

# Spectrum 5.0

## Improving assignment procedures to meet economic and social policy goals

### A position paper<sup>1</sup>

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There are recurring and even growing concerns in Europe about the pace of deployment of new and future wireless technologies and networks. This can be currently observed for the deployment of 4G. It is to be feared those concerns are even more acute with the future deployment of 5G. 5G is actually to be even more complex in terms of technologies, and comprehensive in terms of services and societal impacts, with the expansion of IoT, M2M, and industry services in addition to residential customer markets. Governments in most countries face "...widespread public dissatisfaction around coverage, particularly outside urban areas." (Ofcom, 2016). In a typical example, however, of the right hand ignoring what is being done by the left hand, some branches of Governments, or Agencies in charge of license assignments, tend to focus exclusively or primarily on maximising the fees they can derive from the spectrum auction procedures which govern spectrum assignment today, with only secondary attention being paid to the now widely observed limitations of this policy tool in achieving broader policy objectives. In the end, the present assignment procedures have not been able to incentivise the

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industry development in the expected manner. There is now a growing body of evidence suggesting that spectrum auctions as they are currently being conducted do not stimulate network investments.

A study by GSMA and NERA (2017) concludes that:

“Statistical evidence shows the impact on consumers and links high price outcomes with:

- Lower quality and reduced take-up of mobile broadband services;
- Higher consumer prices for mobile broadband data; and
- Consumers losing out on economic benefits with a purchasing power of an estimated US\$250 billion across 15 countries where spectrum was priced above the global median – equivalent to US\$118 per person.”

A draft Commission study by PolicyTracker, LS Telcom & VVA (2017) “found that the grouping with the highest auction prices also had the poorest network availability... This questions the common view that operators who pay high prices for spectrum must invest in their networks to make this money back.”

Cambini & Garelli (2017) have illustrated the fact that spectrum fees and availability do not have significant impact on operators' revenue and investments.

These empirical studies confirm the analytical assumptions by Pogorel & Bohlin (2016) that pure spectrum auctions aiming at maximising spectrum fees do not serve to stimulate investments and network deployment.

Although most industry and government representatives recognise those facts when discussing behind closed doors, only a few have dared recognise these shortcomings, and publicly come out in favour of a better practice.

The purpose of this position paper is to explore future proof spectrum assignment scenarios that would more harmoniously balance the legitimate goal of the efficient use of spectrum as a limited public resource, with the equally prominent objective of deriving the maximum benefits for the economy that can be expected from investments in wireless network technologies, and putting in place the right incentives for the operators to exploit the potential of future network technologies in fulfilling economic, social and industrial objectives.

We present in this position paper design assignment scenarios in the 5G perspective that would re-balance the auction process, giving full consideration to the investment commitments of the bidders needed to achieve broader economic objectives, alongside the frequency fee paid to the government agency in charge. The 5G political challenges for the EU telecom industry are higher than ever. 5G will serve Industry 4.0, connectivity, cross industry digitisation, and provide the building blocks for the Digital future of Europe.

### **Re-defining spectrum awards procedures to align incentives with overall policy objectives**

In order to circumvent the shortcomings of past spectrum auctions, future spectrum auctions should feature re-balanced spectrum assignment criteria prioritising investment plans of operators and put them at the forefront of public choices.

The Spectrum 5.0 re-balanced competitive procedures would combine:

- investment plans

- with the traditional spectrum fee.

The primary focus of the assignment would be on investment plans. They could be expressed in financial terms of defined as population and/or geographic coverage commitments. In case the government, based on its appraisal of the public interest, sets the assignment conditions at 90-95% coverage, the procedure would resemble a traditional spectrum fee auction. In cases, like early stage 5G deployment, where technology and economic risks and uncertainties are high, NRAs might not want to pre-define coverage obligations. Therefore, the new assignment mode would warrant from the bidders more substantial steps towards investment.

Different modalities can be envisaged:

1. pure investment and coverage commitments
2. investment amount in escrow to be released along the deployment by the operators

With modality 1, the NRA would have to deal with the delicate issue of measuring the coverage outcomes, as is the case currently in many instances. In this respect, modality 2, keeping investment funding in escrow would have the advantage of reversing the burden of the proof: it would be up to the operators to demonstrate they have complied with their commitments.

Other defining elements in the assignments should be considered. Assessing the relationship between a specific frequency band and the network deployment are no different from the current situation. There will also be a need to account for different use cases: 5G in general, and IoT, in particular, have different use cases, with different coverage definitions.

Moreover, the network evolution over a long period will have to be articulated with investment plans and the duration of the license. To make the bids comparable, investments over time will be summed up at present value, accounting also for the evolution of network costs.

#### **What spectrum fee should be paid to the government?**

Fees should be paid for the use of spectrum as a limited resource. We could consider various methodologies:

- % of investments
- % of expected income
- pre-defined fee.

#### **Monitoring and compliance**

One key element is the compliance of bidders in the implementation of the investment objectives in their bids. A major risk is the potential divergence between ex ante commitments and ex post outcomes. While traditional auctions are based on ex ante expectations including auction fees, the investment promotion auction design is based on carefully designed rules of behaviour and follow-up monitoring. To make sure that investments are indeed taking place, institutional arrangements should be designed to ensure the compliance to commitments, and to cope with potential shortcomings.

The task of monitoring the implementation of the selected license holders will not be much different from what is currently performed by NRAs. Some flexibility should be allowed on investment plans, taking into account changing economic conditions. Coverage obligations should be fulfilled, and the present value of the scheduled investments maintained. A degree of flexibility of investments in specific bands is warranted: the commitments cannot be band specific over the long period.

The issue of reverting back unused or under-used frequencies if the commitments are unfulfilled needs to be considered, as is the case for past spectrum assignment procedures.

### **Positive short term and long term impacts at telco, industry, government budget, and macro level**

The results of the alignment of public policy and industry strategies can be expected to be positive.

- MNOs will know precisely what is expected in the terms of their license, allowing them to define their business model and strategy. The fee paid to the government will lose its central status, and be considered as a normal counterpart of the use of the spectrum resources. Funding by banks, especially the EIB, could be made easier. Better consideration could be devoted to entrants with infrastructure investment plans.
- The public will benefit from the faster deployment of new networks, faster diffusion of new services, increased incomes of all industries, and the government from corresponding taxes. Coordination, incentives and public policy initiatives, especially regarding verticals can be positively considered.
- Focus on investments has positive impacts on R&D, technology and standards,

### **The European dimension**

Member states have different starting points, but convergence and consistency are essential for the digital single market, in terms of rules, timing, and conditions. The re-balanced spectrum awards framework corresponds to an EU wide perspective, and can be proposed as a best practice.

### **Conclusions: The value of spectrum resides in its use by the economy and society**

To put it bluntly, and contrary to the hot air common wisdom, spectrum has no value in itself. Its value resides exclusively in the contribution its use makes possible for society and the economy.

It is not too late to think about spectrum awards for 5G in this perspective. Spectrum auctions 5.0 should put an end to the case by case lottery of successive spectrum assignments. It should pave the way for a consistent, less stochastic, system of putting spectrum usage at the service of society, by smoothing spectrum fees, in a manner connected to global usage and in line with the continuity of technological evolutions.

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