

## Shared use of wireless infrastructures and spectrum resources

In a paper published in 2001 addressing possible shared use of wireless infrastructures the Bundesnetzagentur set out the conditions under which sharing would not raise concerns (downloadable at [www.bundesnetzagentur.de](http://www.bundesnetzagentur.de)). It specified what the President's Chamber had said in the UMTS award conditions (cf Rationale Re 3.1 under section 11 number 3 letter c of the President's Chamber Decision; RegTP Official Gazette No 4 of 23 February 2000, page 535). The Bundesnetzagentur assumes that competition will not be affected by the shared use of wireless infrastructures as allowed under the above-mentioned paper. Such shared use is therefore permissible and needs no further authorisation as long as competitive independence is not restricted in the particular case and infrastructure competition continues to be guaranteed.

In its decision of 12 October 2009 on the award of spectrum in the bands at 800 MHz, 1.8 GHz, 2 GHz and 2.6 GHz for wireless access for the provision of telecommunications services (reference: BK 1a-09/002, Order 59/2009, Bundesnetzagentur Official Gazette 20/2009) the President's Chamber determined the following under subsection IV.4.5:

*The Chamber will allow cooperation, as long as this is permitted under regulatory and competition aspects, as called for by the respondents. Yet the Bundesnetzagentur can only examine this when the award proceedings have been completed and on a case by case basis. To meet their coverage obligations, future assignees can use the scope available to them to promote rapid, efficient network build in rural areas too. Economic cooperation with other network operators is possible, within the bounds of what is permitted in regulatory and competition terms. Also possible are agreements on the operation of shared infrastructures and the lease of frequencies.*

*As in earlier award proceedings, so too in these will assignees have options – within the bounds of competition and telecommunications law – facilitating access to frequencies and making it easier to meet their coverage obligations. Under the regulatory principles drawn up by the Bundesnetzagentur on infrastructure sharing, assignees are able to share the use of infrastructures. The Bundesnetzagentur has already stated the conditions under which it considers infrastructure sharing not to raise concerns (downloadable at [www.bundesnetzagentur.de](http://www.bundesnetzagentur.de)). It is planned to update these conditions in light of more recent technological advance and the flexibilisation of spectrum management in particular.*

In connection with the Bundesnetzagentur's bid to introduce greater flexibility into frequency regulation the President's Chamber, in another decision of 12 October 2009 (reference: BK 1a-09/001, Order 58/2009, Bundesnetzagentur Official Gazette 20/2009), pushed the flexibilisation of particular bands to enable them to be used, on a technology and service-neutral basis, for wireless access, pointing out

*"...that, as a consequence of developments in frequency engineering and the economics of competition as well as international developments, redundant restrictions are being removed. Once all the measures needed to achieve this aim have been completed, the regulatory requirements will be scaled back to a minimum."*

The regulatory framework for permissible infrastructure sharing required modification in light of technological advance and flexibilisation (for more details see section I).

Additionally, the Bundesnetzagentur has given consideration to further possibilities of cooperation. Under the original regulatory regime of the Telecommunications Act (TKG) 1996 provision was not made for any further cooperation including, for instance, so-called spectrum pooling. One of the requirements of the TKG 1996 was that assignees, besides de jure control, also had de facto control of the facilities. It also prohibited the transfer of frequencies to third parties. Following the amendment of the TKG in 2004 it is no longer necessary for an assignee also to have de facto control of the frequencies assigned. Also,

section 55(7) allows frequencies to be leased and transferred. As a result, cooperation beyond the original forms had to be reconsidered.

The considerations set out in section II thus apply to all forms of cooperation that go beyond the permitted shared use of wireless infrastructure as described in section I.

In the consultation on the decision of 12 October 2009 on the award of spectrum for wireless access (reference: BK 1a-09/002), respondents called for cooperation to be permitted as a general rule, with a view not least to cost savings.

These calls have largely been accommodated with the modifications to the infrastructure sharing framework. The Bundesnetzagentur recognises that the shared use of wireless infrastructures and spectrum resources can contribute significantly to lowering rollout and operating costs. Particularly as regards rollout the Bundesnetzagentur had to take account of the fact that, for instance, spectrum from the 800 MHz band was to be used initially in regions that were less attractive economically for the wireless operators. Cooperation here can minimise costs and thus encourage rapid, extensive network build and earlier provision of wireless access in rural areas.

Under section 1 of the TKG the Bundesnetzagentur is required to promote competition and efficient infrastructures in telecommunications through technology-neutral regulation. The regulatory approach to shared use of wireless infrastructures and spectrum resources has been developed in accordance with the regulatory aims set out in section 2(2) of the TKG, notably to secure efficient use of frequencies, to encourage efficient investment in infrastructure and to promote innovation. Ways of cooperation must therefore comply with both the regulatory aims of infrastructure competition, that is promoting markets with sustainable competition (section 2(2) para 2 of the TKG) and encouraging efficient investment in infrastructure (section 2(2) para 3 of the TKG).

The principle of competitive independence applies in light of the scarce spectrum resources (as last set out in the President's Chamber decision of 12 October 2009, reference: BK 1a-09/002:

*If frequencies are not available for assignment in sufficient numbers, assignment will be made to companies that are competitively independent of each other, in line with the existing regulatory practice (for details see Order 34/2008, Re 1.2, Bundesnetzagentur Official Gazette of 23 April 2008). The regulatory aim of securing fair competition (section 2(2) para 2 of the TKG) requires the independence of the frequency assignees, or network operators, as competitors.*

A further cooperation possibility, besides shared build and use of network infrastructures, is the shared use of the operators' spectrum resources. Shared use of frequencies when resources are scarce affects the principle of competitive independence for the network operators, however. For this reason, it cannot be permitted as a general rule, but will require examination on a case by case basis for its implications for competitive independence. In the above decision, the Chamber noted the following:

*...that the agreements to be made between network operators wishing to cooperate are also subject to individual checks by the anti-trust authorities to ensure compliance with competition law.*

At international level, too, the Bundesnetzagentur is working on harmonised use of radio frequencies in the European Union. It participates, for instance, in the Radio Spectrum Policy Group (RSPG), working to develop a regulatory approach to spectrum sharing to encourage innovation and promote the efficient use of spectrum (see for example the RSPG Opinion On The Radio Spectrum Policy Programme of 9 June 2010; Document RSPG 10-330 Final).

In light of these considerations, the following conditions apply in respect of shared use of wireless infrastructures and spectrum resources:

## **I Permitted shared use of wireless infrastructures**

## **I.1 Site Sharing**

Shared use of properties, masts, antennas, cables and combiners is permitted. Shared use of these components will not affect the independence of the assignees as competitors.

## **I.2 Site Support Cabinet Sharing (SSC sharing)**

Shared use of site support cabinets (SSCs) with more than one physically separate base station transmitting and receiving the digital payload independently on the frequencies assigned does not affect the independence of the assignees as competitors any more than site sharing (see I.1), and is therefore permitted.

## **I.3 Radio Access Network Sharing (RAN sharing)**

Use of logically separate base stations (eg NodeB+RNC / eNodeB) in a shared physical unit, so-called RAN sharing, is permitted if the individual cooperation agreements guarantee that each assignee will retain independence as a competitor. The prerequisites for this are as follows:

- a. independent control by assignees of their own logical base stations so that each assignee can use only the frequencies assigned to them ("technical" and hence de facto control; no spectrum pool),
- b. no exchange of competition-related data beyond operational information (eg customer data),
- c. separation of operation and maintenance centres,
- d. possibility of operating additional own base stations (planning autonomy guaranteed),
- e. no regional division of coverage areas that rules out network and coverage area overlap for the parties to the cooperation agreement.

*Note:*

*Checks by the anti-trust authority may also be necessary in individual cases for shared use of wireless infrastructure as per section I.*

## **II Explanatory notes on further shared use of wireless infrastructures and spectrum resources**

Shared use of wireless infrastructures (see section I) is possible without further consent from the Bundesnetzagentur, as long as competitive independence is not compromised and infrastructure competition continues to be guaranteed. Shared use of wireless infrastructures and spectrum resources that goes beyond this requires an examination by the Bundesnetzagentur of the individual case and, where appropriate, by the anti-trust authorities.

Such cooperation options may also include, besides the possibility of shared build and use of network infrastructures as per section I, further shared use of the network operators' wireless infrastructures that extends right up to shared use of spectrum resources. A host of business models is conceivable here, some of which were put forward in the consultation on the Chamber decision.

Such forms of cooperation, notably those involving the shared use of scarce resources, affect the principle of competitive independence for the network operators, however. For this reason, they cannot be permitted as a general rule, but will require examination on a case by case basis for their implications for competitive independence. Contrary to what some respondents believed, cooperation agreements will also need scrutiny for their compatibility with the regulatory aims specified in section 2(2) of the TKG, as well as anti-trust examination, in individual cases.

Accordingly, the Bundesnetzagentur, with a view also to the lease of frequencies, stated in Communication 152/2005 (see RegTP Official Gazette of 29 June 2005) that, under section 55(7) of the TKG, this would be subject to examination in individual cases for any implications for competition and thus to the consent of the Bundesnetzagentur.

Provision was made in the economic stimulus package II and in the federal government's broadband strategy adopted by the federal cabinet on 18 February 2009 for spectrum to be used as quickly as possible to accelerate service to sparsely populated areas with innovative mobile applications and broadband Internet access. This should happen above all in regions where broadband Internet access is provided initially as a result of using the digital dividend. To serve precisely these regions, respondents to the consultation called for cooperation agreements to be permitted that allowed the shared use of spectrum resources as well as the shared use of infrastructure.

Especially where the aim of the federal government's broadband strategy is concerned, to provide rural areas with broadband at the earliest possible opportunity, economic reasons could make it attractive for the network operators to share the use of frequencies, at least for a certain time, thus minimising the cost of network build and operation. This would also increase the network capacity in such regions and provide the population with the fastest possible transmission rates. Such forms of cooperation that involve the shared use of limited spectrum resources and are thus of relevance to competitive independence might be permissible, however, given the time and geographic constraints.

The Bundesnetzagentur will continue to explore the possibility of further cooperation. However, attention must be drawn to the fact that the agreements between network operators wishing to cooperate are also subject to checks by the anti-trust authorities in individual cases.

#### **Abbreviations**

RAN	Radio Access Network
RNC	Radio Network Controller
SSC	Site Support Cabinet