

Full Transcript
of the statements made during
the 3rd BEREC Stakeholder Forum Meeting

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(9.30 am)

Opening remarks - Fatima Barros, 2015 BEREC Chair

FATIMA BARROS: Ladies and gentlemen, good morning. I'm delighted to welcome you to our Third Stakeholders' Forum and I'd like to thank you for accepting the invitation to be here today with us and to participate in debate that as you know is very important for BEREC.

The stakeholders' forum were created with the idea of opening the door of BEREC to the stakeholders in order to create a platform for dialogue, and I hope that during this day we will be able to exchange views, not just in what is our work programme for the next year, but specially also to listen to your ideas on what the future of the regulation will be, and especially what will be the big changes that we will face in the future.

I would like to start by expressing my gratitude to all colleagues that made this event possible. Firstly, I would like to thank my colleague and Vice-Chair of the board, Kevin O'Brien, and his team who have organised this forum. They have been working very hard and very successfully because they were able to gather a very impressive number of guest speakers of very, very high quality.

I would like also to thank the BEREC Office which has provided support in terms of logistic and administrative support, and this is really important for us and for the success of the forum.

But let me speak to you a little bit as Chair of BEREC and remind you that BEREC is highly committed to ensure the independent, consistent and high quality application of the regulatory framework for the benefit of Europe and its citizens.

I would like to also highlight the main strategic priorities for BEREC. This is for the period 2015-2017, but of course this doesn't have a term.

We base our priorities on the promotion of competition and investment, promotion of the internal market, and empowering and protecting end users. I like to recall these principles from time to time because we cannot forget what our regulation is about.

This is particularly important in a quite inspiring period like the one that we are living today. Developments in technology, in the electronic communication markets, as well as a continuous change in the consumers' needs, expectations and behaviours, are affecting all sectors of the economy and society. The evolution of the Internet and Internet-driven services mean that some services will increasingly become available independently from

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.

It is thus crucial that electronic communication operators have to be prepared to play an increasingly important role as lifestyle providers, to ensure that its services remain available 24/7 and are fully secure, in this way complying with the consumer needs which will become more stringent in the coming years.

We know that new business models will emerge. We know that the sector will be very different from what it is today, and this is what we would like you to share with us your views on the future.

Our mission today is to reflect on the changes and challenges brought by this new digital ecosystem, and it's relevant to see that the participation in BEREC events like this one is increasingly reflecting the assortment of players that are present in this ecosystem.

The same goes for this year's stakeholders' forum programme. You might notice that we have changed a little bit the way we organise the forum, inviting people from different parts of the world in order to give us a different perspective and to bring different inputs for our discussion.

We will start as usual by presenting the BEREC Draft Work Programme 2016 that is right now under public consultation until the end of the month, and of course we would like to invite you to participate in the public consultation and to submit written comments on this.

You might understand that, as Wilhelm will present later, the work programme for next year will be pretty much focused on the regulatory framework review.

But after the presentation of the work programme and the coffee break -- in between Commissioner Oettinger will join us for a brief intervention. There was a change in the schedule of the schedule. Then we'll have a discussion on something very important for the future as well, Internet of Things and Machine-to-Machine.

In the afternoon we'll have an important discussion on the digital ecosystem that has been built and the challenge and the opportunities for Europe which might result from this new digital ecosystem. For this we have some guests coming from the US that will share with us their perspectives on this, and so we can bring the two perspectives, the European and American, together.

I would like also to take this opportunity to stress out that BEREC is currently drafting an opinion on the review of the regulatory framework as requested by the

European Commission. This meeting and your contribution to the debate will be extremely important as inputs to build up the BEREC views on the issues under discussion.

Of course the digital single market initiative and the discussions around this strategy has marked this year. BEREC has welcomed this initiative, particularly sharing the acknowledgment that telecommunications represent the backbone of digital products and services, and appreciating the recognition of the key role of the demand site that sometimes was forgotten in the discussions.

To this end a review of the regulatory framework is of the utmost importance in order to guarantee that it will enable market players to flourish in an ever expanding and increasingly connected digital world, but also will not lose sight of consumer protection that is essential to increased confidence in new and innovative services. To this end BEREC and its members must always seek to pursue the most efficient, proportionate and least intrusive regulatory approaches, while looking to regulate, co-regulate or deregulate as and when needed.

I really hope that we will have a very productive meeting and that we'll all benefit from the debate and the opinions that will be expressed today here.

So I would like to again thank you for coming and for participating in this debate. You are always very welcome.

I would like now to invite my colleague and BEREC incoming Chair 2016 to present the BEREC draft work programme 2016.

Thank you!

Session 1: BEREC Draft Work Programme 2016

WILHELM ESCHWEILER: Dear all, I would like to welcome you to the BEREC stakeholder workshop as well.

Let me briefly present the draft BEREC work programme for next year and some of the hot topics that we'll continue to work on, I think, that you already had a chance to look at the draft work programme as we started consulting it right after its adoption at the last plenary.

As you all know, the BEREC regulation says that we have to set out an annual work programme. Basically, the work programme of the following year has to be adopted by the plenary at the end of the preceding year. So for this work programme it will be by the end of this year.

The reason why we run a public consultation of the draft work programme is to give the opportunity to raise your opinion and to contribute to the work programme. We believe that it helps to figure out which issues are of importance for the market and not only for us national regulatory authorities.

Several procedural steps were necessary to finally arrive at the current draft. The whole process started this spring with a comprehensive call for inputs from all NRAs.

During the course of this spring and summer, an outline of the BEREC work programme 2016 and a list of topics were discussed among the national regulators, with the aim to balance and to prioritise the issues to be included in the work programme.

After some further discussions and rearranging the topics to be included in the work programme, we finally agreed on the topics that you now find in the current draft.

As you can see, the draft follows the structure of the BEREC strategy 2015-2017. This means that the work programme from next year will continue and develop the activities that have been started in light of the three strategic pillars of BEREC's activities. That means promoting competition and investment, promoting the internal market, and empowering and protecting end users.

Since BEREC is constantly working to improve its working methods and the quality and timeliness of its output, another key area of the work programme is the part so-called quality and operational efficiency.

The main priorities for next year go along this structure and are grouped in three parts.

A clear focus of BEREC's activities next year will be the upcoming review of the current European regulatory framework for electronic communications as an important part of the digital single market strategy and the forthcoming respective legislative proposals of the European Commission.

Furthermore, our work will be significantly influenced and determined by the outcome of the telecom single market package. Various tasks are assigned to BEREC with regard to net neutrality and international roaming.

In addition, BEREC will have to deliver its valuable input to some other important work streams, and of course BEREC will continue to deliver its multi annual work streams.

With regard to the top priority of the telecoms review, let me tell you how we will organise everything.

The work programme explicitly addresses a number of topics which we consider crucial in the context of the framework review, such as oligopolies, OTT services, and several work

streams regarding wholesale access products, spectrum or the reform of the universal service.

I pick two issues which have been debated and raised diverging views in the industry, and I must say also among us national regulators.

The first one concerns oligopolies. The reason why we started this assessment is because we can observe that some markets become more concentrated. This does not mean that such markets are per se of concern, but this may be the case if the market outcome is not competitive and would lead to lessening competition, which is why we regulate telecom markets at all.

As you all know, we consulted our report on oligopolies during the summer and we will finalise it by the end of this year, but still some questions remain and need to be further discussed, such as: is it really necessary to regulate non-competitive oligopolies? If that is the case, is there scope for adapting the framework?

The other very hot topic is OTT services, where we started an assessment already this year, as you all know. This is in fact a hot topic as it involves companies which are not classic telecoms operators, but at the same time these new companies offer services which are similar to telecoms services or even may substitute them.

We have tried to outline a definition of the several OTT services that are being offered, as well as to find a line to distinguish OTT services from telecoms services. This, you all know, is part of the report which is currently under public consultation and will be finalised by the end of plenary 1 next year.

However, several issues still remain under discussion which we will feed into the review of the telecom framework.

The discussion about the framework review will have to include new trends arising from OTT services, as well as to find the right balance with regard to the scope of the framework.

The second main priority for BEREC will be the follow-up with regard to the TSM. You are aware that the TSM regulation provides for BEREC to develop guidelines for the implementation of the obligations of NRAs related to the supervision, enforcement and transparency measures for ensuring open Internet access. The net neutrality guidelines have to be produced after consultation stakeholders and consulting stakeholders and in close co-operation with the European Commission, not later than nine months after the regulation enters into force. These are the pre-conditions.

The same tasks are assigned to BEREC also with regard to international roaming. BEREC will have to deliver inputs on the draft implementation acts, on fair use policy, and

the sustainable of the abolition of retail roaming surcharges. Additionally, BEREC will finalise its report on the wholesale roaming markets.

All these work streams will be crucial with a view to a consistent application of the new TSM rules in practice, but will have to be completed within a tight schedule.

The schedule is in fact quite tight for international roaming. The implementation act on the weighted average of maximum MTR is scheduled for the end of this year. Then follows the implementation act on fair use policy and sustainability of roam like at home services which is due for the end of next year.

Time forces us and the European Commission is already beginning to work on this issue. The schedule is even tighter for the wholesale market review, which we scheduled for plenary 1 next year. This BEREC report will be an assessment of the wholesale roaming market. It's linked to the request by the European Commission about wholesale market data where we sent out a comprehensive questionnaire to stakeholders and NRAs.

The Commission expects us to provide market data by the end of this year which will feed into the wholesale market review due to spring next year. That means on ambitious time frames.

As we are talking about tight schedule, the issues of net neutrality is perfectly matching the scenery. As follow-up of the TSM agreement, BEREC has to develop guidelines for the implementation of net neutrality provisions only nine months after the entry into force of the TSM agreement.

According to the latest news, the key date of the entry into force will be Friday, 13 November. Therefore the respective guidelines have to be in place already by August next year. In light of the complex issues involved, quite a challenge ahead of us.

Against this background, the work has already started at BEREC level, and the consultation with stakeholders is foreseen for early 2016, where your expertise and perspectives will be highly appreciated.

The draft work programme includes further important work streams, such as the input to the European Commission's review of the recommendation on termination rates, the overview of the Article 7.7A cases of various workshops, for instance, on the implementation of the cost reduction directive or accessibility workshop.

BEREC will of course continue to do its monitoring exercises and multi annual work streams, especially the benchmarking of MTRs, FTRs, SMS, the internal roaming benchmark report or regulatory accounting.

So that is in brief our work programme. I want to thank you for your attention.

I am now looking forward to your comments and interventions by the invited stakeholders. Please have in mind we have an ambitious time frame. That means five minutes each. Thank you very much.

Now I want to offer the floor to the first intervention by Mr Beltra. Please.

GUILLERMO BELTRA: Hello. Thank you.

Good morning. Thank you, BEREC, once again for inviting BEUC, European Consumer Organisation, to intervene. The fact that we go first, I think, highlights the very genuine importance that you give to consumer issues, and we are thankful for that.

Before I go into the concrete issues that we are going to be talking today, I have a very quick message that I would like to pass on to BEREC and the BEREC community. That is that we as consumer organisations -- and by the way, BEUC is the largest consumer federation in Europe, we represent over 40 national consumer organisations in over 30 European countries -- we would like to work closer with you.

Enforcement is a very important priority for us and we take that very seriously. We have already had, for example, one of the co chairs of the end user working groups speaking at one of our events on enforcement issues in telecom markets, and that worked out very well.

Also, we would like to help BEREC members work closer with our members on regulatory issues. We have done that very successfully in the energy market and we think this could work as well in telecom markets. So we are open to talk about that.

Now, on BEREC's work programme, 2016 is such an important year for BEREC. There are so many consumer issues on the agenda. I liked the slogan as I came in. I saw the slogan for today's conference is "Towards competitive and user-friendly European electronic communication markets". Keywords here: "competition" and "user-friendly". I would say "consumer-oriented", but that's okay.

We will submit a few written comments to the work programme, but just let me, because I know we don't have a lot of time each to speak, give you a few comments on key highlights of the work programme that we think are important for us. The first one, of course, the review of the framework.

We cannot stress it more clearly and I think BEREC knows this very well. Competition has to continue to be the guiding principle. There is no tradeoff there. We cannot have competition be traded off against investment, for example, or for sure not against consumer protection.

On new issues that we are debating or that we recognise are very important like, for example, level playing field or level playing fields or layered playing fields like some are

saying, we are undergoing our own analysis to see what are the consumer issues there and what would be our approach to these issues, but one very important message from us: this cannot be a race to the bottom. We cannot end up with a new regulatory framework that includes now a better reflection of where are today's markets that means a race to the bottom in consumer protection. So we need you all to bear that in mind.

On the post TSM era, BEREC has such a crucial role here as well.

First of all on net neutrality, I think it is no surprise to any stakeholder today here that we are not entirely satisfied with the final deal on the TSM. It is a step in the right direction, but both on roaming and on net neutrality it's not good enough.

BEREC's role here is now crucial. First, with the guidelines on net neutrality, that is very important so that the rules that have been adopted or that are about to be finally adopted can actually be implemented in practice and mean an open and neutral Internet for all consumers across Europe.

Second, because it is also highlighted in the draft work programme that you will look into issues beyond the last mile, into issues beyond the access market, and we've always said that that is very important. The TSM regulation does not look into that, and it makes good sense for us that BEREC does, to analyse whether there are any issues that have to be tackled there.

Second, on roaming, there are implementation acts that have to be adopted by the European Commission, but BEREC's role is key there. We need you to help the Commission develop further measures that mean that the agreed deal actually means the end of roaming for all consumers.

There's a date. There's 2017 for the abolition of retail roaming. Only one year to reform the wholesale market. We understand that's a big challenge, but then again there BEREC can play a crucial role.

Last but not least, of course, at the core of our focus is the universal service directive. We will try and give all the ideas that we can come up with to try and help BEREC, the Commission, and the colleges later to update the consumer protection framework in this market to reflect today's era.

Thanks a lot and good luck with everything!

WILHELM ESCHWEILER: Thank you very much. Now I want to offer the floor to Matthias, please.

MATTHIAS KURTH: Yes, hello. Thank you, Wilhelm and dear colleagues, my former colleagues from BEREC. I'm always back again here in a way, but now I speak on behalf

of Cable Europe.

I would like to make a statement which I found in the paper of the Nordic regulators, Goran and Torstein, which I think is quite good. There is a sentence that says:

"To promote innovation and new solutions in the European digital economy, the Nordic regulators agree that the starting point should be reducing the regulatory burden where possible rather than extending the present sector's specific regulation."

I think that's a good sentence. I hope the Nordic regulators will have a common position for all of the regulators.

Now I come immediately to a hot topic which Wilhelm mentioned, the ongoing discussion on oligopolies. We contributed to that. We had a study. We gave a lot of material on that. So I will not come to the details.

But I think this discussion is a little bit controversial to what was said by the Nordic regulators because we would enlarge sector-specific regulation and not step back.

We also would go away from the general competition law. We are fine with general competition law. If there is collusion and if it's proven, there is a possibility to regulate. But why going away from principles which are developed by the European Court of Justice in Impala, in Airtours and others?

So I think they are sound, and we all know, Wilhelm, that in Germany, we have to consult our competition authority. Every decision has to go there. We still have the possibility to phase out. If we go now away only in the telecommunications sector from established principles of competition law, in our view that would not be good. Also it would have the risk to have a permanent regulation in this area.

Last point on this is: why do we focus on markets which have the best situation when it comes to broadband and investment, and also prices and competition?

In these markets I think a lot of European colleagues here would be happy if they have a situation of those oligopolies because it's much better than if you have no service.

So we can understand that there is a concern to go to rural areas or to have a specific policy for rural areas where there is no good service, but in these areas we have the best service and the best supply we can find.

Last point. I think we should not punish success stories. For example, the cable industry did a lot for reaching the broadband targets, even much above. We already offer 100 megabytes and 500 megabytes somewhere, much more than the targets are. So we are running before the needs of the consumers, and this should not be punished by changing

the rules in the middle of the game.

So our strong opinion is leave the rules like they are, stick to competition law principles, and then we are happy with that.

Next point is universal service. You mentioned connectivity targets. We are also a little bit cautious to set new targets because the whole broadband development was market driven, and if broadband targets would lead to a situation that a universal service is opened, which we avoided, by the way, in many Member States, when we always said the market forces will drive, roll out. We have now state aid rules. We have a lot of other things. Why should we have artificial other targets?

When a fund would be opened, it always ends up who is paying in the fund, who is getting out of money in the fund, why only infrastructure carriers, why not OTT who would benefit also?

So I think it's better to trust the market forces. We don't see a need for additional targets above the targets we already have.

Last point on my side would be quality of measure. Wilhelm mentioned it. It's part of the net neutrality discussion that there should be an oversight role of BEREC to develop these guidelines, how do we measure quality of service, and coming back also to consumer organisations. We have to talk about what do we really want to measure, how do we measure, and what is the best way to do that.

I think there is a danger that things could be over-prescriptive because a lot of members of us and also of suppliers, they already have an own interest to deliver good quality. The European Commission, for example, had the SamKnows study, which shows by the way that the cable companies are always on top in many of the areas.

So I think we should work close together to develop a system which is sound. BEREC should also reflect the opportunity to have a co-regulation on that because I think an oversight of existing measurements might be better than having an ambitious target to have a unified system all over Europe.

I think the perfect can be sometimes the enemy of the good. We all know that we have not enough staff and not enough head count to do everything in detail. But I assure you and I assure BEREC that we have an own interest to deliver good quality because that's a source for competition and for winning customers.

Thanks for your attention.

WILHELM ESCHWEILER: I think it's always inspiring when we get messages from Matthias and we will analyse it very carefully.

Now I want to give the opportunity to Mr Alexandre de Streel.

ALEXANDRE DE STREEL: Good morning to everyone. Thank you very much for the invitation here.

I'm representing CERRE which is a think tank based in Brussels for better regulation in the network industry. We have 41 members from regulators, operators and academics. We are running a project now that I'm directing with Pierre Larouche on the good regulatory framework for the digital union which is adapted for the app economy and the Internet society.

So we will present the project at the end of January next year, but already at this stage I think I can make five or six points. I have five minutes but I will try to make very quickly.

The first point is that clearly there is an increase of connectivity needs, and that is also mentioned very well in the plan of BEREC. So that for us means that you need to have an investment check behind every regulatory decision. It's very important that every time you check what can be the effect of investment of the decision.

On the question of investment and competition, we know it's a difficult issue. CERRE has produced recently a study on the 423(?) consolidation in the mobile, showing that there is a kind of a tradeoff between price and investment, but we will be very interested to see what BEREC will come with this post-merger study because I think this is the thing we need more, those kind of post fact studies, and that is a very interesting point.

Second point is that clearly mobile data will be key, more than ever. So therefore we cannot miss the 5G evolution.

Third point is that we are moving from a silo to layers in an extended value chain. So that should be taken into account in the regulation. That means to look at OTT obviously, but that also means to understand how privacy works, because clearly personal data is the new oil in this extended value chain and we need to understand better the economic model behind the use of personal data.

Fourth point is that clearly market and technology continue to evolve very rapidly and in an unpredictable way. So that makes the work of regulators obviously very difficult.

But that means that regulation should continue to be based on principle. I think that is a good thing that we have in the framework and that we should not change in the future. That means based on economic analysis. That means based on economic neutrality. We should keep those basic principles that we had before.

Fifth point is that clearly we see more differentiation between Member States and within the Member States themselves. So we think that the subsidiarity here should very forcefully

be applied, and that, for instance, for local infrastructure we are not sure that we need a big European harmonisation. It needs to be left to the Member States and the regulator to decide how they deal with local infrastructure.

On the other hand, for cross-border services clearly there harmonisation or at least one-shop stopping the home country control is needed.

The last point is on the oligopolies clearly we are evolving from monopolies to oligopolies. We think there that the criteria for regulation should be bottleneck. Is there a bottleneck? If yes, then you intervene. If not, then you have a lot of horizontal law. You have competition law. You have privacy law. You have consumer protection. So we don't see any need necessarily to go further.

That is where our reflection is here today. We will end up with a full report at the end of January and we hope to present to BEREC when it's finished.

Thank you very much for the invitation.

WILHELM ESCHWEILER: Thank you very much. Now I want to offer the floor to Mrs -- I hope the pronunciation is now correct -- Ines Nolasco. I'm not familiar with Spanish --

INES NOLASCO: It's correct. Thank you very much.

On behalf of ECTA, I would like to thank BEREC for the invitation and opportunity to attend and speak at this stakeholder event and commend BEREC's open dialogue with stakeholders.

BEREC has a key role in ensuring the consistent application of the regulatory framework, and we very much welcome the enhanced and continued support for nurturing competition in our markets.

Your programme is ambitious and very comprehensive. We are happy to be able to contribute to its refinements which we will do in writing. We would just like to mention three key points.

First, that competition delivers for all. We've seen that competition in legacy broadband has brought not only network investments, but only the best outcomes for consumers, and also for the sector with increasing revenues on broadband.

So what we have seen is that fixed broadband product components and quality have massively increased. We have more products included in a specific package. We have lower prices.

At the same time what this has led to is exponential increase in broadband penetration.

So we have gone from 30 per cent in 2005 to 73 per cent in 2014, and despite the fact that unit prices have gone down, the sector has benefited from increased revenues, from 19 billion in 2005 to 46 billion in 2014.

So what we've seen is that competition enabled by access regulation has been a win/win for all, for end users and also for the sector.

So my second key message is, as has been mentioned before, there is no tradeoff between competition and investment. What we see is that, as has been recognised in the DSM strategy, and in several recent speeches by Commissioners, competition is the best driver of investments.

Investments in NGA networks are ongoing. Today we have 68 per cent of NGA coverage. We foresee by 2020 80 per cent FTTx coverage. The good news is that we are not lagging behind other countries such as the US on FTTH and FTTB. So we have 19 per cent coverage while the US has 17 per cent.

One point which is important to make is that investment is not an end in itself, but it's a means to an end. So we want to have a connected society, a connected economy, and to do so we need to have take-up of these high speed services over these new networks.

This brings me to my third point which is NGA competition needs a boost because fast stream take-up is needed.

The main problem today with NGA markets is twofold. NGA take-up is increasing very slowly and incumbents still retain very high market shares, both at retail and at wholesale level.

What we see is that the competitors have played a key role in driving take-up. So they have consistently led on speed, offered better products, and they have also, when offering the same products or even better, charged lower prices.

So regulation which has enabled competition has had and continues to have a key role in fostering demands and take-up. So if we want the same success story as we have had in legacy broadband be transferred to an NGA setting, we must make sure that regulation ensures competition so that competition can drive take-up and demand.

Some say that the altnets are free driving(?), that they do not invest, that the level of investment has failed, that they are just resellers. This is plainly not true.

What we see is that enabled by regulation, in particular local loop and bundling, the altnets have made broadband a mass market. They have more than 40 million lines at EU level. They have also kick-started FTTH and FTTB deployments. See FASTWEB in Italy, see the case of Free in France. In EU Member States, along with cable operators, they have

delivered fantastic new services and bundles, which in turn have led the incumbents with no alternative but to catch up.

So they do invest. They offer very fantastic offers, but we have to realise one thing. The transition from copper to fibre has not changed a fundamental principle which is economic bottlenecks remain in the last mile. So whereas in some cases duplication of networks is feasible and desirable, this is not in all cases.

So here what we see is that access regulation is key, and this fundamental principle has not changed with the transition to NGA, with the development of OTT services, and is not expected to be changed with virtualisation of networks. So we need appropriate fit for purpose and pro-competitive wholesale access remedies on NGA.

Physical access is key. We couldn't want second-class products which do not allow the alternative operators to innovate as they have done in a legacy world.

We also need business grade products to be offered, and we welcome BEREC's specific attention to business users in its programme.

On mobile, just a short word to say, that we need pro-competitive spectrum option rules so that we can ensure pro-competitive, viable competitive market structures.

So all in all, we welcome very much BEREC's involvement in the ongoing review. We urge BEREC to ensure that promoting competition remains the primary objective of regulatory framework and the pro-competitive thrust of the framework is strengthened.

We very much welcome your work on the oligopolies. NRAs must be equipped with the tools to remedy uncompetitive outcomes of oligopolistic and namely fixed monopolistic market structures, and options such as the one that you have put forth in your report should be thoroughly explored and tested.

Finally, your involvement in the Article 7 and 7A cases is very much commended. The system of checks and balances must be retained.

So all in all, we'd like to thank you BEREC for the very good work which you have done and ask BEREC to ensure that true competitive dynamics unfolds in an NGA world.

Thank you very much.

WILHELM ESCHWEILER: Thank you very much for those very precise comments. Then I want to give the opportunity to Mr Francesco Versace to give us his view. Thank you very much.

FRANCESCO VERSACE: Thank you very much. Good morning to all. I'm

Francesco Versace, representing ETNO today.

I would like to start by commending very much BEREC for this forum and all the work that it's doing in order to open up to stakeholders and to have open and public and constructive discussions on all the work streams that it's engaging in. So we very much appreciate being here and being able to speak here today.

The work programme which is the focus today is, as Ines was saying, quite comprehensive and ambitious, and it's really very much informed by the whole work on the DSM strategy which the Commission is engaging in.

So in the interests of time, I would like to focus on three main points today and leave the rest of our comments, which will be many, to the written consultations.

As ETNO, I cannot help by starting with the first point, which is infrastructure regulation.

As it was said before, investment is not the end, but it's a necessary means to achieve the DSM strategy and its goals. As you know, what we advocate for is a regulatory environment in which investment incentives are maximised. We think that this should be at the core of any reflection on the future framework review.

The DSM strategy, in particular its staff working document, set out some very interesting questions in this respect.

First of all, they have clearly acknowledged that there is an investment gap to reach the digital agenda targets. Here we are talking about the current targets, not to mention what would be needed if the targets were revised upwards.

So the key policy issue is to bridge this investment gap, both for better mobile regulation and for better fixed regulation.

Let me clarify what I intend here. I think that the key question that we should respond here is another question that's been raised in the DSM strategy. Is the current system providing the right incentives to invest in the NGA environment? Is current regulation on access providing the right incentives or is it rather providing a system, a framework in which a "wait and see" approach by operators is incentivised? This is a key question that we should answer to.

We have recently published a report done by Boston Consulting Group which indicates that first of all this investment gap would be even larger, up to 105 billion euros, and which provides some recommendations on how to embark in a pro-investment path for the new regulation.

But I would like to conclude this point to refer to a very interesting read, a paper which was

published by Bruegel some days ago on why Europe is lagging behind on NGA networks and why the regulation for the NGA environment should change with regards to what was done for the copper environment.

I think I will just leave you with the key message of this report, which I encourage all of you to read, which is that clearly the new regulations should be radically simplified and should become radically less strict than it is today.

My second point, and here I refer specifically to the ongoing consultation on OTTs, is on OTT service and regulation.

I think that the draft report really starts from the right question. The current definitions of ECS services with respect to OTT services are becoming more and more blurred, and this is posing the question of how to create new definitions and a new framework which really guarantees fair competition across the value chain. So this is a great starting point, I think.

On the consequences that this entails, as you know, we are, in the past and all more today, encouraging policy makers and regulators to remove more and more sector-specific regulations and replace it with horizontal regulation when same services are provided. So the same rules should be abided by the same services in general.

Does this mean more regulation for all? No, not at all. It means understanding the dynamics of the sector, of the value chain, and providing the right regulatory conditions for all, for all consumers and for all operators, all providers, in fields such as data privacy, transparency, emergency calls and so on.

My final point is on the part of the work programme which is telling how BEREC intends also to expand its remit to other areas, for example IOT virtualisation of networks, SDN. We think this is all very interesting work streams.

I have one point to make here. Since these are all developments which are fast changing and on which the future is uncertain because the market is changing so fast, we think that in these cases the right level regulation is always the lightest possible, and that, as Alexandre was saying before, there should be for all future regulatory operations an investment check before embarking into a new regulatory activity.

With this, I again reiterate my thanks to BEREC for the kind invitation, particularly to Professor Barros and to Dr Eschweiler. Thank you very much again.

WILHELM ESCHWEILER: Thank you very much. Now I want to offer the floor to Mr Edgar Aker.

EDGAR AKER: Thank you. First, thanks to BEREC and to Kevin O'Brien in particular for the opportunity to give the views of the Fibre-to-the-Home Council here today.

Now, there's always risk in a title like the Fibre-to-the-Home Council that people think that we are a single-issue group with a very narrow technology view.

Nothing could be further than the truth. We are looking very broadly into social and economical issue as driver of demand.

We look at other technology in detail, as complementary, as customers, as rivals, and we take a fundamentally economical approach, rather than a technology approach, to the promotion of European digital markets.

But make no mistake, as the Fibre-to-the-Home Council of Europe we promote Fibre-to-the-Home and we make no apologies about it. But we do so because we think we can deliver enormous benefits to those that adopt the technology.

We view our infrastructure, our telecoms network infrastructure, as an ecosystem. As in many ecosystems, there is a collaboration, dependency, interdependency and a richness of interaction. We see fibre as the element that underpins the technology network infrastructure ecosystem.

I will limit my remarks today to two areas: promotion of competition and investment, and the review of the framework.

With regards of the promotion of the competition and investment, like previous speakers I make the same observation. There is no tradeoff between competition and investment, but this cliché should not blind us from the evidence of how different forms of competition -- service-based, infrastructure-based -- have an impact on each other. A completely equal access regime based on virtual remedies with guaranteed margins effectively propose that no one will compete on network differentiation and seek a first mover advantage.

While cable networks have created a string of competition, the telco operators tend to invest in very strategic, just to meet the current demands.

At the Fibre-to-the-Home Council we have seen the greatest investments and the strongest competition dynamics where NRAs have actively pursued Fibre-to-the-Home and Fibre-to-the-Building deployments. We see in Sweden and in Lithuania, in Portugal, Spain and in France, they all achieved a level of infrastructure competition which is ahead of other European countries.

So I would like to ask the NRAs in BEREC to look and learn from each other. Our analysis suggests that there needs to be a deliberate policy to pursue Fibre-to-the-Home. Virtual access remedies of Fibre-to-the-Home were either not available or were greatly curtailed.

In addition, each country took care to ensure that the cost of deployment were minimised

through sharing of expensive passive infrastructure and avoid duplication of those passive network elements.

But let me be realistic. Competition network deployment won't happen everywhere. A way to ensure roll-out in more expensive rural areas will not have to sit beside the market driven approach. Good access in all its forms will be required in those areas as consumers must have access to the deepest form of competition available.

However, in lower cost urban areas we believe that a form of competition can be infrastructure based and that the benefits for the consumers will be very, very high.

Under the heading of competition and investment, therefore, I would like to conclude by asking BEREC to recognise the tradeoff between the different forms of regulatory access granted and the stress of importance of a thorough and effective implementation of the cost reduction directive and further cost reduction measures.

My second topic concerns the upcoming review of the regulatory framework.

While my earlier comments are absolutely relevant and even central in this context, I will not repeat myself. I will touch on another issue that is the issue of technology neutrality and its treatment.

A problem that the Fibre-to-the-Home Council perceived is something that might be called false technology neutrality. Targets and speeds are selected so as to ensure that as many technologies are included as possible. A truly technology neutral approach would simply select the most likely future requirements across all parameters and let the technologies fall as they may.

From an economical perspective, there is no access market in Europe that does not demonstrate market failure. In this instance I would like to demonstrate it by the presence of persistent dominance or SMP. The presence of this market failure means that the specialist regulator -- you, the members of BEREC -- exist to require the form of access that is granted. Specialist regulators also set the price for such access. This is done so that the dominant entities cannot foreclose or limit the market. Yet, although dominant firms do not have the choice about whom to grant access or on what terms, when it comes to technology choice it's presumed that an optimal choice will be chosen.

This approach does not make sense to us. Decisions on technology choice can be just as strategic as pricing or the form of access. To clarify the forthcoming review, I note that the existing provisions on the technology neutrality support the provision of superior technologies. We understand that. It's just that we as a group have chosen to ignore it at this moment.

So finally, let me conclude by committing the resources of the Fibre-to-the-Home Council of Europe to support the work of BEREC and much appreciated for you to be here. Thank you very much.

WILHELM ESCHWEILER: Thank you very much. Now we want to give the opportunity to Mr Daniel Pataki.

DANIEL PATAKI: Thank you very much.

Good morning, ladies and gentlemen. As Matthias, I'm kind of part of the alumni here as well. So really good to be back, and maybe another comment for Guillermo. Always consumer comes first, but I think it's only alphabetical order. So that's why they started with you.

Just a few words. I'm representing GSMA. I'm the Vice President for Regulation, overseeing globally regulation.

A few words for GSMA. For some of you who might not know, GSMA is more than a telco. So we have 250 players in the ecosystem.

We are also more than Europe. So this is a global organisation with around 800 members.

Also we are more than the policy shop. Most of you have been in Barcelona in the big event. So we hope that we will meet you there again next year as well, and GSMA does a lot of market development programmes and so on.

So on the work programme, because I know that time is tight, first of all, I would like to congratulate BEREC. I think it's a very intense and quite extensive work programme, very structured. So I wish my former colleague Annegret really good luck for next year if you want to achieve all of this. Very ambitious, but we try to help you on this.

The other very positive note as well, what I have seen -- and this is to show that I read it -- so the 1.2 and 1.3 items on the work programme. When you think about the future challenges, I think this is really essential, because as many of us know, when this review will come into force it will be 2020 and the whole industry will look very differently. So it's really high time to think about not only the problem of the past and the problem of the present, but the problem of the next future.

Let me concentrate on your work programme on one thing because of the time because we will do our input as well. On the review which is maybe the most important for everyone sitting here.

If you would have only one message from me today, that would be that instead of the review, I really think that it has to be a rethink.

So if I turn back time, like seven years ago, when with some of you here we were working on the review from the regulators' side, we had a slogan which was, "Evolution not revolution". I think that that was fit for purpose, and then the whole regulator package was fit for purpose, but as many of the people know here, and it has been said many times, the world has changed. So we really think that it has to be a rethink this time.

If you would do a rethink, let me offer you just a few principles from the GSMA point of view.

One of the principles is what I would call objective driven. Matthias stole my show a bit but let me do a bit the same thing. It's not the same quote, but I wanted to make the same quote from the same paper. It says:

"At the beginning of the framework review it is thus essential to take enough time to discuss the vision, the objectives and the obstacles reaching the objective. Only then it is possible to agree on measures."

It's not my words. It's the word of the regulators. So I think it's really good to have a stakeholder meeting like this, but many of my colleagues, we tend to jump into the measures, but I think it would be really essential to discuss what is the vision for Europe and what are the objectives. So this would be -- you know already, but I wanted to emphasise this.

The second one which is more difficult, other than an objective driven, what I would call a clean slate approach.

So if you have to rethink, then you have to get rid of a load of legacy. I was a regulator myself. I worked in public policy, in administration. It's a very difficult task, how you can rid of all the legacy what you think is not necessary.

So I think that's a big challenge, but I think that's the second principle people have to take into account.

The third one and the last one which many people touched upon, which I would call dynamic, which is more and more we see that ex-post measures might be more fit for purpose than ex-ante measures.

This comes again with a challenge. How you would make a new framework which is fit for purpose, which is predictable, but also flexible enough because all the changes is coming. We don't have the magic ball, but we will try to help you on this.

Of course, if you talk about ex-post and ex-ante, I saw something which is not in the work programme other than the vision, so I don't know if that would be a question whether you would do something on the vision side in the work programme or this is somewhere else.

One thing I haven't seen is all about the institutions because that's the elephant in the room nobody has mentioned before. So if it is the whole thing, it will be everything. So what is the role of BEREC in this?

From the industry side I think what I have to emphasise is that for us good policy comes first and institutions come second. So if we would altogether find a good policy, then for us institution is secondary.

The second one as well -- but it's maybe because of my past, but I really believe in this -- that BEREC will surely have a strong role whatever construction will come.

The last point, because this was all for you, what is for us because we have to do our homework as well. So our homework, we are doing as many of the people here as well as GSMA. So we are developing our thinking about what should be next. We hope to present it soon, hopefully in Barcelona.

My last note I would like to leave you with, because there are so many meetings, not only in Europe, because we are living in a bigger world, globally, there are CEO meetings in the industry in Cape Town. There was currently in my home town, in Budapest, ITU meetings in telecom, and there was one quote which I want to use. One of the CEOs said that it would be really good to go from an egosystem to an ecosystem.

So I think that is a really good one to stop with. What I can just offer from the industry side, I think there's a willingness to leave the egosystem and arrive to the ecosystem. Thank you very much.

WILHELM ESCHWEILER: Thank you very much. Now I want to give the opportunity for some remarks to Mrs Danielle Jacobs.

DANIELLE JACOBS: Good morning to you all. I'm Danielle Jacobs from INTUG. INTUG is the International Telecommunications User Group and we represent business users. So our members are banks, retail companies, industry, those kind of users.

It's very difficult just to talk in five minutes and to give all these essential points because we really have a lot of worries. So I'll limit myself to three points.

First of all, the Internet of Things. We're very pleased that BEREC is taking this very, very serious because we see a lot of attention for the Internet of Things within the companies. Of course, there needs to be work done on standards, et cetera, but what is for us very crucial is that it is possible for Machine-to-Machine communications that you can change your mobile operator without having to change the SIM card physically. It is too difficult if the machines are on the roads or on ships or whatever to collect them again to have a change of a physical card. So that's a very important point, and I also hope BEREC can

work together with GSM Association.

Another point is, as almost all previous speakers mentioned, competition. We need competition, we are not there yet, and we need a good internal market. So very happy to see that in the working plan of BEREC internal market stays very important, also in the telecom single markets file of course.

But we still have to puzzle together different prices, different players, different approaches in different countries. So it's very difficult for international companies to puzzle your international network services or your mobile policy together. So that's an important point as well.

On net neutrality we can be short. For net neutrality, we are in favour of net neutrality of course. But we would like to stress the importance for business users to have service level agreements.

So for the net neutrality we hope that the decisions that will be taken do not prevent businesses to have service level agreements because with the Cloud, access to Cloud software, this is very, very important.

There is a part in the BEREC working programme empowering users, and under users I also understand business users. I want to mention a very new point because it was said before new issues need to be taken care of as well.

Companies these days, they are really built on software. Using their software, the way they can use software is very, very important to unleash the potential of the digital economy.

What we see now is that there's a lot of unease within companies, and also within public institutions, large companies, small companies, international companies, national companies, on the use of software licences. The contracts, the metrics, they are much too complicated and there needs something to be done.

Now, you probably wonder: why is this a point for BEREC? Software is not really our thing. Well, it is because if you want to empower the users, and we see the movement for Cloud software which is really now at a turning point, it's really the moment to do something about it. What we can offer there, we made a kind of proposal for a code of conduct for software suppliers to really take away the barriers before they are created.

With this, I would like to end. Thank you very much.

WILHELM ESCHWEILER: Thank you very much, Mrs Jacobs.

Now, last but not least, I want to offer the floor to Monsieur Jacques Bonifay.

JACQUES BONIFAY: Good morning, everyone. Thank you very much. Thank you very much, BEREC, to give a share of voice to the MVNOs.

Actually MVNOs represent about 10 per cent of the European market. So I think we are a little bit significant in the market.

MVNOs is about innovation and differentiations because if we don't innovate and we don't differentiate, we basically are dying. So we have no choice but to innovate. I would even argue that we innovate more than MNOs because we don't have a choice.

We do it not only on the consumer segment, but we also do it on the SME segment, to bring more competitiveness to the SMEs and to the enterprise.

We bring all kind of innovation around the fixed mobile convergence, mobile payment, new and better data-only connectivity solutions, et cetera, et cetera.

Going on the roaming, first I would like to point out that MVNOs have been the first to bring low cost roaming solutions on the market, and that started 15 years ago.

On roaming free, the last wholesale cap that we had in July 2014 has been quite efficient to allow some MVNOs and also some MNOs to reduce the price on the market and to bring some kind of roaming like at home offer, especially for voice and SMS, not quite on data. So it was a quite simple measure, the wholesale cap, and that has been quite efficient.

Now if we look at the objectives to bring roaming like at home everywhere and basically to abolish roaming, there is no way that MVNOs can do it without reducing the wholesale cap. It's just not possible. You cannot ask players on the market to play with no gross margin or even negative gross market, especially I'm thinking on data. So it's going to work only if we reduce the wholesale cap. That's pure analytic thinking here.

Another topic, another thing which is important is the MTR. In Europe, you've got plenty of different voice and SMS MTR across Europe which make it very difficult to bring an offer which is (inaudible) roaming aspect. So that needs to be harmonised and we don't see why MTR are not the same throughout Europe for voice and SMS. That should be simplified.

My last point would be about the mergers. We see lots of mergers on MNO, and what is interesting for us is the wholesale access. We don't want mergers to reduce wholesale access for MVNOs.

So we have seen that there are some remedies which give some -- I would say maybe some more short-term access to MVNOs, and we are also interested in long-term access. We want to be sure that in three or four years from now, if we have a new kind of MVNOs coming with very innovative ideas around data, with the development of 4G or with the

emergence of 5G, we want to be sure that those new MVNOs can enter the market.

So we don't want to have solutions which bring some kind of market share on the short-term to MVNOs with no possibility for newcomer to come into the market, and we start to see that a little bit in Europe. That's what we are a little bit afraid of.

Thank you very much.

WILHELM ESCHWEILER: Thank you.

So, dear ladies and gentlemen, these all have been very interesting comments. It is a lot of food for thought for us. We will analyse that very carefully, but now there is the opportunity for ad hoc interventions, including tweets from stakeholders.

So it's now up to Alejandra. I'm in your hands to help me a little bit. There no tweets? Okay.

I would then propose to have ad hoc interventions. There is something from Deutsche Telekom, I think. So please go ahead.

RALF NIGGE: Yes, good morning, Mr Eschweiler and colleagues.

As Deutsche Telekom, first we also want to thank you for the invitation, for opening up the stakeholder forum for individual companies.

2016, it was mentioned before, will be a key year, and it will be mainly because of the framework review, the first fundamental review for 13 years, I think. So our comments will focus on the framework review, and one word on roaming, reacting to what has been said before.

On the framework review BEREC will play a key role, perhaps the most important role next to the three institutions involved in the decision-making process.

We believe it's important that BEREC exercises this role in a balanced and responsible way, to contribute to a pro-investment framework that ensures enhanced investment and infrastructures, as colleagues have pointed out, but also sustainable competition.

For us, a fundamental review of the framework is important in the sense that we need to move from intrusive ex-ante intervention by sector regulators to a monitoring of the market by sector regulators, to not lose the expertise of all those here in the room representing BEREC members, but at the same time giving more flexibility for commercial agreements on wholesale conditions and prices.

At the same time, elements of the current framework need to be stable. One of them is

technology neutrality, addressed by the FTTH Council, perhaps coming from a slightly different angle.

We think that this is a key principle in access regulation, and for us, as Tim Hoettges pointed out this week at ETNO FT, the consumer demand should clearly guide our investment decisions. The consumer doesn't care about technology, we all know this, and consumer demand evolves gradually.

This is not a statement against Fibre-to-the-Home. I think this is future-proof and superior technology clearly, but we have very important contributions to make over the next month and years to the competitiveness of European industry and economy by investing in intermediate technologies as well.

So the plea to BEREC: please ensure that technology neutrality is respected here.

The third and last point on the review I wanted to make is around the threshold for intervention. I would like to echo what Matthias Kurth has said earlier.

The perception of BEREC's role in this process will of course also depend on what type of substantive issues you bring forward. On the oligopoly question, we believe this raises a lot of legal uncertainty. It's a debate we do not need at this stage in our view. We have over the years been informed that the framework has built-in deregulation. It came to the Commission to discuss regulation and we were always assured: wait and see, over time when SMP will cease to exist, markets will be deregulated.

We don't think that at this stage saying, "Hold on a minute, we will not let go of these markets, we continue to regulate", that this is a positive signal to investors. It's clearly the opposite and we do ask you to reconsider your positions on this aspect.

A final word on roaming. Also here, big responsibility of regulators. I want to commend BEREC for the work done on roaming because this has very much contributed to a matter of fact discussion on the TSM. Clearly BEREC played a positive role.

Please continue to do so and ensure that there's no room for arbitrage models that would negatively affect national markets, would distort competition on national markets, but ensure that there will be scope for commercial agreements on the wholesale side, also for commercial conditions to prevent this arbitrage. Key process.

Those were the main points from our side. Thanks a lot.

WILHELM ESCHWEILER: Thank you very much for that statement.

Are there any interventions from the audience? Please introduce yourself if you want to make an intervention. Are problems clearer or not clearer?

So okay. Then I would suggest that we now wait for Commissioner Oettinger. I think Fatima and Kevin are waiting for him. So that gives us the opportunity once again to thank you all for this great debate.

We got an impression of the temperature in the room and that will help us a lot. We wait for your comments. We will get your written comments. Clearly we are in a consultation process. That's absolutely clear.

We will analyse what you will present to us and it has been very helpful in this tense.

I want to thank you all, and now we come to the highlight, to the statement of Commissioner Oettinger, and I would be pleased that you stay in the room and not go outside now. It's a question of courtesy.

(10.59 am)

(A short break)

(11.11 am)

WILHELM ESCHWEILER: Give, please, a welcome to Commissioner Oettinger.

FATIMA BARROS: I would just like to say a very quick word to say how delighted we are to have today Commissioner Oettinger with us. You know, this is also a very important moment because the European Commission is also part of our stakeholders and it's very important for us to have the opportunity to share and to listen also to the views of Commissioner Oettinger.

So thank you so much for coming, and please, I will give the floor to you.

Keynote speech by Commissioner Oettinger

COMMISSIONER OETTINGER: Dear President, Ms Barros, dear Mr Eschweiler, dear Mr O'Brien, dear BEREC members, dear stakeholders, ladies and gentlemen, I am delighted to be able to address you today as we will have to make important policy choices in the very near future.

We just launched a series of consultations with stakeholders, but such direct interaction as today is much appreciated and I hope we can all take something useful and insightful from today's meeting.

Logically your discussion today relates very much to the regulatory challenges in the

telecoms world. This is BEREC's remit. The work you are initiating for 2016, following up on the TSM legislation, is very important for the implementation and the practical success of this legislation on the ground.

However, as is also clear from your agenda for today, the digital single market strategy that the Commission outlined in its vision for a digital union is not only about telecoms. The stakes are much higher.

This is not about one sector, telecoms. It's about how digital technology can boost all economic sectors if we take advantage of the single market.

It's very positive that you discuss these wider issues here today as well.

Naturally, we have to have a competitive telecoms market which invests in high capacity networks. In fact this is crucial because at the end of the day the role the telecom sector has to play in providing connectivity is one of an enabler for all others.

My vision of a digital union is to maximise the positive impacts of digital technologies in creating jobs and growth via protecting competition and providing business and consumers with quality services.

What ties together telecoms and all other economic sectors? First of all, connectivity.

The telecoms regulatory framework, devised in 2002 and revised in 2009, dealt with vertical integration in the market, but above all it was designed for the voice telephony world. The world has changed a lot since then. So have the needs of citizens and businesses. Connectivity is today crucial, as almost all activities in our economy depend on it, from smart homes, e-health and ML services, to entertainment, cars and transport, agriculture and many others.

Modern health applications, for example, can improve the lives of medical patients and help keeping healthcare costs in check, but these applications rely crucially on adequate mobile and fixed telecoms infrastructure.

Society will thus benefit from the advances of technologies such as 5G development. Connectivity and innovations in mobility will enable connected cars, next example. With higher levels of automation, business opportunities expand. Private and professional drivers can use their in-vehicle time connect to the wider Internet. This potentially increases productivity of professional drivers, as well as the value of time spent in cars for private drivers.

The use of vehicles with functionalities which depend on digital technologies has to be safe throughout Europe, governed by the same legal framework and using interoperable solutions.

Ladies and gentlemen, we are yet to answer many pertinent questions, such as: will realtime digital maps function everywhere? Are the data that a car needs available and accessible at any time and at any place? Are the data secure? And of course the fundamental question: who owns the data? And who can use them and under what conditions?

In order to have automated vehicles connected continuously, the coverage of broadband networks along corridors between cities needs to be secured. This might mean covering less densely populated areas as well, rural areas, areas that are not always well served by either fixed or mobile technologies.

The digitalisation of European industry generally is most important, given our current strength in industry and given that our future competitiveness and welfare will depend on whether we can manage this process well. The growth potential for many economic sectors is large, including for telecoms, if we get the basics right.

But whatever example we take, the common theme that cuts through is connectivity. Access to high speed broadband also in rural areas is a pre-condition for the deployment of innovative solutions in sectors mentioned, health, transport, energy, education and so on.

Actions under the digital single market strategy are means to leverage digitalisation in different economic and social sectors.

However, most digital solutions do not yet benefit from the large potential of the internal EU market and have not been deployed at large scale. The outlined opportunities will depend on adequate connectivity to be available everywhere and for everyone.

The current rules governing the telecom sector devised for the voice communication age should be adapted to the needs of ubiquitous connectivity for today and for the near future.

The speeds that were sufficient back in 2002 are no longer relevant, and I'm not mainly talking about someone being able to watch a high definition video online. This is also important for our media and creative industries, for our potential of improved manufacturing processes, the growth of the economy, and the new responses we can find to societal challenges show that much more is at stake.

Thus access to high speed connectivity has become essential for industries and consumers. It's the main challenge to be competitive in a global market.

The quality of connectivity is also becoming increasingly important. In order to reap the full benefits of the digital economy, Europe needs a competitive telecoms sector which invests in high performing networks. This is a prerequisite.

Ladies and gentlemen, according to our estimates of the broadband gap, Europe needs

35 billion euros to reach the target of 100 per cent coverage at 30 megabytes speed and 90 up to 100 billion euros to enable 100 megabytes speed by 50 per cent of households. These are our targets just for 2020. The requirements will not stop there.

For the moment we are checking what should be our ambition for 2025, and we need more input from your side and from our industries and from research people to invest just in time into the right dimension.

So we are regarding the review of the telecoms regulatory framework. Our consultation is focusing at creating the right conditions for digital networks and services.

It has become imperative to pull the framework review on an overall vision of connectivity, taking into account current and future needs of citizens, businesses and the public sector.

The challenge is to deliver consistent regulatory conditions for a true single market. In areas where competition is driving infrastructure investment we should focus access regulation on real bottlenecks, simplifying it and making it in practical terms more consistent across countries.

We must make investments in highest capacity networks rewarding. Adjustments to the current rules are probably necessary to increase the incentives to invest in these networks for both incumbents and access seekers.

We need to make sure that capital works efficiently to achieve our connectivity aspirations. Of course, regulation needs to take into account the state of technological development of networks and the number of networks available in a given area.

If someone takes the risk to build a future-proof infrastructure, moving ahead of short-term demand, that risk needs to be rewarded. If such a network is to gain technological advantage, to differentiate the investor from others, then the most direct way to reward the investor is to let him use that comparative advantage in competition with others.

Of course, we would like every market builder to have equal chances to invest, or if necessary to co-invest, but those who take that chance should then also get the benefit.

However, you should not forget those areas where the investment case is much tougher, where at best only one network is sustainable from the economic perspective. So the current telecoms rulebook promoting competition has to be adjusted in a way that provides incentives that all users, not only those living in urban centres, can benefit from the digital revolution.

This in turn will make the digital market larger and ensure that nationwide services such as those of e-health are easily accessible to everyone.

Yet the current market regulation does not provide effective tools to address those circumstances. That is why we need to explore options to enlarge public authorities' toolbox, to incentivise operators to deploy their networks in the challenging areas.

Dear colleagues, in the public consultations that we have launched we acknowledge that in certain areas, primarily rural or semirural areas, private investments might not be expected on the basis of current regulatory incentives, due to long run cost structures and low and long-term returns on investment.

We therefore look for your views on how to best address these challenge areas, providing incentives to the first mover towards very high capacity network provision that might not otherwise be provided.

In addition, we need to consider wireless connectivity. As you all know, spectrum is an important input for the digital single market. We have to find ways to streamline the allocation and technical harmonisation process which is currently extremely resource- and time-consuming. This is paramount if Europe again wants to be the starting point of a future wireless revolution.

To address the current and future obstacles to the efficient use of spectrum, we should also address means to promote a more flexible access to end use of spectrum, including measures regarding shared access, as well as spectrum trading and leasing.

Take, for example, wireless broadband, which is an increasingly important source of connectivity. We can no longer rely on a spectrum regime that was constructed in a time when connectivity needs were very different from those of today or of tomorrow. We will increasingly see services that can and should be provided on a pan-European basis. Satellite services are only the most obvious example. It makes no sense for services to be subject to 28 and more different authorisation procedures across Europe, sometimes with conflicting requirements.

With regard to a level playing field, we first need to identify the size of the alleged problem. We have to assess how to level the playing field, possibly through simplification and regulating down, rather than regulating up.

So what will be our overall approach to the telecoms reform? We all know the situation has changed since the demand for connectivity and data consumptions exploded. The situation will certainly be again different in the next five years. Therefore, we cannot afford wasting time and using rules and approaches developed for the voice telephony age.

The challenge is to establish a future-proof framework, supportive to the overall digital single market ambition, and this means that in the next decade we need to make top class connectivity available, not only in urban areas, also in rural and less densely populated

areas, making it available for all the SMEs, research centres and vital economy in general.

To achieve this, I'm convinced that where we need common rules, we also need consistent application throughout the single market.

The ambition of the review of the telecoms package, the telecoms regulatory framework, as regards the above-mentioned aspects should also be adequately reflected in the revised and more efficient governance set-up, and in this sense I would like to thank BEREC, which in the past years has provided good value in terms of assisting the Commission, advising the Commission on important regulatory matters such as global roaming and net neutrality.

The recent agreement on the TSM regulation showed that BEREC, despite the limitations of its current establishment, would continue to play an important role in this regard.

In particular, next year BEREC should provide adequate guidelines to NRAs as regards the new net neutrality provisions. It's important that it's made clear to everybody that Europe has set a very high level of ambition as regards net neutrality and it's committed to its swift implementation.

BEREC's input for wholesale roaming market reform is also very valuable. Thus we rely a lot on your detailed input coming in next months.

It would also be positive if, in the context of the next telecoms review, we all approach these issues with an open mind, reflecting about what would be the best institutional structures for efficiently delivering the market and to European citizens.

Ladies and gentlemen, it's not my ambition to centralise functions that do not need to be centralised, and it does not mean increase the Commission powers. I believe that here form follow functions.

We just started and an intensive year lies ahead of us. My ambition is that the proposals should be ready to be presented by the summer 2016 and implemented as soon as possible afterwards.

So let us not forget we have the task to develop a framework for the third decade of the 21st century. Hence we need to apply the lessons learned so far, but doing so by looking into the future.

Our consultation is open until 7 December this year and we are looking forward to receiving good guidance from all stakeholders, so from you in special, and smart analysis to put in place smart regulation for the future telecoms sector.

Thank you all for your attention and let's continue to work together. Thank you.

KEVIN O'BRIEN: Just to mention, we will now have a coffee break, returning here at 12.00 for the next session. Thank you very much.

(11.33 am)

(A short break)

(12.10 pm)

Session 2: Internet of Things (IoT)/Machine-to-Machine (M2M) Communications including BEREC Consultation on M2M

GORAN MARBY: Hello, everybody, and welcome. My name is Goran Marby. Maybe some of you know me. I'm the outgoing Chair of BEREC.

Next year, for the first time in four years, I will not be a member of the board of BEREC, which I'm looking forward to, and I think the rest of the BEREC community as well.

One of the things that over the last years has crept up on us is the discussion of Machine-to-Machine and Internet of Things. I've been lucky enough to be that old and I've seen the Internet grow, and I think to many extent the Machine-to-Machine is really the next revolution of Internet.

One of the things you can say that is talk about numbers. When I gave my first speech about Machine-to-Machine, about four years ago, I think someone said it's going to be 20 million devices and then it was 100 billion, and now it's 200 billion, and every time I go to a conference that number increases, which relates me to the question: how many devices are there in the world, and what is a device? Hopefully we will get that answer today.

As you know, BEREC is working on a study when it comes to drafting a report on Machine-to-Machine. So we thought it was very timely to have this discussion here.

As we know, some of the traffic, not all of them, in Machine-to-Machine will actually be on the Internet. There will also be a large proportion of the traffic that goes directly under the Internet layer, on the technical layer.

So maybe today we will get the answers to things like: 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 it be a cable like mobile operator scheme where all traffic is terminated in a mobile network, or it will be continuing in the fixed network?

Maybe more importantly, how do we avoid to create new monopolies in a very fast

changing technology? And how do we make sure that we give European companies the benefit of the doubt and make sure that they can profit on this when they build services for end users?

I hope that we will get the answer to those questions and many more during this excellent panel.

With that, I will hand over to Cara. Thank you very much.

CARA SCHWARZ-SCHILLING: Thanks, Goran. Thanks for your work in BEREC. You have been an expert of the Internet over the past four years which is my hobby, so I have been very happy about that.

I think now we are talking about something -- the Internet has changed the way we work, communicate and trade, and we are now talking a little bit about those issues that were mentioned by Commissioner Oettinger before, this new digitalisation area. The effect of Moore's law have reached the new stage and the dramatically decreasing cost of processing data make new things happening.

I'm also tempted to ask this revolution/evolution paradigm. I leave it up to you to decide whether we're talking about a revolution or an evolution, but the development of IoT and M2M will affect many sectors that were mentioned before, like health, energy, transport, manufacturing. We see very different sectors, very different business models, but they do share a few common characteristics.

We talk about M2M when machines communicate with each other in a fully automatic way. There is some debate as to whether limited human intervention should be included, yes or no.

BEREC has decided not to fix on a particular definition for the time being, as the developments are at different stages and are still in a flow, but what we do see is that most M2M applications, they need connectivity, but they don't produce huge data volumes. They produce irregular, sporadic data volume. There may of course be also video applications in the future that would then require more debate volume, but not for the time being.

In that sense, connectivity, while it's a necessity, doesn't really account for a large proportion of the revenue opportunity in the value chain.

There is one thing I think that is very important for this debate of global markets, European markets, cross national markets. M2M applications really have a chance of becoming such a market because cars, if they drive, usually cross borders and refrigerators are sold from one country to another. So we truly see more than national markets.

There is also one feature that plays a big role later on when we talk about competition is that many M2M devices have a very long lifetime. It's not like a smartphone that you throw away after two years. A refrigerator can live for quite a while.

The business model is usually a B2B business model, and it may also be a B2B2C model if many, many end user devices are included.

We have drawn up one particular value chain typical example. However, the players we have defined can obviously take more than one role, and there are also different constellations which we've mentioned in the end of the paper.

However, typically you have the connectivity service provider. That is the telco. You have a M2M service provider that may provide a platform, and the typical M2M user is not the end user but it's a car manufacturer, it's an energy company, that then spreads devices to the mass market.

Now, what are the conditions required for IoT and M2M to thrive? Obviously we need sufficient resources, whether it's spectrum or identifiers, and we'll talk about them.

We need a legal framework that's fit for IoT and M2M, and as was mentioned before, we have to ask the question whether a framework that was devised for voice telephony is fit for these applications.

Roaming plays an important role as we are in an international market, and obviously if the consumer doesn't accept the applications, the whole thing will not work. So therefore privacy, security and interoperability are important points.

I'll focus here on those points where BEREC has recognised a need for special treatment and just give you a few points. Otherwise you will have a chance, I think, to comment on the full paper at the later stage.

Now, one of the important points is the identifier question. These numbering issues are not our genuine responsibility. It's primarily dealt with the CEPT and ITU at an international level. However, BEREC has for the time being not identified any scarcity issue in numbering preventing a thriving of M2M applications.

We currently think national solutions, different national solutions can be chosen. Some countries have opened specific M2M number ranges.

A more tricky issue is the issue of the mobile network codes, because here you may run into a lock-in problem, and here you may also run into a scarcity problem as normally countries only have 100 codes, and obviously you have the question whether you want to give a right of application to M2M users like car manufacturers.

The other solution that's currently discussed is over the air provisioning of SIMs. We will come back to that later.

Also, because of the global nature of these connected devices, extraterritorial use of numbers is considered a key to have these business models thrive, and it is happening today. So national regulators are getting more open to this, but obviously have to check about security issues.

There are alternative ways. You could also use international ITU numbering resources, which some countries are going to that direction and the Commission has recently suggested that an ETNS resource might also be a good solution for a European market.

These are issues that we will have to check on, and obviously there is one question which we haven't included in the consultation, but obviously it's a question, whether IPv6 IP numbers are a relevant identifier for the future.

I recall that when the IPv6 discussion started, it was meant to be to connect devices. However, for the time being we are more confronted with mobile applications. Therefore we would be very interested to hear from stakeholders what they think about the prospect of IPv6 IP numbers in this area.

Another issue that we have been confronted with repeatedly by stakeholders is whether these applications are to be considered as electronic communication services. We are discussing this definition in many contexts, also in the OTT context, and it always boils down to the wholly or mainly conveyance of signal. Within the M2M value chain it's fairly clear that the connectivity service provider is an ECS.

Typically, the M2M user is no ECS, but a careful case-by-case approach has to be applied for the time being as there are so many different types of packages, including connectivity, and business models are just beginning to evolve, but here we also have to ask ourselves the question: to what extent is the framework ready for these kind of applications with the current definition.

Obviously you don't want to regulate everyone. There could be high regulatory costs. There could be a high number of licensees if the ECS definition would be extended too far, and that has to be balanced against benefits for end users.

An issue that obviously is a very hot potato is roaming. Many applications are currently based on permanent roaming, and obviously permanent roaming as it's applied now facilitates a truly European M2M market.

However, if we look at the roaming regulation, currently there is no mentioning of permanent roaming, and the rationale for M2M need for roaming is very different from what

the roaming regulation was intended to do, namely protect consumers travelling across the EU.

For that reason, there may be good reasons to ask the question whether we need a specific treatment here for M2M, looking at the specific needs for M2M applications, where it's clearly acknowledged that M2M needs permanent roaming. However, the rationale is very different and it should be acknowledged.

Here I come to the issue that I was referring to earlier. There is obviously, as long as we use mobile applications, a competition issue if customers want to change their connectivity service provider because it requires a physical replacement of SIM cards, and very often SIM cards is fully integrated into a device that lives for 30 years. Therefore it's not very likely that car manufacturers would like to call back their cars to exchange SIM cards.

So what are the solutions possible to have competition continuing here or moving here? There are two solutions that are discussed. One is extending the right of application to IoT M2M users. The other one is allowing over the air provisioning of SIM where we think this has to be encouraged. There's already some development by GSMA going on. However, we think there could still be some improvement and this could be an area for the regulator to step in, in case this doesn't develop into a direction that allows competition.

There's another point where numbers are used. There is an obligation to provide number portability. However, since M2M numbers are never called, again here the rationale for number portability is not really applicable to M2M applications. Therefore we think also here there is a rationale for having specific treatment of M2M applications.

So it's mainly: shall we foster OTA provisioning and do we need number portability for mobile devices?

Here let me come to the last but not least important point. Obviously, as we said, if consumers don't accept these applications and all these applications involve their personal data, that could be a major barrier to the market. So it's a very critical factor of success that end user rights and data are protected.

The current legal framework with the privacy directive and the E-Privacy Directive is there but there are no specific rules with regard to IoT and M2M for the time being. There is a revision of EU data protection under way and the aim is to adapt the privacy rules for the digital era.

So we think there is no need for very special treatment with regard to principles. However, there should be or there might be a need for interpreting and adapting these rules to the M2M context.

User-friendly could impose different requirements for such applications as it does with the classic telco applications.

Let me stop here and hand over to Francesco now, who has been leading the drafting team in this project, to set the scene with questions that we have devised for the stakeholders. We hope to get interesting submissions for our consultation because that's really an evolving topic where we need your input. Thanks.

FRANCESCO SCIACCHITANO: Thank you, Cara, for this brilliant summary of the report we drafted in our drafting team.

As Cara said before, this report is now available for public consultation. It's downloadable in the BEREC website and the deadline for the public consultation is November 2.

So we do believe that this opportunity to present the report here is a wonderful opportunity, not only to present the report itself, but also to stimulate your contributions. Of course our work will depend now on the quantity and quality of the contributions we will receive. So I would like to invite you to contribute as much as you can with your views to the report so that we can have a better work and a more structured report at the end of the public consultation process.

Okay. From a personal point of view, I have to say that working at M2M has been a very interesting and challenging thing. The topic is extremely interesting because we will hear today how the market is developing, how the sector is developing, and we have come across a number of issues on which we wanted to consult all the stakeholders. We would be interested in answer to the consultation.

Of course we will ask for your general comments to the report, but in particular we have elaborated a number of questions that I'm not going to read because they are available in the report. They are in a specific annex of the report. I will just summarise.

One of the questions regards the problem of user numbers abroad that Cara has already explained before.

Another question regards the problem of roaming and the relationship with international roaming and permanent roaming in particular and national roaming which might create some problems in the application of M2M services within the countries.

Then another issue that was discussed also before by Mrs Jacobs in her previous contribution, which is the switching between connectivity providers.

We are then asking our question regarding security and privacy matters, and those matters have been also expressed by Commissioner Oettinger in his speech before.

The last question on which we would like to have your input is a question that regards proprietary standards and the way the market of M2M is developing right now, with proprietary standards which are being created with alliances of operators. The important point would be the possibility of opening those standards, of creating new and open standards. The question is whether this would right now contribute to the development of M2M services or not or when it would do it.

Also to start addressing some at least of those questions, I would like to introduce the two panellists that are going to help us in setting the scene for the answers and for the discussion later on.

The first panellist that I have the honest to introduce is Dr Robert Pepper. He used to be the chief of two offices in FCC, the Office of Plans and Policy and Policy Development, and since 2005 he has become the chief of the Global Technology team in Cisco.

I have had the pleasure of meeting Robert on several occasions, and I have to say that speaking to him and listening to his views is really enchanting. So I would like to ask Robert to share his views with all of us now, and possibly to start providing us a quick feedback on the report and on the questions that would be of interest for you.

Thank you, Robert.

ROBERT PEPPER: Thank you very, very much.

First of all, I really appreciate the invitation to be here with BEREC and to present some of the research that we've done, and working and seeing a lot of friends.

I think you know -- many of you have seen that every year we have a study we call the Visual Networking Index study, and it's a five-year rolling forecast of data with everything to do with the Internet. It's devices, it's people, it's connections, it's traffic, and it's a five-year rolling forecast. We've been doing it for ten years.

So unlike most people who do forecasts, we actually tell you how we did, and once again this year we are within about 10 per cent. We are just using this for example. This was on the compounded annual growth rate on the data.

So I'm very confident in the data. It's not precise. It is a forecast. But it's very close and I'm very confident in the data.

I'm going to focus specifically from this year's forecast on our forecast for Machine-to-Machine devices.

Completely separately, in what I call the tale of two networks, the traffic on the Internet and the global networks is being driven by video. Video, video and video of all kinds, but the

number of devices is being driven by Machine-to-Machine.

We have a very specific definition. Goran said is it going to be 200 billion, 500, whatever. We're focusing in the forecast on what we call Internet protocol enabled devices, IP enabled devices. Things that have IP addresses. The devices with IPv6, essentially.

Those are devices that can actually connect to the Internet. There will be billions more devices that do not have IP addresses, little sensors, RFID chips, et cetera, that in many cases will be aggregated but connect to each other via devices with the IP addresses.

That's actually very important because it goes to one of the questions about IPv6. All of these are IPv6 enabled. So we have to think about identifiers and numbers. So we already know some things about this.

What we're forecasting globally -- and I want to make this very concrete for people because we talk about Machine-to-Machine devices. But what does that mean? I'm going to talk about that in a very concrete way.

But globally what we're seeing is that over the next five years, globally, 43 per cent of all IP enabled devices connected to the Internet are going to be M2M devices, Machine-to-Machine devices. In fact, in Europe, we're forecasting it's going to be 50 per cent of all IP enabled devices.

Over that five-year period in Europe, we're looking at a significant increase in the devices. 76 per cent of all new devices connected in Europe will be M2M devices. So the vast majority of new things with IP addresses connected to the Internet here will be Machine-to-Machine devices.

But what's interesting is that although 50 per cent of the devices will be M2M, only 3 per cent of the traffic will come from M2M.

So there's this kind of myth that we're seeing this explosive growth in the number of devices because of M2M, and therefore we're going to need that much more capacity for M2M. The answer is no. No, we're going to need much more capacity, but that's being driven by video and other types of applications.

But the complexity of the types of devices, that's coming from M2M. It's only going to be about 3 per cent of the data, even though it's half of the devices.

So what do I mean by Machine-to-Machine? As part of the forecast this year for the first time we have visible into the types of devices and the percentage of these devices. This actually has direct applicability to the consultation. We're forecasting that about half of the devices are going to be in the connected home, and I have specific examples of what that means.

But if you think about my connected thermostat, my connected refrigerator, my connected home printer, they don't move, and by the way, they're not going to have SIMs or they may not have SIMs. They probably will not have SIMs.

That's going to be half of the devices. The fastest growing category are devices in connected health. That also includes not just my fitness, my Fitbit, which connects to my smartphone, that then connects via WiFi, no SIM.

Other categories that are growing, and growing rapidly, the connected car. That will have a SIM. And that is related to some of these questions. Smart grid, electric utilities. Connected work.

In fact, if we look at this -- and this is an iChart, I don't expect you to be able to read it, but I'm going to go through it.

We have identified there's nine different industries -- we will call them verticals -- and then there's "other" which includes three others. This is based upon the volume, the number of the Machine-to-Machine devices. So "other", which includes agriculture, construction and emergency services, some of those are going to be devices that are going to be moving around across borders. Many of those things are not.

So let me just spend a little bit of time talking about the types of Machine-to-Machine devices in each one of these groupings and then the different requirements of these devices.

So in the connected home it's going to be security equipment. It's going to be everything from -- you are going to have a little security camera. By the way, that security camera, or the one downstairs when you walk in the hotel, that is continuous. It's broadband. It's video. It's going to be connected with hard wire power and it probably will have ethernet. You have some of those in the home.

On the other hand, I will have my thermostat. I will have my refrigerator. I will have my home routing device. I am going to have my home printer. Those are all considered Machine-to-Machine devices.

Many of them, including my thermostat or even my refrigerator, are not going to be continuous. They're going to burst little bits of data. They're not going to be broadband.

By the way, my refrigerator or thermostat is not sensitive to latency. You know, it can wait to send the temperature, at least by a few seconds, maybe even a minute.

But when I look at things like the connected car, connected transportation, that will be tied to a supply chain. We are forecasting that by 2019 there will be a quarter of a billion connected cars on the road worldwide. Each one of those will have an average of four

modules that will be connected and each module will have multiple sensors. Not all the sensors will be IP enabled, but the modules will be. Some of them are going to be connected to things like my tyre, my engine, for oil pressure, tyre pressure, maintenance records. Latency not an issue.

But if it's connected to my airbag that goes off if there's a crash, latency is really important. It has to have a priority. I need it to connect to the emergency service.

The other thing is when we look at the assisted driving -- not the driverless car, but assisted driving which already exists. Mercedes is making large trucks and they're going to drive in a convoy, 100 kilometres an hour, a metre apart, and every single one of those vehicles need to talk to each other at very low latency, because if the first one brakes to stop, all of them need to know that within 5 milliseconds or they crash.

So in that case, by the way, it's not going to be continuous. It's going to be bursting data, but it's going to have to be very low latency. Different types of requirements.

In healthcare, one of the biggest problems in healthcare today for patients in hospital is they get the wrong medication. It was the other patient, the other room or the other bed.

So now there are devices that the medicine cabinets with the pills and the drawer will not open unless it talks to the wrist band that they put on you in the hospital. So only you get your medication. It's actually saving lives.

That's critical. Latency, no. A lot of data, no. It will burst a little bit. Again, SIM card, no.

Yet there are other health related applications such as being able to track -- and this is a blend of healthcare, supply management and transportation. So there will be a vaccine that is manufactured in Switzerland and it's being taken to a rural clinic in Uganda. If the temperature of that vaccine goes too high, it's not any good. Until now we can't track that. So people get vaccines that are not effective.

So what happens now is that every single vial, every little bottle of vaccine, is tagged and it's tracked. Its temperature is kept between leaving the factory in Switzerland, on the aeroplane, on the trucks, across half the world to Uganda, in the clinic when it's taken out of the refrigerator and administered.

Will that have a SIM? Is it latency sensitive? It's going to be a little bit of data. Very different sets of requirements.

In manufacturing, big robots. Hitachi, Fujitsu, robotics are controlling all of the functions on a factory floor. Siemens is very big in this. Schneider Electric, French company, very big in this. They're not even going to move outside the factory floor. Roaming apply?

I don't think so. Again, very, very diverse sets of requirements.

So let me summarise the types of requirements. Some of the devices are going to communicate over a short distance, some over a long distance.

Some of the devices are going to be broadband, some narrowband. Some of the devices are going to be continuous transmission of data. Other devices are going to chirp little bits.

In an agricultural field there will be a sensor taking temperature and moisture for controlling planting and for controlling remote control for irrigation. Latency is not an issue, and there will be years -- by the way, they are not going to have a battery. Some of them are going to operate off of what's called ambient power. Changes in temperature and moisture will be a reaction that will have enough power for them to wake up and chirp a little bit of data. Then they go back to sleep.

Those are called low power devices. The devices are low power, not the network that connects them. Obviously they are not going to have a SIM.

So some of these are going to be high power, some low power. Then some are going to be very sensitive to latency, and others, latency is not even relevant.

So what is the value of all of this together to society? We did a study two years ago looking at what we called the value at stake for the Internet of everything, and we make the distinction between the Internet of Things which are these M2M devices that when you connect the dots and you do the analytics and you change process and change behaviour, there's an economic impact.

That economic impact we thought was a crazy number. It was US\$19 trillion globally, and in Europe it was US\$6.3 trillion over ten years. So here about US\$630 billion annually in Europe, and you can see the impact, almost a trillion in German, and then that can be broken down.

Now, we thought this number was just way too large, and then McKinsey did a study last year that actually made this number look small.

The point is not the precision of the number, but when you do the analysis and unpack the number we can break it into different industry segments. Since we have both the former Chair and new Chair, I have actually two examples, one from Germany and one from Portugal.

In Germany -- by the way, if you look at the economic impact over ten years in Germany, we're estimating just on the smart factory about US\$120 billion a year, for ten years about 12 billion a year, increased gains of this value at stake by the application of not just the

device, but the architecture, the analytics, the economic value that you can take from that. You can see supply, logistics, physical security, supply chain, smart grid, smart buildings.

Most of these are not moving devices, or if they move, they move slowly. And they're not going across borders, although the chip sets are going to be global, these M2M devices.

In Portugal it's about 6 billion a year, about 62 billion over a ten-year period. Again, smart factories are about 10 per cent. The smart factory, smart manufacturing is between 10 and 15 per cent of the economic value of the Internet of everything architecture based upon these M2M devices.

So I mentioned that Europe, about 50 per cent. It's above the world average of 43 per cent. But if we look in Europe, it's as high as 61 per cent in Italy, interestingly, Francesco.

But there are other countries also that are very advanced, US, Japan and Korea. 72 per cent of all the devices connected to the Internet in Korea are going to be M2M, with a very, very high percentage, not just in the connected home but also in the manufacturing space.

But I'm concerned that, separate from this conversation here today with BEREC, what I'm seeing in the forecast is an emergence of a new digital divide on M2M devices.

If you look at Latin America, 31 per cent. If you look at Middle East, Africa, 17 per cent. India, 13 per cent.

There is, by the way, a disproportionate economic and social benefit in emerging countries for the Internet of Things for development with things like food security, water security, disease detection, that unless the emerging economies also have high levels of deployment and adoption of M2M devices, there will be a new digital divide. But that's for a different conversation.

So takeaways. Number 1, IP enabled Machine-to-Machine devices are growing fast and it's the fastest growing category of devices connected to the net.

Number 2, it's a wide range of M2M devices for a wide range of uses. The majority of these will not be mobile. My refrigerator doesn't move unless there's an earthquake, and then it's not going to move very far.

Most of these devices, by the way, are not going to have SIMs, but there'll be a sub group that will have SIMs that are very important.

But thinking about this through the lens of traditional telecom regulators, roaming and SIMs and permanent SIM or national SIM, doesn't even map. It's important for a subset, but not

across the entire value chain and where there's huge economic benefit.

We are going to have a very, very heterogeneous diverse set of device requirements. As I said, some are going to be long distance, some short distance, some bursty, some continuous, some broadband, narrowband. Some are going to be connected all the time, some not, and then latency.

The environments in which they're going to operate are very heterogeneous. At home, in the factory, in the hospital, in a car, on aeroplanes. The plane taking off from Beijing and landing in Brussels, generating all kinds of data from that engine, so that Rolls Royce knows when that engine needs a part that's replaced so it's sitting at the Brussels Airport to be put in the engine when it lands. They will know that before the pilot.

Heterogeneous spectrum requirements. You are going to need some spectrum for short distance. You are going to need some spectrum for long distance, and we can talk about some of these specialised networks like Sigfox and LoRa, and even what's happening within 3GPP with the extensions on the LTE standard for something called LTE MTC, which is machine type communication.

Finally, it's going to be a very heterogeneous set of regulatory requirements by different regulators in different environments. It will be some of the people in this room, and then it's going to be government departments or regulators in completely different industries. Completely totally different industries.

Later maybe let's talk about the standards and interoperability and where those standards are being set.

One thing to talk about is a new industry group, it's 16 months old, called the Industrial Internet Consortium. It started out 16 months ago with 60 companies. It now has over 200 from around the world. Bosch, SAP, Siemens, Schneider Electric, are just a few examples of the European companies that are leading within the IIC for the standards for interoperability and working groups on things like security.

So that's a context and I look forward to the discussion specifically on the consultation. Thank you very much.

FRANCESCO SCIACCHITANO: Thank you Robert. As usual your view and your speech has opened new views and new possibilities and boundaries for the discussion and for thoughts for regulators. I was personally very interested by seeing the share that Italy has in the number of M2M devices, second only to Japan and Korea. That's really interesting.

Also, I found it very interesting to hear that your opinion is that there is a huge amount of

different devices, a huge amount of cases of applications of M2M which require of course a completely heterogeneous regulatory system.

The problem for us is also to understand whether the boundaries of the regulatory activity, whether the regulatory activity should in this case -- how better the regulatory activity should help enforce the development of the M2M, and in particular in fields in which it is questionable whether the competence belongs only to one regulator or to many regulators, et cetera. You were raising the point of connected health, which of course raises a lot of doubts related to security of data and in particular to privacy of data.

So to that end, for this reason, we are particularly happy to have Cornelia with us, our second speaker.

Cornelia Kutterer is a German lawyer. She's leading Microsoft's digital strategy and she has been representing Microsoft in privacy and security issues at the European and international level.

She was also the head of the legal department of BEUC, the association of consumers, which can be very useful also in this discussion.

We are very happy to have you here, mainly of course to have the view of Microsoft on the development of this sector, but also to have your view on these issues of security and privacy from both the perspective of a leading software company, but also if you wish from the perspective of a person who has been working in the consumers environment.

So that will be very interesting. Thank you, Cornelia.

CORNELIA KUTTERER: Thanks a lot and thank you very much for inviting me here today.

I must say when I first got the question to talk about IoT, I was immediately responding to Francesco, saying, great, something I do, and then I was reading the report and then I was panicking. This is not really what I do. I don't have anything to say.

So I will try to give a little bit of a different perspective. The first thing that I would want to say is we came from being a software company and now everybody is a software company. That is really the change that we have been seeing and the change that IoT will bring. The one word I haven't heard yet, what we believe this is all about, is "data". This is all about data, and connectivity to a certain extent is a feature in that space.

Why is it so important and in particular in Europe? It's because it's about the revenues of every single company and every single sector.

So what Commissioner Oettinger this morning was saying is absolutely right. There is

data that shows very clearly that those companies that apply and adapt IoT and Cloud will have better information to serve their customers, and there's already first studies around the fact that these companies succeed in better stock evaluations. So at the end of the day it is a question about survival in that space.

The digital transformation of each of those sectors that Robert was already mentioning is absolute a prerequisite for them to be competitive on a global level.

So Microsoft has been able to move from being a software company to being a Cloud provider. When you think about the last couple of years in the IoT space, I think Robert is a well-known figure because Cisco has been around for a very, very long time in this space.

In 2014 Forrester had a very nice prediction, and that was we can finally forget about how many connected devices we have because it is about the application in each single customer's environment which counts, and that is where the platforms really kick in.

So the platform Cloud providers are the new kids around the corner that will enable IoT to bring the economic benefit that we see.

So in order to better understand really the economics and the competitive dynamics in this IoT market, it is really interesting to look at the details and the stacks that are in there.

This is a very simplified model. Let me go a little bit more in detail.

There's devices and assets, the things, and they connect to a Cloud infrastructure which will provide the data analytics that then drive the insights for the business transformation.

So in that context let me explain where Microsoft it and why we haven't been playing so much in this how many billions of devices are connected.

Microsoft plays just a certain limited role in the devices. We have a Band, so a health lifestyle device. Then we have Windows 10, Windows Embedded, which plays an increasingly important role, and that is something which you will see more and more features, more and more services added on as Microsoft Azure is our Cloud platform on which the data analytics, the machine learning really, really drives.

In these IoT systems you have really a number of attributes. Natural user interfaces. So the personal computing. You have touch gesture, speech video analytics, around natural user interface.

You have identity. That is a bit of a security issue insofar as you need to have the ability to connect and deliver the right data in the right context to the right person and machine.

You need connectivity of course as an attribute, ubiquitous two-way on demand

connectivity between the device and the Cloud again. Again, the Cloud is really one of the key elements here.

Security I mentioned already, both in the machine as well as in the data.

Manageability. The ability to update/manage programme machines remotely from any location based on the company or consumer requirement.

Analytics. How you capture the data in the system, and the knowledge graphs, really what you get out of the data.

So Microsoft does focus on personal computing, intelligent Cloud, intelligent devices, to a certain extent to data connectivity, intelligent operations aimed at intelligent market places.

We already heard about the different verticals, the sectors that will drive most of those changes and digital transformations, and Microsoft is definitely very, very invested in many of those.

We think about the usage for these verticals and how they will digitally transform, and you have basically scenarios that are relevant across all these sectors, and I just mention a couple of them, which is asset management, remote monitoring servicing, asset tracking, geofencing, personal digital assistant, compliance management, data visualisation, analytics, predictive maintenance, robotics, enterprise integration. There are a couple more.

Just to see that with such a platform, the applications and the scenarios, they are actually relevant in all of the sectors, and this is an important point to mention in the context of standards, as standards are currently evolving in that space.

Now a little bit on the market opportunities. I think that is eventually relevant also to see what's going to happen with the telecommunication reform, because the telecommunication reform in my view will actually define how Cloud and IoT providers and telecom and connectivity providers will position themselves in the market.

I guess to a certain extent companies like Azure are not very familiar to such an environment which is much more regulated.

Let me give you a couple of data points which make that relevant again. So we have these 25 billion connected devices and they will produce a 40 per cent combined annual growth rate in data. The estimates around the global economic value, they differ from analyst to analyst, but, for example, there is one which is Gartner which says it's US\$1.9 trillion by 2020.

The biggest industries -- and this is where most of the Cloud providers and IoT analytics providers will focus on -- is manufacture and healthcare, insurance, banking, retail, electricity, urban infrastructure and security, and these trends, as Robert mentioned, usually are rectified to growth, rather than anything else.

But you can see that even so, a company like Microsoft is late in the game. When you look at the potential revenues, they really lie in the data. So I come back to my first point. This is about data and nothing else. It's about data insights.

What does that mean? We heard about M2M connectivity, and obviously nothing in our world these days is more important than connectivity. Having been in Microsoft for so long, I see the developments around the discussions and where connectivity stays and is, and one of our key business groups is the business development group, and that is where connectivity is.

Then where connectivity also plays a role is in our Cloud and enterprise role. Those are the ones that build the data centres out in Europe and across the world.

We also actually invest in infrastructure. We invest in undersea cables. We invest in interconnection. We invest in WiFi. We try to build alternative ways for connectivity, in emerging markets in particular, but also wherever we see there is a market opportunity.

Nevertheless, it is interesting to think about how the business model is evolving. Maybe we should no longer say a ICT ecosystem. It's a system of partnerships. The partnerships that are evolving are very diverse and they are changing, and with the revision of the telecom framework we will see how the connectivity providers, the Cloud and IoT providers, will partner with each other in order to provide the best services to the customers.

With that last point, I was asked to talk a little bit about IoT and security implications.

From a Cloud provider's perspective who has invested quite a bit in security, there's not that much change really in the IoT world. So we apply security frameworks and evolve them from our Cloud perspective.

But of course there are new questions and issues that we will need to address. Just to give you a couple of them in the context of standardisation initiatives that are currently under way, in the context of security you need to think about the protection measures that involve a combination of deterrents, avoidance, prevention, detection, recovery and correction, and it needs to become part of the enterprise's risk management that applies IoT and transform itself.

The privacy risks become more difficult. There will be ethical questions we will have to

answer, and we can discuss this a little bit more in what types of privacy risks that are increasing.

Certainly the data collection is different in IoT. Through the insights you have different means in identifying data subjects. So we'll have to think hard about how we can work together. Maybe we can also discuss afterwards a little bit the E-Privacy Directive and where we are there.

There are other issues around safety and reliability that are increasingly important, and the resilience obviously in particular, as in IoT scenarios you have a different situation than you had on Internet or just Cloud. In IoT scenarios very often you have physical harms that could happen that we didn't deal with before. So we'll have to think about liabilities differently. We'll have to think about data ownership differently.

So there are a couple of issues that are unsolved, emerging issues, and I'm looking forward to that discussion.

Thank you.

FRANCESCO SCIACCHITANO: Thank you, Cornelia. Thank you very much.

I'm glad that you gave us this insight on the perspective of Microsoft because you made us understand how important also the Cloud dimension of the IoT, and of course this refers to what we were saying before about security and privacy. You just mentioned them.

I hope in the contributions to the public consultations there will also be the possibility of talking more in detail about the necessity, whether you think it would be necessary to have a review of the privacy directive or the E-Privacy Directive, and as far as security is concerned, maybe Article 13 of the framework directive, in order to give us some ideas on whether those could be things that we could suggest.

CORNELIA KUTTERER: Maybe I can already say one thing about the security, if I may.

It's interesting that you are asking this question now where we had our two years' discussion on the NIS Directive, the Network and Information Security Directive, where there was still, I think, an ongoing discussion in the council whether or not to include Internet enablers and Cloud providers.

That question from you is sort of the proof point that the idea to put that in a separate directive and think about it in the context of critical physical infrastructure might have not been the right choice, but really think about security in a broader IoT context. So now it's in principle somewhere else.

FRANCESCO SCIACCHITANO: Indeed. **Thank you very much.**

I also had one question for Robert, but I think we don't have much time unfortunately. I would like to ask whether we can extend this part of the direction of the panel by ten minutes because I would like to open the floor to contributions.

So I would like to ask -- well, during the coffee break there have been a number of people who were interested in delivering a contribution. So I would like to ask you to present yourself, your company or your institution, and make statements, possibly brief, and possibly again statements.

Of course we will welcome questions to the panellists. We would like to have your views on the report in general and the topics that we have addressed specifically in the questions, if it's possible.

Thank you. I will start with Professor Hoeren.

PROF. THOMAS HOEREN: Thank you very much. My name is Thomas Hoeren. I'm a law professor, one of the rare guys here, law professors, from the University of Munster in Germany, and I specialise a little bit in the legal issues of connected cars.

Therefore some short statements. A car is not a telephone. That's very important to notice. A car has a tendency to travel across borders. So we have a big problem.

The problem, I think, is mentioned in the draft report, but I'm sure that not every aspect is mentioned which should be there in the report. There are more problems with the telecom regulations than was mentioned in the report.

For instance, we have a right of the person who is using a car for being mentioned in a public directory. We have a right to block numbers. We have a minimum requirement of telecom standards of telephone contracts of two years ago. So how does it fit into the world of a car?

Another topic which is strikingly not mentioned in the report is the topic mentioned by Mr Oettinger. That is the question of who owns the data. If we have the SIM card, who is saying that the SIM card is owned by the customer, the end user? It's owned by the car manufacturer. So it's a totally different situation and we should be aware of that.

The last critical remark. In the draft report you mentioned IPv6 as a big solution. You should be aware that IPv6 is very dangerous in the world of privacy because we have lost the chance to have dynamic IP addresses in the IPv6, and that has a lot of consequences for privacy issues. Thank you very much.

FRANCESCO SCIACCHITANO: Thank you, Professor Hoeren. If you agree, I would proceed this way. I would gather a number of contributions and then I would ask the panellists to answer to the questions that they think would be more relevant for their

competence, et cetera, and we proceed this way.

Antonio, thank you.

ANTONIO AMENDOLA: Thank you very much. Antonio Amendola from AT&T.

I would first like to congratulate BEREC and the drafting team for this very valuable job in drafting. It's one of those times where the questions are the right ones. Usually when we are facing totally uncharted territory, like this revolution that we're going to see in the few years, the first mistake is to ask the wrong questions.

I think the draft report is going in a very encouraging direction. So I congratulate with you, with Cara, and all the other members of the teams.

Let me just focus on very specific issues which is the numbering issues that you mentioned. We could talk for hours here today, but this is not the case.

I think global IoT new services need innovative and creative numbering solutions to address the requirements of both IoT services and customers and product manufacturers.

At the same time, I think the most effective probably and the quickest solution will be to allow the extraterritorial use of numbering of resources.

I personally do not think that this will be extremely efficient and effective to then create a further layer like the M2M European space, numbering space, that has been lately evoked and proposed in between the national resources and ITU numbering resources.

That is to say that NRAs should probably allow their national number resources to have extraterritorial enlargements of their scope, and at the same time allowing for running numbers to be used in their national levels. I think this will incredibly and very effectively add to the competition.

Of course, I could turn this into a question to the panellists, but this is more of a statement than a question. But if you have time to address that question, I would be very grateful. Thank you.

FRANCESCO SCIACCHITANO: Thank you, Antonio. Yes.

WLADIMIR BOCQUET: Thank you. Wladimir Bocquet, GSMA.

First of all, I would like to welcome the opportunity that BEREC has granted to all the stakeholders to engage in the positive dialogue regarding the policy and regulations for the IoT. It is recognised that socio-economic impact and the value associated done by the mobile operators and other IoT suppliers can be delivered and distributed.

That includes benefits for citizens, consumers, business and government. We understand that. We can have impact on reducing the healthcare cost or improving quality of life, reducing carbon footprint, also improving transportation safety across Europe as the previous speaker mentioned. Recently published a study showing that the MS could save 99 billion euros in healthcare costs across Europe.

But also we should recognise that the IoT is a nascent industry and its value chain, business model, market and services are fundamentally different from the traditional telecommunications services such as voice or messaging.

In that case, we would like to encourage the different policy makers and BEREC to ensure that we are a pro-investment environment which is established and maintained across the IoT value chain.

In order to realise the significant social and economic benefit, as I mentioned through an example for healthcare, we need to ensure that policies and regulations are relevant, flexible, balanced and techno-neutral. I think Dr Pepper mentioned also this techno-neutrality or service neutrality, since we are working across a number of networks and in a heterogeneous environment.

So just to summarise, we believe that consistent regulations need to be applied with clarity and legal certainty across all the IoT players.

We also want to ensure an appropriate level playing field, and also just mentioned by previous speaker, also to apply a privacy and data protections regulations appropriately across all the IoT providers.

Also building trust, because at the end we think that the consumers will rely on trust and believe that having this trust in relations across all the value chains proposed by the IoT will make complete sense and will help to develop this nice opportunity for Europe.

Finally, we will develop with our members a detailed response to the public consultations, and all the details and elements that I just briefly introduced will be developed in our consultations. Thank you.

FRANCESCO SCIACCHITANO: Thank you very much.

FREDDIE MCBRIDE: Good afternoon, everyone. My name is Freddie McBride. I represent the CEPT. You would have seen the CEPT in one of Cara's slides. We do a lot of work harmonising policy for the use of spectrum and numbering resources in our 48 member countries in Europe.

I have a comment in relation to the BEREC report. I think it's a very good report. I think it provides a comprehensive basis for an exchange of views on resource management for

M2M and on the competition and switching issues.

There was a comment from the floor about the extraterritorial use of numbers, and I think that one of the issues with that is that the burden of providing the addressing resources falls disproportionately on one or a few different countries. So as long as there's transparency and co-ordination in terms of that use, then I think you could have a possible solution.

But I don't think we should be looking for winners and losers in terms of what is the best solution. I think Dr Pepper mentioned -- I think the main message in his presentation was to cut through the hype about the number of devices and how many of them will actually have a SIM card and be used in mobile networks and require public resources.

I think from a spectrum point of view, a lot of the applications in M2M will find their home in the spectrum somewhere without huge changes to spectrum policy. Numbering is a bit different.

But in the BEREC report, there's a question, I think it's question 3, where it asks the reader to express a preference between an administrative solution for the provision of E.212 mobile network codes and IMSI ranges versus a technical solution.

At this stage I'd be very cautious about actually seeking preferences. It suggests that as policy makers and regulators we are looking to back winners and losers in this and I don't think we should be doing that.

If you look at some of the applications for M2M, let's say if somebody has an application that requires connectivity for 50,000 devices, should you give them addressing resource with 10 billion units of an addressing space? Probably not. That's not very efficient.

But then on the other hand, looking at the over-the-air provisioning solution that's being standardised at the moment within ETSI and the GSMAs, the specification on it, if you look at that -- and again, Dr Pepper mentioned this -- a lot of the applications are bursty in nature. The devices sleep and then they wake up, send a little bit of data, go back to sleep.

That could be by design for privacy reasons, which is very important. It could be because of something as simple as conserving battery power. And if you look at some of the big applications that are going to come online, like eCall, the eCall device might never connect to a network except for testing.

So if you look at remote provisioning as a solution, how are you going to remote provision all of these devices that aren't even connected?

So my message would be not to be backing winners and losers and picking particular technologies, but to consider that we need to have a competitive environment and to keep

in mind that there are lots of different solutions and some might suit some applications and others might not. Thank you.

FRANCESCO SCIACCHITANO: Thank you very much. Yes.

JACQUES BONIFAY: Jacques Bonifay, representing the MVNO Association.

We see some of our members, including my company, trying to develop some worldwide data MVNO solutions where in some cases it's quite useful to be reachable with a mobile phone number. So of course we could use -- and that's what we actually do today -- international numbers which are not French, not European.

Although I am French, I don't like to use a French number because I do a worldwide business. So I don't want to have a number which is attached to a specific country. I don't think it's good.

So I welcome to have some European number range because it's a first step, and I'd like to be sure that those numbers will be implemented with each operator so that it's actually reachable.

One of the problems when you are a newcomer, you issue a number range. Then it takes lots of time to be sure that those numbers are reached for voice and especially on SMS. It actually takes a very long time to be reachable for incoming SMS.

So I think there is value in having a European number range with a low MTR, because we don't want people to do some strange business with high MTR, and ensuring with the right regulations that those numbers are reachable within a fairly short period of time.

FRANCESCO SCIACCHITANO: Thank you very much. Again, one very valuable consideration.

I think there is one mic down there.

MAARTEN HOGEWONING: Thank you.

Hello. Good afternoon, my name is Maarten Hogewoning. I work for the RIPE NCC, the Regional Internet Registry, and I would like to thank all panellists for their informative presentations.

Discussing numbers, I would like to draw attention to the fact that numbers have usually one of two purposes. One is the identification part, who is talking, the difference you see SIM, and the other part is getting the actual message to its destination, the other SIM part in terms of network address.

What I would love to hear the view of the panellists is how they see the balance there because, for instance, IP addresses generally are dynamic in nature, especially with nomadic use. These things change as you move from one network to the next. Where, for instance, phone numbers are very static. If I roam from one network to the next, my E.164 number stays the same and I stay reachable.

In future evolutions and in convergence of networks, how do you look into where the priority should be? Should there be the identification part or should there be the routed part or should we develop actually two systems that overlap? Thank you.

FRANCESCO SCIACCHITANO: Thank you. Any more contributions? Yes.

JACK HAMANDE: Yes, Francesco. I think it's a hot day today because even the robots are listening to us on the Internet.

Just more seriously, we got also a tweet which is related to Mr Pepper's presentation from Edgar Aker who said that indeed thank you very much, Mr Pepper, to be so specific, and especially what M2M actually is, and the connection with the discussion about latency.

Then of course when we have a discussion about roaming, privacy, connectivity, switching and so on, one of the questions raising now is also about do we need different quality of services for different type of IoT services.

FRANCESCO SCIACCHITANO: Indeed. **Okay. Yes, Tanguy.**

TANGUY VAN OVERSTRAETEN: This may be a last intervention, if I may.

My name is Tanguy van Overstraeten. I'm a partner at the law firm Linklaters, and I would like to give a different angle because I will have to apply all these rules in the future for my clients, and I think it's important to ensure that these rules are legible, make some level of certainty. I think the point has been very, very clearly by some of the panellists.

I wanted to address in particular question 5 of the BEREC, and I thank the BEREC for, first, the report, but also for the questions because that gives us of course the opportunity to answer them and to voice potentially our opinion and concerns.

There are two aspects on this question. I remind you it is a question in relation to data protection.

First of all, whether the current framework, 95/46 and 2002/58 should be modified, knowing that of course there is the new regulation which is upcoming.

I would like to answer this one because one of my concerns is really that the 2002/58 is a very sector-focused document, and this is, I think, contrary to what the regulation is due to

do, because the regulation is technology neutral and it's supposed to in fact provide the principles, the protection for all types of sector.

I believe this is the best approach in my view, and I strongly believe that in fact the 2002/58 should be revised to avoid having companies in the sectors which are subject to the 2002/58 being caught by the two texts and being of course also faced by contradictory rules.

There is also a second aspect which is addressed by the question, which is: what do we think about the document? Is it going in the right direction? I'm talking about the regulation, the draft regulation.

There I would like to make two comments. One is that I think the document, the general approach which has been approved by the Council, by the European Council, is in my view a more business-friendly approach. It is more, let's say, considering the risk-based approach which has been hammered by the industry, and therefore for that I applaud the effort which has been made.

The concern I have, however, is that the price to reach that level of, let's say, business-friendly approach is also a certain reduction in terms of harmonisation. If you look of course at the details of the general approach, you see that there's a lot of room left for the national authorities.

I think in a global world -- and we have insisted on that during the presentation -- I think it's clear that we should have something which is perhaps even more than European. It should be global, but of course we have to do it step by step. Therefore I think I would plead very much for more harmonisation in the text which will be hopefully finalised in a few months.

Thank you.

FRANCESCO SCIACCHITANO: Thank you. Thank you, Tanguy, very much.

Okay. I think we can close the contributions. Time is running, unfortunately. So I would like to give the time for a final comment to each of our speakers.

Maybe we can start with Cornelia. I don't know whether you want to react to what Tanguy was saying, or there was another statement regarding the ownership of data before.

Then I would move to Cara, who might be interested in answering to the statement of connected cars, and then to Dr Pepper, discussing the issue of switching and the standards, very briefly. I don't know if you want to start.

CORNELIA KUTTERER: Okay. So on the data ownership, it's clearly one of the key

new issues that we will be dealing with in the digital single market initiative, as has been clearly stated.

Two things here. One from a Microsoft perspective, what we do to convince our customers to be assured. It is interesting to note that we talk about the Internet of your things and your data, but at the same time, when you think about the regulatory environment in Europe, it's a new concept which is put out there which doesn't stick to data protection. It's not a concept that links to data protection. It is a concept that links more to contract law, to civil law.

But then we also have already existing law in yet another field, which is IP. We have actually a database directive. I haven't seen yet -- and maybe that is something for you, Dr Hoeren, to think about how the database directive would apply in an Internet of Things environment. It's certainly not made for that scenario because that didn't exist at the time.

I might also say that the Commission at one report evaluating the benefits of the directive mentioned very clearly that they didn't actually see any value. Yet they didn't abolish it either.

But it would be interesting because nothing else than databases are the backbone of data analytics. So it could be an interesting issue to evolve before starting new laws. Clearly it would need to be delinked from any personal data, which is very, very often -- that comes eventually to your question -- a problem. Much of the data analysis we talk about, it's not about personal data. So it would also be good for policy makers to very often distinguish these two issues.

On the E-Privacy Directive, as a personal view, I think this will be the next big issue in Brussels in the next year because it is huge. I predict that a lot -- I understand there are stakeholders that asked to abolish it entirely. It's an evaluation to be done in how much the general data protection regulation would cover all those scenarios and cover it correctly. I doubt this is going to happen.

So we'll have to see what makes actually sense to clear us for extending the E-Privacy Directive, which would bring those stakeholders that are not yet part of the E-Privacy Directive under what you were saying. In this legal uncertainty, which one is the one that actually addresses us and covers us?

I guess that's maybe, as a last remark, a general problem that we are seeing in having all the ICT regulatory framework being revised at once.

We see this. We have the consumers protection laws currently revised, while at the same time you think about extending the scope of those consumer protections, which again could be the same similar situation being trapped into two laws.

So I would call for a cautious approach in simply looking from your perspective and then extending to other areas. That is sort of the last point that Robert was mentioning. There are other national regulators and other enforcers that are looking from a different perspective on the same thing. So you should have that in mind when you regulate.

FRANCESCO SCIACCHITANO: Thank you. Thank you very much.

Cara?

CARA SCHWARZ-SCHILLING: Well, I just wanted to make a very short clarification with regard to the fact that, yes, we do recognise that cars are not telephones, and therefore the way we have classified the car manufacturers is as M2M users, rather than the connectivity providers, coming to the conclusion that usually they would not be classified as ECS, and therefore they would not be subject to the obligations that you were just mentioning.

We are very much aware that if you extend ECS to everyone in the digital area, we don't want this burden of regulation, to make it short.

Thank you.

FRANCESCO SCIACCHITANO: Thank you. Robert, the last word.

ROBERT PEPPER: That's the right answer.

There's a lot raised here, and I do think it's exactly the point, Cara, that you made, which is this world of M2M is very, very broad and it's going to be applied and used in so many different ways in so many different industries that thinking about it just from the perspective of traditional network operator regulation is just a very -- it's important, but it's only one lens, and thinking about that as the lens to see the entire world would not be appropriate. It just won't work.

So your answer is absolutely correct. We can't make the assumption that just because part of it looks like something we used to know from the 1990s, it doesn't mean that it's going to be that way in the future. So we need to think about it broadly.

Just even one question related to the data from the automobile. How do you even grant permission or opt in when there is no graphic user interface to read what it says and click "yes"? Is it the first time I put the key in the car and turn the engine on? Is it implied consent or not? Probably not.

Do we even want to permit people to opt out on the data if it's about road safety and information in a crash or information between cars when you're driving fast? Should I be permitted to opt out from sending the data from my car to other cars around me so that I become invisible? I don't want those invisible cars on the road if I'm driving.

So even the notions of how we thought about this when it was all about my device, my smartphone, and me as a person being on the Internet, is very different than we're talking about the machines, and we have to think about it, I think, in that broader way.

FRANCESCO SCIACCHITANO: I think that the messages that we heard right now are the messages that we're receiving today, the most important ones which we will need to think about, and that is probably also a message to the colleagues from the European Commission who are thinking of changing and revising the whole framework. Probably this is something that it will be important also for them.

Okay. I beg your pardon for taking some more time than was expected and for taking you from lunch. I think that we can close the panel here.

I would like to thank all the contributions and of course all the speakers who are close to me. I think it was a very interesting panel. We learned a lot from it and we are waiting to receive the contributions to keep working on this. Thank you very, very much.

KEVIN O'BRIEN: Ladies and gentlemen, we have a very nice lunch for you outside. I can assure you that none of the ingredients are connected in any way to the Internet. So you can consume as much as you want and nobody will know.

Because we've had a very interesting discussion, we would propose to come back at 2.30. So we will recommence at 2.30 sharp. Thank you very much.

(1.38 pm)

(The short adjournment)

(2.30 pm)

(Proceedings delayed)

(2.50 pm)

Session 3: The Digital Ecosystem: Challenges and Opportunities for Europe

KEVIN O'BRIEN: Ladies and gentlemen, I hope you had a pleasant lunch.

We come to a section in our agenda that is really, I think, a little bit of a new departure for the BEREC stakeholder event. This is our third year, and we felt in particular with so much talk about digital single market and a new framework, so much looking to the future, what we should do today is have a session that involved a much broader view of the digital

ecosystem than that that normally concerns us as communications regulators.

So we want to explore this broader digital space and think a little bit about what the future might be. It will probably be a future where regulators such as us play only a small part in that digital ecosystem, but I think still a very valuable and important part.

So to allow this debate to happen, we thought it would be very useful to have players from that system of the future.

In Professor Thomas Hoeren from the University of Munster we have somebody, I think, who can give us a horizontal view across a whole range of issues, and we are delighted to have him here today.

Then in Google, AT&T and Ericsson we have three major global players, all who have different activities, different roles in this digital ecosystem, all who are developing their own business models into the future.

So we're interested in talking about the future a little bit. The famous -- I think he was Danish -- atomic physicist Niels Bohr said prediction is difficult, especially when it's about the future.

But today we're hoping that our esteemed guests can give us some predictions for the future, and we can think as regulators about what our role might be in that space.

I'm delighted that Philippe Defraigne from Cullen International will moderate this session. Philippe will be known to, I think, nearly everybody in this room and has worked for over 25 years in this space with Cullen, working in 50 different countries, with a range of regulators and operators and other stakeholders.

So without further ado, I will hand over to Philippe to moderate this session. Thank you.

PHILIPPE DEFRAIGNE: That's right. I started in this sector when it was called "telecom". 13 years ago we decided to call it "electronic communication", and I'm so pleased that BEREC invited me to moderate a very distinguished panel that is not about the tubes, but rather about the rest of the ecosystem. I think it will be a refreshing change for many of us in this room.

Because as somebody pointed out in the panel on IoTs, connectivity is of course key, but storage, analytics, presentation are what is required to deliver the transformational effect that we hope ICT will have on our societies.

Usually conference organisers have two ways of arranging panels. Either they hire four top experts with similar expertise and they hope they will disagree -- that usually provides a good fight, ideal for after lunch discussions -- or, as BEREC did in its great wisdom today,

they invite four top experts with different expertise to shed a different light on this complex debate.

As Kevin said, we have in Professor Hoeren from the University of Munster a top legal expert of this field who, I need to warn you, BEREC, has a critical view on your recent report on OTT. It means you have an open mind by daring to invite him. So congratulations for that.

We have in Jan Farjh, Head of Standardisation of Ericsson, a top expert of this complex, for me, world of standardisation, and we will need Jan to discuss issues that I hear more and more about like interoperability.

We have in Len Cali somebody who is a top expert in regulation. Len is a senior VP with AT&T, but he's got global responsibilities, just back from South Africa. So it's not just a view from the US. It's really a view from the rest of the world.

Last but not least, we have Carlo d'Asaro Biondo, who is heading for Google Strategic Partnership, one of the topics that we will discuss here.

So without further ado, I suggest that we start with the presentation.

Do you wish to start, Len? As you're the one who travelled the furthest to get here, so I think you should go first.

LEONARD CALI: Thank you for having me. It's a pleasure and an honour to be here.

I thought I would start with a quote that has some currency on the Internet right now and it's quite descriptive of the digital ecosystem.

So it begins:

"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."

That's really not too surprising a statement today. What is surprising about it was it was made in 1926 by Nikola Tesla and it's quite prescient.

What I would add to it is the network makes all this work. The network makes the devices and the people communicate, and the fact that the handset is going to be the remote control for this new digital future we are entering and already beginning.

To the extent there's a need for human interaction, the handset will be the device for

everything from talking and text to monitoring and activating all the devices the prior panel was talking about. You will be using that handset or a similar device.

Now, we have waited a long time since 1926 for this idea to come to fruition and the technology to be ready to really make this possible, and we know from the history of wireless that things should move pretty quickly.

So I have collected a set of data points here. The data points themselves are actually less significant than the point I want to make, which is we have seen amazing and aggressive growth in this space. So wireless connections, mobile video, wireless penetration, wireless revenue, wireless investment have all grown dramatically and are projected to continue to grow dramatically.

In fact, investment in wireline and wireless broadband networks in the US over about the last 15 years have exceeded US\$1.3 trillion, an enormous sum of money that's been invested in broadband in the networks in this digital revolution.

But I'm somewhat afraid that these numbers and numbers like them have lulled people into a sense that this is inevitable, that this growth is inevitable and these investments will continue.

The torrent of investment we've seen in the US resulted from a number of specific factors, including a very deliberate light touch regulatory regime.

So the question here in Europe, and in the US as well, is whether this type of growth can continue into the future. Is it inevitable? Will it occur everywhere, including Europe, including the US? In short, are we going to be able to foster or will we inadvertently slow these developments?

So I'd like to discuss these questions in the context of four industry trends, and we could touch on regulatory issues as we talk briefly about those trends.

So video is the first trend. As you may know, AT&T has placed a very big bet on video with our acquisition of a direct broadcast satellite provider, DTV, in the US.

But the question is really as much about connectivity as it is about pay TV. This is because video service helps pay for the broadband connectivity. This is especially so in the US where we see customers preferring to buy TV in bundles with broadband, and also customers tending to use packages of pay TV along with over-the-top video.

So video of course is more than just entertainment. We are seeing an explosion of video across our network, about half of total traffic today. So it includes everything from entertainment to things like home security cameras, babycams, eldercams, business video conferencing. And video is demanding in a number of ways. Obviously capacity and

speed. In some applications latency and jitter matter.

The trend on video we believe will continue, and it will continue to pressure wireless as well as wireline networks, and that's basically because our customers are choosing to consume video and to create video over mobile devices where and when they want, and we've got to be able to support that.

So my message in talking about video, in addition to just saying here is a big trend that we see happening, I think everyone sees happening, is operators need the flexibility to find the business models that are going to support the ongoing investments we need to upgrade the networks to support this type of video.

Apart from video, there is something else going on with the networks and they are changing at their core. So my second trend is software defined networks, and I think this is somewhat underappreciated or at least underappreciated in the regulatory arena. But this is a major transformation of the networks. We are moving away from a network of telecom-specific hardware to one defined by software.

So earlier Cornelia Kutterer from Microsoft had mentioned that now every company is a software company, and that's true, including your telecom companies. Today about 5 per cent of our traffic is running over software-defined infrastructure. We hope that will be up to 75 per cent by 2020.

So this is enormously innovative. It may go underappreciated, but it will allow for far greater response in this to customer needs and far faster deployment of new services.

So this is a story about innovation and investment in the network at the core. It's not just innovation at the edge that lots of people, especially in the regulatory arena, credit and recognise, but this is innovation at the core.

It is also significant because it confirms the further blurring of lines between traditional telecom operators and edge providers or over-the-top providers, whatever you may call them. Our network and I would guess, for instance, Google's network is increasingly looking alike as we deploy software-defined networking, and policies that treat them differently are going to be look increasingly strained.

The third issue I have to mention, though I won't spend a lot of time on it since the earlier panel did a phenomenal job with it, is the industrial Internet or IoT or M2M.

Here what I will say is it's an area where we need to be particularly mindful of not allowing old rules or inapplicable rules just to hold us back.

It's particularly true with those devices that will require a SIM or a wide area connectivity. So I agree with Dr Pepper's statements that many of these devices will not have a SIM at all.

They will connect regardless and they will connect over short distances, but there are many applications where you are going to want to connect devices over the commercial mobile network.

One, these networks require fairly large investments just to interface, the platforms to interface for customers. There are huge economies of scale, and it could be costly for customers if they don't have seamlessness globally on these platforms.

The most efficient way to operate these devices is to operate them seamlessly across national boundaries, to build, distribute and then operate.

So a good example we talked a little about earlier is the traditional numbering systems, and they don't really apply in this context. These are used differently.

The point I want to make is that if there are substantive regulatory rules like a privacy rule that applies, it should apply, but those rules are separate from how you operationally enable these devices and deploy them, and we should be looking for the most efficient operational way to do that.

Then the last trend I wanted to mention is 5G. There's so much interest in this. It has to be mentioned. But it remains nascent. It's clear its capabilities will significantly increase speed and capacity and it will support IoT perhaps more than anything else.

I think it will do so over licence spectrum, over shared spectrum, over unlicensed spectrum, and it would depend on the device and function how it's used and how it's provisioned.

We are going to invest in 5G. I think the whole industry will invest in 5G because customers expect us to. They will move if we can't support the capabilities that they are looking for. But public policy and regulation will matter in the deployment of 5G services.

For instance, we'll need additional spectrum, as I say, both licensed and unlicensed and shared, both below 6 gigahertz and probably above 6 gigahertz as well. Providing services on spectrum that has no technology limits, and any use can be made of the spectrum as a way to foster innovation and investment in it, and we should try to avoid regulatory limitations that disincent investment in the spectrum. You've heard this before from AT&T.

So, for instance, short spectrum terms without a renewal expectancy means who is going to invest heavily in a ten-year licence in year 8 if at the end of ten years you may no longer have that licence? So long-terms or renewal expectancies are critical to keep the investment flowing into spectrum.

Then of course, as I've said before, the need to operate commercially. To have the commercial flexibility to find returns on new and innovative technology is critical to making

the judgment to make the investment.

Now, my last slide, which, worry not, I will not discuss, is a list of regulatory issues. These were just things that come to mind. It's really not a comprehensive list. But when you start to think about this next evolution or revolution in the industry and the ecosystem, what are some of the things that are implicated?

The one thing I'll mention, just to underscore a point, and it probably is not in issue in Europe, but then I think it makes it a little easier to see the point I'm trying to make, is the last point, global SIM. I have a number of issues under there. Numbering we've talked about. Regulation is an issue.

But this issue of taxation. There are some countries in the world that, based on a voice telephone model, have imposed a tax, a per SIM tax.

The problem with IoT is if you're using a SIM, you are obliged to pay that tax, but often the revenue earned is so small, it doesn't make it economic.

So we have a customer who builds tractors. They're connected tractors that get shipped around the world, and at least one country they've gone into has a per SIM tax. So what's the answer? They've turned off the connectivity. That's not a good answer. That's a failure on the part of the industry and policy makers and the like.

Now I think we'll get that worked out, but there is a period of time where this capability is just not available because there's a tax law that may be perfectly sensible and apply to a voice model that really doesn't fit the new world we are entering of IoT.

So the reason I highlight that of all these list here is not because it's a pending issue here, but because it highlights how an old regulation that might be a good regulation or an old rule applied in this context could just have unforeseen consequences and be negative.

So those are the points I wanted to make as an upfront. I look forward to the conversation, and thank you again for having me.

PHILIPPE DEFRAIGNE: What is dual regulation? I could read in Fatima's eyes she didn't get that one.

LEONARD CALI: Think of the health vertical where you have healthcare. So you may have your telecommunications regulator as well as the FDA regulating, or think of privacy in the US. We have this odd situation where you have the Federal Trade Commission and the FCC. You could look at connective cars where you have the Department of Transportation, NHTSA, on the one hand and the FCC.

I'm not saying each does not have a role, but what you end up doing is creating enormous

cost, operational cost, administrative cost, and sometimes inconsistencies.

So the point of dual regulation is to eliminate it wherever possible. So that was the point on dual regulation.

PHILIPPE DEFRAIGNE: Thank you, Len. Thank you also for providing competition to BEREC with an alternative work programme for next year. That's what your last line looked like.

Carlo, do you want to go next with a view of some examples of Google partnership or relationship with other players in the galaxy?

CARLO D'ASARO BIONDO: Over the years we saw some trends taking more importance, and the trend we see now is that, thanks to the fact we all have those smartphones in our pocket and applications can be developed with them, we feel at Google that the frontiers within industry are blurring.

This is an example of a partnership we are doing with Sanofi. The idea of that is if you measure with a soft contact lens the level of glucose that you have, and if you measure certain parameters of the life we make every day, and then Sanofi provides protocols and provides cure or provides drugs or whatever is to be provided according to the situation. What happens is that we can do or they can do or together we can not only maybe save lives, but provide services and things that are of certain importance.

Now, if you think about this, how to bring that to market? What will be the role of the telcos?

We believe that telcos dispose of unique characteristics for which they can be at the centre of this economy of blurring of sectors. They have trust of the consumers. They have networks, of course, which can allow good quality of connectivity. They have call centres, they have billing, and I only mentioned a few.

I personally am convinced that what's happening today in wholesale, and this is the case of diabetes, is happening also in banking. It will happen in automotive, in many sectors.

This is a new potential for the economy, but maybe also something interesting for regulators as well because it changes somehow the rules of the games we are playing, or maybe it changes the game we are playing, and it can be value creating for the economy in terms of creating jobs and possibilities.

This is another example. I go very quickly on this, but this is the example of a woman, a ballerina. She wants to dance, but she hasn't got doctors where she is, and by using connectivity and using protocols and having a sensor on her feet, she can progress and study. Those kind of services are being created day after day.

In the cars, on Android we've 30 now manufacturers and producers of components working with us with Android Auto to provide services to consumers.

Now, if you think about it, we all enter the car with our phone, and yes, we could theoretically in a car with our phone do certain things.

But if the phone is embedded into the car equipment, and if the information flows properly, and if the ergonomics is good, safety, security, ease of use, all that works in a different way.

As we all know, when all the components are together, the consequence is new services are born. Apple did not invent the iPod. Apple made a better iPod than before, it was easy to use, and everybody adopted it finally.

So I imagine this is important, but if you tell us now, is the car sector entering telcos, are telcos entering the car sector, is Internet or Google entering both sectors, is it a new sector? Honestly it's difficult to answer those questions. The reality is it's a service that requires the work of many different people.

Just to take another example, I received one of my biggest bills from a telco the other day because I have a tracker in my car and Vodafone sends me a bill every year to pay the tracker of my car.

Well, the cost of insurance is low, and I received the other day an offer from my insurance to have a certain service that seems to be competitive. Should I take the insurance one or the telco one? But when a telco offers it to me is it telco, and when insurance offers it to me it's insurance? Well, it's still a telco service somehow. I think it's interesting to discuss about these complexities somehow.

Smart cities. This is a dream. Who doesn't dream, living in Paris or Brussels as well, or London, everywhere you live, to find your parking lot easily? Or who doesn't dream somehow to know where he wants to go in a city if there is traffic or not and change the route? Make GPSs modern. Make those services work. Make traffic in cities improve.

All those are issues that are economically very important and fundamental, but they require work of different people together. Again the telcos, but maybe us as well, and probably people in the cities, and then we have to respect the privacy and it is important. But if we don't make those industries blur, somehow progress will be limited.

And the app economy. I was not believing the numbers when I saw that, because honestly I didn't believe the app economy would have been more important than the Internet economy, grow faster than the Internet economy and have more potential.

But if I think to Europe now, and we are often asked to think about Europe because we are a multinational, but we need to be local in the markets we are in, I think the biggest

opportunity for growth of jobs in the next four years is the app economy. Today the app economy in Europe is about 17 billion. It's about 1.3, 1.4 million people directly developing the apps. It's expected to be, depending on whose consultant you ask, between US\$60 to US\$80 billion within four to five years. So within 2020. Obviously the number of jobs will be multiplied by proportion. So I don't know, new 4 million jobs, new 3.5, new 5 million, new a lot.

Creating those jobs will require competence with not only competences of telcos, nor of the Internet, nor of specific services, because what happens is that apps are developed in every sector. So in pharmaceuticals, in banking, in retail, in any sector of life.

So it's a mixture of skills that comes from software, technology, understanding the economics of a network, of course, because all that is important, but also comes from each and every sector. Who will actually bring those apps to market is something we don't really know.

I would assume, and I would also hope, that telcos do it because they are in position to bring that faster to market maybe than other people, and maybe that creates also a way that the economy gets mobile and jobs are created more everywhere.

But this is something that will depend also of -- and the third element, and then I have finished, is the element on pace of innovation.

We are often asked why do we move constantly. I would like to give you two numbers which to me are striking, working for Google. In July of this year, if I'm not wrong, look at my colleagues, we discovered in July that searches today happen more in the ten biggest countries in the world through a mobile phone than a PC.

We are still there. But it's an important change because people on a mobile phone search in a different way. They don't look for the same things in the same way at the same moment. They don't expect the same ergonomics, and this is a big change. So we have to adapt our service to that if we want to still be alive.

The second element is today in the US, and it was announced today by the Financial Times if I'm not mistaken, people don't Google anymore for products. They Amazon for products. If you look for a product in the US -- I don't have calculations for the other countries, but I know that myself, I don't Google when I want to look for a product. I Amazon in France.

So those are changes. You know, I think there is a gap between what people think of companies and how people perceive companies and what their (inaudible) is.

So a company like ours and many OTTs are obliged to move very fast and change because their environment evolves so fast and people react in certain ways and services that are

important one day get less important the other because something better somehow occurred.

So change happens very fast, and today I think we go from a world where we try to push information to people -- sorry, from pull, from people asking questions, to pushing information to people more, by creating services that will answer to it, like the cards that you see on Google now where people can decide when they are at the airport which route to choose because they get proposals from the phone or the phone prints you the boarding pass and things like this.

So the pace of innovation is continuing to accelerate and it's challenging for everybody, because you get challenged by the changes of what the people do. Like Google has recently been and will continue to be.

The last one is the jobs. I don't want to talk about Google, so I will not spend time on making advertisement for Google. But what I want to say is I think we all share, if I may respectfully, a common responsibility which is, depending on how we will look at all those issues of regulation on one side, of enabling innovation on the other side as maximum possible, of allowing this blurring of sectors which, whether we like it or not, is happening around the world, will create different opportunities for jobs.

Today we know at Google that out of the 3 to 4 million -- honestly I don't know if it's 3 or 4 million jobs that will be created until 2020 for the app economy I was mentioning, we don't have the skills in Europe. It doesn't require skills of engineers with studies. It requires specific skills to develop those kinds of things.

So we decided to launch a programme to form 1 million people to those technologies by the end of 2016, and we are doing this with governments, with others.

But what I'm trying to say here is I often hear that the Internet economy, and it includes telcos and us and everybody, creates or destroys jobs.

If I have to say it in a second, to me the Internet economy is an incredible opportunity to create for people an ability to get access to information and to wealth and to growth in ways that were not possible before. So the value is evident, and the creation of jobs is present, maybe not always where they are destroyed by the advancements.

So our responsibility is to create, I think, together an economy where those jobs can be created everywhere, where it's possible to facilitate the creation of new services, and where all the people in the value chain respect the rules of the game, but can exert a role which is competitive and allows the growth of the economy we all want to grow, because the people in our economies depend from that.

Thank you.

PHILIPPE DEFRAIGNE: Thank you, Carlo.

Now, I don't know how you feel, but I find suddenly our sector much more interesting than when we were spending days discussing mobile termination rates. The drawback is that the market definition will be much more challenging than termination on the individual networks.

Jan, shall we turn over to you?

So Jan Farjh is head of standardisation at Ericsson, and of course, to state the obvious, standards and interfaces will be key to linking all these many elements in the new digital ecosystem.

JAN FARJH: Thank you very much for inviting me.

Before I start my presentation, I would like to give a few examples of what is important, and during my presentation I will also say something about what has made our industry flourish so very well the last couple or 15 years. Those things have been important and will be important also in the future, but there are differences going forward.

Three fundamental things are really important when we are talking about driving an industry forward, and that is innovation, experiment and competition. I think these are three ground pillars which we have to have in mind when going forward.

Whatever regulation we will have in the future, I hope and it's our desire that it will support those three pillars, innovation, experiment and competition.

Some examples of this when we are talking about or some means that would be possible to utilise going forward in that sense is that, looking at the digital single market, we think that there should be a light touch approach. That's our desire. And we must have in mind that the world is changing and we have to be adaptive and able to change things going further.

One fundamental thing for any industry to flourish is that we will have widespread adoption of technology and systems, and regulation should not point to a certain technology direction. That's very important for us.

Of course, if we would like to look at our industry, ICT infrastructure and broadband, stimulation is of course important for us as such.

Having that in mind now, when we are looking at the mobile industry and what has happened so far, we have made some predictions and have some numbers shown on this

slide. It's not really important about the specific figures here, but even though we have had a great and tremendous growth in the mobile industry, there is still more growth to come.

Looking at the mobile broadband subscriptions which are now on top of the agenda, they will grow even in the next coming five years, and the mobile traffic as well, I've heard before, and the fixed traffic will also increase going forward. That of course gives demands on our current network as well as future networks.

One thing with mobile telephony or mobile broadband is that of course you would like to access this wherever you are. Looking at it today and in the next coming five years, we will nearly have the world's population covered by either GSM, CDMA systems or LTE systems, and that is a great achievement, I would say.

One more thing about history here. If we look at what has happened the last 25 years, when GSM started in 1992, it took approximately ten years before we had reached 1 billion subscribers in those networks. Going even further back, it took 100 years to connect 1 billion subscribers in the fixed networks.

But looking from approximately 2010, we have added on 5 billion users in our mobile systems, and we expect now that we are entering a world where even more devices, up to 25 or 30 or 100 billion devices will be connected to the networks on a global base, and that of course is really giving us some opportunities, but of course also challenges.

As I will point out later on, even though it's shown here that 70 per cent of the mobile terminals will be smartphones, there will be diverse devices which are not that smart, as was mentioned earlier morning as well.

So now I have talked a little bit about 2G, 3G and 4G. What is really different now when we are entering and talking about 5G? It is that there will be new use cases which we have not so far had in our systems.

Maybe some of the use cases are already there to some extent, but when we are now entering 5G, and going forward within our industry, we would like to or I think it's inevitable that we will address new industries, getting them into our network. So that puts really some different requirements on our network in the future.

Here are some examples and they have been shown before. So I will not dwell on that, but think about different requirements for different industries, that's the key point here, and we must build our networks flexible and adaptable in the future.

Even though we are talking a lot about wireless systems here, 2G, 3G, 4G and 5G, 5G is not only about the wireless access or the mobile systems. It covers everything from

transport, access, Cloud infrastructure, new applications and management of the systems, and including already from the beginning such things as security and defining network for a sustainable world.

So it's not only radio access. Standardisation will not only happen in 3GPP. It will be in many other different standardisation for us defined in the network, as well as management. So that's a new picture which we have to deal with going further here.

So a little bit about the requirements here. The details here are not of importance, but it was mentioned this morning as well that it's a variety of requirements that we have to cover.

If we are talking about connected sensors, they should not be charged. They should be very cheap and have good coverage of course. But also they don't transmit very much data very often.

If you then look at the critical communication or a machine-type communication where you need instant responses, very high speeds and very high data rates, they're totally different use cases.

So if you don't build a network which can comply with these different requirements in an efficient way, we cannot serve these different use cases.

So that's very important to have in mind. Flexibility both on the network side, but also on the services side, that we can introduce applications and services up to year 2030, and applications and services which we are not aware of today. We have to build those kind of networks going further here.

This is a picture which we have drawn to really show on high level how this will work. We will have different use cases, different industries, connected to different clouds. We will have a high performing network in between which then must be flexible enough to serve these different industries, as well as provide the right requirements at the right time.

You have to be able to do this on quite short notice. We cannot set up these pipes or build this different network for different industries on year(?) time basis. These slices, as we call them, should be able to be allocated on a millisecond basis and provide the right quality of service for different applications and services and industries at the right time instant. So that's a key thing going forward.

So as a summary, I pointed out a few things here which is that performance of the network will be very important. They must be programmable so that we can adjust them to the different circumstances or the different requirements that are needed at different times.

Media services are already now entering our networks and they will produce more data. So performance and providing capacity in our networks will be key going forward.

Given all these capabilities and the flexibility will of course open up for new businesses, new business models which we have to cater for, and security and privacy are things that will be very important.

Last but not least, in order to run a mobile network or a wireless network, we need spectrum, and that is a scarce resource, as you know. It's already today filling up the spectrum below 6 gigahertz, and for 5 gigahertz, as mentioned before, we are looking at higher frequencies, higher bandwidth, and ways to actually on a dynamic base allocate frequencies, both in terms of where in the spectrum we run the services, as well as how much band we will use at the different time instances.

So with that I will end my presentation and be here for the debate or discussion.

PHILIPPE DEFRAIGNE: Thank you very much, Jan. We'll come back to standards in a minute.

Before that, we will listen to Jan. I think we heard three very interesting presentations, the public policy angle, the business angle, the standardisation angle. All these were really comfortable for BEREC to listen to. This one might be different.

PROF. THOMAS HOEREN: I don't know.

Thank you first for the invitation. My task was given to me by Tom Boyce. He said, please, the OTT paper -- he sent me this long paper and I said: come on, I will check the paper in a typical Germanic approach, which means critical.

First, to say really an honest sentence, the quality of these papers are marvellous. Highly sophisticated papers. I have read several of them and checked them, and they are really, really high quality. So that's the starting point.

PHILIPPE DEFRAIGNE: That is not what you promised. That's not in the script.

PROF. THOMAS HOEREN: Okay. That was a good skip for me because I want to tell you a story, a story of a German law professor whose name was called Puchta, and he had the idea in the 18th century to build up a universe of definitions. He called it "Begriffsjurisprudenz" and he had the vision of everything is just if it's part of a definition.

So reading this paper of the OTT, I have used my spelling programme, and it said 56 times the word "definition" is integrated in that paper.

So that brings me to a point. Does it help to start with definitions? It doesn't help at all. I'm in fear to say to you all the whole discussion whether ECS is defined as and how, that doesn't help at all.

The question is not whether OTT is ECS under the definition of so and so. The question is: should it be an ECS? That means the question of the consequences.

Of course, checking the OTT paper, I have seen other normative models. That is the term, "normative models". One is called proportionality. It's difficult to pronounce. To be proportionate. So this sounds to be a striking and really normative model, not the old Puchta system of definitions.

But what does "proportionate" mean? It's a very old term of public law which is used by people coming from the public law area to say: I have a certain aim, a fixed aim, and all these steps to come to that aim have to be proportionate.

But that doesn't help at all because we don't know whether the aim, the end success should be like it is. So it is a typical model of public law regulators, but it's not very helpful at all.

So then we have the term "equivalence". OTT should be regulated under ECS if they are perhaps equivalent to an ECS. But what does "equivalent" mean? Is it meant to be on the technical equivalence? No, of course not. There's some normative model behind that but that's not expressed in the paper because it's not explained.

Then there are other words like "objectivity". Nobody knows what that -- we all hope to be objective, of course. So nobody knows.

Then there is some small reference, only a sentence, saying that proportionate might be something which has to do with social costs, and that brings me to the point because you can only be normative if you stick to the rules of Philipp Heck. Perhaps you have heard about Philipp Heck, a very old lawyer from the 1920s who was the first one to attack Puchta.

He established a new word called "Interessenjurisprudenz". He said law always has to do with interest. We have to define whether the interest is legitimate, and then we can apply modern tools to define how the balance is legitimate interest.

So that brings me to the point. I don't see too much of legitimate interest mentioned in that paper. There is some small reference to consumer protection, a little bit wordings like competition. But whatever is happening with innovation, everything my three predecessors has told about new markets and whatever, and the most striking point is it is missing a whole analysis coming from an economic point. We need to combine law and economics, and that can be done.

It is mentioned in this one sentence of social costs and whatever, but it's not done in the whole study. So it should be there, especially in this new market. So the effect on the new market have to be checked.

The other striking point of this paper. I wonder who has re-read this paper. Only to give you a really rough summary.

It has three categories, saying there is OTT0, OTT1 and OTT2.

OTT0 are not a problem at all because that are the OTTs which have to do with telephone. It's old-fashioned telephone. OTT2 are not a problem either because they are mentioned as being not ECS. So there is a category in the middle which is OTTs which are not ECS but which might compete with ECS.

Now I'm coming to another bad story.

If you're talking about competition -- and there's a lot of reference to competition -- you should know more about markets.

I just destroyed a young researcher in my institute. He has written a 600 pages study on the question of Google and markets, of market definitions regarding Google.

He was killed. He came to the result that he has no result at all. He couldn't find a real market definition for all these new age instruments like Google or Facebook.

So if you're talking about competition of OTT1, what do you mean with "compete" and with "markets"? I really want to make you frightened now.

Who are you as national regulators to talk about competition and markets? There are other guys who can do it better. That is of course competition authorities. They have the power, they have economists, and they should do the job in my understanding.

I know this. I hear the ... Okay. I'm killed afterwards.

Coming to the point at the end, and it's not only the end, what I liked with the paper is of course the summary regarding the need for a reform, because there are two tools mentioned which I like very much.

One is my favourite wording. "It's still too soon." That's what I like, "still too soon", because nonregulation, a moratorium, as Bill Clinton has done in 2000, that's great for new technologies. Don't regulate if there is no need to regulate. In dubio pro libertate, how the old Romans have said it. In doubt, for liberty.

The other thing is to deregulate. But that is my most shocking sentence in the whole study. There is a page 26 where somebody said: what is happening if we are double regulating things? So we have the normal regulation we have in civil law and a regulation in telecommunications law as well. Then there was like a kind of strange humour. They also said the extra burden of sector-specific rule seems to be limited. That is okay.

So you see the cost argument. You can have triple regulations. It doesn't matter at all. If the social costs are limited, the collateral damage, then everything is fine.

That is not of course a solution for deregulation, but we really need to understand that that we have to deal carefully with these new markets.

That leads, again to my last shock, to a new understanding of NRAs. If we have a situation where M2M communication -- my favourite topic this morning -- is not regulated under telecommunication law, and if we have a situation where most of the OTTs are not regulated by telecommunication law, then of course a national regulation authority is losing importance. That's frightening.

You are not national regulation authorities anymore, but you will change and transmute to become what I call an NCA, a national consulting authority. That's good, but that's okay.

Thank you.

PHILIPPE DEFRAIGNE: Thank you, Thomas, for living up to your reputation. I'm not sure you will be invited next year. At least you have been keeping this audience awake. Thank you very much.

For the debate I was thinking to try to have a bit of a structured debate, that we could first discuss business, and then move gently towards perhaps more regulatory legal issues.

Perhaps speaking upon Carlo's presentation, where you had some very kind words about telcos. Telcos have a billing relationship, they have a brand that consumers love. My friend Guillermo has left, so I can say that.

Anyway, all the characteristics of telco can now be leverage, not just to sell telephony, but to do bright things in the world. So I like that bit very much.

I was wondering whether Len buys this message. Do you think, Len, that in this brave new world telcos will be able to strike deal with other partners in the ICT value chain and be able to sell much more than data and voice. Len?

LEONARD CALI: I think I would frame it differently. I think, rather than talk about partnerships, the companies we refer to as over-the-top companies are just essential. It truly is an ecosystem.

This is why I think the view of openness and whether ISPs support openness or not is misplaced, because if you don't support openness you are killing your own business.

So there is a partnership in the sense that we build these massive networks to carry a lot of data, but if you're not giving customers access to the data they want, what good are the

networks?

So I think there is a circle here. I think there is value. Whether there's explicit partnerships, maybe possible in the future, but I think the key here is you want to be open so you are carrying any traffic that customers want and driving value over the network.

PHILIPPE DEFRAIGNE: Carlo, you gave fascinating examples of the relationship you have with other players, other companies at Google. Do you engage actively in partnership with telcos as of today?

CARLO D'ASARO BIONDO: We try.

PHILIPPE DEFRAIGNE: You try. What are the main problems that you encounter?

CARLO D'ASARO BIONDO: Well, I think the first point is trust, stability of the relationship and stability of conditions over time.

Part of the issue with the services that we talk about, whether they are those automotive ones or any app, is that the business models are in constructions while we start and why we want to partner. So the trust is difficult to build because of this instability that is inherent in that economy.

The second element I think is -- it was told me by the President of a telco operator some weeks ago. They told me the difference between the telcos and the OTTs is that the OTTs are led by product people in general and the telcos are led by managers and the product people are below in the organisation.

I think it's an interesting example. I don't know if it's always true, but what does it tell me? It tells me that you need a dialogue between people that understand each other, and that understanding is not always that easy to build.

Now, third element, and why I think that we will see it happening in the next months more and more, is that if we want to bring those services to the market, whether it's us or other industries, and do it fast, nobody has a relationship with customers in big numbers and with trust as the telcos. It's not to be nice. It's a fact of life.

So I hope that in your role of regulators, if I may, you will think about the importance for the telcos to be free to compete in this new ecosystem in a way that when they are on the services, they can compete with us, but also partner with us or compete with us or partner with other people in the industry, because this fact of the blurring of the frontiers between sectors will be a big, big change in the economy.

Honestly, I don't know what pharmaceutical sector -- there will have to be rules for that, of course, but pharmacy blurring with cars, with everything, telcos need to be free to

participate to that the economy and bring what they have without having to look down, but with the ability to look up at the services and not only the network.

PHILIPPE DEFRAIGNE: Len, do you agree that the main obstacles to the telcos co-operating with OTTs is a cultural problem? Your product at AT&T should be promoted?

LEONARD CALI: No, I think, at least speaking for my own company, we're very forward looking and creative. I think you just look at the connective car environment and IoT where we really have led the way.

But I do appreciate Carlo's comments. I think it's important for all the players in the system, particularly as the lines merge, to have freedom to innovate, to find ventures and partnerships and other opportunities to bring value to consumers, and it's very difficult to do that.

If you are in a "mother may I" environment or you're constrained in your opportunities by regulation ex-ante, it's very hard to find that, and therefore it's very hard to invest because you look at the market and say: am I going to earn a return?

In the current environment, with rapid change in technology, the dynamism we see, having the ability to go out and explore business opportunities is just critical.

There's always the opportunity, if anything is done that we find harms consumers, the competition authorities or otherwise, there's always an opportunity to ensure there are no abuses. But to have upfront rules that limit innovation, limit the ability of any player in these markets who all bring different strengths, so I agree there as well, just slows innovation. It goes to the point that are we going to continue to see the aggressive growth of this ecosystem?

PHILIPPE DEFRAIGNE: Carlo, I'm sure I'm not the only one in this room from time to time who has to explain the concept, or try to, of specialised services.

When you do that, they say: Philippe, that's the latest thing that telcos have found to make more money. I say: no, it's not just that, it's really critical for society. We will need specialised services for critical application. Then, apart from IPTV, it's not always easy to find a good one.

So, Carlo, I always dream of meeting a high-level guy at Google to ask the following question: will Google by specialised services to help with the driverless car? Surely you cannot rely on sensors. You need high quality telecom networks.

So for my next presentation on specialised services, I can say: we need specialised services because if you dream of driving a Google car, you will need these services in your country. Can I use that example?

CARLO D'ASARO BIONDO: Of course. Where we have freedom of expression as the minimum, you can --

PHILIPPE DEFRAIGNE: No, I need to be based on facts.

CARLO D'ASARO BIONDO: I would like for one side to go back to the professor here.

Definitions may have different meanings for different people in different environments. So to me something is very clear. We will not build the driverless car. It will be built by manufacturers.

The driverless car will require for all the people operating around it to provide services, to provide skills that are not traditional for them, but are new, and telco operators in that sense will have a different role than the one they have today. It will not be only network provision, but it will be more.

For us at Google -- and on this I want to be very transparent, but also very clear -- for us the fact that information can be carried around networks, respecting the freedom of the desires of the users and the freedom to choose whatever they want to have, is a very important principle for innovation, but also for respecting the customers.

So I don't know what exactly we intend by this concept of specialised services and I don't want to answer to something I don't fully understand.

PHILIPPE DEFRAIGNE: You like definition.

CARLO D'ASARO BIONDO: I think it's important to define it. I think it's important to be clear.

It's clear, however, that I hope, and hope sincerely, that telcos will be in a position to provide something different than just to connectivity, and that the term of connectivity will change in situations where the world is evolving that fast.

PHILIPPE DEFRAIGNE: Thank you. I think it's an excellent answer.

Jan, from your perspective, you're a guy who trawls through many standardisation bodies, including on the telecom side, on the Internet side. You meet colleagues from both sides. What would you say are the main obstacles to telcos and OTTs co-operating more closely?

JAN FARJH: I think that there are no real obstacles, but they have not been forced to do that until, well, a couple of years ago.

I think talking about standardisation, first of all, I would like to say something about standardisation from my point of view because it means different things for different people.

But for me, standardisation from a technology point of view is to write a specification, actually, or agree on a specification. That's the main purpose with standardisation.

Then we can do that in different ways, and in the telecom world we have used ETSI and 3GPP. In the ICT world one example is IETF, where you define the protocols, and also on the application side we have worked together now to define open interfaces so that you really can write applications and introduce new services in the telecom networks, and I think that will continue.

We also see now that open source is another way to make standards, the fact of standards which we have to embrace in our industry and work together.

So I think standardisation is a way to agree on a common specification in order to have scale in our systems.

Talking about the number of subscribers, in the mobile networks where we have 7 billion subscribers today, that wouldn't have been possible without the standard. There wouldn't have been an ecosystem for terminals. There wouldn't have been an ecosystem for networks, and the globalised harmonised frequencies, if they were not there, we wouldn't have a global system.

So I think this is very important, that we agree on a common set of specifications, and then there are different means to come to that point.

But I think what we see now is that we are working more and more together in the different industry segments.

PHILIPPE DEFRAIGNE: That's an encouraging message.

Thomas, I wanted to ask you, when I, as a regulatory guy, try to think of why OTTs and telcos might go to bed together, I'm thinking, okay, OTTs like perhaps for the -- we will see the Google driverless car. OTTs may need to buy specialised services because they need a higher quality. Sometimes telcos may wish to offer content for free to differentiate a product. Usually we call that zero-rating.

My question to you is: do you think we've got all the legal concept we need, like specialised services, zero-rating, others that you may have in mind, to actually understand and for lawyers in the room to advise their clients on this relationship between telcos and OTTs? Do we have the legal toolkit? Is it complete?

PROF. THOMAS HOEREN: We accompanied several projects by big European car producers -- I cannot say who, there are not too many -- and we checked them from a research perspective, only to understand what is happening in the project.

To mention three items, one is I think the culture that was already mentioned is totally different if you take an OTT and a telecom operator. It has to do with the rank of regulation. An OTT has a general feeling: I'm free. I have nothing to do. Of course I shouldn't bother and fight against the competition law authorities, but it's still an open question, but they are free. Freedom of Internet. Everything is free.

A telecom operator is coming from a totally different angle, at least in Europe. He's coming from a big fear that everything which he's doing is within a strict core set of rules. So that causes the second item of course.

In this kind of project we notice a big fear who is responsible for what. So who is responsible for taking care for all these telecom regulations if you have a Volkswagen -- I would like to avoid this name, but I think I have to do it. Within a Volkswagen, who is responsible for this SIM card in this moment, for all the telecommunications supply for that? It's not regulated.

Of course Volkswagen said that should be done by the AT&Ts of the world. AT&T said: we are American, that's another problem. So let us use big lawyers, law companies.

The third item that relates to your question is a problem of market.

If we have zero content, of course, zero, I remember I was with students visiting Google Germany in Hamburg, and we had a lovely two days, good lectures, everything was fine. But there was one topic where we were really in controversy with the Google guys that were of course competition law. Because they said: Thomas, we are not competition law players at all. We are giving everything for free. So there is no market. So we are not talking about markets.

So take your zero approach, of course. Distributing things for free is regarded by some of these players as causing not any market disturbance at all.

PHILIPPE DEFRAIGNE: Not by BEREC.

PROF. THOMAS HOEREN: You see the problem. We need to find new market models so that even Google can understand that they are not giving things for free, but there's a lot of economic impact involved in that.

CARLO D'ASARO BIONDO: I think Google agrees with that. I don't know who you spoke to, but I think we feel that clear.

If I may, I would like to contradict one or two elements of what you said.

This absolute freedom doesn't exist because we are all bound to something that's called the customer. The responsibility versus customers is fundamental because with no trust there

is no service. So I don't think we can say OTT field are completely free.

OTT have an advantage versus maybe people that have a past is that they can create services from scratch. This is true. So creating the service from scratch, I don't have the burden of a process and eventually the costs associated with that process. We can do everything from scratch.

But we have the obligation to think customer oriented, otherwise it doesn't work, and to put the value of the service before the business model. In that sense I agree with what was told to you in Hamburg. We think money after the value of the service. So we think am I providing value, and then how much money will I make, whether in economy, and in particular in Europe we've been taught by schools to the contrary. You do a business plan, you do the revenue first and then the cost. This inversion of the mechanism mentality is an important one.

Now, that people at Google don't think that they are responsible for what they do because their services are free is honestly shocking to me. If they did so, I apologise to you for that because it's insulting. I hope they didn't mean that because it is insulting.

Many media -- I have a situation where the revenue is made in a different part, but we can't say that because it's free -- no, that doesn't make absolutely no sense.

PHILIPPE DEFRAIGNE: Several speakers mentioned 5G. 5G on the wireless side is a bit the backbone for this Internet of Things that we discussed this morning.

One question which I can't resist, Jan, and it's also addressed to you, Jan, because we had a great seminar by Ericsson on 5G, absolutely fantastic. I'm sure many of you attended it.

But the one question which was not really addressed is whether Europe -- the positive impact of society of 5G was very well made, and again today it was clear from your presentation.

What is not clear to me is whether European operators, or perhaps operators around the world, but let's stick to Europe, will invest in 5G for fear that if they don't -- as you said, Len, yourself, if we don't invest in 5G, Verizon will and we will lose customers, which is one reason to invest and a good one.

Now, I'm old enough to remember when operators invested in 2G, where it wasn't a question of not -- we invested there because we were going to make a lot of money.

So is the 5G story only a question of if we don't invest, we will lose? Or is there good news in 5G for the industry, like we will invest and there is a brighter future than with 4G?

Who wants to tackle that? You may say, Jan, I'm selling the boxes, it's up to these guys to

sell them. So maybe you can pass it on.

JAN FARJH: Given my perspective, I think we can do a lot with the systems we have out there today, but then they will be, yes, linearly improving the performance and we have the mobile broadband pipe there, everywhere on the global base.

But as I mentioned earlier, in order to perhaps grow the business and see additional growth, we have to address other industries using our networks, and then we have to do some refinements and fulfilling new requirements. So that's why 5G is needed.

LEONARD CALI: I think the new requirements are positive. So I think there's a reason to invest that's positive. The flipside of the coin is if you don't, consumers will find value in other carriers who do.

One of the things that worries me about 5G, I think the industry, the standards bodies are on target to deliver 5G. It's moving along, and what worries me is whether you start seeing governments starting to compete on the let's establish 5G standards and let's get ahead on 5G.

I think the industry is going to get us there. I think there's need for education to make sure people understand we're headed in that direction. I think the government intervention around 5G will not speed introduction, but I think the regulatory issues around investing, in opportunity on the return are far greater questions than is the industry on track to get to 5G. I think we will.

PHILIPPE DEFRAIGNE: Len, while we are with you on investment for 5G, I remind Karim that you promised me a paper on investment for a few weeks now.

But I was staggered, the other day I saw a paper comparing CAPEX, telecom CAPEX per capita in Europe and in the US over the last 15 years, or not just last year, and it was like a ratio roughly of 1 to 2, and I couldn't believe it.

Are you so inefficient that you need to invest double that what we invest?

LEONARD CALI: That's a good question. I'll point out the answer to the question. Europe used to lead in wireless and now the US does. I think that's part of the interest.

PHILIPPE DEFRAIGNE: Why are you investing so much?

LEONARD CALI: There are a number of factors, like anything else. So let me list four factors that I think are relevant and then go in depth on one.

One is competition. Genuine facilities-based no holds barred competition. Regulatory contrived or resale competition won't necessarily drive investment. It's like walking the

tightrope without a net for a whole host of reasons. But true competition drives investment. It also drives lower prices. They're not inconsistent ideas. So one is competition.

We talked about spectrum and the way spectrum is allocated in the US. The FCC has authority nationwide, so you have more consistency across the country.

Also we have renewal expectancies, which is absolutely critical. So you have a spectrum pipeline and a renewal expectancy so you keep investing in that spectrum because it's your asset.

I'm going to mention tax policy, though I'm no tax expert. We all know the tax rates and depreciation have an effect on investment and capital deployment.

But the fourth one I have mentioned before and I want to go into just a moment of detail, and that's this idea of light touch regulation. It sounds like a talking point, but it's really critical to understand how regulation even inadvertently suppresses investment.

I think the point's about a regulatory overhang. Now the mindset is one I have to check. I'm just not figured to deploy a service that my customers I think want, but does it comport with these regulatory requirements? There's that issue.

Regulation necessarily imposes cost. It can distort a playing field. So it distorts competition. Now I'm trying to make a bet on a new technology, investing risk capital. I'm not sure I'm going to have the opportunity to earn a return.

Sometimes regulation by its nature, sometimes intentionally, sometimes unintentionally, will preclude an entity like a telco from entering certain markets or trying certain service offerings, and that reduces prospects.

So then you have just regulation takes time and the Internet moves quickly. You have to act quickly and regulation can't.

So it's not saying no regulation. I don't want to be heard to say that. I think there's a role for regulation, especially consumer protection regulation, but it should be applied uniformly. It should be applied without regard to technology or operator, and I think it should be bottoms up. We are in a new world today. What are our policy objectives? Can we apply them? Who do you have to apply them to without regard to old categories? I know that's difficult given regulators were designed to regulate telcos.

But I think that's another thing. So 15 years ago, in that timeframe roughly, the US made a very bold but considered decision to deregulate advance services. There's been a flood of investment. I think that was very crucial.

Now we are in a period of uncertainty. We have new rules that look a lot more like utility

regulation. What does that mean? Are there going to be "mother may I"s? Will we, although the regulator says no, be pulled into regulation because they invite complaints? And what are complaints and how do you resolve them?

So I think there's a lot of uncertainty right now in the US. We want to see the growth we've seen over the last 15 years continue.

So a long story. Four elements of a recipe that I think drive investment that I think have been very strong in the US, maybe less so here, and that might explain the difference.

PHILIPPE DEFRAIGNE: Thank you.

Carlo, from a Google perspective, are you happy with the availability, quality of telecom networks in Europe, or would you dream as a European to have for Google in Europe the kind of networks you have in the States?

CARLO D'ASARO BIONDO: I think in Europe there are some things we have to state clearly. The level of competition among telcos, and the regulators have done a great job at that, is such that consumers are in a position to purchase services and express their interest in those services in a very effective way. The prices on average are lower than in the US. I think this is important because it creates a better situation for consumers.

Now it's true that the regulators regulated in Europe at the start, if I'm not wrong because it was one of my first jobs -- I was doing this accounting, verifying that the incumbent were behaving properly with the last mile. This was a reason to create regulation. But I think the world which we are in today is completely different.

So from Google's perspective I think it would be finding a way to look at the world, not as it was 30 years ago, but as it is today, and saying: what can be done to continue to move?

A last element I would like to clarify which is we always tend to think about investment in telcos and imagine that the OTTs live in a sort of cloud that is free and that they don't have to invest. But the reality is we do carry our data on average to 90 per cent of our customers ourselves, and if you look at our balance sheet, we invest probably the same percentage or even sometimes higher than telcos every year in creating data centres, in creating ...

So I think we should not forget that investments need to be promoted for everybody.

You will not have this economy growing if there are no data centres, if there no investment in software, if there is no investment in all the layers, and not only the telcos. I'm not saying telcos aren't important. They are fundamental.

But if you want a proper service, you need the right investment on telcos, but then you need

also the right investments from the side of the OTTs and everybody, and it's just not true that the OTTs don't need to invest.

So if you think about that as an ecosystem where everybody has to do its part, then I think the role of the regulator becomes on one side much more complex, but also honestly to create an environment that fosters investment and makes investment more easy, because our economy depends on that.

What we would love to see in Europe, being very honest, is promotion of investment, so that we see those jobs created, we see those economies moving, and we see ourselves not in a situation where the competitiveness of our continent gets lower than the one in the US or Asia because it's bad for our people.

PHILIPPE DEFRAIGNE: Is Google going to become a telco? Telcos complain that Google was not investing in networks, and then you fibred a few cities, and they say: look, Philippe, now they're going to compete with us on our core business.

CARLO D'ASARO BIONDO: But apologies, investment doesn't mean fibre in cities. We invest in data centres. We've got ten data centres in Europe. We invested in the last two years about 3 billion in Europe in data centres. We just have the need to be connected and we try to bring the information as close as possible to consumers, so that the load on network is as low as possible, which is improving our relationship with the telcos.

So again, there are many other investments than the cabling and the layer of networks, that are necessary for that economy to work, and on that we do invest a lot.

PHILIPPE DEFRAIGNE: Then is it a debate in the States as well, this complaint OTTs are allegedly not investing or not?

LEONARD CALI: No, no, but if I may I just want to make one point on the pricing issue, because it's been here this week and you hear a lot. It's taken for granted prices are cheaper in Europe than they are in the US.

I think that's incorrect. There have been a range of studies. I know you make a face, but there have been a range of studies and it depends --

PHILIPPE DEFRAIGNE: (Overspeaking)

LEONARD CALI: It depends on what you look at, what the speeds are. I think you'll see different price points at different speeds and the relative comparison. Professor Yew(?) at the University of Pennsylvania did a study on this not along ago.

Also it was hard to compare because in the US, at least last year, you're comparing LTE with 3G. So now you have a quality of service issue. When you look at broadband, a lot

of comparisons include video, and what are the cost on the video and are you including taxes or not taxes.

When you get through it all, I don't think pricing is that different, and often you see it's less expensive in the US. But I think the value is critical.

So if you look at what the consumer is getting value for the dollar, one simple measure is how many gigabits are consumed per person in a country or a region. The two areas that consume the most gigabits per person is the United States and South Korea, as I recall, and that's a real measure of value. That's how you determine is the industry delivering to consumers something of value that they're willing to purchase.

So I just wanted to put that in context, that we shouldn't just assume pricing, but let's go look at it very carefully.

PHILIPPE DEFRAIGNE: I agree with you. We should not confuse prices and (inaudible). These are different things.

LEONARD CALI: On investment, I think there has been enormous investment in the US. Google has built some fibre networks which they are welcome to do. In fact, in the US in some cities you could go to Austin now and I think you have two or three fibre networks and a cable network competing against each other in certain areas of Austin today.

It's not a question -- I don't think the issue is you should look at any player in the industry and say: are you investing enough? Investment is important. It's jobs, it's growth. But the real issue is: do we have a policy framework that allows all providers to come and compete in the areas where they feel is appropriate to their business plan, and then investing and trying to make a living doing that, or are there unnecessary constraints?

PHILIPPE DEFRAIGNE: Before we move to the second part of this debate, when people talk about the future of the telecom operators, there is often a contrast between two ridiculously extreme scenarios. Some telcos say we're going to become the pipe providers, like the water company, minimal return on investment.

Then, for example, our previous commissioner, Mrs Cruz(?), was talking about when will one of you become the next Facebook, which is probably equally unrealistic.

I have often wondered what is a realistic expectation, ambition, vocation, for the average European telco. Being a pipe provider. Why not? There are probably investors backing that. They do it for water.

But what is a realistic expectation? Do you want to start? Do you have an opinion? Or do you want AT&T to start and then you say whether they shoot high enough?

LEONARD CALI: We could have a European for Google talking about the European telcos or an American telco talking about the European telcos.

PHILIPPE DEFRAIGNE: Maybe we'll start with Len and then we will hear the others adding to that.

LEONARD CALI: For me, as I mentioned, even our large purchase of direct TV was more about or as much about connectivity as it was about pay TV.

We are a broadband company. We are proud of that. When you talk about pipes it sounds bad or it sounds like there's no future, but I disagree with that.

But I do think there are things telcos bring to the market that are really compelling. Security is going to be absolutely critical going forward, the security of the service you use. We underscore that. We think that's a value add that telcos should be providing in their service offerings in a variety of ways. We can go into the details of how that can be manifest.

There are also other capabilities. Last night I was talking to Bob Pepper and he was outlining in compelling fashion, and I think it echoed something Carlo said as well, which is telcos have millions and millions of customer relationships, and that capability and that relationship, the ability to build, the ability to track data and analyse data is enormous inside a telco.

But it's impossible to sit here today -- I think there was the quote earlier -- and project the future. We don't know where the industry goes. But I do think the telcos in Europe, in the US and around the globe have enormous assets, bring enormous strengths to the marketplace and bring enormous value to consumers and our economies, and we shouldn't sell them short or put them in a box.

I worry about all this talk about utility. We are not utilities. IP networks are not electric pipes. They require a constant innovation and investment and we should encourage that. We should encourage that for all the services you want to provide in the future, and we should be encouraging all the players in this industry to innovate with our permission.

CARLO D'ASARO BIONDO: TLC need to become DSP, distance service providers. TLC should become DSP, distance service providers. What they do, they provide service at distance, and they're in a unique position to provide service at distance, and I think this is a great opportunity in this new economy to look at it differently somehow. Instead of looking at themselves as TLC, look at themselves as DSP.

It's not a joke. I really do believe **(Overspeaking)**

The telcos, it's extremely difficult. Let me take another example to clarify.

Some months ago Larry decided and the board of Google decided to create Alphabet. Why did they do it? Because they thought if we stay and we control Google, we will be lock on to our core business, which is the search, and search is getting less important because of Amazon and because of competition, and if we need to look at something different, we need time to look at something different. So they say: we create Alphabet and we change the perspective and look at something different.

Telcos, if I may, in Europe I hope, and I hope that you can put them in a position to think differently, and say: look, okay, data is fundamental, connectivity is important, but I'm not a TLC. I'm a DSP. I need to provide services. So I need to be in a position where I look at the market this way and exploit my skills and combine them differently with other players and make that happen.

PHILIPPE DEFRAIGNE: Jan, you know this community of telcos very well for many years. Do you see them climbing up the value chain and moving into distance service providers? Or you think they should rather stick closer to their knitting?

JAN FARJH: That's a very difficult question. Service and application development within the telecom networks have been a little bit cumbersome. The application and end user services has been developed outside the telecom network.

But I think when we are talking about now the future here, when we are talking about programmable networks and support different services for different industry sectors, there will be new ways of looking at innovation and application of services.

There I think the regulation must allow then for the operator to play within that area. Otherwise that will also be done outside.

PHILIPPE DEFRAIGNE: Through your work in the various standardisation bodies, you have got a good view of the whole ecosystem.

Should telcos in this room move up in the value chain in these new businesses, they might be sometimes the one facing bottlenecks in the regulatory circles. So far the bottlenecks were on the telco side. As telcos move in this brave new world, do you expect them to face bottlenecks in terms of specific software, interfaces, content? I have no idea.

JAN FARJH: If we take the most obvious bottleneck, it's the availability of spectrum for the mobile systems.

PHILIPPE DEFRAIGNE: I was asking for something more radical. That's too easy, Jan. You should be a bit more daring.

JAN FARJH: That's too easy.

I think if we look back, and we have to take care of that also in building the new standards here. I was talking about flexibility. In order to actually warn the networks and be open then for other industries, as I mentioned before, we have to build a system in a way that they can be upgraded, and that puts demands on our industry as standardising things as well.

So one hinder or one obstacle is that it takes sometimes too long to introduce a new service in a telecom system. So that's one thing which has been a hinder so far. But I think we have to be more flexible. That's important.

PHILIPPE DEFRAIGNE: Len, as a large operator wishing to prosper in this new digital ecosystem, what are the main bottlenecks that you expect to face, if any? Or is it just a rosy future, everything is free market and you do well?

LEONARD CALI: It may be too easy, but true. I think spectrum is a critical component.

I am concerned about regulation. I do think one of the points on the idea of moving to a software-defined network is to begin to really innovate quickly, provide service more quickly. It becomes far more challenging in some sense to provide service to customers which are providing things faster and better and more innovatively.

So I don't know that there are roadblocks or bottlenecks. I do worry again about if you move to a position where you just view the networks as utilities, you essentially put them in a box. Given we don't know what the future holds, that box may not be adequate as a platform for innovation. So the key here is the flexibility, and the inflexibility, my fear, coming from my perspective could be regulation. We do need the inputs from spectrum.

Those would be my concerns.

JAN FARJH: Also I think there are different regulations in different countries. When you are thinking about these new industries, tels sector, car sector, utility sector, power plant sector and things like that, then we have to look at what regulations are there to provide services to those sectors. That's a challenge which we have to face.

LEONARD CALI: Over the last six years AT&T invested US\$120 billion. One company, US\$120 billion. We have shown ourselves not afraid to invest, to go after opportunities, to risk capital. You go after it, and what we need is the freedom to continue to do that.

PHILIPPE DEFRAIGNE: Jan, in this debate on bottlenecks that we are sometimes having, I hear calls for regulators to take steps to ensure interoperability. Interoperability sounds to me -- I'm not an expert -- like mandatory standards.

Jan, what do you think of mandatory standards? Is it something that is welcome in the standardisation bodies that you go to?

JAN FARJH: I don't think that "mandatory" is the right word. But as I said, to be able to operate on a global base, or even country to country, we have to have some common set of standards, and we are defining that in different standardisation bodies.

One of the main tasks in the mobile industry has been to define interoperable systems so that you can roam between countries, between operators on a global basis, and I think that will be equally important in the future.

PHILIPPE DEFRAIGNE: So I'm wrong to assume that interoperability necessarily goes with mandatory standards; it can be free standards and interoperability?

LEONARD CALI: It happens. Look at the Internet. It's made up of thousands and thousands of networks that came together organically. Sometimes just a handshake, people interconnected. But it was because everybody saw value in interconnecting, and that happened. There have been very, very, very few instances of problems on that score. I think the market has worked phenomenally well.

PHILIPPE DEFRAIGNE: Jan, you spend all your life in these standardisation bodies. As you said earlier, for many years on the telecoms side with 3GPP, and more recently you said with ITF and more the Internet work.

Could you contrast the two experiences? Is it the same sort of guys, the same sort of culture, the same pace of development of the standards?

JAN FARJH: I think it's a very different culture since the -- I mean, the result is very different, and 3GPP, even though there are technical people, engineers working there, very skilled people, in 3GPP you produce specifications, paperwork. But behind that is of course that you have evolved and developed a system which will work, and then you go back home and implement it.

In IETF, for instance, you produce protocols, and there you test the protocols. You come there with software, actually write software and see that it works. So the interoperability is already there. The interfaces are working.

When we now are entering open source community and bringing that kind of software into our system, that's a community where individuals produce a software package which will work which you can download in the best world.

But there are at least -- there are different ways of working.

Same kind of people, but different culture and different results from a standardisation, even though the aim is the same.

PHILIPPE DEFRAIGNE: I was amazed to learn earlier today that large manufacturers

were relying on open source standards. I think this is amazing.

JAN FARJH: I think we are doing that on different level, of course. We are using open source software like Linux, for instance. But now when we're talking about network function, virtualisation function and have a virtual environment, we have initiated this open NFV. It's an organisation which started one year ago, where we try to take open source components from different open source communities and integrate them, having a reference platform.

That's our way of trying to utilise the force behind open source development, then even though at the end we should integrate it and have a common set of interfaces and functions in there so that one can take and develop further and differentiate. That's very important, of course. We cannot just produce things for free which are open, but we have to differentiate and be profitable companies.

PHILIPPE DEFRAIGNE: I was wondering whether I could perhaps have a bit of help from the room. I tried to gently initiate this discussion on whether there might be in the galaxy some non-contestable bottlenecks. We heard Len quite rightly coming back on spectrum, and Jan saying, yes, yes, spectrum really important. But I'm sure you're all bored talking about spectrum. So I would like to hear something new.

Do we all agree, apart from spectrum, and of course the old reliable copper pairs, there are no bottlenecks in the digital ecosystem?

Tony, you don't see any? Do you agree with that? Say something. Just a suggestion to help them reacting. What would be a bottleneck in the digital ecosystem, beyond spectrum and the copper loop?

TONY SHORTALL: Obviously content.

PHILIPPE DEFRAIGNE: Yes, content. Absolutely. BT would agree. Thank you, Tony, and sorry for putting you --

TONY SHORTALL: First of all, I don't know why you put me on the spot here.

PHILIPPE DEFRAIGNE: Actually he suggested to me, he said if you see people fall asleep, just ask them what do you think. So I'm just following your suggestion.

TONY SHORTALL: I wasn't falling asleep in fact. I was very interested.

PHILIPPE DEFRAIGNE: You can stop there.

TONY SHORTALL: I was struck by several -- sorry, I did find the conversation very interesting and the interventions very interesting.

I thought Thomas' interventions was very interesting, because we don't talk about type 1 and type 2 perhaps in the way that we should.

We all remember the provisions of new and emerging markets that we had in yesteryear, which have gone off the topic and rightly so. Nobody could define it, and eventually we squared the circle, as it were, by saying if the market wasn't sufficiently stable that we couldn't define it, then that was a new and emerging market.

But I look at these kind of topics and discussions and apps, and see that, you know, very often the cautionary rule should apply. If in doubt, leave it out and don't do anything.

I think you make a good point about competition law, because you can adapt, I think, competition, your interventions in these markets, and use competition law as a means to determine -- you know, has something stabilised or is it a real bottleneck or is it just something that's ...

PHILIPPE DEFRAIGNE: Thank you very much. Kevin and Tom will agree with me that Irish people are the most reliable. Thank you for that.

Other input from the room to stir up this debate.

Erzsebet, I knew I could rely on you. Hungary does well as well. Thank you for your contribution.

ERZSEBET FITORI: Erzsebet Fitori from the European Competitive Telecommunications Association.

I think what you said, the copper loop will remain a bottleneck, but I would really broaden that. It is actually the fixed access network, I think, that will remain a bottleneck, really regardless of whether it is made of copper or fibre.

So I would just really say that whatever it is made of, fixed access networks will remain bottlenecks.

Equally, I found the discussion very interesting and very inspiring. Maybe just a couple of comments and questions with regard to some of the statement that have been made.

I think that for Europe really the regulatory model, which is based on addressing the enduring bottleneck, the fixed access networks, and opening them up to competition, has created a win/win situation.

So in Europe we have seen falling broadband prices, falling fixed broadband prices, and for those lower prices, actually increasing speeds being included in bundles and also additional services being included in bundles, which has then driven enormously take-up of

broadband in Europe. So it has really led to a situation where broadband take-up has increased from 30 per cent to 73 per cent in 2014.

You would think that these falling prices are kind of counter-intuitive of investment incentives and revenues, but really the interesting thing is that it is not, because the very high level of take-up has really increased fixed broadband revenues.

So if you look at the evolution of fixed broadband revenues in Europe, it was, I think, 17 -- sorry, I will just give you the exact figure -- it was 19 billion euros in 2011, and fixed broadband revenues increased to 37 billion euros in Europe in 2015.

So this really shows that actually the European access regulation regime has been a win/win for consumers and for industry.

For consumers, lower prices, more interesting, more innovative products, and then for the industry, a very significant revenue increase from fixed broadband.

I know that some people argue that revenues are overall decreasing, but clearly revenues are decreasing from the more traditional voice and SMS services which, let's just put it this way, they are not the killer applications of the 21st century.

It is also very interesting that you've raised the question of network investment or investments CAPEX levels and them being very strikingly higher in the US, which I think is kind of at the centre of a heated discussion here in Brussels. Does the US have more investment or does Europe have more investment?

But I think the issue here is really the question of network investments and the question of network coverage, because CAPEX in itself can be anything. It could include handset subsidies, CPE, whatever.

But I think when actually we look at fibre network coverage, Europe is slightly ahead of the United States. So Europe has a little bit more Fibre-to-the-Home, a little bit more FTTx, but pretty comparable actually.

Where the US is ahead is next generation cable because historically the US has had a very, very large cable footprint.

But when it comes to the new investments, Europe with its access regulation regime --

PHILIPPE DEFRAIGNE: Not much new bottleneck in that, but the message is title (inaudible) is not the best thing.

LEONARD CALI: The think I want to key off is the assumption of the enduring bottleneck. I think that's a factual question. I think you have to look at the facts to know that. So

more than 80 per cent of US households have access to networks of 100 megabits or more. We are building 12.5 million fibre lines. Verizon's already got 18 million fibre lines to the home.

I think that the problem here is this. If you look and say: gee, I represent resellers who rely on those networks, those networks are platforms for those people, it's a dangerous argument if those networks are competitive for several reasons.

One is: where do you stop? You could go right through operating systems and search engines and everything else and say we have to open all these things up as platforms of innovation for other companies. But you run a very real risk of depressing investment, and I think that's what's happened in Europe.

The reality is if you have an unbundling model, the regulator has to set a rate at the wholesale level, and the reason I say that is like walking a tightrope, if you set it too low, you could get low retail prices to end users, but you just destroyed incentives to invest by the incumbent, as well as incentives to invest by competitors. If you set it higher, you may well have a very fat and happy monopoly, but it might not be high enough to drive competitive investment.

So all I'm saying is: don't suggest there's an enduring bottleneck without looking at the facts, particularly in the cities, where the competitors want to compete, where you have multiple networks, at least in the US, competing with each other, and we should trust the market.

PHILIPPE DEFRAIGNE: Erzsebet, we will come back to you in a minute, but I've got strict instruction from BEREC that this session shouldn't be about the usual stuff. It should be about the thing up there, and you are dragging it back to the ground. So forgive me. We will come back to it.

I first wish to give Tom the opportunity of injecting some fresh blood in this debate. I'll come back to you afterwards.

TOM KIEDROWSKI: Thank you very much, Philippe. Tom Kiedrowski from the Cedar Tree Advisory Service.

Having worked to promote competition both in the electronic communications sector and in the water and waste water sectors, I feel quite qualified to cover it, and I want to go back to Len's point about not pigeonholing yourself as a utility.

When I was at the FT ETNO summit on Tuesday, I felt that some of the chief executives were doing precisely that because they were complaining that the more data people were consuming, the less they were paying for it, and surely there should be some sort of volumetric charge, and the more you use, the more you pay.

So presumably all of you on the panel would say that's not a good model to follow, if indeed we don't want to go down the utility model. But maybe some people do.

LEONARD CALI: I think the market should find the right pricing model. In some cases it will be a volume-based model. You'll sell things in buckets. In other places you may do sponsored data, you may do zero-rating. There are any number of opportunities you could find as you invest in these networks that you create specialised service for specialised needs.

I think we are very different from the utility. But I do worry about the terminology of utility because it tends to put you in a box.

CARLO D'ASARO BIONDO: I have always found that debate very strange. The people that want to use your service the most, you penalise them. Then we discuss about innovation. I think it's a dangerous way to look at things, and it's a way to look at things that's very oriented versus ourselves, whether we're a telco or an OTC.

The winners are the ones which look at the customer, not themselves. I know that, being Roman, it looks much Catholic now, but we need to forget ourselves if we want to survive in this world because everything changes so fast that if we look at it from the perspective of ourselves short term, we limit the possibilities of doing things long term.

VESELA GLADICHEVA: Hello, my name is Vesela Gladicheva. I'm from MLex here in Brussels.

I have a question first of all related to BEREC's OTT report.

According to the three categories, I just wanted to get your views on whether a video OTT service such as Netflix, under which category would it fall out of the three.

Another question, if I may, specifically directed to Google. I know that Google wants to establish a collaboration with European telecom operators. So I just wanted to find out what your plans are exactly in terms of that collaboration, what are you trying get out of it, and what kind of time frame are you looking at.

Thank you very much.

PHILIPPE DEFRAIGNE: So two questions. Shall we ask Thomas to answer the first one? So Netflix, does it fall into OTT0, 1, 2?

PROF. THOMAS HOEREN: I was not the author of this report. I have the feeling, seeing some very dark eyes which are really resting on me, that some of the authors are here in this room.

I would say it's OTT2 because it's quite easy. It's not a classical ECS provider. It doesn't compete with ECS providers. So it should be OTT2, and that means no special regulation so far as I have understood this report correctly.

PHILIPPE DEFRAIGNE: That was a test. Sometimes professors need to take tests.

Carlo, on the concrete plans.

CARLO D'ASARO BIONDO: First of all, the motivation. I think there are two levels of motivation.

One motivation is we realise that we cannot do certain things alone. It is very difficult to innovative and bring certain services to the market fast alone. So we need allies and we need to do it together with companies that have this ability. So this is the initial motivation.

The second one is because we work -- we are in all of European economies, and because we see what happens when people use the Internet, we saw small and medium companies become global exporters. We see the benefits that the web brings to the economy. We are convinced, absolutely convinced, that by exploiting the local strength of the economies, we can do more.

Our limit, as Google, is it's very difficult to go and propose to services linked to developing the economy, SMEs and the rest, with our sales forces because we don't have enough and we will never have enough.

So if we find the motivation for telcos to say, okay, why don't we go together and propose Cloud computing to SMEs, why don't we go together and propose that service that will make people able to better manage their house or their security or their safety or anything, we hope it's faster. We hope it's more convenient for people, and we honestly we also hope that it helps the economy. We do believe that all those elements are very positive for the economy, and this is the motivation.

PHILIPPE DEFRAIGNE: Before I go back to Erzsebet, on bottlenecks?

DOMAGOJ JURJEVIC: I'm Domagoj Jurjevic from Croatian regulatory authority.

Maybe a question for Professor Hoeren regarding the last sentence that Netflix -- not going into the definitions of OTT0, 1 and 2, that Netflix is not competing with telecom operators.

Maybe I can agree on that, but what if in future we will have Netflix 0 Netflix 1, Netflix 2, with sports content, with movies content, with everything? What will happen with operators? Do they will have to change their attitude in order to keep their revenues from IPTV or cable TV users? So the question is: do they really compete or not?

PROF. THOMAS HOEREN: When I finished my answer, I said Thomas, the question was so easy that I could answer it easy.

But you have seen this guy from German Telecom this morning who was standing up. I thought what would happen if the guy from the German Telecom would ask that question? Because they have similar media services like Netflix.

So there you see your question, of course. Netflix is quite easy because it's a simple company with simple services. What is happening with a kind of Google for the poor, Deutsche Telekom, which has a lot of services? How do you measure now competing? That is exactly my problem, competing.

I don't know. It depends on markets and we have to find a market definition for that. If German Telecom is doing it, of course, it has a lot of surprises in it regarding markets.

So I cannot answer your question because it was so complicated. I can only return this question to the people here in the first row. That's all I can do.

PHILIPPE DEFRAIGNE: Deutsche Alphabet.

Yes, gentleman at the back. The microphone is coming to you.

JOHANNES THEISS: Johannes Theiss from the German Broadband Association. So everything that I say is of course always limited to the German market, and I was hoping as you said that this session is not going to drag us back to what we had this morning, although interesting it was, and it may be. But now I see that somehow things are getting back.

When we talk about markets and type of where OTTs may compete or may not compete, I think it's pretty clear that neither Facebook nor Skype is building huge networks, at least not in Germany or somewhere else in Europe.

So for me I think that's the first critical differentiation we should make, that if it's any kind of competition, it will be a competition of services and not a competition in networks.

So any discussion to talk about network regulation in the context of OTTs is just not part of the debate. It's rather a discussion on services, and there we should be very clear.

When we talk about networks it's an entirely different field. Then we can see if the US is actually that much better off in terms of investment figures. When you take the investment rate it's actually not that good. When you take off choice of consumers, 75 per cent of consumers cannot really choose between operators. That's a totally different environment and I think there Europe is quite good.

But really to make it clear, distinguish between services and networks is seriously one of the key things we should do when we talk about competition and competition between OTTs and traditional network operators. Thanks.

PHILIPPE DEFRAIGNE: Thank you. That was a comment, I guess.

So we will slowly come to the end of this session, but, Erzsebet, I promised we would come back to you, now that we have heard a contribution on the bottlenecks, the upper layer bottleneck. Thank you for your patience.

ERZSEBET FITORI: Well, I would certainly agree with Johannes that when we are discussing bottlenecks, and very much a fact-based exercise, I would totally agree that this has to be fact-based, but I think facts coming from independent sources. That when we discuss about connectivities, so really access to the Internet networks, there is where we actually very clearly have enduring bottlenecks which will not go away, simply because the economics of network duplication are not changing, regardless of whether that fixed network is made of copper or fibre.

It is in extremely limited areas where you have economic space to have three parallel networks. In most places the maximum is really one telecoms network and one cable network. In Europe we do not have too much cable. So it's only about 50 per cent of Europe. That is different in the US.

I think that in terms of regulation's and competition's impact on investments, actually in Europe access regulation has been, evidenced by facts, a key enabler of investments by challenger operators. So actually challenger operators are behind quite a lot of fibre investments themselves. But more importantly, they have been triggering, via competitive pressure, investments by the incumbent operators.

That is not entirely different from the dynamic that American operators were not investing originally in cities where Google Fiber was, but when Google Fiber started that investment, then they responded to that competitive pressure.

But access regulation in Europe has been really key to this virtual circle. In terms of investment levels, investment levels have been very consistently and gradually increasing in Europe. NGA coverage has been increasing in Europe. It's at 68 per cent today and we are expected to have about 80 per cent FTTx coverage in 2020 under a very competitive environment.

The US is expected to actually have less FTTx coverage by 2020 under the current regime.

LEONARD CALI: I'm unfamiliar with the study that says we would have less. But in any event, my answer is -- I think you have sort of agreed with it -- let's check the facts. It's

a fact-specific enquiry, and if I think if you look in many, many urban markets, you find multiple competing networks. Certainly that's the case in the US. You find many competing networks outside urban markets. Right now you typically have throughout the US two wire networks, four to six wireless networks, and of course satellite broadband on top of that.

The only thing I would urge is: look at the facts. If you find competitive markets, trust the market. I think the concern is there's too much of an inclination to conclude in default there is an enduring bottleneck or, even if there is competition, these are platforms for innovation. We have always regulated them. We're going to continue to regulate them.

If you go down that road, net neutrality doesn't stop at the network. Unbundling doesn't stop at the network. You could go through the entire ecosystem on a theory like that.

PHILIPPE DEFRAIGNE: Before handing over to Fatima, I would like, if you allow me, Carlo, to ask you a question.

This is a very friendly audience that couldn't find any bottleneck outside the copper and the fibre loops. But Len just said net neutrality doesn't stop at the network, which is a bit in contrast with the previous discussion where nobody could give me an example of a bottleneck.

But assuming Len is true, and assuming the Parliament that will look at platform in a couple of years is less friendly about bottlenecks in the ecosystem than this friendly audience, the question that I'm asking myself is: in terms of the Google public policy strategy for the coming years, would you rather push for being regulated by these professional evidence-based regulators, or lobby to escape that and fall into the hands of MEPs that might come up with, I don't know, neutral search, for example? I don't know what you do with this one. Neutral search. Nobody knows what it is, but it will be in the light.

I think it's not such a stupid idea to go for these guys. Very friendly. Write clever reports, although German professors do not like them. But they are very critical.

CARLO D'ASARO BIONDO: That's not for us to judge. We play the game. It's like in a football team, you say: can I choose who is my referee? I play the game. The referee is chosen by someone else, and it should be chosen by someone else. Then we should respect the rules and go ahead. But we shouldn't choose the referee if we play football, and we love to play football. It's a nice game.

PHILIPPE DEFRAIGNE: Wonderful. Thank you.

Fatima -- shall we first applaud the panel? They did a great job.

Closing remarks

FATIMA BARROS: Ladies and gentlemen, dear friends, just a few words to thank you. I don't want to make any speech. It's already quite late. We have some refreshments outside waiting for you, so you'll still have the opportunity to do some networking and to exchange some ideas.

The most important is for me to express on behalf of BEREC our gratitude for having you with us today, and especially our guests, our panellists, that shared with us their knowledge, their opinions and also their vision of the future.

I think that what we really wanted with this forum today was to bring the discussion to a different layer, as Philippe said, in order to get out of the usual discussion. We know there is one part of the room that wants more regulation, or at least to keep the regulation. Other part of the room wants to lift regulation. Some others say: please keep us away of regulation.

So we have the usual views, but in the end of the day we all have a common goal, the customers that we must serve, and our main objective should be to find the right services at the right prices for our customers, and citizens in the case of the regulators, small businesses, SMEs, et cetera.

So thank you so much for coming. Thank you so much for participating in the debate. Please share with us your opinions, both at the level of the consultation, the public consultation, so you can send your written opinions according to the public consultation, but also through your voices and through your discussions. Please participate in all types of workshops. Sometimes we have public workshops and we invite stakeholders.

But also we hope that next year you'll be here as well to share again your views, and probably next year we'll have more information on what's going on about the regulatory framework review.

Thank you so much. Have a safe journey back home, and please join us for some refreshments outside. Thank you.

(4.45 pm)

(The meeting concluded)

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