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Radio Spectrum Policy Group

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RADIO SPECTRUM POLICY GROUP

Work Item

“Spectrum issues on Wireless Backhaul”

Final Draft RSPG Work Item
“Spectrum issues on Wireless backhaul”

Rationale

Mobile networks are evolving to respond to an increased broadband usage. To respond to related need for higher capacity and speeds, the densification of mobile networks is under investigation. Against this background, mobile operators are considering various forms of backhauls including wireless ones (point to point, non-line of sight¹). New forms of base stations are under study by market players: small cells². The small cells intend to provide cellular coverage in a limited range. An increase in the number of wireless backhaul links required for the small cells could then be foreseen. Moreover, wireless backhaul solutions in frequency bands already licensed for Wireless Broadband (WBB) under harmonized technical conditions could be of interest to the current license holders.

Both wired and wireless solutions are able to meet this backhaul market demand. Various technical solutions could be considered by market players to facilitate roll out, reduce the backhaul cost, and to meet the traffic needs such as optical fibre or wireless and fixed links.

Wireless backhaul links are basically deployed through fixed links under the ‘Fixed Service’ defined in ITU’s RR. Nevertheless wireless backhaul is only one application of the fixed service. A fixed service application in the core network should not be considered as wireless backhaul in the scope of this work. In this report, wireless backhaul should then be understood as the intermediate/last wireless link to connect various forms of base stations³ with either the core network or the backbone network.

Wireless backhaul to deliver higher broadband traffic within the mobile/cellular networks and to the mobile/cellular base stations will face strategic challenges due to mainly:

- Increased wireless backhaul capacity needs for existing macro-cellular sites
- Expected increase number of wireless backhaul links required for the small cells

Various frequency bands for wireless backhauling are already subjected to ECC recommendations which harmonize frequency plans. These deliverables are revised within CEPT if needed and where appropriate (i.e. to introduce new frequency plan for example). According to national demand and circumstances, the frequency bands nationally available for fixed links vary from country to country.

New strategic spectrum challenges on wireless backhaul (non-line of sight wireless backhaul issues, capacity and number of links and its impact on spectrum management, the potential interest of WBB frequencies for wireless backhauling in

¹ A direct line of sight does not always exist in dense urban

² Various definitions exist for small cells: current IUT definition under drafting refers to some criteria to define small cells : power limitation, frequency above 2 GHz, coverage less than 50m, indoor only. "Micro cells" are small cells. Pico cells: "Pico cells" are cells, mainly indoor cells, with a radius typically less than 50 meters.

³ Macro, pico cells including small cells

the context of the service neutrality, etc.) and small cells issues are to be anticipated. These market trends impact the spectrum management which should be assessed for the next 5 and 10 years.

Scope of RSPG activity

RSPG plans to identify and analyze strategic spectrum issues relative to wireless backhaul for mobile networks (lessons learnt, various types of backhaul, trends, needs, etc.) due to:

- higher capacity needs for existing macro-cellular sites
- the densification of base stations and the small cells approach (trends, foreseen impact on spectrum management, non-line of sight wireless backhaul issues) in mobile networks infrastructures

This RSPG activity could include a review of state-of-the-art developments and trends in wireless backhaul in public mobile cellular networks (including use of small cells and mesh networks) including identification of any relevant spectrum sharing and spectrum efficiency issues and an assessment of any implications for spectrum management policies at the EU level.

Planned type of deliverable: RSPG report

Time Schedule: draft report Feb 2015 / Final report June 2015