# Comments to the ERG Public Consultation on Regulatory Principles of IP-IC/NGN Core

July 2008

# GENERAL COMMENTS

Telefónica welcomes the opportunity given by the ERG to comment on the Regulatory Principles of IP-IC/NGN Core which will become a relevant issue in the context of Next Generation Networks already being deployed by main European electronic communication operators. The main questions raised in the consultation are already under discussion at national level in some Member States so the outcome should contribute to the clarification of issues and to give consistency across Europe.

The electronic communications sector is presently at a key point of its evolution that requires important decisions about investments which will radically change the telecommunication infrastructures making possible a whole new generation of services based on NGNs.

The regulation, or not, of interconnection in these networks is a key issue with a very high impact on the sector development in general and on the business models developed by market players in particular, so the impact of any intervention by regulators in this area should be carefully analyzed before its practical implementation, including the issue of technology neutrality.

The increasing complexity of this sector, where the dizzying path of technological evolution is accelerating changes in business models and in market players involved, make any reliable forward looking analysis very complex, so regulatory interventions should rest on the side of forbearance, giving precedence to commercial negotiations. History shows that the more successful examples of evolution come from the dynamics within the free market (see for example internet services evolution).

Moreover regarding the regulation of NGNs, it can be seen that there is no global consensus on the regulation to apply -for example USA, Asia and Europe seem to be following different models- which is an indication of the difficulty to determine the most appropriate model.

There is also a lot of additional work to be done regarding standardization on IMS (IP Multimedia subsystems) networks and services before truly interoperable services could offered to the market.

NGN interconnection is clearly affected by this environment. The main market players face large uncertainties making decisions about network evolution and the development of new services for users. It is currently impossible to predict which will be the most appropriate models for interconnection to deal with market demands.

The most important views about the key issues arising in the public consultation, which are developed in more detail later in this document, are summarized below.

- **Separation between transport and services**

  Although there is a tendency in NGNs to have greater separation between transport and service levels, it is unclear presently if it is going to be possible a complete separation of these levels, especially if end to end service quality is required. For example a QoS guarantee is required for some services where there are demanding parameters such as delay or jitter. This may force operators to manage the transport and services together without implementing a complete separation.

- **Network nodes and interconnection points**

  The introduction of NGNs - accompanied by technological developments may favour future cost reductions, driven by heavy operator investments, leading to the emergence of high performance service control and signalling systems that are more efficient with large amounts of data. This may drive a reduction of the number of interconnection points but it is still unclear what would be the precise number and type of interconnection points.

  The number of interconnection points will depend mostly on the traffic levels required by the services –for example voice services will probably have low requirements in term of transmission capacity and could use a small number of points- and on the need to enable specific points of interconnection depending on the requirements of the services.

- **Charging mechanisms. Bill &Keep.**

  The mandatory adoption through regulatory intervention of Bill & Keep systems would have highly unpredictable results. Absent a predictable view of the impact it is essential to allow the coexistence of several different charging models that can be used depending on the business models, the characteristics of services and the structure of the network. Bill & Keep could be one of those charging models.

  Some of the problems associated to the introduction of Bill & Keep, that are described with more detail later in this document, are: the difficulty of imposing this measure within the European Framework, market distortions, technical inefficiencies, removing incentives for investment.

- **Quality of Service.**

  There is no evidence in Europe that operators are degrading the quality to hurt their competitors.

  QoS is an important competitive tool that will be used by market players in new NGN services so there is no need to regulate minimum QoS. The establishment of measures to ensure the transparency of the quality of service offered to users (on wholesale and retail services) could be enough.

The complexity of NGNs and the large number of players who can affect the quality of end to end service make it premature to establish regulation on these services.

- **New transport and service markets.**

  The proposals developed in the consultation document about the possibility to define new markets susceptible for ex ante regulation for the interconnection transport and service interconnection seem premature, not in line with the objectives of the European framework and will probably have unpredictable effects on sector development.

  On several occasions the advantages of promoting the evolution towards network and service models similar to the ones used in Internet have been put forward. The suggestion is that this has lead to all sorts of services and network infrastructure dramatically proliferating but it is necessary to take into account that this development has occurred with a low level of regulation which has been key to the great dynamism that has been observed in the development of services and infrastructure.

  In the NGN environment it is expected that there will be sufficient levels of competition to allow the dynamic evolution of services without the need for regulation. In this regard it is worth mentioning the report by WIK Consultancy for the European Commission which favours unregulated NGN interconnection systems given the expected competition that could pose Internet Services Providers.

In short Telefonica believes that NGN interconnection is still in an early stage of development, especially for new services, and would be highly premature to introduce through regulatory intervention, interconnection models that could influence its evolution with unpredictable results. Regulators should let market forces lead the evolution, monitor the competition in the market and intervene only if the situation makes it necessary.

# ANSWERS TO THE SPECIFIC QUESTIONS COVERED UNDER THE ERG CONSULTATION DOCUMENT

The present state of development of NGN does not provide, at least in our opinion, comprehensive answers to the questions formulated in the public consultation. However the following are our preliminary views about them.

## 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?**

Telefonica agrees on the differentiation of transport and services layers in NGN networks as it has been recognized in ITU recommendations. The current focus of Telefonica is on IMS[1] deployment focused on new IP multimedia services without involving any MSANs[2] or AGCFs[3] to migrate legacy customers to IP based access in order to drive development of new IP multimedia services and new value added services to its customers.

Telefonica sees IMS as the way to offer new services to its customers rather than legacy services. Whilst Telefonica deploys new equipments in its networks to replace equipment at the end of its life cycle in order to maintain the current PSTN service, there are no plans in the short term to perform massive migration of users towards an MSAN or AGCF based architecture.

Although there is a tendency in NGN to have greater separation between transportation and service levels, it is unclear presently if it is going to be possible for a complete separation of these levels if a QoS guarantee is required for the services, at least if there are demanding requirements in aspects such as delay or jitter. For example, latency is a sensitive issue for mobile operators. GSM digital mobile phones use up circa 100ms of delay, whereas fixed phones use up circa 3ms. High delay plus echo results in poor voice Quality of Service. Thus, all mobile operators are more sensitive to latency than fixed operators. This issue must not be ignored in the migration to IP interconnect.

Some of these issues may force operators to manage the transport and services together without implementing a complete separation.

[1] IMS: IP Multimedia Subsystem
[2] MSAN: Multiservice Access Node
[3] AGCF: Access Gateway Control Function

We believe it is premature to consider the possible definition of different interconnection markets for transport and services susceptible for ex ante regulation. The market for new NGN services, even though there are high expectations from many stakeholders, is still very immature and there are uncertainties about its possible evolution. It is unclear if the market will move to a structure with wholesale services at different layers or if vertical business models will be the evolution path. In addition there are also uncertainties about how competition will evolve. Regulators should observe the evolution and only intervene if there are clear signs of market failure caused by lack of competition.

Hence, the different levels where operators should guarantee access to their networks will depend on the analysis described above, and it should be carried out once these new infrastructure and business models are stable. In addition, it is important to emphasize that NRAs should trust commercial agreements between market players and proceed under "ex-post" regulatory criteria, after evaluating the market against the three criteria test.

Another issue to highlight in this context is the type of interconnection that will develop. The concept of service oriented interconnection will probably be adequate for many services. The ETSI is working in the reference framework for NGN interconnection, having in mind the two following models[4]:

- Service oriented interconnection (SoIx)
- Connectivity oriented interconnection (CoIx)

Service oriented interconnection includes two types of information between the interconnected domains: service related information that allows the identification of the service required end to end (e.g.: SIP signalling), and transport related information (bearer traffic).

In this way, the process of deciding the routing of NGN traffic covers the functions of the service layer and of the transport layer to define the right destination together with the transport resources allocation that is adequate to the specific interconnection.

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 be possible in networks of different service providers. This fact, i.e., mobility as a

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[4] See ETSI ES 282 001:

SoIx interconnection is typically characterized by the presence of two types of information exchanged between the two interconnected domains:

- Service-related signalling information, that allows to identify the end-to-end service that has been requested.
- Transport information, that carries the bearer traffic.

Connectivity-oriented Interconnection (CoIx): the physical and logical linking of carriers and service providers based on simple IP connectivity irrespective of the levels of interoperability.

key ingredient of NGNs, will increase the interconnection requirements and the need to support mobility in the visited network through the right interconnection agreements. These types of agreements either do not exist today or are limited to the simpler roaming schemes.

The main views from Telefonica in this question are:

- Total separation between transport and services levels looks questionable for services with guaranteed quality of service.
- It is premature to consider the ex ante regulation of interconnection for new NGN services at transport or service levels. It is not necessary to impose this separation by regulatory means on network borders.

## 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?**

There are additional issues that could be considered by the ERG for a deeper study. Amongst others the following can be mentioned:

- Telefónica believes that a gradual approach should be considered in any Regulatory Decision taken by the ANRs, and the focus on any decision must be taken under the principle that NGN core development and interconnection requires a long and costly path that could be unduly hindered applying too restrictive and detailed “ex-ante” regulation.
- The possible introduction of mandatory Bill & Keep charging schemes would require a much more comprehensive and deeper analysis including such aspects as the effect on business models, effects on different customers segments, quality of services, incentives for investments etc.
- The suggestion that the E.164 number schemes could be a bottleneck in the future does not take account of other technological solutions that could arise to avoid this problem and reduce the need to regulate termination markets. Further analysis on this issue looking at alternatives is essential.

## 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 introduction of NGNs could be accompanied by technological developments that may favour a cost reduction in the future, following heavy investments by operators, and driven by the emergence of high performance service control and signalling systems (that are more efficient with large amounts of data). This may imply a reduction of the number of interconnection points but it is still very unclear what would be the number and type of interconnection points.

The number of interconnection points will depend on the traffic levels required by the services –for example voice services will have low requirements and could use a small number of points. In other cases it will depend on the need to have specific points of interconnection for certain kind of services with distinctive service parameters.

It is too early to know what interconnection points in NGNs will finally look like, and particularly, considering the different technical requirements that will be needed in order to manage different types of IP traffic (real- time, streaming, best effort ...). 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) affecting also the number and type of interconnection nodes.

NGN networks will show different hierarchical levels to existing PSTN networks and they will reach their optimum efficiency managing higher traffic volumes than existing PSTN networks. Therefore, the number of points of interconnection may tend to be less than today.

The number of point of interconnects may be affected by factors such as:

- Capacity of interconnection points. (i.e.: if the minimum bandwidth of an interconnection is enough for a nationwide demand, only one or two PoI will be theoretically necessary in some cases)
- Structure of the networks. (i.e. in DSL networks an interconnection below the level of the connection of the backhaul to the backbone networks is useless.)
- Costs of transport. In the case that the transport is more expensive than setting up additional regionally distributed POIs, the number of POIs should be increased.
- Robustness. For backup reasons, the number of POI should not be too low.
- Type of services. The requirement of the services (bandwidth, real time requirements ...) may make necessary the deployment of specific interconnection points.

In the short term, for legacy services, in most European countries there are no plans for the massive migration of customers towards an MSAN and AGCF based architecture. Therefore the structure of the point of interconnection for PSTN voice is likely to remain similar to the current one.

Within an IMS context, the points of interconnection to NGN services are expected to be located at the control layer from the Access and peering SBCGs[5] as described in figure 13 of the consultation document and the number of Interconnection points to the IMS networks will be low in the short term and will grow based on the market demand.

However, although the economics of IP networks tend to point to less interconnection points and the current structure of interconnection points (local, single and double transit) will change in a NGN world, that does not mean that there will not be some interconnection hierarchy.

It cannot be ruled out that the concept of distance will not be relevant to establish the form and price of the exchange of traffic between operators in NGN interconnection. Establishing an adequate measurement of "distance" in an NGN context will allow the optimisation of network interconnection, taking into account that QoS is a key factor and there are some situations to avoid, such as "hot potato" routing.

The main views from Telefonica in this question are:

- There is a general trend toward a reduction in the number of interconnection points but the future number of interconnection point may be affected by characteristics of the new NGN services and there is still a considerable amount of uncertainty about this issue.
- In the short/medium term the current interconnection points used for legacy services are expected to be maintained in most European countries.

## 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?**

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 have much more local traffic than P2P networks).
- The increase use of mobile and nomadic services.

[5] SBCG: Session Border Controllers

- 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. On the other hand Telefonica considers that regardless the number of interconnection points, the concept of distance as is understood in PSTN interconnection, that is levels associated to the number of network elements (local, simple and double transit), will continue to play a role.

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

Demand for local interconnect for IMS based services has not been identified yet in the countries where Telefonica has a market presence. However as described in question 3 the logical point to achieve such local interconnection for IMS services is on the access and peering SBCGs.

Regarding a):

In an NGN context, the optimal interconnection level will probably be at a level above the current local level. It seems clear at this stage that it will not be efficient to continue with the current high number of local PoIs of the PSTN.

Regarding b):

It seems reasonable that the typical interconnection point will be at a higher level than the BRAS of an area. Demand (or traffic) aggregation will determine the points adequate for interconnection. For example, metropolitan for cities or business centres or regional (or provincial) in a higher level.

Regarding c):

For the reasons pointed out before, it is not generally possible to establish a parallelism or equivalence of the number of PoIs between current PSTN interconnection and NGN interconnection.

## 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 review of the current regulatory framework is a unique opportunity for European policy makers to define a real European communications policy that will enable progress with the Lisbon goals. One of its key goals was the growth of broadband services and associated NGN services, which has a well known effect on the development of economic and social progress as well as job creation in Europe.

These goals are recognised by the European Commission in its proposals on the review of the framework and are broadly shared by stakeholders. However, discrepancies may arise when designing the model for competition and market development in Europe that best contributes to the achievement of these objectives. The choice between the different possible models is not unimportant and will have significant consequences on the degree of competition, investment and development of European industry, diversity and prices of services, job creation, etc.

The Commission has tabled its proposal without having had a serious political debate on the most appropriate model for Europe, and has opted for continuing current policy. However, the need for investment and innovation in order to develop NGN and services - which was the key issue of the Lisbon Agenda - is lacking from these proposals, precisely at a time when there is a need for the renewal of infrastructures that are becoming outdated in order to address increasing demands from European citizens.

The model proposed tends to perpetuate regulation, without even differentiating between existing networks and future investments in fibre optics, nor without taking into consideration the transitory nature that the framework gives to ex ante regulation. In the same way, with proposals such as functional separation of networks it seems to show a preference for service-based competition, against the always preferable and more sustainable platform-based competition. It must not be forgotten that intrusive regulation can lead to market configurations that are different to those produced by the market.

There are main aspects of the NGN interconnection, like QoS issues, that are addressed in the new framework, under the form of minimum requirements of quality to be fulfilled. These type of requirements could be in contradiction with the general objective of reducing “ex ante” regulation and result in distortions. In our opinion it should be enough to ensure that there is transparency of the QoS offered by operators in wholesale and retail services. The specific regulation of

minimum QoS levels could be inappropriate and harmful for the commercial development of new NGN services (see question 9).

The main views from Telefonica in this question are:

- The proposed Regulatory Framework should be better adapted the development of NGN services and infrastructures in Europe.

## 6) C.3.1 Interoperability issues

### What type of interoperability requirement do you consider necessary?

The industry has been promoting the interoperability of the services as a way to increase its value for customers and to reduce costs. However the fast and complex evolution of next generation services makes it difficult, and probably not commercially attractive, to have full interoperability for all the services from initial launch in the market. Also in a number of cases full interoperability may not be a market requirement.

Regulators should encourage market players to have interoperability in their services but mandatory regulation, as a general rule, could be detrimental for industry –higher costs and lack of flexibility to launch new services- and ultimately for users.

The mandatory regulation of interoperability could be contradictory with one of the EU main regulatory principles, that of limiting ex ante regulation to exceptional and clearly justified cases. 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 seems to effectively promote the usage of this back-stop measure as an important tool to micro-manage the introduction of a new technology.

The main views from Telefonica in this question are:

- Regulators should encourage market players to have interoperability between their services but mandatory regulation, as a general rule, could be detrimental for industry –higher costs and lack of flexibility to launch new services- and ultimately feeding through to users.

## 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?

We do not see that the introduction of mandatory Bill & Keep systems could be the best solution to minimize the problem associated to termination bottlenecks as the ERG proposes. The problems associated with these charging mechanisms are described in the answer to question 11.

The termination bottleneck, that seems to be the area where most competition problems could arise, will tend to disappear in the future as competition develops in the access markets and NGNs capable of offering services from different services providers are developed. Even the bottleneck associated to the control of the E-164 number will tend to diminish as other mechanisms to access users become more popular (ENUM, IPV6 addresses, etc).

## 8) C.3 Bottlenecks and SMP positions

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

As it has been previously said Telefónica believes that the introduction of the NGN could lead to an enhanced competition between an increasing number of different market players in the emerging 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 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. Regarding the bottleneck related to the control of the E.164 number, as it has been said in the answer to the previous question, an increasing number of users will be able to be contacted via other means, as it can be done presently on the Internet, so it remains to be seen to what extent and for how many users it will be a bottleneck in the future.

## 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?**

**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?**

QoS is an important commercial competitive tool for operators and is expected to become even more important in IP networks. Therefore regulators should forbear intervening and should primarily rely on market mechanisms and competition. Regarding minimum QoS levels, **no problems have been identified in the EU regarding this issue** and there is no clear justification for intervention. In any case, any intervention on this issue should be made **on a case by case basis**. Transparency of conditions on QoS offered for wholesale and retail services should be the focus and will generally be more than enough to solve any problem.

The complexity of NGNs and the large number of players that could be involved in service delivery makes it premature and inappropriate to set up an ex ante regulation on QoS.

Furthermore, the regulation of QoS could be detrimental for innovation. The ability of operators to propose alternative charging mechanisms for different QoS should be preserved and not be distorted by regulation. A blanket application of this requirement could totally change the economic models for IP network investment by making aspects of new network provision un-economical.

## 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 deployment of NGN has not yet been carried out in most European countries so there is not enough experience about costs drivers and cost structures in NGNs to have a well based opinion about the costing systems that are most appropriate.

The migration to NGN has the potential to reduce the operating costs in the future and to provide new advanced services. However, important investments are required to deploy the new networks and to develop the advance services, which require 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 new services accepted by the market.

In this sense it has to be considered also that a full use of the capabilities is based on deploying high speed broadband access networks (both in fixed and mobile environments) at costs considerably higher than those of the traditional networks.

In particular the use of additional spectrum in mobile networks to offer new NGN services creates a significant additional cost that should be considered.

Regarding costs structures, the deployment of a new network such as the NGN deserves careful consideration as to the best cost accounting methodology for services that may be subject to price regulation.

The hypothesis that says that NGN interconnection prices should not be higher than current prices is premature. The variety of services that may be provided in a NGN interconnection will probably be different from current TDM interconnection. Even for voice services, that hypothesis would be premature , taking into account the different QoS levels that may be provided.

The current costing models, such as those commonly used for current wholesale pricing regulation, should not necessarily be the model to promote competition in NGNs, especially taking into account that we are in the deployment phase of a completely new technology and that entry barriers are low for the core network.

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

None of the regimes should be excluded, as each one could be more appropriate depending on the type of service involved in interconnection.

Regulators should avoid imposing one model on the market and allow market players to determine which arrangements best meet their needs.

The CBC system in an NGN environment presents many questions and limitations due to the increasing complexity of NGN services.

As an example, the possibility of establishing several consecutive sessions with different QoS requirements during the same communication or call, will lead to establish different bearer capacities with different QoS parameters, which will probably imply taking into account elements difficult to include in a CBC model.

In practice, CBC has been hardly used in the current TDM interconnection. A generalised use of it in an NGN context is disputable. In any case, other possibilities should be explored, such as having the possibility of establishing a mixed base of interconnection tariffing regimes, that takes into account the capacity offered by the operators in the interconnection (in a similar way as in a CBC model), but establishing at the same time some parameters that allow session tariffing (time, bandwith, QoS offered, etc.)

## 11) C.6 Charging mechanisms

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

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

**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?**

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

The mandatory introduction of Bill & Keep systems, as the general charging model to be used, could introduce important distortions in the market dynamics and could have important drawbacks for the sector limiting dramatically the business models that could be developed for Next Generation Networks.

Telefonica considers that mandatory introduction of Bill & Keep systems could have important drawbacks for the Industry and the users of electronics communication systems. Amongst others, some of the issues to be considered by regulators in the introduction of mandatory Bill & Keep systems are the following:

- **The European Regulatory Framework does not properly support the mandatory adoption of Bill & Keep charging systems.**

  According to the ERG, the system of Bill & Keep is a measure of price control that meet the requirements of Article 13 of the Access Directive, which stipulates that the NRA can impose measures to recover the cost or to control prices (as costs orientation) in cases where the market analysis reveals an absence of effective competition so as to promote efficiency and sustainable competition and maximizes the benefits for consumers.

  However, we believe that it is difficult to rely on the European Framework to justify such an obligation:

  - The existing framework (and quite probably the new one) is based on the principles of competition market analysis and in the identification of possible undertakings with SMP. If the market is not competitive, remedies proportionate and adapted to market failure are imposed on SMP operators. However the implementation of Bill & Keep must be

imposed on all operators (even if they do not have SMP) making it problematic to implement. Indeed, Article 5 of the framework directive allows imposition of symmetrical obligations on operators, but only concerning the obligation to facilitate the interconnection "to secure the connection end-to-end", not to impose a new business model such as Bill & Keep.

- Bill &Keep is not a measure of price control as defined in Article 13 of the Access Directive, but goes beyond that –it is a new business model- and therefore can not be imposed by the NRAs and can only be voluntarily adopted by operators.

- **Bill & Keep will not allow the new business models to develop that are required in the era of convergent services**

  The mandatory introduction of Bill & Keep systems, as the general charging model to be used, could introduce important distortions in the market dynamic and could have important drawbacks for the sector limiting dramatically the business models that could be developed over new generation networks.

  As the variety of services and players participating in the provision of the services will increase it seems probable that several billing systems will coexist. The participation of service and content providers in the provision of the services may imply the use of new billing systems, based on sharing costs, not 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 market trend to use it in all the cases.

  NGN interconnection will be based on much more complex business models and service scenarios than the present ones requiring a diversity of charging models that should evolve driven by market forces. NGN is, by definition, a multi-service network where Bill&Keep should play the right role, when necessary, but most possibly not the major role reflected in the document.

- **Bill & Keep can produce important distortion in the market**

  The mandatory introduction of Bill & Keep to interconnect all kind of networks could produce important market distortion especially if asymmetries in the traffic and different network costs are not considered.

  The arbitrage problems will inevitably arise because many countries outside the European Union will not adopt Bill & Keep. Operators out of Bill & Keep regions will develop arrangements to route traffic within that region to avoid paying termination charges but operators –and users- will still pay charges to terminate calls outside Bill & Keep areas.

- **Bill & Keep would lead to reduced incentives for new investments**

  The mandatory introduction of Bill & Keep could affect seriously the possible business models that could be possible on NGNs and consequently the attractiveness of this sector for investors.

- **The use of Bill & Keep in Internet Networks**

  It is often argued that in the public Internet connectivity, billing models based on Bill&Keep were applied because of its simplicity and savings.

  It is true that in the public internet sometimes a peering between two network providers happens, where nothing is charged between the two networks connected. But the strict application of Bill & Keep schemes without payments is not the general rule and the particular conditions to the exchange of traffic are commercially agreed. In practice, the interconnection will only be 'free' as both partners have the impression, that they benefit more or at least at the same level as the interconnection partner. The very moment one of them comes to the conclusion, that the other one benefits more from the interconnection than himself, he will try to get a charge. That is how the current scene works and the system of several Tier One, Tier Two etc. evolved.

  If mandatory obligation for Bill & Keep with regulated standard conditions were imposed, a huge distortion on current business models would be produced with unpredictable consequences. In fact, if B&K would have been imposed on the internet, it would not have led to the overwhelming success of the internet.

The main view of Telefónica in this question is:

- There is no need for regulatoary intervention in order to prescribe a Bill & Keep model