Nasjonal kommunikasjons-myndighet

Internet in Norway – Annual Report 2025

June 2025

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1 Status of the internet in Norway

1.1 Introduction and background

The Internet constitutes a fundamental infrastructure in Norwegian society that provides great opportunities for innovation and growth in many areas of society. Internet access has gradually become the most widely used electronic communications service in Norway and has now become almost indispensable.

The first part of this report describes the status of the internet in Norway, based on an assignment given by the Ministry to Nkom through Report to the Storting No 28 (2020-2021): *Our common digital foundation – Mobile, broadband and internet services*.

The internet serves as an open platform for communication and content distribution. Both consumers, business customers and content providers connect to the platform via their respective internet providers, and based on this, consumers and content providers can communicate freely over the internet.

The second part of this report describes the state of net neutrality in Norway. Net neutrality is the principle that internet traffic should be treated equally, regardless of the sender, recipient, equipment, application, service or content. Annual reporting on net neutrality is a statutory task for Nkom based on the Open Internet Regulation[1].

[1] Regulation (EU) 2015/2120: https://eurlex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02015R2120-20181220

1.2 Internet Access Service Penetration

At the end of 2024, 99.1% and 96.2% of all households were offered internet access with at least 100 Mbit/s and 1000 Mbit/s, respectively, in download speed. At the same time, the basic coverage for 4G and 5G was estimated at 100% and 99.7%, respectively, of households in Norway.

The penetration of the Internet access service largely corresponds to the penetration of broadband. Nkom's coverage survey for 2024 shows that 99.9% and 96.2% of all households were offered broadband with at least 100 Mbit/s and at least 1000 Mbit/s download speed[2], respectively. This is mainly based on fibre or hybrid networks[3], but fixed wireless access also contributes to the coverage figures.

In Norway, 96% of households are offered alternative connections, and the alternatives include fixed wireless access in addition to fibre and HFC. There are geographical differences, but seen as a whole, most Norwegian households have good opportunities to connect to the internet.

The development of the 5G network started in 2020. Nkom's coverage survey at the end of 2024 shows that the basic coverage for 5G (household coverage) for all mobile operators is estimated at 99.7%. At the same time the previous year it was estimated at about 95.3%. Most counties have a coverage of more than 95%, and for most counties the coverage is closer to 100%. [4]

The Nkom Electronic Communications Statistics for 2024[5] show that Telenor, Altibox[6], Telia, GlobalConnect and NextGenTel combined had an estimated 88% of the market for fixed internet access service, with the consumer and business segments combined. In the market for mobile internet access, the concentration is even higher. In total, Telenor, Telia and Ice have about 91% of mobile customers, unchanged from 2023.

Towards the end of 2022, internet access via low-orbit satellites (LEO) from Starlink became available throughout Norway [7]. It is also expected that other players will offer internet access via LEO satellite in the coming years, e.g. Eutelsat-Oneweb. In the field of standardization, work is being done to equip such constellations with ordinary mobile technology so that the phones can connect to these as "ordinary" base stations.

1.3 Development of internet traffic in mobile networks in Norway and of interconnection

In 2024, internet traffic in the mobile networks totalled 1119 Petabytes (PB), an increase of 23% from 2023.

[2] https://nkom.no/statistikk/nokkeltall-og-interaktive-dashbord/bredbandsdekning

[3] Hybrid fibre, which is also called HFC (Hybrid Fibre-Coaxial), refers to the way fibre and coaxial cables are used in combination within a cable network.

[4] https://nkom.no/statistikk/nokkeltall-og-interaktive-dashbord/mobildekning/_/attachment/inline/766457cb-8054-4fb5-972f-43fa501f7444:77c347d65977df41ed5050538f04f7ed5659cbe8/2024%205%20Tilgang%20til%20mobildata%20i%20Norge.pdf

[5] https://nkom.no/statistikk/rapporter-og-analyser

[6] Altibox refers here to the Altibox partnership, which includes Lyse and some thirty other regional fibre providers.

[7] https://www.starlink.com/map

In January 2025, the maximum level of incoming internet interconnection ("peak throughput") to the largest fixed network operators and the largest mobile operators during peak hour was in the range between 0.5 Tbit/s and 3 Tbit/s.

The distribution of internet traffic between different applications is relatively similar in the mobile networks and fixed networks, except for streaming services, which are much larger in fixed networks.

Internet traffic in mobile networks

Traffic development is affected by technological developments and the accompanying increase in network capacity, as well as growth in the number of customers and increased data allowances.

Figure 1 shows the development in internet traffic by ordinary mobile subscriptions, dedicated internet subscriptions[8] and roaming abroad. It is ordinary mobile subscriptions that create most of the internet traffic in the mobile networks (over 80%). In 2024, internet traffic in the mobile networks totalled 1119 Petabytes (PB)[9], an increase of 23% from 2023. The volume of internet traffic via the mobile network in 2024 is approximately twice as large as it was in 2020.

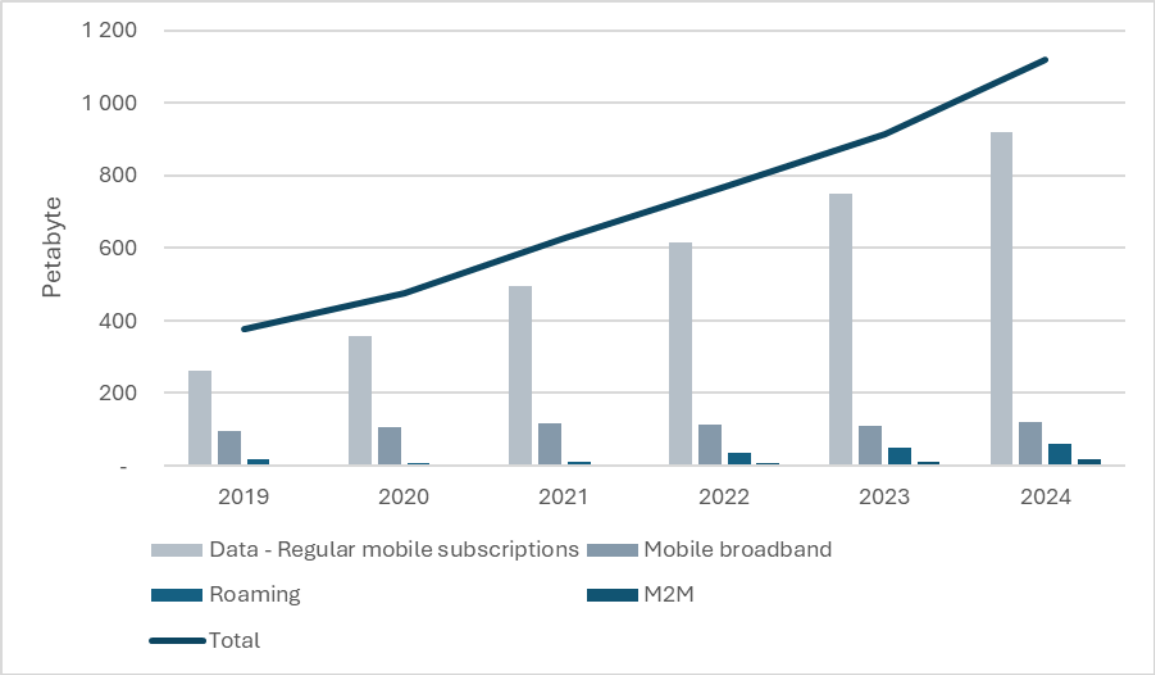


Figure 1 - Internet traffic for different categories of mobile subscriptions (source: Nkom Electronic Communications Statistics)

Internet traffic for roaming abroad in 2024 is 61 Petabytes (PB), this represents an increase of 24% compared to the previous year.

[8] Dedicated internet subscriptions include products that offer a dedicated data service using their own SIM card. The user gets a pure data connection between the terminal and the mobile network, and via this access to the Internet.

[9] Petabyte (PB) is 1000 Terabytes or 1,000,000 Gigabytes.

1.4 Penetration of IPv6 capable accesses and IPv6 traffic share

Over the past year, IPv6 access penetration in Norway has decreased by 6.6 percentage points, to 31.9% in April 2025[10]. Among the Nordic countries, Norway is still in second place when it comes to IPv6 use, behind Finland and ahead of Sweden, Iceland and Denmark. At the European level, Norway has dropped to 15th place, from 10th place last year.

Over the past year, Norwegian Internet service providers have significantly increased the activation of IPv6 for their subscribers. The actual use of IPv6 does not seem to follow the same trend. Nkom is following the development further and emphasizes the importance of the players in the Norwegian market facilitating the use of IPv6 to the greatest extent possible.

Based on the reported activation rate of accesses for IPv6 by the providers compared to the share of IPv6 traffic, Nkom believes that there is still a need to follow up on the replacement of end-user equipment that does not have - and cannot be remotely upgraded to - IPv6. Based on the positive development, Nkom believes that annual reporting will still be sufficient in the future.

About the transition from IPv4 to IPv6

IP (Internet Protocol) is the basic protocol used to transmit traffic on the internet. The IP protocol comes in two versions, IPv4 and IPv6. Public IP addresses are globally unique identifiers for computers that connect to the internet.

There is a need to increase the use of IPv6 on the internet. The reason is a lack of available IPv4 addresses. The complexity of today's internet means that the transition from IPv4 to IPv6 must be done gradually, starting with a period of coexistence with IPv4.

IPv6 access penetration in Norway and compared with other countries

Figure 2 below shows the status of IPv6 access penetration in Norway compared to other countries. The data has been taken from the three main sources of publicly available information about IPv6 penetration (Google[11], Facebook[12] and Apnic[13])[14], and the data collection was carried out in April 2025.

Both Google and Facebook make measurements based on the distribution of traffic against their own services from different users, which can give a bias. Therefore, in 2025, a new statistical source, Cloudflare, has been introduced, which measures the traffic distribution between IPv4 and IPv6 at central measurement points in IP networks in most countries.

During the last year, IPv6 access penetration in Norway has decreased by 6.6 percentage points, to 31.9% in April 2025[14]. The figure below shows how Norway ranks among the Nordic countries when it comes to the use of IPv6. Norway is still in second place, behind Finland and ahead of Sweden, Iceland and Denmark. At the European level, Norway is in 15th place, down five places from last year.

[10] An adjustment in the basis for the calculation is assumed to be part of the reason for this, cf. below on the change from four to three data sources.

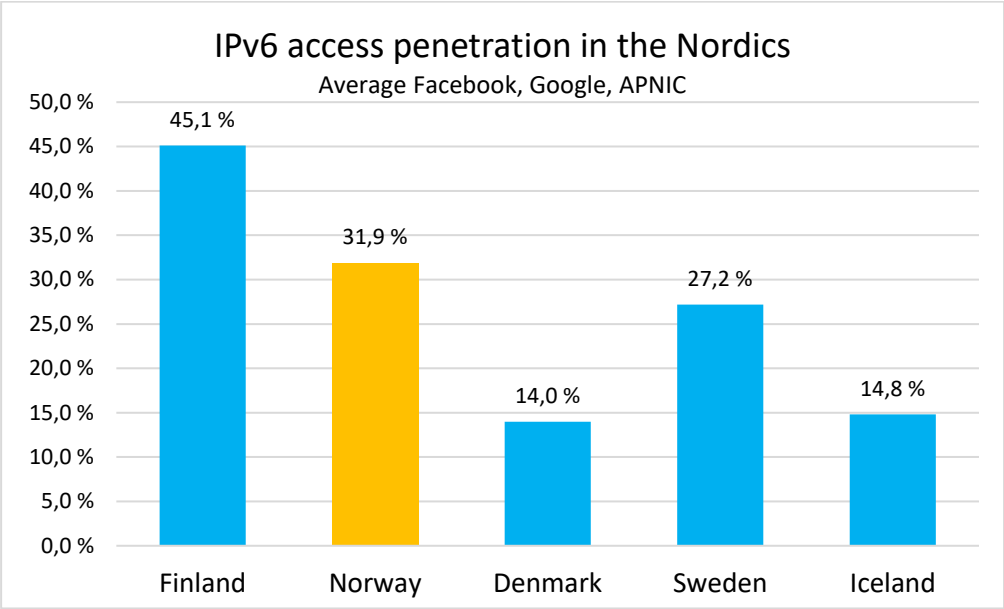
[11] Proportion of Google users who access the services over IPv6: Map-based presentation of data from Google, as well as tabulation of the same data basis

[12] https://www.facebook.com/ipv6/?tab=ipv6_country – downloaded 21.04.25

[13] https://stats.labs.apnic.net/ipv6

[14] Data from Akamai, which has previously been included in the foundation, no longer provides such data and has therefore been removed.

On the list of countries with the highest IPv6 access penetration worldwide[15], Norway moved down from 26th place to 44th place.



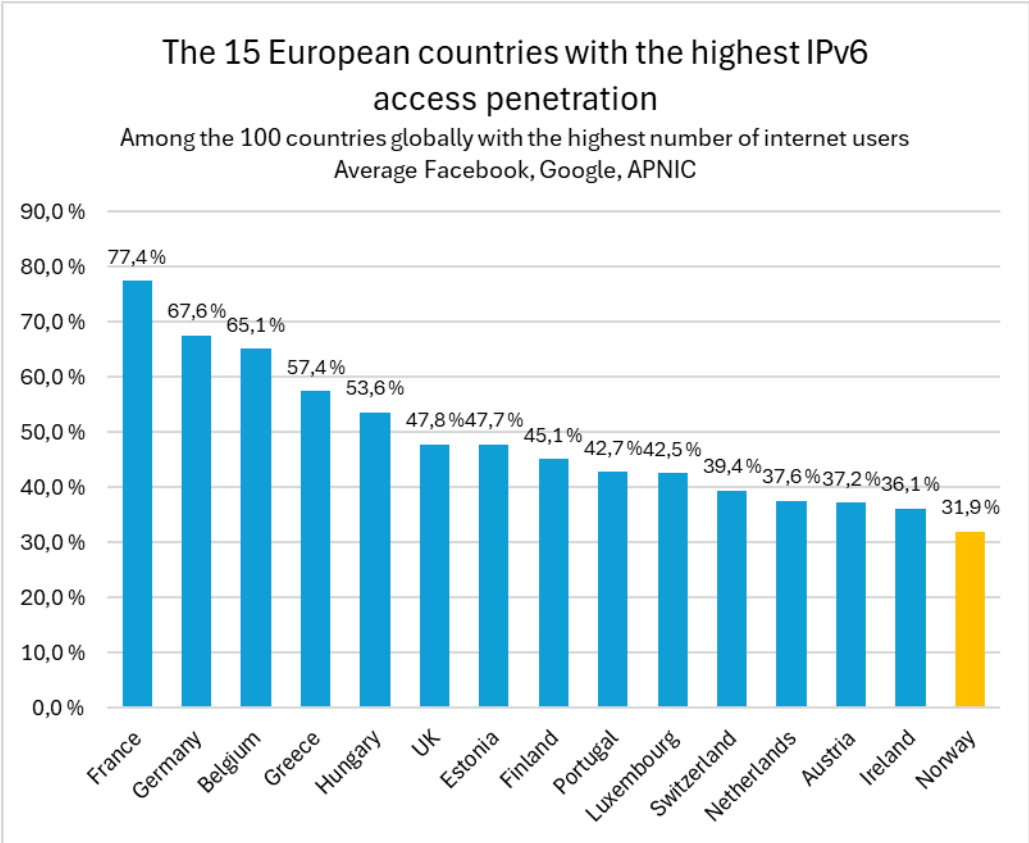


Figure 2 - IPv6 prevalence in Nordic countries and top 15 countries in Europe

[15] Only the 100 countries in the world with the largest number of internet access are included in this comparison.

Figure 3 and Figure 4 below show measurements from Cloudflare of the share of IPv6 traffic in metering nodes in central networks for the Nordic countries and for the 21 countries in Europe Navnene have the largest IPv6 share of traffic and which are also among the 100 countries in the world with the largest number of internet users[16].

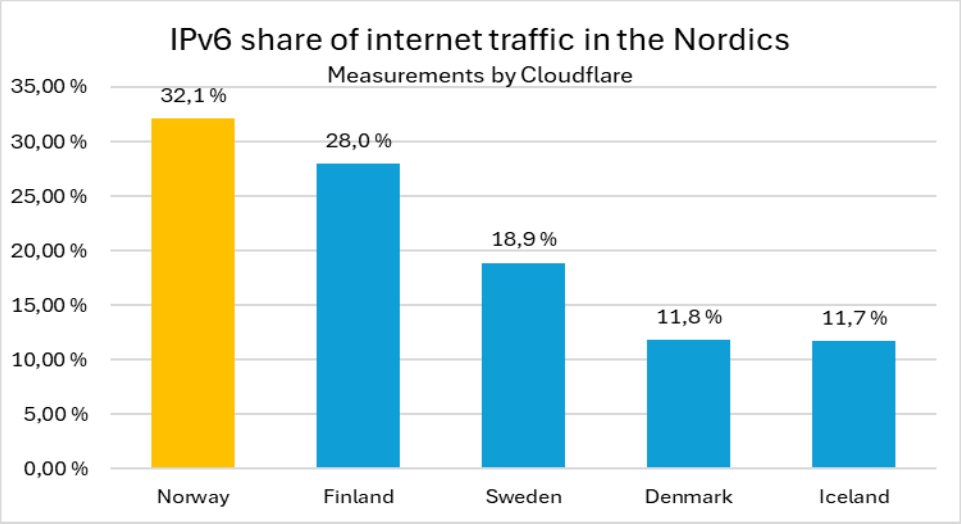


Figure 3 IPv6 share of Internet traffic in the Nordics

[16] https://radar.cloudflare.com/adoption-and-usage - Extraction as of 23.04.25

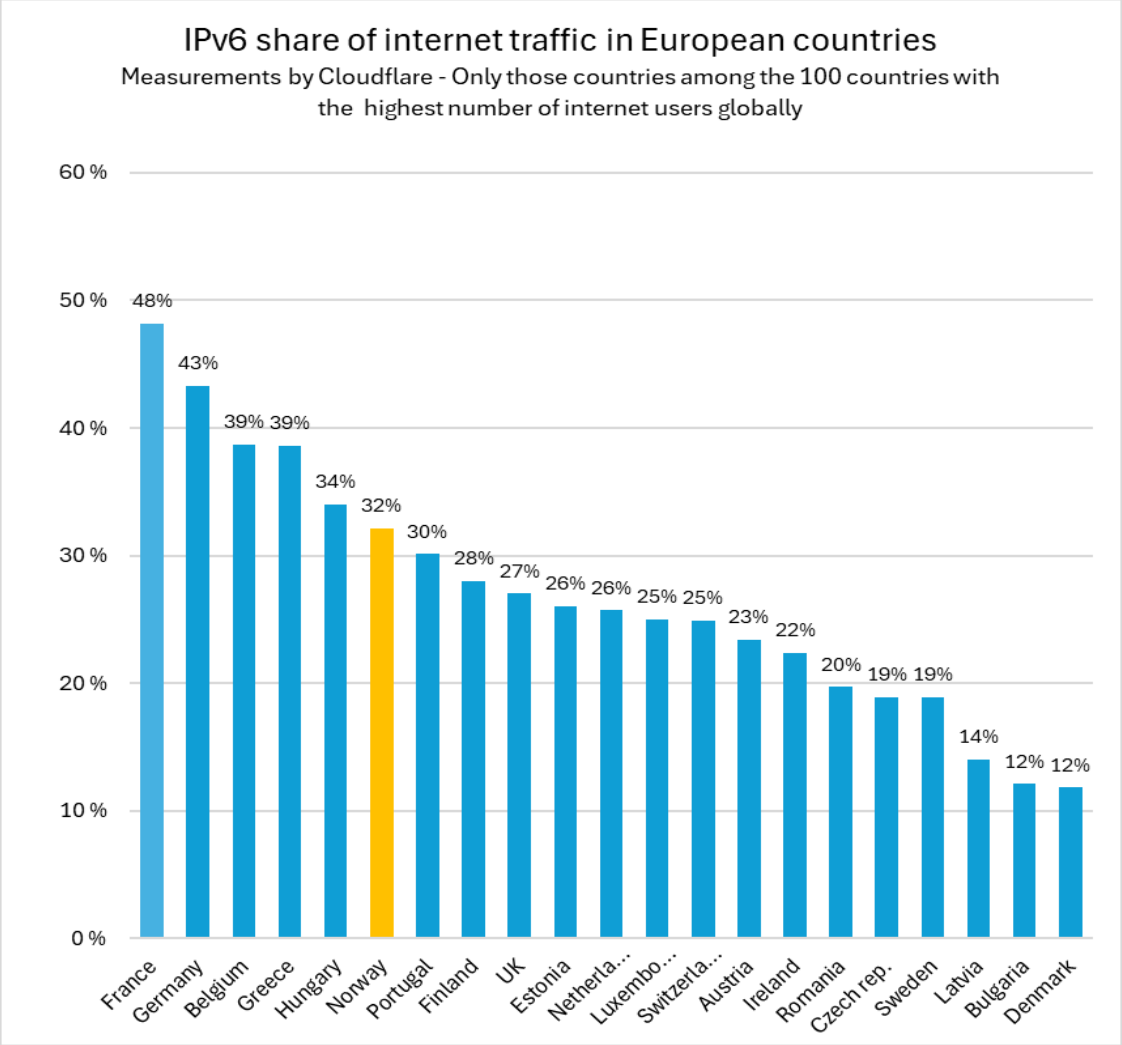


Figure 4 European countries with the highest share of IPv6 traffic among the 100 countries with the highest number of users

Figure 5 and Figure 6 below show the IPv6 access penetration in the largest fixed and mobile networks in Norway combined, respectively, based on information from the providers[17]. For the mobile networks, the proportion of IPv4 and IPv6 traffic in the networks is also shown.

Largest fixed network operations combined	30.04.23	31.08.23	31.12.23	30.04.24	31.08.24	31.12.24
Percentage of accesses activated for IPv6	54 %	56 %	63 %	76 %	75 %	78 %
Percentage of IPv6 compatible CPEs	85 %	88 %	86 %	90 %	96 %	97 %
Percentage of CPEs which will have to be replaced to support IPv6	15 %	12 %	14 %	10 %	4 %	3 %

Figure 5 - IPv6 access penetration and the proportion of IPv6 compatible CPE equipment with the largest fixed network operators

Largest mobile operations combined	30.04.23	31.08.23	31.12.23	30.04.24	31.08.24	31.12.24
Percentage of subscriptions which are IPv6 ready	80 %	80 %	85 %	91 %	91 %	91 %
Percentage of internet traffic volume - IPv6	39 %	40 %	42 %	46 %	47 %	40 %
Percentage of internet traffic volume - IPv4	61 %	60 %	58 %	54 %	53 %	60 %

Figure 6 – Percentage of subscriptions which are IPv6 ready and the share of IPv4/IPv6 of traffic volume with the largest mobile operators

Regulatory follow-up

In April 2023, Nkom held dialogue meetings on IPv6 with the largest internet providers in the Norwegian market to stimulate the transition from IPv4 to IPv6. Nkom presented the following objective for the escalation plan for IPv6 over the next 2-3 years, and the Norwegian Internet Service Providers (ISPs) expressed that they are in line with the proposal in many ways:[18]

1. *By 30 April 2024, Norwegian ISPs will activate IPv6 for all their internet subscribers, possibly with the exception of subscriptions that require physical replacement of home routers.*
2. *By 30 April 2025, Norwegian ISPs will have activated IPv6 for all their internet subscribers, and replaced any home routers that could not be upgraded via software.*
3. *However, home routers based on DSL technology connected to the copper network do not need to be replaced until the decommissioning of the copper network has been completed.*

Nkom will follow the development of IPv6 use in the Norwegian market closely during the transition period.

- *Nkom will publish tertiary statistics on the active availability of IPv6 by Norwegian ISPs, as well as statistics on the use of IPv6 in the Norwegian market that are available from external sources.*
- *Based on the stepwise development (by the end of 2025), Nkom will assess whether there is a need to introduce additional measures to increase the access penetration of IPv6 among Norwegian ISPs.*

Every four months, the ISPs send Nkom statistics on IPv6 activation in their networks. The development for the providers as a whole shows that the development is going in the right direction.

[17] The figures were obtained from fixed network providers and mobile network operators in April 2025

[18] Cf. Internet in Norway – Annual Report 2023, p.21

Nkom has been made aware that at least one of the providers that has had limited IPv6 activation could facilitate a higher activation rate but has had limited demand and has hence chosen to implement it only to a limited extent.

Based on the IPv6 access penetration reported by the providers compared to the share of IPv6 traffic, Nkom believes that there is still a need to follow up on the replacement of end-user equipment that does not have - and cannot be remotely upgraded to - IPv6. However, based on the positive development, Nkom believes that annual reporting will be sufficient going forward.

Nkom encourages Norwegian ISPs to intensify their efforts to increase the use of IPv6 for the internet access services offered. This effort comes in parallel with the trend by equipment providers and software providers to introduce IPv6 in end-user equipment.

2 Status of net neutrality in Norway

The state of net neutrality in the Norwegian market remains generally good. The work on this year's report has not revealed any major changes or deviations compared with last year's assessment.

2.1 Introduction and background

Net neutrality is the principle that all internet traffic should be treated equally, regardless of sender, recipient, equipment, application, service or content. A pan-European regulatory framework on net neutrality was introduced in 2015 and adopted into Norwegian law in 2017. The main purpose of the regulations is "*to establish common rules that ensure equal and non-discriminatory handling of traffic for internet access services, as well as associated end-user rights. Its purpose is to protect end-users while guaranteeing that the internet ecosystem continues to function as an engine for innovation.*" [19]

Regulatory follow-up is also based on BEREC's guidelines on net neutrality, formulated pursuant to Article 5 (3) of Regulation 2015/2120. According to paragraph 19 of the preamble, regulators must take utmost account of BEREC's guidelines when applying the Regulation.

This report covers the period 1 May 2024 to 30 April 2025.

2.2 Access to an open internet

Nkom's follow-up of Norwegian internet service providers shows that Norwegian internet users benefit from open access to the internet via their subscriptions in fixed and mobile networks. The Internet providers' reporting indicates that the traffic management used is in line with the Net Neutrality Regulation.

2.2.1 The right to open internet access

End users have the right to open internet access where they can decide for themselves what the access is used for, both what content is retrieved or delivered, and which applications are used or offered, based on Article 3(1) of the Regulation. The internet provider must transmit traffic in the network in a non-discriminatory manner, but could do certain forms of traffic management, such as blocking traffic for security reasons.

The Internet provider also could offer specialised services, such as IP telephony and IPTV, in parallel with Internet access if these have quality requirements that cannot be offered over the Internet. Furthermore, specialised services can only be provided if the network capacity is sufficient to ensure that it does not compromise the availability and overall quality of internet access services for end-users (see Chapter 2.4).

[19] Regulation 2015/2120, first paragraph of the preamble

2.2.2 Internet access traffic management

As part of the data collection for the annual electronic communications statistics, Nkom has collected information on traffic management of internet access from Norwegian internet service providers. This year's results show no significant difference from last year's results.

According to the information obtained, typical traffic management measures are blocking domain names in DNS by court order, Kripos Child Abuse Filter and blocking TCP/UDP ports by specific security measures (e.g. to prevent DDoS and other forms of computer attacks).

In the Norwegian market, mobile internet access differentiated by speed is offered. BEREC describes in its guidelines that such subscriptions are in line with the regulation if the subscriptions are application-agnostic, i.e. all applications are treated with equal traffic management.

2.2.3 Specialised services

Nkom has also collected information on specialised services, i.e. other services offered in parallel with the internet access service that meet specific criteria in the Regulation. The most typical specialised service in fixed networks is IP telephony. Similarly, VoLTE is commonly offered as a specialized service in mobile networks.

Nkom also asked questions about how the providers ensure that the capacity of the network is sufficient to ensure that the specialised services do not affect the general quality of internet access to the end users. The general answer to this is that the traffic on the connections in the network is continuously monitored and that capacity is expanded when needed.

Nkom has not carried out further investigations of reported traffic management measures and specialised services but assumes that these are offered in accordance with the Regulation. In the future, Nkom will be able to initiate more detailed investigations.

2.3 Information about the Internet access service

Nkom's review of the Internet providers' websites shows that the providers generally provide satisfactory information about traffic management measures. However, on some websites, it can be challenging to find the relevant information, especially when it comes to different speed parameters for fixed internet access.

2.3.1 Information requirements

Article 4 of the Regulation stipulates requirements for information about the Internet access service that providers must make available to their end users. Article 4 (1) sets out requirements for openness and transparency in the agreements between the provider and the end user, while Article 4 (2) regulates the provider's obligation to have transparent, simple and efficient complaint handling procedures.

Nkom has conducted a review of the relevant providers' websites and assessed compliance with Article 4 of the Regulation. In the following, some comments are attached to the review.

2.3.2 Traffic management information

Providers of internet access services are obliged to provide information about which traffic management measures are used.

Relevant traffic management measures are described in section 2.2.2. According to the regulation, the providers must inform about the measures in the contract terms and conditions and make these publicly available, typically on the provider's website. Although the providers can document that the information is made public, it is also relevant to assess the content and quality of the information.

Nkom's review shows that the providers have a varying but generally satisfactory presentation of traffic management measures. It can be challenging to find the relevant information on some websites. Some providers have dedicated pages about net neutrality, where traffic management is one of several topics. Other providers give more direct information about traffic management in their terms and conditions and on their websites. Dedicated thematic pages provide end-users with more comprehensive information about net neutrality, but both solutions discussed in this section are, in Nkom's opinion, in accordance with the regulations.

2.3.3 Speed Information

Fixed internet access

It follows from Article 4 (1) (d) of the Regulation that the end user shall be informed of the speed that the provider is realistically able to deliver.

Providers of fixed internet access must provide information on the following parameters for speed, both download and upload:

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

"Normally Available Speed" means the speed that an end user can expect to achieve most of the time using the service. It is probably this measurement parameter that provides the end user with the most relevant information about the performance of the internet access service. Regarding the Regulation's requirements for openness and transparency, BEREC considers certain types of fixed wireless access (FWA) to be fixed internet access. This includes, for example, cases where wireless technology (including mobile networks) is used for internet access in a fixed location with dedicated equipment and either uses capacity reservation or dedicated frequency bands. In such cases, requirements for the availability of information in contracts and on the provider's website should be in accordance with the requirements that apply to fixed internet access.

For fixed internet access, Nkom sees that the providers to a varying degree provide information about the various speed parameters required by the regulation. On some providers' websites, it looks like there is a lack of information about the various speed parameters.

Mobile Internet Access

In mobile networks, the available speed in a given cell is normally difficult to predict due to the varying number of active users. For this reason, only providers of fixed internet access are required to provide this speed parameter.

However, the regulation requires mobile internet access providers to specify the following speed measurement parameters:

- Estimated maximum speed
- Advertised speed

Mobile internet access services include both regular mobile subscriptions and dedicated internet subscriptions as both are services that provide access to the internet. Regular mobile subscriptions

support both internet access and telephony/SMS, while dedicated internet subscriptions only support access to the internet. The former is often used via mobile phone, while the latter is often used via router.

When it comes to dedicated internet subscriptions in the mobile network, a distinction is often made between "fixed wireless internet access" that is offered in a fixed geographical location, often with a fixed outdoor antenna, and "dedicated mobile internet access" that can be used freely in different geographical locations within the coverage area. These differences may give rise to different conditions for achieving the speed of internet access in the subscriptions.

For mobile internet access, Nkom considers that the providers generally provide information about the various speed parameters required by the regulation.

Conclusion

Nkom's review shows that the providers present the information about the Internet access service to a varying degree. On some websites, it can be challenging to find the relevant information, and in some cases, it looks like there is a lack of information. End users should therefore be aware of what information they are looking for or contact their provider to get specific guidance on where the information is available. Nkom will take a closer look at how the providers give information about the speed of the internet access service and assess whether there is a need for regulatory follow-up.

2.4 Quality of the internet access service

Results from the measurement service Nettfart show that the speed of fixed internet access continues the good trend from the previous reporting period. The average download and upload speeds for fixed internet access in 2025 are 167 Mbit/s and 147 Mbit/s, respectively.

Based on data from Nettfart, we observe that the average download speed, upload speed and latency for the 5G networks in Norway in 2025 were 222 Mbit/s, 40 Mbit/s and 36 milliseconds (ms), respectively.

2.4.1 Requirements for the quality of the internet access service

Article 5 of the Regulation states that NRAs have monitoring and reporting obligations to ensure that providers of internet access services meet their obligations regarding open internet access. Furthermore, the regulator shall promote non-discriminatory internet access with a quality level that reflects technological developments.

Paragraph 17 of the preamble emphasises the importance of ensuring that specialised services and their use do not lead to a reduction in the general quality of the customer's access to the internet. For access to the Internet via mobile networks, the requirements are relaxed somewhat as a result of the special conditions related to varying numbers of active users per cell as well as coverage that is not homogeneous. But over time, one expects the overall quality of internet access to be maintained here as well.

2.4.2 Regulatory follow-up

A regulatory measure for the follow-up of Article 5(1) of the Regulation is to follow the development of quality that end-users measure on their internet access. In this report, Nkom has assessed the results from Nkom's measurement service Nettfart, which can be used via a web browser and/or mobile

application. Nettfart is based on crowdsourcing in that it is the users themselves who actively make measurements and thus produce the data basis that Nkom analyses.

As with all forms of crowdsourcing, the representativeness of the statistical basis may be somewhat limited. However, the measurement results give an indication of how good performance the end users experience on their internet access. The data also shows that over time, information is collected from a very large proportion of the Norwegian providers.

2.4.3 Measurement results

Measurement results from nettfart.no

This section presents results from measurements made via the website nettfart.no. For fixed internet access, the development of average speed across different subscriptions is presented.

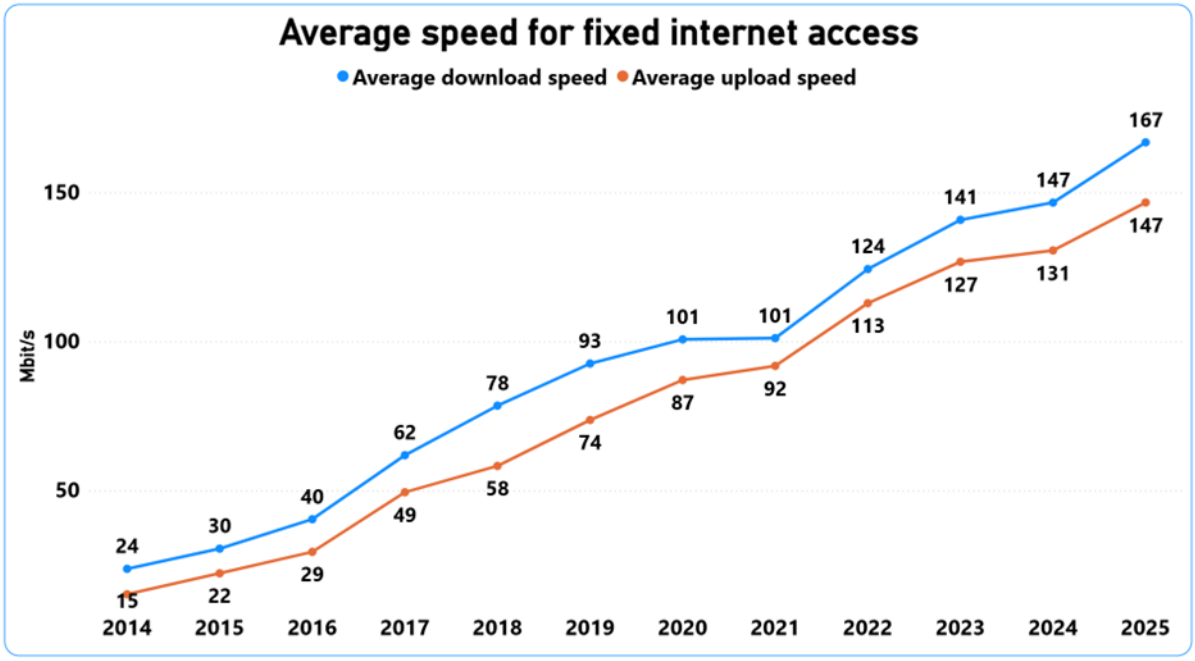


Figure 7 - Average speed for fixed internet access (source: nettfart.no)

Figure 7 shows that the average measured download speed across end-users' different subscriptions, so far in 2025, is almost 70% higher than the values for 2020 and 2021. The trend of annual growth of 10-20 Mbit/s per year seems to continue.

Measurement results from the Nettfart mobile app

Here we present results measured via the Nettfart mobile app, first average speed per technology (4G, 5G and WLAN), and finally key figures for measurements via 5G carried out by customers in the mobile networks in 2025.

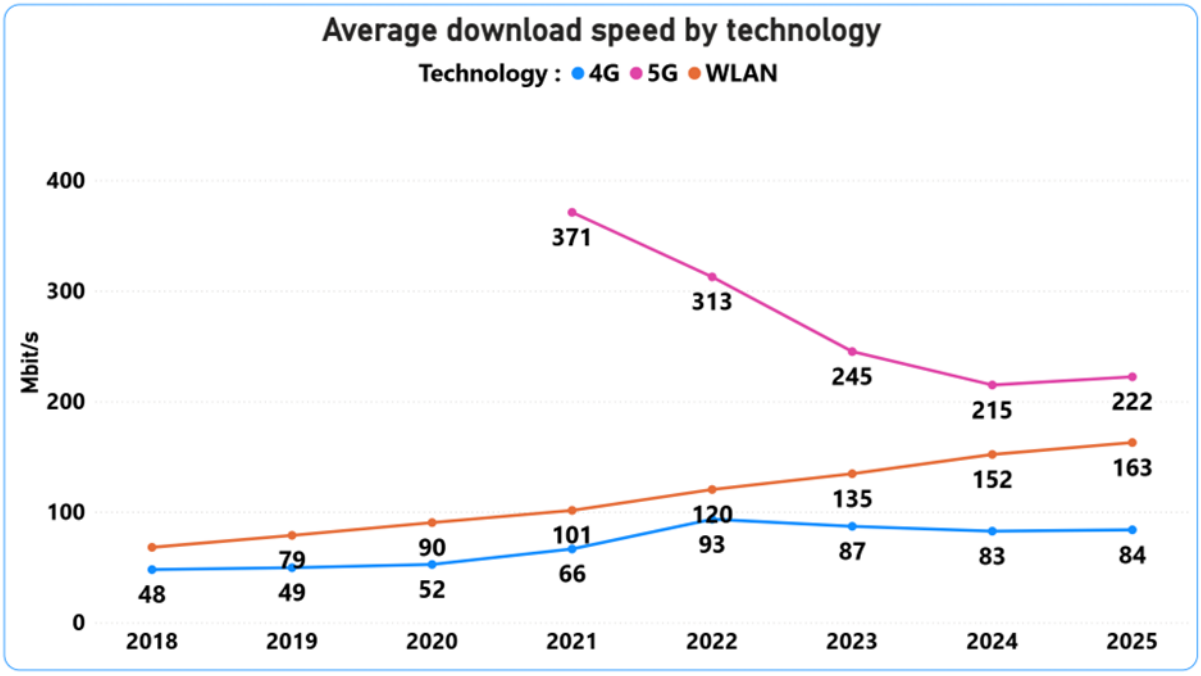


Figure 8 - Average download speed per technology (source: Nettfart mobile app)

Figure 8 Shows the average download speed, broken down by technology. The figure shows that users of the Nettfart mobile app achieve significantly higher download speeds when measuring via 5G, compared especially to measurements via 4G. But also measurements made via WLAN are on average quite a bit lower. For the 5G and 4G mobile technologies, the figure shows a general flattening trend for download speed.

Taken together, the average download speed for 4G and 5G in 2025 has increased slightly compared to 2024. We know that the total traffic volume in the mobile networks has increased over the past year, and so far it appears that the mobile operators are therefore building capacity to keep up with this development.

The average speed of WLAN is still steadily increasing, and in the course of a year it has increased by about 7%. For WLAN measurements, however, it is uncertain which transmission medium is used to and from the place where the measurement was made. It can be fibre, hybrid cable or fixed wireless broadband.

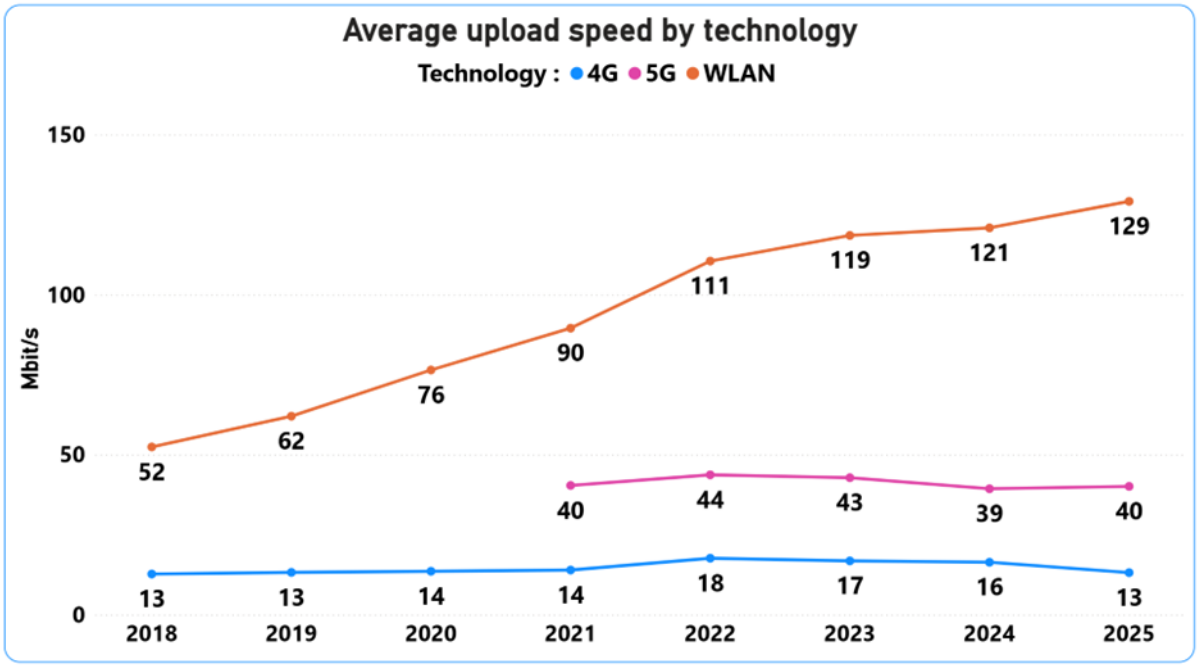


Figure 9 - Average upload speed per technology (source: Nettfart mobile app)

Figure 9 shows that mobile technologies (4G and 5G) have a lower upload speed than what is observed for measurements made via WLAN. One possible explanation is that WLAN is to a greater extent connected to access lines with symmetrical properties, as many fibre subscriptions offer.

The figure also shows that the average upload speed via the mobile networks is at a much lower level than is the case for download speeds (cf. Figure 8). The explanation is probably that the mobile networks reserve a larger part of the available frequency spectrum (and/or the timeslots in 5G) for downloading, as it is assumed that this is the dominant direction of traffic between the internet and the individual user.

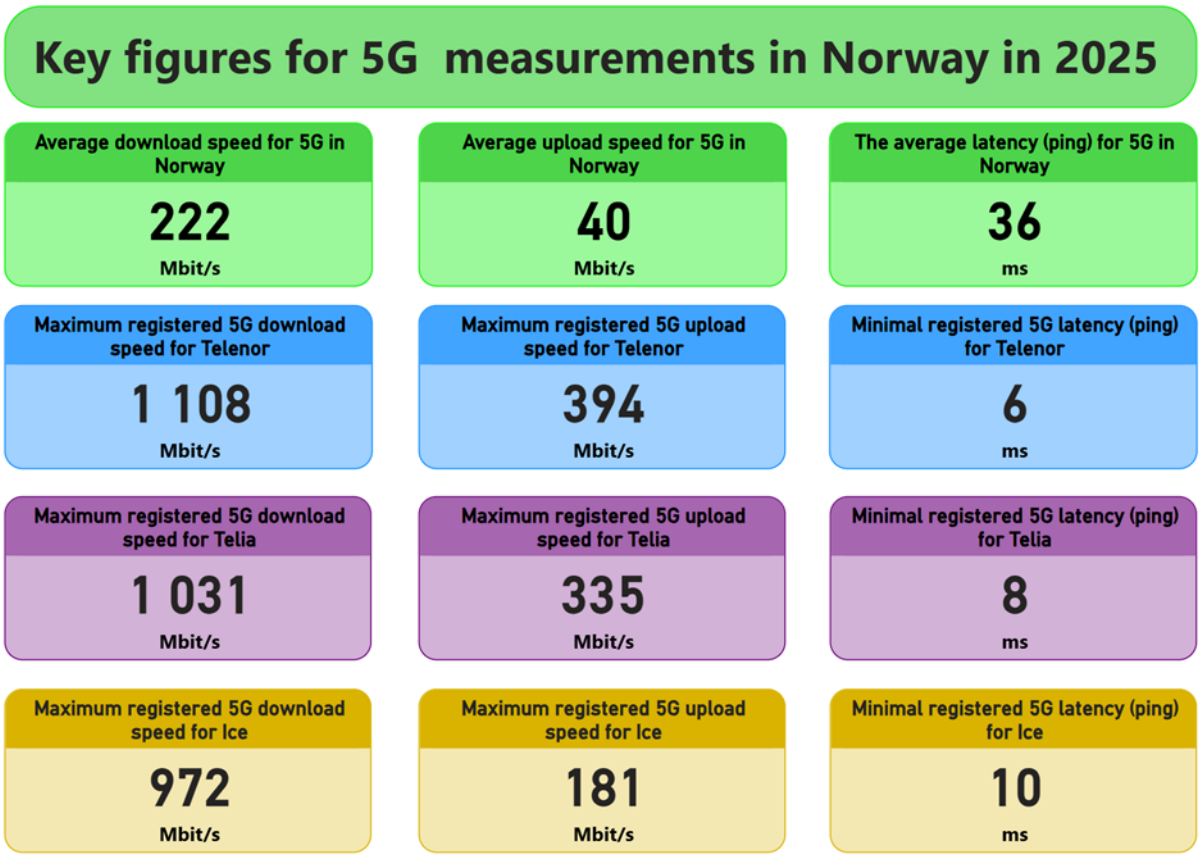


Figure 10 - Key figures for the 5G networks in Norway for 2025 (source: Nettfart mobile app)

Figure 10 shows selected key figures for 5G measurements in the mobile networks in 2025. The average download speed, upload speed and latency for the 5G networks in Norway in 2025 were 222 Mbit/s, 40 Mbit/s and 36 milliseconds (ms), respectively. The measurements, from the Nettfart mobile app, show that the 5G networks in Norway offer internet access with high speeds and low latency. It will also be interesting to see how a future activation of 5G Stand Alone for smartphones will affect the key figures.

2.4.4 Overall quality of the internet access service

Nkom has applied BEREC's method for evaluating the general quality of the internet access service to the measurements made in the mobile networks. The method uses a forecast function based on the average download, upload and delay from previous years and uses these to estimate expectations for the following year. Projected and measured values can then be compared to see if there are large discrepancies in the results.

The figures below show forecasts[20] for download and upload speed as well as latency for measurements made in the mobile networks in Norway, aggregated for all mobile operators. The blue line shows the measured values and the pink dotted line shows the forecast for 2024.

[20] Forecasts for 2024 are based on historical data from 2018-2023.

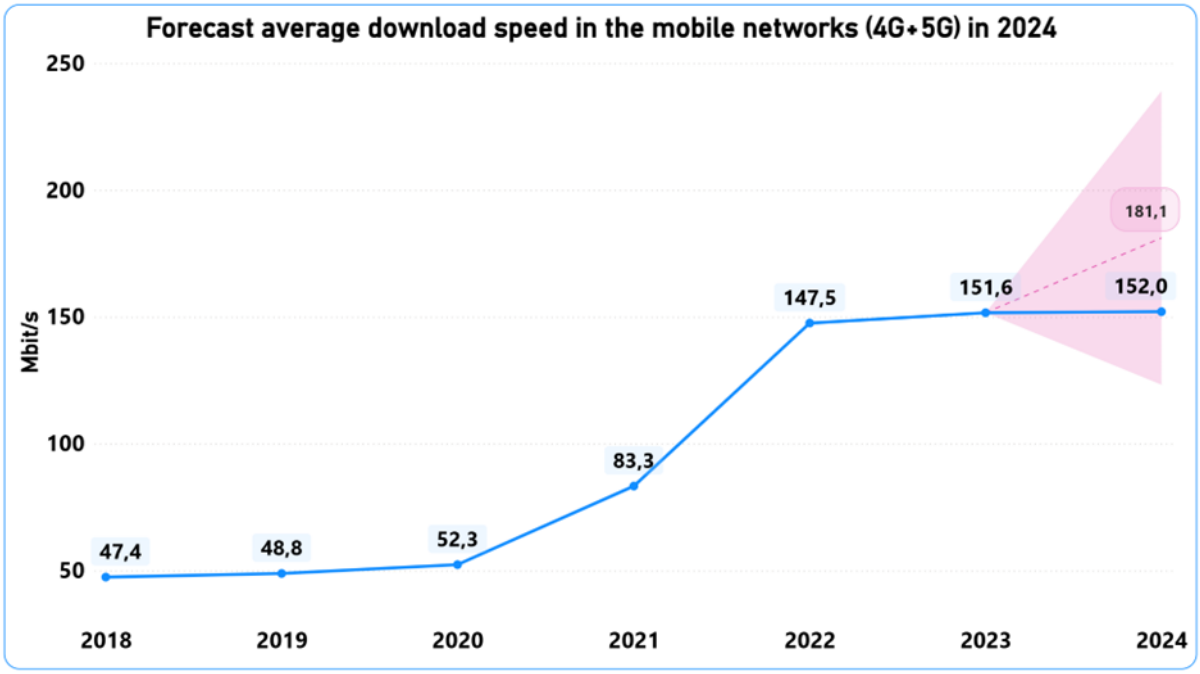


Figure 11 - Forecast for average download speed in mobile networks in 2024

Figure 11 shows the forecast for the average download speed for 2024 of 181 Mbit/s, while the measured average value was almost identical to the previous year, i.e. 152 Mbit/s. This shows that the development for download speed in the mobile networks has not met the mathematical expectation based on the values from previous years. Nevertheless, the discrepancy between measured and predicted value is at an acceptable level.

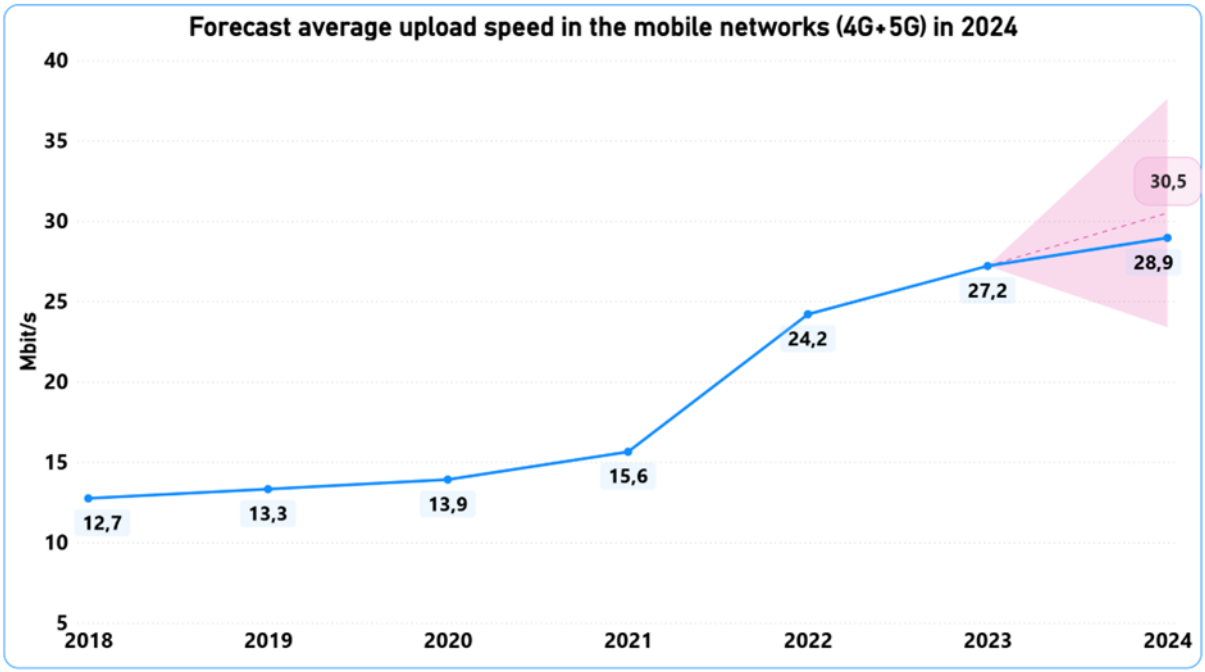


Figure 12 - Forecast for average mobile upload speeds in 2024

Figure 12 shows the forecast for the average upload speed for 2024 of about 31 Mbit/s, while the measured average value was about 29 Mbit/s. This shows that the development for upload speed in the mobile networks was very close to the forecast.

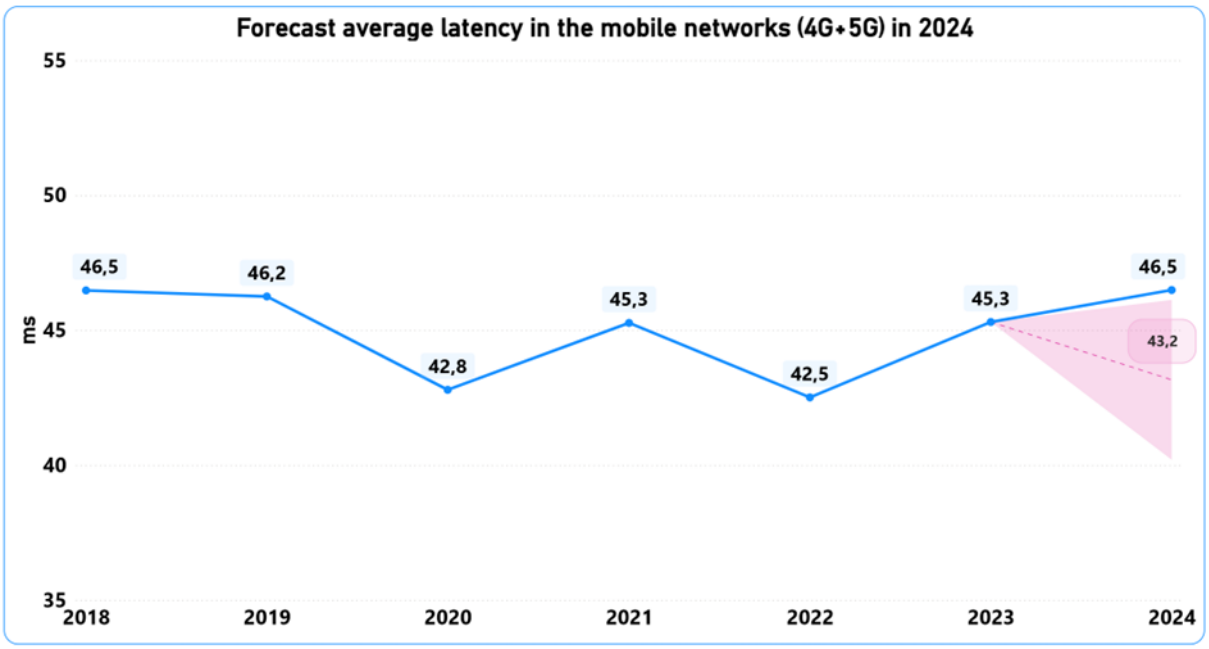


Figure 13 - Forecast for average latency in mobile networks in 2024

Figure 13 shows the forecast for the average latency combined for 4G and 5G in 2024 of 43 ms, and the measured average value was between 46 and 47 ms. This shows that the development for latency in the mobile networks has been somewhat worse than the forecast would indicate. However, we have analysed this more closely and looked at the values for 4G and 5G separately. As the next figures show, it is measurement results from 4G technology that largely influence the overall trend.

Figure 14 represents the values when the 4G measurements are considered separately:

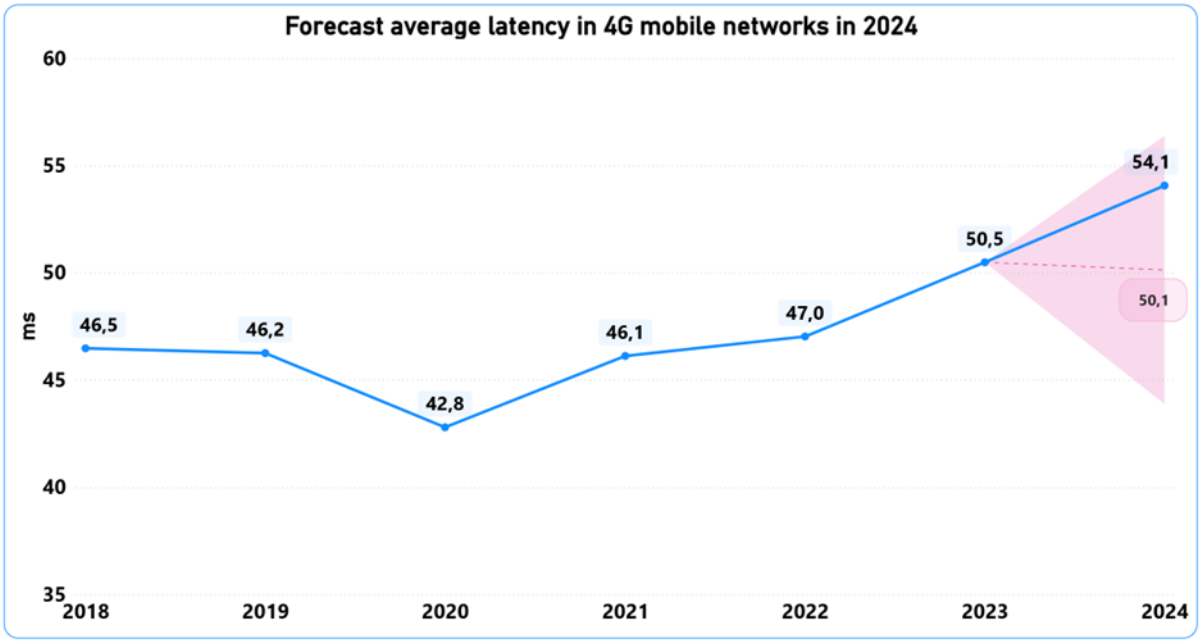


Figure 14 - Forecast for average delay in 4G for 2024

For 5G, the trend is different, and here the technology differences become clearer:

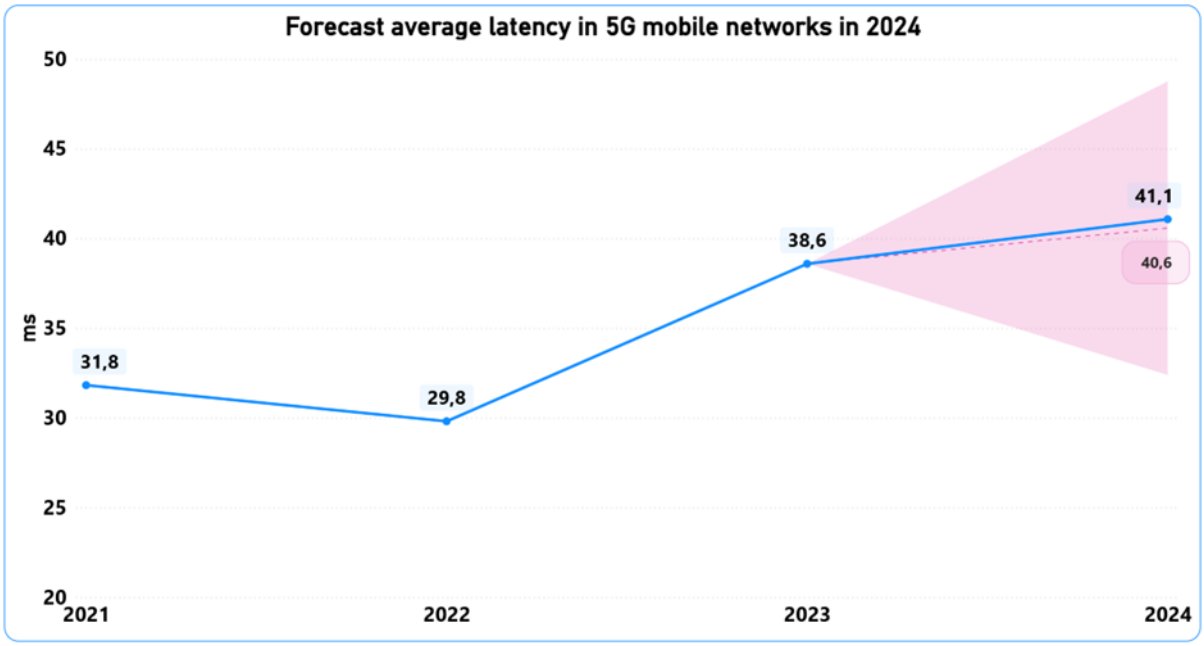


Figure 15 - Forecast for average delay in 5G for 2024

The measurement result as stated in the Figure 15 is here close to the mathematical expectation.

Conclusion

Nkom's analysis of the measurement results from Nettfart, both from the use of the website and the mobile app, reveals two trends: Firstly, measured speed in the fixed networks continues to increase, and secondly, the same trend is not reflected as strongly for measurements carried out in the mobile networks. Given the expected continued increase in data traffic, it will be important to monitor whether mobile network owners can respond to this by continuing to develop capacity in their networks. In the coming years, 5G SA will be used for ordinary smartphones and there are expectations of what this technology can contribute to when it comes to customers' experience of quality.