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DYSPAN 2015

Gösta Lemne´s notes in preparation for Panel debate

DISCUSSION SUMMARY

- One thing we've learned from 2G, 3G and 4G is that we will not be able to fully foresee what the society and market will do with a new generation and it's new level of opportunities.

- In 1993, I was told that GSM will never fly because 7% of Sweden's population already had analog mobile phones. SMS was introduced to tell people they had voice-mails. We had video-telephony in mind when we specified 3G (as internet had not yet grown big at the time), and as late as 2005 analysts told me that people will never watch video clips on a mobile phone – guess they forgot to tell YouTube. And BTW – mobile phones must have mechanic key-boards!

DISCUSSION SUMMARY

- 5G with it's robustness, short latency, extreme data-rates etc. will make people invent new thing and use-cases that we haven't faintest idea about today.

- One thing we DO know is that we'll need spectrum to release this wave of innovations, and spectrum has become scarce lately. We can also be pretty sure that there is a need for both the 6-25 GHz range as well as above 25/30 GHz. Propagation and availability is different, but so are the yet unknown applications.

DISCUSSION SUMMARY

- We'll learn a lot during the next 4-5 years through large and small scale tests and trials, where I think an important part is not to prove the technology to ourselves, but rather to show it to society and get innovative brains going. With this learning, over the next 3-4 years we can say with better accuracy what bands between 6-20 GHz and 30-100 GHz that can and should be used for 5G, globally harmonized as far as possible – that's why we need a AI at WRC-19 for the 6 -20 GHz as well as higher bands.

DISCUSSION SUMMARY

- Sharing (this conference is about sharing) - sharing in time and space will be necessary in some cases. I want to emphasize the two aspects spectrum "utilization" and "efficiency". Spectrum not utilized should be made available somehow, sharing is a potential, but the sharing solution should not compromise the spectrum efficiency in the band, when utilized by either party – spectrum efficiency should be a requirement, or we will soon run out of spectrum again. This applies both to the radio technologies used and the sharing mechanisms.

DISCUSSION SUMMARY

- An example of the latter – as it is not talked about so much: LTE optimizes the use of available spectrum on millisecond level, to send as many bits to as many users as possible - here the sharing system must be designed not to disturb that “millisecond optimization”, and 5G will have an even faster control loop that must be allowed to work efficiently to guarantee maximum spectrum efficiency.
- Below 6 GHz: just like LTE and 3G is being deployed in what was originally GSM bands 5G may eventually be deployed in lower bands, etc., but given the data growth – that we have so far always underestimated, all available spectrum <6 GHz will probably be needed by traditional MBB at the 2020 time frame.

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