

EBU **TECHNICAL**



How can market-based approaches cope with interferences?

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Service neutrality and spectrum pricing

Service neutrality:

- Regulators should encourage flexible use of spectrum by allowing ANY frequency band to be used for ANY type of service

Service neutrality is one of the prerequisites for the market-based approach

Spectrum pricing and service neutrality are linked: More value for the spectrum which allows a full service neutrality, as more candidates would be interested.

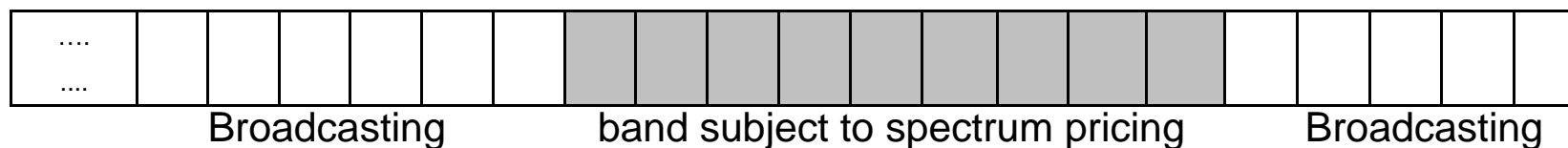
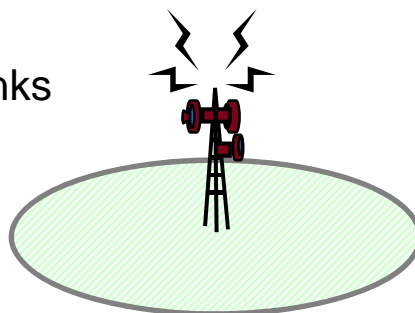
But The interference issue is crucial for the service neutrality principle



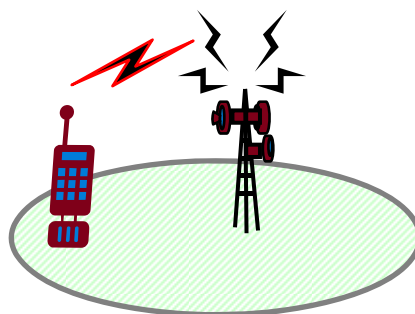
Services are not equal

Two main types of services in terms of their potential interference on broadcasting in adjacent bands

- services using only downlinks



- services using downlinks and uplinks



Limitations for services using downlinks only

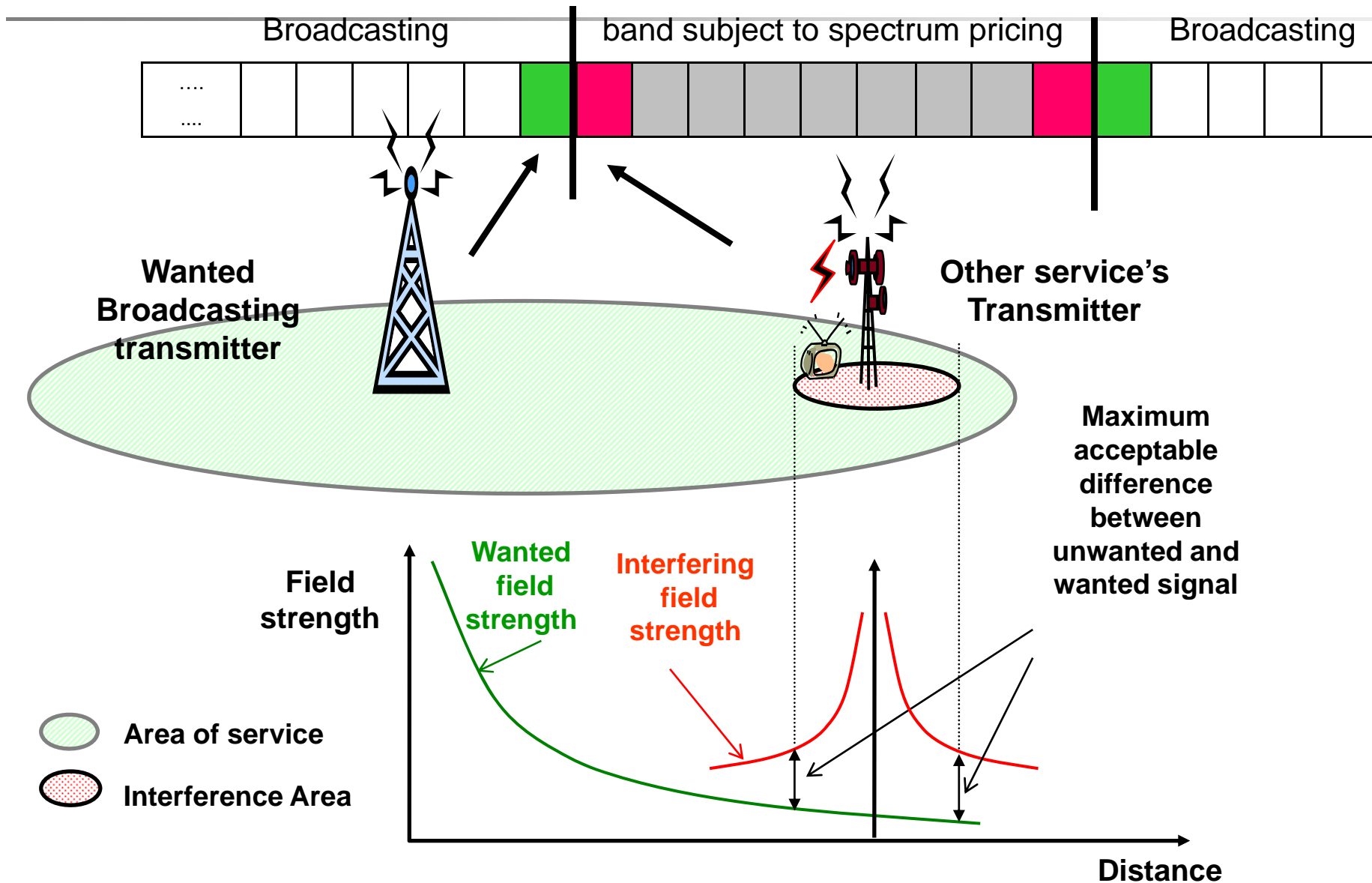
Services using downlinks only,

- **May cause hole punching in the broadcasting services using adjacent bands**
- **Possible solutions for the channels on the edge :**
 - either guard bands are implemented, which means no value
 - or suitable engineering and coordination with the services in the adjacent bands are needed, which means less value

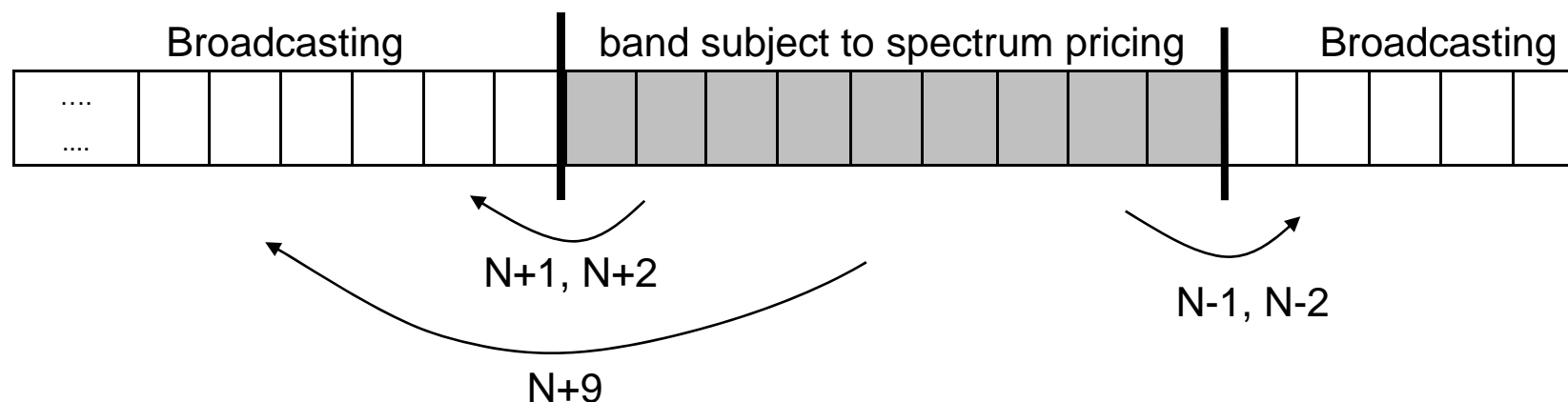
The spectrum on the band's edge may have less value than the remaining spectrum



The hole punching



Limitations for services using uplinks (1/2)



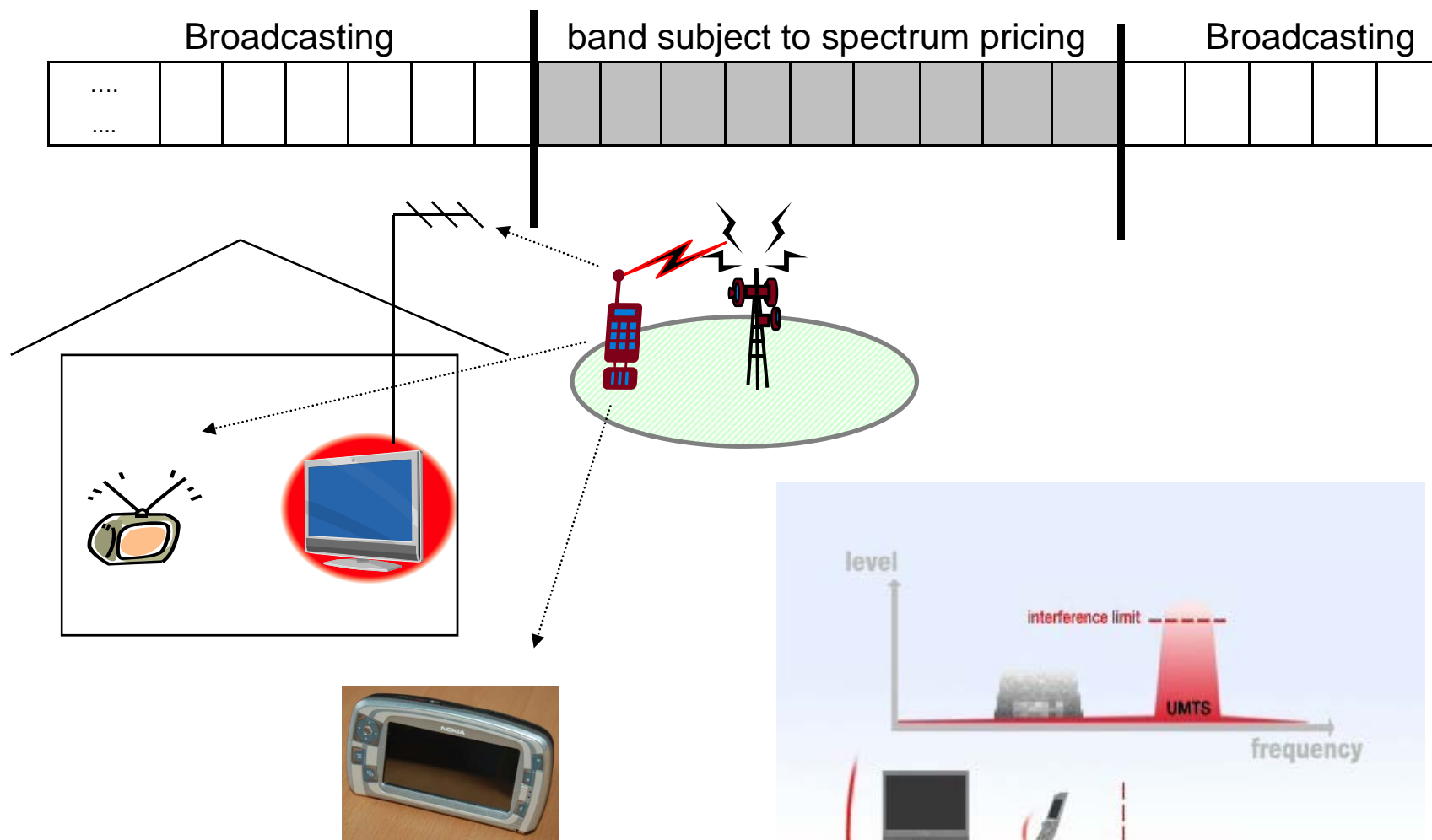
Channels are not equal in their impact when used for uplinks

- Adjacent channels are critical (e.g N+1, N+2)
- Image channels (N+9) may be critical

Overloading could occur when using any channel

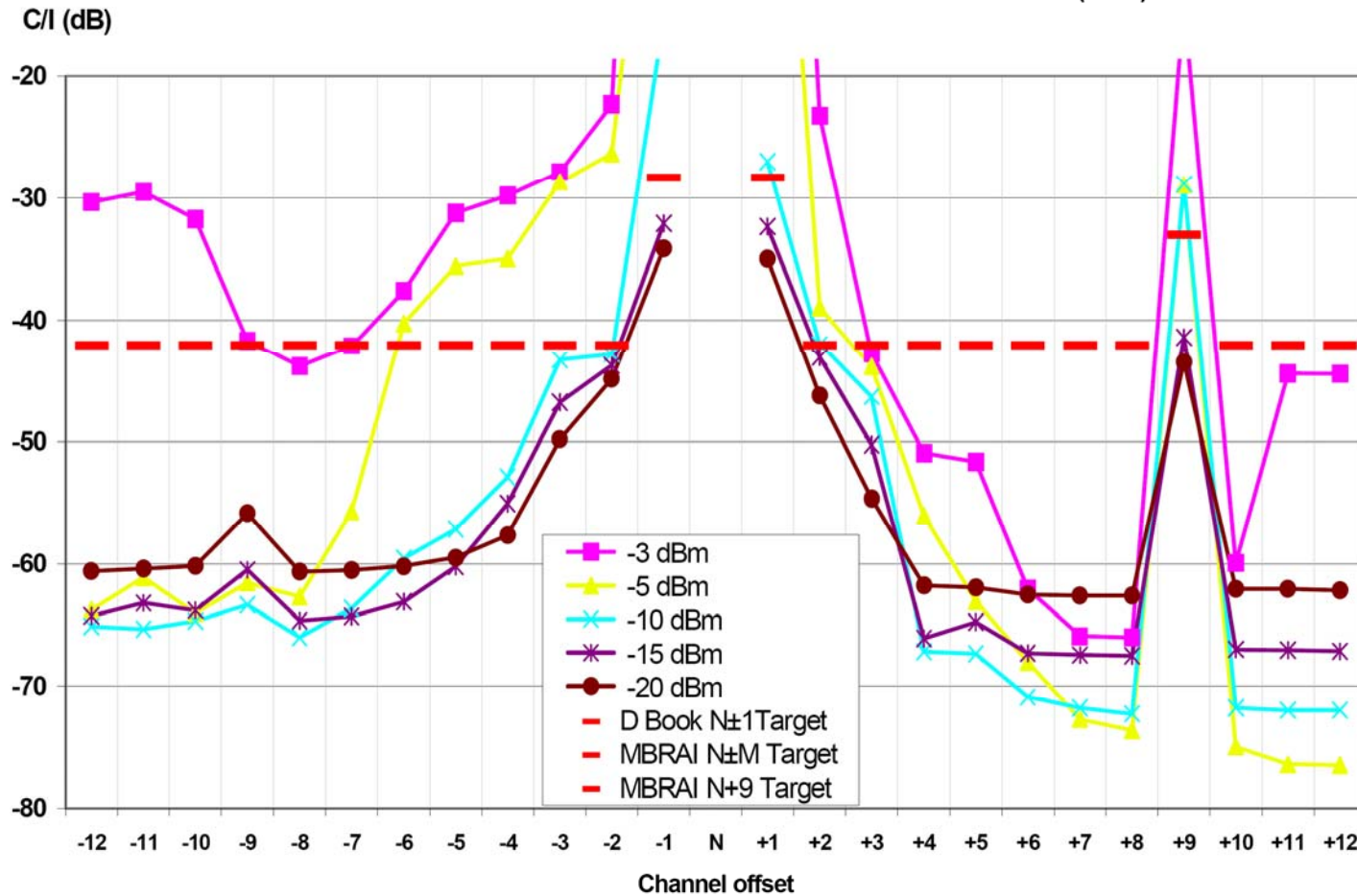


Limitations for services using uplinks

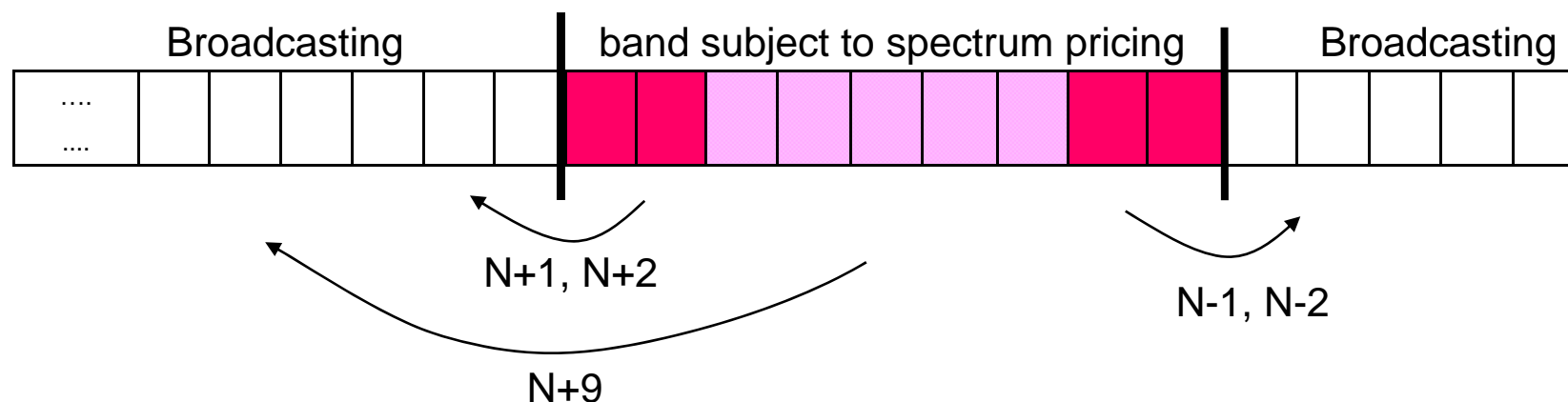


Potential interference for different channel separations

Averaged values (7 receivers) of DVB-T 64Q, r2/3 protection ratio (dB) versus out-of-band DVB-T interferer at different offsets and interferer levels (dBm)



Limitations for services using uplinks (2/2)



Possible solutions to avoid uplink interference :

- Adequate channels arrangement to avoid using adjacent channels
- Transmit power limitation to avoid overloading and image channel interference

Limitations on the use of some channels for uplinks may reduce their value

Broadcasting receiver performance

- **Improve Overloading limits**
- **Strengthen specifications for selectivity**
- **Improve Image channel rejection**



Conclusions

- **Spectrum pricing depends on service neutrality**
- **Services are not equal with regard to their potential interference**
- **The value of a channel may vary depending on its use for downlinks or for uplinks**
- **Technical limitations are required with spectrum pricing mechanism: guard bands, channel arrangements, power limitations, etc.**
- **Broadcasting receiver performance needs to be improved to cope with new interference environment**



Thank you for your attention

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