



Rollout of 5G, Benefits and barriers for future 5G networks

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Helsinki, 5 October 2019



Five industry goals for the 5G era



- 1 Boundless Connectivity for All
- 2 Innovation and Network Economics
- 3 Transformation of Vertical Industries
- 4 Revolutionise the Mobile Broadband Experience
- 5 Help to Grow New Use Cases



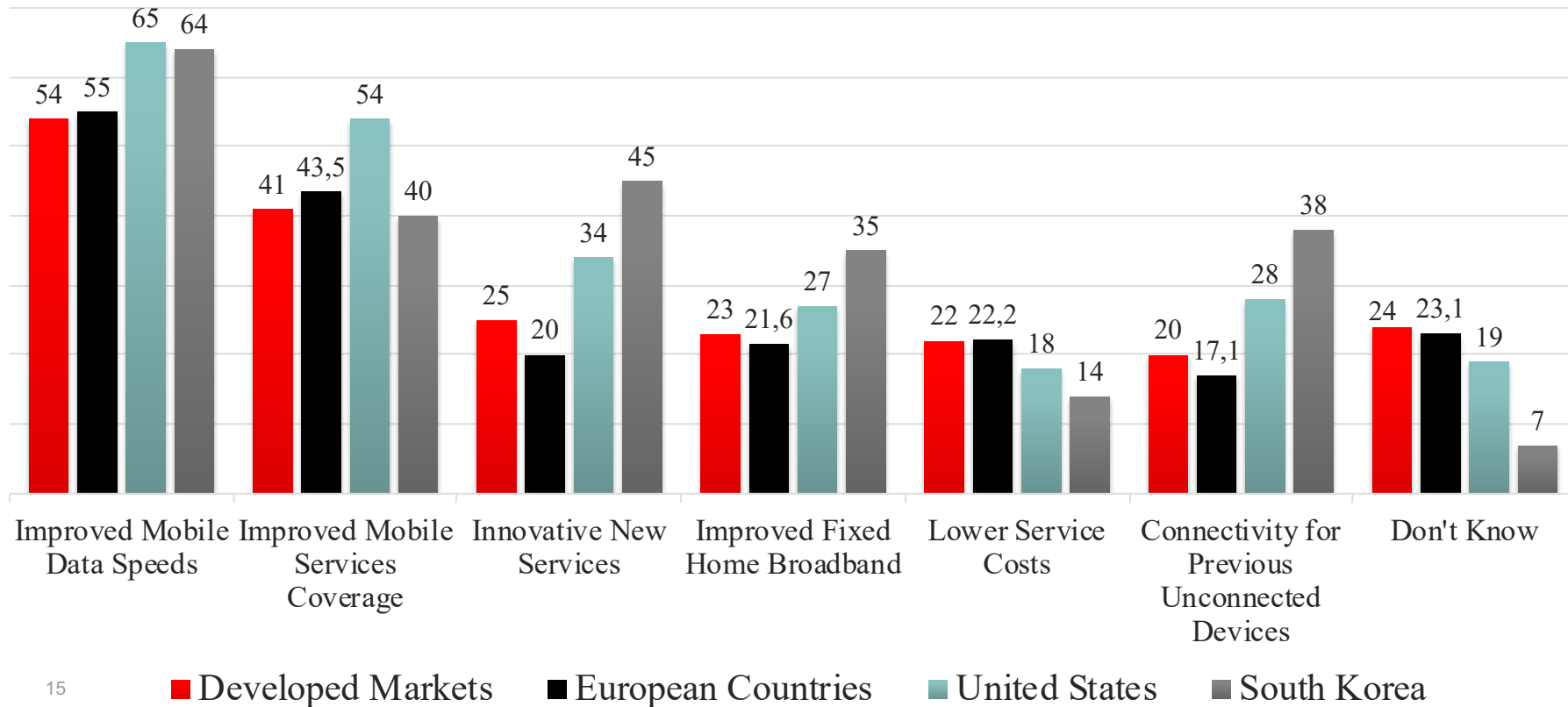
Consumers: what do they expect from 5G?

- Study in September/October 2018
- 15 000 respondents
- 16 developed countries

Non EU Countries	EU Countries
Australia	France
Canada	Germany
Israel	UK
Japan	Italy
Russian Federation	Netherlands
Saudi Arabia	Poland
South Korea	Spain
USA	Sweden



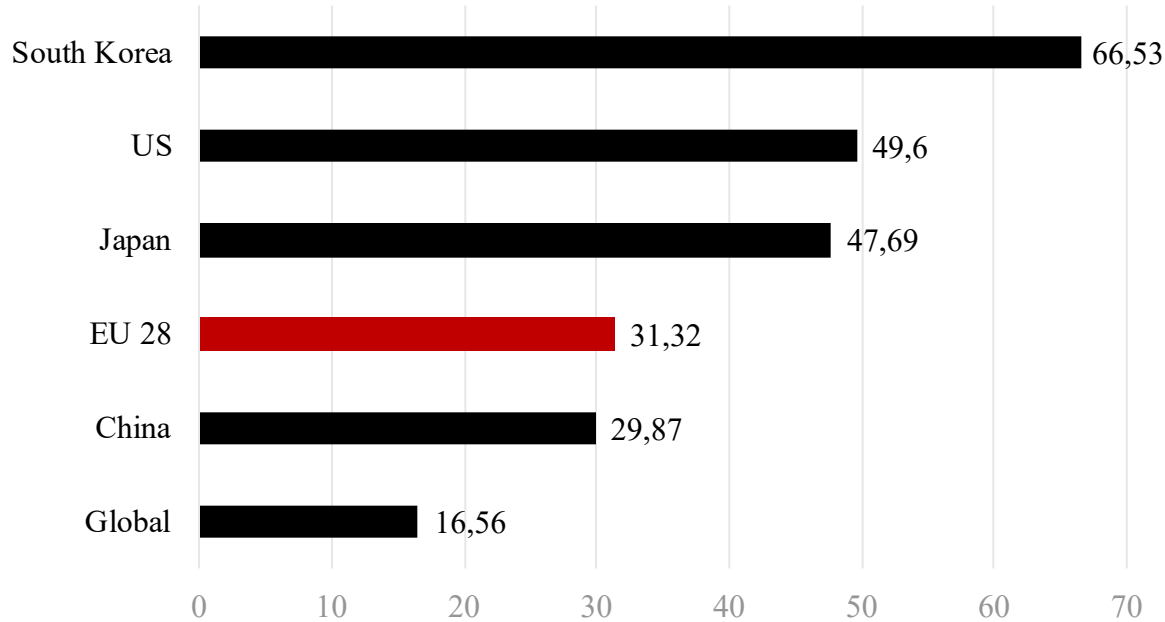
From what you know of 5G, which of the following would you expect 5G networks to deliver?



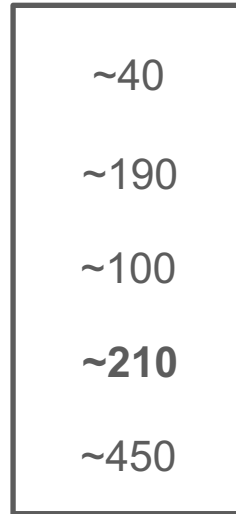


2025 view – 5G customer adoption

5G as % of total mobile connections*



5G connections (mln)*

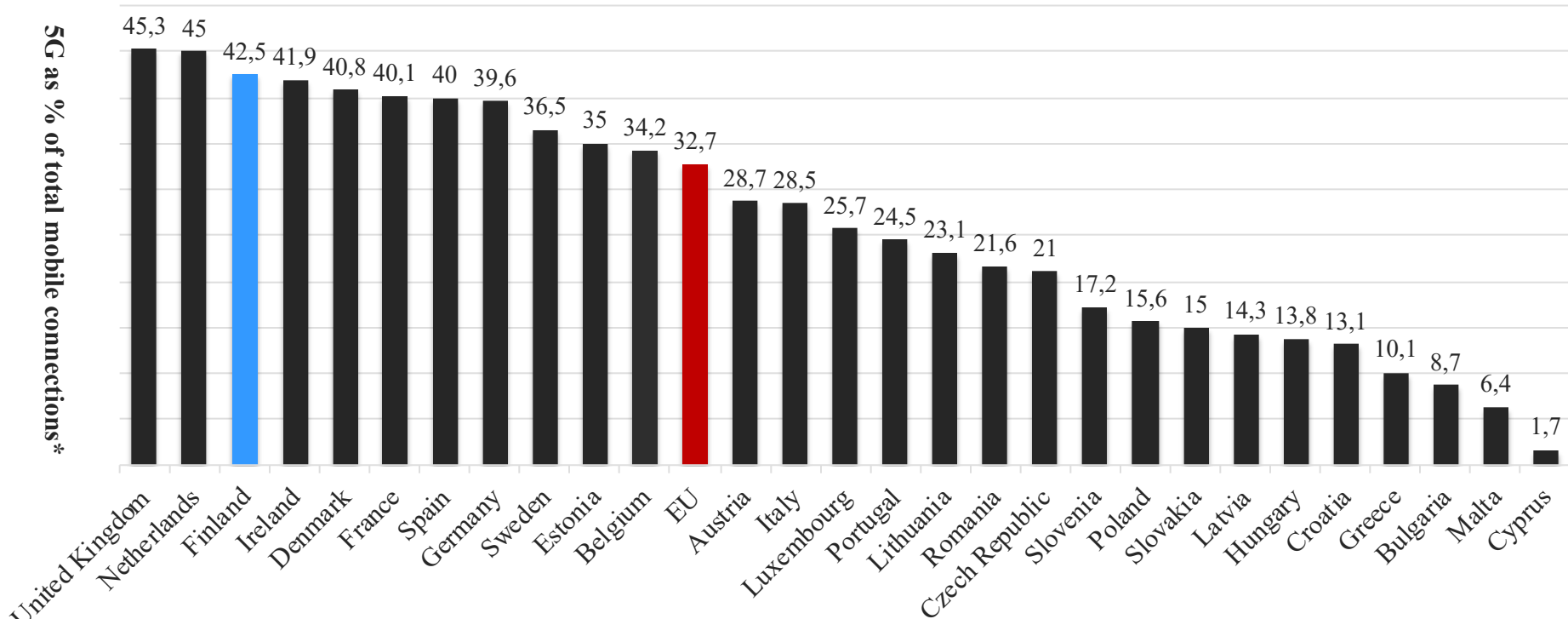


These five economies will account for ~70% of the 1.5 billion 5G mobile connections expected globally by 2025

~1.5 billion

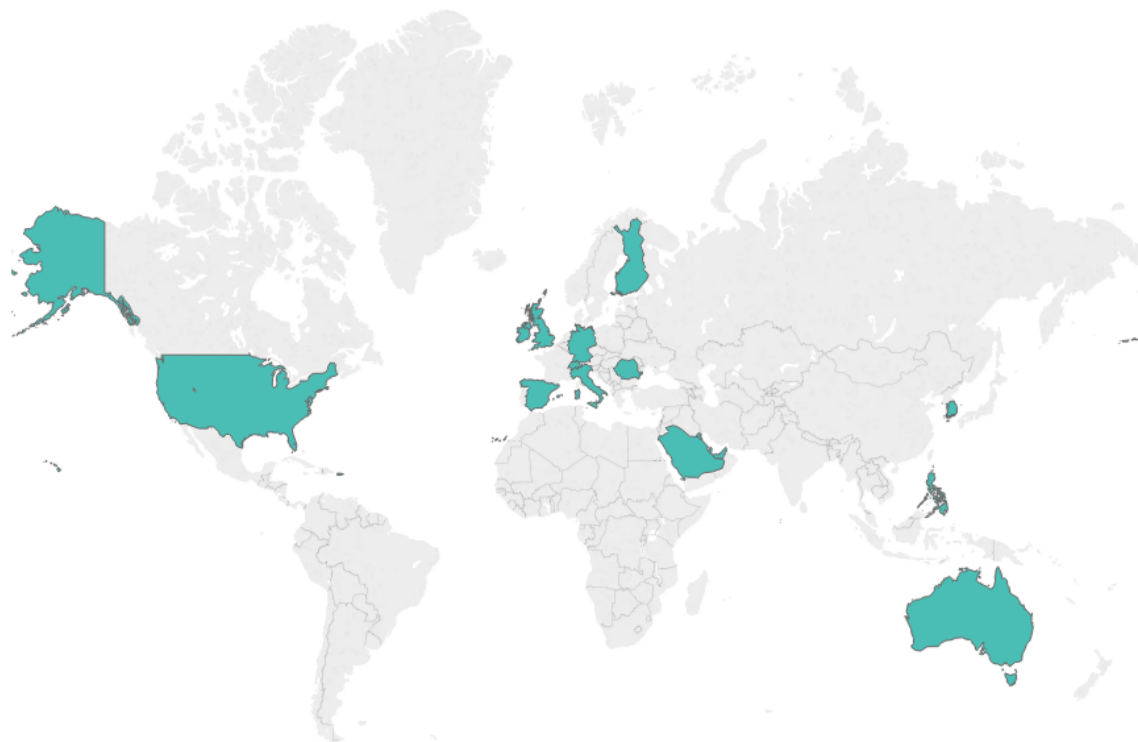


2025 5G customer adoption – EU





5G commercialisation



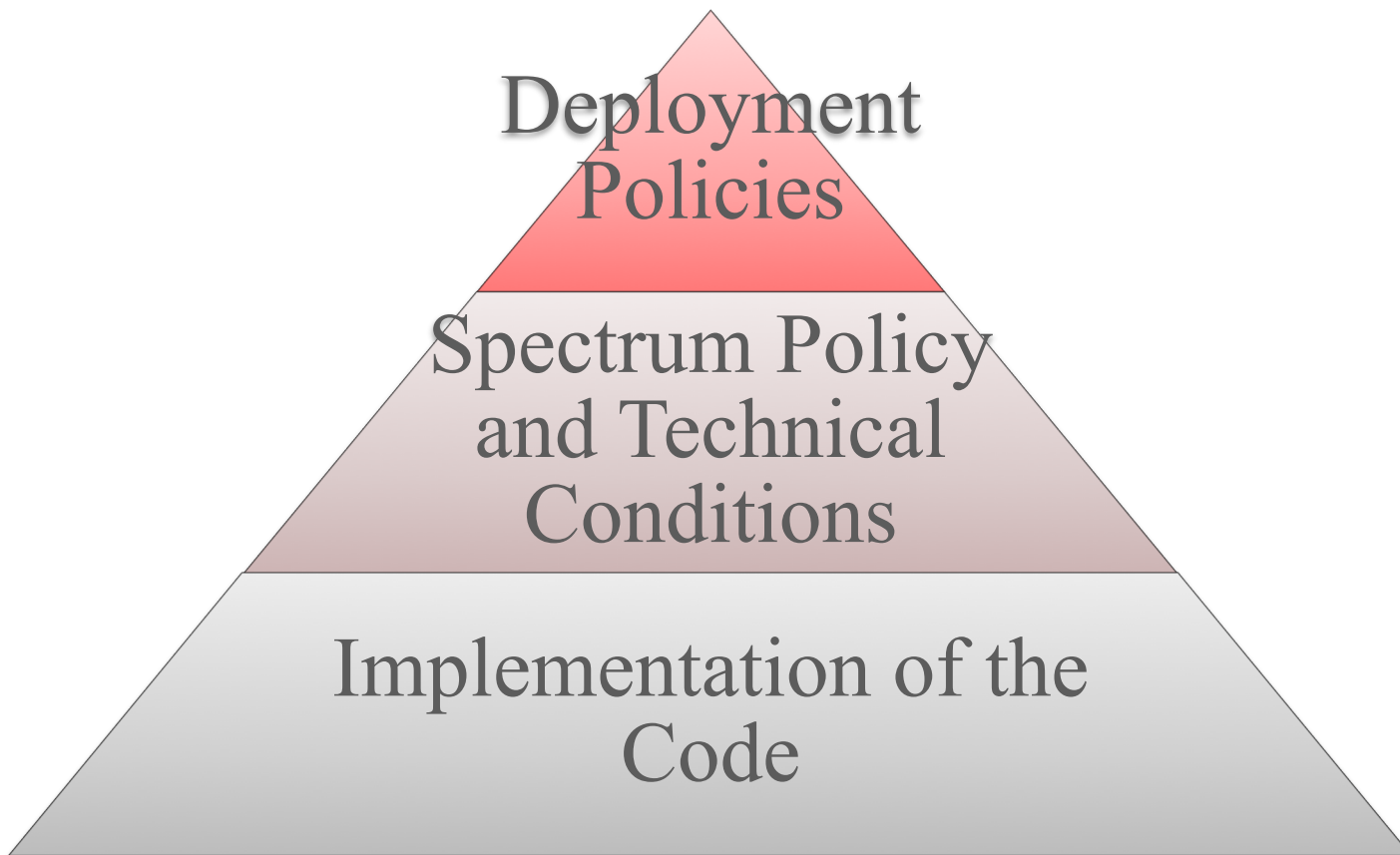
Country	Operator	Country	Operator
Australia	Optus	Philippines	Globe Telecom
	Telstra	Qatar	Vodafone
Bahrain	Batelco	Romania	Digi Mobil
	Viva		Vodafone
Finland	Elisa	Saudi Arabia	STC
Germany	Vodafone	Spain	Vodafone
Ireland	Vodafone	Switzerland	Sunrise
Italy	TIM		Swisscom
	Vodafone	UAE	du
South Korea	KT	UK	Etisalat
	LG Uplus		Three
	SK Telecom		EE
Kuwait	Ooredoo	USA	Vodafone
	Viva		AT&T
	Zain		Sprint
Maldives	Dhiraagu		T-Mobile
Monaco	Monaco Telecom		Verizon Wireless

 Commercial 5G network

*Data correct to 30 August 2019
For updates, see gsmaintelligence.com*



The policy challenges for 5G





The Code – Implementation



Ambition



How strongly a Member State believes in the benefits 5G will bring to its citizens and economy

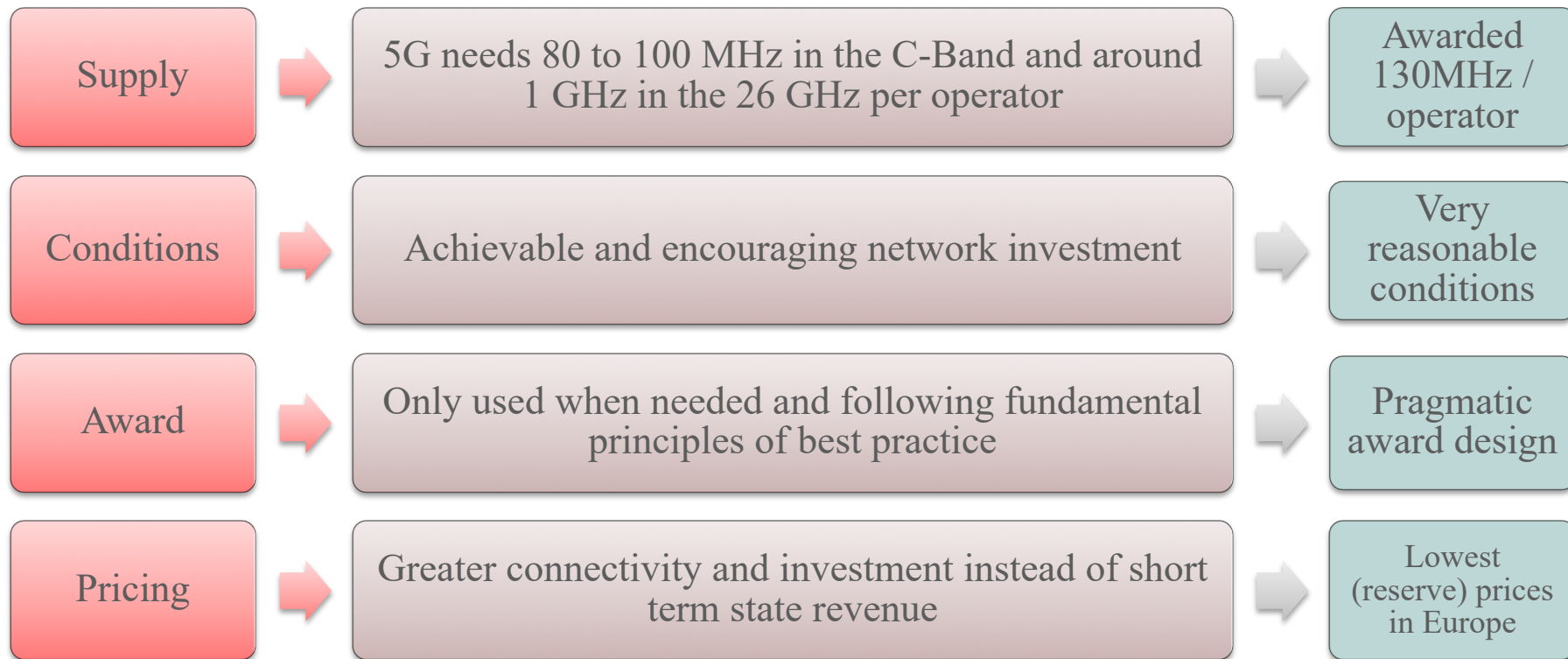
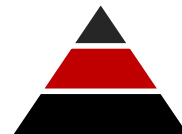
Leadership



Willingness to sacrifice the small short-term gains for the bigger, long-term, benefits

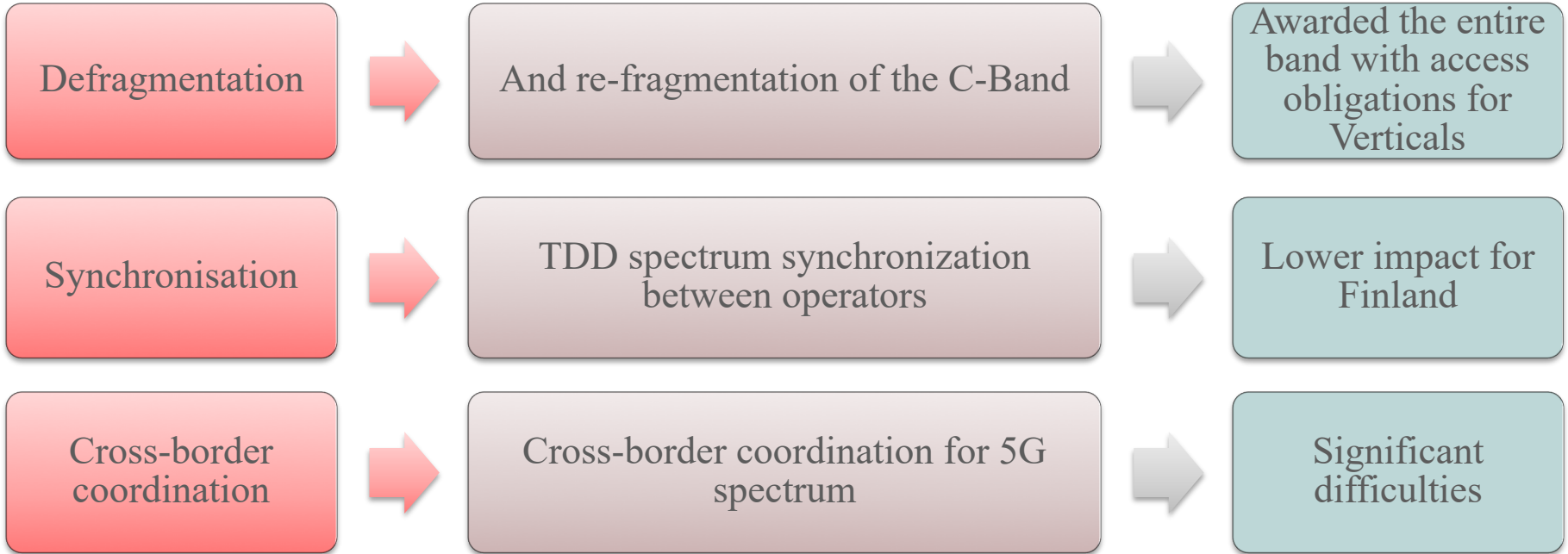


Spectrum: Policy Challenges

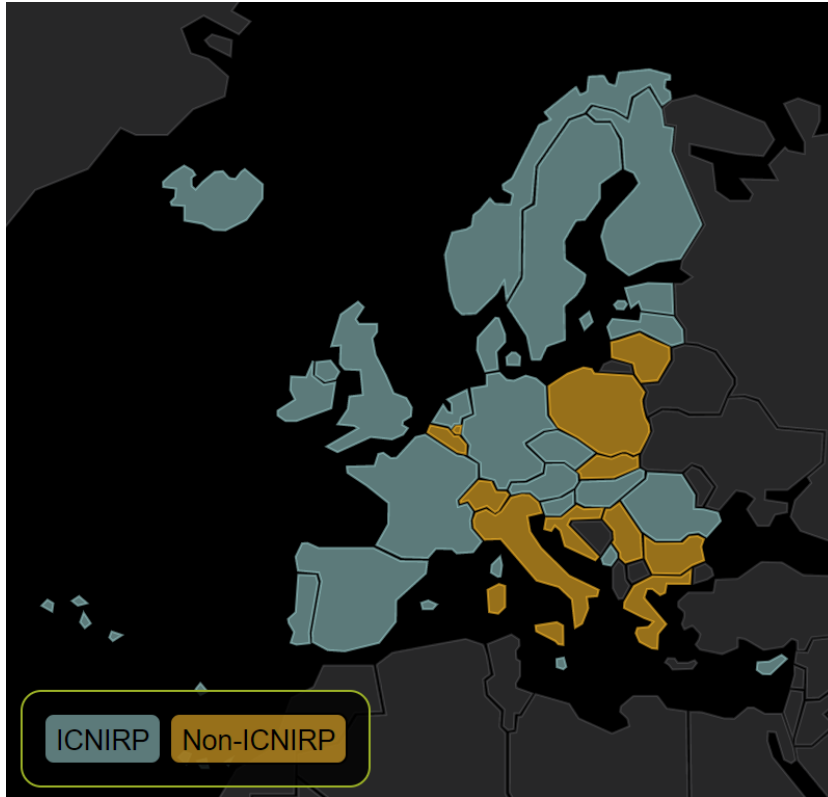




Spectrum: Technical Challenges



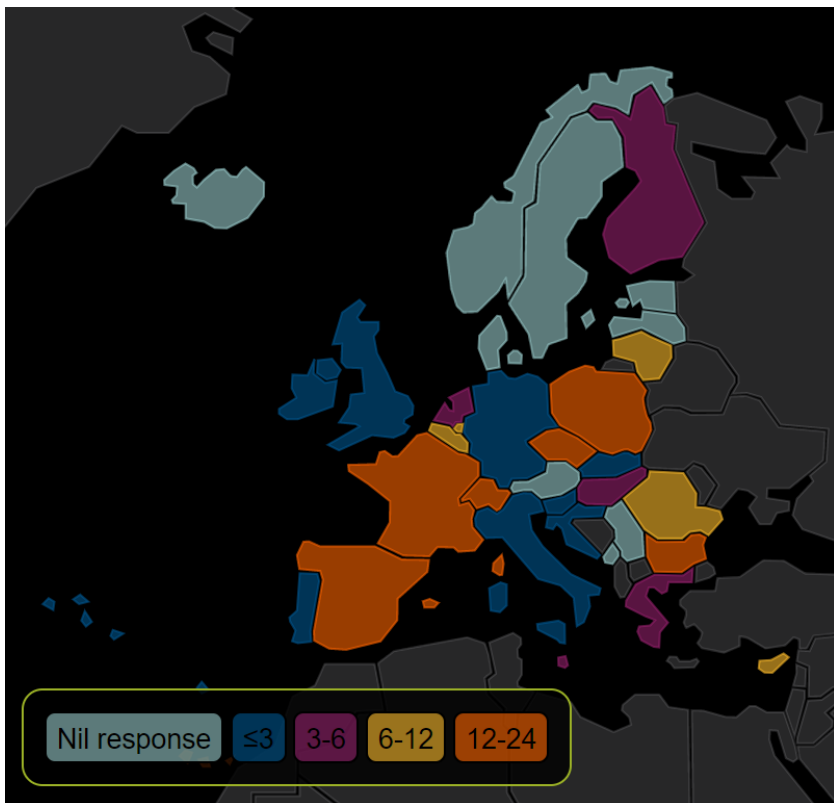
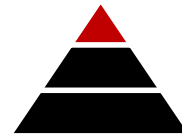
Deployment: EMF Policy



Several Member States do not apply the international (ICNIRP) guidelines as recommended in 1999/519/EC

As a result 140 million (27%) European citizens are affected by less efficient mobile network deployment

Deployment: Siting Policy



Multi-layered (National, Regional, Local) and very bureaucratic with a heavy administrative burden

5G deployment will need a significantly higher number of sites (2-3x times) than previous generations

Streamlining and simplifying the process will significantly help 4G and 5G deployment

Small cell implementing act will help but it is not a silver bullet



Concluding remarks

- Finland is a European and Global leader on 5G
- Europe risks falling behind on 5G in the long term
- Europe could use Finnish leadership