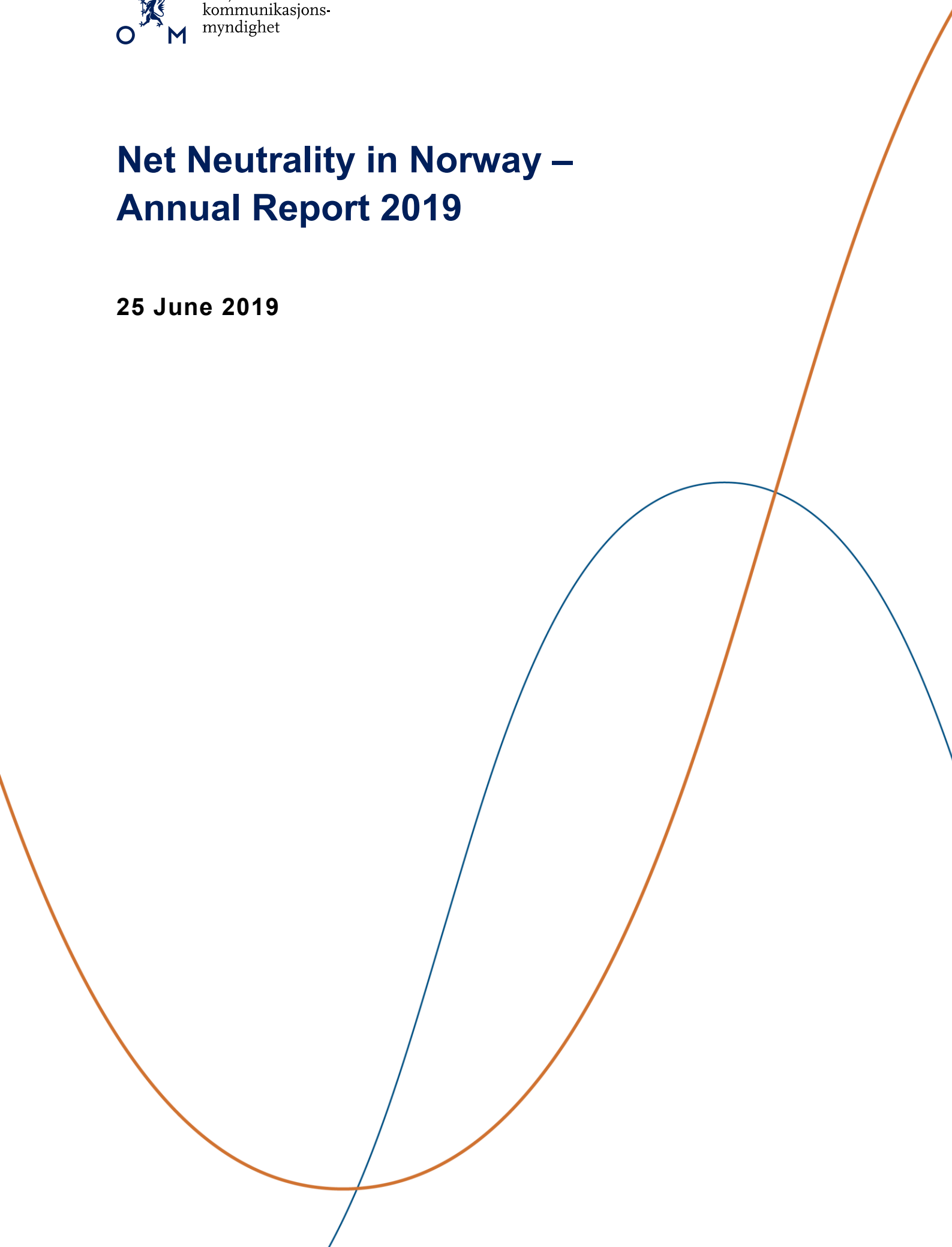


# Net Neutrality in Norway – Annual Report 2019

25 June 2019



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# 1 Introduction and background

This is Nkom's third annual report on net neutrality in Norway. Net neutrality is the principle that all internet traffic must be treated equally, regardless of sender, recipient, equipment, application, service or content. The report describes the status of net neutrality in the Norwegian market.

Net neutrality was codified in law in Norway with effect from March 2017 in connection with the introduction of European rules on net neutrality, in accordance with Regulation 2015/2120<sup>1</sup>. These rules superseded national guidelines on net neutrality from 2009.

This regulation aims "to establish common rules to safeguard equal and non-discriminatory treatment of traffic in the provision of internet access services and related end-users' rights. It aims to protect end-users and simultaneously to guarantee the continued functioning of the internet ecosystem as an engine of innovation."<sup>2</sup>

Nkom monitors the development of net neutrality in the Norwegian market pursuant to Article 5(1) of the Regulation, which describes how the national regulatory authorities shall closely monitor and ensure compliance with the provisions of the Regulation.

The Regulation further stipulates in Article 5(1) that the national regulatory authorities shall publish an annual report on net neutrality in the national market. BEREC's guidelines for net neutrality<sup>3</sup> specify that the period for the annual report shall be 1 May until 30 April of the following year.

Information from internet service providers concerning the development in net neutrality is obtained under the authority of Article 5(2) of the Regulation. This describes how internet service providers shall, at the request of the national regulatory authorities, provide information relevant to the requirements in the Regulation.

The monitoring of net neutrality is also based on BEREC's guidelines on net neutrality, which have been established in pursuance of Article 5(3) of the Regulation. In accordance with recital 19 of the preamble, the national regulatory authorities must take utmost account of relevant guidelines from BEREC.

The report is organised in accordance with the provisions of the Regulation. Section 2 describes access to an open internet via Norwegian providers' internet access services, including assessments of zero-rating offers. Section 3 describes issues related to traffic management in Norwegian providers' networks. Section 4 describes how Norwegian providers provide information about the internet access services they offer. Section 5 describes the quality achieved by Norwegian internet access services.

Finally, Section 6 provides an overall assessment of the status of net neutrality in Norway. This section also serves as an overall summary of the content of the annual report.

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<sup>1</sup> Regulation (EU) 2015/2120 of the European Parliament and of the Council

<sup>2</sup> Recital 1 of the preamble to Regulation 2015/2120

<sup>3</sup> BEREC Guidelines on the Implementation by National Regulators of European Net Neutrality Rules, BoR (16) 127

## 2 Access to an open internet

### 2.1 The right to an open internet access service

Norwegian end-users' access to an open internet is protected by the Norwegian authorities on the basis of the net neutrality provision in the Norwegian Electronic Communications Act<sup>4</sup>, as well as the European Open Internet Regulation and BEREC's net neutrality guidelines.

Article 3(1) of the Regulation describes how the end-users, via their internet access services, shall have the right to access and distribute information and content, to use and provide applications and services, and to use terminal equipment of their choice.

During the reporting period, Nkom has registered that some operators have provided offers in the market that challenge aspects of the net neutrality rules. This section discusses end-user terms and conditions, and also gives an account of the development and effect of zero-rating offers, including the impact of the increasing availability of "free data" products.

### 2.2 End-user terms and conditions

In 2018, Chilimobil AS (Chili) launched an offer called "Free Data". On its launch, the offer had several restrictions to the end-user's possibility to share data with oneself and others, and to move the SIM card from the mobile phone to another entity. Nkom assessed the case based on end-users' right to use terminal equipment of their choice via their internet access service.

On 26 October 2018, Nkom notified a decision on rectification. Chili disputed this notification. The decision was then taken on 20 December 2018. Chili appealed Nkom's decision, and the appeal is now being considered by the Ministry of Local Government and Modernisation.

### 2.3 Zero-rating in Norway

#### 2.3.1 Background

Zero-rating is a form of positive price discrimination concerning selected applications, such as music streaming, without using the end-user's data allowance. The internet service provider decides which applications are zero-rated.

Internet service providers offer zero-rating on the basis of Article 3(2) of the Regulation, which introduces the concept of "commercial practice". The aforementioned Article requires providers to refrain from providing internet access services on commercial terms which limit the end-user's right to an open internet access.

Nkom has obtained updated data from Telenor and Telia concerning the scale of zero-rated services. In addition, a meeting has been held<sup>5</sup> with the Media Businesses Association (MBL) and NRK, and together these bodies have given a written account of their views of the effect of today's zero-rating. The description of zero-rating is based on this data collection.

Regulatory assessment of zero-rating as a commercial practice (provided that it does not entail traffic management measures that are contrary to the Regulation) is performed as an overall assessment based on criteria in accordance with section 46 of BEREC's guidelines concerning net neutrality. The criteria are related to the providers' market position, the effect on content

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<sup>4</sup> Norwegian Act on Electronic Communications, Sections 2-16. Net neutrality

<sup>5</sup> Meeting in Oslo on 4 March 2019.

providers and end-users, and the scale of zero-rating in the market. Below, an account is given of Nkom's assessment of the aforementioned criteria, in addition to an overall assessment.

### **2.3.2 The market positions of the internet service providers**

In its own reports, Nkom has previously assessed zero-rating offers from both Telenor<sup>6</sup> and Telia<sup>7</sup>, both named "Music Freedom". In these instances, Nkom has expressed concern that the offers might have adverse effects, due to the two internet service providers' significant market position and potential influence.

The electronic communication statistics for 2018 show that the duopolistic situation is continuing, since Telenor and Telia together have around 86 percent of the subscribers in the market for telephony-connected mobile services. With regard to turnover, in combination the companies hold more than 90 per cent of the market.

### **2.3.3 Effect on the content providers**

Nkom generally understands that the zero-rating offers can influence the terms of competition in the content market since, due to the positive price discrimination, using selected music applications can seem to be more advantageous for the users than other applications whereby actual consumption uses the data allowance.

MBL and NRK believe that "Music Freedom" negatively impacts Norwegian content providers. Quantifying this presents challenges, but the stakeholders consider that all content providers compete for users' time and that zero-rated services distort use, so there is less time for other content. Consequently, this affects all content providers that are not zero-rated. MBL/NRK believe that content providers with applications that have similarities with the applications included in "Music Freedom", for example podcasts and music, are particularly susceptible.

MBL/NRK state that 37 per cent of the population aged over 15 on a daily basis listen to music streamed from applications such as Spotify, Tidal or YouTube. For the 15-29 year-old age group, no less than 74 per cent listen to streamed music on a daily basis. There is thus considerable potential for zero-rated music streaming to influence the use patterns of a large proportion of the population. MBL/NRK believe that more and more types of subscriptions include zero-rating, so that this is no longer reserved for the youngest subscribers. The increasing scale of larger data allowances could, however, reduce the effect of zero-rating.

MBL/NRK describe how media diversity is a political objective, and that there must be broad availability to Norwegian language and culture. They express concern that users' actual freedom of choice is reduced as a consequence of zero-rated services.

The net neutrality rules indicate that zero-rating of applications within the same category is less problematic than the zero-rating of individual applications, provided that all applications in the same category are treated equally. MBL/NRK point out that category delimitation is complex and express concern that consumption might switch to large global platforms and thereby away from Norwegian content providers. For example, Spotify offers both podcasts and radio programmes. The cited platforms control their own distribution, which reduces Norwegian content providers' knowledge of consumption and users, while also curtailing opportunities for direct contact with users. MBL/NRK maintain that control of distribution increases opportunities for control of larger parts of the value chain.

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<sup>6</sup> Nkom, 29 June 2017, see: [https://eng.nkom.no/topical-issues/news/\\_attachment/29413?\\_ts=15d733a8d41](https://eng.nkom.no/topical-issues/news/_attachment/29413?_ts=15d733a8d41)

<sup>7</sup> Nkom, 18 December 2017, see: [https://eng.nkom.no/topical-issues/news/\\_attachment/36599?\\_ts=1662f6f34c7](https://eng.nkom.no/topical-issues/news/_attachment/36599?_ts=1662f6f34c7)

### 2.3.4 Effect on the end-users

Nkom understands that the zero-rating offers can affect end-users' freedom of choice, in particular because data caps in the Norwegian market are relatively small and relatively highly priced. A Nordic comparison shows that the use of mobile data is low in Norway, cf. Figure 1:

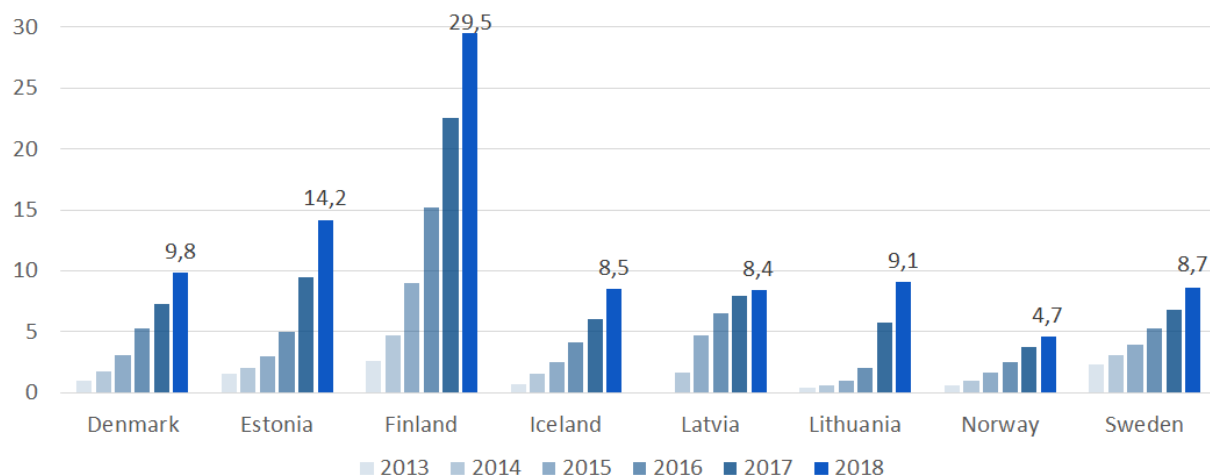


Figure 1: Data consumption in mobile networks per month per capita measured in Gbytes

The steadily increasing scale of zero-rating increases the number of end-users who are encouraged to use certain selected content providers, whereby their freedom of choice can be influenced. At the end of 2017 and 2018, the distribution of the total number of customers (private and business) per data cap was as follows:

Data cap	2017	2018
No data included	30%	27%
< 1 GB	6%	6%
1-5 GB	39%	38%
5-10 GB	16%	15%
10-20 GB	6%	7%
> 20 GB	2%	6%

Table 1: Distribution of total number of customers per monthly data cap

The majority of Norwegian end-users have caps with mobile data exceeding 1GB per month, and the trend from 2017 indicates an increasing proportion of end-users with caps greater than 10 GB per month. To some extent, this trend compensates the negative effects of zero-rated services. When the data caps are large enough, offers of zero-rated services will only have a small impact on the choices made by users.

Several providers have launched mobile subscriptions with “free” data. Telia has launched the “Telia X” subscription, which offers unlimited data consumption at a fixed monthly price. After the customer has consumed 40 GB, the speed is reduced to 3 Mbit/s.<sup>8</sup> Ice has launched “Data Freedom”<sup>9</sup>, which gives up to 1,000 GB per month at a speed of 10 Mbit/s in the company's own network. The offer is launched as a “supplementary service” in combination with the

<sup>8</sup> <https://www.telia.no/mobilabonnement/mobilabonnement-for-alle/telia-x>

<sup>9</sup> <https://www.ice.no/produkt/data-frihet/>

company's main offer ranging from 6 to 30 GB per month. The customer can thereby make use of free data for as long as the customer stays in Ice's network. When the customer is in another network, the data consumption is deducted from the main subscription's data cap. As the only provider without its own mobile network,<sup>10</sup> Chilimobil has launched a subscription that facilitates unlimited data ("Chili Free Data").<sup>11</sup> With Chili Free Data, the customer has unlimited amounts of data in Norway and 19 GB in the EU/EEA. If the customer uses more than 5 GB per day, the speed is limited to 3 Mbit/s until midnight of the day in question.

**2.3.5 The scale of zero-rating**

In last year's annual report, the scale of zero-rating was assessed to be limited. This was the main reason that Nkom, according to an overall assessment, found that there was no basis to give a mandatory order to rectify the zero-rating offers in the market at that time.

It is still the case that zero-rated services include Telenor and Telia's offer of "Music Freedom". In the course of this reporting period, the offer of "Music Freedom" has been linked to an increased number of subscription types. Among other things, as from April 2019 Telenor has included the zero-rated offer in the products targeted at users under 18 years of age. The number of content providers included in "Music Freedom" is unchanged, however.

During the reporting period, the proportion of private users who use "Music Freedom" has increased from around 24 per cent to around 30 per cent. The use of zero-rated data is distributed on various subscription types, and the trend is for subscriptions with the largest data cap to use the offer the most. Overall for Telenor and Telia's customer base, use of zero-rating per data cap has developed as shown in the following table:

Data cap	December 2017	April 2018	April 2019
0-1 GB	0%	0%	1.1%
1-5 GB	16.7%	16.3%	17.1%
5-10 GB	63.7%	49.9%	33.3%
> 10 GB	19.4%	33.6%	48.3%

Table 2: Total customer base (Telenor and Telia) per monthly data cap

**2.3.6 Overall assessment of zero-rating**

In terms of the effect on content providers, zero-rating influences the competitive conditions since it entails positive discrimination for providers that are included. The conditions for content providers have not changed during the past year. Nkom therefore maintains its assessment that the number of content providers that are actually included in the zero-rating schemes is relatively limited, and that this solely includes large, well-established providers.

In terms of the effect on end-users, Nkom has previously expressed that zero-rating is suitable to limiting end-users' freedom of choice, particularly in view of the relatively small, highly-priced data caps compared to other countries. During the past year, however, various offers with more or less unlimited data allowances have been launched in the Norwegian market, and end-users generally purchase larger data allowances. This may contribute to reducing the effect of zero-rating on end-users. Nkom therefore believes that this criterion shows some improvement compared to the situation a year ago.

There is no doubt that the scale and use of "Music Freedom" is increasing. At the same time, zero-rating is increasingly being taken up by users with relatively large data allowances. As a

<sup>10</sup> Chili buys access to Telia's mobile network

<sup>11</sup> <https://www.chilimobil.no/bestill/chili-fri/>

general rule, these users are considered to have sufficient mobile data to have a relatively high degree of freedom to choose which applications they wish to use, and are thereby less motivated to use zero-rated applications. As a consequence of this development, Nkom is less concerned that last year's increased scale of "Music Freedom" has detrimental effects on competition or consumer welfare. This assessment might be different, however, if additional zero-rated content categories were to be launched in the market.

Based on an overall assessment, Nkom therefore does not see a basis for any mandatory orders for rectification of the zero-rating schemes. Nkom will, however, continue to monitor the development of zero-rating in the market, particularly in the light of the input from MBL/NRK concerning freedom of choice and media diversity, and will also follow up on whether the offer of large, unlimited data caps has the assumed dampening effect on the scale of zero-rating.

### **3 Traffic management and specialised services**

BEREC recommends data collection from internet service providers as a method that national regulatory authorities can use to monitor internet service providers' compliance with the net neutrality rules. Nkom has obtained data of this nature as part of its collection of data for use in the annual statistics.

#### **3.1 Traffic management of the internet access service**

Traffic management of the internet access service is especially relevant when assessing net neutrality. The internet access service is defined as a "public electronic communications service offering access to the internet."

Traffic management methods that the internet service providers use for the internet access service are assessed by Article 3(3) of the Regulation. As part of the monitoring of net neutrality in the Norwegian market, Nkom has asked providers for information about the traffic management methods they use in the provision of their internet access services.

Examples of such traffic management methods include the blocking of domain names in DNS pursuant to a judicial order, the Kripos Child Abuse Filter, and blocking of TCP/UDP ports in connection with specific security measures (for example, to prevent DDoS (Distributed Denial of Service) attacks and other types of cyber-attacks) and anti-spam measures (based on Norwegian industry norms).

For mobile networks, there have also been reports of general bandwidth throttling pursuant to the subscription terms and conditions when the data allowance has been used up, but not throttling of specific applications. Bandwidth throttling that treats all applications equally is, in principle, in compliance with the net neutrality rules.

Nkom has not performed a detailed review of the reported traffic management measures, but considers that these are provided in accordance with the Regulation. In the future, Nkom may undertake more exhaustive investigations of the providers' traffic management measures.

#### **3.2 Specialised services**

Specialised services are defined as "services other than internet access services which are optimised for specific content, applications or services, or a combination thereof, where the optimisation is necessary in order to meet requirements of the content, applications or services for a specific level of quality".



Article 3(5) of the Regulation, require internet service providers to ensure sufficient network capacity to be able to offer these services in addition to the internet access services offered. As part of the supervision of specialised services in the Norwegian market, Nkom has asked providers for information about the specialised services they offer.

Frequently reported specialised services in the fixed network are voice over IP and IPTV, and in mobile networks it is relatively common to offer VoLTE (Voice over LTE) in parallel to the internet access service. This is in line with the typical examples of specialised services in BEREC's net neutrality guidelines.

When the providers were asked how they ensure that the capacity of their network is sufficient to ensure that the specialised services are not to the detriment of the general quality of the internet access service for end-users, the general response is that they continuously monitor traffic at all the links in the network and that capacity is increased as needed.

Nkom has not performed a detailed review of the reported specialised services, but considers that these are offered in accordance with the Regulation. In the future, Nkom may undertake more detailed investigations of the specialised services offered by the providers.

### 3.3 Arrangement for 5G

During the past year increasing attention has been paid to the relationship between net neutrality and 5G. The internet service providers have been sceptical towards the European net neutrality regulations that also apply in Norway. More specifically, there has been concerns that the regulations might inhibit development and lead to uncertainty concerning which services will be permitted in any coming 5G network<sup>12</sup>. Both BEREC and Nkom have given weight to analysing this relationship.

In 2018-2019, Nkom participated in BEREC's work to evaluate the guidelines for net neutrality. In a report,<sup>13</sup> BEREC concludes that the regulation of net neutrality generally works well. BEREC's guidelines can, however, be clarified in a few instances.

The report also includes an assessment of compatibility between net neutrality regulation and 5G technology. The net neutrality regulations are technology-neutral, and there is no prohibition against the new technical aspects that are introduced with the 5G technology. As for any other technology, use of the technology must, however, be assessed in each case.

"Network slicing", for example, can be used as a method to offer specialised services in parallel with the internet access service, while preventing any reduction of the general quality of the internet access service. This means that in practice 5G can contribute to compliance with the Regulation's requirements. BEREC's evaluation concludes that the net neutrality regulations provide considerable flexibility for the implementation of the 5G technology.

On 5 March 2019, Abelia held a seminar on 5G and net neutrality. Presentations were given by industry and research representatives, and subsequently there was a round-table debate between stakeholders and the authorities. Both the Ministry and Nkom expressed a clear wish for continued dialogue on the topic and encouraged the internet service providers to revert with specific examples for further follow-up on the dialogue.

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<sup>12</sup> Telenor Group's response to BEREC's consultation on net neutrality, [https://berec.europa.eu/eng/document\\_register/subject\\_matter/berec/download/0/8385-contribution-by-telenor-group-to-the-pub\\_0.pdf](https://berec.europa.eu/eng/document_register/subject_matter/berec/download/0/8385-contribution-by-telenor-group-to-the-pub_0.pdf)

<sup>13</sup> BEREC Opinion for the evaluation of the application of Regulation (EU) 2015/2120 and the BEREC Net Neutrality Guidelines, BoR (18) 244

During the spring of 2019, Nkom held dialogue meetings with Telenor and Telia concerning 5G and net neutrality. Nkom still wishes to contribute to facilitating the development of the 5G networks in Norway, and to follow up on our traditional net neutrality dialogue with the industry.

## 4 Information about the internet access service

### 4.1 Transparency requirements

Article 4 of the Regulation sets requirements concerning the information that internet service providers must make available to their end-users. In Article 4(1) there is a requirement for openness and transparency in providers' contracts concerning internet access services, and that providers must publish such information, while in Article 4(2) providers are required to have transparent, simple and efficient procedures to address complaints of end-users relating to the rights and obligations laid down in Articles 3 and 4(1).

In the annual report for 2018, Nkom concluded that internet service providers could be better at giving their end-users correct information. On this basis, on 21 January 2019, Nkom sent out an information letter to all internet service providers in Norway. The letter concerned Article 4 and the transparency requirements laid down in the provision. Information was also given on Nkom's ongoing follow-up and control of compliance.

As part of the annual follow-up of the net neutrality Regulation, Nkom has asked providers of fixed and mobile internet access services to report what information they provide to their end-users about the internet access service.

In this report, we focus on three topics: information about traffic management measures, information about the normally available speed and finally, information about the handling of complaints related to net neutrality. Providers of mobile and fixed internet access services are treated collectively where the questions are relevant to both types of providers.

### 4.2 Information about traffic management

Providers of internet access services must disclose information about the traffic management measures that are being used. We refer to Section 3 of the report for more information about the actual traffic management measures.

The Regulation requires the internet service providers to give information about traffic management measures in the agreement terms and to publish the information (typically on their websites). Even if the providers can document that the information is given, it is also relevant to assess the actual content and quality of the information.

Again this year, Telia provided good information both in the terms<sup>14</sup> and on its own websites<sup>15</sup> for all of its brands<sup>16</sup>. On these sites, information is presented about the traffic management measures that are applied, and the background and justification for these measures. In addition, the end-user can find information about speed and factors that can affect the speed.

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<sup>14</sup> <https://www.telia.no/globalassets/pdf/telia-bedriftsavtale-generelle-vilkar.pdf>

<sup>15</sup> <https://telia.no/hastighet>

<sup>16</sup> <https://onecall.no/kundeservice/mobildata-hastighet>  
<https://mycall.no/kundeservice/hastighet-mobildata>  
<https://www.phonero.no/kundesupport-artikler/trafikkstyring-hos-phonero>  
<https://www.phonero.no/kundesupport-artikler/hastighet-hos-phonero>

Broadnet<sup>17</sup> and NextGenTel<sup>18</sup> also present information on a separate website with details of traffic management measures, including which applications are blocked, for example due to security measures. Nkom generally takes a positive view of the presentation of information about the internet access service in a way that is easily accessible to end-users and that provides overview of relevant information.

In its terms and conditions,<sup>19</sup> Telenor refers to how traffic management measures can be implemented on the basis of inter alia security, regulatory or statutory obligations. Telenor also describes how they use traffic management as a tool to ensure services of good quality. This concerns traffic management both in normal periods and during periods of abnormally heavy network loads. Even though the information is not at the same level of detail as in Telia's case, it does provide general information about the measures that Telenor has implemented.

Some of the providers also refer to how they adhere to the industry standard for spam. However, Viken Fiber and other internet service providers under the Altibox brand refer to Altibox websites<sup>20</sup> and terms<sup>21</sup> for traffic management that are no longer available.

The investigations thus reveal varying practice among the providers regarding how much information about traffic management measures is made available to end-users, and how the information is made available. Nkom observes that several of the providers have improved their information since last year and made it more readily available to end-users. This is still not the case for all providers, and Nkom recommends providers that have not yet done so to create their own webpages with information about net neutrality, in order to improve transparency in relation to the end-users. Nkom will now assess further steps to ensure that end-users receive sufficient traffic management information.

### 4.3 Information about normally available speed

In order to strengthen the rights of end users, it is a requirement of Article 4(1)(d) of the Regulation that providers of internet access services inform end users of the speed that they are realistically able to deliver. The regulation requires providers of *fixed* internet access services to specify the following parameters for download and upload speeds respectively:

- Minimum speed
- Normally available speed
- Maximum speed
- Advertised speed

By “normally available speed” it is meant the speed that an end user would expect to receive for the majority of the time that they use the service. This parameter is probably the one that provides the most relevant information to end-users about the performance of the internet access service.

The Table 3 following summarises which information the largest providers have made available on their websites regarding fixed internet access service speeds.

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<sup>17</sup> <https://www.broadnet.no/trafikkstyring/>

<sup>18</sup> <https://www.nextgentel.no/priser/vilkar-1#vilkar>

<sup>19</sup> <https://www.telenor.no/privat/vilkar/>

<sup>20</sup> <https://www.altibox.no/privat/bredband/hastighet>

<sup>21</sup> <https://www.altibox.no/privat/kundeservice/vilkår/>

Provider	Access technology	Minimum speed	Normally available speed	Maximum speed	Advertised speed	Remarks
Telenor	Fibre <sup>22</sup>			x	x	
	xDSL <sup>22</sup>	x		x	x	
NextGenTel	xDSL <sup>23</sup>	x	x	x	x	
GET	xDSL			x	x	
Viken Fiber	Fibre				x	Via Altibox <sup>24</sup>
Broadnet/ HomeNet	Fibre			x	x	Service description internet <sup>25</sup>
	xDSL	x		x	x	
Eidsiva Bredbånd	Fibre <sup>26</sup>			x	x	
	Coax <sup>27</sup>				x	
	xDSL <sup>28</sup>	x		x		
Lyse	Fibre				x	Via Altibox

Table 3: Information about fixed internet access service speeds

In mobile networks, the normally available speed in a given cell is more difficult to predict, due to the varying number of active users. For this reason, only fixed internet service providers are required to provide information about this speed parameter. However, the Regulation requires providers of *mobile* internet access services to specify the following parameters for speed:

- Estimated maximum speed
- Advertised speed

The table below summarises which information providers with their own mobile networks have made available on their websites regarding mobile internet access service speed.

Provider	Access technology	Estimated maximum speed	Advertised speed	Remarks
Telenor	Mobile	x	x	Information about theoretical and expected speed
	Mobile broadband	x	x	Information about theoretical and expected speed
Telia	Mobile	x	x	Information about the estimated maximum and advertised download/upload speeds
	Mobile broadband	x	x	Information about the estimated highest speed
ice.net	Mobile	x	x	Information about theoretical speed and expected average speed
	Mobile broadband	x	x	Information about experienced download and upload speeds

Table 4: Information about mobile internet access service speeds

<sup>22</sup> <https://www.telenor.no/privat/internett/>

<sup>23</sup> <https://www.nextgentel.no/priser/bredband#bredbandsabonnement>

<sup>24</sup> <https://www.altibox.no/privat/bredband/hastighet>

<sup>25</sup> <https://www.broadnet.no/wp-content/uploads/2014/01/Tjenestebeskrivelse-Internett-Versjon-3.18.-01.12.2018.pdf>

<sup>26</sup> <https://eidsiva.net/bredband/fiber/>

<sup>27</sup> <https://eidsiva.net/bredband/coax/>

<sup>28</sup> <https://eidsiva.net/bredband/dsl/>

Nkom has not undertaken any investigation of specific contracts between providers and their customers, but observes that in their general subscription terms providers only state various speed limitations.

On the providers' websites (see Table 3), there is a low level of information about normally available speed of fixed internet access services. Information about normally available speed was emphasised as particularly important in the letter Nkom sent to internet service providers in January 2019. Nkom will now assess further steps to ensure that end-users receive sufficient information about normally available speed. Concerning mobile internet access services, sufficient information is given, in accordance with the requirements in the Regulation.

#### **4.4 Information about the handling of complaints related to net neutrality**

Internet service providers must have transparent, simple and effective procedures for the processing of complaints from end-users relating to rights and obligations in Articles 3 and 4(1).

The providers are generally good at providing information about the right to complain. The information is not necessarily limited or adapted to the rights and obligations in Articles 3 and 4(1), but applies to the processing of complaints by the provider in general. The Regulation does not require the procedure for handling complaints regarding net neutrality to be separate from the providers' processing of complaints in general.

Nkom believes that joint processing of complaints by the providers is acceptable for as long as it is evident that complaints about net neutrality can also be made to the providers.

## **5 Quality of the internet access service**

### **5.1 The overall quality of the internet access service**

Article 5 of the Regulation states that national authorities have a monitoring and reporting obligation to ensure that providers of internet access services fulfil their obligations regarding open internet access. Article 5(1) stipulates that national regulatory authorities have a duty to follow up on providers' compliance with Articles 3 and 4.

Recital 17 of the preamble highlights the importance of the fact that specialised services and the use of such services should not reduce the general quality of the customer's access to the internet. Concerning internet access services via mobile networks, some of the requirements are eased due to the particular conditions associated with varying numbers of active users per cell, as well as non-homogeneous coverage. Yet over time, in this case too, it is expected that the general quality of the internet access service will be maintained.

### **5.2 Regulatory follow-up**

A measure to follow up on Article 5(1) of the Regulation is to monitor end-users' quality of their internet access services. In this report, we have considered the results from Nkom's measurement service, Nettfart, which consists of tools for measurement via PC and mobile applications adapted to iOS and Android. For the first time, the report includes measurement results from the Nettfart mobile application.

As for all types of crowd sourcing, the representative value of the statistical basis may be limited, since use of the measurement service is voluntary, and depends on the individual end-user taking the initiative to conduct measurements. However, the measurement results provide an indication of the quality of the internet access service experienced by the end-users. Review of the underlying data also shows that, over time, information is collected from a very large proportion of the providers and that all access technologies are represented.

### 5.3 Measurement results

#### 5.3.1 Measurement results for fixed internet access services

For fixed internet access services, the report presents the development in average speed measured by Nettfart.no across the end-users' different subscriptions, as well as the development in average speed per technology (fibre, cable TV and xDSL). Finally, measured speed compared to the advertised speed of the end-users' subscriptions is presented.

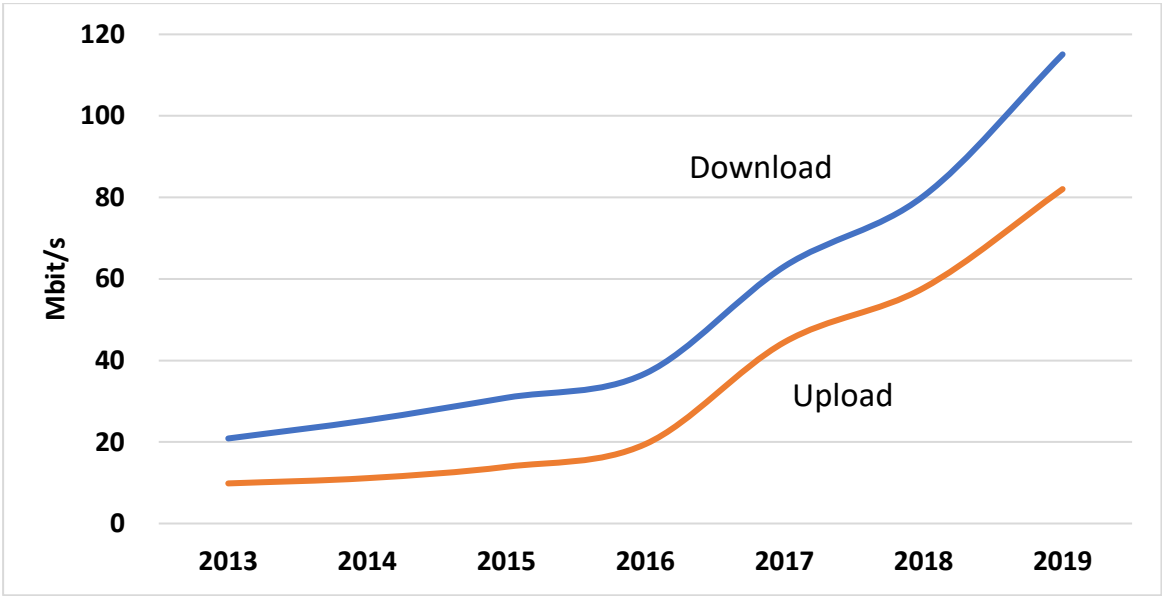


Figure 2: Average speed for fixed internet access services (source: nettfart.no)

Figure 2 shows that the average speed measured across the end-users' different subscriptions so far in 2019 is three times as high as in 2016. This applies to both download and upload speeds. The growth from the previous reporting period appears to be continuing. Compared to the results up to 2016, the development in recent years has been significant. This increase in speed will enable customers, with a good margin, to use all types of applications via their internet access services.

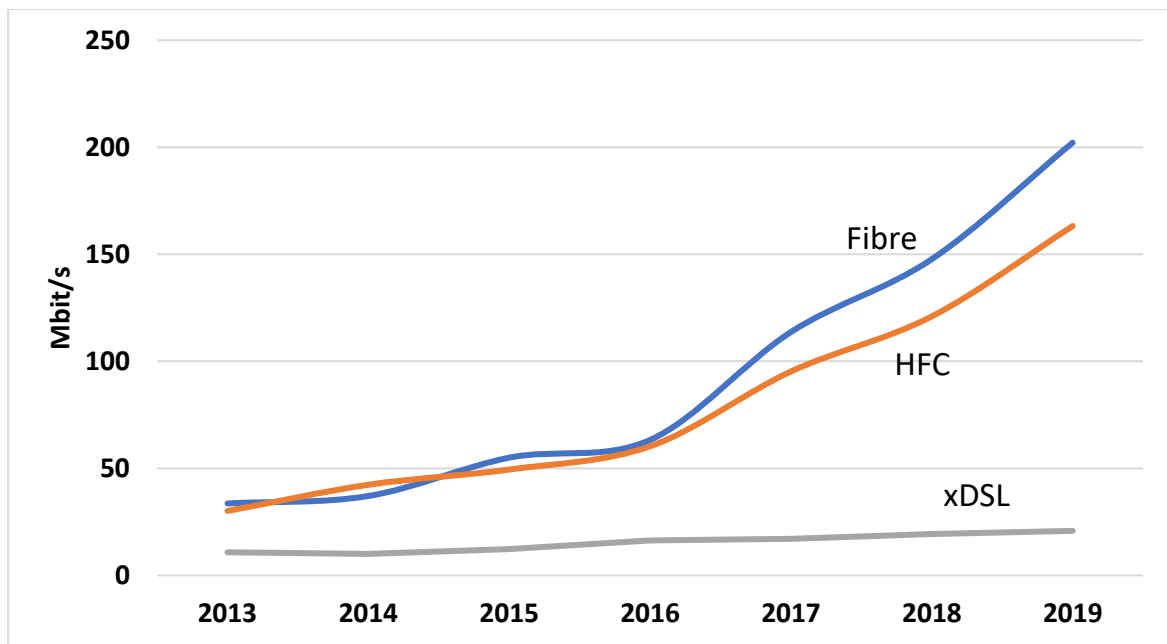


Figure 3: Average download speed by technology (source: nettfart.no)

The breakdown by access technology shows Figure 3 that there are variations in the speeds achieved by users via fibre, cable TV (HFC) and xDSL. The fibre and cable TV technologies offer significantly higher download capacity than internet access service based on xDSL. The various different characteristics of the transmission media are the main explanation for this. Fibre accesses and HFC have considerably greater bandwidth available in practice, compared to accesses based on copper cable. This may also be due to a lack of investment in the xDSL technologies.

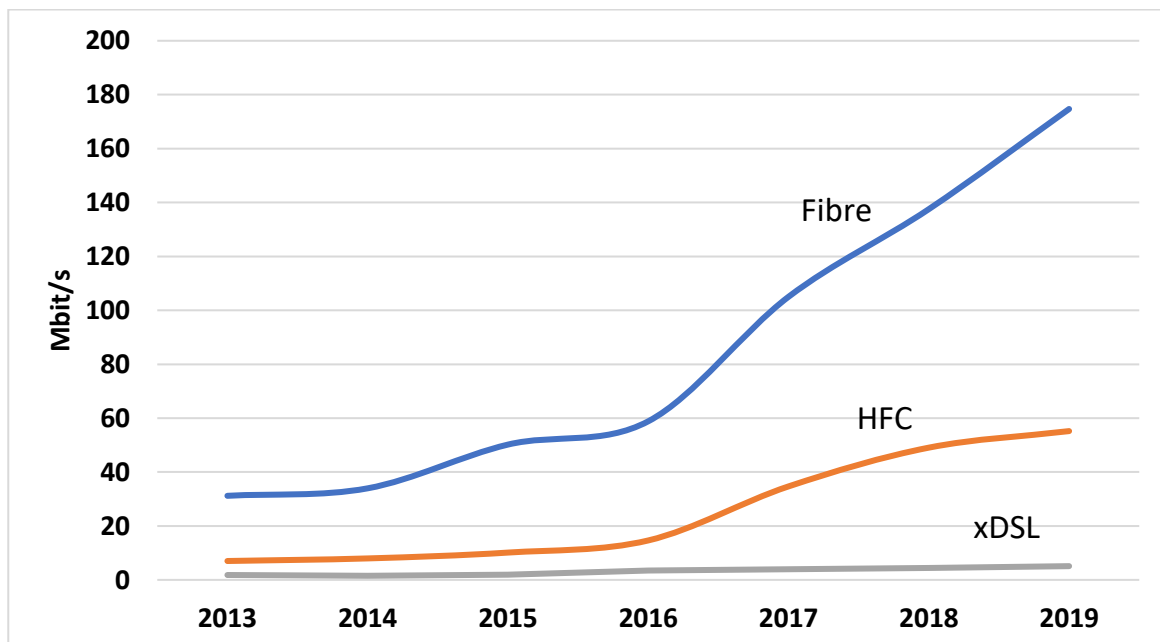


Figure 4: Average upload speed by technology (source: nettfart.no)

There are also greater variations between fibre and cable TV (HFC) when it comes to the average measured upload speed, see Figure 4. As from 2016 onwards, fibre accesses in particular experience a great increase in average upload speed. This is probably due to the introduction of several subscriptions with the offer of symmetrical speeds for the customer, i.e. the same traffic capacity to and from the internet. Subscriptions based on xDSL show marginal development when it comes to average upload speed.

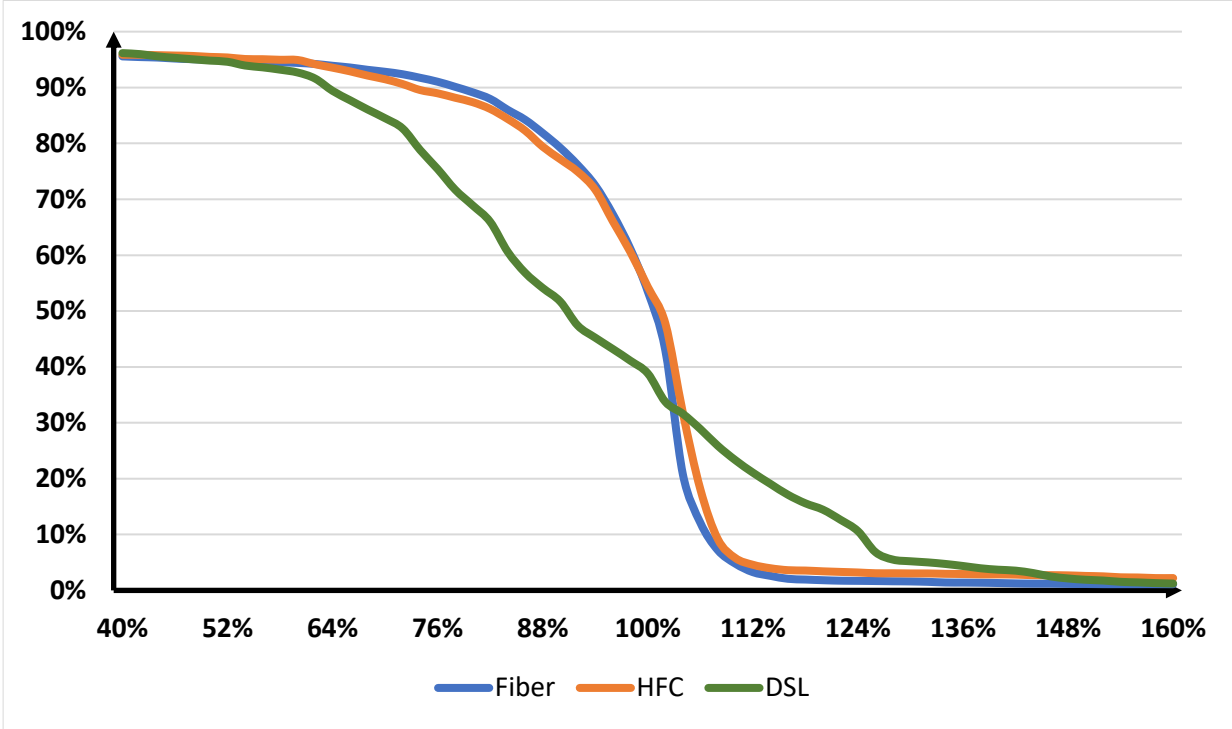


Figure 5: Measured speed compared to advertised speed (source: nettfart.no)

Figure 5 shows the relationship between measured speed and advertised speed on fixed internet access services (fibre, cable TV and DSL) from 1 May 2018 until 30 April 2019. The figure shows the proportion of the measured accesses (vertical axis) that, as a minimum, achieve the corresponding proportion of the advertised speed (horizontal axis). In line with the Regulation, it is important that the providers offer a speed that matches the advertised speed that is specified in contracts and on the provider's website. The results for fibre and cable TV are relatively good, while the results for DSL vary.



### 5.3.2 Measurement results for mobile internet access services

For mobile internet access services, the report presents the development in average speed measured by Nettfart.no. Average speed per technology (3G, 4G and WLAN) is also presented, as measured with Nettfart Mobil. Finally the variation in speed over 24 hours is presented.

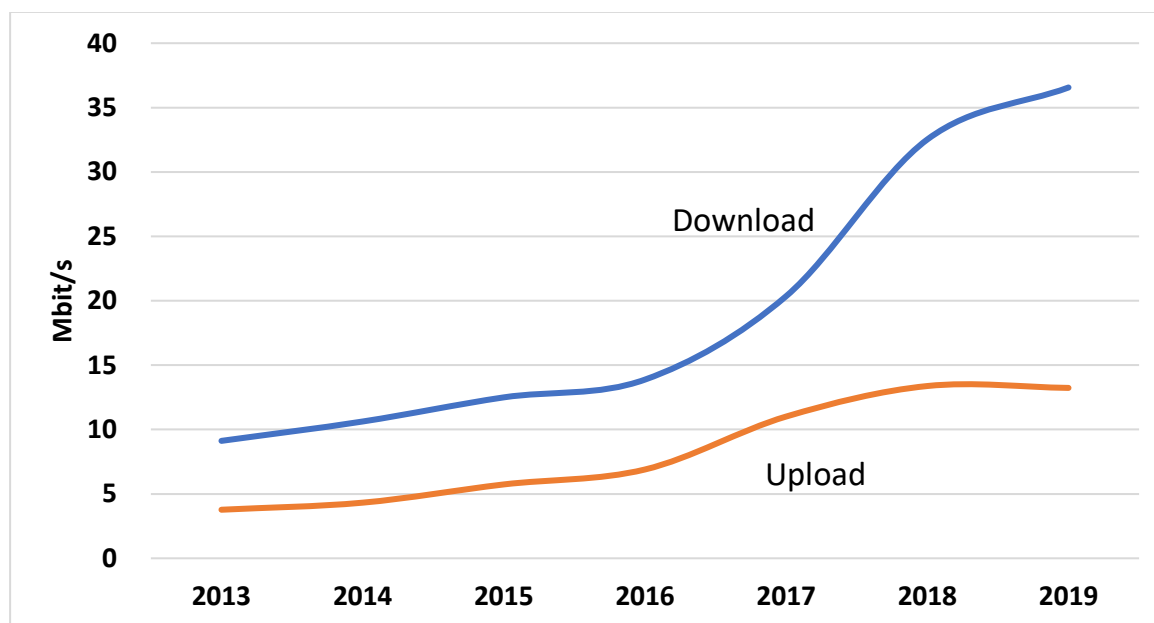


Figure 6: Average speed for mobile internet access services (source: nettfart.no)

Figure 6 shows that for internet access services via mobile networks there is also a positive trend in terms of the development in the measured average download speed. For upload speed, there appears to be a marginal decline. Nkom observes that Norwegian internet users have the lowest consumption of mobile data in the Nordic countries (cf. section 2.3.4). This entails lower traffic loads in the mobile networks than would have been the case if Norway's mobile data consumption had been equivalent to that in our neighbouring countries.

Figure 6 shows the average speeds for 2G, 3G and 4G. These measurement results can therefore deviate somewhat from the figures presented in figures 7 and 8 below, where the measurement results are distributed across the different technologies.

It is interesting to note that mobile-based solutions now offer speeds that in technical terms can make them viable alternatives to wire-based internet access services. In the case of 5G, the further development of mobile internet access service is one of the most important focus areas. It is thus the pricing structure for subscriptions and technical availability (coverage) that influences how widely this form of internet access service can develop as an alternative to a fixed internet access service.

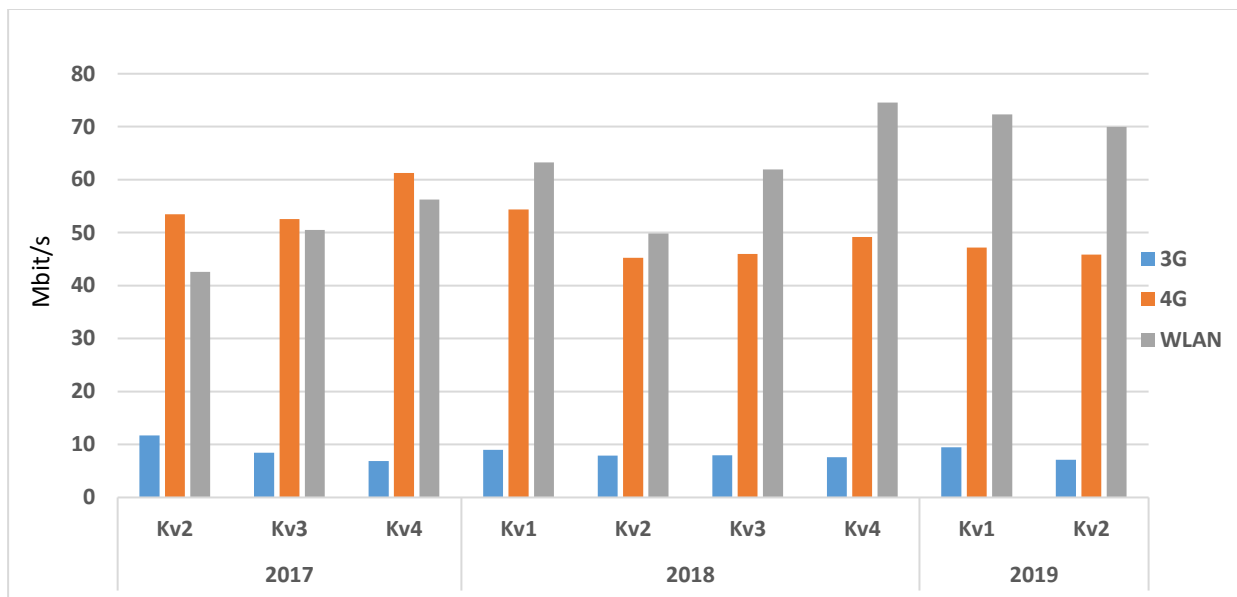


Figure 7: Average download speed per technology (source: Nettfart Mobil)

Figure 7 shows differences in the average measured download speed by radio technology. The figure shows that the measurement application's users achieve higher speeds when the phone or tablet is connected to wireless LANs, compared to measurements via mobile networks.<sup>29</sup> This may indicate that the capacity development in mobile networks does not follow the same trend as wired accesses via WLAN. (Q2 2019 solely includes data up to and including April.)

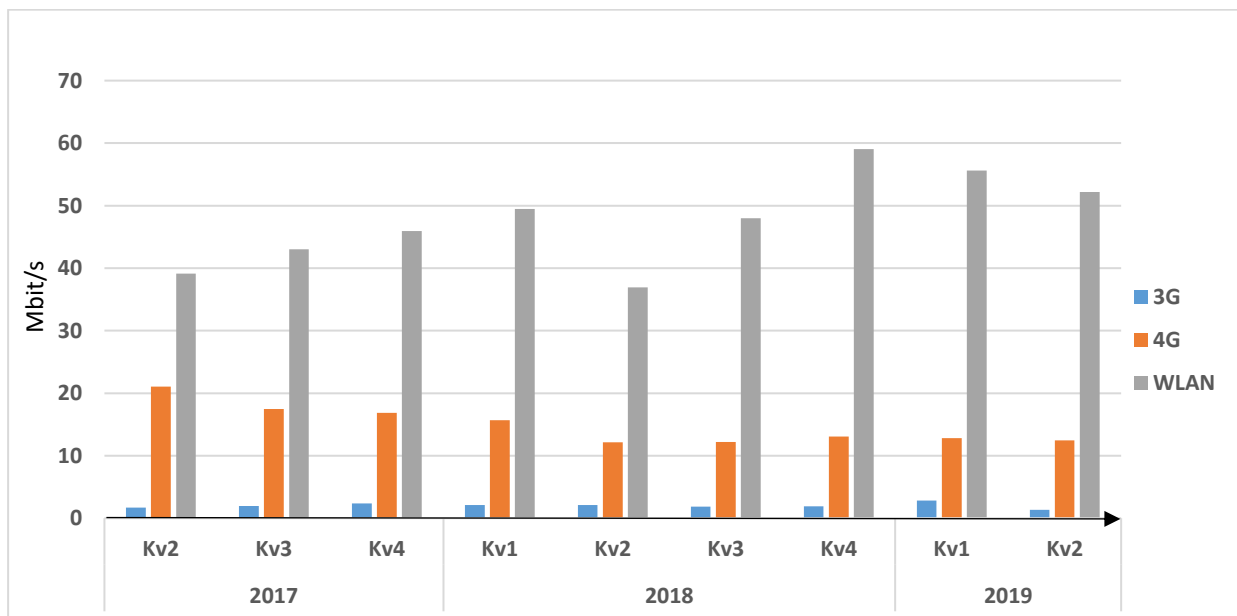


Figure 8: Average upload speed by technology (source: Nettfart Mobil)

Figure 8 shows that the differences between measurement results via the mobile networks compared to measurement results via WLAN are even clearer when it comes to upload speed. An explanation may be that the mobile networks reserve a larger proportion of the available spectrum for download, since it can be assumed that this is the dominant direction of data

<sup>29</sup> Measurement results from all users of Nettfart Mobil, irrespective of which provider they have a contract with.

flows between the internet and the individual customer. (Q2 2019 solely includes data up to and including April.)

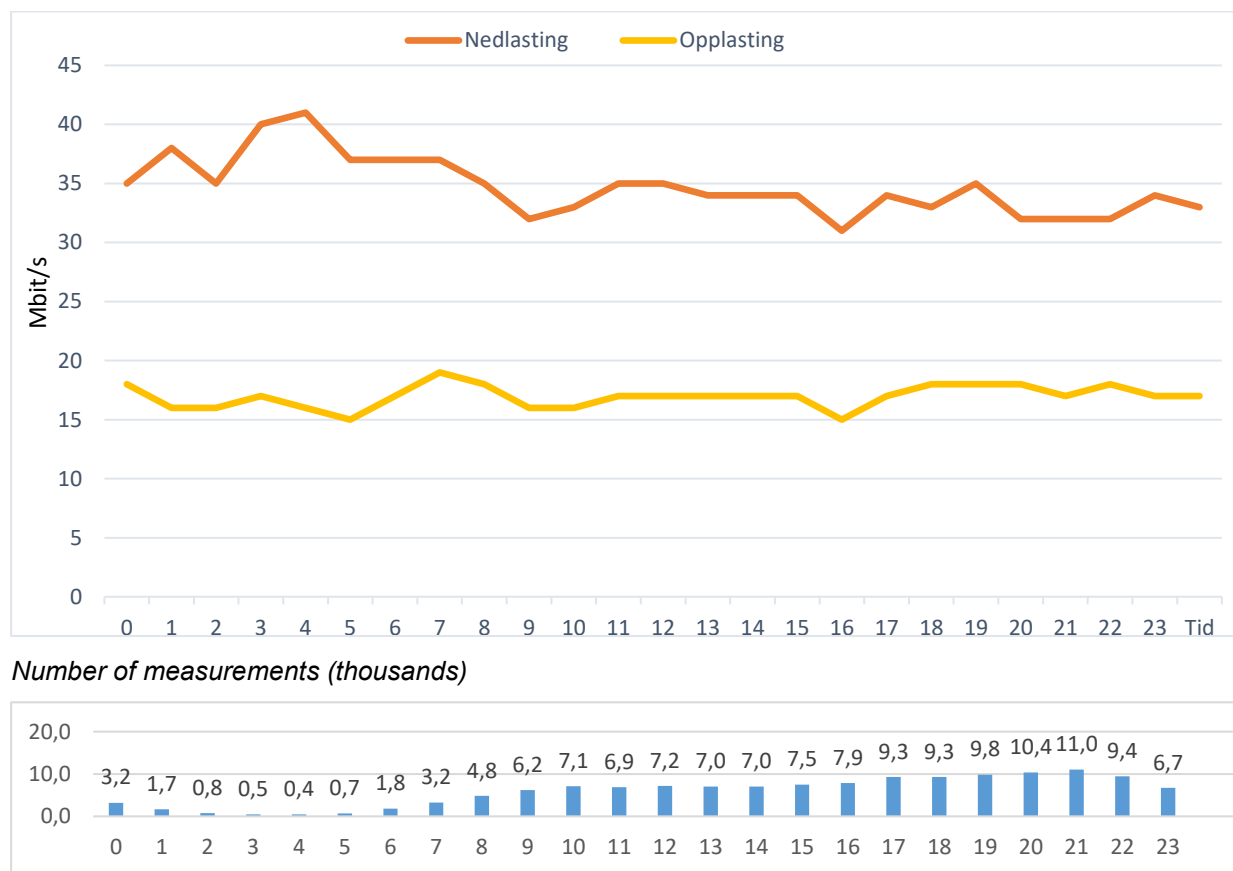


Figure 9: Median of download and upload speeds per hour (source: Nettfart Mobil)

Figure 9 shows the median value of download and upload speeds distributed per hour throughout 24 hours, measured over the period from 1 May 2018 to 30 April 2019. It is evident from the graph that the variation in download speed over 24 hours is relatively small. For upload, the variations are even smaller. This indicates that the internet service providers are good at adapting the available capacity to customer demand and that the networks can meet the need for more and more capacity.

### 5.3.3 Assessment of measurement results

It is positive to note that the development in available capacity is continuing the favourable trend from the previous reporting period. This is particularly evident for internet access services based on fibre and HFC. It is evident that customers using xDSL are not subject to the same development. The network owner (Telenor) has announced that the copper network will be discontinued up to 2023<sup>30</sup>. Existing customers will thus face the question of whether it is possible to switch to fibre or wireless solutions, in order to match the same development.

The results from Nettfart Mobil also draw a positive picture of available internet access capacity via mobile networks. Mobile operators seem to be able to meet the demand by

<sup>30</sup> <https://www.mynewsdesk.com/no/telenor/pressreleases/telenors-norgessjef-om-moderniseringen-vaart-maal-er-at-alle-skal-ha-tilgang-til-internett-og-ha-bedre-opplevelser-2858596>

expanding coverage and implementing radio technologies that effectively leverage the available spectrum. Nkom will continue to monitor this development closely.

The increased available internet access capacity – as a consequence of technological development, commercial campaigns by providers, or customers' willingness to spend more on high-speed subscriptions – enables end-users to utilise a wide range of internet-based applications without having to battle with each other for their required share of the total capacity. In line with this development, the need for traffic management of the internet access services should also be limited.

## 6 Overall assessment

### ***Access to an open internet***

The net neutrality regulations give internet users the right to an open internet and specify that commercial practices such as zero-rating should not limit this right. During the reporting period, however, Nkom has registered that some internet service providers have had offers in the market that challenge aspects of these regulations.

In 2018, Chilimobil AS launched a subscription that, at its launch, imposed restrictions on the end-user's possibility to share data with oneself and others, and to move the SIM card from the mobile phone to another entity. Nkom assessed the case based on end-users' right to use terminal equipment of their choice via their internet access service. Nkom took a decision on rectification in December 2018. The decision was appealed, and the appeal is now being considered by the Norwegian Ministry of Local Government and Modernisation.

### ***Zero-rating in the Norwegian market***

Zero-rating is a form of positive price discrimination concerning selected applications, such as music streaming. Based on an overall assessment that takes various criteria into account, Nkom assesses whether zero-rating limits the end-user's right to open internet access.

Telenor and Telia offer zero-rating schemes in the market for internet access services via mobile networks, and these providers have a combined 90 per cent market share. In terms of the effect on the content providers, Nkom maintains its assessment from last year that the number of content providers actually included in the zero-rating schemes is relatively limited, and solely includes large, well-established providers.

In terms of the effect on the end-users, Nkom has previously expressed the opinion that zero-rating contributes to restricting end-users' freedom of choice, particularly due to relatively small, highly priced data caps in the Norwegian market, compared to other countries. During the past year, however, various offers with more or less unlimited data allowances have been launched in the Norwegian market, and the end-users generally purchase larger data caps. Nkom therefore believes that this criterion shows some improvement.

There is no doubt that the scale and use of "Music Freedom" are increasing. At the same time zero-rating is increasingly being taken up by end-users with relatively large data allowances. As a general rule, these end-users are considered to be less motivated to use zero-rated applications. As a consequence of this development, Nkom is less concerned that last year's increased scale of "Music Freedom" has detrimental effects on competition or consumer welfare.

Based on an overall assessment, Nkom therefore does not see a basis for any mandatory orders for rectification of the zero-rating schemes. Nkom will, however, continue to monitor the development of zero-rating in the Norwegian market, particularly in the light of the input from

Norwegian content providers concerning freedom of choice and media diversity, and will also follow up on whether the offer of large and unlimited data caps has the assumed dampening effect on the scale of zero-rating.

### ***Traffic management and specialised services***

Nkom's data collection from internet service providers shows no significant changes compared to last year in terms of traffic management of the internet access services, as well as the provision of specialised services in the market. Providers typically report on the traffic management of the internet access service based on legal orders and security measures. Frequently reported specialised services in the fixed network are voice over IP and IPTV, and on mobile networks it is relatively common to offer VoLTE as a specialised service.

Nkom has not conducted a detailed review of the reported traffic management measures or the specialised services, but considers that these are provided in accordance with the Regulation. In the future, Nkom may undertake more detailed investigations of the measures taken by the providers.

During the past year increasing attention has been paid to the relationship between net neutrality and 5G. The internet service providers have been sceptical towards the net neutrality regulations. It has been argued that the regulations might inhibit development and lead to uncertainty concerning which services will be permitted in coming 5G networks.

In 2018-2019, Nkom participated in BEREC's work to evaluate the net neutrality guidelines. In a BEREC report it was concluded that the regulation generally works well, but that BEREC's guidelines could be clarified in certain respects. The report also concludes that the net neutrality regulations provide considerable flexibility for implementation of the 5G technology.

In March 2019, Abelia held a seminar on 5G and net neutrality. Both Nkom and the Ministry expressed a clear wish for continued dialogue on the topic and encouraged the providers to revert with specific examples for further follow-up. Nkom has subsequently held dialogue meetings with Telenor and Telia concerning 5G and net neutrality. Nkom wishes to contribute to facilitating the development of 5G networks in Norway, and to follow up on the net neutrality dialogue with the industry, and is optimistic that new technologies such as 5G can be introduced without conflict with the net neutrality rules.

### ***Information about the internet access service***

Again this year, Nkom reviewed the internet service providers' information to end-users about the internet access service, such as concerning traffic management and internet access service speed. The results show that the providers give this information, but with varying availability, clarity and levels of detail. Concerning mobile internet access services, sufficient information is given concerning speed, in accordance with the requirements in the Regulation.

Concerning fixed internet access services, the Regulation also requires providers to give information about the *normally available speed*. Little information is given about this speed on the providers' websites. Information about normally available speeds was emphasised as particularly important in the letter Nkom sent to internet service providers in January 2019.

Nkom will now assess further steps to ensure that end-users receive sufficient information about traffic management and normally available speed.

### ***Quality of the internet access service***

The Regulation describes how regulators must inspect the *general quality of internet access services*, in order to ensure that this is not negatively affected by any specialised services that are offered. Among other things, Nkom has used the measurement results from Nettfort to make an overall assessment of this.

For fixed internet access services, the measurement results from Nettfart.no for the past year, show that the average speeds for both download and upload are increasing, as well as demonstrating a good correlation between advertised speed and measured speed.

A positive development in speed has also been recorded for mobile internet access services. However, Nkom observes that Norwegian internet users have the lowest consumption of mobile data in the Nordic countries, which results in lower traffic loads than would have been the case if Norway used mobile data to the same extent as our neighbouring countries.

### ***Main conclusion***

In general, the state of net neutrality in the Norwegian market seems to be relatively good. Nkom will, however, assess which measures must be taken to ensure that end-users get the information about their internet access services to which they are entitled.

Nkom will continue to monitor the development of zero-rating in the Norwegian market, and will in particular follow up on whether the offer of large and unlimited data caps in the market has the assumed dampening effect on the scale of zero-rating in Norway.