory arena" in the IP/NGN environment evolving from the "traditional" one (with its possible negative effect on the development of new services and business models). Regulatory focus needs, on the other hand, to settle the appropriate conditions to lower this regulatory pressure. As mentioned before, in an NGN environment the level of investment carried out by those who enact the NGN, and particularly a next generation access network (NGAN), should reasonably lead to a revisited regulation applicable to the access network.

Undue regulation of access infrastructure, and particularly cost orientation, could induce a reduction or negation to investment. It should not be assumed, per-se, that new access networks represent a bottleneck. These networks are different from existing networks and cost conditions as well as conditions for entry are also different. Therefore, the cost of interconnection products should be dealt carefully since it simply provide a bottom line and the conditions for offering such products in a increasingly competitive environment should cover the risk as well as the opportunity cost that the alternative networks enjoy when postponing its build or buy decisions.

Telefónica also recognises some contradictions along the ERG consultation document, particularly when footnote 38 states that "Furthermore it is commonly assumed that Next Generation Networks will be operated at significantly lower costs than other fixed networks by passing to a single infrastructure based on IP for transporting any kind of flow, voice or data, and for any access technology (DSL, FTTH, WiFi, etc.). NGNs can provide operators ample flexibility in their cost base to reduce OPEX and CAPEX", and previously the documents states that "In any case, QoS management requires additional resources leading to higher costs". Indeed, **Telefónica would like to clarify that while the provision of different services/applications across a NGN architecture implies greater scale and scope economies, new CAPEX is needed to really be able to deploy such a network architecture that is capable of supporting innovative service models**. Besides, it should be recognized that an NGN architecture embraces both the NGN core network and, notably, an NG Access

Network able to allow flowing traffic into the core network to reach any consumer anywhere. Therefore, the level of investments will be both at core level and at edge or access level. CAPEX will be very significant in order to achieve service objectives and later on reach OPEX reductions once the core and access networks are deployed together with control (signalling) and service creation and management environments.

- ***On the principles of billing (wholesale/retail) in an IP-enabled NGN***

Telefónica considers relevant to insist at this point that there is a clear distinction between a NGN (all-IP) environment and the Internet one. The former is characterised by the existence of the possibility to develop innovative services and business models based on the advantages of an all-IP "controlled" environment which, fundamentally, provides some sort of network intelligence to a mere transmission of IP packets (QoS management, routing techniques, ...). The latter, on the other hand, is fundamentally an open and best effort-based environment that, to some extent, might be sufficient to provide alternative service provisioning models to the end users (but should be understood as complementary to the previous). NGN will be able to provide telecommunication services and to make use of multiple broadband, QoS-enabled transport technologies, with service-related functions independent from underlying transport-related technologies (see ITU Rec. Y..2001). The joint capability of QoS and service and control layers is key to understand the difference. **This distinction is very relevant in order to consider the suitability of the different types of billing regimes that currently apply separately to the PSTN and Internet contexts for an NGN environment.**

As a general principle, **Telefónica considers that there is no need for a specific regulatory intervention choosing winners and losers with regards to business models launched for different services/applications, and particularly, a specific billing regime (neither at a wholesale nor retail level)**. Market agents are undoubtedly better positioned in order to choose the more economic efficient option, taking into account, both the service provision model (offer side) and the specific demands/preferences shown by the end users.

In particular, Telefónica foresees from the consultation document itself a possible desire to move towards a wholesale Bill&Keep interconnection regime. Telefónica would like to show its concern with this issue since, as stated previously, a very early decision might have a negative effect on operators´ willingness to upgrade their infrastructures and to deploy new services and business models.

At the public Internet connectivity wholesale level, billing models based on Bill&Keep were applied because of its simplicity, savings and, most notably, the nature of the traffic handed over. The basic parameters were simple, volume of traffics and symmetry or asymmetry of the service providers and networks interconnected. But even in this service simplistic scenario, contention has existed between parties in order to achieve a more balanced situation.

NGN interconnection will be based on much more complex business models and service scenarios. Keeping QoS for those who agreed to do so and adjusting network remuneration to who is willing to pay for the end service will be taken into account. If Bill&Keep is certainly be insufficient to replicate existing PSTN billing arrangements, why should it be adequate to support billing services in a mucho more complex scenario, with service providers able to participate more broadly in the value chain, in a richer way, and with new services offered to end users. At least, current charging models for PSTN are likely to remain appropriate in the NGN.

NGN are, by definition, multi-service networks where Bill&Keep should play the right role, when necessary, but nor probably the major role reflected in the document. Bill&Keep is not necessarily the most convenient model when competition is present, because it does not incentive an approach to reduce termination costs in other networks through licit commercial practices, therefore, it does no promote efficiency. The inefficiencies of the "Hot potato" scenario would be the most probable reaction to is application.

Billing should take into account the usage of the network and its associated resources made by the party requiring the service, i.e., the network which hosts the party requiring the service.

Finally, it is worthwhile noticing that a relatively long transition period will exist before reaching an all IP NGN environment, and therefore, existing models should coexist with any new model at wholesale level. Bursting in a disruptive billing model must be handled with the utmost care.

ANSWERS TO THE SPECIFIC QUESTIONS COVERED UNDER THE ERG CONSULTATION DOCUMENT

As it has been commented before the present state of development of NGN does not allow to provide, at least in our opinion, comprehensive answers to the questions formulated in the public consultation. However we provide some preliminary views about them.

How should the transition from the PSTN number of interconnection points to the probably reduced number of interconnection points in NGNs look like? Which are the implications for the price structure and price level of interconnection rates?

The transition will depend heavily on the operators' strategy to migrate to NGN (overlay vs. substitution). For the case of overlay networks the interconnection infrastructure of the PSTN can be initially used to provide interconnection for some of the services provided through the NGN and to facilitate a smooth transition to new interconnection models in the future.

There may be different interconnection schemes for different services, and in different countries. NGN networks carry very different services, with different traffic profiles and consumers patterns. For instance, VoIP, TVoIP, and Internet data traffic (P2P, web browsing, ...) may have very different traffic profiles.

The evolution to the use of new interconnection models should be agreed by market players, planned with enough time to minimize the costs and to facilitate an efficient transition, and based on mature standards.

NGN all IP networks will show different hierarchical levels than existing PSTN networks. Technically speaking IP networks tend to reach its economical and service optimum managing higher traffic volumes than existing PSTN networks and therefore, the number point of interconnection with economic and businesses sense may tend to diminish.

The migration to NGN has the potential to reduce the operating costs in the future and to provide new advance services. However, important investments are required to deploy the new networks and to develop the advance services, which requires the right return on investments. So it is not clear that the mere transition to NGN will reduce the costs if it is not accompanied by a new panoply of services accepted by the market.

What is the equivalent to "local" interconnection in NGNs?

It is not clear if the local interconnection level will make sense in the future in NGN. There are a number of factors that tend to increase the level in the architecture of the interconnection points. Among others we can mention:

- The percentage of local traffic in an integrated network that carries all kind of services (voice, data, video, ...) is much lower than in specialised networks (for example voice network has much more local traffic than P2P networks).
- The increase use of mobile and nomadic services.
- The reduction in the cost of the transmission.
- The tendency to increase the level in the network architecture of the router.

However, as it has been said before, it is still too early to know, especially for new services requiring high bandwidth, if the local interconnection points will completely disappear.

An eventual regulatory requirement to maintain local interconnection points could distort the investment decisions of the operators and making them to incur in non-efficient costs that, ultimately, would be supported by the users.

A major feature of NGN will be generalized mobility, which will allow a consistent provision of services to a user, i.e. the user will be regarded as a unique entity when utilizing different access technologies, regardless of their types and possible in networks of different service providers. This fact, i.e., mobility as a key ingredient of NGNs, will increase the interconnection requirements and the need to support mobility in visited network through the right interconnection agreements. These kinds of agreements simply do not exist today or are limited to quite simple roaming schemes.

Reflecting the transition towards NGNs what are the implications for existing SMP products and bottleneck facilities? Does this technological change remove existing SMP positions or bottlenecks or could new ones emerge in NGNs?

As it has been previously said Telefónica believes that the introduction of the NGN could lead to an enhance competition between an increasing number of different market players in the new value chain of convergent services. The flexibility of the new networks to provide all kind of different services and to allow the participation of different players will foster the competition.

The deployment of new networks, the use of new technologies, and the introduction of new services will tend to reduce the present bottlenecks but may allow the emergence of new ones controlled by other agents besides traditional

telecommunication operators that are already well positioned (internet service providers, contents aggregators, DRM providers, etc).

The increasing complexity and the fast changing rate of the markets (number of players, products, will make increasingly difficult the application of specific regulation without producing important distortions in the evolution of the markets. It would not be fair nor acceptable to regulate in a fully different ways how players may perform at the various levels of the value chain. SMP and bottlenecks will be co-mingled in a common competitive space were rule governing competition should reach similar levels.

How do you evaluate the advantages and disadvantages of different charging principles?

Telefónica considers that there is and will be in the future a clear distinction between the public Internet and the all-IP NGN next generation networks. The type of services and the billing systems will remain different.

As the variety of services and agents participating in the provision of the services will increase it seems probable that several billing systems will coexist. The participation of service and content provider in the provision of the services may imply the use of new billing systems, based on sharing costs, no explored in the ERG document.

Bill and Keep can be one of the billing systems used that could be appropriate for some types of services and networks but we do not see that it could be a general trend to use it in all the cases. At the public Internet connectivity wholesale level, billing models based on Bill&Keep were applied because of its simplicity, savings and, most notably, the nature of the traffic handed over. The basic parameters were simple, volume of traffics and symmetry or asymmetry of the service providers and networks interconnected. But even in this service simplistic scenario, contention has existed between parties in order to achieve a more balanced situation.

NGN interconnection will be based on much more complex business models and service scenarios. Keeping QoS for those who agreed to do so and adjusting network remuneration to who is willing to pay for the end service will be taken into account. If Bill&Keep is certainly insufficient to replicate existing PSTN billing arrangements, why should it be adequate to support billing services in a much more complex scenario, with service providers able to participate more broadly in the value chain, in a richer way, and with new services offered to end users?

NGN is, by definition, a multi-service network where Bill&Keep should play the right role, when necessary, but most possibly without the major role reflected in the document. Bill&Keep is not necessarily the most convenient model when competition is present, because it does not incentive competition, p.e. through the reduction of termination costs in other networks through licit commercial practices. Therefore, it does not promote maximum efficiency. The inefficiencies

of the “Hot potato” scenario would be the most probable reaction to its application.

NGN charging principles should need to support complex service environment, were, generalized mobility will have a presence unknown today for which Bill&Keep may no be sufficient.