

IPv6 and net neutrality

Swedish IPv6 Forum, 28 November 2023
Lars Edvard Storjord and Frode Sørensen
Norwegian Communications Authority (Nkom)

Nkom internet-related portfolio – «*Internet programme*»

Security regulation

Security of internet-connected equipment

CRA

Security of networks and services

NIS2

EkomCERT/
cybersecurity

Markets and services

Internet-based services and platforms

DSA

Internet Ecosystem

DA

Open Internet

OIR

Horizontal Activities

Evolution of internet-related regulation

AIA

«Internet in Norway»
Annual Report

Internet governance

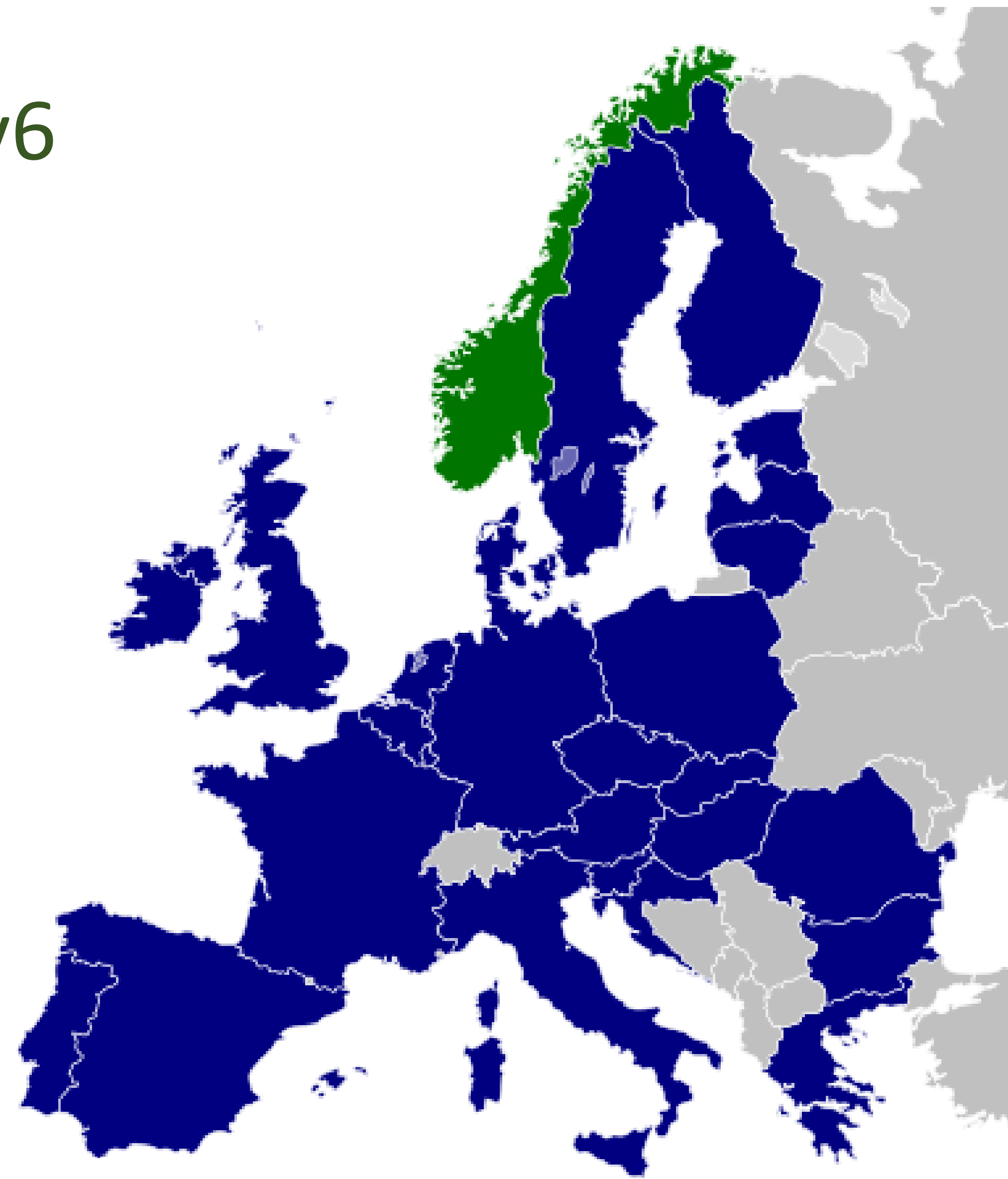
Background for Nkom activities on IPv6

Communication to the Norwegian parliament

Stortingsmelding 28 (2020-2021)

The government will...

- That Nkom, in collaboration with relevant market actors, should accelerate the work with the use of IPv6, so that Norway is at least on par with comparable countries.
- Work to promote freedom of information and continue to support the open and accessible internet.
- Continue the work to contribute to ensuring that the core functions of the Norwegian internet are secure and futureproof.
- Continue national dialogue within relevant areas related to the core functions of the internet.



Characteristics of the transition from IPv4 to IPv6

No more IPv4 addresses available

- Except for a few IPv4 addresses resold for very high prices
- RIPE NCC ran out of IPv4 addresses November 2019
- Some end-users must therefore share IPv4 addresses

The transition from IPv4 to IPv6

- The long-term solution is the replacement of IPv4 with IPv6
- Dual stack is a common transition technique
- Requires introduction both within network infrastructure and user equipment

The development during recent years

- Relatively slow progress due to lack of incentives
- The sum of measures over the previous years has led to some progress
- Carrier Grade NAT can cause «port collisions», public IPv4 addresses when requested

Net neutrality and the transition from IPv4 to IPv6

Open Internet Regulation – Article 2 – Definitions

- ‘Internet access service’ means a publicly available electronic communications service that provides access to the internet, and thereby **connectivity to virtually all end points of the internet**, irrespective of the network technology and terminal equipment used.

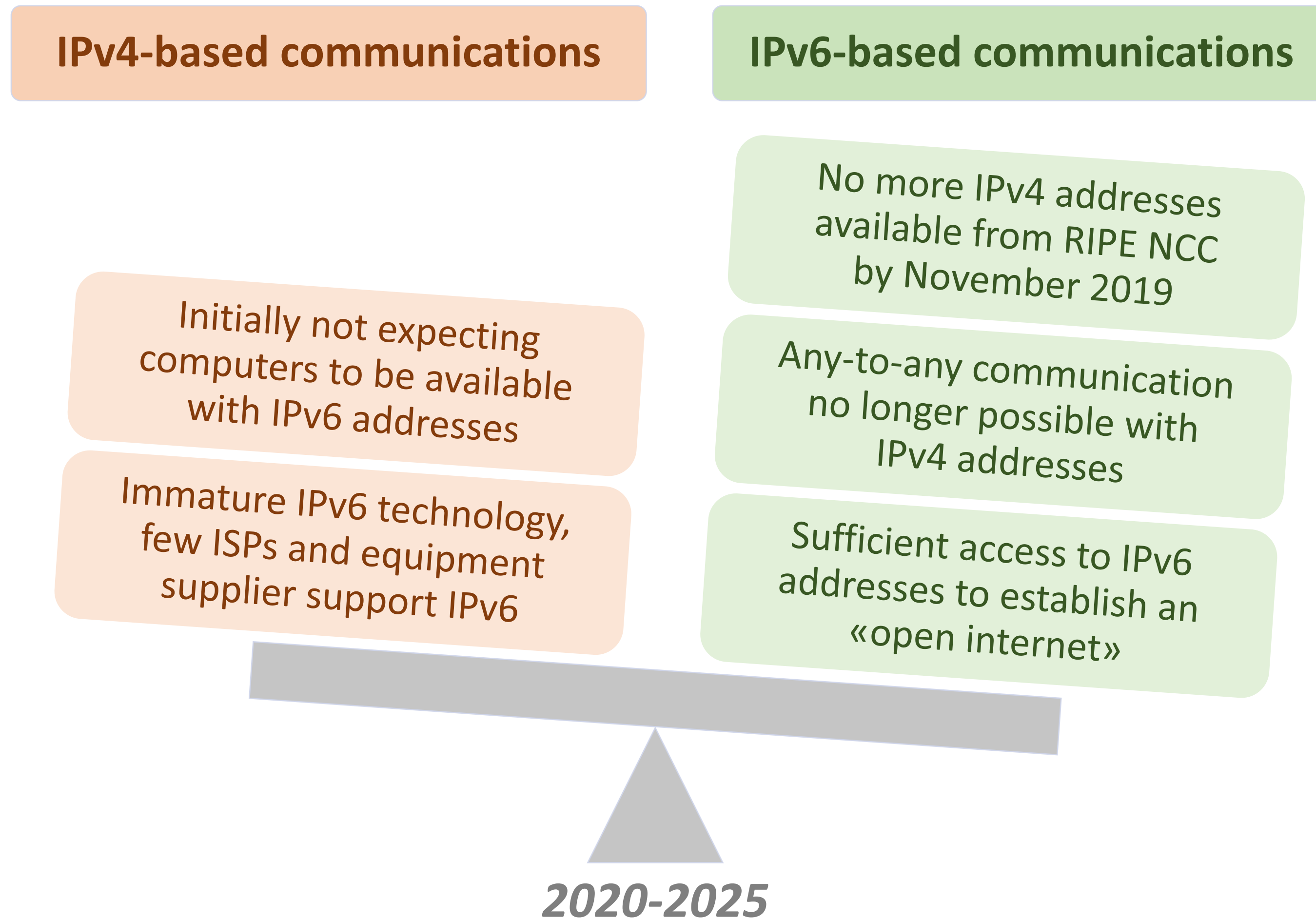
OIR – Article 3 – Safeguarding of open internet access

- End-users shall have the right to **access and distribute** information and content, **use and provide** applications and services, and use terminal equipment of their choice, irrespective of the end-user’s or provider’s location or the location, origin or destination of the information, content, application or service, via their internet access service.

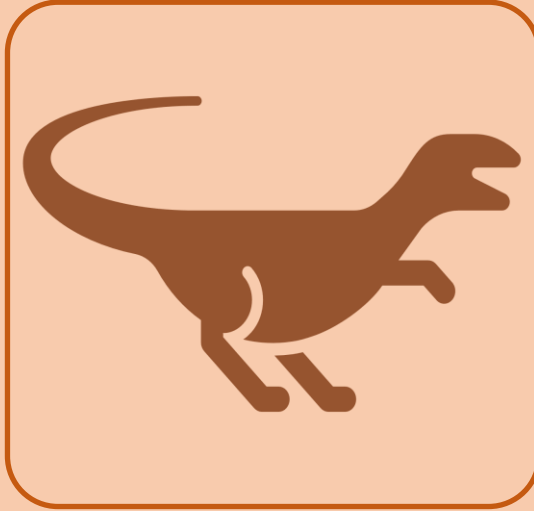
In summary ...

- This means that net neutrality requires that all endpoints on the internet must be able to communicate with each other, which **requires that the subscribers are offered their own public IP address**.

Have we arrived at the tipping point for IPv6?



Current status of the transition from IPv4 to IPv6



Assessment related to IPv4 in the current phase

- Partly solved by CGN, but servers need public IPv4 addresses
- Net neutrality presupposes free public IPv4 address on request
- Increasingly difficult for new players due to little access to IPv4 addresses



Has the development reached the tipping point?

- 20-25% of IPv6 in Norway / 32-40% average of IPv6 globally
- Common operating systems support IPv6, is it the turn of the ISPs?
- Any obstacles to using IPv6 are significantly reduced



Assessment related to IPv6 in the next phase

- The strategy of extending the lifetime of IPv4 may have been good
- Reinforced measures to increase the use of IPv6 is now the best approach
- Nkom proposes voluntary measures from the ISPs in Norway

Step by step evolution for IPv4 to IPv6 in Norway

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 routes.

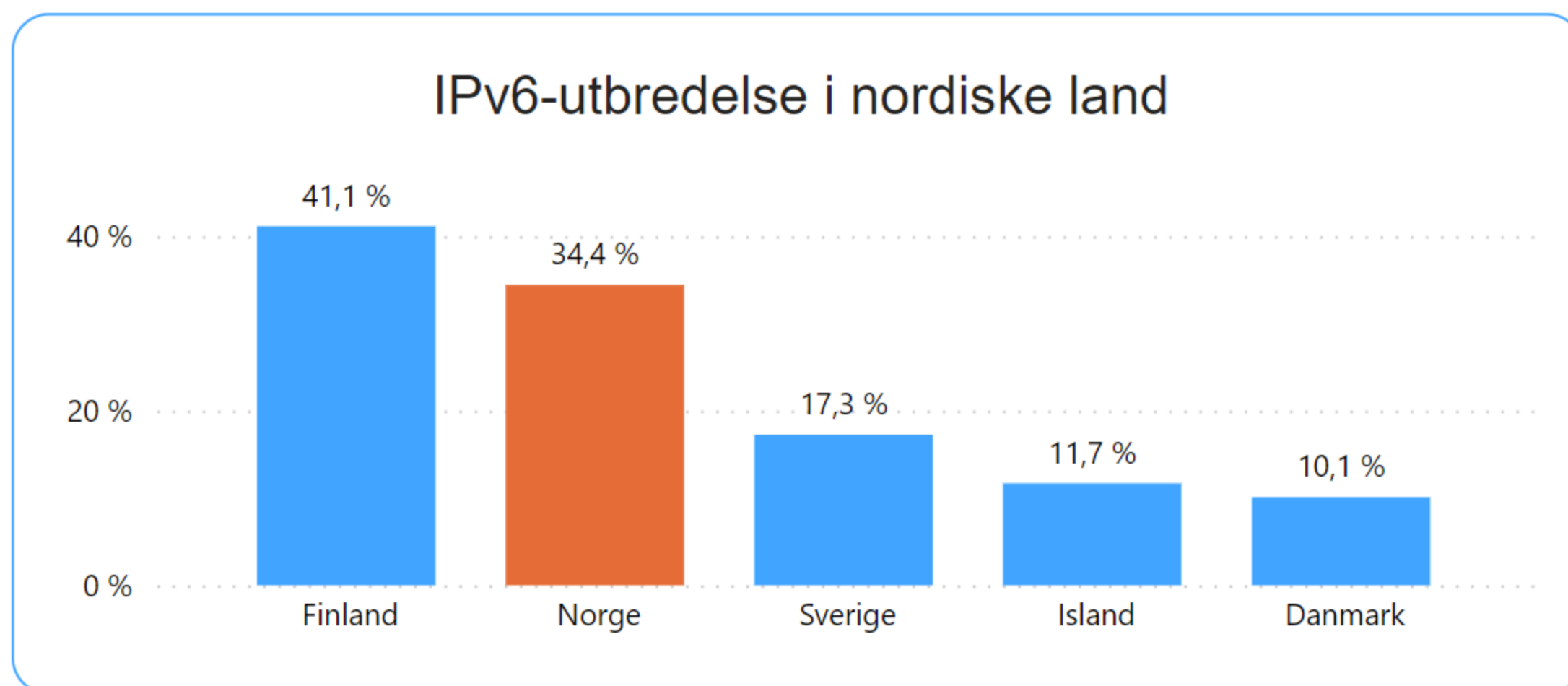
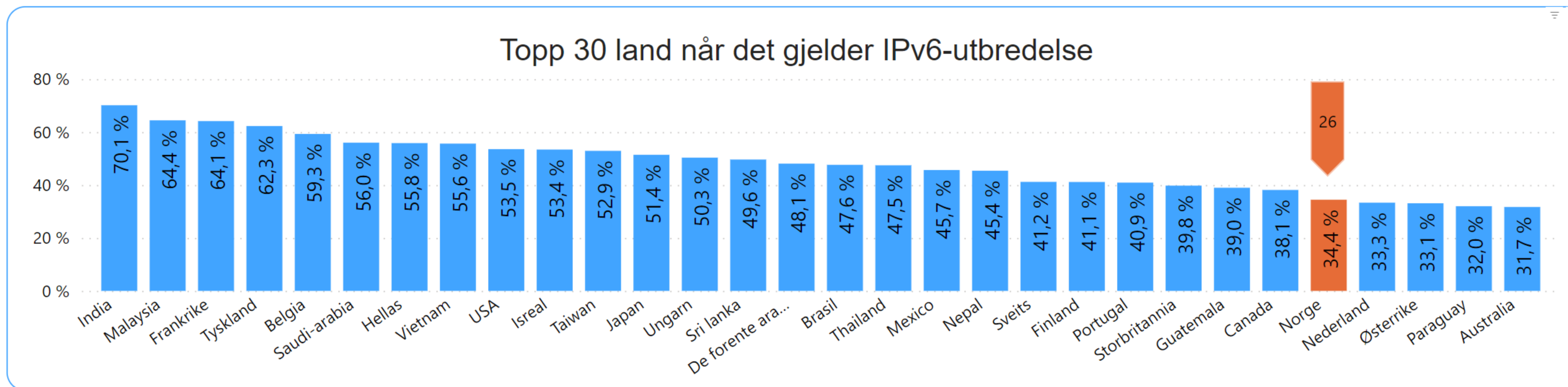
By 30 April 2025

Norwegian ISPs have activated IPv6 for all their internet subscribers, as well as replaced any home routers that could not be upgraded via software.

Except for ...

Home routers based on DSL technology linked to the copper network do not need to be replaced before the remediation of the copper network has been completed.

Latest developments in IPv6 adoption in Norway



- Norway ranked 26th in the world in terms of IPv6 adoption, up 9 places from last year.
- In the course of one year, IPv6 adoption in Norway increased from 27% to 34%.
- At European level, Norway advanced four places from last year, up to 10th place.

Next steps – How Nkom follows the IPv6 deployment

In dialogue meetings with the largest internet service providers in the Norwegian market, they have expressed that they are to a large extent in line with the proposal.

Nkom follows the development closely during this period and regularly publish statistics on the availability of IPv6 by Norwegian ISPs.

Nkom will assess by the end of 2025 whether there is a need to introduce national regulation to make IPv6 mandatory among Norwegian ISPs.



Main takeaways

- IPv6 is a prerequisite for real net neutrality
- We may have reached the tipping point for IPv6
- Regulators may have a role to play in IPv6 deployment
- Nkom is using a soft law approach to stimulate the transition from IPv4 to IPv6 in Norway

- Nkom note on IPv4, IPv6 and net neutrality
[«Prinsippnotat om IPv4, IPv6 og nettnøytralitet»](#)
- Nkom statistics on IPv6 adoption in the Norway
[«Statistikk over aktiv tilgjengeliggjøring av IPv6»](#)

Many thanks for your attention!

Norwegian Communications Authority (Nkom)

Lars Edvard Storjord, las@nkom.no

Frode Sørensen, fso@nkom.no