



Introduction





Brett Tarnutzer







5G Ramps Up



O2 commercial 5G gives music fans intimate access to gigs and musicians through cutting edge Virtual Reality







5G IN EUROPE 17 live networks 43 trials

26 GHz auctions planned for 2020/21







The socio-economic benefits of mmWave 5G (2020-2034)

Europe Edition





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5G Trials and Launches

Mats Ohman





5G AND SPECTRUM NEEDS

Mats Öhman, TeliaCompany GSMA Seminar for CEPT WRC-19 Sharm el-Sheik

November 4, 2019



BACKBONE STRUCTURE OF 5G

DEVICES CONNECTIVITY DATA STORAGE

ANALYTICS APPLICATION

GITAL RVICE

5G Success is not only about spectrum but it plays a key role

ROLES OF DIFFERENT SPECTRUM RANGES



SUFFICIENT SPECTRUM NEEDED IN ALL RANGES



• WHAT HAS TELIA DONE WITH 5G?

SEVERAL TRIALS IN MMWAVES AND MID-BANDS WITH VARIOUS PARTNERS

TELIA COMPANY PARTNERSHIP PROGRAM

COMMERCIAL LAUNCH IN FINLAND AND PLANS IN OTHER COUNTRIES PENDING ON SPECTRUM AVAILABILITY



ABB ASSEMBLY LINE: 5G + AI + CLOUD



Real time quality assurance, low latency 5G connection, machine vision analytics running in datacenter



VOLVO CONSTRUCTION EQUIPMENT FACILITY REMOTE-CONTROLLED MACHINES AND AUTONOMOUS SOLUTIONS





BOLIDEN MINE - 5G UNDERGROUND NETWORK



Sustainable mining better safety and productivity with less CO2





FACIAL PAYMENT OVER 5G

Fancy a top-quality ice-cream just showing your face for payment ?







AND MANY MORE ...





eSports



Forrest industry mill



Drone+video analytics

Airport robot



Movie theater



Virtual reality collaboration



Cruise ship



DATA USAGE IN TELIA-COUNTRIES?

- Development of data transferred over mobile networks per capita in a month (Gbytes) in Nordic and Baltic countries in 2013-2018. Up to 160% annual increase.
- 5G services expected to drive high demand, e.g.
 - HD video 90min/day => 84 GB monthly
 - VR/AR 10 min/day => 110 GB monthly
 - Very fast increase experienced already in Asian countries with early 5G-launch



Ref. Telecommunications Markets in the Nordic and Baltic Countries 2018, statistics from NRAs

TELIA WISHLIST FOR WRC-19 MM-WAVES





TELIA WISHLIST FOR WRC-23 AGENDA

UHF-band review:

Mobile data increase is driven by media consumption. Co-primary mobile allocation provides flexibility to use spectrum for mobile when use of terrestrial broadcasting decreases.



Spectrum enabling high capacity and sufficient propagation (incl. outdoor-indoor) is needed especially in urban and suburban areas in mid-long term.

THANK YOU!





Public



Sverker Magnusson



5G ECOSYSTEM UPDATE

Sverker Magnusson GSA CEPT



VISION



large contiguous amounts of high band (mmWave) harmonised spectrum, with suitable regulatory conditions, helps enable extreme capacity and ultra fast local area services. planning for the future with WRC-23 mid & low band agenda item



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spectrum from the low-band, mid-band and high-band frequency ranges helps realise the Vision



wirelessly connect almost all 7 billion people globally to new and exciting services through 100 billion devices and things, by 2030

USE CASES









STANDARDS



Release 15 complete (2017-2018)

Release 16 development (2018-2020)

Enhancements, Unlicensed, URLLC+ & IoT+, V2X, etc

Release 17 planning (2019-2021)

Enhancements to support verticals, coverage improvements, NTN, etc

3GPP 5G specs complete – work underway on enhancements



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SPECTRUM





Wide area coverage, deep indoor (mMTC, eMBB, URLLC) Low band Extended coverage e.g. 600, 700 MHz etc Upto 20 MHz channel bandwidth 2020 onwards

Various applications and services require access to spectrum from low, mid and high bands

The Road to 5G with GSA

The Industry Voice of the Global Mobile Ecosystem

Facts - Figures - Graphs - Reports - Market Monitoring - Analysis - Advocacy - Databases... Read Mores

THANK YOU

Check out <u>www.gsacom.com</u> for regular report updates

5G licensing update

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5G ecosystem update





Conclusion

Glyn Carter







26 GHz (24.25-27.5 GHz)

- Limits to protect EESS (passive)
 -28 to -32 dB(W/200MHz)
- No conditions necessary for FSS/ISS since sharing studies show significant protection margin

40 GHz (37-43.5 GHz)

- Identification of whole range provides
 harmonisation with other Regions
- FSS downlink: ES sharing is a national issue
- FSS uplink: sharing studies show a significant protection margin

50 GHz (45.5-52.6 GHz)

- Good options to support future 5G
 growth
- Studies have been performed and show sharing is possible

66 GHz

(66-71 GHz)

- Flexible use for unlicensed 5G systems - both IMT and non-IMT technologies
- Shared with WiGig
- Supported by APT, ATU, ASMG, CEPT



WRC-23 supported bands

GSMA supports WRC-23 AIs for IMT in 470-960 MHz, and consideration of the bands below





Experiences at the GSMA stand

Live 5G demos



City of the Future VR experience



Interactive library - all reports straight to your inbox

