

Spectrum strategy for the Norwegian Communications Authority

2015-2016



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2 Background

The purpose of the Electronic Communications Act¹ is *"to secure good, reasonably priced and future-oriented electronic communications services for the users throughout the country through efficient use of society's resources by facilitating sustainable competition, as well as fostering industrial development and innovation."*

The Norwegian Communications Authority's (Nkom) frequency management shall be organised in such a way that it provides the greatest possible benefit to society over time. Nkom believes that few restrictions, few administrative burdens, and intervention from the Authority only when necessary will help ensure that the use of radio frequencies provides the greatest possible benefit to society over time. The purpose of the Authority's frequency management is to define the framework conditions and otherwise minimise the burden for the industry by means of simple processes, easily accessible information and prompt allocation of frequencies. Nkom believes that this will lead to innovation and rapid introduction of new services, which are expected to provide significant social benefits.

The Ministry of Transport and Communications (SD) has recently approved a change in practice concerning who handles applications for frequency licences. Previously this responsibility was shared by Nkom and SD, depending on which frequency band the application pertained to. Now all applications for frequency licences shall be submitted to Nkom. In Nkom's opinion this will help simplify the process for the operators. Nkom will be in charge of the processing of applications and will involve the Ministry when relevant.

The government has set a target of access to high-speed broadband throughout the entire country with a minimum data speed of 100 Mbps². In many cases access to frequency resources will be a key factor in the development of broadband networks and therefore in the attainment of the government's broadband target. Nkom's frequency strategy must also underpin this target.

In its allocation of frequencies, Nkom must take into account efficient use of society's resources through sustainable competition, free movement for services and harmonised use of frequencies, in accordance with the Electronic Communications Act. In connection with the advertisement of a limited number of licences, the selection criteria shall be objective, transparent, non-discriminatory and proportionate. Frequencies are allocated as either general

¹ Act no. 83 of 4 July 2003 on electronic communications (Electronic Communications Act)

² [Political platform for a government formed by the Conservative Party and the Progress Party, Sundvollen, 7 October 2013](#)

frequency licences (the regulation concerning general licences³) or individual frequency licences (spectrum licences or transmitter licences).

The frequency spectrum is a finite and valuable resource. One important aspect of Nkom's frequency management is promoting the greatest possible realisation of value from the frequency resources. Technological advances have led to expansion of the useful part of the spectrum. Whereas in the past some radio systems could only use certain specific frequency bands, now large parts of the spectrum can be used to produce the same electronic communication services. This has resulted in a significant increase in the demand for spectrum.

Good frequency management is about more than merely satisfying the users' demands for ever better products and services at ever lower costs. The frequencies are an important input factor for providers of electronic communications services, but are also at least equally as important for socially critical infrastructure. Accidents, natural disasters, terrorist acts and challenging rescue operations have all revealed how dependent we are on access to good radio communications. Good radio services are essential for maintaining and further developing effective emergency communication solutions from public and private providers. In addition, access to frequency resources is important for many other user groups in areas such as culture, research and non-profit organisations. When necessary, the authorities can directly assign a frequency licence for specific purposes for public benefit, including for use by emergency and preparedness services, to the Armed Forces and for research purposes, cf. section 6-4, third paragraph, of the Electronic Communications Act.

Nkom has a general strategy for the period 2012 to 2016, in which three main objectives are defined:

- Nkom shall be up-to-date on developments and challenges in the industries
- Nkom shall be a proactive facilitator for the actors
- Nkom shall be the best source of knowledge for all relevant problems

The frequency strategy for 2015–2016 builds on these three overarching objectives.

More detailed information on frequency management can be found on www.nkom.no.

3 Nkom shall be up-to-date on developments and challenges in the industries

³ Regulation no. 628 of 19 January 2012 concerning general authorisations for the use of radio frequencies (the Free Use regulation)

3.1 In Norway

In order to be able to do the best possible job of managing Norway's frequency resources, Nkom must be present in relevant arenas where spectrum issues are addressed, both industry events and the public debate. Nkom organises the annual Frequency Forum, which is an arena for academic discussion on spectrum issues. Here Nkom puts both current and future issues on the agenda.

Nkom is positive to operators who want to meet Nkom to discuss challenges they face.

3.2 Internationally

Frequency harmonisation means that several countries agree on common criteria for the use of frequencies.

Nkom provides the operators with basic advice and guidance about harmonisation, and the operators can participate in the Norwegian delegation in meetings we attend. In addition Nkom can promote Norwegian interests and make proposals for harmonisation on behalf of Norwegian operators.

We give priority to participation in European forums in order to exert an influence on harmonisation efforts that are in line with Norwegian interests and to ensure we remain up-to-date with developments. We will also consider participation in global work groups, particularly groups where Norwegian operators have specific interests.

Nkom strives to ensure that the harmonising measures are flexible and are based on technology neutrality and to this end harmonised technical conditions are included in the frequency licences.

Nkom is responsible for the national preparations prior to the ITU's World Radiocommunication Conferences (WRC) and collaborates with and seeks advice from the industry through the NORWRC working group.

4 Nkom shall be a proactive facilitator for the actors

4.1 National Table of Frequency Allocations

Nkom prepares the National Table of Frequency Allocations and publishes it on nkom.no⁴. The purpose of the table is that up-to-date information should be available to all interested parties who need to know about the current use and which radio services the frequencies have been allocated to.

4.2 Assignment of frequency resources

4.2.1 Individual frequency licences

Individual licences are granted in the form of an individual decision, either as a spectrum licence or a transmitter licence. As far as possible it shall be possible to trade licences in the secondary market. Nkom is going to introduce electronic application forms for frequency licences to simplify the process for the users and to ensure efficient processing.

With a view to ensuring predictability for the industry and a good process for all the parties involved, the goal is that frequency awards involving existing licences are completed no later than two years before the licences expire.

4.2.1.1 *Spectrum licences*

The spectrum licences that Nkom assigns shall have no more restrictions than necessary and shall as far as possible be technology and service neutral. The licences shall also have a long duration to ensure predictability for the licensees. Technical conditions will be based on decisions on harmonised use of frequencies to which Norway is a party.

4.2.1.2 *Transmitter licences*

Nkom is responsible for the detailed planning for the frequency bands that are reserved for specific services such as radio links, professional mobile radio (PMR), local broadcasting, and programme making and special events (PMSE). It should be easy for operators who need a limited number of radio transmitters to get a transmitter licence. Nkom will continuously assess whether there are sufficient frequencies allocated for transmitter licences, and will consider whether certain licences should be issued for a longer period.

4.2.1.3 *Testing and research*

Nkom will always try to accommodate requests for licences for testing, including for research purposes, and shall continue to process applications for these kinds of licences quickly.

⁴ [About the National Table of Frequency Allocations](#)

Licences for testing purposes have limitations regarding frequency, geography and time, allowing as many applications as possible to be granted.

4.2.2 General frequency authorisations (free use)

Nkom implements harmonised European decisions and national decisions on unlicensed use of frequency bands for specific services and/or technologies through the regulation concerning general licences. Nkom will update the regulation regularly so that operators can start using frequencies for new technology and new equipment promptly.

4.2.3 Frequency auctions

When there is excess demand, frequencies are generally assigned through an auction. The process that must be carried out prior to a frequency auction is largely identical each time. Nkom will therefore follow a standard execution plan for auctions⁵. The work on preparing for and carrying out an auction must typically be started around 12 to 20 months before the actual auction, depending on the complexity of the process.

4.3 Focus areas

4.3.1 Efficient use of frequencies

There is steadily growing demand for services produced using radio frequencies, meaning the frequencies must be used as efficiently as possible. Nkom wants to use a variety of means to meet the increasing demand for frequencies and to continue to be able to ensure the population good, reasonably priced and future-oriented electronic communication services.

The demand for more frequencies for mobile broadband has highlighted the need to prioritise what the frequency resources can be used for. Nkom will compare different service platforms against one another and allocate frequency resources where they will provide the greatest benefit to society over time. Nkom will also follow the guidelines laid down in the government's broadband strategy in its allocation of frequencies.

Nkom aims to share frequencies between the primary and secondary users without disruption to the primary user. For example, Nkom wants to allow use of dynamic spectrum access (cognitive radio) on a secondary basis where appropriate. Nkom envisages a gradual process towards the goal of more spectrum sharing. A greater degree of coexistence between different services will entail stricter requirements regarding the technology and equipment to ensure satisfactory service quality for the various services.

⁵ [Procedure for carrying out frequency auctions](#)

4.3.2 Frequencies for wireless data traffic

The demand for wireless data traffic is increasing, and the majority of this data traffic is indoors via WLAN (licence exempt) connected to cable-based broadband. Traffic via WLAN also serves to relieve the traffic on the public mobile networks.

Going forwards Nkom will also work to ensure frequencies are set aside for public networks for mobile broadband. At the same time, strong demand for frequencies will also entail that the market operators will have to phase out old technology and replace it with new and better technology that uses the frequencies more efficiently.

Nkom will work internationally for the allocation of more frequencies for licence exempt use in order to meet the increasing demand for wireless data capacity indoors. This might also be an effective tool to meet the challenges of providing satisfactory indoor coverage from outdoor transmitters.

4.3.3 470–790 MHz

Nkom has received clear feedback from the market that prompt clarification is needed regarding the future use of the 470–790 MHz frequency band. On the basis of the international discussions on the future use of this band and the decisions in Norway's neighbouring countries to use the 700 MHz band for mobile services, Nkom recognises the necessity of assessing and clarifying use of the 470–790 MHz frequency band in Norway.

4.3.3.1 Frequency coordination

Nkom is responsible for coordinating frequency use with other countries in accordance with international agreements and for keeping international frequency registers updated in order to protect radio services against harmful interference. During this strategy period Nkom will focus on coordination in particular, as a result of the changes internationally in the use of the 700 MHz band.

4.4 Trade of frequency licences

In the frequency licences that Nkom issues there is a possibility that on certain conditions the licence can be transferred or leased to third parties⁶. The possibility to resell licences is positive for all the parties and can help ensure better utilisation of the frequency spectrum.

With a view to ensuring the best possible conditions for the market, Nkom provides information about vacant and allocated frequencies on nkom.no⁷.

⁶ [On transfer and lease](#)

⁷ [Overview of allocated frequency licences](#)

4.5 Handling noise and interference

The risk of harmful interference shall be minimal when using frequencies in accordance with a licence. In order to be able to efficiently monitor frequency use and radio noise throughout the entire country, Nkom has both staffed offices and remote-controlled monitoring stations.

4.5.1 Handling complaints

Nkom handles complaints about noise and interference as soon as is practically possible within normal working hours⁸. Nkom gives priority to cases where noise and interference may pose a threat or hazard for life, health and safety.

Nkom compiles statistics on its frequency monitoring cases to identify areas that require focus in the future.

4.5.2 Supervision at major events

Nkom will be present at selected events to ensure that frequencies are used in accordance with the allocated licences and to avoid interference from other radio services.

4.5.3 Electromagnetic radiation

Nkom has a collaboration agreement with the Norwegian Radiation Protection Authority (NRPA) and can perform measurements in matters relating to non-ionising electromagnetic radiation.

Nkom shall check that the operators label their antenna systems if there is any risk of the limits for electromagnetic radiation being exceeded in public areas.

4.6 Illegal use of frequencies

Nkom's frequency monitoring service supervises frequency use in Norway and documents illegal and/or improper use.

Through targeted campaigns Nkom aims to identify non-compliant or illegal use of products that creates problems for frequency users. Products of this nature include mobile amplifiers, d-GPS transmitters and DECT phones.

Nkom provides information to prevent illegal use of frequencies, but also campaigns against illegal use of frequencies, and follows up any detected issues with sanctions in accordance with the law and regulations. The sanctions imposed shall reflect the severity of the case in hand.

⁸ [Interference with electronic communication – Nkom's practice](#)

5 Nkom shall be the best source of knowledge in matters concerning frequency management

Nkom will hold lectures for private and public actors, be visible in the media and participate in debates.

Everyone who contacts Nkom shall receive the best possible information on frequency management from Nkom's staff.

5.1 National Table of Frequency Allocations

Nkom prepares the National Table of Frequency Allocations and publishes it on nkom.no. The purpose of the table is that up-to-date information should be available to all interested parties who need to know about current uses and which radio services the frequencies have been allocated to.

The plan provides a snapshot of how the Norwegian frequency resources are currently being used. The National Table of Frequency Allocations also provides information about the holders of frequency licences and whether the licences are negotiable or can be leased. The information is also reported to the ECO Frequency Information System (EFIS)⁹.

5.2 Frequency Forum

The annual Frequency Forum is Nkom's arena for frequency issues. At the Frequency Forum Nkom raises current issues in the field and discusses them with the industry.

5.3 Nkom's online services

5.3.1 www.nkom.no

Nkom's website is our main information channel, and it is our goal that all relevant information on frequency management should be available and up-to-date on nkom.no.

5.3.2 www.finnsenderen.no

Finnsenderen.no is intended to be a simple, reliable tool that shows the geographical location of base stations for public mobile networks and broadcasting. Finnsenderen is also a tool for finding available frequencies that can be used for wireless microphones in defined geographical areas. In addition it shall provide good and correct information about radiation. The service is updated each quarter.

⁹ www.efis.dk

6 Glossary

CEPT	European Conference of Postal and Telecommunications Administrations
DECT	Digital Enhanced Cordless Telecommunications
ECO	European Communications Office
EFIS	ECO Frequency Information System
Ecom	Electronic communications
GPS	Global Positioning System
DGPS	Differential GPS
ITU	International Telecommunication Union
PMR	Professional / Private Mobile Radio
PMSE	Programme Making and Special Events
WLAN	Wireless Local Area Network (other terms are also used, such as RLAN and Wi-Fi)
WRC	World Radiocommunication Conference