

5G Huddles
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Spectrum Challenges for 5G

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5G might be introduced in existing mobile bands

- Regulation is technology neutral :
 - ✓ bands already harmonised in Europe might be used in Europe for 5G
 - ✓ Some adaptations for accommodating 5G characteristics, if needed (small cell ? BEM ?)

- Two bands have limited use so far and interesting bandwidth
 - 3400-3800 MHz
 - ✓ technical conditions reviewed in 2014
 - ✓ TDD arrangement for 3.6-3.8 GHz, preferred for 3.4-3.6 GHz
 - 2300-2400 MHz
 - ✓ Technical conditions agreed in 2014
 - ✓ Licensed shared access (LSA)

...could be envisaged for early introduction of 5G in lower bands

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Frequency bands already harmonised by ECC for broadband

Band	Size (MHz)	Ref
800 MHz	2x30	ECC DEC(09)03
900 MHz	2x35	ERC DEC(94)01 & ERC DEC(97)02 & ECC DEC(06)13
1452-1492 MHz	40	ECC DEC(13)03
1.8 GHz	2x75	ERC DEC(95)03 & ECC DEC(06)13
2 GHz	2x60	ECC DEC(06)01
2.6 GHz	2x70+50	ECC DEC(05)05
3.4-3.8 GHz	400	ECC DEC(11)06
	Sub-Total : 1030 MHz	
700 MHz	2x30 + 20	ECC DEC(15)01
2.3-2.4 GHz	100	ECC DEC(14)02
	Total : 1210 MHz	

WRC-19 Agenda Item on 5G spectrum

- Request from Research and Industry for 5G spectrum in higher bands
- Worldwide consensus : WRC-15 should launch studies for identification of 5G spectrum in higher bands at WRC19

... preferable to focus studies on certain frequency bands

But which one ?

ECP for WRC15 on 5G bands to be studied

	Bandwidth	Remarks – compatibility challenges
24.5-27.5 GHz	3 GHz	Existing and future earth stations for EESS and SRS (↘) and for FSS (↗), P-P and P-MP fixed service
31.8-33.4 GHz	1.6 GHz	“HDFS” band in RR 5.547 - Radionavigation
40.5-43.5 GHz	3 GHz	ECC DEC(02)04 for MWS - FSS, BSS, Radioastronomy
45.5-48.9 GHz	3.4 GHz	MSS/RNSS/FSS
66-71 GHz	5 GHz	ISS/MSS/RNSS
71-76 GHz	5 GHz	Fixed service, FSS/MSS/BSS
81-86 GHz	5 GHz	Fixed service, FSS/MSS, radioastronomy

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... and oppose studies in **27.5-29.5 GHz** because of satellite broadband communications

Does it respond to the need ?

- How to address spectrum requirements ? Not only amount of spectrum : access/backhaul in the same spectrum, sharing opportunities ...
- Proposed band for studies respond to the requirement for **wider bandwidth** and **higher spectrum**
- Some of these bands are **currently lightly used** (eg, 40.5-43.5 GHz) : this might enable easier introduction of 5G
- Although, some industry have claimed for bands <20 GHz, no opportunities for bands with sufficient bandwidth

ASMG : > 31 GHz

Views of other regional groups ?

From (GHz)	To (GHz)	Bandwidth (GHz)
25.25	25.5	0.25
31.8	33.4	1.6
39	47	8
47.2	50.2	3
50.4	52.6	2.2
66	76	10
81	86	5

APG

From (GHz)	To (GHz)	Bandwidth (GHz)
25.5	27.5	2
31.8	33.4	1.6
39.5	41.5	2
45.5	47.5	2
48.5	50.2	1.7
50.4	52.6	2.2
66	76	10

RCC

From (GHz)	To (GHz)	Bandwidth (GHz)
10	10.45	0.45
23.15	23.6	0.45
24.25	27.5	3.25
27.5	29.5	2
31.8	33	1.2
37	40.5	3.5
45.5	47	1.5
47.2	50.2	3
50.4	52.6	2.2
59.3	76	16.7

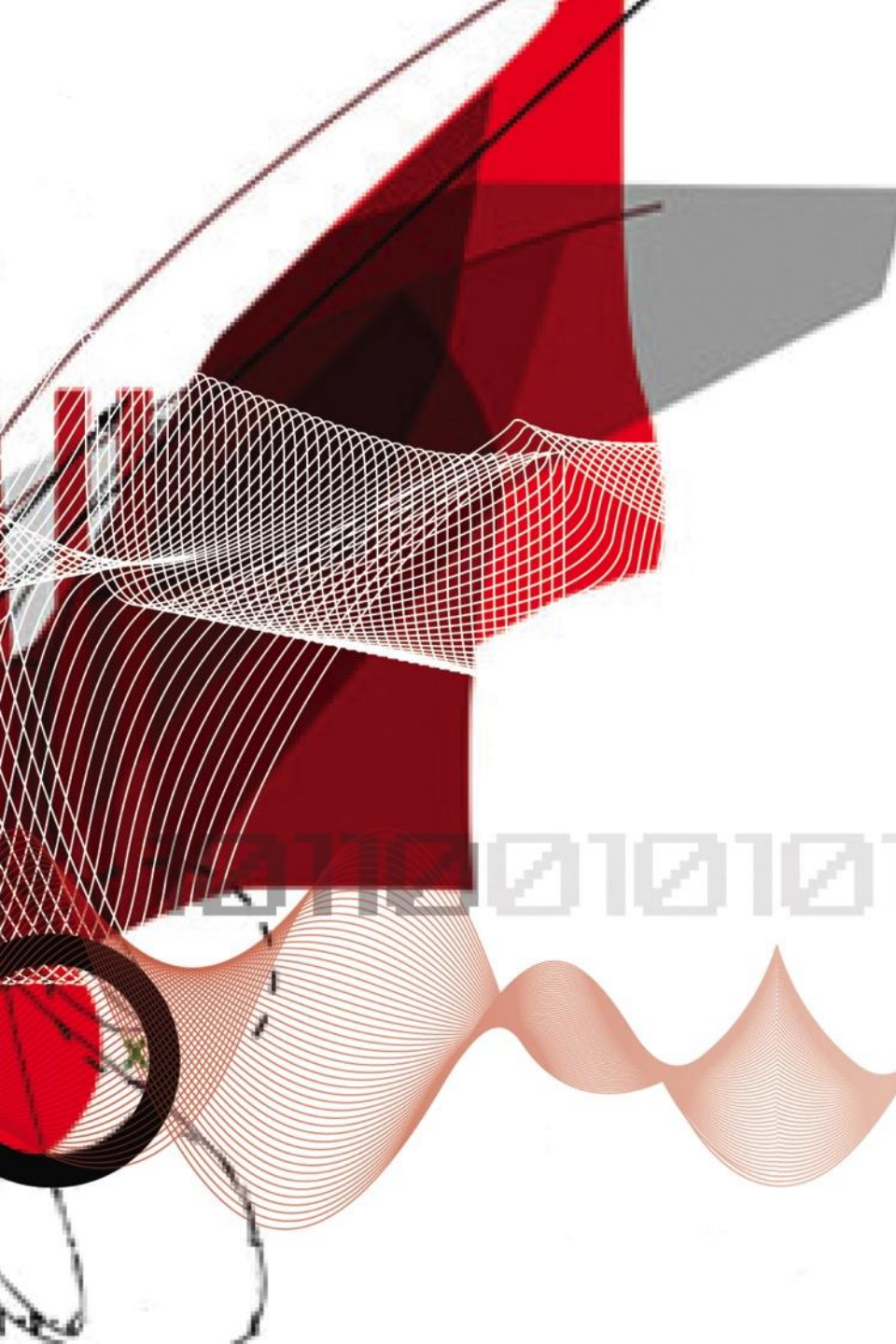
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Other spectrum challenges ?

- **Convergence between access and backhauling**
 - Convergence with which kind of backhauling ? Small cells ?
 - Existing backhauling may not be “convergent”
 - **Sharing capabilities**
 - Improvement of adjacent channel/band performance. To which point ?
 - New (cognitive) features for easing sharing with other applications. But which one ?
- ... but sharing conditions will be necessary in some of the WRC-19 bands**

Timeline

- WRC-15 decision on **WRC-19 agenda item** – bands to be studies
- **Sharing studies in CEPT and ITU-R** : 2016-2018
- Any evolution of harmonised technical regulation in **existing bands** : 2016-2018
- **WRC-19**
- Post 2019 : ECC activity to harmonise bands identified at WRC-19



CEPT **ECC**
Electronic Communications Committee

Thanks ...

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