

3rd BEREC Stakeholder Forum Meeting

Summary **of the Outcomes of the 3rd BEREC Stakeholder Forum Meeting**

Chair: Prof. Fatima Barros
President of the Board
ANACOM (Portugal)

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Introduction and participation

On 15 October 2015, at the Sheraton Brussels Airport Hotel, the Body of European Regulators for Electronic Communications (BEREC) gathered together more than 180 participants for the 3rd annual BEREC Stakeholder Forum. Topics for discussion were the BEREC Work Programme 2016, a BEREC report on the Internet of Things, and an open session on the challenges and opportunities for Europe in the digital ecosystem.

In her opening remarks, the BEREC Chair, Fátima Barros, underlined the changes and challenges brought by the new digital ecosystem and highlighted the importance of the meeting and participants' inputs for BEREC in the drafting of its opinion on the regulatory framework review, within the Digital Single Market initiative.

The incoming 2016 BEREC Chair, Wilhelm Eschweiler, then introduced the participants to the main challenges of [BEREC's work programme](#) for next year, emphasizing the tight schedule to implement the new rules for international roaming. As part of the process to approve its annual work programme, BEREC is publicly consulting on the document. The consultation is running until 30 October.

The EU Commissioner for Digital Economy and Society, Günther Oettinger, gave a keynote speech, stressing the importance of connectivity, and agreed that 'Europe needs a competitive telecom sector which invests for quality services'.

During the Forum, the participants were also introduced to the [BEREC draft report on Enabling Internet of things](#). The public contributions on the draft report must be delivered by 6 November. The report aims at presenting the most common M2M/IoT characteristics and assessing whether M2M/IoT services might require special treatment with regard to current and potential future regulatory issues. The multinationals [Cisco](#) and [Microsoft](#) gave their industry perspective in this area.

The last session of the Stakeholder Forum was dedicated to the future opportunities and challenges for Europe in the digital ecosystem. To share their views on what the future will look like in the electronic communications sector and the role of regulators in this space, BEREC invited some major global market players – [Google](#), [AT&T](#) and [Ericsson](#) – and a representative who provided a vision from the academic world.

The 3rd Stakeholder Forum was web-streamed and the recorded videos and presentations are available at the [BEREC website](#).

Items discussed

Opening Remarks – Prof. Fatima Barros, 2015 BEREC Chair

Prof. Barros welcomed participants to a debate which was very important for BEREC. The Stakeholder Forum had been created to stimulate dialogue. She hoped to exchange views not only concerning the BEREC Work Programme for 2016 but also to hear ideas on the future of regulation and future market changes expected. She thanked all who had helped to organise the Forum, in particular her BEREC colleagues and officials of the BEREC Office.

Prof. Barros recalled that BEREC exists to ensure independent, consistent and high quality application of the regulatory Framework for the benefit of Europe and its citizens. She went on to recall the current main strategic priorities for BEREC. The priorities are based on promotion of competition and investment, promotion of the Internal Market and empowering and protecting users. These principles are important and should constantly be kept in mind. This would be especially important during the current period of rapid change. Evolution of the internet and internet-driven services means that services will increasingly become available independently of location device or platform. Consequently, consumers will demand hyperconnectivity, superfast broadband, wide coverage, high quality experience, service ubiquity and personalised experience suited to their needs. Electronic communication providers therefore need to be prepared to ensure services remain continuously available and are fully secure, to satisfy ever more demanding consumer needs.

BEREC knows that new business models will emerge and that the sector will evolve considerably but needs stakeholder views on likely changes. She noted that a wide range of players was represented at the Forum and welcomed participants from other parts of the world who could bring a different perspective.

Prof. Barros went on to introduce briefly the programme for the day, starting with the BEREC Work Programme. It was natural that in 2016 this should focus strongly on the Framework Review where BEREC was already drafting the Opinion requested by the Commission. The proceedings of the Forum and subsequent written stakeholder input would be invaluable inputs to the development of BEREC thinking.

She recalled that 2015 had been marked by the Digital Single Market (DSM) Initiative. BEREC had welcomed this, especially the recognition that telcoms represents the backbone of digital products and services, and the significance of the demand side, sometimes overlooked in discussions.

The Framework Review is therefore vital so that market players can flourish in an ever-expanding and increasingly connected digital world, without losing sight of consumer protection which is essential to build confidence in innovative services. Regulators must always seek the most efficient, proportionate

and least intrusive regulatory approaches, including co-regulation and deregulation where appropriate. Finally, she handed over to BEREC Vice-Chair and the incoming Chair for 2016, Wilhelm Eschweiler, to present the draft BEREC Work Programme for 2016.

Session 1: BEREC Draft Work Programme 2016

The incoming BEREC Chair Mr Wilhelm Eschweiler (BNetzA) recalled that the BEREC Regulation requires the formulation of an annual Work Programme (WP) to be adopted by the end of the previous calendar year. So for 2016, BEREC would adopt the WP by the end of 2015. He said that the consultation would help BEREC to identify the issues of importance to the market and not only to the regulators. He described briefly the internal BEREC process which had led to the current draft which was intended to deliver a balanced programme of priority items. He believed that the draft was consistent with the BEREC Strategy outlined earlier by Prof. Barros.

Improvements in quality and timeliness are also important to BEREC and this gives rise to a key part of the work programme concerning quality and operational efficiency. There is a clear focus on the upcoming Framework Review, as an important part of the DSM Strategy and the forthcoming legislative proposals of the Commission. The DSM Regulation had already assigned to BEREC some important tasks in relation to net neutrality and international roaming. There are of course other workstreams, some of which span more than one calendar year.

For the Framework Review, the WP explicitly addresses a number of topics which BEREC considers crucial, in particular oligopoly, OTT services, wholesale access, spectrum and universal service reform. He focused further on two topics which are controversial, both amongst the industry and regulators. The first of these concerns oligopolies where it could be seen that some markets were becoming more concentrated. Concentration was not a concern in itself but could lead to the restriction of competition. An earlier BEREC consultation left important questions to be addressed, in particular whether it was necessary to envisage regulation in this area and, if so, whether the Framework could be adapted for this purpose.

The other hot topic is OTT services which allow non-telecoms companies to offer services similar to telecoms services or even substitute for them. BEREC had explored the boundary and overlaps between traditional telecoms and OTT services and this had led to a number of questions to be considered during the Framework Review.

On the TSM Regulation, BEREC must develop Guidelines for NRAs and market players on the supervision, enforcement and transparency measures necessary to ensure open internet access, after consulting stakeholders and in close co-operation with the Commission. These must be operational not more than 9 months after the date the Regulation enters into force (which he said was currently expected to be 13 November). Similarly, on international roaming, BEREC must deliver inputs for the

Implementation Acts, on fair use policy and the sustainability of the abolition of retail roaming charges. Additionally, BEREC will finalise its report on wholesale roaming markets. This work is crucial to the successful implementation of the TSM regulation and the timescale is very tight, with some deadlines within the next few months. The BEREC Report on wholesale roaming will be comprehensive and is linked to the request from the Commission for market data in respect of which BEREC had issued a questionnaire to stakeholders and NRAs.

These tight deadlines posed a tough challenge to BEREC, making it important to take maximum advantage of the stakeholder expertise and perspectives. He went on to mention other important work streams, such as input to the Commission review of termination rates, the input to Art 7/7A cases and workshops on implementation of the Cost Reduction Directive and on accessibility.

BEREC will also continue its regular monitoring exercises, especially the benchmarking of MTRs, FTRs, SMS, roaming benchmarks and the annual report on regulatory accounting.

Mr Eschweiler closed his remarks by looking forward to comments and interventions and opening the floor to the pre-arranged speakers.

The key messages conveyed during the first session of the first meeting of the BEREC Stakeholder Forum (in order of presenting) are the following:

Guillermo Beltra (BEUC)

Mr Beltra showed enthusiasm for working more closely with BEREC. There has already been BEREC participation in a BEUC event which had proved very useful. He wanted to help BEREC to co-operate with BEUC member associations; such co-operation had already proved fruitful in energy markets.

BEUC's view was that competition must remain a guiding principle for regulation. There should be no trade-off between competition and investment. He was also concerned about the risk of a race to the bottom on consumer issues.

BEUC was not entirely satisfied with the outcome of the new legislation on net neutrality and roaming. BEREC's role would be crucial on both topics, for example to help achieve a real end to roaming by 2017. On net neutrality, he applauded BEREC's decision to look beyond the access market.

BEUC will also put effort into the need for changes to the Universal Services Directive.

Matthias Kurth (Cable Europe)

Mr Kurth was concerned about the temptation to increase sector-specific regulation when the need was to decrease it. In this context, he referred with approval to a recent position of the Nordic regulators which he hoped would be adopted by all. He was very concerned about the BEREC approach to regulation of oligopolies. The cable industry had done a lot to increase availability of broadband, for example; it was inappropriate to punish such success.

He was cautious on the need for new connectivity targets. The market-driven approach had worked well so far. It was positive that a Universal Service Fund had been avoided in most Member States; he hoped this could continue to be the case.

Mr Kurth noted that suppliers generally had an interest in delivering good quality; indeed Commission statistics placed cable companies at the top of the league table. There needed to be a very good discussion about the types of quality measurement to be made. An over-prescriptive approach should certainly be avoided. Review of existing measures might well be more effective than an ambitious target to develop a harmonised system.

Alexandre de Streel (CERRE)

Mr de Streel referred to a forthcoming CERRE Report which he hoped could be discussed with BEREC. He picked out some of the main messages which it would contain.

CERRE has noted an increase in connectivity needs of end-users. To ensure these needs are satisfied, an investment-compatibility check on every regulatory decision is necessary. The CERRE study of mobile market consolidation shows a trade-off between prices and investment. He looked forward to the BEREC post-merger study for further analysis.

Mobile data is of key significance for the future. Europe cannot afford to miss the 5G evolution.

The markets are moving from silos to layers in an extended value chain. There is a real need to understand the economic model behind the use of personal data which is the new oil in the value chain. Markets and technology evolve rapidly and unpredictably, posing a real challenge for regulators. Therefore, it was essential that regulation should be based on clear principles. In particular, economic analysis based on economic neutrality is necessary.

There is evidence of more differentiation between and within Member States. Consequently, there should be more use of the subsidiarity principle. Mr de Streel thought, for example, that questions of local infrastructure could be left to the national authorities. In contrast, cross-border services required effective harmonisation or one-stop shopping, as necessary.

Noting the evolution from monopolistic to oligopolistic markets, he thought that the need for regulation should be judged according to bottlenecks. Where there was no bottleneck, horizontal law should be sufficient and no sector-specific regulation necessary.

Ines Nolasco (ECTA)

Ms Nolasco started by noting that competition has driven investment. This provided a win/win situation – lower prices and better services for end users and increased revenue for providers. Between 2005 and 2014, broadband penetration had increased from 30% to 73%. Simultaneously with price decreases and service enhancements, industry revenues had increased from €19bn to €46bn over the same period. There should therefore be no trade-off between competition and investment.

She noted that next generation access competition was increasing only very slowly. Incumbents still dominate at both wholesale and retail levels. Regulation would continue to have a key role in fostering competition and take-up. Altnets are sometimes criticised for lack of investment. However, this criticism was unfounded in the case of legacy regulation and is also unfounded in the case of NG services. She cited Fastweb in Italy and Free in France which kick-started FTTH and FTTB deployment. Along with cable companies, altnets have led the way in innovative service bundles. Economic bottlenecks remained in the last mile as duplication of investment is often economically inefficient. Therefore, effective access regulation continues to be necessary; the transition to NGA, the development of OTT services and the virtualisation of networks do not change this.

Ms Nolasco briefly mentioned 3 other concerns. Pro-competitive spectrum auction rules are essential. The BEREC work on oligopolies is welcome, as is BEREC's ongoing involvement in Art 7/7A cases.

Francesco Versace (ETNO)

Mr Versace began by recalling that investment is not an end in itself but a pre-requisite for the achievement of strategic objectives. ETNO advocates an environment in which investment incentives are maximised. He noted that a recent GSM Europe staff working document identifies a significant investment gap relative to that needed to meet current targets. He felt it important to improve regulation to fill the gap as current access regulation does not provide the correct incentives and relies on a “wait and see” approach.

Mr Versace referred to 2 further recent publications. A report for ETNO by Boston Consulting included recommendations on how best to incentivise investment. Brugel had analysed European lags in NGA investment and why the regulatory environment needed to change. Significantly less regulation was needed.

On OTT services, Mr Versace considered that BEREC had started with the right issue, namely the question of definitions. A more horizontal approach to regulation was needed, which reflected the nature of a service and not its means of delivery. This did not imply more regulation; on the contrary, it was critically important to understand the dynamics of the sector and value chain and to provide a regulatory environment on issues such as data privacy and transparency which applied equally to all providers.

On emerging areas such as virtualisation of networks, Mr Versace advised that the best regulation is the lightest possible.

Mr Edgar Aker (FTTH Council)

Mr Aker started by noting that his was not a single issue group. It considered socio-economic issues and viewed other technologies as complementary, as customer and as rivals. He argued for a fundamentally economic approach to promotion of European digital markets.

There was indeed no trade off between competition and investment – but it remained necessary to be

aware of the impact of different forms of competition on each other. If the access regime unduly favours the access-seeker, there is little incentive to seek first mover advantage through network differentiation. FTTHC has observed the strongest competition dynamics where NRAs have actively encouraged FTTH/FTTB deployment, for example in Sweden, Spain and France. Mr Aker felt that other regulators could learn from these experiences. He felt it also very important to minimise deployment costs through sharing of passive infrastructure elements.

Mr Aker recognised that competitive network deployment is not viable everywhere. All forms of access need to be available in such areas so that competition can take place at the deepest level possible. But in lower cost urban areas, infrastructure-based competition should deliver very high benefits for consumers.

He expressed concern about the approach being taken to net neutrality. There seemed to be a tendency to over-elaboration in order to ensure that as many technologies as possible are covered by policy targets. An approach of identifying the most likely requirements, independently of technologies available, should be preferred.

He closed by asking BEREC to recognise the trade-offs between the different forms of regulatory access granted. He also stressed the importance of thorough and effective implementation of the Cost Reduction Directive and of other cost reduction measures.

Mr Daniel Pataki (GSMA)

Mr Pataki briefly summarised the activities of the GSMA. He considered that BEREC was correct to analyse the problems of the future and not simply concentrate on those issues which had arisen already. He made some high level observations about the strategic approach to the Framework Review, promising more detail and further engagement over the coming months.

He felt that the Framework needed a fundamental rethink. It was important to take enough time to discuss the regulatory vision and objectives. The detailed measures adopted should then be coherent and fit-for-purpose. He advocated a “clean slate” approach; no existing measure should be retained automatically, without sufficient justification. He felt that ex post approaches could be more appropriate in future than ex ante. A fit-for-purpose Framework needs to be both predictable and flexible enough to accommodate market evolutions. The primary goal should be to get the policy right; for the industry, questions of institutional design were of less importance.

Finally, Mr Pataki echoed the words of a CEO at a recent conference who called for the arrival of “an ecosystem, not an ego-system”.

Ms Danielle Jacobs (INTUG)

Ms Jacobs briefly addressed 3 issues in the draft BEREC Work Programme.

On the Internet of Things, standards were important, in order to facilitate switching of service provider.

The Single Market for electronic communications was still some way from realisation of its potential. Business users find difficulty of finding competitive supply for a package of international network and mobile services.

INTUG understood and supported the push for net neutrality. However, she stressed the need for service level agreements for business users. Net Neutrality rules should not obstruct this

Finally, Ms Jacobs proposed that BEREC should also concern itself with software licensing issues where there was concern amongst both companies and public institutions about growing complexity which had the potential to create unnecessary barriers to efficient use of software, in particular cloud software.

Mr Jacques Bonifay (MVNO Association)

Mr Bonifay recalled that MVNOs need to innovate and differentiate themselves, in order to survive. Such differentiation was apparent in both consumer and business segments and applies both to basic and value-added services.

Turning to roaming, Mr Bonifay says that the “roam like at home” policy to be introduced next year would be impossible for MVNOs without reductions in wholesale charges. Moreover, there was too much variation in voice and SMS termination rates across Europe. This variation should be reduced to facilitate the new policy.

MVNOs were wary that mobile network operator mergers had the potential to reduce access for MVNOs. In considering mergers, there was a danger of over-focusing on short-time issues whereas long-term solutions were needed.

Speakers representing an individual company:

Mr Ralf Nigge (Deutsche Telekom)

Mr Nigge stressed the importance of BEREC's role on the Framework Review; the role should be pursued in a balanced and responsible way. He echoed some earlier speakers in stating the critical importance of investment incentives. He felt a move from intrusive ex ante regulation to market monitoring was justified.

Some elements of the Framework need to be stable, for example the principle of technological neutrality. Consumer demand should guide investment decisions; consumers care about the service they receive but not usually much about the technological means to deliver it.

He felt that a debate on oligopoly would be unnecessary and would unhelpfully create a lot of uncertainty. The Framework has a built-in deregulatory aim; in contrast, he considered that BEREC was trying to apply the brakes to such deregulation. He asked for reconsideration of BEREC's position.

On roaming, Mr Nigge paid tribute to BEREC's work in this area. He pleaded for the avoidance of arbitrage which distorts competition on national markets, while ensuring room for wholesale commercial

agreements to be negotiated.

Summing-up for session

Mr Eschweiler thanked speakers for their very useful contributions and promised careful consideration of these comments and the written comments to follow.

KEYNOTE SPEECH – Mr Gunther Oettinger, EU Commissioner for Digital Economy and Information Society

Commissioner Oettinger described his vision of a Digital Union where the impact of digital technologies is maximised in creating jobs and growth through protection of competition and provision of quality services to businesses and consumers. The Digital Single Market Strategy outlined by the Commission describes how digital technology can boost all economic sectors. Connectivity ties together telecoms with other sectors. For this vision, it would be crucial for players in a competitive market to invest adequately in high speed networks.

The existing Framework dealt with vertical integration but was designed mainly for an era of voice telephony. The world has moved on, as have the needs of consumers and businesses. Connectivity is crucial, right across the economy. The current rules designed for the voice communication age should be adapted to the needs of ubiquitous connectivity for today and the near future. The Commissioner articulated a number of examples of social and economic benefits which could be expected to result from increased connectivity, for example in the fields of health, transport, energy and education. He mentioned in passing that key issues of ownership and security of data remained to be resolved.

The growth potential for many economic sectors is large, provided Europe gets the basics right. A competitive telecoms sector which invests in high-performing networks is a pre-requisite. Most digital solutions have not yet been deployed at large scale. The maximum potential will be realised only if connectivity is available everywhere for everyone

The speeds sufficient in 2002 are no longer relevant. The Commissioner was not thinking mainly of the requirements for online video but rather for a much wider range of domestic and business services. The quality of connectivity is also very important. The Commission estimates that €35bn investment is needed to reach its 2020 target of 100% coverage at 30 mb/s and €90-100bn to enable 100mb/s for 50% of households. Moreover, it is inevitable that further investment will be needed to meet the requirements of 2025. The Commission is currently considering what these requirements might be and particularly welcomes input from market players and experts.

The Review of the Framework will focus on connectivity, taking into account the current and future needs of citizens, business and the public sector. It will be a challenge to deliver consistent regulatory

conditions for a true Single Market.

Where competition is driving infrastructure investment, access regulation should be focused on real bottlenecks, simplifying it and improving consistency across countries. Investment in high capacity networks must be adequately rewarded. Adjustments to current rules are probably necessary to increase investment incentives for both incumbents and access seekers. Investors who take risks, anticipating future demand, deserve reward. Where such investments confer a technological advantage, the most direct form of reward is to allow investors to use that advantage in competition with others.

The situation is different where the investment case leads to the conclusion that at most one network is economically viable. The current rule-book promoting competition has to be adjusted in a way that provides investment incentives so that all users, whether based in urban or rural areas, can benefit from the digital revolution. In time, this will enlarge the digital market and ensure that e-services are ubiquitous. To achieve this, additional tools will be needed by the Member State authorities to incentivise network roll-out in economically challenging areas. The Commissioner called for views on which tools would be most effective for this purpose.

Turning to spectrum, the allocation and technical harmonisation process urgently needs to be streamlined, in order to allow Europe to be at the head of a wireless revolution. To maximise efficient use, methods will be needed to promote more flexible access, including shared access and leasing. Increasingly, services can and should be provided on a pan-European basis. Individual national authorisation procedures make no sense in this context.

The Commissioner thanked BEREC for its valuable advice over recent years, especially on important issues such as net neutrality and roaming and looked forward to their further important contributions envisaged in the recently agreed DSM legislation.

Looking ahead, there should be an open mind about the best institutional structure for delivering the Commission's vision efficiently. This does not automatically mean more centralisation or increases in Commission powers. Form should follow function.

The Commissioner said that he intended proposals on the future Framework to be ready for negotiation by Summer 2016 and implemented as soon as possible afterwards. Past lessons need to be learned but applied to a landscape that has evolved and will evolve further. The Commission's current consultation is open until 7 December. He closed by looking forward to excellent stakeholder input so as to put in place a smart regulatory Framework fit for the third decade of the 21st Century.

Session 2: Internet of things (IoT) and Machine to Machine (M2M) communications including BEREC consultation on M2M

Introducing this session, **Mr Goran Marby, BEREC Vice-Chair (PTS)**, posed a number of questions.

- Why do you need a SIM card in every device?
- How do you handle privacy when everything is connected?
- Where will the traffic terminate in the future? Will all traffic be terminated on a mobile network, or will it continue in the fixed network?

However, most important of all was to avoid the creation of new monopolies when technology was changing fast; and to ensure that European companies which invest to bring new services to end users are adequately rewarded.

He then handed over to Dr Cara Schwarz-Schilling and Mr Francesco Sciacchitano to lead the session.

Dr. Cara Schwarz-Schilling referred to profound changes in the way we work, communicate and trade and the dramatic decrease in data processing costs which facilitate those changes. As mentioned already by the Commissioner, these developments will affect many sectors. Those sectors are very different but have a number of common characteristics which Dr. Schwarz-Schilling went on to describe.

Before doing so, she noted that BEREC thought of M2M in terms of situations where communication between devices took place automatically. Some commentators also included situations where there was limited human intervention. BEREC had decided not to adopt a precise definition for the moment.

Turning to the common characteristics, she said that:

- while M2M applications obviously need connectivity, they do not in general generate large data volumes, at least for the time being;
- some M2M applications, for example those associated with vehicles, are likely to give rise to transnational markets;
- another feature is the lifetime of the device; unlike mobile handsets, the devices in which M2M applications are embedded are likely to have an economic lifetime of a number of years;
- the value chain typically includes a telco providing connectivity, a platform provider and providers of specific applications (e.g. energy company, car manufacturer) which may embed those applications in mass market products

Dr. Schwarz-Schilling then outlined the conditions necessary for IoT and M2M to thrive. These included sufficient resource (spectrum or identities) and a suitable legal framework. Roaming was of course relevant for transnational applications. To ensure end-user acceptance, privacy, security and interoperability are important.

On identities, she noted that this was the responsibility of ITU and CEPT. But BEREC believed that scarcity was not currently a concern and that national approaches would be acceptable. In contrast, mobile network codes could be in short supply. Transnational use of numbers appears to be key to success of business models. This was no longer considered so problematic by regulators although security issues needed to be addressed. The Commissioner had suggested that an ETNS resource might be a good solution for a European market.

One question for the future, not included in the current consultation, is whether IPv6 would be a relevant identifier for the future. BEREC would nevertheless be interested in stakeholder comments on this.

Another issue is whether M2M services count as “electronic communication services” covered by the definition in the Framework. In order to avoid arbitrary differences in treatment of equivalent services, BEREC considers that the ECS definition needs to be carefully reconsidered during the forthcoming Review. Number portability is irrelevant to M2M as the number is never called; this is another area where M2M services may justify special treatment under the Framework.

M2M roaming may be permanent, whereas the rationale for roaming regulation is based on the use of mobile services during temporary periods of overseas travel. If controls are put in place to limit permanent roaming, specific treatment for M2M applications may be necessary.

When customers want to change their connectivity provider, the SIM will need to be updated. For many applications, physical SIM-swap will be infeasible. To avoid a competition bottleneck, two solutions are under discussion. The first is to extend the right of application to IoT/M2M users. The second is over-the-air provisioning of the SIM. BEREC thinks this should be encouraged. Although industry discussions are underway, BEREC recognises that regulators may need to intervene in this area to prevent the formation of a bottleneck.

The Privacy and e-Privacy Directives contain no specific rules for IoT and M2M for the time being. However, discussions are underway to adapt the privacy rules to the digital era.

Summing up, Dr. Schwarz-Schilling said that while M2M raised the need for no new principles to be adopted, there might be a need to adapt the standard regulatory rules in order to maximise the potential and use of M2M services. She then handed over Mr Francesco Sciacchitano to introduce BEREC's questions for stakeholders.

Mr Francesco Sciacchitano noted that the BEREC consultation had been published on the web-site and was open until 2 November. This session was a good opportunity to stimulate stakeholder responses. All comments were welcome but BEREC would be especially grateful for reactions to the specific questions it had posed.

He observed that some issues already been touched on by Dr. Schwarz-Schilling and other earlier speakers – transnational use of numbers, permanent roaming, switching between connectivity providers and security and privacy matters – were covered by explicit BEREC questions. Additionally, BEREC

sought input on whether proprietary standards currently under development should be opened up or whether new open standards should be developed, in either case in order to contribute to the development of M2M services.

Mr Sciacchitano went on to introduce the first of 2 panelists, **Dr. Robert Pepper, Chief of the Global Technology Team at CISCO and formerly a senior official at the FCC.**

Dr. Pepper began by introducing the annual CISCO Visual Networking Index study which provides a rolling 5-year forecast of a comprehensive range of internet data – devices, people and traffic. It had been produced for 10 years and was considered to be reliable, on the basis of validation of past forecasts against actual outturn data.

He wanted to focus on the forecast for devices which are IPv6-enabled and which can connect to the internet. In addition, there are billions of other devices which may connect to each other via devices with IP addresses but do not have their own IP address. Over the next

5 years, CISCO forecast that 43% globally (50% in Europe) of all devices connected to the internet will be M2M devices. Over that period, there will be a significant increase in M2M devices – 76% of new devices in Europe. Despite this, only 3% of traffic will derive from M2M. Much more network capacity will be needed but this will be driven by video, not by M2M.

Dr. Pepper ran through a wide range of applications in a number of sectors, for example, the connected home (about half the devices), the connected car (1 bn worldwide by 2019), healthcare (another fast-growing sector), smart manufacturing and agriculture. These would exhibit diverse characteristics, for example:

- some communication over short distances, some long;
- some are broadband, some narrowband;
- some communicate continuously, others in short bursts
- some will require batteries, others operate on ambient power
- some will have SIMs, some not
- for some, latency would be an issue, for others not
- some will be mobile, so that roaming may arise, others not

CISCO estimated that the economic impact of these developments would be US\$ 19trn globally (Europe US\$ 6.3 trn) over 10 years. Initially they were a little sceptical of this figure but a more recent study by McKinsey suggested it was an under-estimate. Giving some European examples at a more disaggregated level, Dr. Pepper thought that the economic impact in Germany alone for smart manufacturing would be US\$ 12bn per year whereas for Portugal it would be US\$ 6bn across all sectors, with 10% accounted for by smart manufacturing.

There would also be variation in the extent of adoption of M2M applications. Compared with the global

figure of 43% of devices connected to the internet in 2020 being M2M devices (Europe 50%), he noted that Italy was expected to have the highest national figure within the EU (61%) whereas US, Japan and Korea would have 72%. Although M2M devices would be of disproportionate benefit to emerging countries, he feared the opening of a new digital divide; corresponding figures were Latin America 31%, Middle East and Africa 17% and India 13%.

Summing up, he said that the use of M2M devices was growing very fast – the fastest growing category of devices connected to the net. There are a wide range of devices for a wide range of uses. The majority are not mobile. Most will not have SIMs but an important subset will have SIMs. There will be a very heterogeneous set of device requirements and operating environments. Regulatory involvement will be similarly heterogeneous; this will include telecoms regulators but also government departments and regulators from other sectors.

He closed with a word on standardisation, mentioning a new industry group, formed 16 months earlier, the Industrial Internet Consortium. A number of prominent European companies are leading within IIC for standards on interoperability and in working groups on security and privacy issues.

Thanking Dr. Pepper for his fascinating and well-informed presentation, Mr Sciacchitano thought that 2 of the key questions were the extent to which regulation was needed to support market development and the scope and extent of co-operation between different types of authorities which would be needed. He went on to introduce the second panellist, Ms **Cornelia Kutterer of Microsoft and formerly head of the Legal Department of BEUC.**

Ms Cornelia Kutterer said that Microsoft's origins were in software and had moved into the Cloud. Now every company is a software company. IoT is all about data; connectivity is a feature in that space. IoT is important because it concerns revenues of companies in general, in all sectors. Available data confirm that companies that embrace IoT and the Cloud have better information to serve their customers and increase their survival and success prospects. Digital transformation in a range of sectors is a pre-requisite for global competition.

In 2014 Forrester predicted that the number of connected devices is no longer relevant because it is the application in each customer's environment that counts. The platform Cloud providers, such as Microsoft, will enable IoT to realise its economic potential.

She went on to describe a simplified model of the IoT landscape, starting with devices and assets – the “things” which connect to a Cloud infrastructure. This provides the analytics which drive the insights for business transformation. In the IoT systems, there are a number of attributes, starting with natural user interfaces, such as touch gesture, speech and video analytics. Another attribute is identity which gives rise to security issues; it is necessary to connect and deliver the right data in the right context to the right person and machine. Two-way connectivity between person and Cloud is necessary, ubiquitously and on demand. Security is needed in the machine and the data. The programme must be capable of being

updated and managed remotely from any location required by the customer. What the customer gets out of the data depends on the analytics.

Microsoft is interested in all sectors which will drive most of the changes and has identified a number of usage scenarios relevant across all sectors, for example concerning asset management, remote monitoring and servicing, asset tracking, geo-fencing, personal digital assistant, compliance management, data visualisation, analytics, predictive maintenance, robotics and enterprise integration. The relevance to a number of sectors is significant in the context of standardisation.

The reform of the telecoms regulatory Framework will influence how Cloud and IoT providers and telecoms connectivity providers will position themselves; Cloud providers are not especially used to working in a regulated environment.

She went on to offer some forecasts of market development, for example that the 25 trn connected devices will produce an aggregate annual 40% growth rate in data. While analysts' forecasts do vary, Gartner, for example, had estimated that the global economic value would be US\$ 1.9 trn by 2020.

Amongst the various sectors using IOT, the most significant, where most of the Cloud providers and IoT analytics providers would focus are manufacture, healthcare, insurance, banking, retail, electricity, urban infrastructure and security.

She repeated an earlier point that IoT developments are about data insights and connectivity is vital. Connectivity is significant for Microsoft which invests in infrastructure, for example undersea cables, interconnection, wi-fi and in alternative methods of connectivity, in particular in emerging markets.

Turning to the evolution of business models, she thought that the concept of an ICT ecosystem might be outdated. It could be more relevant to concentrate on a system of partnerships which is very diverse and changing. With the revision of the Framework, it will be interesting to see how the Cloud and IoT Providers will form partnerships to provide the best services to their customers.

As for security, from the perspective of a Cloud provider which has invested significantly in IT security, the IoT world had not brought fundamental change. But of course it did raise detailed questions to be addressed. For example, it is necessary to think about protection measures which involve a combination of deterrence, avoidance, prevention, detection, recovery and correction and this needs to become part of the enterprises's risk management.

Privacy issues become more difficult however and ethical questions need to be answered. For example, data collection is different. Through the insights gained, there are different means to identify data subjects.

Safety and reliability raise increasingly important issues, and especially resilience. The situation in IoT scenarios is not the same as for the internet or the Cloud. In IoT scenarios, there may be the risk of physical harm to be considered. So liabilities will have to be thought about differently, as will data ownership.

Thanking Ms Kutterer, Mr Sciacchitano commented that the public consultations provided an opportunity

for sharing views on the necessity of changes to the Privacy and e-Privacy Directives and on whether new security considerations need to be reflected in Art 13 of the Framework Directive. This prompted Ms Kutterer to comment that in 2 years' discussion in the Council on the Network and Information Security Directive, there was an issue about whether or not to include internet enablers and Cloud providers. Mr Sciacchitano's question underlined the view that the idea to put that in a separate Directive might not have been correct.

Mr Sciacchitano now invited **contributions from the floor** .

Prof. Thomas Hoeren (University of Munster) noted that the draft BEREC Report mentions several regulatory issues arising from connected devices in cars but not all the relevant ones, for example, the right to a directory entry and the right to block numbers.

Another topic not mentioned is the question of who owns the data – the end user or the service provider. Finally, he thought that IPv6 is very dangerous in the world of privacy. The choice to have dynamic addressing had been lost which meant a lot of consequences for privacy issues.

Antonio Amendola (AT&T) congratulated BEREC on having asked the correct questions. Focusing on numbers, he believed new global IoT services need innovative and creative numbering solutions to address the requirements of both customers and manufacturers. He believes that the most effective and quickest solution would be to allow the extraterritorial use of numbering resources. He did not believe that a further layer such as ETNS would be efficient or effective.

Wladimir Bocquet (GSMA) echoed the remarks of earlier speakers about the socio-economic impact of IoT, including reductions in healthcare costs, improvements in quality of life, reductions in carbon footprint and improvements in transportation safety across Europe. There was a need to recognise that IoT is a nascent industry and its value chain, business model, market and services are fundamentally different from the model for traditional telecoms services. GSMA requested policy-makers and BEREC to ensure that a pro-investment environment is established and maintained across the value chain. Policies and regulations need to be relevant, flexible, balanced and techno-neutral. Consistent regulations need to be applied with clarity and legal certainty across all IoT players. GSMA wanted a level playing field and stressed that privacy and data protection regulations should be applied appropriately across all IoT providers. Consumers will rely on trust; having trust in relations across the entire IoT value chain will make complete sense and will help to develop the market. He promised a definitive response to the public consultations in due course.

Freddie McBride (CEPT) praised BEREC report for the comprehensive basis for an exchange of views

on resource management for M2M and on the competition and switching issues. On the question of extraterritorial use of numbers, he noted that the burden of providing the addressing resources feels disproportionately on a few members. Provided that there is transparency and co-ordination in extraterritorial use, this could be a solution. However, he noted there was a degree of hype over the question of resources, given that many devices would not need a SIM card. On spectrum, he thought that applications would find spectrum without necessitating fundamental changes in spectrum policy. Q3 in the BEREK Report asks about preferences between an administrative or technical solution for the provision of E.212 mobile network codes and IMSI ranges. He was cautious about making a choice at this stage – it would be an exercise in “picking winners”. On the one hand, it would not be efficient to provide addressing resources of 10 million units for an application which requires only 50000. On the other hand, some applications are bursty in nature while some do not expect to connect to the network except for testing. Remote provisioning of such devices could be impractical.

Jacques Bonifay (MVNO Association) welcomed the possibility to have an ETNS number range which was useful for the MVNO business model. However, this was only the first step. Those numbers need to be implemented by each operator so that they are reachable. This is a real current problem, especially for SMS. He also stressed that the European number range should have a low MTR.

Maarten Hogewoning (RIPE NCC – regional internet registry) noted that there were generally two purposes for numbers, to identify source and destination. He asked for the views of panellists on the balance between these, bearing in mind that IP addresses are dynamic whereas E.164 numbers are static. Which should get priority or should 2 overlapping solutions be developed?

Edgar Aker (FTTH Council) asked via Twitter whether different service quality was needed for different types of IoT services

Tanguy van Overstraten (Linklaters) referred to Q5 of the BEREK consultation, relating to data protection. He noted that Directive 2002/58 is a very sector-focused document whereas the general regulatory philosophy is that regulation should be technology-neutral. He believed that the Directive should be revised so that companies avoid being caught by 2 potentially contradictory set of rules.

On the current draft Regulation, he thought that the document approved by the Council embedded a business-focused approach which however had been delivered partly at the expense of harmonisation. He pleaded for a greater degree of harmonisation in the final text.

Mr Sciacchitano now invited the panel to respond to comments from the floor.

Referring to data ownership, **Ms Kutterer** reiterated that this would be a key new issue. She noted that this raised issues not only about data protection but was more closely associated with civil contract law. IP law is another relevant area. It was not clear to her how the Database Directive would apply in an IoT environment; it had certainly not been drafted with this in mind. This point should be considered as databases are the backbone of data analytics. It is a separate issue from use of personal data because most IoT data analysis does not involve personal data.

The forthcoming revision of the e-Privacy Directive was going to be an important matter. While some stakeholders are arguing for abolition, she thought that general data protection legislation does not cover correctly all of the IoT scenarios. In general, she was also concerned about overlapping and potentially contradictory laws. She called for caution in extending existing legislation to new areas. Other regulators would be considering the same issues from different perspectives. All the relevant issues needed to be brought together.

Responding to Prof. Hoeran, **Dr. Schwarz-Schilling** confirmed that BEREC did not think that the burden of electronic communications legislation should automatically fall on IoT providers, for example in the case of connected cars.

Dr. Pepper also stressed that automatic extension of existing regulation to supposedly similar new services should be avoided and that a broad view needed to be taken. He closed by raising the example of opt-in/out for data from the connected car. Opt-in might be impractical while opt-out could in some instances raise severe safety implications.

Mr Sciacchitano thanked all the speakers and looked forward to stakeholder contributions to the questions raised by BEREC.

Session 3: The digital ecosystem: challenges and opportunities in Europe

Introducing the session, **Mr Kevin O'Brien**, BEREC Vice-Chair (ComReg), said that it was appropriate to have a session with a very broad view of the future digital ecosystem. It was useful to think about the regulatory implications of that ecosystem, even though regulators may play only a small part in its development. He briefly mentioned the panellists for the session, one of whom could give a horizontal view while the others brought specific and diverse industry perspectives. Finally he handed over to Philippe Defraigne of Cullen International to moderate the session .

Mr Philippe Defraigne added that while connectivity is key, storage, analytics and presentation are all required to deliver the transformational effect we expect from ICT. He then handed over to the panellists.

Leonard Calì (AT&T)

Mr Calì began with a prescient quote from Nicola Tesla dating from 1926

"When wireless is perfectly applied the whole earth will be converted into a huge brain. We shall be able to communicate with one another instantly, irrespective of distance, and the instruments through which we shall be able to do this will be amazingly simple compared with our present telephone."

Mr Calì added that it is the network which makes this work since devices and people communicate through the network. The handset will be the vehicle for all human interaction, for speech, text, monitoring and activating the devices.

There has been very strong growth in the wireless space; connectivity, mobile video, penetration and revenue have all grown rapidly and are projected to continue to experience dramatic growth. In the US, over \$1.3 trn has been invested in broadband networks over the last 15 years. People may have been lulled into believing that growth is inevitable and that such investments would automatically continue. But the growth has resulted from a number of specific factors, including a light touch regulatory regime. He wondered whether future growth was inevitable in US or Europe or whether they would be slowed inadvertently by inappropriate public policies. He had selected 4 trends which he thought would shed light on these questions.

Video provides the first trend. AT&T had invested heavily through its acquisition of the broadcast satellite provider DTV. Video revenues help pay for broadband connectivity, especially in the US where customers prefer to buy TV in bundles with broadband and tend to use packages of pay TV with OTT video. Video is more than entertainment. There is an explosion across the AT&T network and it accounts for about half of total traffic today. Aside from entertainment, it facilitates applications as diverse as home security, babycams, eldercams and business video conferencing. It is obviously demanding of capacity and speed; for some applications, latency and jitter are important. AT&T believe that customers will choose to create and consume ever more video and so providers must be able to meet these needs. For this, they need the flexibility to find business models to support the necessary investments in network upgrade.

The second trend affects the core network and is a trend towards software-defined networks. He felt this was not especially well understood in regulatory circles. The world is moving from a network of telecoms specific hardware to one defined by software. Today 5% of AT&T traffic runs over software-defined networks; they hope for it to be 75% by 2020. This will allow for far greater responsiveness to customer needs and for faster deployment of new services. It amounts to innovation at the core of the network, not at the edge where it is usually expected, especially in the regulatory arena. It confirms further blurring of the lines between traditional telecoms providers and OTT providers. This probably made AT&T's network and that of, for example, Google look increasingly similar as software-defined networks are increasingly deployed.

On IOT/M2M, he echoed earlier comments that it is necessary to avoid the temptation to apply old rules to new services automatically, without justification. This is especially true for the devices that need a SIM or wide area connectivity. Sometimes, connection will be needed over the commercial mobile network. Such networks require large investments to interface with customers. The most efficient way to operate these devices is seamlessly across national boundaries, maximising economies of scale. Substantive regulatory rules, such as privacy rules, should be applied in such a way that they do not undermine efficiency in the operational enablement and deployment of the devices.

His final trend related to 5G. There was a lot of interest in this but, so far, it is nascent. It will significantly increase speed and capacity and will probably support IoT more than anything else. It seems likely to be used over licensed, shared and unlicensed spectrum and the device and function will determine how it is used and provisioned. The industry will invest in 5G because customers expect it and would otherwise take their custom elsewhere. But public policy and regulation will have an impact on deployment. Additional spectrum will be needed, licensed, unlicensed and shared, probably below and above 6Ghz. Innovation and investment can be fostered by avoiding regulatory limitations on use. So, for example, short license terms of up to 10 years without a renewal expectancy will limit investment. It is also essential to have commercial flexibility to exploit spectrum to the maximum extent.

He finished by showing a list of unresolved regulatory issues, starting with Global SIM, probably not an issue in Europe, and numbering, already discussed by earlier speakers. Some countries impose a tax per SIM which will disincentivise embedding of IoT applications. This is an example of a model from the voice world which does not translate well to the world of IoT.

Responding to a request from Mr Defraigne to explain the term “dual regulation”, he said that it applied to the situation where more than one authority had oversight of an issue, as in the US where the FTC and FCC had overlapping jurisdiction. Such situations had the potential to give rise to considerable cost and uncertainty and the overlap needed to be carefully managed.

Carlo d'Asaro Biondo (Google)

Mr d'Asaro Biondo starting by noting that industry boundaries are blurring. He exemplified this by referring to a partnership between Google and Sanoff to develop devices, such as a soft contact lens, which would monitor health parameters automatically and provide a real-time alert of the need for medical intervention.

He believed that telcos have unique characteristics which permit them to be at the centre of these developments. For example, they are trusted by customers, their networks allow good quality connectivity, they have call centres and billing systems. There are innovative developments in a number of sectors. This activity creates economic value and jobs while raising issues for regulators. Giving another example, he mentioned the connected car where 30 manufacturers are now working with Google on Android applications. Most applications could in principle be run from a smartphone but where

successfully embedded in the car, this brings potential benefits in terms of security, safety and ease of use.

New services require co-operation of players across traditional industry boundaries. It is not clear or especially useful to consider which industry is working in the other's space; there is movement from both directions. Further examples of new services were of a ballerina wearing a sensor during training which allowed her activity to be monitored remotely and the smart city where the aim was to use real-time data and connectivity to manage traffic and reduce congestion and delays. Without blurring of the various industries, progress would be constrained.

Today the app economy in Europe is about \$17bn, with up to 1.4m people developing the apps. It could account for \$60-80bn economic value within 5 years, with a commensurate growth in jobs. These jobs will not only require traditional telco and internet competences but also competences across industry sectors. It is not clear yet which types of industry will bring those apps to market. If telcos do it, they may be able to commercialise it faster than others and disseminate the benefits more quickly.

Companies such as Google have to innovate constantly because customer habits and needs evolve continuously. In the 10 biggest countries of the world, there are now more internet searches via smartphone than via PC. This is important because, when using a mobile phone, people search in a different way. This requires services adaptation by Google in order to survive. Customers no longer tend to use Google for product searches – that business has moved to platforms such as Amazon. Changes such as this often seem surprising. They give rise to the necessity for Google to deliver more “push” services, anticipating customer needs, rather than relying on traditional “pull” services.

Returning to jobs, he said that Europe would not have enough skilled people for the jobs required by 2020 to create all the apps envisaged. So Google decided to launch a programme, with support from governments and others, aimed at developing the necessary skills in 1m people.

He concluded with the message that the internet economy is creating opportunities to access information, and creating wealth and growth in ways which were not previously possible. Jobs will change but he was in no doubt that net jobs would be created. It was the responsibility of all to create an economy where jobs can be created everywhere, where creation of new services is facilitated and where all players in the value chain respect the rules, act competitively and thereby contribute to maximise economic growth.

Jan Farjh (Ericsson)

Mr Farjh started with a few examples of what is and would still be important in the mobile industry, while noting that there would be changes in future. Innovation, experimentation and competition are all vital for progress. It is key that regulation should not point to a particular technological direction. Although there has been tremendous growth in the mobile industry, there is more growth to come – mobile broadband subscriptions will grow, as will mobile and fixed traffic. That has implications for both current

and future networks. Mobile services ought to be accessible everywhere; it would be a great achievement that, within 5 years, almost the entire world population is expected to be covered by GSM, CDMA or LTE systems. It took 10 years after GSM service started to reach 1 bn subscribers, which was rapid when compared with the 100 years it took to connect 1 bn subscribers to the fixed network. But since 2010, around 5 bn subscribers have been added. He anticipated in the medium term 100 bn connected devices which provides both major opportunities and major challenges. Although 70% of mobile phones will be smartphones, there will be a very large number of devices which are not very smart.

So far his remarks had been about 2G, 3G and 4G. 5G would bring many new types of service which barely exist at the moment. He thought it inevitable that new industries would access the network, bringing new requirements to the network. Networks must therefore be flexible and adaptable for the future. It was necessary to consider not only wireless issues but also transport, access, cloud infrastructure, new applications and management of the systems. Security and design of network for a sustainable world needed to be considered from the start.

Standardisation would take place not only in the traditional wireless forum but also in many other bodies. The mobile industry needed to keep abreast of this.

Connected sensors needed to be cheap and to have good coverage but do not normally transmit data frequently or in great volumes. In other cases, there needed to be instant responses, very high speeds and data rates. The network needs to deal efficiently with these disparate needs. He showed a slide illustrating at a high level different applications, different industries connected to different clouds, all facilitated by a flexible high-performing network which delivered the right requirements at the right time. Looking ahead, he summed up by saying that the networks had to be able to respond to disparate demands instantaneously at the right quality. It will need to be programmable so that it can be adjusted to different circumstances at different times. Use of media services over mobile networks will grow. Performance and capacity will be key issues. Security and privacy will be very important. More spectrum will be needed. The industry recognised this to be a scarce resource and is already developing ways of using it more efficiently.

Prof. Thomas Hoeren (University of Munster)

Prof. Hoeren concentrated his remarks on the BEREC paper on OTT services. He noted that the BEREC paper paid a lot of attention to definitions but he felt this was not very productive. The key question was whether or not OTT services should be treated as ECS. BEREC also laid some stress on proportionality, as was traditional under public law. But Prof. Hoeren felt this did not take the debate forward. He next considered the term 'equivalence', noting that this obviously did not mean technical equivalence. Again this did not focus interpretation very much. Similarly, objectivity was an obvious aspiration but not a well-defined concept.

Prof. Hoeren had not found much in the BEREC paper about legitimate interests which he considered to be a pre-requisite for formulation of regulations. There had to be analysis from an economic perspective; law and economics needed to be brought together.

BEREC had identified that the issues to be addressed at present by regulators concerned only those services which competed with ECS. But he felt national regulators were not the right group to consider problems of competition and markets; competition authorities are better equipped for this.

Prof. Hoeren noted that BEREC had referred to the danger of regulating too soon and he stressed the virtue of non-intervention in the absence of a clear need. He observed that if M2M communication is not regulated under telecoms law, then the importance of NRAs would be diminished.

Mr Defraigne now picked up various general themes from the speakers' remarks and asked them to comment further.

Partnerships between telcos and other industries

Mr Cali did not think it especially useful to talk about partnerships. Rather, there was an eco-system with mutual interdependencies. He considered that those who do not support openness are killing their own business. Networks should be open to carry the traffic that customers want, thereby driving value over the network.

Mr d'Asaro Biondo considered that the issues which commonly arise in partnering other industries were trust, stability of the relationship, and stability of conditions over time. Business models are often under development before the partnership is established. The instability in the economy makes it difficult to build trust.

Mr Cali did not think there were cultural barriers to co-operation with other industries, certainly not at Google. He stressed the importance for all players to have freedom to innovate in the rapidly changing environment. Ex-ante regulation could restrict such opportunities as companies would be concerned about their ability to make a reasonable return. Competition law would ensure that there were no abuses. Mr Farjh thought that there are no real obstacles to collaboration but companies had not had to do it until very recently.

Specialised services

Mr Defraigne she he had experienced difficulty trying to explain the concept of specialised services to those who were sceptical that it had any relevance. He asked whether Google would need specialised services, for example for the driverless car.

Mr d'Asaro Biondo did not understand the concept and therefore could not answer the question directly. By contrast with Prof. Hoeren, he thought definitions are important, as otherwise terms would mean different things to different people in different environments. He said that he believed it necessary that telcos should be in a position to provide something more than connectivity and that the meaning of

connectivity will change in situations where the world is evolving fast. Mr Defraigne confirmed that was a good answer to his question.

Legal concepts

Mr Defraigne asked Prof. Hoeren whether all the necessary legal concepts had been developed and were well understood.

In reply, Prof. Hoeren highlighted 3 issues. First, the mindsets of OTT players and telcos are different. OTT players expect to be unregulated whereas telcos, at least in Europe, expect to be bound by a strict core of rules. That led directly to his second issue, the question of who, in a collaboration was responsible for ensuring the rules were satisfied.

Third, OTT players often thought that the concept of markets was irrelevant to them, in particular if they were providing services free of charge. They did not necessarily recognise that such behaviour could be considered to be abusive under competition law. He thought that new models of markets were needed so that companies could recognise the true economic impact of their actions.

Mr d'Asaro Biondo did not recognise the concern Prof. Hoeren had about company ignorance of their obligations under competition law. He also observed that while OTT companies may be unused to regulatory constraints, they had always faced many commercial constraints deriving from the needs and interests of their customers. He recognised that OTT companies had one advantage over others in that they were unconstrained by legacy thinking and processes. But he insisted that they fully recognised the economic value and impact of the services they deliver.

Motivation for investment in 5G

Mr Defraigne wondered whether companies would be investing in 5G if they did not fear that their competitors would gain an advantage if they did not.

Mr Farjh said that a lot could be done with current systems and that their performance could be improved. Nevertheless, in order to maximise company growth prospects, it was necessary to address the use of networks by other industries. 5G is needed for that.

Mr Cali broadly agreed. He thought that the new requirements gave a positive reason to invest. The defensive considerations led to the same conclusion but they were not the prime motivation.

Standardisation

Mr Farjh wanted to make a point about standardisation, in the sense of agreement on a specification. He pointed out that there are many different ways to achieve that, for example via ETSI, 3GPP, IETF or Open Source. It would not have been possible for the mobile industry to gain 7 bn subscribers today without global standardisation and globalised harmonisation of frequencies. In that case, there would have been no ecosystem for terminals or networks. He observed that the different standardisation for a

work in different ways – for example, 3GPP processes lead to a specification while IETF delivers protocols – but they all do good work. He stressed that there is increasing need for co-operation between different industry segments in the various fora.

Mr Cali had a different point about 5G standardisation. He thought that the market players and fora would deliver the necessary standardisation. Government intervention would not bring forward deployment but he was nevertheless detecting signs that some governments thought they had a significant part to play in the standardisation process. He thought that governments would do better to concentrate on defining the right regulatory framework to facilitate commercial success.

Capital expenditure

Mr Defraigne observed that US network investment per head was running at double European levels and asked for an explanation.

Mr Cali identified 4 factors, each of which he thought gave the US an advantage. The first was in competition, genuine facilities-based competition in particular. Regulatory-contrived or resale competition would not necessarily driven investment. The second was spectrum. The fact that FCC had jurisdiction over all US spectrum was an advantage for the market. Also, the expectation, under the US regime, of spectrum license renewal was very important. Third, tax rates and depreciation treatments have an effect on investment and capital policy.

Mr Cali went into more depth on his fourth factor, light touch regulation. It is critical to understand that regulation can inadvertently suppress investment. Regulation necessarily imposes costs and can distort a playing field. When considering whether or not to deploy a new technology, it is sometimes unclear whether a return can be expected from it, depending on the regulatory stance taken. Lack of clarity over whether or not a service meets regulatory requirements reduces the chance that it will be deployed. Regulation may also sometimes preclude, intentionally or inadvertently, a telco from entering certain markets. Finally, regulation invariably takes time and the internet moves fast.

Regulation to protect consumers was certainly necessary. But it should be justified from a zero base, rather than built on legacy approaches. It should be applied uniformly without regard to technology or operator.

Mr Cali observed that, 15 years ago, the US had made a conscious and wise decision to deregulate advanced services. He believed that had delivered a flood of investment. The climate had now changed and there was concern in the US about whether OTT companies were going to be dragged in to utility-style regulation.

Availability and quality of European telecoms networks

Mr d'Asaro Biondo noted that regulation had done a good job of promoting competition in Europe. This

had empowered consumers and prices are lower than in the US. However, the world had moved on and it was now appropriate to ask what regulatory framework is needed today. He pointed out a common misconception that OTTs free-ride on the heavy investments of telcos, making few investments themselves. In fact, 90% of data carried by Google to customers was over their own network. Probably, Google invested a greater percentage of its turnover than a typical telco, for example on data centres and software which was equally relevant to delivery of advanced services to customers. Data centres brought information closer to the customer, thereby significantly reducing the load on networks and the need for network investments. So OTT investments are complementary to telco investments and public policies for promotion of investment, while certainly vital for telcos, are equally important for OTT providers. This made the role of the regulator more complex.

Prices

Mr Cali sought to correct a misconception about US and European pricing. He thought recent studies had undermined the notion that prices were lower in Europe. First, it was necessary to make like for like comparisons. For example, comparing prices for LTE services with those for 3G services hid a quality difference. Sometimes, video was bundled, there were tax differences and so on. It was also important to compare the value per dollar paid. He noted the US and Korean customers consumed more Gbits per person than in other regions. That gave a real measure of value received.

Realistic expectations of European telcos.

Mr Defraigne noted that some said that European telcos were in danger of becoming mere utilities. Other commentators thought they should raise their ambitions, even to the extent of becoming the next Facebook. He wondered what was realistic.

Mr Cali noted that AT&T was proud of being thought of as a broadband company and perceived no stigma to that. Telcos have assets and strengths which are crucial, for example security. In this way, telcos provide added value in their offerings. The ability to track and analyse data from millions of customers is also vital. In any case, talk of utilities is misguided. IP networks are not dumb pipes. They require constant innovation and investment.

Mr d'Asaro Biondo thought that telcos should regard themselves as distance service providers which they were in a unique position to do.

Mr Farjh noted that service and application development by telcos had been cumbersome. But in future, networks would be programmable and would support services for different industry sectors and there will be new ways of looking at innovation and application of services. Regulation must facilitate this. He reiterated the need for networks to be flexible, to be open to other industries and to be capable of speedy upgrade. All this had to be built in to the standardisation process. Speed of introduction was important.

Obstacles to speedy development

Mr Defraigne asked what were the biggest obstacles to speedy introduction of new services.

Mr Cali thought that the need for spectrum could prove an obstacle. Inappropriate regulation could be an obstacle to flexibility which, as mentioned earlier, would be a pre-requisite of success.

Mr Farjh added that there are different regulations in different countries, notably in other sectors where there was a large potential for innovative services, for example power and transportation

Interoperability

Mr Defraigne asked about the need for interoperability which in turn might imply use of mandatory standards.

Mr Farjh noted that global operation demanded a common set of standards which were currently being defined in the various bodies. He recalled that interoperability had been important for global roaming and thought its importance would continue.

Ericsson made considerable use of open source software and were instrumental in setting up a new industry forum in development of open source network standards. They were trying to use the fruits of open source developments to the maximum extent, even though it was necessary to integrate it and have a common set of interfaces and functions. Ultimately however, companies needed to differentiate themselves to be profitable.

Mr Cali pointed to the example of the internet where global standards had been developed through market forces.

Enduring bottlenecks

Mr Defraigne now asked for contributions from the floor on whether there were any enduring bottlenecks for the regulators to be concerned about, apart from spectrum and the copper loop.

Mr Tony Shortall said that content was another obvious candidate. He echoed the point expressed earlier that regulatory forbearance should be practised unless the existence of an emerging bottleneck was clear. There was a link with market definition, as the experience some years ago of the debate over new and emerging markets had shown. It was clear that if a market had not stabilised sufficiently to be defined, there was no question of a bottleneck.

Ms Erzsebet Fitori (ECTA) stressed that the bottleneck was not just the copper loop but the whole of the local access network, fibre or copper. She pointed out that in Europe, the regulatory model of opening up the enduring bottleneck, the fixed access networks, to competition had produced a win/win situation – falling broadband prices, increased speeds and addition of other services to bundles, all of which had been instrumental in driving growth. The very high level of broadband take-up (73% in 2014) has increased broadband revenues which almost doubled between 2011 and 2015. Revenue from

traditional voice and SMS may be decreasing but these are hardly the killer apps of the 21st Century. Access to internet networks were very clearly a bottleneck in Europe which would not go away. The economics of network duplication will not change, irrespective of whether the network is copper or fibre. Three parallel networks are economically viable only in extremely limited cases. Most places cannot expect more than one telecoms network and, perhaps, one cable network. She noted that there was significantly less deployment of cable in Europe than the US. She considered that there was persuasive evidence that European access regulation has been a key enabler of investments by challengers. They have themselves invested significantly in fibre and have triggered, through competitive pressure, investments by incumbents. Moreover, investments in networks were only part of the story. Investments could be made in other areas, for example handset subsidies, all of which helped to build the market. Ms Fitori noted that the dynamic of incumbent investment triggered by challenger investment was not confined to Europe. Where Google had deployed fibre in the US, this forced incumbents to respond to that deployment. But in Europe, access regulation has been key to promotion of this virtuous circle. Investment levels have consistently increased. NGA coverage was now 68% and 80% FTTx coverage is expected by 2020 under a very competitive environment. The US is expected to have less coverage under its current regime. It was admittedly ahead in deployment of next generation cable but this could be explained by a historically larger footprint.

Mr Cali thought it inappropriate to assume that bottlenecks would endure. This should be established by examining the facts. Over-focus on bottlenecks could lead to an explosion of regulation – not only for network infrastructure but also for operating systems and search engines, for example. He thought that over-regulation in Europe had already depressed investment. Unbundling models required the regulator to set an access price and this was extremely difficult to get right.

He was unfamiliar with the study which suggested that FTTx would be less extensive than in the US but would be content for the case for regulation to be determined by the facts. Where there was evidence of multiple networks, competition should be left to market forces. In many markets in the US, both in urban areas and outside, there were competing networks. Typically, throughout the US, you could expect two fixed networks, four to six wireless networks plus satellite networks. This did not look like a bottleneck to him.

Process for defining regulation

Mr Defraigne asked whether, in the event that policy-makers decided that regulation was necessary, the NRAs should be empowered to define the detail or whether this should be determined by the political process. He thought there was much to be said for empowering the NRAs.

Mr d'Asaro Biondo said this was not a question for the industry. Others decided the rules and appointed the referee. Industry's duty was to reflect the rules laid down.

Other points

Tom Kiedrowski (Cedar Tree Advisory Service) asked what the panel thought about volumetric charges and whether the apparent tendency of incumbent CEOs to favour them was an example of thinking like a utility.

Mr Cali thought that companies should have the flexibility to find the right model. Sometimes this would be volumetric, sometimes it involved making services available free of charge.

Mr d'Asaro Biondo thought it odd to penalise customers who want to use a company's services most. The winning companies are those who focus on customer needs and are not solely obsessed with their own.

Vesela Gladicheva (MLex) asked for clarification under which of BEREC's categories of OTT service Netflix would fall. Prof. Hoeren considered that this would be an 'OTT 2' service which would not therefore, according to BEREC, justify regulation under the Framework. It was not an ECS service; nor did it compete with one.

Domagoj Jurjevic (Croatian Regulatory Authority) followed up by asking whether regulation might be justified if a Netflix-style service were offered by a telco, especially if the offer included premium content. Prof. Hoeren said that an analysis would be needed of the facts of the case; there was no universal answer. A careful competition analysis would be a pre-requisite to deciding whether there was a problem to solve.

Ms Gladicheva also asked about Google's motives and expected timeframe in respect of its plans for collaboration with European telcos.

Mr d'Asaro Biondo commented that Google's motivation was, first, the realisation that it was not practical to try to do everything itself, especially in order to bring innovative products to the market quickly. Second, Google was convinced that they could achieve more by exploiting the strengths of the local economies. But they do not have the resources to stimulate local companies to adopt services which develop the local economy. Telcos are better positioned for this.

Johannes Theiss (German Broadband Association) commented that OTT providers such as Facebook or Skype were not building significant networks in Europe. So any competition involving OTT providers was necessarily service competition and those providers were irrelevant, from the point of view of network regulation. He stressed the necessity of distinguishing between network and services competition. He noted that 75% of US consumers have no effective choice of broadband service provider. In his view, Europe compared well.

Mr Defraigne closed the session by praising the panel for their excellent contributions.

Closing Remarks

Closing the Forum, Prof. Barros expressed the gratitude of BEREC for all the contributions. The objective of the afternoon session had been to get away from the usual questions and look to the future. BEREC understood that some wanted more regulation, some wanted less while others simply wanted to be exempted from regulation. But all had the common goal of serving customers, citizens and business. It was important to BEREC to debate the issues widely so as to find a reasonable way forward. Prof. Barros stressed the need for further contributions to the debate in other events and for written contributions to BEREC consultations. She looked forward to the corresponding Stakeholder Forum in 2016 when there would probably be more clarity regarding the review of the Framework.

Brussels, 15 October 2015

Table of Contents

Introduction and participation	1
Items discussed	2
Opening Remarks – Prof. Fatima Barros, 2015 BEREC Chair	2
Session 1: BEREC Draft Work Programme 2016.....	3
The key messages conveyed during the first session of the first meeting of the BEREC Stakeholder Forum (in order of presenting) are the following:	4
Guillermo Beltra (BEUC).....	4
Matthias Kurth (Cable Europe).....	4
Alexandre de Streel (CERRE).....	5
Ines Nolasco (ECTA)	5
Francesco Versace (ETNO)	6
Edgar Aker (FTTH Council)	6
Daniel Pataki (GSMA).....	7
Danielle Jacobs (INTUG).....	7
Jacques Bonifay (MVNO Association).....	8
Speakers representing an individual company:	8
Ralf Nigge (Deutsche Telekom)	8
KEYNOTE SPEECH – Mr Gunther Oettinger, EU Commissioner for Digital Economy and Information Society	9
Session 2: Internet of things (IoT) and Machine to Machine (M2M) communications including BEREC consultation on M2M.....	11
Goran Marby, BEREC Vice-Chair (PTS).....	11
Dr. Cara Schwarz-Schilling.....	11
Mr Francesco Sciacchitano.....	12
Dr. Robert Pepper, Chief of the Global Technology Team at CISCO	13
Cornelia Kutterer of Microsoft	14
Contributions from the floor.	16
Session 3: The digital ecosystem: challenges and opportunities in Europe	18
Kevin O'Brien, BEREC Vice-Chair (ComReg).....	18
Leonard Cali (AT&T).....	19
Carlo d'Asaro Biondo (Google).....	20

Jan Farjh (Ericsson)	21
Thomas Hoeren (University of Munster)	22
Closing Remarks	30
Annex	33

List of Organisations
represented at the 3rd BEREC Stakeholder Forum Meeting
15 October 2015, Brussels

Nº	Country (if applicable)	Organisation (full name)	Abbreviation
1.	Austria	Austrian Regulatory Authority for Broadcasting and Telecommunications	RTR
2.	Belgium	Belgian Institute for Postal services and Telecommunications	BIPT
3.	Croatia	Croatian Post and Electronic Communications Agency	HAKOM
4.	Cyprus	Office of the Commissioner of Electronic Communications and Postal Regulation	OCECPR
5.	Czech Republic	Czech Telecommunication Office	CTU
6.	Denmark	Danish Business Authority	DBA
7.	Finland	Finnish Communications Regulatory Authority	FICORA
8.	France	Autorité de Régulation des Communications Electroniques et des Postes	ARCEP
9.	Germany	Federal Network Agency	BNetzA
10.	Greece	Hellenic Telecommunications and Post Commission	EETT
11.	Hungary	National Media and Infocommunications Authority	NMHH
12.	Ireland	Commission for Communications Regulation	ComReg
13.	Italy	Autorità per le Garanzie nelle Comunicazioni	AGCOM
14.	Latvia	Public Utilities Commission	SPRK
15.	Lithuania	The Communications Regulatory Authority	RRT
16.	Liechtenstein	Amt für Kommunikation	AK
17.	Luxembourg	Institut Luxembourgeois de Régulation	ILR
18.	Norway	Norwegian Communications Authority	Nkom
19.	Poland	Office of Electronic Communications	UKE

Nº	Country (if applicable)	Organisation (full name)	Abbreviation
20.	Portugal	Autoridade Nacional de Comunicações	ANACOM
21.	Romania	National Authority for Management and Regulation in Communications	ANCOM
22.	Slovenia	Agency for Communication Networks and Services of the Republic of Slovenia	AKOS
23.	Spain	Comisión Nacional de los Mercados y la Competencia	CNMC
24.	Sweden	Swedish Post and Telecom Authority	PTS
25.	Switzerland	Federal Communications Commission	ComCom
26.	United Kingdom	Office of Communications	Ofcom
27.	USA	Federal Communications Commission	FCC
28.		European Commission	EC
29.		Office of the Body of European Regulators for Electronic Communications	BEREC Office
30.		IRG Secretariat	IRG
31.		European Consumer Organisation	BEUC
32.		Axon Partners Group	
33.		BELTUG	BELTUG
34.		Bonanova	Bonanova
35.		BOUYGUES Telecom	BOUYGUES
36.		BT	BT
37.		BREKO German Broadband Association	
38.		Cable Europe	Cable Europe
39.		Cedar Tree Advisory Service	
40.		Cellnex Telecom	
41.		Centre on regulations in Europe	CERRE
42.		Communication Services Tele2 GmbH	Tele2
43.		Cullen Internationals telecom	CULLEN INT
44.		CISCO	CISCO

No	Country (if applicable)	Organisation (full name)	Abbreviation
45.		Deutsche Telekom AG	Deutsche Telekom
46.		European Competitive Telecommunications Association	ECTA
47.		Ericsson	
48.		European Telecommunications Network Operators	ETNO
49.		European Communications Office	ECO
50.		Europolitics	Europolitics
51.		EUD	EUD
52.		Pan -European association of the ISP associations of the countries of the European Union	Euroispa
53.		Europlan UK	
54.		Exane BNP Paribas	
55.		Fastweb SPA	
56.		FTTH Council Europe ASBL	FTTH Council
57.		Google	Google
58.		GSM Operators' Forum	GOF
59.		GSMA Europe	GSMA
60.		Hubble bvba	
61.		Hutchison Europe	Hutchison Europe
62.		International Telecommunications Users Group	INTUG
63.		Institute for Information, Telecom and Media	
64.		INTUG	INTUG
65.		Kreab Gavin Anderson	KGA
66.		Liberty Global	Liberty Global
67.		Lysios Public Affairs	Lysios
68.		Link Laters	Linklaters
69.		Microsoft	Microsoft

No	Country (if applicable)	Organisation (full name)	Abbreviation
70.		MLex Marker Insight	Mlex
71.		MVNO Europe	
72.		N-square Consulting	
73.		Orange	Orange
74.		Rewheel	
75.		RIPE NCC	
76.		RTL Group	
77.		Sigfox	
78.		Starhomemach	
79.		Stokab	
80.		STRATEGIS COMMUNICATIONS	
81.		TDC	
82.		Telage	
83.		Tele2 Group	
84.		TELEKOM AUSTRIA GROUP	
85.		Telecom Italia	
86.		Telefonica	
87.		Telenor	
88.		Telecommunication Regulatory Expertise Europe	T-REGS
89.		Association of Telecommunications and Value-Added Service Providers	VATM
90.		Verizon	Verzion

№	Country (if applicable)	Organisation (full name)	Abbreviation
91.		Vodafone Group	Vodafone
92.		Wissenschaftliches Institut für Infrastruktur und Kommunikationsdienste GmbH	WIK
93.		WIND Telecomunicazioni-Wind Italy	Wind

15 October 2015