

Foreword

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Our society is undergoing a rapid and profound transformation; a digital transformation that will change our way of life forever. Yet the success of this revolution is far from guaranteed. If it is to succeed - and I believe it must succeed - it will be due to a combination of the right political, strategic and economic choices. One of these is making sure that 5G connectivity is widely available.

Without first-class communication networks, there will be no Digital Single Market. A society built on citizens' ability to connect to anything from anywhere in order to manage their daily lives is only possible if connectivity is reliable and ubiquitous. And ensuring that this required level of connectivity is there to fuel the digital revolution in Europe is one of the key tenets of the Digital Single Market.

I firmly believe that 5G has the potential to transform our economy. It will enable wireless broadband services to be provided at gigabit speeds, and offer low latency and high reliability to support new types of applications, connecting devices and objects through the Internet of Things. It will fuel the development of innovative business models across multiple sectors, from transport, health and manufacturing to logistics, energy, media and entertainment.

This transformation is not waiting for the advent of 5G to take place, of course. Many of the digital changes to our society are already underway, using existing networks. But what 5G brings them is the speed, reliability and spread they will need to reach their full potential in the coming years. Take AI for example: 5G will allow a significant increase in real-time data collection and processing and distributed computing through the cloud, in turn fuelling potential advances in artificial intelligence.

The 5G for Europe Action Plan

The potential of 5G has long been understood in the EU. We started the 5G Infrastructure Public Private Partnership (5G PPP) - the biggest 5G research and development programme in the world - back in 2013. This in turn has led to the 5G standards that we see starting to emerge today, and which are the basis for all the large-scale 5G trials currently underway.

But getting the infrastructure and the standards in place is only part of the picture. If we want to reach the levels of connectivity we will need for the digital transformation of our society, we also need a long-term strategy for how to get there.

This was the logic behind the 5G action plan adopted by the European Commission in 2016, which aims to ensure the early deployment of 5G in Europe. The plan set out a number of targets that will need to be reached in order to ensure the 5G connectivity we need.

These targets include starting the first 5G trials in Europe in 2018 with a view to full deployment in 2020, with at least one "5G city" in every Member State, and ensuring the availability of 5G along main transport paths in 2025. The plan also identified the need to designate the pioneer frequency bands to be used by 5G in order to facilitate the early trials and full commercial introduction in 2020, as well as supporting 'holistic' standards not limited to eMBB, the so-called 'super broadband'. Finally the plan also acknowledged the need for financial support to stimulate the growth of the market, calling for easy access for SMEs to venture capital to catalyse the development of a 5G ecosystem.

But this is not just the position of the European Commission: in fact there is a very wide consensus among the EU Member State governments and all the European institutions that Europe has to act together, and quickly, to deliver on its 5G promise. This is why we have developed together a European 5G roadmap, a comprehensive plan for 5G development and deployment agreed in December 2017. It is now up to each EU country to devise its own national roadmap for 5G, and to expand their cross-border 5G trials.

The 5G Observatory – monitoring the position of Europe in the world

It is not enough however to simply have a plan, even one agreed by every EU Member State. We have to make sure that we stick to the plan, that we do what we have agreed needs to be done. This is where the European 5G Observatory comes in. Launched in 2018, the observatory monitors market developments related to 5G and the work being done by public authorities across the EU to prepare for the roll-out of 5G. Its first quarterly report was published in September 2018, providing an overview of where Europe stands in terms of 5G cities, trials and spectrum assignment, as well as the state of play with regards to the development of national 5G strategies.

The report makes for interesting reading, in particular with regard to Europe's progress compared to other parts of the world. In the US, for example, at least two telecoms operators will start limited 5G-related services in 2018, while investments in 5G infrastructure in some Asian countries, notably Japan, Korea and China, are already in the billions of euros a year. But if developments in Europe are moving at a slower pace, they are certainly moving. In Germany, for example, Deutsche Telekom recently announced its commitment to invest €20 billion in bringing 5G connectivity to 99

It is vital that Europe does not get left behind in terms of 5G development; any delays would be detrimental not only for the telecom sector but for the entire European economy. Since 5G is expected to drive the overall competitiveness of European industry in the future, we need to make sure we stick to the ambitious timetable agreed in the action plan and invest the time, money and skills we need in ensuring comprehensive 5G coverage as quickly as possible.

We need to learn from the lessons of the past. There were unfortunate delays to the roll-out of 4G in several Member States which we absolutely cannot afford to repeat. And now more than ever we are looking at these issues within the context of the single market, which means differences in the deployment and quality of 5G between countries must be avoided at all costs. So we need to move quickly, but in concert to ensure full 5G coverage everywhere.

Europe's competitive advantage

Europe's approach to 5G deployment is also coordinated in other ways. While making sure that all countries act together to ensure the best possible coverage is key, the European approach has also been to look at the importance of 5G beyond the traditional telecoms sector. There is massive potential for 5G to be the basic ingredient of a whole new way of doing business, across the whole of European industry, within the Digital Single Market. Europe was one of the first to see this potential and to look at 5G as much more than 'just' a telecoms issue; the fact that other parts of the world are coming round to seeing it in the same way is clear validation of his approach.

It is no exaggeration to say that the innovation potential 5G brings is huge - even if we cannot accurately predict exactly what its limits are. Who, for example, could have predicted the rapid and global development of companies such as Uber, AirBnB or WhatsApp on the back of 4G, which at the outset was essentially 'sold' as little more a faster and more reliable telecoms service? Yet the availability of 4G was all that was needed to spark the innovation that led to these companies seeing the light of day.

The potential, then, for 5G to drive innovation is even greater, for two main reasons.

First, the ecosystems needed to develop the Internet of Things, where everything from household appliances satellites are potentially connected, are already part of the 5G concept. IoT innovation is blossoming in Europe, predicated on a reliable, comprehensive 5G network across the entire single market, and we must ensure that we continue to fuel this innovation in Europe.

Second, 5G will be based on cloud technologies, significantly reducing the cost of connectivity. This in turn opens up the digital domain to many businesses in sectors beyond ICT, where the relatively high cost of connectivity has traditionally impeded their development.

These two factors combined mean that we can expect to see the most important changes thanks to 5G not in the traditional telecoms-related sectors but in those industries where connectivity has not been a central importance in the past. In short, inexpensive, reliable and widespread 5G connectivity will spark a digital revolution in anything from transport and energy to manufacturing or healthcare.

And the EU is well-placed to ride this wave of innovation. The EU is already the world market leader in many of the sectors that will likely benefit from the increased connectivity from 5G, from the automotive sector to public transportation or energy distribution. But the digital transformation of these industries will not happen automatically; we need to be working already to develop these new business and economic models to ensure that 5G is able to meet their needs as soon as it is deployed.

The 5G Corridors for Connected and Automated Driving

One excellent example of how this is already happening - industry and policymakers working closely together to ensure that the technology of the future can be used already today - is the work being done on connected and automated driving applications.

Since 2007, 27 EU countries and 2 EEA countries have been cooperating on creating of 5G cross-border corridors for large scale testing and early deployment of driverless cars. These corridors typically cover segments of motorways of at least two neighbouring Member States to allow for uninterrupted large-scale cross-border experimentation. Ten 5G cross border corridors will act as test-beds for this exciting technology. Three large-scale 5G corridor trial projects are kicking off in 2018, under the aegis of the 5G PPP. And the Commission is already proposing to set aside EU funding to support the deployment of 5G corridors within the next EU budget as part of the €3 billion set aside for the Connecting Europe Facility Digital programme.

Conclusion

As a fully connected digital society fueled by 5G comes ever closer to becoming a reality, there is plenty to be excited about. We know where we want to go, we know how to get there. But we cannot take our foot off the pedal. We need the continued commitment of business, of policy makers, of national authorities to complete this journey. And to do this we need to make sure that the real benefits of a 5G connected world are widely known and understood. Publications such as this one are a vital tool in making this happen, and I am happy to commend it to you.

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