



IT- og Telestyrelsen

Ministeriet for Videnskab
Teknologi og Udvikling

Regulatory Aspects of SDR and Cognitive Radio usage

IDA

Tuesday 1 December 2009

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Agency



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New Frequency Act

- Enter into force 1 January 2010
- To a higher degree decided by the market
- The methods of assigning frequency licences have been revised;
- The use of radio spectrum will be liberalised;
- The scope for transferring licences has been extended.



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Priorities

- The Spectrum Policy Framework mandate
- The Frequency Plan
- Competition and essential public interest considerations in the frequency area must still be safeguarded



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Technology- and Service Neutrality

- Workshop March 2009
- Workshop June 2009
- Consultation July – August 2009
- Recommendation to Minister October 2009
- Decision by Minister October 2009



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Frequency bands proposed by NITA

Frekvens [GHz]	Anvendelse af naboallokeringer	
	Nedre	Øvre
3,4 – 3,8	Radar (fly)	FS (Fixed Service), FSS (Fixed Satellite Service) modtagere
24,5 – 26,5	23,6 – 24,0: Passiv EESS (Earth Exploration Satellite Service), RAS (Radio Astronomy Service) ENG/OB (Electronic News Gathering/Outside Broadcast)	Militær
27,8285- 28,4445 GHz 28,8365-29,4525 GHz	FSS (Fixed Satellite Service)	FSS (Fixed Satellite Service)
31,8 – 33,4	31,3 – 31,8: Passiv EESS (Earth Exploration Satellite Service)	Militær
40,5 – 43,5	FSS (Fixed Satellite Service)	42,5 – 43,5: RAS (Radio Astronomy Service), ikke i DK, Militær
57,1 – 58,9	Passiv EESS	FS (Fixed Service), militær
64,0 – 71,0	63,0 – 64,0: ITS (Intelligent Transport Systems)	FS (Fixed Service), broadcast



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Frequency bands liberalised as of 1 January 2010

Frekvens [GHz]	Anvendelse af naboallokeringer	
	Nedre	Øvre
3,4 – 3,8	Radar (fly)	FS (Fixed Service), FSS (Fixed Satellite Service) modtagere
31,8 – 33,4	31,3 – 31,8: Passiv EESS (Earth Exploration Satellite Service)	Militær
57 – 66	Passiv EESS	FS (Fixed Service), broadcast



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The chosen Approach

BEM – Block Edge Masks

- ⑩ In-block and out-of-block emissions limits

PFD – Power flux Density

- ⑩ Defining the limits towards other geographical areas

A detailed description can be found here.

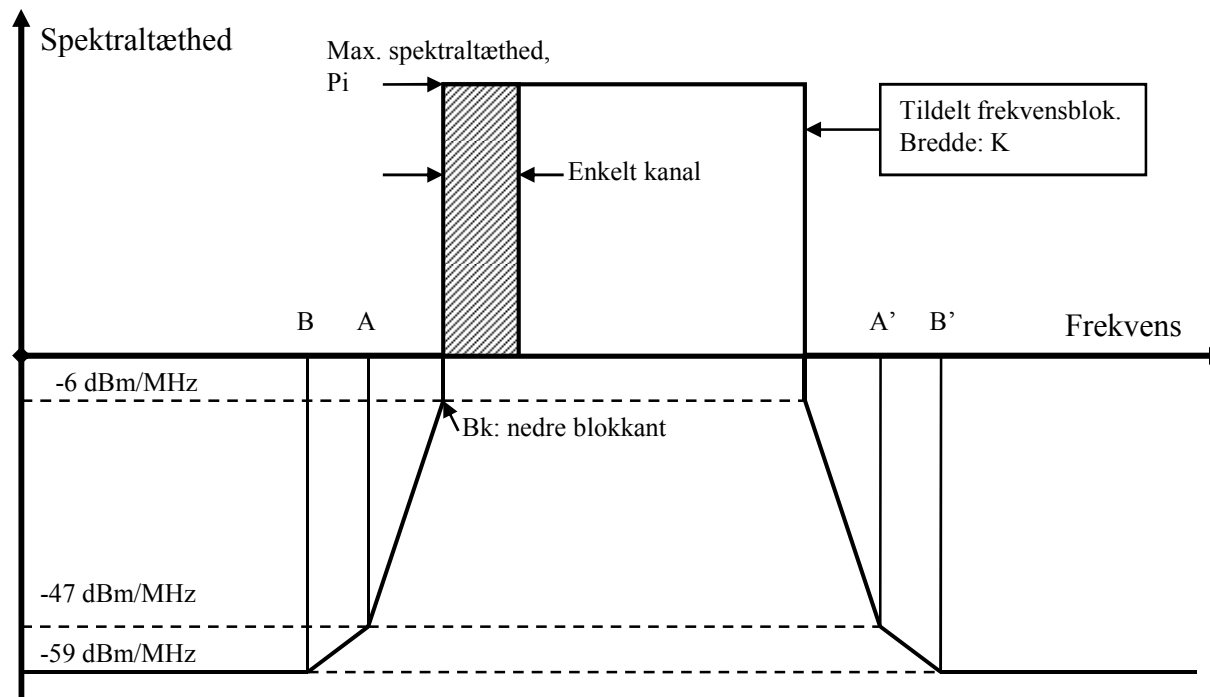
<https://www.borger.dk/Lovgivning/Hoeringsportalen/Sider/Fakta.aspx?hpid=2146000618>



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Example of a Block Edge Mask





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Activities in Europe regarding SDR and cognitive radio

- ⑩ ECC correspondance group
- ⑩ RSPG working group

ECC roadmap

- ⑩ Identification of CRS applications, review of spectrum needs and usage
- ⑩ Feasibility study, addressing identified CRS applications
- ⑩ Identification of bands and regulation
- ⑩ Impact on current regulatory framework for equipment



Options for Cognitive Radio

Regulatory Invention	Vertical Sharing	Horizontal Sharing
CUS Model	<ul style="list-style-type: none"> · Designate the frequency band where cognitive radio could share spectrum with existing users on an opportunistic basis. · Define the appropriate technical conditions for the cognitive devices. 	<ul style="list-style-type: none"> · Designate the frequency band to allow usage on a cognitive basis which does not interfere with existing users; · Define technical conditions for the block of spectrum where cognitive radio will operate within.
Rights of spectrum usage could be tradable or leased	<p>Vertical Sharing</p> <ul style="list-style-type: none"> · Define the framework for trading or leasing of rights of spectrum usage (including, where needed, QoS requirements; · Assess the results of negotiations between market parties and their effects on e.g., competition and approve them. 	<p>Horizontal Sharing</p> <ul style="list-style-type: none"> · Define the framework for trading and leasing of rights of spectrum usage; · Provide defined mechanisms in case of disputes and interferences issues and in case of not fulfilling the conditions of use.
<ul style="list-style-type: none"> · Ensure that the rights of spectrum usage are tradable or could be leased and are flexible <p>Identification of spectrum for cognitive access lies with the existing licensed holders and not with regulators</p>		



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WRC-12

- Conference will be held 23 January – 17 February 2012
- Agenda Item 1.2 regarding flexibility in spectrum management
- Agenda Item 1.19 regarding measures to enable introduction of software defined radio and cognitive radio systems



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Agenda Item 1.19 regarding software defined radio and cognitive radio systems

CEPT will develop a Common European
Proposal on cognitive radio to WRC-12

Some elements of the ECP will be

- SRD/CRS should not be included in RR
- SDR/CRS tuning ranges could be harmonised
- Worldwide implementation of pilot channel
- No regulatory action required for SDR/CRS



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Where to find additional information

National IT- and Telecom Agency:

www.itst.dk

ECC

www.ero.dk

RSPG

http://rspg.groups.eu.int/consultations/index_en.htm