

Overcoming the Regulatory Challenges Posed by Small Cells

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The last few years has seen a rapid increase in the use of small cells in mobile networks around the globe. This is not surprising, given the various benefits which their use brings to operators, customers and society at large.

For the operator, small cells bring the opportunity to extend the reach of their networks to enable better coverage in buildings and other hard-to-reach areas, while at the same time offloading traffic onto fixed broadband lines, thereby alleviating congestion in the radio access network. This, in turn, leads to a better experience not just for those who are connected to the small cells but, also those who remain on the macro network.

Valuable spectrum is used more efficiently, capacity is increased, overall costs are reduced, customers get a better experience and new location-based services become possible. As such, it's easy to see why more and more operators are deploying small cells. However, the changing shape of mobile networks has also led to the need for regulatory and policy makers to re-examine the ways in which they authorize and regulate small cell deployments in order to realize these economic and social benefits for local industry and citizens.

The Small Cell Forum has been active since its inception in promoting the benefits of small cells to policy makers, evangelizing key regulatory principles to promote small cell adoption, and sharing best practice between different jurisdictions around the world. In the early years, the emphasis was on the lowest power domestic/home office femtocells where the key principles included:

Licensing – There is no need for additional or individual licenses for such devices, since they operate in operators' licensed spectrum. Individual registration requirements should be avoided to reduce unnecessary administrative cost. Fees should be structured to allow for high density roll-out of small cells.

Interference & Safety Concerns – Small cells remain under the control of the licensed operator and restrict their powers to avoid interference. The radiated emission levels are within accepted Health & Safety guidelines.

Security – Small cells use secure mutual authentication between the device and the

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network. They are manufactured to be tamper-proof devices with no user controls.

Privacy Concerns – User opt-in is required for any location based services, the subscriber and device identity is fully protected.

All the above hold equally true for low-power LTE small cells, as they do for 3G, with no additional regulatory measures being needed and, indeed, we have witnessed positive changes to regulations in most markets over the last five or six years in recognition of these points.

More recently, the emphasis on small cell regulation has shifted towards the evolving use cases and new issues arising from the use of progressively higher power small cells in enterprise, urban and rural environments. This brings into play a number of additional regulatory considerations.

For example, planning laws, usually handled at the local municipality level, place specific requirements on operators seeking to deploy small cells in outdoor situations and these can vary considerably between different local authorities. The key here is to streamline the processes as much as possible and for industry to work with local authorities to remove unnecessary obstacles to small cell deployment. At the same time, there's a need to respect and preserve the environment, particularly in areas of cultural sensitivity and natural beauty. Guidelines need to be developed on ways to install and design the small cell terminals in order to minimize their visual impact.

Site sharing requirements are another factor which comes into play, as are the issues around the obtaining of way leaves, access to power supplies, etc.

Health & Safety concerns are an issue which the mobile industry has needed to address from the outset. Established guidelines exist for macro sites, but operators need to be aware of the requirements which are relevant to the particular location. More generally, the industry needs to encourage greater consistency across local and national jurisdictions based on compliance with standards for emission levels which are aligned with international health organizations' recommendations.

Finally, some topical moves in regulatory circles in both Europe and the United States involves the use of shared spectrum as a means of finding additional spectrum to meet the ever-increasing demands for mobile broadband. This is known as Licensed Shared Access (LSA) in Europe and is very different from the traditional approach where each operator acquires the exclusive rights to a particular block of spectrum. Only certain frequency bands are suitable for such considerations, depending on incumbent usage and in Europe the focus right now is on 2.3 – 2.4

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GHz.

Similarly, in the US the FCC initiated an NPRM earlier this year to examine the possibility of using spectrum around 3.5 GHz (currently used by military radar systems) on a shared basis, taking into account the particular advantages of small cells and their ability to mitigate interference to and from neighboring applications. The details are complex and such proposals raise some interesting and challenging technical and regulatory issues which will need to be worked through over the coming months and years. Nevertheless, the rapid changes in technology mean that regulators need to continually adapt the rules to facilitate network deployments and make best use of the scarce and finite spectrum resource.

The above gives a flavor of the changing regulatory landscape brought about by increasing use of small cells in mobile networks. Small Cell Forum will continue to work with operators, manufacturers, application providers and the relevant regulatory authorities around the world to address such issues and ensure that the benefits of small cells can be brought to as wide a population as possible.

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