Norwegian
Communications
Authority

Decision on designation of providers with significant market power and imposition of specific obligations in the markets for voice call termination on individual mobile communications networks (Market 7)

Case: 1206565
13 January 2015

Summary

On the basis of analysis of the markets for voice call termination on individual mobile communications networks (hereinafter voice call termination on mobile networks, Market 7), the Norwegian Communications Authority (Nkom)[1], pursuant to section 3-3 of the Electronic Communications Act designates Com4 AS (Com4), Lycamobile Norway Ltd (Lyca), Network Norway AS (Network Norway), Phonero AS (Phonero), TDC AS (TDC), Telenor ASA (Telenor), Tele2 Norge AS (Tele2) and TeliaSonera Norge AS (TeliaSonera) as providers with significant market power in the market for voice call termination on their own mobile networks.

The Authority has identified a number of competition problems within the relevant markets for voice call termination on mobile networks. The competition problems are largely due to the existence of absolute entry barriers in the relevant markets.

At present it is not possible to offer competing products in other providers' termination markets, nor is it likely that this will happen within a reasonable time horizon. Each provider thus has a monopoly on termination on its own mobile network. Combined with the calling party pays (CPP) principle, absolute entry barriers mean that the providers have little incentive to set efficient prices for voice call termination on their own mobile network. Excessive pricing in the wholesale market for termination may have an anti-competitive effect if the excessive price is passed on to the retail market.

In light of the above, the Authority regulates the markets for voice call termination on mobile networks on the basis of principle 2 in Nkom's remedies document. This means that the interests of consumers shall be protected since replication of infrastructure will not be able to remedy the competition problems in question.

Nkom has assessed the appropriateness and proportionality of the remedies available. All providers with significant market power must meet any reasonable request for interconnection in the form of termination on the providers' mobile networks. All regulated providers will be subject to an obligation of non-discrimination. In addition, Telenor and TeliaSonera will be directed to prepare and publish standard reference offers. For Com4, Lyca, Network Norway, TDC, Tele2 and Ventelo, Nkom considers publication of the companies' termination charges to be sufficient.

[1] By 1 January 2015 Norwegian Post and Telecommunication Authority (NPT) changed name to Norwegian Communications Authority (Nkom). In this document Nkom is used even where it refers to decision and processes when the official name was NPT.

The objective of Nkom's regulation of the mobile termination rates is that all providers of termination shall have termination charges based on costs for an efficient operator, which means that prices will also be symmetric. Based on updated cost models the following regulatory price caps are imposed on Com4, Lyca, Network Norway, Phonero, TDC, Telenor, Tele2 and TeliaSonera:

Maximum price from 1 July 2015	**Maximum price from 1 January 2016**	**Maximum price from 1 January 2017**
8.3	7.5	6.5

Table 1: Maximum price for per minute voice call termination on mobile networks, stated in øre (NOK 0.01) excl. VAT.

Contents

1 Introduction and background

1.1 Introduction

1. Section 3-2 of Act no. 83 of 4 July 2003 on Electronic Communication (Electronic Communications Act) requires the Norwegian Communications Authority (Nkom) to define relevant product and service markets and geographic markets pursuant to the EFTA Surveillance Authority (ESA)'s Recommendation on relevant markets (the Recommendation)[2]. The Authority shall analyse the markets and identify any providers with significant market power. Providers designated as having significant market power shall be imposed at least one of the specific obligations provided for in chapter 4 of the Electronic Communications Act. Specific obligations are imposed after an assessment of potential competition problems in the relevant market and the relevant provider's position in this market.

2. This is Nkom's sixth round of analysis of one or more of the markets for voice call termination on individual mobile communications networks. The markets are hereinafter referred to as the markets for voice call termination on mobile networks. The first three analyses were based on the ESA Recommendation on relevant markets from 2004, while the analyses from 2010 and 2011 were based on the ESA Recommendation from 2008. In the 2004 Recommendation the market for voice call termination was designated as Market 16. The market is retained in the ESA Recommendation from 5 November 2008, but is now referred to as Market 7. The definition of the market is unchanged.

3. On 9 October 2014, the European Commission adopted a new recommendation[3] on relevant markets. Wholesale markets for voice call termination on mobile networks remain susceptible for ex-ante regulation, referred to as market 2. ESA is expected to take a similar view, but until such recommendation is in place the ESA recommendation from 5th November 2008 is valid in Norway and Nkom referrers to the relevant markets as market 7.

4. The table below provides an overview of the providers that in previous decisions have been designated as operators with significant market power:

Decision date	Operators designated as having significant market power
19 September 2005	Telenor ASA, Teletopia Mobile Communications AS (Teletopia), Tele2 Norge AS, TeliaSonera Norge AS.
8 May 2007	MTU Networks AS[4] (MTU), TDC AS[5] (TDC), Telenor ASA (Telenor), Tele2 Norge AS (Tele2), TeliaSonera Norge AS (TeliaSonera)[6].

[2] EFTA Surveillance Authority Recommendation of 5 November 2008 on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with the Act referred to at point 5cl of Annex XI to the EEA Agreement (Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services), as adopted by Protocol 1 thereto and by the sectorial adaptations contained in Annex XI to that Agreement.

[3] COMMISSION RECOMMENDATION of 9.10.2014 on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services.

[4] Teletopia Mobile Communications AS was acquired by MTU Networks AS at the beginning of 2007. MTU Gruppen petitioned for bankruptcy at the end of November 2007.

[5] Its formal name in the decision was TDC Song AS.

17 November 2008	Barablu Mobile Norway Ltd., (Barablu) MTU Networks AS, Network Norway AS, Phonero AS[7], TDC AS and Tele2 Norge AS.
27 September 2010	Network Norway AS, Phonero AS, TDCAS, Telenor ASA, Tele2 Norge AS, TeliaSonera Norge AS.
15 June 2011	Lycamobile Norway Ltd (Lyca).

Table 2: Previous decisions and operators identified as having significant market power.

5. Nkom has carried out a new analysis of all the markets for voice call termination on mobile networks (Annex 1). In the analysis Nkom concludes that Com4, Lyca, Network Norway, TDC, Telenor, Tele2, TeliaSonera, and Ventelo all have significant market power in their respective termination markets.

6. Nkom received replies from TDC, Telenor and a joint comment from Tele2 and Network Norway. Nkom prepared a draft decision and presented an English translation of the documents ESA for notification, cf. Framework Directive Article 7 and ESA's recommendation on Article 7. ESA had no comments on proposed market definition, designation of undertakings with significant market power or to the suggested remedies.

7. This decision has a time horizon of two to three years.

1.2 Legal basis

8. The regulatory framework for electronic communication is based on five directives adopted by the European Union (EU)[8]. The directives have been implemented in Norwegian law through the Electronic Communications Act and associated regulations, including the Regulations of 16 February 2004 on electronic communications networks and services (the Ecom Regulations).

9. Pursuant to these rules the obligations for providers with significant market power are determined individually according to specific assessments on the basis of a market analysis and with a limited forward-looking time horizon[9]. Particular attention must be paid to the expected pro-competitive effect of the relevant remedies.

---

6 Its formal name in the decision was NetCom AS. TeliaSonera Norway AS is TeliaSonera AB's Norwegian business. The company was established in January 2011 (formerly NetCom AS). NetCom and Chess are the company's retail brand names.

7 Formal name in the decision is Ventelo AS. The companies Ventelo AS and Phonero AS merged 1 January 2015 under the new name Phonero AS.

8 Directive 2002/21/EC on a common regulatory framework for electronic communications networks and services (Framework Directive); Directive 2002/20/EC on the authorisation of electronic communications networks and services (Authorisation Directive); Directive 2002/19/EC on access to, and interconnection of, electronic communications networks and associated facilities (Access Directive); Directive 2002/22/EC on universal service and users' rights relating to electronic communications networks and services (Universal Service Directive); Directive 2002/58/EC concerning the processing of personal data and the protection of privacy in the electronic communications sector (Directive on privacy and electronic communications).

9 See further details about the time horizon in the ESA guidelines for market analyses and assessment of significant market power, paragraph 20.

10. In choosing specific obligations Nkom has taken into account the assessments described in Nkom's revised remedies document of 12 June 2009 (Nkom's remedies document)[10]. This document is based on "Revised ERG Common Position on the approach to remedies in the ECNS regulatory framework", prepared by the European Regulators Group for electronic communications networks and services (ERG)[11]. The guidelines and principles embodied in the ERG remedies document are intended to stimulate the development of the single market for electronic communications networks and services as well as facilitate uniform and consistent regulatory practice in the various member states.

1.3 The structure of the document

11. This decision consists of a main document, containing the background and reasoning behind the imposed obligations, plus three annexes. Annex 1 comprises the analysis of the markets for termination of voice calls on mobile networks. Annex 2 presents the results of the national consultation, and Annex 3 contains the documentation of the LRIC model, version 8. Annex 4 is ESA's comments to Nkom's draft decision.

12. In chapter 2 providers with significant market power are identified on the basis of the market analysis in Annex 1. Chapter 3 provides a brief overview of the regulatory starting point for the choice of remedies, while chapter 4 provides an overview of the current specific obligations in the markets for voice call termination on mobile networks. Chapter 5 gives a description and overview of potential competition problems in the relevant markets. Chapter 6 discusses some general principles for use of remedies, including the possibility of the emergence of sustainable competition in the relevant markets and the requirement that the use of remedies shall be proportionate. Based on the preceding chapters and the annexed market analysis, chapter 7 discusses the choice of specific obligations. The specific obligations that are being imposed are presented in chapter 8, and the relationship to the existing obligations is described in chapter 9. Information about appeal options is found in chapter 10.

2 Designation of providers with significant market power

13. On the basis of the analysis of markets for voice call termination on mobile networks (Annex 1) and pursuant to section 3-3 of the Electronic Communications Act, Nkom notifies that the following companies will be designated as providers with significant market power in the following respective markets:

- Com4 AS: Voice call termination on Com4 AS's mobile network.
- Lycamobile Norway Ltd: Voice call termination on Lycamobile Ltd.'s mobile network.
- Network Norway AS: Voice call termination on Network Norway AS's network.
- Phonero AS: Voice call termination on Phonero AS's mobile network.

[10] http://www.npt.no/marked/markedsregulering-smp/rammer/introduksjon-til-markedsregulering-smp/_attachment/479?_ts=137da56ab33

[11] http://www.irg.eu/streaming/erg_06_33_remedies_common_position_june_06.pdf?contentId=542920&field=ATTACHED_FILE

- TDC AS: Voice call termination on TDC AS's mobile network.
- Telenor ASA: Voice call termination on Telenor ASA's mobile network.
- Tele2 Norge AS: Voice call termination on Tele2 Norge AS's mobile network.
- TeliaSonera Norge AS: Voice call termination on TeliaSonera AS's mobile network.

3 Regulatory basis for the choice of remedies

14. It ensues from section 3-4, first paragraph, of the Electronic Communications Act that providers with significant market power shall have one or more special obligations imposed on them pursuant to sections 4-1, 4-4, 4-5, 4-6, 4-7, 4-8 and 4-9. Relevant obligations for the markets for voice call termination on mobile networks are:

- Access obligations, cf. sections 4-1, 4-2, 4-4 and 4-5 of the Electronic Communications Act.
- Obligation of non-discrimination, cf. section 4-7 of the Electronic Communications Act.
- Obligation to publish standard reference offers, cf. section 4-6 of the Electronic Communications Act.
- Obligation of transparency, cf. sections 4-6 and 4-8 of the Electronic Communications Act.
- Obligation of accounting separation, cf. section 4-8 of the Electronic Communications Act.
- Obligations of price controls and cost accounting cf. section 4-9 of the Electronic Communications Act.

15. Pursuant to section 3-4, second paragraph, of the Electronic Communications Act, obligations may in special cases be imposed beyond what follows from these provisions. In such cases the consultation procedure under section 9-3 of the Electronic Communications Act is to be followed.

16. In its remedies document Nkom has defined the principles that in general will guide the Authority in its choice of remedies:

Principle 1 Substantiated decisions shall be prepared in accordance with the national regulatory authority's obligations pursuant to the directives.

Principle 2 The interests of consumers shall be protected when replication of infrastructure is not considered feasible.

Principle 3 In markets where Nkom considers it likely that duplication of infrastructure may be attained over time, Nkom will ensure that its use of remedies lends support to the transition to a market characterised by sustainable competition.

Principle 4 Remedies shall be designed to be incentive compatible.

17. In accordance with the general principles of administrative law and the proportionality principle in European Community law, any obligations Nkom imposes on providers with significant market power shall be appropriate to, and not go further than necessary for, furthering the purposes of the Electronic Communications Act. The main objectives of the Electronic Communications Act are stated in section 1-1, which reads:

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

18. In addition to section 1-1, a special purpose provision has been included in section 3-4, third paragraph. This provision lays down requirements for the use of specific obligations:

> *"Obligations pursuant to the first and second paragraphs that are imposed in the individual case shall be appropriate to promote sustainable competition as well as facilitate national and international development in the market. The Authority may amend obligations imposed."*

19. The European Commission published its recommendation on the regulatory treatment of fixed and mobile termination rates on 7 May 2009[12]. ESA published an identical recommendation on 13 April 2011[13]. Nkom has largely taken the principles set out in this document into account in its design of the relevant use of remedies.

4 Current specific obligations

20. All the providers covered by this decision, except Com4, which is being subjected to special regulation for the first time, are currently required to comply with specific obligations pursuant to chapter 4 of the Electronic Communications Act.

21. In accordance with Nkom's decision of 27 September 2010, the Ministry of Transport and Communications' appeal decision of 11 May 2011 and Nkom's decision of 15 June 2011, the following specific obligations apply to Lyca, Network Norway, Phonero, TDC, Telenor, Tele2 and TeliaSonera respectively (the maximum prices have been adjusted for inflation):

Lyca:

- An obligation to meet any reasonable request for interconnection and to negotiate such agreements without undue delay, cf. sections 4-2 and 4-1 of the Electronic Communications Act.
- An obligation to publish its interconnection rates; cf. section 4-6 of the Electronic Communications Act. The company shall also send Nkom a copy of all negotiated agreements for voice call termination on mobile networks, cf. section 10-3 of the Electronic Communications Act.
- Price cap of NOK 0.16 per minute from 1 January 2013 for termination of voice calls on own network estimated from a weighted average of various price elements, cf. section 4-9 of the Electronic Communications Act.

[12] The Commission's Recommendation: http://ec.europa.eu/information_society/policy/ecomm/doc/implementation_enforcement/article_7/recom_term_rates_en.pdf

[13] ESA's recommendation: http://www.eftasurv.int/media/internal-market/ESAs-Recommendation-on-termination-rates.pdf

Network Norway:

- An obligation to meet any reasonable request for interconnection and to negotiate such agreements without undue delay, cf. sections 4-2 and 4-1 of the Electronic Communications Act.
- An obligation not to discriminate between external providers and to offer interconnection and access to other providers on the same or equivalent terms and of the same or equivalent quality as its own operations, cf. section 4-7, first and second paragraphs, of the Electronic Communications Act.
- An obligation to publish its interconnection rates; cf. section 4-6 of the Electronic Communications Act. The company shall also send Nkom a copy of all negotiated agreements for voice call termination on mobile networks, cf. section 10-3 of the Electronic Communications Act.
- Price cap of NOK 0.16 per minute from 1 January 2013 for termination of voice calls on own network estimated from a weighted average of various price elements, cf. section 4-9 of the Electronic Communications Act.
- An obligation to report every six months on the development of Mobile Norway's mobile network, cf. section 10-3 of the Electronic Communications Act.

Phonero:

- An obligation to meet any reasonable request for interconnection and to negotiate such agreements without undue delay, cf. sections 4-2 and 4-1 of the Electronic Communications Act.
- An obligation to publish its interconnection rates; cf. section 4-6 of the Electronic Communications Act. The company shall also send Nkom a copy of all negotiated agreements for voice call termination on mobile networks, cf. section 10-3 of the Electronic Communications Act.
- Price cap of NOK 0.16 per minute from 1 January 2013 for termination of voice calls on own network estimated from a weighted average of various price elements, cf. section 4-9 of the Electronic Communications Act.

TDC:

- An obligation to meet any reasonable request for interconnection and to negotiate such agreements without undue delay, cf. sections 4-2 and 4-1 of the Electronic Communications Act.
- An obligation to publish its interconnection rates; cf. section 4-6 of the Electronic Communications Act. The company shall also send Nkom a copy of all negotiated agreements for voice call termination on mobile networks, cf. section 10-3 of the Electronic Communications Act.
- Price cap of NOK 0.16 per minute from 1 January 2013 for termination of voice calls on own network estimated from a weighted average of various price elements, cf. section 4-9 of the Electronic Communications Act.

Telenor:

- An obligation to meet any reasonable request for interconnection and to negotiate such agreements without undue delay, cf. sections 4-2 and 4-1 of the Electronic Communications Act.
- An obligation not to discriminate between external providers and to offer interconnection and access to other providers on the same or equivalent terms and of the same or equivalent quality as its own operations, cf. section 4-7, first and second paragraphs, of the Electronic Communications Act.

- An obligation to formulate and publish a reference offer for interconnection, cf. section 4-6 of the Electronic Communications Act. The company shall also send Nkom a copy of all negotiated agreements for voice call termination on mobile networks, cf. section 10-3 of the Electronic Communications Act.
- Price cap of NOK 0.16 per minute from 1 January 2013 for termination of voice calls on own network estimated from a weighted average of various price elements, cf. section 4-9 of the Electronic Communications Act.

Tele2:

- An obligation to meet any reasonable request for interconnection and to negotiate such agreements without undue delay, cf. sections 4-2 and 4-1 of the Electronic Communications Act.
- An obligation not to discriminate between external providers and to offer interconnection and access to other providers on the same or equivalent terms and of the same or equivalent quality as its own operations, cf. section 4-7, first and second paragraphs, of the Electronic Communications Act.
- An obligation to publish its interconnection rates; cf. section 4-6 of the Electronic Communications Act. The company shall also send Nkom a copy of all negotiated agreements for voice call termination on mobile networks, cf. section 10-3 of the Electronic Communications Act.
- Price cap of NOK 0.16 per minute from 1 January 2013 for termination of voice calls on own network estimated from a weighted average of various price elements, cf. section 4-9 of the Electronic Communications Act.
- An obligation to report every six months on the development of Mobile Norway's mobile network, cf. section 10-3 of the Electronic Communications Act.

TeliaSonera:

- An obligation to meet any reasonable request for interconnection and to negotiate such agreements without undue delay, cf. sections 4-2 and 4-1 of the Electronic Communications Act.
- An obligation not to discriminate between external providers and to offer interconnection and access to other providers on the same or equivalent terms and of the same or equivalent quality as its own operations, cf. section 4-7, first and second paragraphs, of the Electronic Communications Act.
- An obligation to formulate and publish a reference offer for interconnection, cf. section 4-6 of the Electronic Communications Act. The company shall also send Nkom a copy of all negotiated agreements for voice call termination on mobile networks, cf. section 10-3 of the Electronic Communications Act.
- Price cap of NOK 0.16 per minute from 1 January 2013 for termination of voice calls on own network estimated from a weighted average of various price elements, cf. section 4-9 of the Electronic Communications Act.

5 Competition problems

5.1 General – competition problems

22. A provider with significant market power would be able to exercise behaviour with the purpose or intention of driving competitors out of the market, preventing potential competitors from entering the market and/or exploiting consumers. Such behaviour is referred to as competition problems.

23. Nkom's remedies document contains a general description of potential competition problems within the relevant markets. Based on the practical experience of the national regulatory authorities in Europe[14], the document identifies 27 standard competition problems.

24. Specific obligations imposed on providers designated as having significant market power must be suitable to remedy actual or potential competition problems in the relevant market. The imposition of specific obligations is not conditional on the abuse of market power actually taking place. It is sufficient that anti-competitive behaviour can potentially arise under given conditions.

25. In the following, competition problems are discussed in connection with the markets for voice call termination on mobile networks. The point of departure for the assessment of competition problems is a "modified greenfield approach", namely a requirement that the relevant market was not subject to ex-ante regulation.

5.2 Denial to interconnect

26. In most cases a provider will have an incentive to offer interconnection in the form of termination. The utility value of a network increases with the number of users connected to it, which suggests that mobile operators will want to enter into interconnection agreements with other providers.

27. Providers with few end users will normally consider themselves served by terminating calls from providers with large retail volumes. In this way more people will have the opportunity to contact the smaller provider's end users, making the smaller provider's service more attractive.

28. For larger providers, it may be less important to enter into an agreement on interconnection with small providers. There will be less appreciable loss of quality of their mobile service if the provider's own end users cannot be called by the smaller provider's customers. Such a denial to interconnect could represent a significant competition problem since it will complicate and potentially make it impossible for it or the affected providers to engage in competitive activities. In addition, such behaviour might result in reduced consumer welfare in that the objective of any-to-any communication is not attained.

29. Section 4-2, third paragraph, of the Electronic Communications Act requires providers with significant market power to meet reasonable requests for interconnection within those areas in which the provider has significant market power. This provision thus reduces the competition problems related to denial to interconnect, since the obligation to offer voice call

14 http://www.irg.eu/streaming/erg_06_33_remedies_common_position_june_06.pdf?contentId=542920&field=ATTACHED_FILE

termination on their own network is authorised directly in the Electronic Communications Act for all the providers covered by this decision.

30. The obligation to enter into interconnection agreements under section 4-2, third paragraph, of the Electronic Communications Act includes only interconnection "*within those areas in which the provider has significant market power*". Since Market 7 is limited to voice call termination, the operators may have the opportunity and incentive to receive only voice calls, and not SMS and MMS messages.

31. Moreover, the obligation under section 4-2, third paragraph, for providers with significant market power in Market 7 is limited to agreements on voice call termination on their own network. The providers in question will also have the incentive to refuse to enter into an agreement to purchase termination from other providers.

32. An issue closely related to denial to interconnect is when a provider that does not have an incentive to conclude interconnection agreements makes the conclusion of such agreements difficult by resorting to various forms of delaying tactics. Typically such a practice may be resorted to where there is an obligation to meet reasonable requests for interconnection, but where nothing has been decided on how efficient the negotiations are to be time-wise. Thus, delaying tactics may represent a not-insignificant competition problem, even if the access obligation is enshrined in law.

5.3 Excessive pricing

33. Excessive pricing is the main competition problem in the relevant termination markets. The calling party or network owner with which the call originates has no control over which network the called end user is connected to. In reality the network owner who originates the call has no choice but to carry out the call and then pay the price the other network owner requires (the CPP principle[15]). This creates a monopoly situation for the receiving network owner where it has the opportunity to demand an excessive price for termination on its network. Providers with significant market power in the markets for voice call termination on mobile networks thus have the incentive and the opportunity to set termination charges that are higher than those they could charge in a market with functioning competition. The incentive to set high termination charges is described further in the section on cross-subsidisation.

34. All the regulated providers are subject to a price cap for termination. From 1 January 2013, the price cap is NOK 0.16 per minute. Historically, all providers of termination on mobile networks have set their price for termination at the same level as the price cap. The affected monopoly markets are characterised by the absence of competition in offering termination on the respective networks, entailing that the providers are not obliged to take their competitors' prices into account. The providers of termination therefore have the opportunity to set prices above the level that would exist in a market with competition.

35. In view of the inherent incentives that exist in monopoly markets, and on the basis of the providers' historical prices, Nkom believes that there is a potential for excessive pricing.

36. In markets where one or more providers set termination charges that are substantially higher than the underlying efficient costs, pricing in the long term could have adverse consequences in terms of resource use and lead to distortion of competition. Excessive pricing of termination results in costs being shifted to other providers and ultimately their end users. High and possibly asymmetric prices among mobile providers can also lead to differentiated rates for calling between different mobile networks. In Nkom's opinion, such a development is

[15] The calling party pays principle is further described in section 2.2.1 of the market analysis (Annex 1).

unfortunate in terms of transparency in the retail market, and also leads to the transfer of resources between customer groups in different mobile networks.

37. Excessive pricing by the established network owners can also create entry barriers for new and small network owners and Mobile Virtual Network Operators (MVNOs). Such providers usually have little customer volume in an early phase, and the bulk of the calls originated on their networks will be terminated on the networks of the established providers with far larger market shares. If the established providers require termination charges that exceed the efficient level, termination could be very costly for smaller operators that have relatively little internal traffic.

38. Furthermore, excessive pricing of termination on mobile networks will lead to fixed network customers effectively subsidising mobile network customers. This may in turn lead to less fixed to mobile network traffic than is desirable from an economic perspective.

39. On this basis, Nkom believes the operators' opportunity and incentive to charge an excessive price for termination on their mobile networks constitutes a significant competition problem.

5.4 Cross-subsidisation

40. Excessive pricing enables cross-subsidisation in that the termination revenues that exceed the underlying costs can be used to subsidise parts of the operators' own business where earnings do not cover the costs. For example, termination revenues in excess of the underlying costs may be used to finance parts of the market for access and call origination on mobile networks (Market 15), to offer low retail prices in general, to subsidise mobile phones, or in other business areas.

41. Asymmetric termination has previously been used as a regulatory tool to lower the entry barriers for new providers. In previous decisions Nkom has highlighted the unfortunate consequences of such practices becoming permanent or being used for a long time and has therefore always stressed that asymmetric regulation is only relevant for a limited period.

5.5 Price discrimination

42. Providers of termination services may have an incentive to offer better prices to internal or certain external providers. For example, it is conceivable that the providers will offer a more advantageous price to companies in the same group or any prospective partner companies. Similarly, providers who pose a greater potential threat than other could conceivably be charged a higher price than those who do not represent as great a threat.

43. Discrimination between providers may result in increased costs for some providers and may ultimately lead to exclusion from the market. Price discrimination among providers may therefore constitute a competition problem.

5.6 Non-price discrimination

44. A provider with significant market power may also have an incentive to discriminate between its own or related activities and the activities of others in connection with factors other than price. This discrimination may apply to the interconnection services that are offered, the quality of technical interfaces, level of service, quality of information and so forth. It is also conceivable that incentives exist for providers to drag out interconnection negotiations and make undue demands linked to interconnection (guarantees, bundling, etc.). Nkom believes

such discrimination could create distortion of competition, potentially posing a competition problem in the analysed markets.

6 Remedies; a general discussion

45. In the following Nkom provides an account of certain issues of a general nature relating to the choice of remedies in the markets for voice call termination on mobile networks.

6.1 Feasibility of replication of infrastructure in the markets for voice call termination on mobile networks

46. According to the presentation of principles 2 and 3 in Nkom's remedies document, key to the choice of remedies will be whether replication of the infrastructure in the relevant market is considered feasible (i.e. whether or not bringing about sustainable infrastructure competition is likely). If the market is covered by principle 2, it will normally be necessary and legitimate to operate with a stricter set of regulatory obligations[16].

47. Even though it may be possible to achieve infrastructure-based competition in the mobile market in the form of several competing mobile networks, this will still not remedy the relevant competition problems in the termination markets, cf. chapter 5 of this decision. This is because it is impossible for anyone other than the provider that controls the physical or virtual network to offer termination to end users on that provider's network. Providers are therefore in a monopoly situation with absolute entry barriers in terms of providing termination on other providers' networks. On this basis Nkom believes that the markets for voice call termination on mobile networks shall in principle be regulated by principle 2.

48. In previous decisions in the markets for voice call termination on mobile networks, regulation has been seen in the context of the market for access to and call origination on mobile networks (Market 15). In light of the interaction between the two markets the providers have been imposed asymmetric termination rates to facilitate infrastructure-based competition, including the establishment of a third mobile network. The period of asymmetric termination rates was concluded at the end of 2012. At the close of 2013 Tele2's mobile network had achieved more than 75 per cent population coverage[17].

49. In this decision Nkom has emphasised that imposed obligations shall encourage the efficient use of existing infrastructure, ensure cost coverage for the regulated operators and not dampen the willingness to invest.

6.2 General remarks on proportionality

50. The principle of proportionality is discussed in more detail in Proposition no. 58 (2002–2003) to the Odelsting in the remarks concerning section 3-4 of the Electronic Communications Act.

[16] See further details about principle 2 in NPT's remedies document dated 12 June 2009.

[17] Report on mobile development, letter to NPT from Tele2 dated 15 January 2014. Parts of the letter are exempt from public disclosure.

"The obligations imposed shall be proportionate, non-discriminatory, based on objective and fair criteria and be publicly available. Proportionate means that obligations imposed regarding access or significant market power with appurtenant conditions are suitable to compensate for a lack of sustainable competition and will help to promote consumer interests and, where possible, contribute to national and international development. The burdens of the remedies imposed are to be proportionate with regard to what they seek to achieve. This also permits the authorities to link the obligations to certain areas of the relevant market if appropriate."

51. The principle means that when choosing between several options that can promote the purpose just as effectively, Nkom shall choose the least burdensome option. The content of the proportionality principle is described in more detail in Nkom's remedies document. This document states that the principle of proportionality implies that measures that are supposed to be suited to realising the objective behind them should not be more burdensome than necessary in the individual case and that the benefits of the intervention are to outweigh the burdens.

52. However, neither the principle of proportionality nor the principle of minimal regulation may be cited in support of the argument that Nkom should not or cannot impose burdensome obligations on providers with significant market power. The core of these principles is that stricter obligations than are necessary shall not be imposed. However, the imposition of burdensome obligations such as price controls may very well be proportionate and necessary in markets where other less burdensome obligations are not deemed to be adequate to fulfil the purpose of regulation.

7 Explanation of the choice of specific obligations

7.1 Interconnection obligations

7.1.1 Background and basis for imposition of obligations

53. End users expect to be able to make calls to other end users regardless of which network they use. Being able to terminate traffic on other providers' networks is crucial for the competitiveness of the mobile and fixed network providers. Interconnection is essential for enabling the end users of different providers to make calls to each other. Termination is thus demanded by operators who want to meet their own end users' demand to be able to communicate with users of other mobile networks.

54. Section 5.2 describes the competition problems of denial to interconnect and delaying tactics. Interconnection / access obligations will remedy the identified competition problems.

55. The obligation of providers with significant market power to meet all reasonable requests for interconnection follows from section 4-2, third paragraph, of the Electronic Communications Act. The provision states:

"Within those areas in which the provider has significant market power, the provider shall meet any reasonable request to enter into or amend an agreement on interconnection. In the assessment of whether a request is reasonable, an evaluation shall be undertaken in accordance with section 4-1, second paragraph. A provider with significant market power shall document and justify rejection of a request for interconnection."

56. Since all providers that have been evaluated in these markets have significant market power in their own termination market, the obligation to offer access to termination of voice calls on their own networks follows directly from the Act. It is thus not necessary to impose interconnection separately. Termination is included as an element of interconnection. All providers covered by the analysis are therefore required to comply with reasonable requests for termination on their own mobile network.

7.1.2 Content of the obligation

57. A specific request for interconnection shall be complied with to the extent that the request is reasonable. Pursuant to section 4-2, third paragraph, second sentence, of the Electronic Communications Act the assessment of reasonability shall be the same as pursuant to section 4-1, second paragraph, of the same Act. This provision states:

> *"In considering whether a request is reasonable an assessment shall be undertaken inter alia of the provider's interest in control over its own infrastructure against the need to give others the access necessary to be able to offer competing services. In the assessment of what is necessary, account shall be taken of whether in the light of market trends it is technically and commercially possible to install or use competing infrastructure. In the assessment of whether a request is reasonable, account shall also be taken of:*
>
> *1. available capacity*
>
> *2. the provider's investment and investment risk, including any public support and grant schemes*
>
> *3. sustainable competition*
>
> *4. the need to sustain the network's integrity*
>
> *5. intellectual property rights and*
>
> *6. establishment of pan-European services".*

58. To remove some of the basis for possible conflicts related to negotiations on termination, in its decision of 8 May 2007 Nkom made some general assessments of the elements in the assessment of reasonability pursuant to section 4-2, third paragraph, second sentence, of the Electronic Communications Act, cf. section 4-1, second paragraph. It was emphasised that the objective of achieving any-to-any communication normally had to be accorded more weight than the providers' interest in managing their own infrastructure. Nkom believes the discussions in the decision still provide an adequate picture of Nkom's assessment of the elements to be included in the assessment of reasonability. Beyond this, Nkom cites that assessments of reasonability must be made in relation to specific conditions.

59. As stated in the discussion of competition problems in section 5.2, mobile providers can also have an incentive to refuse to enter into interconnection agreements for services outside the obligation in section 4-2, third paragraph, of the Electronic Communications Act. Providers covered by this decision are designated as having significant market power for terminating voice calls on their own networks. The obligation under section 4-2, third paragraph, therefore does not apply to receiving SMS and MMS traffic from other providers. Nor does the obligation apply to purchases of termination from other providers. Such forms of denial to interconnect could have an anti-competitive effect and may be in conflict with the objective of any-to-any communication.

60. Section 4-2, second paragraph, of the Electronic Communications Act authorises the imposition of interconnection obligations in specific cases when necessary to ensure any-to-any communication. It follows further that in this case Nkom may impose an obligation to enter into an agreement. This provision does not require the provider on whom obligations are imposed to be designated as having significant market power in the market to which the obligations relate. Nkom has no knowledge of instances of denial to interconnect related to SMS and MMS traffic, but will in specific cases assess the use of section 4-2, second paragraph, of the Electronic Communications Act. The same applies to any cases where a mobile provider refuses to buy termination of voice calls on other networks.

61. In section 5.2 delaying tactics are described as a potential competition problem in the relevant termination markets. Nkom believes the objective of any-to-any communication would not have been adequately safeguarded if the interconnection obligations were not followed up by obligations to complete negotiations within a reasonable time. Article 12, no. 1, second paragraph, of the Access Directive explicitly states that the regulatory authority may impose such obligations on an operator. Nkom believes that section 4-1 of the Electronic Communications Act provides authority to establish rules on the time spent.

62. An obligation to counteract delaying tactics can be formulated in various ways. Nkom believes that a general obligation that termination agreements shall be negotiated without undue delay is appropriate. In order to ensure compliance with the obligation, it should be combined with a requirement to account for time spent related to interconnection negotiations. Such documentation should be made available upon request to a provider who believes delaying tactics have been taking place. To prevent the obligation of documentation from being unnecessarily burdensome and give the party who believes they were subjected to delaying tactics the incentive to react relatively quickly, Nkom believes the documentation requirement should be limited in time. A demand for presentation of documentation must therefore be submitted within three months after the relevant negotiations were concluded. A copy of the documentation of the time spent shall in such a case be submitted to Nkom without undue delay.

63. Because functional interconnection is of such great importance to competition in the retail market for mobile telephony, and to ensure any-to-any communication, Nkom believes it is necessary to impose the above-mentioned interconnection obligations on providers.

64. Nkom believes that the interconnection obligations are suited to compensating for the identified competition problems related to interconnection not addressed by section 4-2, third paragraph, of the Electronic Communications Act and are thus suited to realising the goal of sustainable competition, cf. section 1-1 of the Electronic Communications Act. At the same time, in Nkom's view, the interconnection obligations go no farther than necessary.

65. Nkom believes that the public interest in imposing interconnection obligations exceeds the disadvantages this obligation represents for those providers. Furthermore Nkom cannot see that there are less intrusive remedies that can sufficiently counteract the identified competition problems.

Conclusion

66. All the providers that have been designated as having significant market power in the market for voice call termination on mobile networks have an obligation to meet all reasonable requests for interconnection, cf. section 4-2, third paragraph, of the Electronic Communications Act. To ensure functional interconnection, Nkom finds it is necessary to impose interconnection obligations on providers in order to safeguard aspects not covered by section 4-2, third paragraph, of the Electronic Communications Act. The impositions of interconnection obligations are presented in chapter 8.

7.2 Non-discrimination

67. In section 5.5 Nkom identified discrimination between various internal and/or external providers in terms of price or other conditions as a potential competition problem in the relevant market. The same applies to differences in termination rates for on-net and off-net calls.

68. Section 4-7 of the Electronic Communications Act authorises the imposition of the obligation of non-discrimination. The first and second paragraphs of the provision read:

> *"The Authority may order a provider with significant market power to offer interconnection and access to external providers on non-discriminatory terms.*
>
> *The Authority may order a provider with significant market power to offer interconnection and access to other providers on the same or equivalent terms and of the same or equivalent quality as provided for internal operations, subsidiaries or partnerships."*

69. An obligation of non-discrimination may be imposed in two contexts. Under the first paragraph, the Authority may order a provider with significant market power not to discriminate between external providers. The provision's second paragraph empowers the Authority to order the provider with significant market power to offer the same or equivalent quality and terms to competing providers as to its own or associated operations.

70. An obligation of non-discrimination could reduce the ability to exercise exclusionary behaviour and thus prevent the transfer of market power from the wholesale to the retail market. Exclusionary behaviour refers to conduct which has the purpose or effect of preventing access and/or foreclose competitors from markets by operating with prices and/or access conditions that favour their own operations. Methods to increase competitors' costs and thereby reduce the demand for competitors' products may be examples of such behaviour.

71. Price discrimination will largely be remedied through the price obligations imposed in section 7.4. Regulated maximum prices will ensure that the provider cannot demand higher prices than the regulated price for termination on its own network. There will still be opportunity for a certain degree of price discrimination if one or more providers are given lower prices than the regulated maximum price.

72. With regard to any differences in termination charges between on-net and off-net calls, Nkom believes that it would not be appropriate to require the charge for terminating off-net calls to be equal to the implicit termination charge for on-net calls. The prerequisites for such discrimination will also be weakened when the prices for off-net calls are reduced to an efficient level. For this reason Nkom believes the most appropriate and effective instrument for remedying the competition problem is to regulate the off-net price directly. In the further consideration of discriminatory behaviour any differences in termination charges for on-net and off-net calls are not discussed.

73. In Nkom's opinion, an obligation of non-discrimination, cf. section 4-7 of the Electronic Communications Act, is the only one of the available remedies that effectively addresses non-price discrimination.

74. The main point of a claim of non-discrimination is that similar situations are to be treated equally with regard to prices, information and other terms, regardless of the activity in question. Any differences in the terms should therefore be based on objective criteria. The obligation of non-discrimination means that providers are able to compete on equal terms, which will have a positive effect on the competition in the market.

75. In the decision of 27 September 2010, Nkom considered the impact of a non-discrimination obligation for the affected operators. Nkom came to the conclusion that an obligation of non-discrimination should be continued for Network Norway, Telenor, Tele2 and TeliaSonera, but that there was no need for such an obligation for Phonero and TDC. Lyca was not imposed an obligation of non-discrimination in the decision of 15 June 2011.

76. The reason that Lyca, Phonero and TDC were not imposed an obligation of non-discrimination was that these three operators had a relatively small share of the terminated traffic and that any discriminatory behaviour would therefore have a very limited adverse effect on the competitive situation. Nkom therefore found that it was not necessary or proportionate to restrict these operators' freedom of action by imposing an obligation of non-discrimination. Similarly Nkom held that discriminatory behaviour by Network Norway, Telenor, Tele2 and TeliaSonera, which have substantial shares of terminated traffic, would have major negative effects.

77. Differences in the imposition of obligations of non-discrimination must be viewed in light of the fact that there has been asymmetric regulation of termination rates for quite some time. Asymmetric termination rates have been a policy instrument in the work to achieve the authorities' goal of infrastructure-based competition in the mobile markets. The idea has been that newcomers are subject to more lenient regulation to allow them to establish themselves and gain a foothold in the market. Nkom has nevertheless stated that it only intends to use asymmetric termination rates as a policy instrument for a limited period of time and that the long-term goal is to achieve an efficient and symmetric price level for all operators. The goal of a symmetric price level was reached on 1 January 2013, and Nkom believes it is now appropriate to introduce equal treatment in terms of the obligation of non-discrimination too.

78. Nkom maintains that the potential anti-competitive effect of discriminatory behaviour by the above-mentioned providers will be limited, but has, on the basis of the above, concluded that this issue is no longer sufficiently weighty to justify continuing differentiating between providers as regards the obligation of non-discrimination.

79. In order to be able to offer a competitive service, operators must be able to provide end-to-end connectivity. In practice this means that the operators will be forced to buy termination services from other operators. If any of these favour certain buyers of termination, situations where competition is distorted may therefore arise. As mentioned earlier, the price controls discussed in section 7.4 will to some extent remedy the competition problems related to price discrimination. Providers will still be able to have the incentive to provide more favourable prices and other terms to companies in the same group or to any future partner companies. Such discrimination is not addressed through price regulation. Nkom also believes discrimination related to terms other than price becomes relevant in that price discrimination is largely prevented by the price obligations.

80. On this basis Nkom finds it necessary to impose an obligation of non-discrimination on all providers of call termination on mobile networks. To be sufficiently effective, Nkom believes that an obligation of non-discrimination in connection with price and other terms must apply both between external operations (Electronic Communications Act, section 4-7, first paragraph) and between a provider's own internal operations and external operations (Electronic Communications Act, section 4-7, second paragraph). Nevertheless, this does not apply to any differences in termination charges for on-net and off-net calls cf. the discussion on this topic above.

81. The obligation of non-discrimination represents a continuation of existing obligations for Network Norway, Telenor, Tele2 and TeliaSonera and a restriction for Lyca, Phonero and TDC. The obligation is new for Com4 as the company has not previously been subject to regulation. In Nkom's view, this obligation is proportionate. The remedy can be viewed as a best terms doctrine in that the more favourable terms achieved by a provider will also be

reflected in the terms offered other providers. In Nkom's opinion, the disadvantages of such a curtailment of providers' scope of action are outweighed by the benefits of competition. Moreover, Nkom cannot see that other means will be able in sufficient degree to remedy the relevant competition problems.

82. Discriminatory terms may reflect abuse of dominance pursuant to section 11 of the Competition Act. For the provision to apply to the discriminatory terms, the competition authorities must designate the relevant provider as dominant in the relevant market. Moreover, it must be established that discrimination has or is likely to produce anti-competitive effects, reducing predictability for the operators. In Nkom's view, the provision's implied prohibition against non-discrimination provides insufficient protection against such behaviour. Sector-specific ex-ante obligations will also permit frequent and prompt intervention to a greater degree.

Conclusion

83. All the providers that have been designated as having significant market power in the market for voice call termination on mobile networks are imposed an obligation of non-discrimination in connection with termination on their respective mobile network, cf. section 4-7, first and second paragraphs, of the Electronic Communications Act. The orders concerning imposition of an obligation of non-discrimination are presented in chapter 8.

7.3 Reference offers and publication

84. Pursuant to section 4-6 of the Electronic Communications Act specific obligations can be imposed on providers with significant market power to publish specified information and to prepare and publish standard offerings for electronic communications networks and services (reference offers). Such obligations are usually referred to as transparency obligations. Transparency in itself is rarely sufficient for remedying competition problems, but it may improve the efficacy of other measures[18]. For example, for access issues, transparency will help simplify and speed up negotiations if the key terms for connection follow a standard reference offer that is publicly available. Reference offers will thus often be cost-saving for the providers and reduce the risk of disputes. A transparency obligation will also make it easier for other providers and Nkom to monitor compliance with non-discrimination obligations.

85. All the providers of termination will be subject to access obligations; see section 7.1 above. This makes it necessary to consider an obligation of transparency in order to streamline the requirement to meet reasonable requests for termination. Nkom is also imposing an obligation of non-discrimination on all the providers. An obligation of transparency could also streamline this obligation and further counter attempts at discriminatory behaviour.

86. One possible downside of transparency is that easily available information on prices may facilitate tacit collusion. Competition will be harmed if competitors adjust their prices to each other rather than fix them on a free basis. However, this issue is not very relevant for the termination markets. In this connection Nkom refers to the fact that the termination markets consist of a limited number of operators whose prices are already transparent. In addition the parties gain knowledge about the other party's termination charges through their interconnection agreements, since the providers depend on such information to be able to invoice one another. The termination rates are also subject to a symmetric price cap, cf. section 7.4. Normally, all the rates are identical to the price cap. Nkom therefore believes that the potential harm of an obligation of transparency will be very limited.

[18] There is more information about the correlation between transparency obligations and other obligations in ERG's remedies document, page 42 ff.

7.3.1 Telenor and TeliaSonera

87. A reference offer obligation for interconnection with specific requirements for content will serve to streamline access obligations in that important details have already been determined before the negotiations start, thereby helping create predictability for both parties. Furthermore, specific requirements for content will facilitate compliance with the non-discrimination requirement and make it easier to check whether the obligation is being complied with.

88. In Nkom's decision of 27 September 2010, Telenor and TeliaSonera were ordered to prepare a reference offer for interconnection with the company's mobile network. Other providers have in practice largely based their interconnection negotiations on these standard reference offers.

89. Nkom believes that the objective of streamlining interconnection negotiations and obligation of non-discrimination suggest that both Telenor and TeliaSonera should still be directed to comply with an obligation of transparency in the form of publication of a reference offer. Publishing standard reference offers on the company's website is a satisfactory form of publication.

90. In Nkom's opinion, the reference offer should contain relatively detailed provisions on matters of importance to providers that wish to negotiate on interconnection. In light of this, Nkom finds that the agreement shall contain all information vital to the service to be provided, including information on:

- the interconnection service being offered,
- general contractual terms and conditions,
- termination charges,
- price elements and the services the individual price elements cover,
- any discounts and criteria for discounts,
- the methods for calculating any offerings without a fixed price,
- geographical supply area,
- any significant capacity limitations on delivery,
- characteristics of a technical and physical nature, including interfaces used at network termination points, as well as the standards that are used,
- points of interconnection,
- agreed quality level, and
- provisions regarding reasonable compensation for failure to meet the agreed quality level.

91. Nkom would particularly emphasise the importance of requiring reasonable compensation for failure to meet agreed quality levels, cf. the Electronic Communications Act, section 4-6, first paragraph, no. 5. Such an obligation must be considered reducing the incentives to discriminate regarding the quality of the call termination product. Such a requirement will also be in accordance with principle 4 in Nkom's remedies document and is a continuation of a similar obligation laid down in Nkom's decision of 27 September 2010.

92. An obligation has previously been imposed on Telenor and TeliaSonera to submit all signed agreements on access and voice call termination on mobile networks and any amendments thereto to Nkom. Nkom believes it is no longer necessary to be sent a copy of all the agreements, and this obligation will therefore not be continued.

93. Changes to a provider's termination product could affect the competitive situation of other providers. In reality Telenor and TeliaSonera have limited opportunities to change the prices of the termination product to the detriment of other providers since said providers are

subject to both price cap regulation and obligation of non-discrimination. Section 2-4, third paragraph, of the Electronic Communications Act states that end-users must be given one month's notice of any changes in the terms and conditions. Providers that purchase termination services from Telenor and TeliaSonera must have sufficient time to take into account changes relating to the termination product of these providers in the terms they offer their own end users. Pursuant to section 4-6, first paragraph, of the Electronic Communications Act (cf. fourth paragraph), Nkom therefore finds that Telenor and TeliaSonera must be ordered to give notice to other providers of any changes to existing services that disfavour the other parties, no later than two months before the change is implemented.

94. Nkom believes that the transparency obligations are proportionate. Telenor and TeliaSonera are having their obligations reduced through the discontinuation of the obligation to submit signed and amended interconnection agreements, while the remaining obligations constitute a continuation of the obligations imposed in Nkom's decision of 27 September 2010. The work linked to preparing and publishing standard reference offers has already been done. However, there will be some administrative costs associated with updating the reference offers. These are considered to be relatively limited, so that the benefits of competition clearly exceed the disadvantages the requirement may entail for these providers.

95. Nkom believes the provisions of the Competition Act will not be sufficient to safeguard the considerations noted above in favour of transparency obligations. The main reason for this is that the Competition Act will not be able to address the need for predictability to the same degree. With respect to transparency obligations, the intention is in part to facilitate the most efficient negotiations possible on interconnection. Nkom believes in this context that it is crucial that the obligations can be imposed in advance of any negotiations. Since the competition rules assume that the dominant operator must have used its position to the detriment of competition before the authorities can intervene, Nkom finds these rules are less suited to addressing the interests that underlie transparency obligations than ex-ante regulation.

Conclusion

96. Pursuant to section 4-6, third and fourth paragraphs, of the Electronic Communications Act, Nkom imposes an obligation on Telenor and TeliaSonera to prepare and publish standard reference offers for interconnection on their mobile networks as specified above. Pursuant to section 4-6, first paragraph, of the Electronic Communications Act (cf. fourth paragraph), Nkom orders Telenor and TeliaSonera to give advance notice to other providers of any changes to existing services that disfavour the other parties no later than two months before the changes are implemented. The imposition of specific obligations related to reference offers and publication are presented in chapter 8.

7.3.2 Com4, Lyca, Network Norway, Phonero, TDC and Tele2

97. Network Norway, Phonero, TDC and Tele2 were not ordered to prepare and publish a reference offer for interconnection in Nkom's decision of 27 September 2010. This constituted a continuation of earlier decisions for these providers, with the exception of Tele2, which received more lenient requirements than in the decision of 8 May 2007. Lyca was not ordered to prepare a reference offer in the decision of 15 June 2011. The Authority held that such an order would be unnecessary since in practice these operators have used Telenor's and TeliaSoneras reference offers as a basis for the interconnection negotiations. Since the interconnection agreements currently in effect between these providers have been reached by negotiations and few amendments are made, it does not seem to be particularly necessary for these providers to prepare and publish their own complete reference offers. In Nkom's view, it will be sufficient that Com4, Lyca, Network Norway, Phonero, TDC and Tele2 publish their termination rates.

98. Lyca, Network Norway, Phonero, TDC and Tele2 have previously been required to submit to Nkom signed agreements for voice call termination on mobile networks and any changes to these, with the exception of agreements entered into with Telenor and TeliaSonera. Nkom holds that it is no longer necessary to be sent a copy of these agreements, and this obligation will therefore not be continued.

99. The price controls discussed in section 7.4 pertaining to Com4, Lyca, Network Norway, Phonero, TDC and Tele2, will limit the ability of these providers to make substantial changes in the prices they charge for the termination product. However, Nkom believes that issues related to factors other than price and the objective of predictability for other providers must be given weight. Pursuant to section 4-6, first paragraph, of the Electronic Communications Act (cf. fourth paragraph), Nkom believes that Com4, Lyca, Network Norway, Phonero, TDC and Tele2 must be ordered to give notice to other providers of any changes to existing services that disfavour the other parties no later than two months before the change is implemented.

100. Nkom finds that the transparency obligations being imposed on Com4, Lyca, Network Norway, Phonero TDC and Tele2 are proportionate and well suited to streamlining the access obligations. The companies covered by the decisions of 27 September 2010 and 15 June 2011 are having their obligations reduced through the discontinuation of the obligation to submit signed and amended interconnection agreements, while the remaining obligations constitute a continuation of existing obligations. The obligations are new for Com4, which is now having specific obligations imposed for the first time. The Authority cannot see that an obligation as outlined above will cause the companies to incur appreciable costs or inconveniences.

101. Furthermore, Nkom believes as mentioned above that the provisions of the Competition Act will not be sufficient to safeguard the considerations behind the transparency obligations. In this context reference is made to Nkom's assessments in section 7.3.1.

Conclusion

102. Pursuant to section 4-6, third and fourth paragraphs, of the Electronic Communications Act, Nkom imposes an obligation on Com4, Lyca, Network Norway, Phonero, TDC and Tele2 to publish their termination rates. Pursuant to section 4-6, first paragraph, of the Electronic Communications Act (cf. fourth paragraph), Nkom orders Com4, Lyca, Network Norway, Phonero, TDC and Tele2 to give advance notice to other providers of any changes to existing services that disfavour the other parties no later than two months before the changes are implemented. The imposition of specific obligations related to reference offers and publication is presented in chapter 8.

7.4 Price controls

103. In chapter 5 Nkom has shown that excessive pricing and cross-subsidisation are potential competition problems in the relevant market.

104. Pursuant to section 4-9 of the Electronic Communications Act, the authorities may impose price obligations for access and interconnection on providers with significant market power in cases where the provider can exploit its market power to the detriment of the end users by sustaining a disproportionately high price level, or by subjecting competing providers to price squeezes.

105. Section 4-9 of the Electronic Communications Act sets no requirement that the regulated provider actually does charge a disproportionately high price: It is sufficient that the provider with significant market power might potentially do it in the future. As stated in the description of the competition problem of excessive pricing, Nkom believes the condition for price regulation of the relevant termination markets has been met.

106. In the Authority's opinion, remedies such as reference offers, publication and non-discrimination are insufficient to counteract competition problems related to excessive pricing. Price regulation is therefore necessary to remedy the competition problem of excessive pricing and thus prevent the unfortunate consequences described in chapter 5.

7.4.1 Starting point for regulation

107. The price controls in this decision are based on Nkom's and the Ministry of Transport and Communications' previous decisions in the markets for voice call termination on mobile networks. In addition, the European Commission and the EFTA Surveillance Authority (ESA)'s recommendation on the regulation of termination rates (cf. section 7.4.1.2) and the general objective of harmonisation have played an important role in shaping this decision.

108. It follows from the current decision that an impact assessment will be conducted during the course of the regulatory period to assess the consequences of only including traffic-related costs and excluding all coverage costs from the LRIC calculation in Norway[19]. The consequences of using pure LRIC as the basis for the calculation of costs are considered in section 7.4.3.

7.4.1.1 Nkom's and the Ministry's previous decisions in the markets for voice call termination on mobile networks

109. Table 2 in this document provides an overview of the timing of the imposition of obligations on providers of termination with significant market power. In connection with Nkom's decision of 8 May 2007 the Authority performed a thorough assessment of a number of methods for determining the cost of termination. The Authority concluded that the development and implementation of the LRIC model would be appropriate in this market, a view that was supported by the Ministry of Transport and Communications, the Norwegian Competition Authority and ESA. In this decision the price controls were based on gradual reduction towards the efficient costs based on LRAIC+++[20]. A detailed justification for the choice of cost method was given in the decision.

110. The price cap regulation in the decision of 8 May 2007, followed by the decision of 17 November 2008 and the Ministry of Transport and Communications' decision of 19 May 2009, resulted in the continued use of LRAIC+++ as the basis for price setting and also led to asymmetric termination rates for the purpose of sustainable competition.

111. Nkom's decision on termination on mobile networks of 27 September 2010 covered all the providers of termination on mobile networks. This time the price regulation was designed on the basis of calculated efficient costs based on LRAIC without any mark-up for common costs. New rates were implemented using a glide path with gradually reduced prices for all the providers down towards symmetric rates from 1 July 2012. After that efficient, symmetric prices based on LRAIC[21] were to apply from 1 January 2013. The decision was appealed.

112. The Ministry of Transport and Communications made a decision in the appeal case on 11 May 2011, upholding Nkom's decision with the exception of the maximum prices for Tele2 and Network Norway. For these providers the Ministry of Transport and Communications decided to extend the period with asymmetric rates and to set a higher maximum price in the period until 1 January 2013.

[19] Nkom's decision of 27 September 2010, section 6.4.3.2.

[20] LRAIC+++ (Long Run Average Incremental Costs) includes a mark-up for common costs and business overheads.

[21] LRAIC without mark-up for common costs and business overheads. LRIC is often used as a generic term for LRAIC and LRIC with and without a mark-up as well as for pure LRIC.

113. Lyca launched retail services in Norway in April 2010. The services are based on an access agreement with TeliaSonera. On 15 June 2011 Lyca was identified as a provider with significant market power, and Nkom imposed the same price cap regulation on Lyca as for other MVNOs, including Phonero and TDC.

114. On 19 September 2011 the Ministry of Transport and Communications received a request for extension of the period with asymmetric prices from Tele2 and Network Norway to enable them to fund the further expansion of their mobile network beyond 75 per cent population coverage. The reason for this was that the companies had revised their business plans and found it was necessary for the establishment of a competitive third mobile network that the network was large enough that they could manage without national roaming. Nkom considered this request. Nkom's network analysis showed that there was considerable spare capacity in the existing networks. At the same time the competition analyses identified a number of factors that indicated that a third mobile network ought to have a higher degree of coverage than 75 per cent to be able to compete effectively with the established network owners to a sufficient degree. Nevertheless Nkom concluded that any competition problems linked to access to mobile networks ought to be addressed through further regulation of Market 15 and not in the termination markets. Further, the Authority found that the owners of the third network had commercial incentives to continue expanding the network beyond 75 per cent population coverage, and that further roll-out could therefore be expected without publicly controlled subsidies. Nkom rejected the request in its decision of 26 June 2012.

115. Tele2 and Network Norway appealed Nkom's decision. The Ministry of Transport and Communications concluded that it would be commercially profitable for the companies to continue expanding the network beyond 75 per cent population coverage and upheld Nkom's decision of 20 December 2012. Symmetric termination rates based on LRAIC were thus introduced in Norway from 1 January 2013.

7.4.1.2 The Commission and ESA's recommendation on the regulatory treatment of fixed and mobile termination rates on 7 May 2009.

116. In view of the need for harmonised regulation of termination charges, the Commission published its recommendation on the regulatory treatment of fixed and mobile termination rates on 7 May 2009[22]. ESA published an identical recommendation on 13 April 2011[23]. The Commission and ESA stated that the Recommendation was important for a number of reasons, including to provide greater legal certainty for the operators and the right incentives for potential investors, as well as to reduce the regulatory burden on existing operators that are currently active in several countries.

117. In the Recommendation, cost orientation is considered the most appropriate instrument for remedying the competition problem of excessive pricing. Moreover, the Recommendation states that the authorities shall establish termination rates based on costs for an efficient operator, which means that prices will also be symmetric, cf. the Recommendation, point 1. According to the Recommendation, this regulation will promote efficiency and sustainable competition and maximise consumer welfare. LRIC is recommended as a method for determining costs; cf. the Recommendation, point 2. Additional guidance related to the development of the recommended LRIC model (pure LRIC) will be discussed in section 7.4.3.

118. According to the Commission, only different frequency licences can provide a basis for sustained asymmetric termination rates. Sustained asymmetry also implies that the

[22] The Commission's Recommendation: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:124:0067:0074:EN:PDF
[23] ESA's recommendation: http://www.eftasurv.int/media/internal-market/ESAs-Recommendation-on-termination-rates.pdf

frequencies are assigned directly without the use of market-based allocation mechanisms (e.g. auctions) and that there is not a functioning secondary market, cf. recital 16 and point 9 of the Recommendation.

119. However, the Commission and ESA take into consideration that new providers may have higher unit costs in the initial phase before they achieve an efficient volume ("minimum efficient scale"). In special cases, national regulatory authorities can permit new providers a transitional period of up to four years from launch to take into account the cost disadvantage due to scale disadvantages, cf. recital 17 and point 10 of the Recommendation.

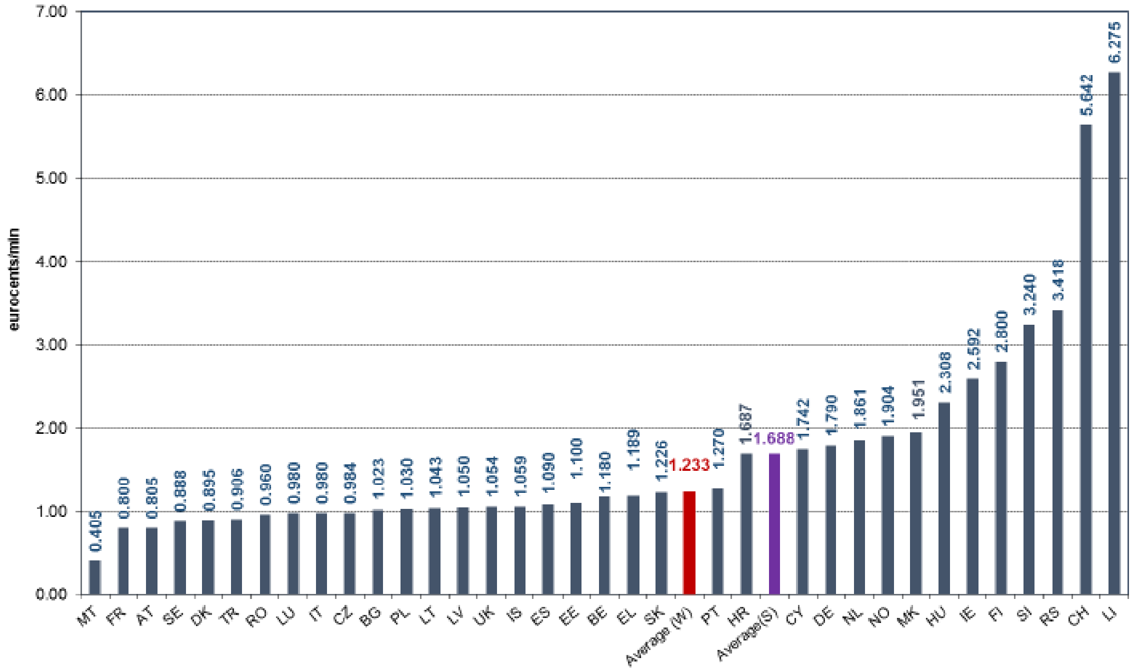
120. In the Recommendation, it is assumed that national regulatory authorities shall ensure that termination charges are set at a cost-effective, symmetric level by 31 December 2012[24].

7.4.1.3 Harmonisation in Europe

121. Termination rates in EEA countries have been substantially reduced in recent years. The trend will undoubtedly continue over the next few years, partly as a result of the Commission's recommendation that the price controls on termination charges be based on pure LRIC from 1 January 2013.

122. The Body of European Regulators for Electronic Communications (BEREC)[25] prepares on a regular basis price comparisons for countries in Europe. A comparison from July 2014 shows that the weighted average termination price in Europe is 1.233 eurocent (approx. NOK 0.1 based on exchange rates per July 2014[26]). At the same time, the average rate in Norway was 1.904 eurocent (approx. NOK 0.16). BEREC's price comparison from July 2014 is shown in the figure below.

Average MTR per country – July 2014



---

[24] Nkom regards the exception stipulated in point 12 of the Recommendation for regulatory authorities with limited resources as irrelevant to Norway.

[25] http://berec.europa.eu/eng/document_register/subject_matter/berec/reports/4794-termination-rates-benchmark-snapshot-as-of-january-2014-integrated-report-on-mobile-termination-rates-amp-sms-termination-rates

[26] http://www.norges-bank.no/statistikk/valutakurser/

Figure 1: Average termination rates in European countries at July 2014, in eurocents per minute.

123. On the basis of gathered information Cullen International[27] has compiled the following overview showing how far European national regulatory authorities have come in terms of notifying or adopting termination rates based on pure LRIC. The overview also shows that the price level in countries that have introduced termination rates based on pure LRIC varies between approx. 1.3 and 0.8 eurocent for the period January 2013 to January 2015.

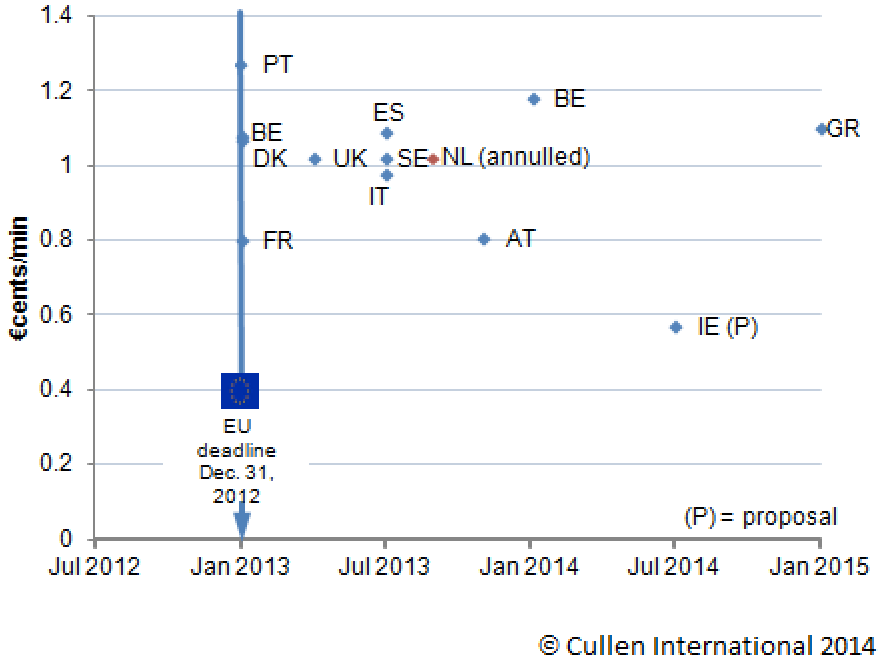


Figure 2: Level and date of introduction of termination rates based on pure LRIC. Source: Cullen International 2014

124. In line with the determination of termination rates in the EEA countries on the basis of the Recommendation, the prices show a downward trend, at the same time as the prices are now largely symmetric within the individual countries. In this context it is also relevant to point out that in those cases where the national regulatory authorities have announced price controls that deviate from the Recommendation, the Commission has lodged formal objections[28]. For example, decisions to regulate termination charges in the Netherlands, Spain and Germany on the basis of methods that deviate from the use of pure LRIC have led to objections from the Commission. As a general rule BEREC has agreed with the Commission's objections[29] if the termination rates have been determined using a cost basis other than pure LRIC. The objections have resulted in the norm that the national regulatory authorities adapt their decisions to ensure that they satisfy the Commission.

[27] http://www.cullen-international.com/

[28] Articles 7 and 7a of the Framework Directive provide for a harmonisation procedure whereby parts of decisions in Member States must be approved by the Commission.

[29] An overview of cases where the Commission has objections to the proposed regulation of termination rates is available at: http://www.cullen-international.com/cullen/telecom/europe/states/markanalv2/manphase2.htm

125. The above shows a trend where termination rates are falling and where price setting is increasingly being based on pure LRIC. At the same time, however, there are still relatively large variations in the price levels between the various European countries, meaning that the goal of a harmonised price level cannot yet be said to have been reached.

7.4.2 LRIC as a price control method

126. Nkom assumes that the markets for voice call termination shall be regulated according to principle 2, cf. section 6.1. This means, as mentioned, that the Authority shall facilitate to the greatest extent possible the efficient use of existing infrastructure, as well as facilitate a sufficient profit to provide incentives for necessary maintenance, upgrading and investment.

127. In the termination markets, where Nkom believes that price controls are necessary to prevent excessive pricing, the Authority assumes that the regulated price should mimic prices that would have arisen in a market with effective competition. Such a price will give mobile operators incentives to produce the termination service at the lowest possible cost. Simultaneously, the operators who have requested termination are given incentives to optimise their own investment decisions, in much the same way as if the subscribers had had the opportunity to choose between several competing networks to terminate a call. In this way price controls can contribute to efficient utilisation of social resources.

128. Nkom considers that LRIC (Long Run Incremental Costs) is a recognised and well-documented method for calculating the costs on which the operators would have based pricing in a market with effective competition. Nkom performed a thorough assessment of a number of methods for cost determination for termination prior to the adoption of the LRIC method in the decision of 8 May 2007. This method has subsequently also been recommended by the Commission and ESA, cf. section 7.4.1.2. Most European countries now base their determination of the costs of termination on the LRIC method. In view of this, Nkom does not see a need to reassess this fundamental issue. However, it is necessary to update some parts of the conceptual choices of the LRIC model, and a number of key decisions must be made before Nkom finally decides how the results from the LRIC model will be specified and used in price controls. In the next section Nkom will give an account of the assessments that have been made in connection with introducing the use of pure LRIC as the cost basis in Norway.

7.4.3 Assessment of introducing use of pure LRIC in Norway

7.4.3.1 LRAIC versus pure LRIC

129. In the current period Nkom is using LRAIC[30] as the cost basis for determining the termination rates for both the fixed and mobile networks. Up until the decision of 27 September 2010, the termination rates in Market 7 were based on LRAIC+++. An important premise in the aforementioned decision for the introduction of LRAIC (without mark-up) as the cost basis was the Commission and ESA's recommendation that termination rates be set on the basis of pure LRIC[31].

130. In its decision of 27 September 2010, Nkom largely used the same arguments from economic theory as ESA and the Commission for changing the cost basis from LRAIC+++ to LRAIC. The decision to exclude common costs, location costs and business overheads was in part based on the fact that the market for termination is bilateral, and the view that both the operator that initiates a call (origination) and the subscriber that receives the call (termination) should cover a portion of the total costs of termination. Nkom also found that common costs could probably be covered more efficiently in the retail market where there is competition.

[30] LRAIC (Long Run Average Incremental Costs) without any mark-up for common costs and business overheads.
[31] EC Recommendation of 7 May 2009 on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EU (2009/396/EC)

131. According to the Recommendation, the termination rates must not include any mark-up for common costs, but should only reflect the true, pure, variable costs of providing terminated calls. In practice, pure LRIC means that only traffic-driven costs are taken into account, while all common costs, such as the coverage components of the radio network, are excluded from the cost basis. The method entails that the LRIC model is run twice to calculate LRIC for an operator that offers several services, with and without the termination service included. The difference between these two cost results is pure LRIC or the avoidable cost of termination. The differences between pure LRIC, LRAIC and LRAIC+++ can be illustrated in simplified terms as follows.

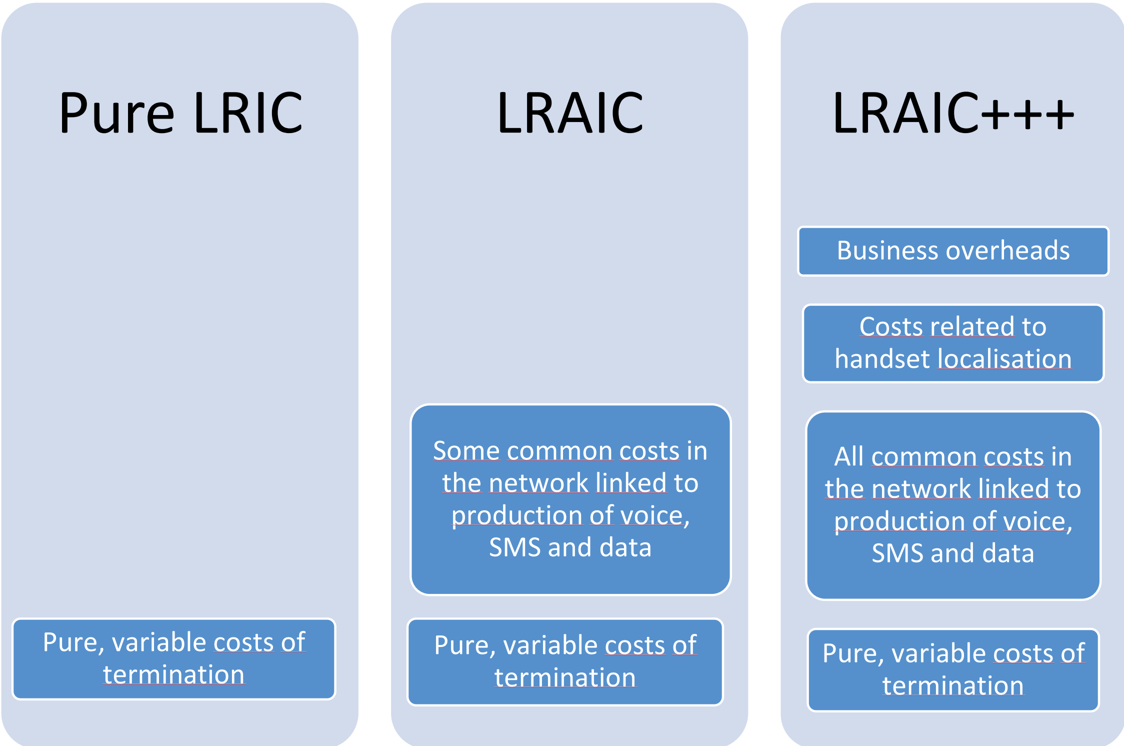


Figure 3: Simplified presentation of pure LRIC, LRAIC and LRAIC+++

132. At the time of the decision in 2010 Nkom held that it would be difficult to introduce pure LRIC in Norway from 1 January 2013 in line with the Recommendation. The main reason for this was that the preliminary results for pure LRIC, which were based on version 7.1 of the model, seemed relatively low at that time compared with a number of other countries in Europe (including Denmark, the Netherlands and Belgium). It seemed paradoxical that lower termination prices were calculated for Norway with its sparse, widespread population than for the aforementioned countries, which are much more densely populated. In Norway the building of mobile networks is driven more by coverage needs than traffic, and thus the total operating and investment costs in Norway may nevertheless be higher relative to the number of subscribers. One reason why pure LRIC seems relatively low in Norway is the nature of the LRIC method: The method isolates the true variable costs of termination. The sizeable coverage costs are less sensitive to the volume of terminated traffic, and thus the variable costs that are omitted when termination traffic is excluded will be relatively modest.

133. Similarly, pure LRIC has an opposite relationship to volume compared with LRAIC+++. With low volumes the results for LRAIC+++ will tend to be relatively high, as there is little volume to which common costs can be allocated, and then fall as volume increase and economies of scale come into play. By contrast, the unit costs based on pure LRIC will be low

at low volumes since the already established coverage network has available capacity, and then increase as the capacity on the network has to be increased in order to handle more traffic. This is illustrated in the figure below.

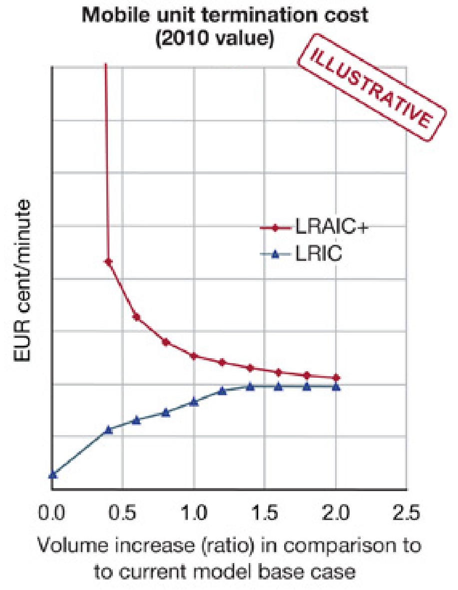


Figure 4: Developments in LRAIC and LRIC at different volumes. Source: Analysys Mason

134. Nkom was concerned that pure LRIC would result in disproportionately low termination rates in a country with large (and expensive) coverage networks and a smaller traffic base than in many other European countries. The LRIC model version 7.1 showed that the pure LRIC result constitutes approximately half of the LRAIC result for the operator with the highest costs.

135. When Nkom issued a new decision in the market for call termination on the fixed networks (Market 3) on 1 August 2011, it was important to ensure a consistent approach for the mobile networks and the fixed network. One of the objectives of the Recommendation, in addition to contributing to the harmonisation of cost determination among the EEA countries, was precisely to promote harmonisation of the termination rates between mobile and fixed networks. In 2011 Nkom decided to use LRAIC as the cost basis for termination on the fixed network, referring to the same arguments about the bilateral nature of the market.

136. In connection with Nkom's assessment of whether pure LRIC or LRAIC should be used as the cost basis in Market 7 in the next regulatory period, it is natural to use the identified problems that the Recommendation is intended to address as a starting point, including *fundamental competitive distortions* and *regulatory uncertainty.*

137. *Fundamental competitive distortions* are caused by transfers between different mobile operators' end users, between different operators' end users in the fixed and mobile networks, and between different operators' end users in different countries. Termination rates that are higher than warranted by the underlying costs can lead to significant payments from small to larger operators (due to the unequal distribution of on-net / off-net traffic) and higher retail prices for initiating calls and possibly decreased consumer welfare[32].

[32] The Recommendation, recital 3.

138. *Regulatory uncertainty* may arise as a result of the different national regulatory authorities choosing different approaches to the determination of termination rates. This can lead to lower willingness to invest and a heavier regulatory burden for operators that active in several countries[33].

139. Nkom shall as far as possible adhere to the guidelines provided in the Recommendation. It is stated in the Recommendation that the greater the gap between the termination rates and pure LRIC, the greater the competition-distorting effects between the fixed and mobile networks and/or between companies with asymmetric market shares and traffic patterns. If Nkom chooses not to introduce pure LRIC in Norway, the benefits of doing this must therefore outweigh the competition-distorting effects described here, or it must be the case that the adoption of pure LRIC in Norway will have even greater negative effects for the operators and consumers than continuing to base the prices on LRAIC in the next regulatory period.

7.4.3.2 Probable consequences of introduction of pure LRIC for mobile termination in Norway

140. The Norwegian mobile market is characterised by high penetration of users. At mid-2014 the providers reported a total of almost 6 million mobile phone subscribers. Many end users are switching from using a fixed-line telephone to using a mobile phone, and nearly 80 per cent of the total traffic in first half of 2014 originated on mobile networks[34]. The technology is also changing rapidly. Both Telenor and TeliaSonera have launched LTE and have announced further roll-out in the wake of the 800/900/1800 MHz auction, which took place in December 2013. Compared with most other European countries, Norway is experiencing continued economic growth, and Norwegian consumers have relatively good ability to pay.

141. There is basically little to indicate that the competitive benefits entailed by termination rates based on pure LRIC cannot be realised in Norway, compared with, for example, Sweden and Denmark, where pure LRIC has already been introduced. Given that the Norwegian market is fairly concentrated and has limited competition on the network level, it is likely that a transition to pure LRIC will be able to have similar efficiency gains here as elsewhere in Europe. The economic efficiency gains that transition to pure LRIC is intended to yield can be assessed in terms of allocative efficiency, productive efficiency and dynamic efficiency[35].

Allocative efficiency

142. *Allocative efficiency* refers to the fact that the mix of products and services on offer maximises the overall welfare – for producers and consumers alike. If coverage of common costs is not allowed on the wholesale level, these costs will have to be recuperated in the retail market. By using pure LRIC, and thereby lower termination costs, a smaller proportion of the retail revenues that the mobile operators receive from their own customers will have to be spent to cover the costs of termination on other providers' networks. Revenues from termination will also be reduced correspondingly. This means that a larger share of the total costs must be covered by revenues from the provider's own end users instead of from subscribers to other networks. Much of the cost coverage will thus be more efficient in the competitive retail market than through regulated termination rates at the wholesale level.

143. Mobile operators already differentiate their prices based on different user groups (prepaid / post-paid subscriptions, high / low consumption and different voice, SMS and data packages). With the transition to pure LRIC, operators will be able to exploit customer

[33] The Recommendation, recital 4.

[34] Nkom report: "Det norske markedet for elektroniske kommunikasjonstjenester, 1. halvår 2014", page 6 and 7.

[35] See for example http://www.regjeringen.no/nb/dep/jd/dok/nouer/2002/nou-2002-18/17/2.html?id=368421 for an explanation of the various types of economic efficiency. Allocative efficiency means that resources are channelled to those areas where they will yield the greatest returns and that there are no markets or regulatory factors that restrict production relative to what is optimal. Productive efficiency means that any quantity of services is produced at the lowest possible cost given the production conditions.

preferences and opportunities for price discrimination in order to cover a larger share of their common costs from their own end users, and since the operators have better knowledge of the elasticity of demand than the authorities, this will result in an increase in overall welfare.

144. Although it can be argued that termination is less price-elastic than the sum total of all the retail services, and that a mark-up in the wholesale market will lead to increased allocative efficiency, this could have a different effect for subscribers of operators with a net profit from termination compared with operators with a net loss from termination. Providers who have larger revenues than expenses from termination will be able to benefit from these kinds of transfers in that the surplus income can be used to subsidise handsets, etc. Providers whose expenses are greater than their revenues from termination will most likely lose money. Norwegian traffic data indicate that the traffic flows between the operators are relatively evenly balanced and that this effect will be offset at the aggregate level. By their very nature, balanced traffic flows suggest that the consequences for allocative efficiency will in all probability not be especially large if the termination rates are symmetric and are lowered on the grounds of a transition from LRAIC to pure LRIC as the cost basis. The traffic flows are presented in the table below[36].

	Lyca	Network Norway	TDC	Tele2	Telenor	TeliaSonera
From other mobile networks	75 448	735 697	53 130	540 286	2 002 078	1 438 564
To other mobile networks	16 844	717 991	42 389	509 579	1 763 094	1 756 442
+/- termination	58 604	17 706	10 741	30 707	238 984	-317 878

Table 3: Incoming and outgoing traffic minutes (measured in 1,000 minutes) to other mobile operators, domestic traffic (excluding on-net traffic and traffic to / from the fixed network), full year 2013. Source: Nkom's ecom statistics.

145. Allocative efficiency is also discussed in connection with the so-called network externalities and distribution issues. If there are positive externalities that cannot be realised by setting the price as equal to the long-term marginal cost (pure LRIC), a mark-up in price might lead to increased welfare. Such a mark-up could be used by the operators to fund subsidised handsets, for example. However, in well-developed markets, such as the market in Norway, with high penetration of subscriptions and unused handsets per household[37], there is little to suggest that there is a general need to subsidise new handsets to attract more subscribers to the mobile networks. Purchasing power in Norway and the forecasts for economic growth[38] are other factors that also argue against the need for this kind of subsidy to realise potential network effects in the future.

146. Several studies have been conducted to ascertain how lower termination rates affect the welfare of different groups of consumers, including marginal groups. One concern has been that marginal groups (for example, groups with low ability to pay and/or low consumption) will suffer if the operators, as a result of increasingly differentiated prices in the retail market, raise their prices for the cheapest subscriptions. This may have a huge impact for customers that generate more inbound than outbound traffic. However, studies[39] performed in other countries

[36] Phonero is not included in this table due to insufficient data.

[37] http://www.aftenposten.no/okonomi/innland/Vil-ta-mobilbrukerne-i-nakken-5353245.html

[38] https://www.ssb.no/nasjonalregnskap-og-konjunkturer/artikler-og-publikasjoner/ny-konjunkturoppgang-forst-i-2015

[39] See, for example, Ofcom's consultation in 2010: http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/summary/wmvct_consultation.pdf, pages 147 and 148, cf. http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/annexes/wmvct_annexes.pdf pages 219 and 220.

indicate that low-wage groups are more evenly distributed across the different categories of subscription and between those who only have fixed or mobile subscriptions than might normally be expected, and there are grounds to believe that the situation in Norway does not differ significantly from the findings of these studies.

147. It is also interesting to look at the impact of changes in prices for the welfare of senior citizens. Nkom's survey of the population's use of electronic communications services[40] found that people over the age of 66 years are overrepresented among the customers who have a fixed telephony subscription. A study from Ireland draws a similar picture, indicating that citizens over the age of 65 years are overrepresented among the customers who only have a fixed telephony subscription[41]. It is highly probable that these subscribers would be better off with a significant reduction in the termination rates, assuming that such a reduction in termination rates would make it cheaper to call from fixed networks to mobile networks.

148. As stated above, there are several factors related to distributional issues that argue in favour of a transition to pure LRIC in Norway. It is likely that a more efficient allocation (mark-up) of common costs to competitive retail services will improve welfare in the Norwegian market.

Productive efficiency

149. *Productive efficiency* means that products and services are produced at the lowest possible cost, given the available resources. As mentioned above, the prospect of no longer having the common costs of the termination product covered will increase the focus on cost control and cost efficiency, as providers will have to have these costs covered by their own end users. In addition, symmetric termination rates will mean that no operators will be compensated for any higher costs than their competitors, entailing that all operators will have an incentive to produce efficiently.

150. Lower price caps on termination will curtail the operators' opportunity to set prices that are higher than the cost of producing termination in the wholesale market. However, the providers of mobile telephony tend to focus on the retail market, and a significantly larger proportion of the total revenue is generated in the retail markets than in the termination markets. Providers are expected to strive for high retail income and low production costs. It is therefore natural to assume that competition in the retail market has the greatest impact on productive efficiency. Furthermore, it is to be expected that the providers' desire to increase production efficiency will result in increased investment and innovation.

Dynamic efficiency

151. *Dynamic efficiency* has a forward-looking perspective and pertains to the facilitation of innovation and investment in the short term with a view to increasing production efficiency over time. Introducing pure LRIC as the cost basis will help boost competition in the retail market by making it easier for smaller operators to compete with the price the larger operators offer for on-net traffic, including subscriptions with advantageous rates for family members, etc. If the authorities allow higher termination charges than indicated by a cost basis based on pure LRIC, this means that it is permitted for operators to charge a higher rate for off-net traffic than the costs associated with terminating calls on their own network. Nkom has previously stressed that this kind of price makes it difficult for operators to offer subscriptions with unlimited use since real calling patterns, including the distribution of on-net versus off-net traffic, are unknown at the launch of new services. Developments in the retail market have resulted in a marked shift towards package pricing based on data usage, and many of these

[40] http://www.nkom.no/marked/ekomtjenester/statistikk/det-norske-ekommarkedet-rapporter/_attachment/10955?_ts=1430fdc9760

[41] http://www.comreg.ie/publications/analysys_mason_report_-_fixed_and_mobile_termination_rates_in_ireland.583.104136.p.html

types of subscription do not have a limit on voice calls. Such a development is likely to give the largest networks with a high share of on-net traffic a competitive advantage vis-à-vis the smaller networks, since the latter bear a greater risk due to the expected lower share of on-net traffic (assuming the larger networks reap greater benefits from effects such as economies of scale than the smaller networks).

152. Statistics from the Norwegian market show that the proportion of a provider's total (inbound) traffic that is on-net varies from 85 per cent (Lyca) to 24 per cent (Tele2)[42]. It is still likely that on-net / off-net price discrimination will be in evidence to some extent in the Norwegian market. Smaller operators also offer Family subscription plans, and this pricing model has become an established part of the market. Fixed-price subscriptions, which have largely replaced the effect of Family subscription products, are now also offered by operators who do not have a nationwide network. This may be a sign that the competition-dampening effect of high off-net costs is decreasing in line with the declining termination rates. It is nevertheless likely that a continued reduction of the prices down to a level based on pure LRIC will serve to intensify competition between mobile operators further and enhance dynamic efficiency in the retail market. This will also make it easier for new operators without their own network to gain entry to the market.

153. Operators offering fixed telephony and operators offering both fixed and mobile telephony may, as a result of reduced termination rates, find themselves exposed to less financial risk if they can offer packages where airtime to mobile and fixed networks is included. The reduction in termination rates will therefore serve to increase the competition between fixed and mobile operators.

154. Regulatory predictability is essential to promote investment and facilitate dynamic efficiency. Regulatory uncertainty reduces the investment incentives, since the adjustments that are made to adapt to regulatory constraints may entail sunk costs, and thus in some cases changes in the regulatory regime may constitute a major disadvantage for the affected operators. The Commission and ESA's 2009 / 2011 Recommendation on termination rates means that the goal of harmonisation of termination rates at an efficient level has been common knowledge for several years. In light of this, one could say that the market has been expecting further reductions in the prices after the current regulatory period. This is also in line with the long-term goal of increasing convergence between the prices for call termination on fixed and mobile networks, despite the fact that these services are based on two different access technologies, which may entail absolute cost differences between the services.

155. Based on the above factors, it seems clear that the same cost and competitive benefits that pure LRIC is intended to trigger in the EEA are also likely to occur in Norway. In principle, more efficient cost coverage and heightened competition among the mobile operators and between fixed and mobile operators will provide grounds for differentiated and cheaper services for consumers and increased investments and innovation among operators.

7.4.3.3 Incentives to invest in coverage and harmonisation

156. One of the objections to basing termination rates in Norway on pure LRIC has been that this method of calculating termination costs may be less appropriate in a country with large coverage networks and a thin population base. Norway has one of the lowest population densities in Europe with 13 people per km^2[43]. The effect of excluding coverage costs as a relevant cost will thus have a greater impact on LRIC in Norway than in countries with a higher mobile subscriber density and more traffic relative to the established network capacity.

[42] Based on the full-year figures for 2013.

[43] http://no.wikipedia.org/wiki/Norge

157. By introducing pure LRIC, the termination rates will be regulated down from NOK 0.16 to NOK 0.065 in the next regulatory period (based on results from version 8 of the LRIC model). One question is whether a lowering of the price to this level will reduce the operators' incentives to invest in their own coverage network, as coverage components will no longer be included in the cost basis for the termination rate.

158. Before answering this, it is necessary first to find out to what extent the incentives to invest in their own infrastructure and coverage are affected by factors in the wholesale market and/or by factors in the retail market.

159. It is still a goal for the authorities in Norway to pave the way for further expansion of the mobile networks, cf. the following statement on the Ministry of Transport and Communications' website:

> *"One of the objectives of our work on electronic communications is to secure good, reasonably priced and future-oriented electronic communications services for users throughout the country. Nowadays the mobile phone has taken over much of the voice traffic from the fixed network, and in recent years people have started using the mobile networks for a growing number of services. Good, stable mobile coverage is therefore becoming increasingly important for people all over the country*."[44]

160. In light of these guidelines Nkom must assess whether the transition to pure LRIC will hamper attainment of this goal in Norway.

161. Telenor and TeliaSonera currently have close to 100 per cent population coverage for 2G. Telenor's 3G network has 95 per cent population coverage[45], while TeliaSoneras 3G network has slightly lower coverage. Both companies state that their 4G networks have achieved substantial population coverage[46] and have announced relatively aggressive plans for further roll-out. At the end of 2013 Tele2 had reached 75 per cent population coverage with its 2G / 3G network and has previously announced[47] that it was going to start rolling out 4G in the most densely populated areas. However, the outcome of the frequency auction in December 2013 meant that Tele2 had to return the licences for frequencies in the 900 MHz band in line with the spectrum licence, meaning its future network coverage may change. TeliaSoneras announced acquisition[48] of Tele2 has also created uncertainty regarding the future exploitation of Tele2's network. TelcoData[49] gained access to a number of important licences in the same auction and has announced that it will be making significant investments in a mobile network through the company ICE. The specific details of their plans have not yet been published.

162. There is much to suggest that the operators in the Norwegian market make decisions regarding investments in network coverage on the basis of the need to be competitive in the

---

44 http://www.regjeringen.no/nb/dep/sd/tema/telekommunikasjon/mobilutbygging-i-norge.html?id=439291

45 http://www.telenor.no/privat/dekning/utbygging.jsp

46 See TelecomRevy, 23 May 2014 where it is mentioned that Telenor has achieved 70 per cent population coverage at that time. See https://netcom.no/dekning/dekningsnyheter/artikkel/-/journal_content/56_INSTANCE_Zlb4/10156/2302676 where NetCom states that 166 municipalities now have LTE coverage and that the goal for the future is 98 per cent, cf. also the terms and conditions of the frequency auction in December 2013, where NetCom committed to expanding to 98 per cent within five years.

47 http://e24.no/digital/tele2-droemte-om-aa-eie-naa-maa-de-leie/22660778

48 On 18 July 2014 TeliaSonera AB notified that it was merging Tele2 Norway AS and Network Norway AS. The Norwegian Competition Authority is currently processing this matter.

49 TelcoData and ICE Norge and ICE Communications are all owned by the same owners, cf. http://no.wikipedia.org/wiki/Telco_Data. The licences are formally owned by ICE Communications, and the operations in Norway are performed through ICE, cf. InsideTelecom 6 March 2014.

retail market. The fact that Tele2 previously wanted to launch 4G services using a trial licence in the 1800 band illustrates just how important it is to offer new services to end customers before the market starts cementing. A similar tendency has been observed in other countries, including the United Kingdom where there has been fierce competition to be the first to launch LTE[50].

163. Network expansion does not appear to be negatively affected by steadily declining revenues from termination. Nor do symmetric price levels seem to have had a negative effect on the companies' levels of investment. This may also be a sign that competition in the retail market is a more important driver of investments in infrastructure than interconnection revenues.

164. Nkom believes that the considerations presented above suggest that a transition to pure LRIC is not expected to significantly reduce the operators' incentives to continue expanding their networks. In terms of timing, introduction of pure LRIC in the coming regulatory period will mean that the operators in Norway will have had slightly longer to adapt to pure LRIC than their counterparts in the other EEA countries, thereby ensuring compliance with expectations regarding regulatory predictability.

7.4.4 Calculation of efficient cost

7.4.4.1 Selection of model for calculating efficient cost

165. Nkom developed the original LRIC model (version 4) in collaboration with the consulting firm Analysys Mason in 2006. The original model calculated the costs for voice call termination on Telenor and TeliaSoneras 2G networks. Nkom used LRIC version 7.1 as the basis for its decision of 27 September 2010. This version calculates the carrier-specific costs for voice call termination on both 2G and 3G networks for real operators and for a hypothetical network operator. Nkom has now further developed and updated the LRIC model to version 8[51], which calculates the costs for voice call termination on the networks of Telenor, Tele2 and TeliaSonera.

166. Nkom's relatively long experience with cost modelling based on LRIC has shown that there are only minor cost differences between the various Norwegian network operators. In view of this insight, and based on the recommendation that pricing should be based on the costs of an efficient operator, Nkom has successfully developed a model variant for a generic operator. This approach has also been used in other European countries, including both Sweden and Denmark.

167. Nkom has not identified a need to update the cost models for MVNOs, mainly because the previous cost models showed that there were not significant differences in costs between MNOs and MVNOs for that part of the production that MVNOs supply themselves.

168. Version 8 of the LRIC model has been designed on the basis of traffic data for 2013. In the first quarter of 2013 cost data and network data were collected from the operators, and updated coverage calculations have also been performed.

169. In light of the fact that the model is a further development of a well-established tool that produces results for both real network operators and for a generic operator, Nkom finds that version 8 of the LRIC model provides the Authority with a very good basis for defining efficient rates in the coming regulatory period.

[50] http://www.bbc.co.uk/news/technology-19786041

[51] The LRIC model version 8 draft was subject to a national consultation from 4 March to 8 April 2013. The model and results yielded by the model have been presented and discussed with the operators both prior to and in the wake of the consultation.

7.4.4.2 Various methodical approaches in the LRIC model

170. Version 8 of the LRIC model calculates the long-term incremental termination costs for operators based on different methodological approaches. The model calculates the termination costs for Telenor, Tele2, and TeliaSonera and for a generic operator, based on the same principles used in the original version, i.e. LRAIC+++ (mark-up for common costs, location costs and business overheads), LRAIC and pure LRIC.

171. Pure LRIC is calculated in line with the Commission and ESA's Recommendation and does not include a mark-up for common costs.

172. In its decision of 27 September 2010 Nkom stated that the mark-up for common costs, handset localisation and business overheads in the termination rate would not be included in the calculation of efficient price. Nkom's main reason for this is that the operators still have the opportunity to cover these costs in the retail market where prices are not regulated. Nkom stressed that removing these mark-ups from the regulated termination charge will provide efficiency incentives if these costs instead must be covered in the retail market where there is competition. The operators will then have incentives to reduce these common costs to the greatest extent possible in order to be competitive on price to the end customers, cf. also the previous discussion of allocative efficiency.

173. Based on the discussions above, Nkom finds that mark-ups for common costs, handset localisation and business overheads shall not be included in the calculation of efficient price.

174. Furthermore, the Commission and ESA's Recommendation states that only traffic-driven costs should be included. In practice this means that the LRIC model is run twice to calculate LRIC for an operator that offers more services with and without the termination service included. The difference between these two cost results is pure LRIC or the avoidable cost for termination.

175. In the 2010 decision Nkom held that the results based on pure LRIC were relatively low in Norway compared with a number of other countries in Europe and concluded that LRAIC without mark-up for common costs should form the basis for the regulated termination price in the current regulatory period. As already discussed, however, the level of termination charges in Europe has since fallen. The results for Norwegian mobile operators provided by the updated LRIC model can thus no longer be regarded as significantly lower than for other countries.

176. By setting termination rates on the basis of pure LRIC using the LRIC model annexed to this decision, the Norwegian termination rates will not be markedly lower than in other countries it is natural to compare Norway with. Thus there are no grounds for claiming that the termination rates have negative consequences for harmonisation and investment across national borders.

177. A thorough overall assessment suggests that the positive effects of switching to pure LRIC that other national regulatory authorities (the Danish Business Authority, the Swedish Post and Telecom Authority (PTS), Ofcom, etc.) have identified will most probably also occur in Norway, and there are few arguments against Nkom not introducing pure LRIC in the coming regulatory period. Nor is it likely that the transition to pure LRIC would reduce the operators' incentives to continue expanding their networks.

178. On the basis of the assessments discussed in section 7.4.3 and the impact assessments in section 7.4.9, Nkom has concluded that pure LRIC is suitable as a price control methodology in Norway.

7.4.4.3 Selection of operators for determining efficient price

179. As mentioned, Nkom has had operator-specific LRIC models developed in addition to a LRIC model for a generic operator. The LRIC model calculates the costs from a bottom-up

perspective and therefore uses relevant price information from the operators. The bottom-up calculations are calibrated against accounting information provided by the operators (top-down), thereby ensuring a hybrid perspective.

180. The attached model documentation specifies the underlying assumptions used in the models. The modelling of a generic operator was based on data derived from information provided by existing operators. The generic operator is not identical to any of the existing operators; rather the model indicates the costs for a hypothetical operator that has a business that is representative of the operators in the Norwegian market. In Nkom's opinion the way in which the generic operator has been modelled satisfies the Commission and ESA's general efficiency requirements, cf. the Recommendation on termination rates.

181. In light of the outcome of the frequency auction in December 2013[52] it can be queried whether the frequency assumptions used in the modelling of Tele2 are realistic and thus whether the generic model is representative. Nkom has assessed if there is a need for updating the model using new spectrum allocation data and has concluded that it is not necessary, in part because any changes in the spectrum assumptions would not alter the outcome of the LRAIC or pure LRIC calculations.

182. In connection with Nkom's assessment that there is no need to modify the model, it is also pertinent to refer to analyses conducted in 2011 and 2012 as a result of Tele2's request for extension of the period with asymmetric termination rates to finance the development of a third mobile network beyond 75 per cent population coverage. Nkom concluded that an efficient market structure requires three networks where the third network has more than 75 per cent population coverage. At the same time Nkom also claimed it was overwhelmingly probable that Tele2 would have incentives to continue rolling out its network without any help from asymmetric termination rates[53].

183. The assessment of efficient market structure in Norway is based on Telenor and TeliaSoneras existing mobile networks and Tele2's mobile network, which is still being rolled out. Nevertheless, the frequency auction in December 2013 led to changes in the right of disposal for some of the main frequencies that the Tele2 model is based on, and it is unclear how these frequencies will be used. Among other things, it is uncertain whether the 1800 MHz frequencies will be used for LTE, in which case they would be beyond the scope of the LRIC model. Nor is it clear how the 900 MHz frequencies that were at Tele2's disposal will be used in the future, but it cannot be ruled out that they will be used for 2G / 3G voice[54]. As long as these uncertainties exist, there will also be uncertainty linked to making discretionary changes in the spectrum assumptions in the LRIC model, and Nkom has found it most appropriate to uphold the assumptions used in the model. Regardless, the operator-specific model for Tele2 provides a good picture of an efficient operator and is thus a relevant input in the basis for deriving a generic operator.

184. The previous models and the updated model both indicate that there are no significant cost differences that can justify imposing different termination rates on the different operators. Nor is there any evidence to suggest that some of the networks are inefficient. By deriving a model for a generic operator on the basis of operator-specific, efficient models, the efficiency requirements linked to the generic operator will be satisfied. It is also an advantage that the LRIC model used as a basis for price controls is available for everyone involved and that it does not include operator-specific information that is exempt from public or party disclosure.

[52] In the auction Tele2 did not achieve spectrum as they had wanted, and was initially supposed to return their 900 MHz licences 1 October 2014. However, the company has agreed with ICE to borrow a 5MHz block until April 2015.

[53] http://www.nkom.no/marked/markedsregulering-smp/marked/marked-7/_attachment/2346?_ts=139b9c2a05b.

[54] Cf. for example the fact that Tele2 has applied for an extended period of use for the 900 band, InsideTelecom 25 June 2014

185. Nkom holds that the generic operator provides a robust cost model for an efficient operator and that it is thus well suited as a basis for pricing in the coming regulatory period.

7.4.5 Assessments relating to mobile VoIP[55]

186. In its decision of 11 May 2011 the Ministry of Transport and Communications encouraged Nkom to include assessments of the longer-term issues surrounding the increased use of mobile VoIP in the assessment of the impact of introducing price controls based on pure LRIC. This suggestion was based on Telenor and TeliaSoneras claims that symmetric termination rates based on a cost standard (LRAIC and possibly pure LRIC) that differs from fully allocated costs does not sufficiently take into account the cost-related challenges that the growing use of new services (mobile VoIP, etc.) entail for the mobile operators.

187. Network owners have expressed concern that increased use of mobile VoIP may lead to a reduction in circuit-switched mobile traffic and that the revenues generated by voice telephony may decline. The market operators have been critical to the specific design of the price controls too, especially the fact that pure LRIC does not provide cost coverage for fully allocated costs. In connection with the current decision in termination markets, some operators claimed that increasing traffic originated as a VoIP service and terminated in a circuit-switched mobile network, where the mobile operator is obliged to offer termination at a price cap that doesn't cover fully allocated costs, may lead to mobile operators neither earning any profit nor covering their costs.

188. In terms of cost determination, Nkom refers to recommendation number 4 in the model documentation for the LRIC model. It is explained in the documentation that an LTE network has not been explicitly modelled, but that migration to new technology and allocation of infrastructure costs for different technologies have been included in the model.

189. In connection with Nkom's decision of 27 September 2010 the Authority referred to a report from Analysys Mason that forecast that mobile VoIP would represent a relatively modest volume in the coming years[56]. Telenor believed that the potential for mobile VoIP was larger, and that its prevalence would have major consequences for competition between traditional mobile operators and OTT[57] operators.

190. It is still very unclear how mobile VoIP will develop in the future. Analysys Mason predicts a global development of OTT VoIP services where the numbers of users of such services will more than double from 2013 to 2018[58]. In respect of the development in services in Norway, however, there is considerable uncertainty about the prevalence, volume growth and consequences for the operators[59].

191. In February 2014 Facebook acquired the messaging service Whatsapp and has announced that they will also offer voice services in this application. Telenor has characterised this as posing an enormous threat to the telecom operators[60], whereas in Nkom's perception of the situation, the threat will be smaller in Norway than in other countries where Telenor is present. In Norway the network operators are focusing on the further expansion of the fourth generation (4G / LTE) mobile network – a network designed for data traffic and packet-

[55] Mobile Voice over Internet Protocol, such as Skype.

[56] "Mobile VoIP: operators must re-evaluate their core portfolio", Analysys Mason research report March 2011, Steven Sale.

[57] "Over-the-top" (OTT), for example, Google and Skype.

[58] http://www.analysysmason.com/Research/Content/Reports/OTT-communication-services-worldwide-forecasts-20132018/#13%20December%202013

[59] Cf. for example Torstein Olsen's article on Telecruise dated 8 May 2014, InsideTelecom 12 May 2014.

[60] Cf. Teleforum 2014, for example InsideTelecom, 4 March 2014.

switched communication. Telenor has announced that the company also wants to offer voice over LTE (VoLTE) from 2015[61]. The reason for the switch to VoLTE is that it provides more efficient resource utilisation of the spectrum and network.

192. A study conducted by Nokia Solutions and Networks (NSN)[62], a major supplier of equipment and systems in the telecom industry, concludes that the mobile standard VoLTE is better than OTT VoIP, because VoLTE uses less battery power and less network capacity, in terms of both signalling and data volume. While the report can hardly be regarded as completely objective, it does seem to comply to a certain degree with Telenor's view that the use of VoLTE allows efficient resource utilisation.

193. The user interface for VoLTE means that mobile users will not notice the difference if a call is originated or terminated on a 2G, 3G or 4G network. A user who uses an OTT service must normally use a separate application and cannot make use of the phone's ordinary voice call functions ("press the green button.") By offering voice services as VoLTE the operators can influence the behaviour of their own end customers, for example by reducing any preferences for mobile VoIP. Concerns over the growing volumes of OTT services and inadequate cost coverage for termination of calls are thus, in Nkom's opinion, less relevant.

194. At the same time data-centric services to own customers also provide operators with the best basis for balancing their price plans, thereby improving their ability to control retail revenues. The operators' price plans in the retail market are now dominated by the fact that the price is determined by the volume of data that the customer wants included in their subscription. This is a sign that the operators have already undertaken a re-balancing of the prices for the various services, and the risk of further loss of income due to increasing use of OTT services seems to have been substantially reduced.

195. In line with other players in the industry and decision makers, Nkom finds that the future development of mobile VoIP is uncertain, but there is certainly much to indicate that the mobile operators must adapt to increasing competition over services. This uncertainty brings both opportunities and threats.

196. In the above Nkom has summed up the discussions and considerations that are most relevant to include in an assessment of the longer-term issues concerning increased use of mobile VoIP. In Nkom's opinion the outlined developments related to real and potential threats from OTT operators do not constitute grounds for concluding that these pose significant implications for the operators' revenue base nor necessitate any direct constraints for the design of the price controls beyond what is stated in the model documentation for the LRIC model.

7.4.6 Specific price cap regulation

197. In the decisions of 27 September 2010 and 15 June 2011 regulated operators were imposed a price cap for voice call termination of NOK 0.015[63] per minute. The price cap is based on the LRAIC result for the operator with the highest costs, calculated using Nkom's LRIC model version 7.1[64]. The LRIC model version 8 calculates costs on the basis of both pure LRIC and LRAIC for each year, thus providing Nkom with the information necessary to decide the future price.

[61] Cf. InsideTelecom 4 February 2014

[62] See for example: https://blogs.nsn.com/mobile-networks/2014/04/03/why-operator-volte-beats-ott-voip/

[63] The price cap has been indexed up to NOK 0.16.

[64] See NPT's decision of 27 September 2010 sections 6.4.4 – 6.4.6 for a detailed discussion of the method of price regulation for different types of providers, including MVNOs.

198. In section 7.4.4.3 Nkom concluded that it is most appropriate to use the LRIC model for the generic operator as the basis for setting the efficient price for voice call termination on mobile networks. For the sake of completeness, Nkom has prepared the following figure showing the cost trends for the LRIC model version 7.1 for the operator with the highest costs and the cost trends for the LRIC model version 8 for a generic operator.

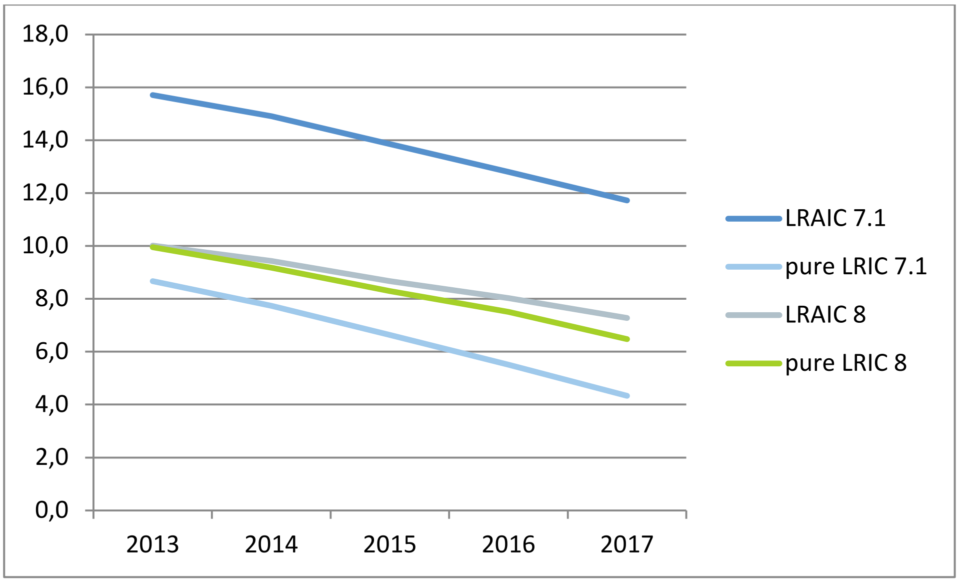


Figure 5: Developments in termination costs based on the LRIC models version 7.1 for the operator with the highest costs and version 8 for a generic operator. Nominal prices in øre (NOK 0.00) per year.

199. Nkom finds that the results yielded by the updated model represent the real efficient cost level and ought to be implemented as quickly as possible for all providers. Nkom has assessed the operators' need to adjust to the new rates and the need for a new glide path. Nkom has concluded that the Norwegian operators have had a relatively long period of time to prepare for the introduction of pure LRIC, and that there is therefore no need for a glide path to explicitly enable adaptation to the new calculation principles. The operators have been aware of the results of Nkom's LRIC model version 8 since May 2013[65], and Nkom has concluded that it is not necessary to introduce a glide path that explicitly provides the operators with more time to adapt to lower termination rates. The current price cap is based on LRAIC, which indicates falling prices for each year. By continuing to use the rates for 2013 in 2014 and also first half of 2015, in reality the operators have been given the opportunity to set their prices above efficient costs for an extended period of time. As shown in section 7.4.9 below, nor have any significant consequences been identified that might justify a longer adjustment period.

200. The prices are based on the changed principles for calculating the efficient cost (cf. the definition in section 7.4.4) and thus reflect costs based on pure LRIC and not LRAIC, as previously. In Nkom's opinion the new price path strikes a good balance between the economic benefits of reduced termination rates for the regulated operators and the commercial consideration that indicates that they ought to be given a certain amount of time to adapt to the new regime.

201. In light of this Nkom sets the following maximum prices for Com4, Lyca, Network Norway, Phonero, TDC, Telenor, Tele2 and TeliaSonera.

[65] Presentation of 22 May 2013: http://www.nkom.no/marked/markedsregulering-smp/kostnadsmodeller/lric-mobilnett

	Current maximum price[66]	1 July 2015	1 January 2016	1 January 2017
All regulated operators	16 øre	8.3 øre	7.5 øre	6.5 øre

Table 4: Maximum price for per minute voice call termination on mobile networks, stated in øre (NOK 0.01) excl. VAT.

202. The price cap applies to termination of voice calls, regardless of whether termination takes place on the GSM or UMTS network. The rates for termination of voice mail services must not exceed the prices in the table above.

203. The maximum prices are based on the efficient costs for each individual year and do not represent a glide path towards a future efficient price. Nkom therefore finds it appropriate that they be adjusted for inflation. Nkom finds that the maximum prices shall be based on inflation forecasts for the entire regulatory period, as opposed to an ongoing annual inflation adjustment. This is because Nkom finds it unlikely that inflation will deviate significantly from the forecasts for the next two to three years, cf. the forecasts in the LRIC model.

204. Experience from recent years has shown that all the providers have started to base their termination rates on pure per-minute charges. Nkom finds that the lower price cap for termination is a factor that reduces the providers' incentive to introduce other price structures than pure per-minute charges. In Nkom's opinion there is therefore no longer any need to pave the way for other price structures than pure per-minute charges, and therefore no reason to establish a procedure for approving alternative price structures.

205. Nkom assumes that prices will be the same for calls from all external networks in the European Economic Area (EEA). It also follows from the non-discrimination obligation (cf. section 7.2) that any differences must be justified objectively.

206. Nkom aims to make new decisions in the relevant markets before the end of the price cap period which follows from this decision, probably by the end of 2017. Until a new decision is made, the termination charge shall not exceed 6.5 øre (NOK 0.065) per minute.

7.4.7 Calls originating outside the EEA

207. The Commission and ESA's recommendations on the regulation of termination rates have resulted in substantial reductions in the termination charges in the EEA countries in recent years. This means that the Norwegian providers face termination rates that are on roughly the same level as in Norway when they purchase termination on mobile networks in most other EEA countries, cf. figure 1 in section 7.4.1.3. However, this is not necessarily the case for purchases of termination on mobile networks in countries outside the EEA. Since the providers of mobile termination in Norway will be subject to price controls, which is not normally the case for mobile providers in countries outside the EEA, the Norwegian providers will in many cases have to pay a significantly higher price for termination than they can demand from their counterparts outside the EEA. This may result in substantial asymmetry in the Norwegian providers' disfavour. It might also mean that Norwegian end users will have to pay significantly more for calls to countries outside the EEA than end users in these countries have to pay for equivalent calls to Norway.

[66] Current maximum rate for all the providers except Com4, which is being imposed obligations for the first time in this decision.

208. Nkom has obtained information from Telenor and TeliaSonera regarding interconnection rates to countries outside the EEA. This information shows considerable price variations between different nations. In some countries the aforementioned Norwegian operators experience terminations rates that correspond to the Norwegian price cap. In other countries they meet lower prices and in some countries they are faced with prices multiple of the Norwegian price cap. In addition there seem to be a lack of price harmonisation between countries within the same continent.

209. BEREC[67] works continuously to ensure that the European framework for electronic communications is implemented in a harmonised manner. As part of this work BEREC looks into how different European countries regulate the termination of calls originated in countries outside the EEA. BEREC has not yet provided any specific recommendations in this area, but has outlined some possible methods to avoid imbalances. One option is to include in the market definition calls that are originated outside and terminated within the EEA, but not to impose price controls on these calls.

210. In a decision dated 26 June 2014 the Czech electronic communications authority imposed price cap regulation for voice call termination on mobile networks based on pure LRIC. The decision stated that this price cap regulation does not apply to calls originated outside the EEA. The reason for limiting the area of application of price controls is that asymmetric costs, i.e. that providers must pay significantly higher prices for terminating calls to operators in countries outside the EEA than in the opposite direction, lead to fundamental competitive distortions and discriminatory cross subsidisation between operators, with a risk of this being passed on to the end users.

211. Nkom believes that price cap regulation in Norway may lead to providers outside the EEA having a considerable advantage over Norwegian providers and pave the way for low retail prices for calls to Norway. However, calls originating outside the EEA will not contribute to increased consumer welfare for Norwegian or EEA citizens. This factor in itself weighs in favour of limiting the scope of the price controls. Furthermore, Nkom believes that a delimitation of the price controls would provide Norwegian operators with increased bargaining power vis-à-vis operators outside the EEA. In the long run this might lead to lower termination rates outside the EEA and further contribute to lower retail prices for calls to these countries.

212. In Nkom's view, none of the objectives behind the European framework for electronic communications will be jeopardised by limiting the scope of the price cap regulation. The objective of low, harmonised prices in the EEA has also been followed up in the work on a harmonised regime for international roaming, in order to reduce barriers to communication when end users visit other European countries.

213. Limiting the regulation of termination rates to apply only to calls that are originated within the EEA does not, in Nkom's opinion, entail any material risk that the price level will be set disproportionately high or that prices will be squeezed by Norwegian operators to the detriment of consumer welfare.

214. On the basis of the above, Nkom has concluded that price cap regulation shall be restricted to apply only to termination of calls originated in the European Economic Area.

7.4.8 Interconnection charges (traffic capacity and other charges)

215. In principle, charges for interconnection (traffic capacity and other charges) are set according to commercial negotiations between the parties. The providers covered by this decision have both the incentive and the opportunity to charge excessive prices for these types of products. Nkom therefore sees a need for the regulation of these prices too and

[67] Body of European Regulators for Electronic Communications.

imposes an obligation on Com4, Lyca, Network Norway, Phonero, TDC, Telenor, Tele2 and TeliaSonera to charge reasonable prices for interconnection.

216. What can be regarded as a reasonable price will have to be decided on a case-by-case basis. If necessary, for example should cases arise in the future where negotiations are unsuccessful or Nkom receives complaints, Nkom will assess whether the specific price is reasonable. Actual costs related to interconnection will be key in such an assessment.

7.4.9 Expected consequences of the price controls in more detail

217. In this section, an assessment is made of the overall consequences for existing providers, new providers and end users in the mobile and fixed telephony market.

218. An assessment of the financial consequences for providers and end users must be based on certain preconditions. Nkom has based the following calculations on the traffic pattern for 2013 and the real price reduction being imposed on the providers.

7.4.9.1 Expected consequences for regulated providers

219. The decision entails a reduction in the termination charge from NOK 0.16 to NOK 0.065 in 2017. Based on reported traffic volumes and flows in 2013, this will have a different impact financially for the different providers. The ecom statistics for 2013 show that the number of incoming minutes terminating on the mobile networks of Lyca, Network Norway, Phonero, TDC, Telenor and Tele2, exceeds the number of outgoing minutes from their respective mobile networks. The reduction in revenue as a result of the lower termination rates will therefore exceed the reduction in costs as a result of the same price reduction. Given the price change from 1 July 2015 and volumes corresponding to those in 2013, Nkom has calculated the average annual net effect for the period 1 July 2015 to 31 December 2017. The net effect will be negative for Lyca by NOK 5.3 million, negative for Network Norway by NOK 13.6 million, negative for Phonero by NOK 2.0 million, negative for TDC by NOK 2.2 million, negative for Telenor by NOK 39.8 million and negative for Tele2 by NOK 7.5 million. By contrast TeliaSonera has a traffic flow in which more outgoing calls are generated than incoming calls measured in minutes, and the average annual net effect for 2015, 2016 and 2017 is therefore positive by NOK 2.4 million.

220. Fixed telephony operations will also be affected by the regulation of mobile termination charges in the form of reduced external cost of sales. Nkom assumes that these cost reductions will most likely benefit fixed telephony customers in the form of reduced retail prices for calls from fixed networks to mobile networks, and that the net effect for operators of fixed telephony operations will therefore be almost nil, cf. the description of expected consequences for end users.

221. Seen in isolation, the introduction of lower termination rates will have a negative net financial impact for most mobile operators because the reduction in the total revenues from termination services will be larger than the reduction in total termination costs. Norwegian operators have known about the trend towards lower termination rates for quite some time now, both because it has been a clear, explicit goal in Europe that termination rates are to be reduced, and by virtue of the fact that Nkom has regulated the termination rate for several years. In Nkom's opinion, the benefits of setting efficient termination rates, based on the method recommended by the Commission and ESA outweigh the disadvantages that the operators will experience in the transition to lower rates for termination. In this context reference is made to the assessments in section 7.4.3.

7.4.9.2 Expected consequences for Com4

222. The attached market analysis shows that Com4 is a relatively new provider in the Norwegian market. The company entered into an access agreement as an MVNO with TeliaSonera in December 2012 and in May 2013 launched its machine-to-machine

communications (M2M) services. At mid-2014 Com4 was about to enter into interconnection agreements with the other operators and had set a termination charge in the concluded agreements that matched the regulated price cap of NOK 0.16. To date the company has not reported on interconnection in the ecom statistics, and therefore Nkom does not have the same basis for calculating the financial impacts as it does for the other providers. Nkom has no grounds to assume that a reduction in termination rates will have significant negative consequences for Com4.

223. Com4 operates primarily in the M2M market, and it can therefore be expected that it will have a limited scope of termination traffic. Nkom nevertheless finds that Com4 will benefit from lower cost of goods for termination on other operators' mobile networks, while regulation of the price of incoming calls will constitute a corresponding disadvantage. In Nkom's opinion, the benefits of setting efficient termination rates for Com4, based on the method recommended by the Commission and ESA outweigh the disadvantages that the operators will experience in the transition to a lower rates for termination.

7.4.9.3 Expected consequences for potential new providers of mobile telephony

224. Obligations of interconnection, non-discrimination, publication and reference offer reduce entry barriers in electronic communications markets by ensuring new providers interconnection without excessively high transaction costs and on non-discriminatory terms in relation to already established providers.

225. Price regulation for Com4, Lyca, Network Norway, Phonero, TDC, Telenor, Tele2 and TeliaSonera will help to reduce the entry barriers for other new providers in the mobile market because they will have lower cost of goods for external termination.

7.4.9.4 Expected consequences for the market for access to and call origination in public mobile communications networks (Market 15).

226. In the market for access to and call origination on public mobile communications networks (previously Market 15), Telenor is, as a result of Nkom's decision of 5 August 2010, required to provide access on non-discriminatory terms and to report accounting separation for the regulated forms of access on a half-yearly basis. This decision[68] specifies the principles for reporting accounting separation, including the requirement that interconnection revenue must be reported using only Telenor's own termination rates. It is proposed that these obligations are continued in the new regulation; cf. the notification of decisions dated 16 January 2014. As a result of lower termination rates for Telenor, this may lead to a reduction in the relevant access charges; cf. the effect that a reduction in termination revenues has on the profit in accounting separation. In Nkom's opinion, this will help enhance competition and thereby increase consumer welfare.

7.4.9.5 Expected consequences for end users

227. Approximately 11 per cent of the traffic terminated on mobile networks is originated in the fixed network. Reduced prices for termination in mobile networks will enable reduced retail prices for calls from fixed networks (including VoIP) to mobile networks. Telenor has previously reduced the retail prices for calling from the fixed network to mobile networks as a result of reductions in termination charges. Cf. the description in section 6.4.9.4 of the decision of 27 September 2010 on specific price reductions. However, the development of "unlimited usage" products for fixed network customers too renders it less relevant to undertake a detailed analysis of the trends in traffic-dependent price reductions. Lower retail prices may lead to more efficient use of the resources and thereby increase consumer welfare.

[68] Cf. also additional decision 29 October 2010.

228. It is nevertheless difficult to estimate more specifically what effect a reduction in the termination rates will have on the retail prices for calls between different mobile networks and between fixed and mobile networks. When the revenues from mobile termination are reduced, the regulated providers can choose to rebalance their retail prices to compensate part of the revenue loss on the termination side. Such rebalancing is often referred to as the "waterbed effect" and is discussed in, for example, the Explanatory Note to the Commission's Recommendation from 2007[69].

229. However, Nkom holds that a rebalancing of retail prices, in which the different types of calls between mobile and fixed networks and between different mobile networks largely reflect underlying costs, would yield more economically efficient pricing, even though it would not necessarily entail price reductions for all end users.

7.4.9.6 Overall assessment of expected consequences for end users

230. In this decision the Authority has sought to strike a balance between the constraints imposed by the ESA recommendation dated 13 April 2011 and the Ministry of Transport and Communication's decision of 11 May 2011. Efficient pricing is sought to be achieved as quickly as possible, and the providers have been given time to adapt in that the Recommendation on termination rates and the LRIC model and its results have been known for some time. Nkom therefore believes that regulation also facilitates sustainable competition, which in turn can ensure good services for end users in terms of service quality, innovation and prices for mobile services.

231. On the basis of the above, Nkom concludes that the expected consequences of the decision are in accordance with both the objective behind the regulation of Market 7 (i.e. principle 2 that efficient use of resources and interests of consumers shall be protected when replication of infrastructure is not considered feasible), and with the overall objective of sustainable competition in the mobile market.

7.5 Regulation of new providers

232. In the event that new providers of call termination on mobile networks enter the market, Nkom will have to consider whether and to what extent the provider shall be granted a period of more lenient regulation. However, in the decision of 27 September 2010 Nkom stated that it must not be taken for granted that any future newcomers will be granted such a period. In this connection Nkom emphasised that the competition analysis and the need to comply with the ESA Recommendation on termination rates will not necessarily be compatible with allowing asymmetric rates. Nkom's view on this matter has not changed.

7.6 Assessment of the overall effect of the specific obligations

233. As part of the proportionality assessments Nkom undertakes an assessment of the overall effect of the specific commitments imposed on providers with significant market power.

7.6.1 Telenor and TeliaSonera

234. Telenor and TeliaSonera are imposed similar obligations as in the decision of 27 September 2010. However, the price controls have been tightened somewhat in that the price

[69] For the Explanatory Note to the Commission's Recommendation, see: http://ec.europa.eu/smart-regulation/impact/ia_carried_out/docs/ia_2009/sec_2009_0600_en.pdf

cap has been set to the costs of voice call termination calculated as pure LRIC, as opposed to LRAIC as previously, cf. Nkom's updated LRIC model.

235. The obligations being imposed on Telenor and TeliaSonera could in Nkom's view represent a relatively heavy regulatory burden in the aggregate. Nevertheless, Nkom believes that it will be proportionate to impose all of these obligations. Telenor is the largest provider of termination followed by TeliaSonera. To prevent exploitation of market power and to facilitate efficient use of existing resources, including ensuring any-to-any communication, efficient interconnection negotiations and efficient pricing, Nkom believes that all of the obligations must be put into effect. As long as there are no alternative forms of regulation better suited to producing a satisfactory outcome, the fact that the overall effect will be relatively burdensome cannot be accorded decisive weight. Nkom has not been able to identify such conditions and thus believes that the overall effect of the remedies cannot be considered disproportionate.

7.6.2 Network Norway and Tele2

236. Network Norway and Tele2 are imposed similar obligations as in the decision of 27 September 2010, with the exception that the companies are not required to report on the roll-out of mobile networks. However, the price controls have been tightened somewhat in that the price cap has been set to the costs of voice call termination calculated as pure LRIC, as opposed to LRAIC as previously, cf. Nkom's updated LRIC model.

237. The obligations being imposed on Network Norway and Tele2 could in Nkom's view represent a relatively heavy regulatory burden in the aggregate. Even so Nkom believes it will be proportionate to impose all of these obligations to ensure the effective use of resources and prevent undesirable distortion of competition over time. As long as there are no alternative forms of regulation better suited to producing a satisfactory outcome, the fact that the overall effect will be relatively burdensome cannot be accorded decisive weight. Nkom has not been able to identify such conditions and thus believes that the overall effect of the remedies cannot be considered disproportionate.

7.6.3 Com4, Lyca, Phonero and TDC

238. Com4 is imposed obligations for the first time; these obligations are similar to those imposed on the other MVNOs in the market. Lyca is imposed similar obligations to those in the decision of 15 June 2011 and Phonero and TDC are imposed similar obligations as were imposed in the decision of 27 September 2010. In addition, an obligation of non-discrimination is imposed on Com4, Lyca, Phonero and TDC. The price controls have been tightened somewhat in that the price cap has been set to the costs of voice call termination calculated as pure LRIC, as opposed to LRAIC as previously, cf. Nkom's updated LRIC model.

239. The obligations imposed on Lyca, Phonero and TDC are slightly more comprehensive than in previous decisions, and in Nkom's view may represent a relatively heavy regulatory burden in the aggregate. Com4, which is being regulated for the first time, will also have several burdens imposed. Even so Nkom believes it will be proportionate to impose all of these obligations to ensure the effective use of resources and prevent undesirable distortion of competition over time. As long as there are no alternative forms of regulation better suited to producing a satisfactory outcome, the fact that the overall effect will be relatively burdensome cannot be accorded decisive weight. Nkom has not been able to identify such conditions and thus believes that the overall effect of the remedies cannot be considered disproportionate.

8 Imposition of specific obligations

240. Against the backdrop of the review above, Nkom has concluded that providers with significant market power in the markets for voice call termination on mobile networks shall be subject to several specific obligations. This chapter specifies the content of these obligations.

8.1 Com4 AS

241. Nkom imposes the following specific obligations in the market for voice call termination on Com4 AS's virtual mobile network:

8.1.1 Interconnection

242. Since Com4 AS has been designated as a provider with significant market power in the market for voice call termination on mobile networks, the company has an obligation to meet all reasonable requests for interconnection, cf. section 4-2, third paragraph, of the Electronic Communications Act.

243. Pursuant to section 4-1 of the Electronic Communications Act, Com4 AS is imposed an obligation to conclude negotiations on entering into or amending agreements on termination on its mobile network without undue delay. At the request of the requesting party Com4 AS is required to document vis-à-vis the party the time spent in connection with the relevant contract negotiations. Nkom shall receive a copy of the relevant documentation. Nevertheless, the documentation obligation does not apply if the request was made later than three months after the relevant negotiations were concluded.

244. If access is denied, the party requesting access shall receive a documented and justified refusal of the request, cf. section 4-2, third paragraph, last sentence, of the Electronic Communications Act. The justification must contain all information necessary to evaluate the basis for the refusal, such as, for example, the reason access is being denied, with the necessary technical documentation.

8.1.2 Non-discrimination

245. Pursuant to section 4-7, first and second paragraphs, of the Electronic Communications Act, Nkom imposes an obligation of non-discrimination in connection with termination on Com4 AS's mobile network. To be sufficiently effective, Nkom believes that an obligation of non-discrimination must apply both between external operations (Electronic Communications Act, section 4-7, first paragraph) and between a provider's internal operations and external operations (Electronic Communications Act, section 4-7, second paragraph). Nevertheless, the obligation of non-discrimination does not apply to any differences in termination charges for on-net and off-net calls.

246. The obligation of non-discrimination does not prevent Com4 AS from demanding different termination charges for calls originated in countries outside the EEA, cf. section 8.1.4 below.

8.1.3 Publication

247. Pursuant to section 4-6, third and fourth paragraphs, of the Electronic Communications Act, Com4 AS is imposed an obligation to publish its prices for termination on mobile networks. Publishing on the company's own website is regarded as a satisfactory form of publication. Standard rates and any discounts with related criteria shall be stated.

248. Pursuant to section 4-6, first paragraph, of the Electronic Communications Act (cf. fourth paragraph), Com4 AS is imposed an obligation to give advance notice to other providers

of any changes in disfavour to existing interconnection services for mobile telephony no later than two months before they are implemented.

8.1.4 Price controls

249. Pursuant to section 4-9 of the Electronic Communications Act, Com4 AS is imposed an obligation to set charges for voice call termination on mobile networks that do not exceed the amounts in the table below.

Applicable maximum price	From 1 July 2015	From 1 January 2016	From 1 January 2017
16 øre	8.3 øre	7.5 øre	6.5 øre

Table 5: Maximum price for per minute voice call termination on mobile networks stated in øre (NOK 0.01) excl. VAT.

250. The maximum prices apply per minute to voice call termination regardless of whether termination takes place on the GSM or UMTS networks, and to the voice mail service connected with Com4 AS's mobile network.

251. The maximum prices take expected inflation into account, cf. section 7.4.6.

252. The maximum prices do not apply to calls originated in countries outside the EEA.

253. Nkom will be able to issue new decisions on price controls at the end of the price cap period, or decide to remove price controls. Until a new decision is made, the price shall not exceed NOK 0.065 per minute (inflation-adjusted).

254. Pursuant to section 4-9 of the Electronic Communications Act, Com4 AS is imposed an obligation to have reasonable prices for interconnection to mobile networks.

8.2 Lycamobile Norway Ltd

255. Nkom imposes the following specific obligations in the market for voice call termination on Lycamobile Norway Ltd.'s virtual mobile network:

8.2.1 Interconnection

256. Since Lycamobile Norway Ltd has been designated as a provider with significant market power in the market for voice call termination on mobile networks, the company has an obligation to meet all reasonable requests for interconnection, cf. section 4-2, third paragraph, of the Electronic Communications Act.

257. Pursuant to section 4-1 of the Electronic Communications Act, Lycamobile Norway Ltd is imposed an obligation to conclude negotiations on entering into or amending agreements on termination on its mobile network without undue delay. At the request of the requesting party Lycamobile Norway Ltd. is required to document vis-à-vis the party the time spent in connection with the relevant contract negotiations. Nkom shall receive a copy of the relevant documentation. Nevertheless, the documentation obligation does not apply if the request was made later than three months after the relevant negotiations were concluded.

258. If access is denied, the party requesting access shall receive a documented and justified refusal of the request, cf. section 4-2, third paragraph, last sentence, of the Electronic Communications Act. The justification must contain all information necessary to evaluate the basis for the refusal, such as, for example, the reason access is being denied, with the necessary technical documentation.

8.2.2 Non-discrimination

259. Pursuant to section 4-7, first and second paragraphs, of the Electronic Communications Act, Nkom imposes an obligation of non-discrimination in connection with termination on Lycamobile Norway Ltd.'s mobile network. To be sufficiently effective, Nkom believes that an obligation of non-discrimination must apply both between external operations (Electronic Communications Act, section 4-7, first paragraph) and between a provider's internal operations and external operations (Electronic Communications Act, section 4-7, second paragraph). Nevertheless, the obligation of non-discrimination does not apply to any differences in termination charges for on-net and off-net calls.

260. The obligation of non-discrimination does not prevent Lycamobile Norway Ltd from demanding different termination charges for calls originated in countries outside the EEA, cf. section 8.2.4 below.

8.2.3 Publication

261. Pursuant to section 4-6, third and fourth paragraphs, of the Electronic Communications Act, Lycamobile Norway Ltd is imposed an obligation to publish its prices for termination on mobile networks. Publishing on the company's own website is regarded as a satisfactory form of publication. Standard rates and any discounts with related criteria shall be stated.

262. Pursuant to section 4-6, first paragraph, of the Electronic Communications Act (cf. fourth paragraph), Lycamobile Norway Ltd is imposed an obligation to give advance notice to other providers of any changes in disfavour to existing interconnection services for mobile telephony no later than two months before they are implemented.

8.2.4 Price controls

263. Pursuant to section 4-9 of the Electronic Communications Act, Lycamobile Norway Ltd is imposed an obligation to set charges for voice call termination on mobile networks that do not exceed the amounts in the table below.

Applicable maximum price	From 1 July 2015	From 1 January 2016	From 1 January 2017
16 øre	8.3 øre	7.5 øre	6.5 øre

Table 6: Maximum price for per minute voice call termination on mobile networks, stated in øre (NOK 0.01) excl. VAT.

264. The maximum prices apply per minute to voice call termination regardless of whether termination takes place on the GSM or UMTS networks, and to the voice mail service connected with Lycamobile Norway Ltd.'s mobile network.

265. The maximum prices take expected inflation into account, cf. section 7.4.6.

266. The maximum prices do not apply to calls originated in countries outside the EEA.

267. Nkom will be able to issue new decisions on price controls at the end of the price cap period, or decide to remove price controls. Until a new decision is made, the price shall not exceed NOK 0.065 per minute (inflation-adjusted).

268. Pursuant to section 4-9 of the Electronic Communications Act, Lycamobile Norway Ltd is imposed an obligation to have reasonable prices for interconnection to mobile networks.

8.3 Network Norway AS

269. Nkom imposes the following specific obligations in the market for voice call termination on Network Norway AS's virtual mobile network:

8.3.1 Interconnection

270. Since Network Norway AS has been designated as a provider with significant market power in the market for voice call termination on mobile networks, the company has an obligation to meet all reasonable requests for interconnection, cf. section 4-2, third paragraph, of the Electronic Communications Act.

271. Pursuant to section 4-1 of the Electronic Communications Act, Network Norway AS is imposed an obligation to conclude negotiations on entering into or amending agreements on termination on its mobile network without undue delay. At the request of the requesting party Network Norway AS is required to document vis-à-vis the party the time spent in connection with the relevant contract negotiations. Nkom shall receive a copy of the relevant documentation. Nevertheless, the documentation obligation does not apply if the request was made later than three months after the relevant negotiations were concluded.

272. If access is denied, the party requesting access shall receive a documented and justified refusal of the request, cf. section 4-2, third paragraph, last sentence, of the Electronic Communications Act. The justification must contain all information necessary to evaluate the basis for the refusal, such as, for example, the reason access is being denied, with the necessary technical documentation.

8.3.2 Non-discrimination

273. Pursuant to section 4-7, first and second paragraphs, of the Electronic Communications Act, Nkom imposes an obligation of non-discrimination in connection with termination on Network Norway AS's mobile network. To be sufficiently effective, Nkom believes that an obligation of non-discrimination must apply both between external operations (Electronic Communications Act, section 4-7, first paragraph) and between a provider's internal operations and external operations (Electronic Communications Act, section 4-7, second paragraph). Nevertheless, the obligation of non-discrimination does not apply to any differences in termination charges for on-net and off-net calls.

274. The obligation of non-discrimination does not prevent Network Norway AS from demanding different termination charges for calls originated in countries outside the EEA, cf. section 8.3.4 below.

8.3.3 Publication

275. Pursuant to section 4-6, third and fourth paragraphs, of the Electronic Communications Act, Network Norway AS is imposed an obligation to publish its prices for termination on mobile networks. Publishing on the company's own website is regarded as a satisfactory form of publication. Standard rates and any discounts with related criteria shall be stated.

276. Pursuant to section 4-6, first paragraph, of the Electronic Communications Act (cf. fourth paragraph), Network Norway AS is imposed an obligation to give advance notice to other providers of any changes in disfavour to existing interconnection services for mobile telephony no later than two months before they are implemented.

8.3.4 Price controls

277. Pursuant to section 4-9 of the Electronic Communications Act, Network Norway AS is imposed an obligation to set charges for voice call termination on mobile networks that do not exceed the amounts in the table below.

Current maximum price	From 1 July 2015	From 1 January 2016	From 1 January 2017
16 øre	8.3 øre	7.5 øre	6.5 øre

Table 7: Maximum price for per minute voice call termination on mobile networks, stated in øre (NOK 0.01) excl. VAT.

278. The maximum prices apply per minute to voice call termination regardless of whether termination takes place on the GSM or UMTS networks, and to the voice mail service connected with Network Norway AS's mobile network.

279. The maximum prices take expected inflation into account, cf. section 7.4.6.

280. The maximum prices do not apply to calls originated in countries outside the EEA.

281. Nkom will be able to issue new decisions on price controls at the end of the price cap period, or decide to remove price controls. Until a new decision is made, the price shall not exceed NOK 0.065 per minute (inflation-adjusted).

282. Pursuant to section 4-9 of the Electronic Communications Act, Network Norway AS is imposed an obligation to have reasonable prices for interconnection to mobile networks.

8.4 Phonero AS

283. Nkom imposes the following specific obligations in the market for voice call termination on Phonero AS's virtual mobile network:

8.4.1 Interconnection

284. Since Phonero AS has been designated as a provider with significant market power in the market for voice call termination on mobile networks, the company has an obligation to meet all reasonable requests for interconnection, cf. section 4-2, third paragraph, of the Electronic Communications Act.

285. Pursuant to section 4-1 of the Electronic Communications Act, Phonero AS is imposed an obligation to conclude negotiations on entering into or amending agreements on termination on its mobile network without undue delay. At the request of the requesting party Phonero AS is required to document vis-à-vis the party the time spent in connection with the relevant contract negotiations. Nkom shall receive a copy of the relevant documentation. Nevertheless, the documentation obligation does not apply if the request was made later than three months after the relevant negotiations were concluded.

286. If access is denied, the party requesting access shall receive a documented and justified refusal of the request, cf. section 4-2, third paragraph, last sentence, of the Electronic Communications Act. The justification must contain all information necessary to evaluate the basis for the refusal, such as, for example, the reason access is being denied, with the necessary technical documentation.

8.4.2 Non-discrimination

287. Pursuant to section 4-7, first and second paragraphs, of the Electronic Communications Act, Nkom imposes an obligation of non-discrimination in connection with termination on Phonero AS's mobile network. To be sufficiently effective, Nkom believes that an obligation of non-discrimination must apply both between external operations (Electronic Communications Act, section 4-7, first paragraph) and between a provider's internal operations and external

operations (Electronic Communications Act, section 4-7, second paragraph). Nevertheless, the obligation of non-discrimination does not apply to any differences in termination charges for on-net and off-net calls.

288. The obligation of non-discrimination does not prevent Phonero AS from demanding different termination charges for calls originated in countries outside the EEA, cf. section 8.8.4 below.

8.4.3 Publication

289. Pursuant to section 4-6, third and fourth paragraphs, of the Electronic Communications Act, Phonero AS is imposed an obligation to publish its prices for termination on mobile networks. Publishing on the company's own website is regarded as a satisfactory form of publication. Standard rates and any discounts with related criteria shall be stated.

290. Pursuant to section 4-6, first paragraph, of the Electronic Communications Act (cf. fourth paragraph), Phonero AS is imposed an obligation to give advance notice to other providers of any changes in disfavour to existing interconnection services for mobile telephony no later than two months before they are implemented.

8.4.4 Price controls

291. Pursuant to section 4-9 of the Electronic Communications Act, Phonero AS is imposed an obligation to set charges for voice call termination on mobile networks that do not exceed the amounts in the table below.

Current maximum price	From 1 July 2015	From 1 January 2016	From 1 January 2017
16 øre	8.3 øre	7.5 øre	6.5 øre

Table 12: Maximum price for per minute voice call termination on mobile networks stated in øre (NOK 0.01) excl. VAT.

292. The maximum prices apply per minute to voice call termination regardless of whether termination takes place on the GSM or UMTS networks, and to the voice mail service connected with Phonero AS's mobile network.

293. The maximum prices take expected inflation into account, cf. section 7.4.6.

294. The maximum prices do not apply to calls originated in countries outside the EEA.

295. Nkom will be able to issue new decisions on price controls at the end of the price cap period, or decide to remove price controls. Until a new decision is made, the price shall not exceed NOK 0.065 per minute (inflation-adjusted).

296. Pursuant to section 4-9 of the Electronic Communications Act, Phonero AS is imposed an obligation to have reasonable prices for interconnection to mobile networks.

8.5 TDC AS

297. Nkom imposes the following specific obligations in the market for voice call termination on TDC AS's virtual mobile network:

8.5.1 Interconnection

298. Since TDC AS has been designated as a provider with significant market power in the market for voice call termination on mobile networks, the company has an obligation to meet all reasonable requests for interconnection, cf. section 4-2, third paragraph, of the Electronic Communications Act.

299. Pursuant to section 4-1 of the Electronic Communications Act, TDC AS is imposed an obligation to conclude negotiations on entering into or amending agreements on termination on its mobile network without undue delay. At the request of the requesting party TDC AS is required to document vis-à-vis the party the time spent in connection with the relevant contract negotiations. Nkom shall receive a copy of the relevant documentation. Nevertheless, the documentation obligation does not apply if the request was made later than three months after the relevant negotiations were concluded.

300. If access is denied, the party requesting access shall receive a documented and justified refusal of the request, cf. section 4-2, third paragraph, last sentence, of the Electronic Communications Act. The justification must contain all information necessary to evaluate the basis for the refusal, such as, for example, the reason access is being denied, with the necessary technical documentation.

8.5.2 Non-discrimination

301. Pursuant to section 4-7, first and second paragraphs, of the Electronic Communications Act, Nkom imposes an obligation of non-discrimination in connection with termination on TDC AS's mobile network. To be sufficiently effective, Nkom believes that an obligation of non-discrimination must apply both between external operations (Electronic Communications Act, section 4-7, first paragraph) and between a provider's internal operations and external operations (Electronic Communications Act, section 4-7, second paragraph). Nevertheless, the obligation of non-discrimination does not apply to any differences in termination charges for on-net and off-net calls.

302. The obligation of non-discrimination does not prevent TDC AS from demanding different termination charges for calls originated in countries outside the EEA, cf. section 8.4.4 below.

8.5.3 Publication

303. Pursuant to section 4-6, third and fourth paragraphs, of the Electronic Communications Act, TDC AS is imposed an obligation to publish its prices for termination on mobile networks. Publishing on the company's own website is regarded as a satisfactory form of publication. Standard rates and any discounts with related criteria shall be stated.

304. Pursuant to section 4-6, first paragraph, of the Electronic Communications Act (cf. fourth paragraph), TDC AS is imposed an obligation to give advance notice to other providers of any changes in disfavour to existing interconnection services for mobile telephony no later than two months before they are implemented.

8.5.4 Price controls

305. Pursuant to section 4-9 of the Electronic Communications Act, TDC AS is imposed an obligation to set charges for voice call termination on mobile networks that do not exceed the amounts in the table below.

Current maximum price	From 1 July 2015	From 1 January 2016	From 1 January 2017
16 øre	8.3 øre	7.5 øre	6.5 øre

Table 8: Maximum price for per minute voice call termination on mobile networks, stated in øre (NOK 0.01) excl. VAT.

306. The maximum prices apply per minute to voice call termination regardless of whether termination takes place on the GSM or UMTS networks, and to the voice mail service connected with TDC AS's mobile network.

307. The maximum prices take expected inflation into account, cf. section 7.4.6.

308. The maximum prices do not apply to calls originated in countries outside the EEA.

309. Nkom will be able to issue new decisions on price controls at the end of the price cap period, or decide to remove price controls. Until a new decision is made, the price shall not exceed NOK 0.065 per minute (inflation-adjusted).

310. Pursuant to section 4-9 of the Electronic Communications Act, TDC AS is imposed an obligation to have reasonable prices for interconnection to mobile networks.

8.6 Telenor ASA

311. Nkom imposes the following specific obligations in the market for voice call termination on Telenor ASA's virtual mobile network:

8.6.1 Interconnection

312. Since Telenor ASA has been designated as a provider with significant market power in the market for voice call termination on mobile networks, the company has an obligation to meet all reasonable requests for interconnection, cf. section 4-2, third paragraph, of the Electronic Communications Act.

313. Pursuant to section 4-1 of the Electronic Communications Act, Telenor ASA is imposed an obligation to conclude negotiations on entering into or amending agreements on termination on its mobile network without undue delay. At the request of the requesting party Telenor ASA is required to document vis-à-vis the party the time spent in connection with the relevant contract negotiations. Nkom shall receive a copy of the relevant documentation. Nevertheless, the documentation obligation does not apply if the request was made later than three months after the relevant negotiations were concluded.

314. If access is denied, the party requesting access shall receive a documented and justified refusal of the request, cf. section 4-2, third paragraph, last sentence, of the Electronic Communications Act. The justification must contain all information necessary to evaluate the basis for the refusal, such as, for example, the reason access is being denied, with the necessary technical documentation.

8.6.2 Non-discrimination

315. Pursuant to section 4-7, first and second paragraphs, of the Electronic Communications Act, Nkom imposes an obligation of non-discrimination in connection with termination on Telenor ASA's mobile network. To be sufficiently effective, Nkom believes that an obligation of non-discrimination must apply both between external operations (Electronic Communications Act, section 4-7, first paragraph) and between a provider's internal operations and external operations (Electronic Communications Act, section 4-7, second paragraph). Nevertheless, the obligation of non-discrimination does not apply to any differences in termination charges for on-net and off-net calls.

316. The obligation of non-discrimination does not prevent Telenor ASA from demanding different termination charges for calls originated in countries outside the EEA, cf. section 8.5.4 below.

8.6.3 Reference offers and publication

317. Pursuant to section 4-6, third and fourth paragraphs, of the Electronic Communications Act, Telenor ASA is imposed an obligation to prepare and publish a reference offer for interconnection. Publishing the reference offer on the company's own website is regarded as a satisfactory means of publication. The reference offer shall be adequately divided into individual elements with appurtenant terms and conditions based on the needs of the market, so that the other party is not forced to accept services, functions or benefits that are not requested. The reference offer shall be kept updated and contain all information vital to the service to be provided, including information on:

- the interconnection service being offered,
- general contractual terms and conditions,
- termination charges,
- price elements and the services the individual price elements cover,
- any discounts and criteria for discounts,
- the methods for calculating any offerings without a fixed price,
- geographical supply area,
- any significant capacity limitations on delivery,
- characteristics of a technical and physical nature, including interfaces used at network termination points, as well as the standards that are used,
- points of interconnection,
- agreed quality level, and
- provisions regarding reasonable compensation for failure to meet the agreed quality level.

318. Pursuant to section 4-6, first paragraph, of the Electronic Communications Act (cf. fourth paragraph), Telenor ASA is imposed an obligation to give advance notice to other providers of any changes in disfavour to existing interconnection services for mobile telephony no later than two months before they are implemented.

8.6.4 Price controls

319. Pursuant to section 4-9 of the Electronic Communications Act Telenor ASA is imposed an obligation to set charges for voice call termination on mobile networks that do not exceed the amounts in the table below.

Current maximum price	From 1 July 2015	From 1 January 2016	From 1 January 2017
16 øre	8.3 øre	7.5 øre	6.5 øre

Table 9: Maximum price for per minute voice call termination on mobile networks stated in øre (NOK 0.01) excl. VAT.

320. The maximum prices apply per minute to voice call termination regardless of whether termination takes place on the GSM or UMTS networks, and to the voice mail service connected with Telenor ASA's mobile network.

321. The maximum prices take expected inflation into account, cf. section 7.4.6.

322. The maximum prices do not apply to calls originated in countries outside the EEA.

323. Nkom will be able to issue new decisions on price controls at the end of the price cap period, or decide to remove price controls. Until a new decision is made, the price shall not exceed NOK 0.065 per minute (inflation-adjusted).

324. Pursuant to section 4-9 of the Electronic Communications Act, Telenor ASA is imposed an obligation to have reasonable prices for interconnection to mobile networks.

8.7 Tele2 Norge AS

325. Nkom imposes the following specific obligations in the market for voice call termination on Tele2 Norge AS's virtual mobile network:

8.7.1 Interconnection

326. Since Tele2 Norge AS has been designated as a provider with significant market power in the market for voice call termination on mobile networks, the company has an obligation to meet all reasonable requests for interconnection, cf. section 4-2, third paragraph, of the Electronic Communications Act.

327. Pursuant to section 4-1 of the Electronic Communications Act, Tele2 Norge AS is imposed an obligation to conclude negotiations on entering into or amending agreements on termination on its mobile network without undue delay. At the request of the requesting party Tele2 Norge AS is required to document vis-à-vis the party the time spent in connection with the relevant contract negotiations. Nkom shall receive a copy of the relevant documentation. Nevertheless, the documentation obligation does not apply if the request was made later than three months after the relevant negotiations were concluded.

328. If access is denied, the party requesting access shall receive a documented and justified refusal of the request, cf. section 4-2, third paragraph, last sentence, of the Electronic Communications Act. The justification must contain all information necessary to evaluate the basis for the refusal, such as, for example, the reason access is being denied, with the necessary technical documentation.

8.7.2 Non-discrimination

329. Pursuant to section 4-7, first and second paragraphs, of the Electronic Communications Act, Nkom imposes an obligation of non-discrimination in connection with termination on Tele2 Norge AS's mobile network. To be sufficiently effective, Nkom believes that an obligation of non-discrimination must apply both between external operations (Electronic Communications Act, section 4-7, first paragraph) and between a provider's internal operations and external operations (Electronic Communications Act, section 4-7, second paragraph). Nevertheless, the obligation of non-discrimination does not apply to any differences in termination charges for on-net and off-net calls.

330. The obligation of non-discrimination does not prevent Tele2 Norge AS from demanding different termination charges for calls originated in countries outside the EEA, cf. section 8.6.4 below.

331.

8.7.3 Publication

332. Pursuant to section 4-6, third and fourth paragraphs, of the Electronic Communications Act, Tele2 Norge AS is imposed an obligation to publish its prices for termination on mobile

networks. Publishing on the company's own website is regarded as a satisfactory form of publication. Standard rates and any discounts with related criteria shall be stated.

333. Pursuant to section 4-6, first paragraph, of the Electronic Communications Act (cf. fourth paragraph), Tele2 Norge AS is imposed an obligation to give advance notice to other providers of any changes in disfavour to existing interconnection services for mobile telephony no later than two months before they are implemented.

8.7.4 Price controls

334. Pursuant to section 4-9 of the Electronic Communications Act, Tele2 Norge AS is imposed an obligation to set charges for voice call termination on mobile networks that do not exceed the amounts in the table below.

Current maximum price	From 1 July 2015	From 1 January 2016	From 1 January 2017
16 øre	8.3 øre	7.5 øre	6.5 øre

Table 10: Maximum price for per minute voice call termination on mobile networks, stated in øre (NOK 0.01) excl. VAT.

335. The maximum prices apply per minute to voice call termination regardless of whether termination takes place on the GSM or UMTS networks, and to the voice mail service connected with Tele2 Norge AS's mobile network.

336. The maximum prices take expected inflation into account, cf. section 7.4.6.

337. The maximum prices do not apply to calls originated in countries outside the EEA.

338. Nkom will be able to issue new decisions on price controls at the end of the price cap period, or decide to remove price controls. Until a new decision is made, the price shall not exceed NOK 0.065 per minute (inflation-adjusted).

339. Pursuant to section 4-9 of the Electronic Communications Act, Tele2 Norge AS is imposed an obligation to have reasonable prices for interconnection to mobile networks.

8.8 TeliaSonera Norge AS

340. Nkom imposes the following specific obligations in the market for voice call termination on TeliaSonera Norge AS's virtual mobile network:

8.8.1 Interconnection

341. Since TeliaSonera Norge AS has been designated as a provider with significant market power in the market for voice call termination on mobile networks, the company has an obligation to meet all reasonable requests for interconnection, cf. section 4-2, third paragraph, of the Electronic Communications Act.

342. Pursuant to section 4-1 of the Electronic Communications Act, TeliaSonera Norge AS is imposed an obligation to conclude negotiations on entering into or amending agreements on termination on its mobile network without undue delay. At the request of the requesting party TeliaSonera Norge AS is required to document vis-à-vis the party the time spent in connection with the relevant contract negotiations. Nkom shall receive a copy of the relevant documentation. Nevertheless, the documentation obligation does not apply if the request was made later than three months after the relevant negotiations were concluded.

343. If access is denied, the party requesting access shall receive a documented and justified refusal of the request, cf. section 4-2, third paragraph, last sentence, of the Electronic Communications Act. The justification must contain all information necessary to evaluate the basis for the refusal, such as, for example, the reason access is being denied, with the necessary technical documentation.

8.8.2 Non-discrimination

344. Pursuant to section 4-7, first and second paragraphs, of the Electronic Communications Act, Nkom imposes an obligation of non-discrimination in connection with termination on TeliaSonera Norge AS's mobile network. To be sufficiently effective, Nkom believes that an obligation of non-discrimination must apply both between external operations (Electronic Communications Act, section 4-7, first paragraph) and between a provider's internal operations and external operations (Electronic Communications Act, section 4-7, second paragraph). Nevertheless, the obligation of non-discrimination does not apply to any differences in termination charges for on-net and off-net calls.

345. The obligation of non-discrimination does not prevent TeliaSonera Norge AS from demanding different termination charges for calls originated in countries outside the EEA, cf. section 8.7.4 below.

8.8.3 Reference offers and publication

346. Pursuant to section 4-6, third and fourth paragraphs, of the Electronic Communications Act, TeliaSonera Norge AS is imposed an obligation to prepare and publish a reference offer for interconnection. Publishing the reference offer on the company's own website is regarded as a satisfactory means of publication. The reference offer shall be adequately divided into individual elements with appurtenant terms and conditions based on the needs of the market, so that the other party is not forced to accept services, functions or benefits that are not requested. The reference offer shall be kept updated and contain all information vital to the service to be provided, including information on:

- the interconnection service being offered,
- general contractual terms and conditions,
- termination charges,
- price elements and the services the individual price elements cover,
- any discounts and criteria for discounts,
- the methods for calculating any offerings without a fixed price,
- geographical supply area,
- any significant capacity limitations on delivery,
- characteristics of a technical and physical nature, including interfaces used at network termination points, as well as the standards that are used,
- points of interconnection,
- agreed quality level, and
- provisions regarding reasonable compensation for failure to meet the agreed quality level.

347. Pursuant to section 4-6, first paragraph, of the Electronic Communications Act (cf. fourth paragraph), TeliaSonera Norge AS is imposed an obligation to give advance notice to other providers of any changes in disfavour to existing interconnection services for mobile telephony no later than two months before they are implemented..

8.8.4 Price controls

348. Pursuant to section 4-9 of the Electronic Communications Act, TeliaSonera Norge AS is imposed an obligation to set charges for voice call termination on mobile networks that does not exceed the amounts in the table below.

Current maximum price	From 1 July 2015	From 1 January 2016	From 1 January 2017
16 øre	8.3 øre	7.5 øre	6.5 øre

Table 11: Maximum price for per minute voice call termination on mobile networks, stated in øre (NOK 0.01) excl. VAT.

349. The maximum prices apply per minute to voice call termination regardless of whether termination takes place on the GSM or UMTS networks, and to the voice mail service connected with TeliaSonera Norge AS's mobile network.

350. The maximum prices take expected inflation into account, cf. section 7.4.6.

351. The maximum prices do not apply to calls originated in countries outside the EEA.

352. Nkom will be able to issue new decisions on price controls at the end of the price cap period, or decide to remove price controls. Until a new decision is made, the price shall not exceed NOK 0.065 per minute (inflation-adjusted).

353. Pursuant to section 4-9 of the Electronic Communications Act, TeliaSonera Norge AS is imposed an obligation to have reasonable prices for interconnection to mobile networks.

9 Relationship to current decisions

354. The existing obligations of Lyca, Network Norway, Phonero, TDC, Telenor, Tele2 and TeliaSonera in the markets for voice call termination on individual mobile communications networks (cf. chapter 4) are repealed when the new decision enters into force.

10 Entry into force of the decision, time limit for appeals, etc.

355. The decision and the appurtenant obligations in the market for termination of voice calls on individual mobile communications networks shall enter into force immediately.

356. The decision may be appealed within three weeks of the date on which it is received, cf. section 11-6 of the Electronic Communications Act and section 29 of the Public Administration Act. Appeals shall be directed to the Ministry of Transport and Communications but sent to the Norwegian Communications Authority.

357. Only the Ministry of Transport and Communications may make a decision on deferred implementation of the decision, cf. section 11-6, fourth paragraph, of the Electronic Communications Act and section 42 of the Public Administration Act.