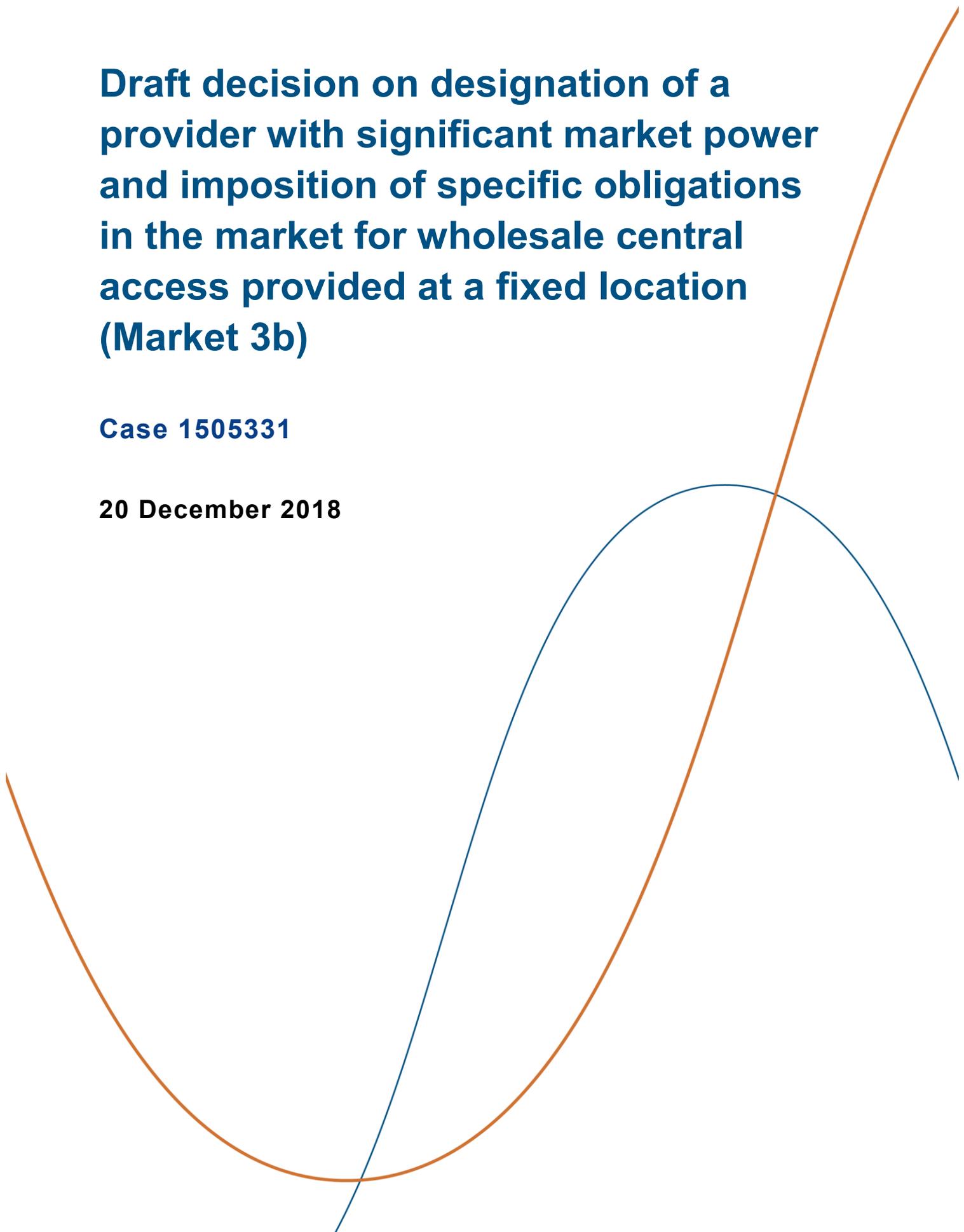


Draft decision on designation of a provider with significant market power and imposition of specific obligations in the market for wholesale central access provided at a fixed location (Market 3b)

Case 1505331

20 December 2018



Summary

Based on an analysis of the market for wholesale central access provided at a fixed location (Market 3b), the Norwegian Communications Authority (Nkom) designates Telenor ASA (Telenor) as a provider with significant market power in Market 3b pursuant to Section 3-3 of the Electronic Communications Act.

Nkom has identified a number of actual and potential competition problems in the market for wholesale central access provided at a fixed location. The competition problems are linked to vertical leveraging between markets and single market dominance. With regard to vertical leveraging, it is primarily various forms of discriminatory behaviour that pose the greatest competition problems. This includes both price-related discrimination that could subject Telenor's rivals to a margin squeeze in downstream markets, and discrimination relating to other circumstances that could restrict competitors' opportunities. In the case of single market dominance, the main potential competition problems are entry-deterring behaviour through, for example, an increase in the cost of switching provider at both wholesale and retail levels, and exploitive behaviour through overpricing and price discrimination.

Goals related to providing investment incentives and promoting more sustainable infrastructure competition in the broadband market argue in favour of using regulatory principle 3 for both the copper-based and the other parts of Market 3b. At the same time, Nkom also wants to continue to encourage competition in areas where Telenor is the only access provider, regardless of whether the access network is based on copper, fibre or HFC. In light of this, Nkom has concluded that the use of remedies in Market 3b, regardless of access technology, should be designed both to provide incentives for investments that contribute to attainment of the high-speed network coverage goals defined in the government's electronic communications policy plan, while continuing to foster competition in the retail market based on access to Telenor's networks. This means that Nkom does not find it appropriate to draw an absolute conclusion regarding whether to base regulation of Market 3b on regulatory principle 2 or regulatory principle 3.

Nkom has assessed whether, despite the fact that Market 3b is geographically defined as the whole of Norway, it is nevertheless appropriate to impose different obligations on Telenor in different parts of the country as a result of variations in the degree of infrastructure competition. Because of the dynamics of the roll-out of NGA networks, including any upgrading of the copper network, which may not necessarily be limited to specific geographical areas in Norway, combined with the absence of stable geographical boundaries for the roll-out of fibre, Nkom believes that a continuation of uniform wholesale regulation throughout the whole country in Market 3b is best suited to achieve the objectives of regulation. Nkom has concluded that it is more appropriate to continue national obligations in Market 3b, than to attempt to introduce geographically differentiated use of remedies based on multiple uncertain assumptions about future infrastructure competition and market share developments in

different geographical areas that cannot be delimited on the basis of counties, municipalities or urban settlements.

Nkom believes that it is necessary to continue an access obligation to Telenor's network at the central level in the wholesale market to ensure that providers without their own network will still be able to represent a competitive factor in the retail market. Telenor will continue to be obliged to accommodate any reasonable requests for access to Broadband access in copper-based access networks.

By upgrading the copper network by utilising the technological capabilities that are available to offer higher capacity to end users, other providers will no longer be able to offer local, physical access to the copper network in the areas being upgraded. Instead, Telenor must provide a replacement product that ensures buyers of access local, virtual access to copper-based access networks (VULA copper) in Market 3a. Nkom believes there is also a need for a similar, central-level access product in Market 3b, and Telenor will therefore be ordered to offer VUA copper. At a minimum, VUA copper is to be offered in the areas of Telenor's copper network that will be upgraded. Telenor's duty to provide Broadband access will lapse in areas where VUA copper is offered.

In case of fibre-based access networks, Telenor will still be obliged to accommodate any reasonable request for central access to fibre-based access networks in the form of VUA fibre.

Any wholesale access to Telenor's HFC network will entail a need to upgrade the network with associated investments for Telenor. In view of the fact that only a relatively limited number of accesses will be available, and that most of these are covered by other access technologies, Nkom has concluded that it is not proportionate to impose an access obligation for Telenor's HFC network in Market 3b.

Telenor shall provide access to backhaul/transport services, co-location and information and support systems related to access in Market 3b.

Nkom has further developed the LRIC models for access networks and core networks. It is now possible for Nkom to model costs for the Basic variants of Telenor's Broadband access products ADSL and VDSL in Market 3b by combining calculations from the further developed access network and core network models. For the Proff og Premium variants of Broadband access ADSL and VDSL, Nkom has made a simplified calculation to ensure that today's relative price differences between these variants and the Basic variants of the same wholesale products are continued. On the basis of these cost calculations, Nkom has determined price caps for Broadband access ADSL and VDSL for 2019, 2020 and 2021.

Nkom has no basis for modelling a price cap for SHDSL Broadband access in the same way as for ADSL and VDSL Broadband access. Nkom will therefore, for the coming regulation period, require Telenor to set prices for SHDSL Broadband access products that do not deviate significantly from today's level.

Telenor is subject to price regulation in the form of an obligation to offer access to VUA copper at prices which ential that the access buyer is not subject to margin squeeze. In order to ensure that the prohibition against offering access prices which make the access buyer subject to margin squeeze is observed, Nkom will perform margin squeeze tests. As far as possible, Nkom will apply the same principles to the margin squeeze test for VUA copper as apply to the margin squeeze test for central access to Telenor's fibre-based access network (VUA fibre).

For central access to fibre-based access networks in Market 3b, Telenor is subject to price regulation in the form of an obligation to offer access to VUA fibre at prices which ential that the access buyer is not subject to margin squeeze. In order to ensure that the prohibition against offering access prices which make the access buyer subject to margin squeeze is observed, Nkom will perform margin squeeze tests and gross margin tests for VUA fibre. The margin squeeze test will ensure that an effective, alternative provider can replicate a portfolio with Telenor's commercially most attractive fibre-based retail products. In addition, Telenor must pass gross margin tests for all individual fibre products in the retail market.

Nkom believes that it is necessary to regulate the price Telenor must be able to claim from the access buyer for the establishment of drop cables to "homes passed" households. Nkom believes that Telenor's fixed establishment fee for fibre connections (retail price) can be used as an estimate of Telenor's internal settlement price and considers it appropriate to use this price as the starting point when determining the price regulation for "homes passed". The fixed establishment fee (excluding VAT) will in principle be regarded as a price cap for the price that Telenor may charge the access buyer for the establishment of drop cables to "homes passed". To ensure the transparency and notoriety of the applicable establishment fees, Telenor's lists of "homes passed" must be updated at all times with the current establishment fee that Telenor's own retail activity will charge on any densification sale.

The prices for the establishment of copper-based Broadband access and other relevant supplementary services, including access to information and support systems, must be cost-oriented, based on fully-distributed, historical costs. The pricing of co-location must continue to be based on the principle of cost orientation.

E-line is a backhaul/transport service that the access buyer is obliged to purchase in order to be able to offer services based on copper-based Broadband access to its own retail customers. The pricing of this service or equivalent service must be cost-oriented, based on fully-distributed, historical costs.

Nkom continues Telenor's obligation to keep cost accounts based on fully distributed historical costs for copper-based Broadband access. Telenor must also continue to prepare cost accounts for co-location in fixed networks, in line with current practice. In order to give Nkom a basis for effective follow-up of price regulation for E-line or equivalent service, it is necessary that Telenor also prepares cost accounts for this service, based on fully-distributed historical costs.

Nkom also imposes on Telenor an obligation on non-discrimination for access in Market 3b. The obligation of non-discrimination applies between internal use and external provision, as well as between different external buyers of access. Nkom has assessed whether to impose on Telenor an obligation of non-discrimination based on equivalence of input in Market 3b, but has concluded that, from a cost–benefit perspective, it is neither necessary nor proportionate to impose this kind of non-discrimination obligation. However, Nkom finds it necessary to clarify and partially sharpen the requirements regarding documentation of non-discrimination in the market. Telenor will therefore be required to conduct a technical replicability test. This means that prior to launching a new or substantially modified retail product, Telenor must send documentation to Nkom proving that a test has been carried out that shows that it is technically possible for external buyers of access to replicate the retail product.

Nkom is continuing the obligation imposed on Telenor to prepare and publish reference offers. Nkom finds that in some areas it is necessary to further specify the requirements regarding the content of the reference offers beyond what is stated in the Electronic Communications Act and the Electronic Communications Regulation. Nkom has also further specified the requirements regarding publication of key performance indicators (KPIs) in more detail. The reason for this is to ensure that the KPIs for the external wholesale provision and Telenor's internal use are comparable.

In this decision, Nkom is imposing new provisions regarding notice. The new notice provisions must be seen in the light of the discussion in the Broadband Forum about the notice Telenor provided regarding changes to the copper access network. Nkom finds that it is necessary to impose on Telenor an obligation to provide three years' notice of changes to its copper access network in cases where the company is going to make changes that result in the loss of accesses. However, if the access buyer is offered a relevant replacement product in connection with upgrades and other changes to the copper access network that cause accesses to be lost, a notice period of six months is sufficient. Planned changes that do not affect granted access require three months' notice.

Nkom imposes new requirements on Telenor's fault correction policy in the decision. The new requirements must be seen in the context of Nkom's opinion that there is a potential for Telenor to have a fault correction policy that undermines the considerations on which the notice provisions are based.

Telenor will continue to be subject to an obligation of accounting separation for central access to fibre-based access networks (VUA fibre) in order to monitor compliance with the obligation of non-discrimination. The purpose is to clarify whether buyers of this type of access can operate in the retail market for fibre-based broadband with a positive result based on the current access prices, given that they are equally efficient in their operations as Telenor. The accounting separation will be a supplement to the margin squeeze test imposed for VUA fibre.

Contents

1	Introduction and background.....	9
1.1	Introduction.....	9
1.2	Legal basis.....	11
1.3	Structure of the document.....	11
2	Designation of a provider with significant market power.....	12
3	Regulatory basis for the choice of remedies.....	12
4	Current specific obligations.....	13
5	Competition problems.....	14
5.1	Competition problems in general.....	14
5.2	Vertical leveraging.....	16
5.2.1	Denial of access.....	17
5.2.2	Leveraging by means of non-price variables.....	18
5.2.3	Leveraging by means of pricing.....	20
5.3	Single market dominance.....	22
5.3.1	Entry-detering behaviour.....	23
5.3.2	Exploitative behaviour.....	23
5.3.3	Inefficient production.....	24
5.4	Summary of potential competition problems.....	24
6	Choice of remedies in general.....	25
6.1	Scope for duplication of infrastructure in the market.....	25
6.2	Proportionality.....	28
6.3	Assessment of the need for geographically differentiated use of remedies.....	28
7	Choice and content of specific obligations.....	31
7.1	Recommendations from the European Commission and BEREC.....	31
7.1.1	The NGA Recommendation.....	31
7.1.2	Recommendation on consistent non-discrimination obligations and costing methodologies.....	32
7.1.3	BEREC recommendations.....	33
7.2	Access.....	34
7.2.1	The statutory basis.....	34
7.2.2	General comments on need for access obligation.....	35
7.2.3	Central access to copper-based access networks.....	37
7.2.4	Central access to fibre-based access networks.....	41

7.2.5	Central access to Telenor’s hybrid network of optical fibre and coaxial cables (HFC networks).....	43
7.2.6	Central access to Telenor’s network for fixed radio access	50
7.2.7	When the obligation of access in Telenor’s systematically developed fibre network applies	51
7.2.8	Access for connection of “homes passed” in Telenor’s systematically developed fibre access network	53
7.2.9	Access to backhaul/transport services	58
7.2.10	Access to co-location	59
7.2.11	Access to information and support systems	61
7.2.12	Prohibition of unreasonable requirements and unreasonable terms of contract.....	63
7.2.13	Obligation to have service level agreements (SLA) and associated compensation arrangements (SLG).....	64
7.2.14	Timeliness in connection with access requests and deliveries	68
7.2.15	Special obligations related to access.....	69
7.3	Price and accounting regulation.....	71
7.3.1	Regulatory basis	71
7.3.2	Central access to copper-based access networks in the form of Broadband access.....	72
7.3.3	Central access to copper-based access networks in the form of VUA copper.....	82
7.3.4	Central access to fibre-based access networks (VUA fibre)	85
7.3.5	Homes passed.....	94
7.3.6	Establishment, access to information and support systems, and co-location.....	99
7.3.7	Supplementary backhaul/transport services	100
7.3.8	Cost accounting	100
7.3.9	Proportionality	102
7.3.10	Special obligations related to prices and accounts	103
7.4	Non-discrimination.....	109
7.4.1	Regulatory basis	109
7.4.2	Assessment of the need for an obligation of non-discrimination.....	109
7.4.3	Assessment of whether obligations of non-discrimination should be based on EoI or EoO	110
7.4.4	Non-discrimination based on EoO.....	113
7.4.5	Content of the obligation of non-discrimination	114
7.4.6	Proportionality	120
7.4.7	Special obligations related to non-discrimination	121
7.5	Publication and reference offers.....	122
7.5.1	Regulatory basis	122
7.5.2	Transparency obligations	123

7.5.3	Reference offers	123
7.5.4	Access to specified information	128
7.5.5	Obligation to give notice	131
7.5.6	Proportionality	145
7.5.7	Special obligations relating to publication and reference offers	146
7.6	Accounting separation	149
7.6.1	Regulatory basis	149
7.6.2	Assessment of the need to impose an obligation of accounting separation for central access to Telenor's copper-based access network in the form of Broadband access	150
7.6.3	Assessment of the need to impose an obligation of accounting separation for central access in Telenor's copper-based access network in the form of VUA copper	150
7.6.4	Assessment of the need to impose an obligation of accounting separation for central access in Telenor's fibre network (VUA fibre).....	151
7.6.5	Accounting separation for central access in Telenor's fibre network (VUA fibre).....	151
7.6.6	Proportionality	152
7.6.7	Special obligations related to accounting separation	152
7.7	Assessment of the overall impact of the remedies.....	154
7.8	Relationship with ordinary competition legislation	156
8	Relationship with current decisions	157
9	Entry into force and appeals	157
Annex 1:	Analysis of the market for wholesale local access provided at a fixed location (Market 3a) and the market for wholesale central access provided at a fixed location (Market 3b)	
Annex 2:	Result of consultation concerning Nkom's notification of decisions in Market 3a and Market 3b	
Annex 3:	Principles for the use of margin squeeze tests for central access to Telenor's fibre access network in Market 3b (VUA fibre), with related Excel model	
Annex 4:	Conceptual approach to upgrading Nkom's LRIC model of fixed access networks in Norway,	
Annex 5:	Documentation of Nkom's vAcc2.3 model, with the corresponding LRIC model	
Annex 6:	Modelling the costs of copper networks in the Norwegian context	
Annex 7:	Comments from ESA	

1 Introduction and background

1.1 Introduction

1. Pursuant to Sections 3-2 and 3-3 of Act no. 83 of 4 July 2003 relating to Electronic Communications (Electronic Communications Act), the Norwegian Communications Authority (Nkom) has been directed to define and analyse relevant product and service markets and geographical markets in accordance with the EFTA Surveillance Authority's (ESA) recommendation on relevant markets (the Recommendation)¹ and identify any providers with significant market power. Pursuant to Section 3-4 of the Electronic Communications Act, at least one of the specific obligations provided for in Chapter 4 of the Electronic Communications Act will be imposed on providers that are deemed to have significant market power. Such obligations will henceforth be known as specific obligations. Specific obligations are imposed after a proportionality assessment based on actual and potential competition problems in the relevant market.

2. The Recommendation defines the following wholesale markets for access at a fixed location:

- Market 3a: Wholesale local access provided at a fixed location
- Market 3b: Wholesale central access provided at a fixed location for mass-market products
- Market 4: Wholesale high-quality access provided at a fixed location

3. This decision applies to Market 3b.

4. Nkom has conducted an analysis of Market 3b (see Annex 1). The analysis has been performed in accordance with the Recommendation. This is the first analysis of Market 3b.

5. Market 3b is based on the former market for wholesale Broadband access (formerly Market 5). The relationship between these markets is explained in more detail in Section 1.1 of the market analysis.

6. Nkom has issued decisions on the designation of Telenor ASA (Telenor) as a provider with significant market power in the market for wholesale Broadband access three times: on 20 February 2006, 3 April 2009 and 20 January 2014. In these decisions, specific obligations were imposed on Telenor.

7. In a letter dated 22 February 2016, Nkom invited the operators to provide feedback on several issues related to definition and delimitation of the product markets for Markets 3a, 3b

¹ EFTA Surveillance Authority Recommendation of 11 May 2016 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 sectoral adaptations contained in Annex XI to that Agreement

and 4. Nkom received responses from Broadnet AS (Broadnet), NextGenTel ASA (NextGenTel), Telenor and Telia Norge AS.

8. In the period 12 January 2018 to 12 March 2018, Nkom conducted a national consultation process concerning Markets 3a, 3b and 4. Nkom received consultation responses from Broadnet, NextGenTel and Telenor. Nkom invited the operators to comment on the received consultation responses by 4 April 2018. Nkom received comments on the consultation responses from Broadnet, Get AS / TDC AS, NextGenTel and Telenor.

9. On the basis of the notification and the consultation response, Nkom has drawn up a draft market decision. The draft was translated into English and notified to ESA on 1 November 2018, cf. Section 9-3 of the Electronic Communications Act, Article 7 of the Framework Directive and ESA's Article 7 recommendation.² On 3 December 2018, ESA submitted its comments concerning Nkom's notification, see Annex 7. ESA's comments pertained to the following aspects:

- The development of competition from fibre and declining interest in investments in copper networks, see Section 2.3.2.7 of the market analysis in Annex 1.
- The need for notification of product characteristics and prices for virtual access products, as well as clarification of deadlines, see Section 7.2.3.2 below.
- The need to expand the proportionality assessment related to the "homes passed" access obligation and to reassess the price regulation for the establishment of drop cables, see Sections 7.2.8 and 7.3.5 below.
- Effective monitoring of the non-discrimination obligation in order to ensure technical replicability, see Section 7.4.5 below.
- The need to monitor the impact of the method of cost accounting for copper access prices, see Section 7.3.2.6 below.

10. Nkom has reviewed ESA's comments and on this basis made certain adjustments to the assessments resulting in Nkom's conclusions in the decision. The main content of ESA's comments and Nkom's assessment of the comments are included in the market analysis and the decision, as specified above.

11. In the analysis of Market 3b, Nkom concluded that Telenor has significant market power in this wholesale market. The analysis has a horizon of two to three years.

² EFTA Surveillance Authority Recommendation of 2 December 2009 on notifications, time limits and consultations provided for in Article 7 of Directive 2002/21/EC on a common regulatory framework for electronic communications networks and services.

1.2 Legal basis

12. The regulatory framework for electronic communications in Norway is based on five directives adopted by the European Union (EU)³. 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 Electronic Communications Regulation).

13. According to these regulations, the obligations for providers with significant market power are determined individually on the basis of a market analysis and with a limited forward-looking time horizon⁴. Particular attention must be paid to the expected pro-competitive effect of the relevant remedies.

14. In choosing specific obligations, Nkom has taken into account the considerations discussed in Nkom's revised remedies document of 12 June 2009⁵. This document is based on "Revised ERG Common Position on the Approach to appropriate remedies in the ECNS regulatory framework", drawn up by the Body of European Regulators for Electronic Communications (BEREC). The guidelines and principles embodied in BEREC's remedies document are intended to stimulate the development of the single market for electronic communications networks and services as well as facilitate a uniform and consistent regulatory practice in the various member states.

1.3 Structure of the document

15. This decision consists of a main document, which contains an assessment of the need and grounds for imposing specific obligations, and seven annexes. Annex 1 contains an analysis of Markets 3a and 3b. Annex 2 contains the results of Nkom's national consultation on the notification of the decisions in Markets 3a and 3b. Annex 3 contains principles for the use of margin squeeze tests for central access to Telenor's fibre access networks. Annex 4 and Annex 5 contain documentation of the LRIC model used as the basis for the price controls. Annex 6 contains a memo from Analysys Mason regarding the LRIC model. Annex 7 contains ESA's comments to Nkom's draft decision.

16. In Chapter 2, Telenor is designated as a provider with significant market power. The designation was made on the basis of the market analysis in Annex 1. Chapter 3 provides a

³ 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).

⁴ See further details about the time horizon in the ESA guidelines for market analyses and assessment of significant market power, paragraph 20.

⁵ The document is published on Nkom's website www.Nkom.no under "Market regulation (SMP)".

brief overview of the regulatory starting point for the choice of remedies, while Chapter 4 provides an overview of the current obligations for Telenor in the market for wholesale Broadband access. Chapter 5 provides a description and overview of potential competition problems in Market 3b. General principles for the use of remedies are discussed in Chapter 6, including possibilities for duplicating infrastructure and the proportionality principle. Based on the preceding chapters and the market analysis in the annex, Nkom discusses the choice of specific obligations in Chapter 7. Chapter 7 imposes also the specific obligations. Chapter 8 contains information about the relationship to the current decisions in former Market 5. Chapter 9 contains information on the implementation of the decision and the right to appeal.

2 Designation of a provider with significant market power

17. Based on the market analysis in Annex 1, Nkom designates Telenor ASA as a provider with significant market power in the market for wholesale central access provided at a fixed location (Market 3b) pursuant to Section 3-3 of the Electronic Communications Act. For further justification, see the analysis in Annex 1.

3 Regulatory basis for the choice of remedies

18. It follows from Section 3-4, first paragraph, of the Electronic Communications Act that a provider that has significant market power shall be subject to one or more specific obligations that follow from Sections 4-1 and 4-4 to 4-10. Relevant obligations for the market for wholesale local access provided at a fixed location are:

- Access obligations (cf. Sections 4-1, 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 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)
- Price controls and obligation of cost accounting (cf. Section 4-9 of the Electronic Communications Act)

19. In special cases, obligations may also be imposed beyond what follows from these provisions, provided the consultation procedure in Section 9-3 of the Electronic Communications Act is followed.

20. In its remedies document, Nkom has reviewed the principles that in general will guide Nkom in its choice of remedies. The four principles are:

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

Principle 2: The interests of consumers shall be protected when duplication of infrastructure is not assumed to be 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 supports the transition to a market characterised by sustainable competition.

Principle 4: Remedies shall be formulated to incentivise compliance.

21. In accordance with the general principles of administrative law and the proportionality principle in Community law, the 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 basic purposes 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.”

22. In addition to this basic purpose, a special purpose provision is set out in Section 3-4, third paragraph. The provision stipulates special, relevant considerations for imposing specific remedies:

“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.”

4 Current specific obligations

23. In the decision of 20 January 2014, Telenor was designated as a provider with significant market power in the market for wholesale Broadband access (formerly Market 5)

and made subject to specific obligations. In its decision on 27 August 2015, Nkom decided on the use of margin squeeze tests as a tool to follow up on the requirement of non-discrimination for fibre-based Broadband access.

24. The specific obligations that currently apply to Telenor in this market are principally:

- The obligation to accommodate any reasonable request for access in the form of Broadband access in copper-based and fibre-based access networks. Refusal to grant such access must be justified and documented.
- The obligation to meet any reasonable request for access to co-location and/or access to information and support systems, to the extent that such access is necessary for access in the form of Broadband access to function effectively and appropriately for other providers.
- The obligation to set cost-oriented prices for copper-based Broadband access.
- The obligation to set prices for co-location and access to information and support systems in relation to copper-based and fibre-based Broadband access, on the basis of the principle of cost orientation.
- The obligation to compile cost accounts for copper-based Broadband access and for co-location.
- The obligation not to discriminate with regard to prices and other terms. The obligation applies to non-discrimination both between external operators and between internal and external operators. The obligation to pass specific margin squeeze tests for fibre based Broadband access.
- The obligation to prepare and publish standard quotations for copper-based and fibre-based Broadband access and required additional services. The standard quotation must include provisions concerning reasonable compensation for failure to fulfil agreed quality levels.
- The obligation to publish key performance indicators (KPIs) for Broadband access based on both copper and fibre access networks.
- The obligation to establish accounting separation for fibre-based Broadband access.

5 Competition problems

5.1 Competition problems in general

25. A provider with significant market power would be able to engage in behaviour with the purpose or consequence of restricting competition, including driving competitors out of the market, preventing new operators from entering the market, or exploiting consumers. This kind of anti-competitive behaviour is also referred to as competition problems.

26. Specific obligations imposed on providers with significant market power must be suited to remedy actual and/or potential competition problems in the relevant market. The imposition of specific obligations is not conditional on the abuse of market power actually having occurred. It is sufficient that a competition problem might potentially arise under given conditions.

27. Nkom's remedies document contains a general description of potential competition problems within the market for electronic communication.

28. Nkom's market analysis (Annex 1) concluded that there is not sustainable competition in the market for central access provided at a fixed location (Market 3b). Telenor can, to a large degree, act independently of competitors, customers and consumers, and has therefore been designated as a provider with significant market power. This chapter describes the competition problems within the relevant market, which then form the basis for the imposition of specific obligations.

29. When assessing the competition problems in the market, Nkom will have to consider behaviour and strategies that may arise if the market is not regulated. Nkom's remedies document also specifies that the assessment of competition problems is linked to the operators' "possible behaviour" within the decision's time horizon. National regulatory authorities do not need to establish that an operator has previously abused its market power in order to be able to impose specific obligations. In the assessment of potential competition problems, it is useful to examine what incentives the market structure would give the provider with significant market power in the absence of regulation.

30. The potential competition problems are described in a general manner in order to capture as many specific situations as possible that may arise in the absence of regulation. Nkom cannot anticipate every specific competition problem that might arise in the absence of regulation.

31. The potential competition problems in the market can be subdivided into three categories: vertical leveraging (category 1 in Nkom's remedies document), horizontal leveraging (category 2 in Nkom's remedies document) and single market dominance (category 3 in Nkom's remedies document).

32. A review follows below of the various competition problems of relevance to Market 3b. The potential competition problems in Market 3b are primarily linked to vertical leveraging of market power and single market dominance. The overview is not exhaustive, but contains potential competition problems that Nkom has identified.

5.2 Vertical leveraging

33. Vertical leveraging⁶ is the term we use to refer to a situation where a vertically integrated provider with significant market power in the wholesale market (the upstream market) attempts to transfer market power from the wholesale market to a related downstream market (for example, the retail market or an underlying wholesale market) by shutting out or counteracting competitors in favour of its own operations in downstream markets.

34. For vertical leveraging to represent a problem, the provider must for some reason be prevented from fully exploiting its dominance in the upstream market. If, for example, the dominant operator in the upstream market is subject to price controls, the operator may have incentives to transfer market power to related downstream markets. It is generally assumed that the more strictly the relevant upstream market is regulated, the more problems related to vertical leveraging are likely to increase in scope in downstream markets. Nkom would, however, point out that the purpose of regulation at the wholesale level is to prevent an operator with significant market power in a wholesale market taking advantage of its market power, with a view to ensuring equal terms of competition in downstream markets. This means that wholesale regulation will not necessarily increase the need for regulation in the related downstream markets. Indeed, it is more likely to have the opposite effect.

35. Market 3b is a wholesale market in which the retail market for standardised broadband access is the most relevant downstream market. However, Market 3b can also be considered to be a downstream market, viewed in relation to Market 3a. For example, local access in the form of LLU can be regarded as an input factor in the production of central-level access products (e.g. bitstream access).

36. Nkom considers it likely that Telenor, as a provider with significant market power, will not generally be able to fully exploit its dominance in this market. This follows directly from prohibition provisions in the Competition Act, among others. In addition, any specific obligations imposed pursuant to the Electronic Communications Act (such as price controls and obligations of non-discrimination) will reduce Telenor's opportunity to exploit its market power in this market. Various forms of vertical leveraging will therefore represent potential competition problems in the market. The most important of these competition problems are discussed below.

37. With regard to choice of remedies, it is helpful to distinguish between three types of (strategies for) vertical leveraging:

- Denial of access

⁶ Vertical leveraging may be defined as "...any dominant firm's practice that denies proper access to an essential input it produces to some users of this input, with the intent of extending monopoly power from one segment of the market (the bottleneck segment) to the other (the potentially competitive segment)" (Rey/Tirole 1997, quoted in the BEREC document).

- Leveraging by means of non-price variables
- Leveraging by means of pricing

5.2.1 Denial of access

38. An established provider with significant market power in an upstream market may try to leverage market power by denying access to operators that offer competing services in the related downstream market, thus restricting competition in these markets. By cutting off competitors from essential upstream inputs, the dominant operator may, to a certain extent, protect its own downstream operations against effective competition. Nkom finds that Telenor may have an incentive to deny other operators access to necessary wholesale products in this market.

39. This competition problem includes situations where the wholesale provider with significant market power refuses to deal with competitors, as well as cases where access is offered, but on unreasonable terms.

40. For denial of access to represent a problem, it must lead to weakened competition downstream. If there is sufficient competition in the downstream markets, for example, due to potential competition from alternative networks and/or technologies, denial of access will not necessarily weaken the competition downstream.

41. Nkom nevertheless finds that in many contexts Telenor's rivals in related downstream markets will be dependent on access in this wholesale market to be able to offer competitive solutions to end users in competition with Telenor. Furthermore, it is assumed that any denial of access in the wholesale market would lead to significant weakening of the competition in the retail market.

42. The prevalence of alternative access networks has continued to grow since Nkom issued decisions on specific obligations in the broadband access market (former Market 5) in 2014. Prior to the decision in 2014, xDSL was still the most widely used access technology with approximately 44% of all broadband subscriptions in the retail market. Although copper-based access is no longer the dominant access technology, the copper access network is still used as an input factor for approximately 26% of all fixed broadband subscriptions in the retail market⁷. Nkom believes that any denial of access at the local level to Telenor's copper-based access network could substantially weaken the downstream market. It is also important to emphasise that the copper access network is the only nationwide access network. In the absence of an imposed obligation of access, denial of access therefore still represents a potential competition problem in Market 3b.

43. Fixed broadband can also be provided via fibre access networks, HFC networks (hybrid fibre coaxial, also referred to as cable television networks) and fixed radio access (such as

⁷ Cf. Nkom's electronic communications statistics for 2017.

fixed LTE⁸ and WiMax⁹), as well as via the copper access network. The prevalence of alternative access networks has increased dramatically in recent years. There has been especially strong growth in the number of customers receiving broadband via fibre access networks, and fibre-based broadband is now the most widespread access technology. In addition, the existing HFC networks have been significantly upgraded, also contributing to more broadband customers via the HFC networks. In 2014, Nkom based its decision in former Market 5 on the assumption that the competition problems that denial of access to Telenor's copper access network would represent could largely also apply to denial of access to Telenor's fibre access and HFC networks.

44. On several occasions, Telenor has indicated an increased commitment to fibre-based broadband and has expressed a target of 800,000 homes passed by fibre in 2020.¹⁰ This will lead to lower prioritisation of the copper network. Nkom finds it probable that Telenor will build fibre accesses to most new homes and commercial buildings in the coming years, while a growing number of copper accesses will be replaced by fibre accesses. Furthermore, it is possible that Telenor will buy up competitors that have fibre access networks, as was the case with the acquisition of LOS Bynett and Bynett Privat. In this way, Telenor will be able to maintain its market share and market power even if utilisation of the copper access network is reduced. This kind of development, combined with the fact that it is commercially uninteresting to duplicate already established access networks based on, for example, fibre, means that Nkom still finds that denial of access to Telenor's fibre access and HFC networks represents potential competition problems in Market 3b.

5.2.2 Leveraging by means of non-price variables

45. Leveraging by means of non-price variables refers to various types of discriminatory behaviour between internal and external customers in the wholesale market. This is especially relevant if an operator with significant market power in an upstream market is subject to regulated access charges that render price discrimination difficult or impossible.

46. Competition problems of this type include delaying tactics, undue requirements, quality discrimination, and discrimination or misuse related to information. These competition problems are described in more detail below. For instance, these types of competition problems can often give the established operator a "first mover advantage" over rivals in the downstream market, thereby restricting the competitors' opportunities in the downstream markets.

⁸ For more information on fixed LTE, see the newsletter from Telenor, published in April 2016: http://app.emarketeer.com/ext/webpage/show.php?p=274290a94fb0bf954a6a2b621eed8926416f02c&from=groupmessage&isappinstalled=0&ic_source=fmwc17&ic_medium=hwdc

⁹ WiMax is a standardised wireless technology for the provision of broadband accesses.

¹⁰ See, for example, the presentation from Telenor's Capital Markets Day in February 2017: <https://www.telenor.com/wp-content/uploads/2017/02/Telenor-CMD-2017-Telenor-Norway.pdf>

47. One potential competition problem is delaying tactics, such as lengthy negotiations or unreasonably long delivery times. If, as part of an access obligation, there are no requirements for negotiations for access to be implemented without unnecessary delay or for delivery times to be the same for external wholesale customers as for its own downstream operations, Telenor may have an incentive to use various forms of delaying tactics to slow down access. These kinds of delays could potentially represent a competition problem.

48. Undue requirements and quality discrimination are also potential competition problems. Undue requirements to access buyers may be intended to shut them out from the market. Examples of undue requirements include demanding large bank guarantees, strict sales requirements with a repayment obligation if the sales requirement is not met, and unnecessary information requirements. Quality discrimination refers to the opportunity to ensure better quality for its own downstream operations than for access buyers. Varying fault correction times is an example of quality discrimination.

49. Potential competition problems in Market 3b related to information management may include discriminatory use or withholding of information and misuse of information. In respect of discriminatory use or withholding of information, Telenor may have an incentive to provide its downstream operator with information that they do not provide to external wholesale customers, or refuse to provide information necessary for the wholesale customers to be able to provide services in downstream markets. For example, Telenor may have an incentive to furnish only its own retail operations, and not its external wholesale customers, with information about the wholesale operations' roll-out plans. This could be particularly problematic if Telenor plans upgrades or other changes to the access network affecting external wholesale customers that buy access from Telenor. These operators need predictability to protect their investments. If changes are made in network structures etc. that affect the access buyers, the latter need information about this so that they have sufficient time to adapt to the changes.

50. In terms of misuse of information about rivals, Telenor receives customer growth forecasts from the wholesale customers in Market 3b. Telenor's wholesale business needs them to be able to operate and develop the access network in the most efficient manner possible. These forecasts give Telenor's wholesale operations a certain amount of information about the marketing plans of external wholesale customers. This is information that could potentially be misused by Telenor if it becomes available to Telenor's own retail operations.

51. In the current regulatory period, Nkom has processed several complaints relating to possible discrimination between internal and external downstream operations. In May 2015, Broadnet complained that Telenor was in breach of several key obligations in Nkom's decisions in former Markets 4 and 5 (see Section 3.6.7 of the market analysis). The complaint pertained to, among other things, Telenor's information and support systems, set-up fees in connection with placing an order, cancellation fees, delivery times and cancellation of orders.

52. Furthermore, there have been conflicts between Telenor and access buyers in connection with notice periods for changes as a result of Telenor's upgrading of the copper network (see Section 3.6.4 of the market analysis). Telenor provided six months' notice of the changes, even in cases where the changes were relatively major and would partially deprive the wholesale customers of the opportunity to provide services to their own end users from the main exchange. Nkom issued a decision on 8 July 2016, ordering Telenor to change the notice period in those cases where the changes to the access network are of a scope that, according to regulations, requires a notice period of three years. Telenor appealed the decision, but Nkom's decision was upheld in the Ministry of Transport and Communications' appeal decision of 19 December 2017.

53. All in all, it is Nkom's view that all seven competition problems from 1.2 to 1.8 as referred to in Nkom's remedies document and BEREC's remedies document could potentially arise in Market 3b.

5.2.3 Leveraging by means of pricing

54. This kind of vertical leveraging includes behaviours whose purpose or effect is to increase competitors' costs, limit their sales in downstream markets, or subject competitors to a margin squeeze. Below is a discussion of the most likely forms of leveraging by means of pricing in the relevant market.

55. A common feature of competition problems of this kind is that they pertain to the relationship between prices in the market for wholesale local access (Market 3a), the market for wholesale central access (Market 3b) and the retail market for standardised broadband access respectively, and not the price level in the respective markets per se. In Nkom's view, it is important that the prices are balanced so as to facilitate efficient investment decisions and effective competition where possible, in the best interests of the end users. This means that for an efficient operator it must be possible to enter the market at different levels of access and compete with Telenor in these markets on equal terms.

5.2.3.1 Price discrimination

56. A vertically integrated provider with significant market power in the wholesale market will have an incentive and the opportunity to discriminate on price between different providers and between its own and external operations. Basically, price discrimination occurs when the wholesale provider charges different prices for the same services. However, it can also take place more indirectly; for example, if the price plans at the wholesale level are formulated so that in practice it is difficult for rivals to have a competitive price structure in the retail market.

57. One possible consequence of price discrimination is that the costs for one or several competitors will be higher than the costs for the dominant operator's own retail operations, thus subjecting competitors to a margin squeeze. In this context, margin squeeze is defined as differences between access charges in Market 3b and the vertically integrated provider's retail

prices that entail that the margin becomes so small that efficient competitors cannot earn a reasonable rate of return and are therefore at risk of being squeezed out of the market.

58. Nkom has conducted three rounds of margin squeeze calculations linked to Telenor's fibre-based Broadband access obligation (see Section 3.6.6 of the market analysis). On all occasions the results of the margin squeeze tests showed that an effective access buyer would not be able to replicate Telenor's retail products. Nkom therefore found it necessary to order Telenor to adjust its prices for access to the product VULA in order to meet the regulatory requirements associated with non-discrimination in terms of prices. Decisions on the correction of access charges were made on 9 May 2016, 21 February 2017 and 20 April 2018. Telenor appealed all Nkom's decisions. In the first case, the Ministry of Transport and Communications ruled that Telenor's rates must be reduced by 24.7%. The appeal of Nkom's other decisions is currently being considered by the Ministry.

59. Price discrimination per se does not necessarily constitute a competition problem. For example, volume discounts based on objective criteria will often not constitute a competition problem. However, if the threshold for the discounts is set so high that only Telenor's own downstream operations receive discounts, price discrimination in the form of volume discounts may nevertheless constitute a competition problem.

60. Nkom finds that price discrimination is a potential and real competition problem in Market 3b. In Nkom's opinion, in the absence of regulation, Telenor would have an incentive and the opportunity to discriminate between internal and external operations such that Telenor's internal downstream operations would base its production on lower prices than external competitors in relevant downstream or retail markets.

5.2.3.2 Cross-subsidisation

61. In this context, cross-subsidisation can occur between Market 3b and associated downstream markets, particularly the retail market for standardised broadband access. The competition problem is related to and in part overlaps the competition problem of price discrimination.

62. Cross-subsidisation can also occur between Market 3a and Market 3b, where the latter will be the downstream market. For further description of the cross-subsidisation between these two wholesale markets, see Section 5.2.3.2 of the decision for Market 3a.

63. In the event of cross-subsidisation linked to vertical leveraging, a dominant operator would typically be able to charge a price that is considerably higher than the underlying costs in the wholesale market, while the price in the downstream market is lower than the costs.

64. For example, cross-subsidisation can occur by Telenor setting (excessively) high prices in Market 3b and (excessively) low prices in the retail market for standardised broadband access. In this case, Telenor would be able to use income from Market 3b to cover losses in the retail market, while potential rival providers in the retail market would be subject to a

margin squeeze. In this context we refer to the presentation of Nkom's margin squeeze tests for fibre-based Broadband access in Section 5.2.3.1 above.

65. In Section 5.2.3 Nkom pointed out that it is important that the prices in Market 3a, Market 3b and the retail market for standardised broadband access are balanced so as to facilitate efficient investment decisions and effective competition where possible, in the best interests of the end users. In Nkom's opinion, cross-subsidisation between these markets may have the opposite effect.

66. Nkom believes that cross-subsidisation between Market 3b and the retail market for standardised broadband access is a potential and real competition problem. In Nkom's opinion, in the absence of regulation, Telenor would have an incentive and the opportunity to use cross-subsidisation, thereby subjecting its rivals to a margin squeeze.

5.2.3.3 Predatory pricing

67. Like cross-subsidisation and price discrimination, Telenor can use predatory pricing to leverage market power from Market 3b to the retail market for standardised broadband access.

68. In the event of predatory pricing linked to vertical leveraging, a dominant operator would typically be able to charge a price in the downstream markets that is considerably higher than the underlying costs.

69. For example, predatory pricing can occur by Telenor setting (excessively) low prices in the retail market for standardised broadband access in order to subject rival providers in the retail market to a margin squeeze.

70. Like cross-subsidisation, predatory pricing can cause an imbalance in the prices in Market 3a, Market 3b, and the retail market for standardised broadband access, which may in turn prevent efficient investment decisions and effective competition where possible.

71. Nkom believes that predatory pricing in the retail market for standardised broadband access is a potential competition problem. In Nkom's opinion, in the absence of regulation at the wholesale level, Telenor would have an incentive and the opportunity to use predatory pricing, thereby subjecting its rivals to a margin squeeze.

5.3 Single market dominance

72. In addition to potential competition problems associated with vertical leveraging between markets, there are also potential competition problems associated with an operator's strong position in a particular market. As mentioned in Nkom's remedies document, it is appropriate to distinguish between three types of single market dominance:

- Entry-detering behaviour
- Exploitative behaviour
- Inefficient production

5.3.1 Entry-detering behaviour

73. This type of behaviour encompasses situations where a dominant operator tries to erect new entry barriers to potential newcomers in the market, for example by increasing the cost of switching operator through restrictive contractual terms, such as unreasonably long lock-in or notice periods.

74. Nkom believes that Telenor will be able to have incentives to seek to create new barriers to the establishment of operators wishing to become established as providers in Market 3b. These establishment barriers may be directed at operators wishing to use copper-based LLU as an input factor, and at providers wishing to use alternative access networks, such as fibre access networks.

75. Competition problems of this type are therefore relevant in Market 3b. Nkom considers it likely that Telenor may wish to increase operator switching costs at both the wholesale and retail level in the broadband market, in order to impede establishment as a provider in Market 3b.

5.3.2 Exploitative behaviour

76. Exploitative behaviour is situations where the dominant operator exploits customers through excessive pricing or price discrimination.

77. According to economic theory, prices can be considered excessive if they enable the provider of a product to sustain profits over time higher than it could expect to earn in a competitive market (super-normal profits). Operators with significant market power may set prices that are higher than the underlying costs warrant. Excessive pricing may appear to be the “next best thing” for operators that are obligated to give rival providers access to wholesale services.

78. Nkom regards overpricing as a serious potential competition problem in this market. In Nkom’s assessment, Telenor will have incentives to set high prices in this wholesale market, compared with the price that would prevail in a market with effective competition, in order to achieve higher profits in the wholesale market. An excessive price in the wholesale market may also spread to the retail market for standardised broadband access, entailing that end users on average pay an excessive price for the service and deterring some end users from purchasing broadband access. Overpricing could thus result in a decline in socioeconomic welfare and reduced competition. In this context we refer to the presentation of Nkom’s margin squeeze tests for fibre-based Broadband access in Sections 5.2.3.1 and 5.2.3.2 above.

79. Like exploitative behaviour, price discrimination can encompass various forms of differentiation of prices and/or price structures between different categories of customer and between internal and external access buyers. In Market 3b, price discrimination will primarily be a strategy for leveraging market power downstream, and less a problem related to exploitation of retail customers.

5.3.3 Inefficient production

80. This type of competition problem refers to different types of product inefficiencies due to lack of competition. The reason is that the market lacks the disciplining effect that exposure to competition is assumed to have on production efficiency. Potential competition problems of this sort include lack of investment, cost inefficiency and low quality.

81. Nkom does not consider it likely that lack of investment is a relevant competition problem in Market 3b. In recent years Telenor has made investments to increase, for example, the prevalence of VDSL, but has, as previously mentioned, stated that investments in the copper access network will have lower priority going forwards. However, significant investments in alternative infrastructure (such as fibre access networks) from both Telenor and other operators mean that inefficient production due to lack of investment is not considered a competition problem in Market 3b.

82. Nor does Nkom consider it likely that cost inefficiency and low quality will pose serious problems in Market 3b. In theory, a dominant operator in a market where there is little or no real or potential competition may have little incentive to operate cost-effectively. The competition from operators that purchase access in Market 3a at Telenor and from providers which use alternative access technologies gives Telenor relatively strong incentives for cost-effective operation in this part of the market. However, in areas where the copper access network is overlapped by Telenor's fibre or HFC network, it may nevertheless be likely that Telenor has no incentive to strive for cost-effective operations, but would prefer to wind up operation of the copper access network. However, this is not a question of whether cost-effectiveness and low quality pose a competition problem, but rather about the choices Telenor makes regarding use of infrastructure available to them in these kinds of areas.

5.4 Summary of potential competition problems

83. The potential competition problems in Market 3b are linked to vertical leveraging between markets and single market dominance.

84. With regard to vertical leveraging, it is chiefly various forms of discriminatory behaviour that pose the greatest competition problems. This includes both price-related discrimination that could subject Telenor's competitors to a margin squeeze in downstream markets, and discrimination relating to other circumstances that could limit competitors' opportunities in downstream markets. In this context, the most relevant downstream market will be the retail market for standardised broadband access.

85. In the case of single market dominance, the main potential competition problems are entry-detering behaviour through, for example, an increase in the cost of switching provider at both wholesale and retail levels, and exploitive behaviour through overpricing and price discrimination.

6 Choice of remedies in general

86. In the following, Nkom gives an account of some factors of a general nature relating to the choice of remedies in Market 3b. The actual choice of specific obligations is discussed in detail in Chapter 7.

6.1 Scope for duplication of infrastructure in the market

87. According to the review of principles 2 and 3 in Nkom's remedies document, key to the choice of remedies will be whether or not duplication of the infrastructure used in the relevant market is deemed possible. If infrastructure duplication is not deemed possible, the consumers' interests must be protected by making the best possible use of the existing infrastructure (principle 2). With this alternative, more static efficiency is attained. In markets where Nkom considers it likely that duplication of infrastructure could be achieved over time, a balance will have to be struck between the objectives of competition in the short and the long term.

88. Nkom based its decision from 2014 in former Market 5 on different regulatory principles for Telenor's copper network and high-speed networks based on different access technologies. Nkom concluded that copper-based access fell under principle 2, whereas for other access technologies it was not appropriate to draw an absolute conclusion with regard to regulatory principle 2 or 3. The use of remedies for fibre-based access networks was therefore designed to safeguard investment incentives to the maximum extent possible, while fostering competition based on wholesale access. One of the reasons for the distinction was that Nkom considered it unlikely that Telenor's rivals would find it appropriate to establish a parallel copper-based access network, as opposed to the case for roll-out of high-speed networks based on access technologies other than copper.

89. It is stated in the Norwegian government's electronic communications policy plan in "Digital agenda for Norway" from 2016 (Report no. 27 to the Storting (2015-2016) that an overarching goal for the government's electronic communications policy is that 90% of Norwegian households should have an offer of 100 Mbit/s broadband, based on commercial development in the market, by the end of 2020, and that the long-term goal is that all households have an offer of high-speed broadband. The report "Broadband coverage 2017"¹¹ shows that approximately 80% of households in Norway had an offer of at least 100 Mbit/s downstream speed in 2017, and that 100 Mbit/s coverage has increased gradually in recent years (from 73% in 2015 and 78% in 2016). A number of new fibre networks are still being planned and rolled out in Norway, and several providers have expressed interest in upgrading the copper network by means of vectoring and/or G.fast. Against this backdrop, Nkom expects

¹¹ Report prepared in September 2017 by Analysys Mason on assignment from Nkom.

that 100 Mbit/s coverage will also increase in the coming years, in line with the objectives defined in the government's electronic communications policy plan.

90. This trend indicates that the current regulation of the wholesale markets for fixed access has not affected the roll-out of high-speed networks in Norway in a negative direction, and that use of remedies aimed at both providing incentives for new investments (regulatory principle 3) and ensuring competition based on access to Telenor's networks (regulatory principle 2) seems to have had the intended effect. Nkom therefore deems it natural to use the conclusions reached in connection with the 2014 decision as a starting point.

91. There is still much to suggest that duplication of the copper-based access network is neither likely nor desirable. In areas where new infrastructure is going to be established to provide broadband and internet access in the retail market, other more modern technologies are used. Nkom assumes that new infrastructure will continue to be based on technologies other than copper and regards it as unlikely that rivals to Telenor would find it appropriate to establish a parallel copper-based access network.

92. At the same time, there has been new interest in upgrading parts of the copper network in recent years. This kind of upgrade will necessarily require investments, in connection with the roll-out of remote micronodes, among other things. Although duplication of the copper access network is not more likely today than it was in 2014, the goal of ensuring investment incentives linked to upgrading suggests that it is no longer natural to differentiate between the regulatory principle used for copper and that used for other access technologies. On the contrary, it will be important in the coming years that the use of remedies in the wholesale regulation of Telenor's copper access network serves to both provide investment incentives for upgrading the copper network and continue to foster access-based competition in the retail market.

93. The scope of alternative access networks, especially fibre-based networks, has continued to increase since 2014. At the end of the first half of 2017, approximately 43% of fixed broadband subscriptions were based on fibre, approximately 29 % were based on HFC networks, while some 26% were based on copper. Nkom expects significant investments in the development of alternative access networks, particularly based on fibre, from both Telenor and other operators. As previously mentioned, Telenor has indicated on several occasions that it is going to increase its investments in fibre-based broadband.

94. Nkom considers continued roll-out of high-speed networks based on other access technologies than copper both desirable and probable, and regulation of Market 3b should therefore pave the way for a development towards maximum sustainable infrastructure competition. As a result, in its formulation of specific obligations in this market Nkom will attach importance to incentives for further investment in high-capacity broadband networks.

95. There is growing competition among the developers of high-capacity broadband networks. In addition, there is reason to assume that mobile broadband will increasingly

become an alternative to fixed broadband for a growing number of broadband users in the coming years, even if the degree of substitutability is not yet considered large enough to warrant defining mobile broadband access as part of the relevant wholesale markets for fixed network based broadband access. In addition, OTT operators represent competition on the service side of the broadband market, entailing that parts of the infrastructure owners' service offerings will be more exposed to competition than in previously. These factors suggest that the assessment of remedies linked to other access technologies than copper in Market 3b ought to be based on regulatory principle 3.

96. At the same time, Nkom wants to prevent new competition problems arising after Telenor establishes more access networks based on alternative access technologies. Nkom regards it as unlikely that new broadband networks will be duplicated in areas where Telenor establishes fibre access networks and to a certain extent in areas where Telenor has established HFC networks. As long as Telenor's copper access network is maintained in the relevant areas, access obligations in the copper network will nevertheless help ensure competition in these areas. However, new competition issues may arise from the time that Telenor chooses to decommission the copper-based broadband offering in an area. In this case, the competition from broadband providers that rely on access to the copper access network will disappear, unless some form of access to the fibre access network and/or the HFC network is granted. Nkom expects that Telenor's increased investments in fibre-based access networks may entail decommissioning of the copper access network in an increasing number of areas. This is a factor that suggests that regulation of Market 3b ought to be based on regulatory principle 2, regardless of access technology.

97. Similarly, new competition problems may arise if fibre access from Telenor is the only broadband infrastructure established when new residential and commercial developments are built. In these kinds of situations, broadband users' interests must be safeguarded through regulation paving the way for the best possible utilisation of the established infrastructure. This argues in favour of regulatory principle 2.

98. In summary, considerations of investment incentives and the goal of more sustainable infrastructure competition in the broadband market suggest using regulatory principle 3 for both the copper-based part and the other parts of Market 3b. At the same time, Nkom also wants to continue to encourage competition in areas where Telenor is the only access provider, regardless of whether the access network is based on copper, fibre or HFC.

99. In light of this, Nkom has concluded that the use of remedies in Market 3b, regardless of access technology, should be designed both to provide incentives for investments that contribute to attainment of the high-speed network coverage goals defined in the government's electronic communications policy plan, while continuing to foster competition in the retail market based on access to Telenor's networks. This means that Nkom does not find it appropriate to draw an absolute conclusion regarding whether to base regulation of Market 3b on regulatory principle 2 or regulatory principle 3.

6.2 Proportionality

100. The principle of proportionality is discussed in more detail in Proposition no. 58 (2002-2003) to the Odelsting in the remark concerning Section 3-4 of the Electronic Communications Act. This remark contains the following comments on the proportionality assessment that the national regulatory authority is obligated to carry out in connection with the imposition of obligations:

“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.”

101. This principle means that when choosing from several alternatives, all of which could promote the objectives equally effectively, Nkom should choose the least burdensome alternative. Under the circumstances, an absolute requirement will also have to be put in place not to impose obligations that are disproportionately burdensome.

102. The content of the proportionality principle is also described in relative detail in Nkom’s remedies document. This document states that the principle of proportionality implies that measures should be suited to realise their underlying objective, should not be in excess of what is necessary in each case, and should result in benefits which outweigh the burdens.

103. 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 more burdensome obligations, such as price controls, could very well be proportionate or necessary where other less burdensome obligations are not considered adequate to achieve the objective of regulation.

6.3 Assessment of the need for geographically differentiated use of remedies

104. In the market analysis (Annex 1), Nkom has concluded that the geographical wholesale market for central access provided at a fixed location is delimited to the whole of Norway. The analysis on which this conclusion builds is based on both different networks’ coverage and the competition situation in the retail market.

105. According to the Explanatory Note (page 14), in this kind of situation it may nevertheless be assessed whether it is appropriate to differentiate the use of remedies geographically. Different levels of infrastructure competition in different parts of the country are highlighted in the Explanatory Note as a circumstance that might provide grounds for geographically differentiated use of remedies:

“In a situation where NRAs could not clearly identify substantially and objectively different conditions stable over time in order to define wholesale sub-national markets, the existence of geographically differentiated constraints on a SMP operator who operates nationally, such as different levels of infrastructure competition in different parts of the territory, are more appropriately taken into account at the remedies stage by imposing a geographically differentiated set of obligations.”

106. Against this backdrop, Nkom has assessed whether, despite the fact that Market 3b is geographically delimited to the entire country, it is nevertheless appropriate to impose different obligations on Telenor in different parts of Norway as a result of variations in the degree of infrastructure competition.

107. As shown in the attached market analysis, there are variations in the degree of infrastructure competition in the Norwegian market for broadband access. This implies that Telenor meets varying degrees of competition from alternative broadband developers in the retail market around the country. Nkom has therefore assessed whether Telenor’s obligations in Market 3b ought to be differentiated based on a distinction between areas with competition and areas with limited infrastructure competition.

108. In those parts of the country where operators other than Telenor have established NGA networks and where Telenor’s market share in the retail market at the same time has declined considerably in recent years, there may be an argument for relaxing wholesale regulation in Market 3b. An important prerequisite for this kind of geographically differentiated use of remedies would be that it is possible to distinguish clearly between areas with competition and areas with limited infrastructure competition, based on documentable criteria. In addition, Nkom believes that any such differentiation must be operational and proportionate, in the sense that any geographical areas in which obligations are differentiated be reasonably large and cohesive.

109. The attached market analysis shows that it is not possible at the county or municipal level to distinguish clearly between areas with competition and areas with limited infrastructure competition (cf. Section 2.5.3.2 of the market analysis). However, the market analysis does identify differences in the various networks’ and access technologies’ coverage in urban settlements and rural settlements respectively. This applies in particular to technologies that offer higher capacities (cf. Section 2.5.3.3 of the market analysis). This may indicate that it would be appropriate to define urban settlements (as defined by Statistics Norway) as areas with competition and with less need for wholesale regulation, while areas that are not urban

settlements (referred to as rural settlements in the coverage report cited in the market analysis) are defined as areas with limited infrastructure competition and with a greater need for wholesale regulation.

110. At the same time, Section 2.5.3.3 of the market analysis states that the largest relative increase for combined fibre, HFC and VDSL coverage in recent years has been in rural settlements, and that in recent years several fibre providers have started using roll-out models that have been adapted for use outside urban settlements. Although the coverage report reveals a difference in the roll-out of higher speeds between urban settlements and rural settlements, this indicates that the development is towards a closing of this gap. In the market analysis, Nkom has therefore found there is no basis for concluding that the competition situation in urban settlements and rural settlements is so different that this distinction could be used as the starting point for defining different geographical markets.

111. Nkom holds that the same reasoning can also be used when assessing whether the use of remedies in Market 3b ought to be differentiated between urban settlements and areas that are not urban settlements. Pursuant to the attached market analysis, there is no basis for defining all areas that are not urban settlements as areas with limited infrastructure competition. Similarly, the degree of infrastructure competition varies within several urban settlements. For example, there are areas within several urban settlements that have neither fibre nor HFC coverage from operators other than Telenor, where wholesale regulation is necessary to ensure effective competition. This implies that the removal or relaxing of the wholesale regulation of Telenor's copper and fibre networks in urban settlements might have negative competitive effects in certain areas within the urban settlements.

112. Against this backdrop, Nkom finds that a distinction between urban settlements and areas that are not urban settlements is not an appropriate starting point for geographically differentiated use of remedies in Market 3b.

113. This means that specific assessments of the degree of infrastructure competition and developments in market shares must be made on a level other than county, municipality or urban settlement if Telenor's obligations in Market 3b are to be differentiated geographically. As mentioned above, Nkom wants to ensure that any geographically differentiated use of remedies is operational and proportionate. In a situation where neither the counties, municipalities, nor urban settlements can be used as a basis for distinguishing geographical areas with different needs for wholesale regulation in Norway, Nkom believes that the principle of operational and proportionate use of remedies implies that it is not appropriate to adopt geographically differentiated use of remedies in Market 3b.

114. Because of the dynamics of the roll-out of NGA networks, including any upgrading of the copper network, which may not necessarily be limited to specific geographical areas in Norway, combined with the absence of stable geographical boundaries for the roll-out of fibre, Nkom believes that a continuation of uniform wholesale regulation throughout the whole

country in Market 3b is best suited to achieve the objectives of regulation in this decision period.

115. Further, Nkom believes importance should be attached to the fact that the current national obligations in these wholesale markets have not impeded the development of alternative NGA infrastructure in Norway. On the contrary, figure 29 in the market analysis shows that Norway has achieved the highest fibre to the home (FTTH) penetration in Europe despite the national obligations imposed on Telenor in the wholesale markets for Broadband access (former Markets 4 and 5). Nkom finds that this indicates that the design of the wholesale regulation in the Norwegian broadband market has both provided a basis for increased competition based on access to Telenor's networks throughout the entire country and still provided the necessary incentives for NGA development. This means that national obligations in the wholesale markets for Broadband access cannot be said to have had unintended negative effects on competition in the retail market.

116. In light of this, Nkom has concluded that it is more appropriate to continue national obligations in the wholesale markets for Broadband access, including Market 3b, than to attempt to introduce geographically differentiated use of remedies based on multiple uncertain assumptions about future infrastructure competition and market share developments in different geographical areas that cannot be delimited on the basis of counties, municipalities or urban settlements.

7 Choice and content of specific obligations

117. In this chapter, Nkom assesses the specific obligations that are to be imposed on Telenor as a provider with significant market power in the market for wholesale central access provided at a fixed location (Market 3b). The aim is to determine the obligations that are best suited to fulfil the objectives of the Electronic Communications Act and to counteract identified competition problems, while at the same time ensuring that the remedies are proportionate.

7.1 Recommendations from the European Commission and BEREC

7.1.1 The NGA Recommendation

118. Originally the European Commission's Recommendation on regulated access to next Generation Access Networks (the NGA Recommendation¹²) applied to regulation of former Market 4 and former Market 5. However, in the Explanatory Note (page 50), the Commission points out that the NGA Recommendation is also relevant for Markets 3a and 3b.

¹² Commission Recommendation of 20 September 2010 on regulated access to Next Generation Access Networks (NGA) (2010/572/EU)

119. The purpose of the NGA Recommendation is to provide incentives for investment and innovation in NGA and at the same time ensure competition and predictable regulation. The Recommendation builds on the EU's Digital Agenda, which defines a goal of increasing NGA coverage.

120. The Commission defines NGA as fixed access networks consisting wholly or partly of optical elements and capable of delivering broadband connectivity with enhanced properties (such as higher speeds) compared with the existing copper-based access network. In this context, increased NGA coverage primarily means the roll-out of optical fibre, but also includes upgrading of the existing copper access network in combination with fibre. The Commission regards it as important that regulation is consistent across national borders to avoid bias within the single market and to ensure predictability for the operators in the market.

121. The specific recommendations in the document are largely obligations linked to fibre networks for operators that are considered to have significant market power in the relevant markets.

122. Firstly, the Recommendation states that the remedies which already exist for providers with a significant market power in the former Market 5 should be continued or changed for existing and substitutable services.

“31. Where SMP is found on Market 5, wholesale broadband access remedies should be maintained or amended for existing services and their chain substitutes. [...]”

123. It is furthermore stated that:

“33. NRAs should mandate the provision of different wholesale products that best reflect in terms of bandwidth and quality the technological capabilities inherent in the NGA infrastructure so as to enable alternative operators to compete effectively, including for business grade services.”

124. The NGA Recommendation also states that access to fibre accesses should be granted at cost-oriented prices:

“35. NRAs should in principle impose cost orientation on mandated wholesale broadband access products in accordance with Annex I, taking into account differences in bandwidth and quality of the various wholesale offers.”

7.1.2 Recommendation on consistent non-discrimination obligations and costing methodologies¹³

125. The European Commission's Recommendation on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment, which was published on 11 September 2013 (the 2013 Recommendation) provides additional guidance regarding regulation of access to broadband

¹³ See <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:251:0013:0032:En:PDF>

networks. As a starting point, the Recommendation applies to regulation of former Market 4 and former Market 5 and builds on the EU's Digital Agenda. As was the case for the NGA Recommendation, the Commission points out in the Explanatory Note (page 50) that this Recommendation is also relevant to Markets 3a and 3b.

126. The purpose of this Recommendation is to provide incentives for investment and innovation in NGA and at the same time ensure competition and predictable regulation in the member states. It is considered important to create a common framework for national regulatory authorities on regulation of NGA with a view to fostering competition in the market, but also to increase willingness to invest in order to increase the pace of development of new infrastructure. The Commission regards it as important that regulation is consistent across national borders to avoid bias within the single market and to ensure predictability for the operators in the market. The specific recommendations in the document largely pertain to designing obligations related to copper and fibre access networks for operators regarded as having significant market power in the relevant markets.

127. The NGA Recommendation includes a number of details regarding which types of access should be offered as wholesale products, and requires that the offered products be priced on the basis of cost orientation. In the Recommendation on consistent non-discrimination obligations and costing methodologies, the Commission eases the requirement regarding cost-oriented prices in the relevant wholesale markets to a certain extent. The Commission expresses, for example, that in connection with access to NGA, cost orientation should not be imposed if there are requirements on strict non-discrimination, and the Commission specifically highlights "equivalence of input" (EoI) as a strict form of non-discrimination. In brief, equivalence of input means that the access products offered to external wholesale customers are exactly the same as those delivered internally to own retail operations, and that support systems for ordering, operational support, etc. are identical for external and internal deliveries. In the current regulation of former Markets 4 and 5, it is a requirement that wholesale access offered in the market must provide wholesale customers with the opportunity to offer the same end products in the market as Telenor. This type of non-discrimination obligation can be described as "equivalence of output" (EoO).

7.1.3 BEREC recommendations

128. In 2012 BEREC published a Common Position on regulation of former Market 5¹⁴. The document provides recommendations on obligations that ought to be imposed on a provider with significant market power in this market. Although the document was prepared for former Market 5, Nkom finds that it is also relevant for Market 3b. Nkom has therefore referred to BEREC's recommendations in connection with assessing what obligations ought to be imposed on Telenor in Market 3b.

¹⁴ BEREC Common Position on Best Practice in remedies on the market for wholesale Broadband access (including bitstream access) imposed as a consequence of a position of significant market power in the relevant market, BoR (12) 128.

129. In addition, in 2016 BEREC published a Common Position on Layer 2 Wholesale Access Products¹⁵ (Layer 2 referring to the OSI model¹⁶). Nkom has also referred to this document in preparing the obligations.

7.2 Access

7.2.1 The statutory basis

130. The general provision in the Electronic Communications Act regarding access¹⁷ is defined in Section 4-1 of the Act. The first paragraph of the provision reads:

“The Authority may order a provider with significant market power to meet any reasonable request to enter into or amend an agreement on access to electronic communications networks and services.”

131. In addition, the Act has its own provisions for certain special forms of access, such as Section 4-4 on co-location and Section 4-5 on information and support systems.

132. The extent to which a specific request for access is reasonable must be evaluated according to the criteria in Section 4-1, second paragraph, of the Electronic Communications Act:

“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 in relation to the risk with which the investment has been associated*
- 3) sustainable competition*
- 4) the need to sustain the network’s integrity*
- 5) intellectual property rights*

¹⁵ BEREC Common Position on Layer 2 Wholesale Access Products, BoR (16) 162.

¹⁶ See Annex 1, Section 2.4.1, for a description of the OSI model.

¹⁷ Access means making facilities and/or services available to other providers, on certain terms, with the objective of offering electronic communication services. The term covers, inter alia, access to networks, network elements and related facilities that can involve connection of equipment by cable or radio-based connection, access to physical infrastructure, including buildings, cable channels and masts and access to relevant software systems, including operating support systems. The term does not include access for end users.

6) *establishment of pan-European services.*”

133. The preparatory works to the Electronic Communications Act emphasise that this list is not exhaustive¹⁸.

134. When assessing the imposition of access obligations, the interest of the infrastructure owner in having control over its own network must be weighed against other providers' needs to have access to facilities that are necessary in order to offer competing services. Imposing obligations that increase competition in the short term should not reduce the competitors' incentive to invest in alternative infrastructure that in turn may boost competition in the long term.

135. Section 1-1 of the Electronic Communications Act also states that considerations relating to sustainable competition should be accorded weight in the assessment of whether or not a request for access is reasonable. The objective is to create a market that generally manages itself without regulatory intervention other than that pursuant to ordinary competition law.

136. Section 4-1 of the Electronic Communications Act provides the legal authority to set requirements regarding fairness, whether a request is reasonable, and compliance with deadlines in connection with access. Article 12, no. 1, third paragraph, of the Access Directive explicitly states that the regulatory authority may impose such obligations on an operator. Nkom holds that Section 4-1 of the Electronic Communications Act provides sufficient legal authority to set a general requirement that Telenor must not set unreasonable requirements or use unreasonable terms of contract in connection with accommodating a reasonable request for access and to set specific requirements relating to fairness, reasonableness and timeliness. The Ministry of Transport and Communications's decision in the appeal case dated March 9, 2018 in former Market 15 also confirms that the Electronic Communications Act authorises the Authority to impose such obligations.

137. Like other obligations, access obligations are subject to proportionality requirements. This is stated both in Article 12, no. 1, of the Access Directive (cf. Article 8, no. 4) and in Article 12, no. 2.

7.2.2 General comments on need for access obligation

138. In Chapter 5, Nkom assessed actual and potential competition problems in this wholesale market. One of the competitive issues identified is denial of access. To ensure that a vertically integrated provider with significant market power in a wholesale market does not shut competitors out of the retail market by denying or limiting competitors' access at the wholesale level, it will normally be necessary to impose access obligations on this provider in the relevant wholesale market. Such an access obligation may include direct access to the

¹⁸ Proposition no. 58 (2002-2003) to the Odelsting, p. 101.

relevant market and access that is necessary to support an access obligation in the relevant market, such as access to backhaul.

139. Access to Telenor's copper-based access network has been regulated at the central level since the current framework for sector-specific ex-ante regulation in the ecom sector was introduced through the new Electronic Communications Act in 2003. Several of Telenor's competitors have based their retail offerings of broadband access on wholesale access at the central level in Telenor's copper network. Nkom's 20 January 2014 decision on the designation of undertakings with significant market power and imposition of specific obligations in the wholesale market for Broadband Access (formerly Market 5) also imposed access obligations to the fibre-based access network on Telenor. This access obligation will be met through Telenor's VULA product.

140. Although infrastructure competition is growing in the retail market for standardised broadband access, Telenor still has significant market power in the wholesale market for central access to fixed access networks, cf. the market analysis in Annex 1. A continuation of the access obligation to Telenor's access network at the central level will ensure that providers who do not, or only to a limited extent, have their own access network will also have the opportunity to offer nationwide services in the retail market in the years ahead. The market analysis shows that buyers of access in this wholesale market constitute a major competitive factor in the retail market. The presence of operators who have based all or part of their business model on wholesale access to Telenor networks thus helps to ensure effective competition at the retail level throughout the country. This is especially true in areas where Telenor's infrastructure encounters little competition, but also in areas with parallel access infrastructure.

141. At the same time, it is imperative that access obligations in this wholesale market are designed so that they are not liable to limit the development of alternative access networks where such development is possible. The purpose of the access obligation is thus to balance the considerations of facilitating competition from providers without their own network and ensuring incentives for continued development of alternative networks. The access obligation in former Market 5 does not appear to have had negative effects on the incentives for the development of alternative access networks. At the end of 2013 there were 488 825 fibre accesses in Norway, compared with 928 560 at the end of 2017. This means that 439 735 new fibre accesses have been added during this period. Of these, 326 005 fibre accesses have been rolled out by Telenor's competitors, while the remaining 113 730 fibre accesses have been established by Telenor.

142. Although a growing share of the retail offering of broadband access is based on access infrastructure other than Telenor's network, Nkom believes that access to Telenor's copper-based access network at the central level will continue to be essential for competition in the broadband market in the years ahead. The possibility of an upgrade of the copper access network may help limit the decrease in the number of copper-based end user accesses. In

areas where such upgrading is being carried out, broadband access via the copper network will be able to achieve increased competitive power compared with broadband access over other technologies.

143. Local access to the copper access network alone will not meet the needs of wholesale customers who wish to have a nationwide offering, since it will not be profitable in many geographic areas to make necessary investments related to local access. In addition, when development shows that demand for local copper-based access is decreasing, access on the central level will get increased importance.

144. At the same time it is clear that Telenor is highly focused on the development of fibre-based access networks. Telenor is by far the largest single provider of fibre-based broadband and has expressed an ambition to grow further in this part of the market. Continued access to Telenor's fibre-based access network is expected to have a large and growing impact on the competition in the retail market for standardised broadband access.

145. For this reason, Nkom believes that it is necessary to continue an access obligation to Telenor's network at the central level in the wholesale market to ensure that providers who do not, or to only a limited degree, have their own access network will still be able to represent a competitive factor in the retail market. However, the access obligation must be proportionate to the identified competition problems. Below, Nkom has undertaken a further assessment of the obligations on access to Telenor's copper access networks, fibre access networks and HFC networks, as well as for additional services required to sufficiently contribute to the access-based competition in the retail market.

7.2.3 Central access to copper-based access networks

7.2.3.1 Broadband Access

146. Central access to Telenor's copper access network in the form of Broadband Access allows other providers access to bitstream. These providers will thus be provided with an opportunity to resell broadband connections based on ADSL, VDSL and SHDSL produced by Telenor. The wholesale product developed to meet this access obligation is called DSL Broadband Access.

147. The issue is whether Telenor shall still be obliged to offer Broadband Access in copper-based access networks. In order to address this issue, the requirements for the access product(s) in Market 3b must be identified. In the light of the requirements, a position must then be taken on whether Broadband Access is sufficient for meeting the access obligation in Market 3b. A position must furthermore be taken as to whether access should provide a possibility to use related services such as multicast and unicast (various forms of IP addressing).

148. Nkom believes that there is a need for an access obligation in Market 3b besides access in Market 3a.

149. Access products in Market 3b are further distinguished by that the quality of the wholesale service is “best effort”. This means that the wholesale provider cannot guarantee the service quality of the products.

150. The connection points for access products in Market 3b will typically be at a central or regional level in the network, but also products with a local connection point will be included in Market 3b if the other requirements concerning products in Market 3a are not fulfilled.

151. Furthermore, access products in Market 3b will often have a higher “contention ratio” than access products in Market 3a. A high “contention ratio” means that there are potentially many users sharing the capacity in the connection between the termination point at the end customer and the connection point. This could affect the efficient bandwidth, especially during periods where many people use the bandwidth at the same time.

152. In Nkom’s assessment, Telenor’s “DSL Broadband Access” product and the associated ADSL, VDSL, and SHDSL products will be at Layer 2 of the OSI model. This means that the wholesale customers will have a certain level of control over their broadband services. The aforementioned products will furthermore not have a guaranteed quality of service.

153. According to Telenor, DSL Broadband Access is offered at approx. 150 BNGs in Telenor’s network. The connection points for Broadband Access will thus be at what must be seen as the central level in a copper network infrastructure.

154. DSL Broadband Access has a higher “contention ratio” than, for example, the wholesale product VULA copper, which Nkom has ordered Telenor to offer in Market 3a (where the requirement is that the product shall be “uncontended”).

155. Based on the above, Nkom believes that DSL Broadband Access has characteristics that characterise access products in Market 3b.

156. Nkom also believes that Telenor shall facilitate related services such as multicast to ensure equal competition opportunities in the retail market.

157. On this basis, Nkom sees that it is still necessary to impose an obligation on Telenor to accommodate reasonable requests for access to Broadband Access. However, the obligation to provide Broadband Access may lapse in certain cases, see Section 7.2.3.2.

7.2.3.2 VUA copper

158. According to how the VULA Cu product¹⁹ is specified in the Broadband Forum, it will be possible to supply it in both an “uncontended” and “contended” version. In the “contended” version, the capacity of the connection between the termination point at the end customer and the connection point will be shared by multiple users. This gives the wholesale customers limited opportunities themselves to control the degree of utilisation, including having the

¹⁹ See description in Section 7.2.5 of the decision in Market 3a and the technical specifications in Annex 6 of the same decision.

capacity of the connection at their disposal. The wholesale customers will therefore have little ability to design the provision of services to end users. In the following, Nkom will refer to the “contended” version of VULA Cu as VUA copper.

159. The problem is whether Telenor should be obliged to accommodate requests for access to VUA copper in Market 3b.

160. The Danish Business Authority has ordered TDC to offer “*a contended VULA product in areas, where an exchange is connected to a remote connection point, or where vectoring technology has been adopted, including at the higher speeds that result from this.*” In other areas, it is up to TDC to decide whether they offer a contended VULA product.

161. The Authority exempts TDC from the obligation to offer bitstream access in areas where TDC offers a contended VULA product. The Authority believes this is proportionate: “*It is the Danish Business Authority’s assessment that TDC’s ability to phase out the copper-based BSA product under the stipulated preconditions is proportional in relation to the identified competition problems, precisely because another – and better – access product is available instead. If TDC is unable in that way to phase out the copper-based BSA product, TDC will be obliged to provide two, almost identical products, which is not proportionate in relation to the competition problems that have been identified.*”

162. The Danish Business Authority points out that the access buyers will have sufficient control over the connection to the contended VULA product in order to undertake a certain amount of product development/design of services to the end users. Nkom has the impression that the same is the case for Telenor’s “contended” VULA Cu offer, which has been presented in the Broadband Forum.

163. Telenor has reduced its ambitions for upgrading the copper network. Nkom refers to the review of this in the decision in Market 3a. TDC in Denmark has major plans to upgrade the copper network. It can therefore be argued that the need for VUA copper in Norway is less than in Denmark.

164. Another difference between Denmark and Norway is the level of the network architecture to which the access buyers have access. In Denmark, the VULA copper connection point in Market 3a is either on a remote micronode or exchange/MC. In Norway, the connection point in Market 3a for VULA copper is mainly at the BNG level. This means that the difference in terms of connection points in Market 3a and 3b is less in Norway than in Denmark. However, this will also apply even if the wholesale product in Market 3b should only be a Broadband Access. Although the access points are different in Denmark and Norway, Nkom will also assume that the characteristics of VULA copper in Denmark and Norway are relatively similar (concerning control, service independence and “uncontended” connection). Nkom therefore believes that the access point will not be decisive for the question of whether an obligation shall be introduced to provide VUA copper in Norway.

165. Telenor is ordered to offer VULA copper in Market 3a in areas where Telenor upgrades the copper access network with exclusionary effect. It will therefore be consistent to order Telenor to offer VUA copper in Market 3b in the same areas.

166. The work done by the Broadband Forum has shown that there is a reason to develop the VULA and VUA products in parallel, and Telenor has proposed offering VULA Cu in both the contended and uncontended versions and with ODP2 access. The development costs for VUA copper are assumed to be relatively small on this basis.

167. Nkom believes on this basis that Telenor shall be obliged to accommodate reasonable requests for access to VUA copper in Market 3b.

168. Nkom refers to the assessments made in the Market 3a decision whether Telenor should offer VULA copper throughout the network. This raises questions about whether VUA copper shall be offered throughout the network. Nkom refers to the Danish Business Authority's solution to this question, cf. the description above. Nkom believes that a similar solution in Norway will give Telenor the opportunity to get more volume on VUA copper and thereby get more out of an investment in virtual access products. Reference is also made in this connection to what is said above about the product development of the VULA and VUA product. In summary, Nkom therefore believes that it is sufficient to order Telenor to offer VUA copper where the copper network has been upgraded with exclusionary effect.

169. In its comments on Nkom's notification of the draft decision in Markets 3a and 3b, ESA has asked Nkom to clarify the timeline for when virtual access products must be available. In the Market 3a decision, Nkom has clarified the timeline for each phase that Telenor must undertake in order to be able to offer VULA copper as a substitute for physical access to the copper access network.

170. With regard to deadlines for VUA copper, Nkom refers to the assessments in Section 7.2.5.6 of the Market 3a decision concerning deadlines associated with VULA copper. Nkom cannot see any basis for the various deadlines to be different for VUA copper. On this basis, Telenor will have an obligation to offer VUA copper at the same time as VULA copper, i.e. that the product must be operational at the latest from the date on which physical access lapses. Furthermore, Telenor's reference offer for VUA copper, including prices, must be ready by no later than six months before the physical access lapses. It must be possible to order VUA copper no later than three months before the physical access lapses.

171. If Telenor believes that a need has arisen to make changes to the VULA Cu product description, Telenor must inform Nkom of this in writing. Nkom specifies that this applies to any change in the product description. If the change is of such a nature that it changes the characteristics of the access product on which the providers agree in the Broadband Forum, Telenor must furthermore involve the access buyers.

172. The obligation to offer access to Broadband Access lapses where Telenor offers VUA copper, either based on Telenor's duty to offer VUA copper or a voluntary offer for this. For this

reason, Telenor will not be obliged to offer both VUA copper and Broadband Access in the same area.

173. An obligation for Telenor to offer VUA copper makes a requirement for migration from Broadband Access to VUA copper necessary.

7.2.4 Central access to fibre-based access networks

174. Through Nkom's decision of 20 January 2014 in former Markets 4 and 5, Telenor was ordered to accommodate all reasonable requests for LLU access to fibre-based access. At this time, Telenor did not have an existing wholesale offer for fibre access, and the 2014 decisions therefore contained an order to develop such an offer. The 2014 decision for Market 5 stated that the access obligation for fibre could be met through a VULA product. On this basis Telenor developed the VULA product, which was launched at the beginning of 2015. VULA is currently available in Telenor's PON-based fibre network. In the following, Nkom will review central access to fibre-based networks such as VUA fibre.

175. The issue is whether Telenor's obligation to accommodate requests for access to VUA fibre shall be continued. In that case, Nkom must shed further light on the specific details of the obligation.

176. Nkom is of the opinion that the competition problems that justified the obligation to offer access to Telenor's fibre accesses in the decision for Market 5 in 2014 are still applicable. This suggests that it is necessary to continue the access obligation for VUA fibre in Market 3b. Nkom refers to the consideration of competition problems in Chapter 5 of this decision, and will particularly highlight denial of access as a relevant competition problem in this context.

177. In the preceding section, Nkom argued in favour of imposing an obligation on Telenor to offer VUA copper. Among other things, reference was made to the connection between VULA copper and the upgrading of the copper access network. However, the access obligation for VULA fibre in Market 3a is not linked with the copper network upgrade. Similar arguments for an access obligation cannot therefore be used in conjunction with VUA fibre. The decisive factor in this context is then that the access obligation is necessary for the competition and not particularly burdensome for Telenor.

178. In the last couple of years, Telenor has accounted for a substantial proportion of the growth in the number of fibre accesses, and Telenor's stated growth ambitions for further fibre development indicate that Telenor will strengthen its position in fibre access in the years to come. Nkom finds that continued growth in the number of Telenor's fibre accesses suggests that there is a need to continue the access obligation for fibre-based access networks.

179. Furthermore, there is no reason to believe that Telenor's development of fibre networks will be negatively impacted to a particular degree by the access obligation in Market 3b, possibly in addition to Market 3a. Telenor's stated growth ambitions for fibre-based broadband must, among other things, be seen in light of the fact that Telenor has already had access to

its fibre access network for several years. Nkom also points out that fibre networks are being established based on a long-term investment perspective and not short-term competition considerations. Any reduced profitability for Telenor due to having to sell access will therefore not be decisive for Telenor's investment decision.

180. Nkom believes on this basis that it is necessary to impose access in Market 3b to Telenor's fibre access network.

181. Telenor's wholesale product for PON-based fibre networks, VULA, was launched in 2015, and some access buyers have already made investments to use such access. In Nkom's opinion, this product will meet an access obligation for VUA fibre in Market 3b. Continuing the obligation to offer VUA fibre will not be very burdensome for this reason.

182. Sales of Telenor's wholesale product for fibre are currently fairly limited. This can have several reasons, such as that there have been a limited number of available accesses and that the price for the product has been too high. It can further be connected with the fact that the wholesale customers' opportunities to design broadband service for their end users has been limited. In this context, Nkom refers to Nkom's conclusion that Telenor shall be obliged to offer VULA fibre in Market 3a.

183. Nkom has ordered Telenor to change the company's wholesale prices for fibre-based access in three rounds, most recently in the decision of 20 April 2018. The last two cases have been appealed to the Ministry of Transport and Communications, but if the Ministry accepts Nkom's recommendations, the access prices will be further reduced, which in turn can lead to increased demand for the wholesale product.

184. Nkom believes that key characteristics of the current access product in former Market 5 must be continued in Market 3b. Among other things, this applies to product characteristics that can support multicast and prioritise data.

185. Like VUA copper, VUA fibre will continue to provide adequate control over the connection so that the wholesale customers can undertake a certain amount of product development/design of services to end users.

186. Nkom also refers to the decision from 2014 in former Market 5, which set out that a fibre access product should have the following key characteristics:

- Possibility of differentiated quality of service and access capacity for end users
- Possibility to supply various retail services regardless of which products Telenor itself chooses to market
- Practical access points in the network for access buyers
- Flexibility in choice of network terminals/user equipment

187. VUA fibre shall be offered with characteristics similar to those for VUA copper, i.e. have characteristics that can provide adequate control over the connection so that the

wholesale customers can undertake a certain amount of product development/design of services to end users. This implies a continuation of the characteristics that were assumed for a fibre access product in the decision from 2014 in former Market 5.

188. As the decision for Market 3a shows, Nkom believes that, as of today, Telenor's VULA product does not fully meet the requirements of products in Market 3a, even though the level of connection may be deemed to be local. As one of the obligations in Market 3a, Telenor is therefore required to prepare a further developed VULA product which meets the requirements applying to products in Market 3a. The obligations in Market 3b are imposed irrespective of this obligation in Market 3a. Nkom will nonetheless assess the need to maintain or adjust the obligation to provide access in Market 3b for VUA fibre when the requirements for virtual local access in Market 3a are determined.

7.2.5 Central access to Telenor's hybrid network of optical fibre and coaxial cables (HFC networks)

189. In the decision for the former Market 5 from 2014, Nkom found that there was no basis to impose an access obligation for Telenor's HFC networks²⁰. Even though the technology-neutral market definition in the former Market 5 in principle advocated that Telenor's access obligations should include all technologies used by the company to offer broadband access in the retail market, access to the HFC networks would still require technical adjustments. At the same time, the upgrading of HFC networks for broadband purposes had been ongoing for several years without creating new competition problems, which in turn would indicate that it was not necessary to impose access regulation in HFC networks.

190. In this section, Nkom will assess whether in Market 3b there is a basis for maintaining the conclusion from the previous decision in Market 5. In this context, Nkom will assess the extent to which there is a need for central access to Telenor's HFC networks in order to achieve sustainable competition, including a proportionality assessment which entails weighing the significance of access to competition against the complexity of having to grant access.

191. Nkom defines HFC networks as networks in which both fibre and coaxial cables are used. If a HFC network is upgraded, however, with fibre all the way to the building, so that the fibre terminates inside the building or against the foundations of the building, the network is reclassified as a fibre network.

192. At the end of first half of 2018, there were just under 616,000 broadband subscriptions via HFC networks, equivalent to around 28% of the Norwegian private fixed broadband market. For several years, HFC networks were the form of access with the greatest absolute growth in the number of subscriptions. In the past few years, however, the number of broadband subscriptions via HFC networks has flattened out and begun to decline. From the end of first half of 2017 to the end of the first half of 2018, there was a drop in the number of subscriptions

²⁰ Referred to as cable TV networks in the decision from 2014.

delivered via HFC networks of more than 12,000. The reason for the decline in the number of broadband subscriptions provided via HFC networks is an ever-increasing degree of fibre expansion both by Telenor and other regional and national fibre developers. Nkom expects this development to continue and that in the years to come there will be a further decrease in the number of broadband subscriptions delivered via HFC networks.

193. Telenor is the country's second largest provider of services based on HFC networks. Telenor's HFC infrastructure consists of the HFC networks owned by Telenor, as well as user-owned HFC networks for which Telenor undertakes the delivery of TV and/or broadband. At the end of first half of 2018, Telenor delivered broadband to almost 285,000 customers in HFC networks, which indicates a market share above 45%. During the last three years there has been a decrease in the number of broadband subscriptions delivered via HFC networks by Telenor. The number of subscriptions decreased by almost 9,000 from the end of 2016 to the end of first half of 2018.

194. As was also indicated in the decision in the former Market 5, HFC networks are only regulated to a small degree in other countries. According to the information from Cullen International²¹, the authorities of Belgium, Denmark, France, Hungary and Macedonia have imposed obligations in connection with HFC networks. In all of these countries, with the exception of Belgium, the regulated providers are required to give bitstream access to the HFC network, although France only requires access to speeds exceeding 30 Mbits. In Belgium, providers with HFC networks are required to give access to their digital broadcasting platform and to resell their analogue TV services, as well as their Internet services.

195. So far, the access has only been used in practice in Belgium and Denmark. In Belgium, Orange launched a wholesale product on 1 March 2016, almost 5 years after the access obligation for HFC networks was imposed.

196. The authorities in Denmark imposed an access obligation for TDC's HFC network in 2009. The regulated access was subject to two technical conditional terms. First of all, the retail customer was required to have a TV subscription through the YouSee company (owned by TDC), and secondly, access buyers could not use multicast functionality for transmission of IPTV signals. Up to and including 2012, no providers purchased access to TDC's HFC network. In 2012, the Danish Business Authority therefore announced a more detailed analysis of the two technical conditional terms. The main reasons that no one had purchased access to TDC's HFC network were the level of wholesale prices, as well as the limitations imposed by the two technical conditional terms. The Danish Business Authority concluded, however, that based on a proportionality consideration, the two conditional terms could not be eased or repealed. In November 2014, the Danish Business Authority notified a draft decision in which an obligation was imposed on TDC to offer provision of TDC's TV packages, provision of

²¹ <http://www.cullen-international.com/product/documents/CTTEEU20170095>

individual channels, and access to deliver “on demand” functionality to third parties via TDC’s HFC network.

197. After the notification, TDC presented the Danish Business Authority with an alternative commercial solution for wholesale access to TDC’s HFC network. The solution entailed a comprehensive channel realignment in TDC’s HFC network and the addition of a further physical filter separating the broadband frequencies (DOCSIS channels) from the TV basic package. This allows for “data-only” access. TDC’s solution enables the access buyers to offer broadband via TDCs HFC network to retail customers that do not receive a TV basic package. If access buyers wish to deliver their own TV offers via the broadband connection, this can be done through a unicast solution.

198. The Danish Business Authority has assessed that the authorities do not have the authority under the Danish Telecommunications Act to impose an obligation on TDC concerning a duty of access which entails such an extensive realignment of the company’s HFC network. The Authority has thus not found it proportional to require the implementation of additional physical filters or forced channel realignment in TDC’s HFC network in order to be able to oblige TDC to offer “stand alone” broadband access to the company’s HFC network. The Authority gives weight to TDC’s demonstration that the commercial solution is financially sustainable for alternative providers, and that TDC ensures that the technical set-up that gives alternative companies access is functioning satisfactorily. The alternative providers’ opportunity to offer “data-only” products to end-users became a reality on 18 April 2016. According to the information received by Nkom, so far one company has used the wholesale product, while other companies have tested the product.

199. Nkom has defined Market 3b as technologically neutral and has concluded in the market analysis that wholesale access at central level in HFC networks is included in Market 3b. Broadband provided in the HFC network is included, among other things, in the calculation of market shares and in the assessment related to the designation of a provider with significant market power in the market for wholesale central access to fixed access networks.

200. Telenor’s HFC network is a point-to-multipoint network, like the fibre-based GPON network. In any such network, a larger part of the network closer to the retail customer will be a shared resource than is the case in a point-to-point network. However, there are some significant technical differences between GPON and HFC networks. In an HFC network, the network is divided according to a frequency plan, so that certain frequency bands are used for broadband and others for TV. This is often termed RF transmission. Since the frequencies are a limited resource, broadband and TV will compete for the utilisation of the total capacity. In a fibre-based GPON network, greater flexibility in the distribution of capacity is possible.

201. Telenor’s transfer of TV capacity currently uses traditional HFC-based TV technology. This entails that Telenor does not use IP for the distribution of TV in its HFC network, and all reserved TV capability in the network is dedicated to TV distribution. Even if a customer does

not subscribe for the TV service, this capacity is not released on the customer's access to broadband. If Telenor is to provide TV services through wholesale access in the HFC network, the signals must be sent as an IPTV or OTT service via the Internet access.

202. Telenor's HFC network is not currently dimensioned to deliver TV via the Internet access. Telenor can increase the Internet capacity in a geographical area by segmenting the network. Segmentation of the HFC network is the physical division of Telenor's HFC network into smaller segments, which entails investments in Internet nodes and fibre cables. Any wholesale access to Telenor's HFC network will increase the need for capacity in the HFC network significantly and thereby increase the need to upgrade the network, either by segmenting the network or by upgrading to new DOCSIS standards. Any such upgrades will entail a need for investment by Telenor.

203. There is uncertainty regarding the extent to which Telenor will upgrade the HFC network. At a meeting with Nkom on 24 April 2018, Telenor notified that the company has focus on building fibre all the way to the retail users. According to Telenor, the reason for this includes that the retail users have a preference for fibre. Even though equivalent speeds can be delivered using other technology, Telenor believes that the retail users want fibre. For this reason, Telenor is not willing to make significant investments in order to upgrade the HFC network, since it is uncertain to what extent the HFC network will be able to compete with fibre networks in the future. Furthermore, at the meeting Telenor confirmed that the company has no specific plans to upgrade the DOCSIS standard in the HFC network from version 3.0 to version 3.1.

204. Telenor's HFC network is separated from the rest of Telenor's value chain, and this value chain is not currently aligned for delivery via Telenor's wholesale interface. Developing such an interface would take time and entail costs.

205. The proportion of broadband customers with collective agreements in Telenor's HFC network was around 61% at the end of first half of 2018, i.e. above 171,000 subscribers. Under collective agreements, the selected service provider will control the internal HFC transmission network, while the service provider will undertake to provide the services covered by the agreement, be it TV, broadband or both services. These services are provided to all residential units, irrespective of whether the individual resident uses these services or not.

206. Housing associations leverage the advantage of having many units in one overall agreement to negotiate lower prices. In cases where the HFC transmission network in the collective agreement is owned by housing associations, the housing associations themselves can hold tenders for the service deliveries. This is not usually the case for operator-owned networks in residential areas where the infrastructure owner and service provider are one and the same company.

207. Collective agreements typically have an agreement period of 3-5 years. If the housing association chooses another service provider after the agreement term, the current service

provider will have to disconnect from the housing association's HFC distribution network and remove all active equipment in the network and at the residents. New service providers will thus be able to get connected by setting up their own equipment in the interface and possibly in the residential units.

208. At meetings with Nkom, Telenor, other infrastructure owners and access buyers in the broadband market have described the competitive conditions as strong in cases where the housing association is also the infrastructure owner. Customers are perceived as more price- and quality-conscious than before and they feel little affiliation to the existing provider if the housing association receives a better offer from a competing operator. Telenor and Get have traditionally been the two dominant operators in the market. In recent years, however, competition has increased in intensity, among other reasons because additional fibre operators have appeared. This applies particularly to housing associations that currently have HFC distribution networks and that wish to be upgraded to fibre.

209. The increased competition in the housing association segment is also reflected in consistently lower prices for customers with collective agreements, compared to customers with individual agreements. The figure below shows the average monthly retail price for customers with broadband via HFC networks, with individual and collective agreements.

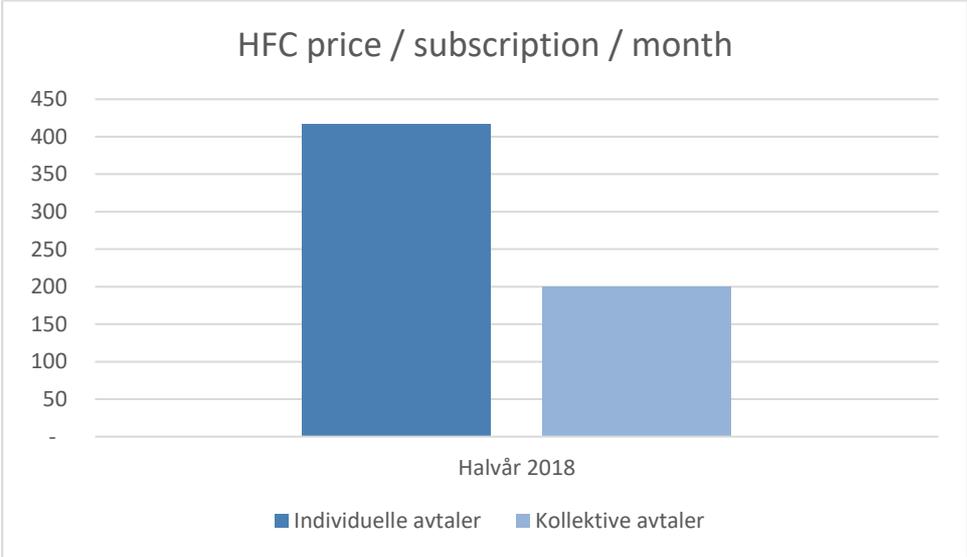


Figure 1: Average retail price per month for customers with broadband via HFC networks with individual and collective agreements (source: Nkom’s electronic communications statistics for first half of 2018.)

210. The figure shows that the price of broadband via HFC networks is considerably lower in collective agreements than in individual agreements. The figure does not, however, take account of any differences in speeds between the two segments. If the average speed in individual agreements is higher than in collective agreements, this may to some extent explain a higher price. Furthermore, the average cost of offering services to detached homes will

normally be higher than for housing associations. This may also explain a rather higher price in individual agreements than in collective agreements. Longer agreement periods, as well as greater negotiating strength, are other factors that may explain a lower price in collective agreements than in individual agreements. Nkom nonetheless believes that the difference in price, as shown in the figure, between individual agreements and collective agreements is so great that it indicates a greater degree of competition in the segment for housing associations with user-owned networks.

211. At the end of 2017, Telenor delivered broadband via own HFC networks to around 114,000 customers. Telenor's HFC networks are mainly located in densely-built residential areas. In Nkom's assessment, these are areas where it is attractive to establish fibre networks. Fibre networks are increasingly being established in Norway, which also applies to the areas covered by HFC networks. Other regional and national fibre developers than Telenor are mainly undertaking the development in the areas where Telenor has its own HFC networks. To some extent, however, Telenor has also established fibre networks in areas where the company has its own HFC network. Telenor has confirmed this at a meeting with Nkom. As stated above, Telenor has focus on establishing fibre networks all the way to the retail customer, and Telenor is upgrading its HFC networks to a lesser degree. This may result in HFC networks, in time, being less competitive with fibre networks, as retail users increasingly require higher speeds, which in turn will increase Telenor's and other fibre providers' incentives to establish fibre networks in the areas currently covered by Telenor's HFC networks. Nkom believes that there is reason to expect that the number of broadband customers in Telenor's HFC networks will decline in the years to come.

212. Nkom undertakes regular fixed broadband coverage surveys. The surveys measure the coverage for the various broadband technologies, based on "homes passed", i.e. the number of households passed by a broadband technology that is or can be connected to and is available for marketing. Coverage surveys conducted in 2018 show that over 99% of the households connected to Telenor's HFC networks had the opportunity to purchase broadband from Telenor or other providers with download speeds of minimum 4 Mbit/s via copper networks. The survey also shows that around 52% of the households connected to Telenor's HFC networks were passed by a fibre cable from Telenor or other fibre providers that are or can be connected to and are available for marketing. The coverage survey thus shows that there was a very limited number of households that had Telenor's HFC network as the sole broadband access option in 2018.

213. In principle, the technology-neutral market definition in Market 3b indicates that the access obligations for Telenor should include all technologies which the company uses to offer broadband access in the retail market. On the other hand, it is still the case that wholesale access to Telenor's HFC network will increase the need for capacity in the HFC network and increase the need for upgrading of the network, e.g. in the form of greater segmentation of the network. Any such upgrades will entail a need for investment by Telenor.

214. In 2017, the proportion of Telenor's HFC-based broadband customers connected via user-owned HFC networks totalled 60%. Both buyers of wholesale access from Telenor and other providers with their own infrastructure have good opportunities to compete for this part of the customer population. In meetings with Nkom, Telenor, other infrastructure owners, and access buyers in the broadband Market have described the competition for customers connected to the user-owned network as strong. Figure 1, showing the average annual retail price for customers with broadband via HFC networks, with individual and collective agreements respectively, also indicates strong competition for retail customers in the user-owned network.

215. On this basis, Nkom believes that it would be disproportionate to impose an access obligation on Telenor's HFC-based broadband customers connected via user-owned HFC networks. Any access obligation for Telenor will thus, in Nkom's assessment, only be relevant in the part of the HFC network where Telenor is also the infrastructure owner.

216. At the end of 2017, Telenor delivered broadband via own HFC networks to around 114,000 customers. This represents around 5% of the total number of fixed broadband customers in Norway. The number of customers that will be subject to any HFC-network access obligation will thus be relatively limited. Nkom believes that there is reason to expect that the number of broadband customers in Telenor's HFC networks will decline further in the years to come. Coverage surveys conducted by Nkom also show that over 99% of the households connected to Telenor's HFC network have the opportunity to purchase broadband via copper or fibre from Telenor or other providers. Access buyers will thus have the opportunity to offer broadband services to most of these customers via Telenor's copper and fibre networks.

217. It will be technically challenging for an access buyer to deliver linear TV via HFC networks. For such an operator it will therefore be most relevant to only offer broadband to the customers in Telenor's HFC network. The potential customer base is thus limited to the customers in Telenor's HFC network who only require a broadband connection and not linear TV. The number of potential customers for the access buyer is thus significantly lower than the 114,000 broadband customers in Telenor's HFC network. Nkom's statistics show that the majority of buyers of broadband via Telenor's HFC network also buy linear TV. In 2017, more than 98% of Telenor's broadband customers in the HFC network also bought linear TV via the HFC network. Part of the reason for the high proportion may be that broadband via Telenor's HFC network as a "stand alone" product has only been available in the retail market since 1 January 2017. Nkom therefore believes that it is also relevant to consider the proportion of Telenor's broadband customers via the fibre network that buy linear TV. In 2017, this proportion was in excess of 81%. Even though the proportion may decline somewhat in the years ahead as a consequence of the transition to streaming services, Nkom expects that a large proportion of Telenor's retail customers will still require linear TV in addition to the broadband service.

218. In summary, Nkom can state that any wholesale access to Telenor's HFC network will entail a need to upgrade the network, with associated investments for Telenor. There is uncertainty regarding the extent to which Telenor will upgrade the HFC network. In view of the fact that only a relatively limited number of accesses will be available and that Nkom expects this number to fall further in the years ahead, and that the vast majority of these accesses are covered by other access technologies, Nkom has concluded that there is a basis to maintain the conclusion from the previous decision in the former Market 5 that it is not proportional to impose an access obligation for Telenor's HFC network in Market 3b.

7.2.6 Central access to Telenor's network for fixed radio access

7.2.6.1 WiMax-based broadband

219. Prior to the decision in the former Market 5 in 2014, Telenor had rolled out WiMax-based broadband in some areas, but only to a very limited extent. In the decision in 2014, Nkom concluded that there was no basis to impose an access obligation on Telenor concerning broadband access in WiMax-based access networks. In the grounds for this, Nkom emphasised that an access obligation could have a negative effect on Telenor's incentives to roll out this type of broadband in parts of the country that could otherwise risk being without broadband coverage.

220. In this chapter, Nkom will assess whether there is a basis in Market 3b to maintain the conclusion from the decision in the former Market 5.

221. Telenor's offer of WiMax-based broadband still has very limited scope. The number of subscriptions was reduced in both 2014 and 2015, and at the end of 2015 Telenor had 864 of these subscriptions. In the first half of 2016, however, the number of subscriptions increased to 2,811 as a consequence of Telenor's acquisition of Nordix Data AS. Following this acquisition, the number of WiMax-based subscriptions at Telenor has still continued to decline, and by the end of 2017, Telenor had 1,850 subscriptions for WiMax-based broadband.

222. WiMax-based broadband is no longer marketed on Telenor's or Nordix Data's websites, and this type of broadband does not appear to be a focus area for Telenor. Nkom therefore expects the reduction in the number of subscriptions to continue.

223. On this basis, Nkom does not consider it proportionate to impose an access obligation on Telenor concerning WiMax-based broadband in Market 3b.

7.2.6.2 Other types of fixed radio access

224. Nkom has received information from Telenor about the "Fixed Mobile Broadband" project whereby Telenor is developing a product as a possible replacement for DSL-based broadband. The product is based on 4G technology in Telenor's mobile network, and the user equipment consists of an indoor router and an outdoor antenna that is locked to 1-3 base stations. In the first instance, Telenor is conducting a pilot project in three areas with a small

number of customers, in order to gather experience concerning such a product. If the experience is positive, Telenor will assess whether to offer the product to customers who are affected by the discontinuation of DSL-based broadband.

225. Since “Fixed Mobile Broadband” is currently in the testing stage, Nkom has not assessed whether such a product will be included in Market 3b. This will be necessary, however, if Telenor offers the product on a commercial basis. It would then also be necessary to assess whether Telenor must be subject to an access obligation for such a product, among other things in the light of how the product could replace copper-based accesses that as of today are subject to an access obligation.

226. Telenor has also indicated that it might be relevant to offer other technical solutions, including Fixed LTE and 5G Fixed Wireless Access, to larger customer groups at a later time. It will also be necessary to make a separate assessment of such services if Telenor chooses to offer these.

7.2.7 When the obligation of access in Telenor’s systematically developed fibre network applies

227. A particular problem in connection with access to Telenor’s fibre-based access network has been to determine when the obligation of access should apply from and therefore also whether the access buyer’s and Telenor’s retail operations are to be treated equally during the development of new fibre access networks. Whether the obligation of access applies during this period will affect, for example, whether the access buyer will be able to establish end-user agreements during this phase, including whether the access buyer is entitled to information that will be necessary to provide broadband services on equal terms with Telenor’s own retail operations.

228. The question of when the obligation of access is to apply from was considered by the Ministry of Transport and Communications in its appeal decision on 18 December 2014 in former Markets 4 and 5. The Ministry gave the following assessment of this issue in the appeal decision:

“The Ministry refers to the fact that, in principle, the obligation of non-discrimination means that Telenor should not discriminate between its own retail operations and other providers. The core of the question here is, in the Ministry’s opinion, whether the obligation of non-discrimination implies that the same information that will be available to Telenor’s own retail operations ahead of the establishment of new access networks, i.e. in the planning phase and/or sales phase, before the new network is established, should also be made available to Telenor’s wholesale customers.

The Ministry of Transport and Communications refers to the fact that it is currently established practice that fibre developers conduct advance sales in areas where they are considering rolling out fibre before they make any major investment decisions. The level of coverage they achieve in the advance sales is a key element in the company’s

decision to invest in the individual area. There is often competition between several network providers to win a sufficient proportion of the households before they start building.

Establishing infrastructure for electronic communications usually requires major investments and normally involves significant risks for the developer. In the Ministry's opinion, caution should be exercised when imposing regulation that may reduce the incentives for further development when development is socially desirable. As a provider with significant market power, Telenor should be able to participate in the competition for the roll-out of new modern broadband networks on an equal footing with other developers, while at the same time paving the way for competition for the customers in the downstream market, i.e. end users.

The Ministry has considered whether an obligation of non-discrimination in connection with the sales process would reduce the incentives for further development. If it is considered profitable to develop a fibre access network in an area and roll-out is planned, it may, in the Ministry's opinion, entail a heightened risk for the project if the developer is obliged to share information about these plans with other providers in the same market. We believe that an obligation for Telenor to share information about development plans prior to the establishment of new networks will entail a risk of lower levels of development in some areas. In light of this, the Ministry has concluded that an obligation to grant access and an associated obligation of non-discrimination, which only come into effect after the access network has actually been established, strikes an appropriate balance between the need to safeguard Investment incentives and the need to ensure sufficient competition in the downstream market. The Ministry understands that, in practice, this conclusion will mean that Telenor will have the opportunity to get new subscribers to sign up with a normal lock-in period of one year for fibre access networks that Telenor builds in geographical areas where Telenor does not already have an established fibre access network. At the same time, it will also entail that the company will pave the way for competition after the lock-in period has expired or if there is no lock-in agreement."

229. The Ministry concludes its discussion as follows:

"Against this backdrop, the Ministry further specifies PT's decision as follows: The obligation of access (cf. Section 4-1 of the Electronic Communications Act) in Markets 4 and 5 in respect of fibre only applies to already established access networks."

230. In the appeal decision the Ministry assumes that Nkom, in its next market review of the relevant broadband markets, will reassess the need for any changes in the scope of the obligation of access.

231. The question Nkom must address is therefore whether the obligation of access in the fibre-based network is to apply from an earlier point in time than the time when the fibre

network has been established, and thus whether Telenor shall be obliged to share information with its wholesale customers in the planning phase and/or the sales phase, before a new fibre network is established.

232. Nkom recognises that obligations of access in the fibre access network before the network has been established, including an obligation to share detailed information on the area the network will cover, will entail increased risks associated with the project. In this context, Nkom refers to the fact that Telenor may be competing with another provider on the establishment of the relevant fibre network, or other relevant infrastructure, and the fact that Telenor cannot refuse a request for access on the basis of which provider is seeking access. Nkom therefore assumes that sharing information about its own plans would undermine Telenor's ability to compete with other potential developers and thus weaken Telenor's incentives to invest in some areas.

233. Nkom therefore concludes that the obligation of access to Telenor's fibre-based access network shall apply from the date the fibre access network is established. A fibre access network is regarded as established when it is being used to deliver broadband services to end users.

7.2.8 Access for connection of “homes passed” in Telenor's systematically developed fibre access network

234. When Telenor establishes systematically developed fibre access networks, there will generally be some potential customers in the defined geographic development area that choose not to connect to the network during the establishment phase. Such potential customers are often referred to as “homes passed”. For a developer of fibre access networks, “homes passed” will be potential future end users, and so-called densification sales directed at such groups are common. In those cases some “homes passed” customers desire fibre access, a fibre connection must be established from the existing fibre network in the area up to the relevant building. The connection that connects the building to the existing fibre network is hereinafter referred to as a drop cable.

235. In its 18 December 2014 decision in the complaint case in former Markets 4 and 5, the Ministry of Transport and Communications concluded that the applicable access obligation for fibre in these wholesale markets is limited to already established access networks. This means that Telenor is first obliged to offer access to systematically developed fibre access networks when the initial sales process has ended and the fibre network is rolled out in the relevant area.

236. In Section 7.2.7 above, Nkom upheld the Ministry's conclusion, and has placed decisive emphasis on the fact that equal access for access buyers in the establishment phase may restrict Telenor's investment incentives in the fibre access network. However, the reasons that indicate that an access obligation should not be imposed in unestablished fibre access networks do not apply in the same way to access to connect “homes passed”. Nkom points out

that in cases where it is relevant to request access to connect “homes passed”, the fibre access network as such will already be established.

237. Densification sales directed at “homes passed” will be carried out after a systematically developed fibre access network has been established in a defined geographic development area. The need for non-discrimination between access buyers and Telenor’s own retail business indicates that access buyers should have equal opportunities as Telenor’s own retail business to carry out densification sales vis-à-vis “homes passed” in Telenor’s established fibre access network. Equal opportunities suggest in this context that Telenor should be ordered to provide access to the establishment of drop cables to “homes passed” located within the defined development area of the relevant fibre access network. Such an access obligation is necessary if access buyers are to have an equal opportunity to conclude agreements for the delivery of fibre-based retail services to “homes passed” customers through densification sales and will not be achievable by a less intrusive remedy. In Nkom’s view, such an access obligation for the connection of “homes passed” in established fibre access networks will also be in Telenor’s interest as it can help increase the number of customers within the development area for a systematically developed fibre access network.

238. Nkom has reviewed various alternative designs of the access obligation for connection of “homes passed”. A possible alternative would be for access buyers themselves to undertake the establishment of drop cables. Nkom believes, however, that any such approach has several significant drawbacks:

- To a great extent, Telenor’s expansion of fibre networks is undertaken by contractors and installers that are not owned by Telenor, and it is likely that there will be geographical variations in terms of choice of contractors/installers. From both a quality and cost perspective, it will be an advantage to avoid many different contractors/installers being involved in the same fibre network development project.
- Until now, the current access buyers have been providers with limited own infrastructure. The transaction cost of identifying and hiring contractors for excavation and installers for laying drop cables for a GPON tree²² is probably a major barrier to establishment, compared to accessing the same services through Telenor’s framework agreements in each individual development area.
- In general, the risk associated with investing in a drop cable will be higher for an access buyer than for Telenor, particularly since normal practice in the Norwegian market is for the establishment price to be subsidised to a great extent by the provider establishing the access, cf. Section 7.3.5. If the end user decides to terminate the agreement with the access buyer, the investment in the drop cable will in principle be lost. On the other hand, Telenor will still be able to earn income from the access

²² For an installer, security clearance may be required.

through the sale of wholesale access, if the end user terminates its agreement with Telenor.

- Permitting an access buyer to establish a drop cable in a GPON network that is otherwise operated as a network might lead to an unclear distribution of responsibility.

239. Another possible approach could be to require Telenor to make it possible for access buyers to use Telenor's contracts with contractors/installers. However, this would probably require changes in Telenor's current contracts. Since Telenor has different contract partners in different areas, the transaction costs for the access buyers might be very high.

240. Nkom has also assessed the possibility of access buyers being invited to order the installation of drop cables to their end users before Telenor enters into agreements with end customers in a given area. This approach was proposed by the Commission as a less intrusive solution in conjunction with the Danish Business Authority's imposition of a similar obligation on TDC²³. Here, Nkom refers to our assessment in Section 7.2.7, which shows that, in view of Telenor's investment incentives, the access obligation concerning Telenor's fibre-based access network must apply as from the establishment of the fibre access network. Nkom therefore does not consider any such solution for the establishment of drop cables to be relevant.

241. On the basis of these assessments, Nkom believes that the least intrusive alternative for Telenor will be for Telenor itself to undertake the establishment of drop cables to "homes passed", at the request of access buyers. Nkom also believes that any such solution will also be the most appropriate for the access buyers.

242. Nkom has furthermore considered how an obligation to provide access for connection of "homes passed" should be arranged. One option used by some other regulators is to link the obligation to a maximum distance from the established fibre access network to the particular building where the drop cable must be established, for example 30 or 50 metres. Nkom has concluded that such a distance limitation is not practical. This is related to the fact that in some areas with systematically developed fibre networks there can be buildings that lie within the selected distance limit, whether it is 30 or 50 metres, which was not considered expedient for connecting the relevant fibre access network when it was planned and realised. High costs connected with crossing roads or similar may be reasons why buildings relatively close to the established fibre access network were not considered relevant upon the establishment of the network. In such cases, conduits, splice points, etc. will normally not be established to connect to the building in question, and the establishment of a drop cable will then involve extensive adaptations with associated significant costs.

243. At the same time, other geographic areas may have buildings more than 50 metres from the established fibre network that were offered connection during the initial sales process,

²³ <https://circabc.europa.eu/ui/group/2328c58f-1fed-4402-a6cc-0f0237699dc3/library/0a8b8d46-ca2b-4479-952f-07ef8f14d98a/details>

and where the network is planned and rolled out so that it is already ready for the establishment of a drop cable to the relevant “homes passed” at a later date. This could, for example, be the case in areas outside densely populated areas, where there is a relatively long distance between the buildings.

244. For this reason, Nkom believes that it is proportionate to delineate an access obligation for the connection of “homes passed” to end users who are potential densification customers in a systematically developed fibre access network for Telenor’s own retail business, regardless of the distance from the established network to the household in question.

245. Telenor has established a regime for densification sales followed by Telenor’s retail business. In order for the access buyer to have an opportunity equal to Telenor’s own retail business to undertake densification sales, and thus reach these potential customers, Nkom believes it is expedient that access buyers can enter into this regime. In Nkom’s assessment, such a delineation of the access obligation will allow the access buyer to compete on equal terms with Telenor’s own retail business on “homes passed” customers in Telenor’s fibre access network, and be sufficient at the same time, but not go further than the purpose dictated by the regulation.

246. Entering into the same regime that Telenor’s retail business observes in the case of densification sales means, among other things, that access buyers shall be given access to the same “homes passed” list (the HP list) that Telenor’s own retail business uses. The HP list shall furthermore be made available at the same time as for Telenor’s retail business and have the same quality. Any changes to the HP list shall also be communicated to access buyers in a similar manner as to Telenor’s own retail business.

247. That Telenor shall allow access buyers to enter into the “homes passed” regime also means that Telenor must establish a regime for access buyers’ sales to “homes passed” customers that ensures non-discrimination between access buyers and Telenor’s own retail business with respect to:

- a) authorisation limits for entry costs for densification sales
- b) possibility of so-called mini-development in an area, if the entry cost for a single customer exceeds the authorisation limits
- c) access to contractor capacity in areas with systematically developed fibre access networks
- d) requirements for delivery times in densification sales
- e) ability to communicate with the end customer during the establishment process after densification sales, from the date of sale to the start-up of the delivery of the service
- f) any restrictions on the possibility for densification sales in the initial period after a development project has been concluded in a geographic area

248. On this basis, Telenor shall accommodate reasonable requests for access for connection of “homes passed” in established, systematically developed fibre access networks, with associated establishment of drop cables to relevant buildings. Nkom emphasises that a request for access to “homes passed” will normally be deemed reasonable in cases where the particular building exists on the updated HP list, while the remaining prerequisites and framework conditions in Telenor’s regime for densification sales that apply to both access buyers and Telenor’s own retail business are met.

249. In order to ensure that the access buyer’s ability to use the access obligation to “homes passed” on equal terms is real, it is imperative that the regime described above is established as quickly as possible and without undue delay. Telenor shall therefore establish this regime within 30 days of the entry into force of this decision. Telenor shall also send Nkom and access buyers a description of the regime.

250. In order for the access obligation for connection of “homes passed” to be sufficiently effective, it is necessary that the access obligation is supported by a requirement that Telenor shall provide access buyers with information about which buildings are candidates for densification sales within each systematically developed fibre access network, and provide information about other prerequisites and framework conditions in Telenor’s regime for densification sales. This means it is necessary for access buyers to have access to up-to-date, transparent and readily available HP lists for the development areas for Telenor’s fibre access network, and that the prerequisites and framework conditions in the densification sales regime are communicated to access buyers in a clear and predictable manner. Such a transparency obligation is set out in Section 7.5.4. Furthermore, Nkom believes it is necessary for Telenor to document the requirement for equal treatment between access buyers and Telenor’s own retail business, and will therefore clarify that the requirement for the disclosure of KPIs as stated in Section 7.5.4.2 also applies to the access obligation for connection of “homes passed”.

251. Nkom cannot see that less intrusive remedies can address the potential competition problems arising from the first-mover advantage Telenor has in fibre deployment projects. At the same time Nkom believes that the chosen approach, where access buyers enter into the same regime for “homes passed” as Telenor’s own retail business, does not imply a disproportionate burden for Telenor. Telenor will only be obliged to establish new infrastructure in cases where Telenor itself has identified the location as relevant for densification sales.

252. For the price regulation of access to “homes passed”, Nkom refers to Section 7.3.5 below.

253. In its comments on Nkom’s notification of the draft decision in Markets 3a and 3b, ESA has invited Nkom to expand the proportionality assessment related to the access obligation concerning “homes passed”. ESA writes, among other things, the following:

“In this regard, the Authority invites NKOM to include additional proportionality considerations in its final measure, such as those set out in its reply to the Authority’s

second RFI, in order to show that the proposed obligation is based on the competition problems identified and is the least intrusive measure available.”

254. On the basis of ESA’s comments, Nkom has extended the assessments in this section, including by highlighting other alternative designs of the access obligation.

7.2.9 Access to backhaul/transport services

255. Based on the market definitions in the current decisions in former Markets 4 and 5, including the delineation between these two wholesale markets that were generally based on a distinction between physical and virtual access, the current decision in former Market 5 does not include any specific obligation for Telenor to offer backhaul services in this wholesale market.

256. In the market delineation between Markets 3a and 3b, which is the basis for this decision, the distinction between local and central access in the network provides the overall starting point for the delineation between the two wholesale markets. This change in the market delineation means that the Nkom has found reason to assess whether Telenor should be subject to a specific duty to accommodate reasonable requests for access to backhaul services in Market 3b, in the same way as in Market 3a.

257. Even though access to backhaul services is not mentioned specifically in the current decision in former Market 5, it has been assumed that the access obligation in this market also includes any supplementary services necessary for the access buyers to have equal opportunities to compete in the retail market, based on access products in this wholesale market.

258. Telenor’s product sheet for DSL Broadband access states that copper-based Broadband access can only be provided together with the E-line supplementary service or equivalent service. E-line is thereby a service that the access buyer is obliged to purchase in order to be able to provide services based on copper-based Broadband access to its own retail customers. As the E-line service is a required supplementary service to which there are no alternatives for access buyers, Nkom believes that it is necessary and proportional that Telenor is subject to an obligation to accommodate reasonable requests for access to E-line and equivalent necessary services for the use of access products in Market 3b.

259. It can be questioned whether it is appropriate to define E-line and equivalent necessary services for the use of access products in Market 3b as backhaul services. E-line can also be characterised as a transport service. Nkom assesses that the use of the concept is not decisive in this respect. The important aspect is to make it clear that the access obligation in Market 3b also includes access to E-line and equivalent necessary services for the access buyers ' use of access products in Market 3b.

260. Nkom believes that this clarification is in line with BEREC’s “Common position on best practice in remedies on the market for wholesale Broadband access (including bitstream

access) imposed as a consequence of a position of significant market power in the relevant market” from 2010. Here, there is reference among other things to how it may present a potential competition problem that providers with significant market power do not offer access to the necessary associated services in a way that makes it possible for access buyers to offer competitive broadband services in the retail market:

“SMP operators do not provide suitable wholesale products to connect the bitstream access point (local, regional, national) to the operators infrastructure on terms which permit an efficient alternative provider to offer a competitive broadband service.

SMP operator put arbitrary restrictions on the points at which the SMP operator will provide connectivity.”

261. On this basis, BERC describes “best practice” associated with this potential competition problem as follows in the same document (BP6):

“NRAs should impose an obligation requiring that the bitstream access point can be reached with an appropriate remedy on regulated terms (although not necessarily covered by the same market review) unless the NRA is satisfied that such access products are available under competitive conditions on reasonable terms throughout the relevant geographic market.”

262. In Nkom’s assessment, a specific duty to offer backhaul/transport services in Market 3b in the form of the E-line service and equivalent necessary services for access buyers’ use of access products in Market 3b will not be particularly onerous for Telenor since these are services that Telenor already offers access buyers in this wholesale market. Nkom therefore believes that it is proportional to impose any such obligation on Telenor in Market 3b.

263. Since VUA fibre will have a handover point on BNG, Nkom considers that there is no need to impose an obligation to give access to backhaul/transport services for fibre-based access products in this market.

7.2.10 Access to co-location

264. Section 4-4, fourth paragraph, of the Electronic Communications Act states that Nkom may require a provider with significant market power to meet reasonable requests for co-location within the market in which the provider has significant market power, when this is appropriate in order to promote sustainable competition. In the assessment of whether a request is reasonable, an evaluation must be undertaken in accordance with Section 4-1, second paragraph.

265. The current decision in former Market 5 states that, to the extent that access to co-location is necessary for access to this wholesale market to function effectively and appropriately for other providers, Nkom believes that the co-location obligation must be subject to the special obligations imposed on Telenor, in the same way as for the former Market 4.

266. Even though access to co-location can in principle be assumed to be somewhat less relevant for access buyers in Market 3b than in Market 3a, Nkom's opinion is that it is necessary to continue the duty of access to co-location in Market 3b. A duty of co-location might contribute to streamlining the access obligation in this wholesale market and increasing the competition in the market, including by giving access buyers opportunities to purchase related transport services from other providers than Telenor.

267. Nkom furthermore believes that it is proportional to impose an obligation on Telenor for access to co-location in Market 3b. As stated, this access obligation is a continuation of the current duty in the former Market 5, and it is thus considered not to be particularly onerous for Telenor to maintain this obligation.

268. In the decision in Market 3a, Nkom has found it appropriate to define what would normally be considered to be reasonable requests for co-location. Nkom believes in principle that the same definitions, with related justifications, are relevant for the co-location obligation in Market 3b. On this basis, Nkom has concluded that the following clarifications are appropriate concerning what would normally be deemed to be reasonable requests for co-location in this wholesale market:

- In principle, Telenor's obligation of co-location includes all locations in the network with possible interconnection points for Market 3b products.
- Although the obligation of co-location is limited to locations with possible interconnection points for Market 3b access, and the obligation of co-location will be designed to promote compliance with the obligation of access in this relevant wholesale market, the access buyer can nevertheless modify or extend the use of the location as long as this is done in a manner that complies with reasonable requirements from Telenor regarding the use of the location, including reasonable safety and security requirements.
- The obligation of co-location in Market 3b entails that the access buyer is given the opportunity to allow a third party access in order to install and maintain equipment at that location, provided this is in compliance with reasonable requirements regarding safety, security, etc. that Telenor sets for all providers that are co-located at this location.
- The obligation of co-location applies to all locations with possible interconnection points for Market 3b access that Telenor owns, rents or otherwise controls. This obligation is not limited to the co-location facilities that Telenor itself uses to provide broadband access in the retail market.
- It is up to Telenor to choose how a reasonable request for co-location is to be met. This means, among other things, that Telenor can choose whether the obligation of co-location in a specific case is to be met through offers of placement of equipment in the

existing exchange or cabinet, through expansion of the existing exchange or cabinet, or through establishment of new exchanges or cabinets.

- In respect of requests for co-location requiring establishment of new locations, these kinds of requests will not, as a starting point, be deemed reasonable if the location for co-location does not exist, or has not been planned, at the place in Telenor's network where the access buyer requests co-location.
- Requests for co-location that require expansion of the capacity at existing locations may be deemed reasonable on the basis of an overall assessment. A request for co-location involving development or expansion of the capacity at the existing location may be deemed reasonable if other factors included in the assessment of whether a request is reasonable are afforded greater weight than existing available capacity in the specific case.
- If it is not considered proportionate in the specific case to fulfil the obligation of co-location through expansion of the capacity at existing co-location points, the obligation must be met through virtual co-location. Virtual co-location must enable access buyers to have the same access, with the same functionality, as was requested, but at a different location.
- Telenor's co-location offer must be adapted to the needs of the individual access buyer's co-location needs. This entails, among other things, that access buyers in Market 3b should not have to buy greater co-location capacity than they need.
- It is part of the obligation of co-location for Market 3b that Telenor shall ensure that access buyers can link up their co-located equipment in an appropriate manner at the location in question. This includes both internal cabling between an access buyer's own equipment and between own and third-party equipment at the location, including cabling for backhaul purposes.

7.2.11 Access to information and support systems

269. Pursuant to Section 4-5, first paragraph, of the Electronic Communications Act, Nkom may impose the obligation on a provider with significant market power to meet any reasonable request to provide access to information and support systems, if such access is necessary for the requester to be able to supply competing services. In the assessment of whether a request is reasonable, an evaluation must be undertaken in accordance with Section 4-1, second paragraph.

270. Nkom believes that access to information and support systems in Market 3b is a necessity for Telenor's competitors that are based on access products in this wholesale market to have the same opportunities as Telenor's own retail activity to compete in the downstream market. Telenor is therefore obliged to provide access to information and support systems in Market 3b. Pursuant to Section 2-5, first paragraph, of the Electronic Communications

Regulation, such access may include access to systems for operational support, databases for obtaining information before ordering, delivery, orders, maintenance, fault handling and invoicing.

271. Requests for access to information and support systems must be reasonable, in the same way as for the other access obligations in this decision. With a view to limiting the number of disputes about the content and scope of the obligation of access to information and support systems and to increase predictability associated with assessments of whether a request is reasonable in cases where the supply side and the demand side in Market 3b have different interpretations of what the obligation entails, in the following Nkom defines more precisely what might normally be regarded as reasonable requests for access to information and support systems in this wholesale market. These specifications are not exhaustive for the content of the obligation, but are considered to cover key issues related to this obligation in coming years.

272. Vertical leveraging, including various forms of discriminatory behaviour, has been identified as a potential competition problem in Market 3b. This decision's imposition of an obligation of non-discrimination (cf. Section 7.4) shall ensure that Telenor's wholesale operations provide external buyers of access with equivalent opportunities as Telenor's own retail operations to compete in the downstream market. In order to ensure that external access buyers are not discriminated against in respect of information and support systems, and that the obligation of access to these systems is effective, Nkom finds it necessary to specify the following in this decision:

- Telenor must provide access to information and support systems, in accordance with the principle of non-discrimination. This means, for example, that the information provided by the systems that Telenor offers to external buyers of access must be of the same quality as the information that Telenor's own retail operations have access to, albeit not necessarily identical.
- Telenor must provide external buyers of access in this wholesale market with all the information necessary for the implementation, operation and use of the information and support systems. In this context, Telenor must provide information on administrative procedures to access information and support systems that clearly describes the use of the systems.
- Telenor shall ensure that the information and support systems to which external buyers of access are given access are as reliable as those used by Telenor's own retail operations, and make sure that the systems can be used by external buyers of access in a cost-effective way.
- In connection with improvements to information and support systems used by Telenor's internal retail operations, corresponding to the systems offered to external buyers of

access, Telenor must implement similar improvements to the information and support systems used by external buyers of access.

- In connection with modifications and development of the information and support systems that affect the interface with external access buyers' operations, Telenor must take into account the access buyers' needs and the effects of the changes for the access buyer before these kinds of changes are made. In connection with modifications and development of the information and support systems that entail that access buyers must make major changes to their own interfaces, systems or routines, Telenor must consult the access buyers in respect of how the change can be implemented in an appropriate, functional and reliable manner before any such changes are made. In these kinds of situations, external buyers of access must have access to all the information necessary to make their own changes or adaptations within a reasonable time and no later than 90 days before the changes are made. In addition, external buyers of access should be able to demand reasonable testing of new interfaces and systems before they are put into service. Modified and new information and support systems cannot be implemented until testing has been completed. Telenor can set reasonable requirements that access buyers must participate in an effective test period.
- Telenor must ensure that the information and support systems are up-to-date at all times. Among other things, this means that Telenor must continually ensure that the systems are updated with relevant information, both information that Telenor generates itself and information that Telenor receives from third parties. This also means that Telenor must make arrangements to enable external buyers of access to update the information and support systems with relevant information.
- Through information and support systems Telenor must grant access to information that supports external access buyers' ability to establish, operate and end customer relationships in the associated retail market. The information must be searchable on the basis of indicators such as line number, telephone number and/or address details.
- In the event of errors or downtime in the information and support systems offered to external buyers of access, Telenor must take all reasonable steps to correct the error as quickly as possible.

7.2.12 Prohibition of unreasonable requirements and unreasonable terms of contract

273. Nkom has in Section 5.2.2 identified undue requirements as a relevant competition problem linked to the transfer of market power by means of non-price variables. It is therefore relevant to consider setting requirements that limit the opportunity for such conduct.

274. As a provider with significant market power, Telenor may have incentives and opportunity to setting unreasonable requirements in connection with a reasonable request for

access covered by Telenor's access obligations in this decision. Such conditions may have the potential to undermine a development towards effective competition. In some cases, such conditions may constitute a breach of other obligations, including the obligation of non-discrimination. However, to make the access requirement sufficiently effective, Nkom is of the opinion that it is necessary to impose on Telenor an explicit obligation not to set unreasonable requirements or use unreasonable terms of contract in connection with accommodating a reasonable request for access.²⁴

275. When assessing whether a term is unreasonable, the starting point for Nkom will be whether the relevant term may be seen as in line with what would have been offered if the market could be characterised as competitive and if terms which imply limitations on the access seekers may be considered as founded in protectable interests of Telenor. If a condition is widely used in commercial practice, this will in the view of Nkom raise the threshold for finding that the condition in this relation is in breach of the prohibition of unreasonable terms.

276. The prohibition of unreasonable terms further implies, but is not limited to, that, in connection with the follow-up of the access obligation, Telenor can not introduce procedures, criteria, requirements, definitions or other measures that are capable of delaying, restricting or impeding compliance with the access obligation, unless this is justified in a protectable interest of Telenor.

277. In the view of Nkom, an obligation not to use unreasonable conditions may in itself not be regarded as particularly burdensome. However, such a requirement will reduce the predictability for Telenor. In the view of Nkom, the benefits to the competition by setting such a requirement outweighs the burden for Telenor consisting of reduced freedom of action. Nkom is of the opinion that other obligations are not to a sufficiently extent able to effectively remedy the relevant competition problem.

278. In the light of the above, Nkom finds that it is proportionate to prohibit Telenor to require anything unreasonable or use unreasonable terms in contract in connection with accommodating a reasonable request for access. Therefore, Nkom imposes on Telenor such an obligation, in line with the clarifications above.

7.2.13 Obligation to have service level agreements (SLA) and associated compensation arrangements (SLG)

279. An obligation to prepare service level agreements (SLA) and associated compensation arrangements in the form of service level guarantees (SLG) will incentivise Telenor to ensure the quality of the company's wholesale products. Nkom holds that this should be part of the obligation of access based on Section 4-1 of the Electronic Communications Act. The obligation also promotes compliance with Telenor's obligation of non-discrimination in Section

²⁴ In what is further referred to as «prohibition of unreasonable terms»

7.4 and is considered, together with the obligation to prepare and publish KPIs, as a necessary part of a holistic EoO regime.

280. As regards the correlation between requirements related to KPIs and SLAs, SLAs should specify quality targets for wholesale deliveries from Telenor to access buyers, while KPIs should measure various parameters that have been agreed in advance in SLAs between Telenor and access buyers. The purpose of measuring and publishing KPIs is to ensure that quality levels agreed in the SLAs are observed, to facilitate transparency on actual quality levels, and to strengthen the opportunity to verify and document the obligation of non-discrimination between external buyers of access and Telenor's internal retail operations linked to key activities in the supply chain. Service level guarantees (SLGs) will help provide Telenor with incentives to ensure that the actual quality levels provided do not deviate from the levels agreed in the SLAs.

281. Since the purpose of KPIs is to measure parameters that have been agreed in advance in SLAs, it is essential that the requirements to KPIs and the requirements to SLAs in this decision are coordinated. The Commission's 2013 Recommendation stresses that KPIs should be related to key activities in the supply chain and cover the entire chain, including the ordering process, the delivery or provision of the service, quality parameters linked to faults and fault correction times, and migration between different access products.

282. With this as a starting point, Nkom believes that the requirements for SLAs in Telenor's reference offers should be related to the same key activities in the supply chain as the KPI requirements. For a more detailed description of the requirements related to KPIs, see Section 7.5.4.2 below.

283. The SLA requirements in the current decision for former Market 5 (cf. Section 7.5.5 in the decision of 20 January 2014), do not cover all the parameters included in the KPI requirement in Section 7.5.4.2 in this decision. In this light, Nkom finds it necessary to specify more precisely which key activities in the supply chain the SLAs must be related to. An obligation is therefore being imposed on Telenor to prepare SLAs for the wholesale products covered by the obligation of access in this market linked to the following key activities:

- a) System access
- b) Deliveries
- c) Fault management and fault correction times
- d) Migration between different access products

284. To support compliance with the requirement for access to be granted on non-discriminatory terms, the SLAs for these key activities should be determined on the basis of the corresponding quality targets for system access, deliveries, fault management and fault correction times, and migration between different access products that apply to Telenor's own retail operations.

285. Specific SLA targets for these key activities should be included in Telenor's reference offer, and the SLAs should as a minimum contain the following elements:

a) System access

- SLA for uptime for Telenor's ordering systems and appurtenant support systems, which are made available to external buyers of access and which are necessary for the access buyers to order wholesale products in Market 3b. These kinds of SLAs must indicate an agreed percentage of uptime (for example, that the systems will be available x% of the time).
- SLAs for response times for Telenor's ordering systems and appurtenant support systems, which are made available to external buyers of access and which are necessary for the access buyers to order wholesale products in Market 3b. These kinds of SLAs must indicate the agreed response time for the individual wholesale product (for example, that the systems respond correctly within x seconds).

b) Deliveries

- SLAs for the supply of Telenor's wholesale products in Market 3b. These kinds of SLAs must indicate targets for the maximum delivery time for the individual wholesale product (for example, delivery of wholesale product x will take place within y working days) and a target for deliveries in accordance with the agreed time.

c) Fault management and fault correction times

- SLAs for fault correction linked to Telenor's wholesale products in Market 3b. These kinds of SLAs must indicate targets for the maximum fault correction time for each individual wholesale product (for example, faults linked to wholesale product x will be corrected within y hours or working days).

d) Migration between different access products

- SLAs for migration between Telenor's various wholesale products. These kinds of SLAs must both set targets for maximum migration time between different wholesale products (for example, migration between two wholesale products will take place within x working days) and targets for migration within the agreed times.

286. Nkom is of the opinion that service level guarantees (SLG) are important to ensure that the actual quality levels do not deviate from the agreed quality goals set out in SLAs (cf. Section 2-5, first paragraph, no. 6, of the Electronic Communications Regulation) requires Telenor to include provisions in the company's reference offers on compensation for failure to comply with agreed delivery times. Nkom finds that in Market 3b it is also necessary to ensure that Telenor's reference offers include provisions on reasonable compensation for any failure to comply with the agreed quality levels for the other key activities for which SLAs must be

prepared. Nkom refers to the fact that Section 2-5 of the Electronic Communications Regulation on a general basis imposes on Telenor an obligation to have provisions regarding quality parameters in its reference offers, and requires Telenor to include provisions for reasonable compensation in the event of failure to provide the agreed quality level. In order to support compliance with the requirement that access to Market 3b is granted on non-discriminatory terms, Nkom finds there is also a need to specify the obligation to provide SLGs linked to the abovementioned SLA obligation in greater detail.

287. It is important that a compensation scheme is established that gives Telenor an incentive to comply with the quality targets defined in SLAs. In order for SLGs to provide a sufficient incentive for achievement of the SLA targets, Nkom finds it necessary that the principles for calculation of compensation are agreed in advance, that the agreed compensation is large enough to have the intended incentivising effect, and that compensation is paid without any unnecessary delay. Nkom also finds it important that the compensation scheme is as simple and predictable as possible, so that in the event of any deviation from agreed SLAs, it will be as clear as possible to both Telenor and the access buyers what the compensation should be.

288. Against this background, an obligation is imposed on Telenor to include provisions in its reference offers on the compensation that will be provided in the event of non-fulfilment of the SLAs on system access, deliveries, fault management and fault correction times, and migration between different types of access products in Market 3b. The principles for calculation of this kind of compensation must be described in the reference offers and be formulated in such a way that they provide the maximum degree of predictability with regard to the compensation sum in the event of non-fulfilment of the agreed SLAs. It must also be stated that the calculation and payment of compensation shall be made without undue delay and quarterly.

289. This obligation implies that a new compensation scheme must be established in the form of new SLG provisions in Telenor's reference offers for Market 3b products. To ensure that this compensation scheme is as straight-forward and predictable as possible, and that it will be as clear as possible to both Telenor and buyers of access what the compensation should be in the event of non-fulfilment of SLAs, an obligation is imposed on Telenor to consult the industry before the content of the new compensation scheme in the reference offers for Market 3b products is decided. The Broadband Forum may be an appropriate venue to obtain views from access buyers. Furthermore an obligation is imposed on Telenor to send the new SLG provisions to Nkom within three months after this decision enters into force. In the event that agreement has not been reached between Telenor and access buyers about a new compensation scheme within expiry of this time limit, Telenor shall send its proposals for new SLG provisions to Nkom, with a description of why agreement has not been reached on the new compensation arrangements.

7.2.14 Timeliness in connection with access requests and deliveries

290. A provider without an incentive to grant access may resort to delaying tactics to delay the processing of other operators' requests. Potentially anti-competitive behaviour of this nature cannot be prevented by an access obligation alone. However, a non-discrimination obligation will reduce such problems to a certain extent. In connection with imposing access obligations, requirements must therefore be set that negotiations must be concluded without undue delay and that the delivery times from the date an order is placed until the connection is ready must be predictable and binding on the provider with significant market power in this wholesale market.

291. Nkom considers that Section 4-1 of the Electronic Communications Act (cf. Section 4-6) provides sufficient authorisation for setting rules on timeliness. In addition, Article 12, no. 1, second paragraph, of the Access Directive explicitly states that the regulatory authority may impose such obligations on an operator. Imposition of this kind of obligation will also be in accordance with principle 4 in Nkom's remedies document that obligations shall be imposed in a manner that provides incentives for compliance.

292. Pursuant to Section 4-1, third paragraph, and Section 4-4, sixth paragraph, Telenor is obliged to document and justify any refusal of a request for access and co-location. In addition, an obligation will be imposed on Telenor to have reference offers (see Section 7.5). In any case, response time requirements cannot be regarded as being particularly burdensome, compared with the consequences of an unnecessary delay for the other party.

293. Provisions for counteracting delaying tactics can be formulated in various ways. Nkom finds it appropriate to continue the current obligation from former Market 5 in Market 3b that access agreements shall be negotiated without undue delay. Nkom is also continuing Telenor's obligation to document time spent in connection with access agreements, if the rival provider believes that contract negotiations and conclusion are taking a disproportionate amount of time. However, this does not apply to requests made later than three months after the relevant negotiations were concluded. Nkom shall receive a copy of the relevant documentation of time spent. The time spent on contract negotiations may vary depending on the form of access requested. The requirements that access agreements are to be negotiated without undue delay applies regardless of how Telenor chooses to organise its case processing internally. For example, if the company is unable to process a large number of requests for access at the same time because the task is not given priority internally or is not organised in a satisfactory manner, Nkom may order that the situation be remedied and also consider imposing coercive fines or other penalties.

294. Nkom finds that an obligation to provide access within a reasonable period of time and without taking undue time may be of limited value unless a documentation obligation is also imposed on Telenor at the same time. As long as the objective is to prevent delaying tactics, Nkom deems that the documentation obligation is both necessary and proportionate. There is

an asymmetry of information connected with access requests. Normally, Telenor alone will possess the information on the amount of time that is necessary. Unless other operators or Nkom have the opportunity to have Telenor document how the time was actually spent, Nkom will have very limited ability to detect and intervene to prevent delaying tactics. Nkom considers that this kind of documentation obligation comes under the conditions that according to Section 4-6 may be imposed in connection with access requests pursuant to Section 4-1 of the Electronic Communications Act (cf. Article 12 of the Access Directive):

“National regulatory authorities may attach to those obligations conditions covering fairness, reasonableness and timeliness.”

295. Nkom also finds it necessary to continue the requirement that delivery must take place without undue delay from former Market 5 to Market 3b, while also maintaining Telenor’s obligation to offer its customers clear, predictable delivery times. As was the case in former Market 4, the obligation applies to access to Telenor’s copper-based and fibre-based access networks. It is also necessary that Telenor provides clear information about delivery times and any non-compliance in connection with installation at the other party’s customers’ premises. The obligation to provide SLAs and SLGs regarding delivery times and delivery at agreed times is also discussed in Section 7.2.12 of this decision.

296. Section 11 of the Competition Act may be brought to bear against the use of delaying tactics. However, any order to rectify the matter pursuant to the Competition Act would only have effect after the Competition Authority issued a decision. Nkom is of the opinion that the need for predictability and quick intervention in the market suggests that this provision will be less suited to effectively preventing the use of delaying tactics than imposition of a specific obligation.

7.2.15 Special obligations related to access

297. Nkom refers to the aforementioned assessments concerning which special obligations associated with access are to be imposed on Telenor in Market 3b. The special obligations imposed on Telenor ASA (in the remainder of the chapter referred to as Telenor) are stated in this chapter.

298. Pursuant to Section 4-1 of the Electronic Communications Act, Nkom requires Telenor to meet any reasonable request for access to broadband access, in line with Section 7.2.3.1.

299. Pursuant to Section 4-1 of the Electronic Communications Act, Nkom requires Telenor to meet any reasonable request for central, virtual access to copper-based access networks (VUA copper), in line with Section 7.2.3.2. The obligation is limited to the cases where Telenor’s upgrading of copper access networks entails that physical access is degraded or terminates.

300. Pursuant to Section 4-1 of the Electronic Communications Act, Nkom requires Telenor to meet any reasonable request for central, virtual access to the fibre-based PON network (VUA fibre), in line with Section 7.2.4.

301. Pursuant to Section 4-6 of the Electronic Communications Act, Nkom requires Telenor to prepare a process for handling requests for changes and additions to the reference offer for VUA fibre. The description of this process must be included as part of the reference offer.

302. Pursuant to Section 4-1 of the Electronic Communications Act, Nkom requires Telenor to meet any reasonable request for access for connection of “homes passed” in established, systematically developed fibre access networks, with associated establishment of drop cables to relevant buildings, in line with Section 7.2.8. Within three months after this decision enters into force, Telenor must have established a regime for “homes passed”.

303. Pursuant to Section 4-1 of the Electronic Communications Act, Nkom requires Telenor to meet any reasonable request for backhaul/transport services for copper-based access products included in Market 3b, in line with Section 7.2.9.

304. Pursuant to Section 4-4 of the Electronic Communications Act, Nkom requires Telenor to meet any reasonable request for co-location, in line with Section 7.2.10. In the same chapter Nkom has specified what would normally be considered reasonable requests for co-location in this market.

305. Pursuant to Section 4-5 of the Electronic Communications Act, Nkom requires Telenor to meet any reasonable request for access to information and support systems, in line with Section 7.2.11. In the same chapter, Nkom has clarified which requirements Telenor must follow to ensure effective and non-discriminatory access to information and support systems.

306. Pursuant to Section 4-1, first paragraph, cf. Section 3-4, third paragraph, of the Electronic Communications Act, Nkom prohibits Telenor to set unreasonable requirements or use unreasonable terms in contract in connection with accomodating a reasonable request for access, with the clarifications arising from Section 7.2.12.

307. Pursuant to Section 4-1 of the Electronic Communications Act, Nkom requires Telenor to have service level agreements (SLAs) and associated compensation schemes (SLGs), in line with Section 7.2.13.

308. Pursuant to Section 4-1, cf. Section 4-6, of the Electronic Communications Act, Nkom requires Telenor to give access to copper- and fibre-based access networks, backhaul services, co-location, and information and support systems, without undue delay, which also includes a duty to finally negotiate necessary agreements without undue delay, in line with Section 7.2.14. On the same basis, Nkom furthermore requires Telenor to document the time spent in connection with providing access to and final negotiation of agreements. Telenor will send Nkom a copy of such requested information. The obligation to document the amount of

time spent does not apply to requests made later than three months after the relevant negotiations have been concluded.

309. Pursuant to Section 4-1, cf. Section 4-6, of the Electronic Communications Act, Nkom requires Telenor to offer clear and predictable delivery times, and requires that delivery take place without undue delay, in line with Section 7.2.14.

7.3 Price and accounting regulation

7.3.1 Regulatory basis

310. Vertical leveraging of market power through pricing, including price discrimination, cross-subsidisation and predatory pricing, is referred to as a potential competition problem in the market; see Chapter 5. Single market dominance, including exploitative behaviour in the form of excessive pricing and price discrimination, was also considered such a potential problem.

311. In accordance with Section 4-9 of the Electronic Communications Act, Nkom can impose price obligations on providers with significant market power. This applies, for example, in cases where the undertaking can exploit its market power by maintaining a disproportionately high price level, or by subjecting competing undertakings to price squeezes.

312. In the remarks to Section 4-9 of Proposition no. 58 (2002-2003) to the Odelsting, a 'disproportionately high price level' is defined on page 106:

“The maintenance of a disproportionately high price level means that competition has not helped to lower retail prices sufficiently. When assessing whether the price level is disproportionately high, the authorities may compare the price levels in analogous markets, nationally or internationally.”

313. Even if price regulation is considered to be a necessary remedy, price regulation methods must be used that are proportionate and are not unnecessarily burdensome for the provider in question. We refer to the remarks on Section 4-9 of the Electronic Communications Act in Proposition no. 58 (2002-2003) to the Odelsting, page 109.

“If, pursuant to the provision’s first paragraph, the authority directs an undertaking to offer price-controlled access and imposes on it a method for calculating prices pursuant to the second paragraph, the method must enable the undertaking to obtain a reasonable return on capital employed. The cost method that is chosen is to be appropriate with regard to the need for regulation and to promote sustainable competition, as well as maximise the benefits to the consumer.”

314. In the decision of 20 January 2014 in the former Market 5, Nkom concluded that the remedies of transparency and non-discrimination would not be sufficiently effective to alleviate the competition problems relating to the pricing of copper-based access in this market. On this

basis, an obligation was imposed on Nkom to have cost-oriented prices based on fully-distributed historical costs that in principle were to apply at an overall level to Telenor's

315. With regard to fibre-based access in the former Market 5, in the decision of 20 January 2014, Nkom concluded that, at that time, price regulation was neither necessary nor proportional with price regulation, but that obligations concerning access, transparency and non-discrimination, with related follow-up in the form of accounting separation and margin squeeze tests, were sufficient.

316. Below, Nkom will assess the need for price regulation of Telenor's wholesale offering in Market 3b in the next few years. Nkom will first assess whether and, if so, how, the price regulation for central access to copper-based access networks in the form of Broadband access is to be continued. This is followed by assessment of the need for, and any design of, price regulation for central access in the form of VUA copper. Furthermore, the need for and any design of price regulation for fibre-based access (VUA fibre) is assessed in this wholesale market, before Nkom finally assesses price regulation for co-location, access to information and support systems, and supplementary services for transport/backhaul (E-line).

317. In the light of the conclusions concerning price regulation, the need is then assessed to impose a duty on Telenor to keep cost accounts in Market 3b.

7.3.2 Central access to copper-based access networks in the form of Broadband access

7.3.2.1 Assessment of the need for price regulation

318. The number of broadband customers in the copper-based access network has gradually been reduced in recent years. The further development will depend, among other things, on the development rate for fibre networks in the years ahead and on how the process for the upgrading of copper networks is progressing.

319. At the same time, the copper access network still accounts for around 26% of the accesses in the retail market. For some of the providers, the access to Telenor's copper access network is a necessary input factor for their broadband offering in the retail market. In addition, access to Telenor's copper access network is an important supplement for several providers with their own access infrastructure that wish to provide retail services in geographical areas that are not covered by the provider's own infrastructure. This indicates that the pricing of access to copper-based access networks is still of great significance to the competition situation in the related retail market.

320. Even though copper access accounts for a rather lower percentage of the access technologies used in the retail market today than in 2014, Nkom cannot see that there have been significant changes with regard to potential competition problems relating to the pricing of Broadband access since the current decision in the former Market 5 was taken.

321. In the decision of 20 January 2014, reference was made to how most recently before this decision there had been a tendency for the number of accesses purchased from Telenor in the former Market 5 to increase in relative terms, compared to the development in the former Market 4. This was substantiated with figures showing that the number of LLU-based subscriptions in the retail market declined by around 13,000 (equivalent to approximately 5.5%) from the end of 2011 to the end of 2012, while the number of subscriptions based on Broadband access had been virtually stable in the same period.

322. According to Telenor's own statistics for the sale of Broadband access and LLU, the development from 2013 to 2017 indicates that this tendency has continued. From the end of 2013 to the end of 2017, the number of LLU-based subscriptions fell by around 98,000 (equivalent to approximately 37.3%). The number of subscriptions based on Broadband access also declined somewhat during this period, by around 140,000 (equivalent to approximately 24.2%), but this decrease is relatively smaller than for LLU-based subscriptions.

323. This entails that Broadband access constitutes an ever-increasing share of Telenor's total wholesale sales of copper-based access. Nkom believes that this development indicates that there is a need in Market 3b to continue the price regulation of copper-based access in the former Market 5, while continuing the price regulation of LLU access in the former Market 4 in Market 3a.

324. Against this background, and on the basis of the market analysis, cf. Annex 1, and the competition problems described in Chapter 5 of this decision, Nkom has concluded that it is necessary to continue an obligation for Telenor concerning price regulation of central access to copper-based access networks in the form of Broadband access in Market 3b.

7.3.2.2 Design of price regulation

325. Nkom has assessed various methods of price regulation of Telenor's offer of Broadband access, including price caps, cost-oriented prices, benchmarking and so-called retail-minus-regulation. Based on international practice and previous experience with price regulation, Nkom considers price caps and cost-oriented prices to be the most relevant options for this type of access.

326. In the case of cost-oriented price regulation based on historical costs, the prices are linked to cost information obtained from cost accounts. Allocating costs to specific products and services is a complex task that can be solved in various ways. An advantage of cost orientation is that prices are based on the regulated provider's actual production costs of providing access or producing the service. Under a cost-oriented price regime, the regulated undertaking is only permitted a normal return in addition to the coverage of its actual or modelled costs.

327. One disadvantage of cost orientation is that calculating the cost basis of various forms of access and products may be quite demanding, especially since electronic communication has a large element of fixed and shared costs. Another drawback arises especially if prices are

directly linked to a cost basis, such as in the form of rate-of-return regulation. Such regulation may provide little in the way of predictability for operators. This is because the assumptions for the calculation of average cost, such as volume development and level of investment, change over time. Moreover, the imposition of cost-oriented prices gives limited incentives for streamlining by the regulated provider, since any efficiency gains might in principle result in an obligation to reduce cost-oriented prices.

328. Several of these drawbacks concerning cost orientation will not be applicable if the price regulation is based on price caps. The use of price caps will give predictable prices for all operators in the period to which the regulation applies. Furthermore, price caps give incentives to reduce costs and operate effectively, since the regulated provider itself may retain any gains for as long they remain below the price cap. One major challenge on designing long-term price cap regulation is, however, to take account of the uncertainty concerning the future development in sales volume and cost level. Setting any requirements for expected efficiency improvements may also be a challenge.

329. In the decision of 20 January 2014 in former Market 5, reference was made to how Nkom sees many benefits of a price cap for Telenor's offer of copper-based Broadband access. It was pointed out that any such price regulation would ensure predictability for the operators, give clear incentives for cost effectiveness and also facilitate Nkom's follow-up in the decision period. The decision of 20 January 2014 also shows that at this time no LRIC model had been developed that could be used to model a price cap for bitstream access. Reference was made in the decision to how the determination of price caps in the former Market 5 based on the LRIC model of the access network will require additional model development.

330. On this basis, in the 2014 decision in the former Market 5, Nkom imposed cost-oriented prices based on fully-distributed, historical costs for copper-based Broadband access, instead of price caps.

331. After the 2014 decision, Nkom has further developed the LRIC model for access networks. However, this model is primarily developed to calculate the relevant costs for local, physical access to Telenor's access network in Market 3a and thus cannot solely provide a basis to model costs for wholesale products in Market 3b. However, Nkom has also adjusted the LRIC model for Telenor's core network²⁵ after the 2014 decision. This means that it is now possible for Nkom to model costs for the Basic variants of Telenor's Broadband access products in Market 3b by combining calculations from the further developed access network and core network models.

332. In model terms, there are some challenges related to LRIC-calculation of costs for Telenor's Broadband access products with enhanced quality of service (QoS), i.e. the Premium and Proff variants. These parameters are not part of the LRIC models. The inclusion

²⁵ See Annex 4 and Annex 5.

of service quality of this type will not be trivial and its modelling will entail significant costs. Nkom therefore believes that it is more appropriate to have a simpler cost calculation for the Premium and Proff variants. This is further described and discussed in Section 7.3.2.3 below. The Basic products in total amount to approximately 76% of Telenor's sales of Broadband access, while Premium and Proff account for the remaining share. On the basis of an overall assessment, Nkom has concluded that a simplified cost calculation for Premium and Proff is more than outweighed by the benefits of price-cap regulation for access to copper-based Broadband access.

333. Nkom has given weight to how price-cap regulation for Telenor's copper-based Broadband access products will provide increased predictability for the operators, give clearer incentives for cost effectiveness and facilitate Nkom's follow-up of the price regulation for Broadband access in Market 3b in the decision period. In addition, transition from cost-oriented prices with follow-up via cost accounting to price caps based on modelled costs for copper-based Broadband access entails that the methodological basis for the price regulation of local, physical access and central access in the form of Broadband access is harmonised. In Nkom's assessment, this will contribute to the price regulation of copper-based access at local and central level in the network becoming more consistent, and ensure that no unintended effects arise as a consequence of different methodological approaches to the price regulation of existing copper access products in the two wholesale markets.

7.3.2.3 Further details of the cost basis and method of determining the price cap

334. In the decision of 20 January 2014 in former Market 5, Nkom assessed the appropriate level of detail for the price regulation of copper based Broadband access. Reference was made to how any such obligation might be imposed at an overall level for the market, or that there might be different degrees of detail for the obligation concerning products and services offered in this market. At that time, Nkom gave emphasis to how a high level of detail would be resource-intensive as a consequence of a relatively large number of products in this wholesale market, while it was also found that a high level of detail might entail a less robust cost allocation. At the same time, it was emphasised in the 2014 decision that if the LRIC model in the former Market 4 was further developed, in line with the Commission's recommendation, it might be relevant to expand the model, so that costs at product level in the former Market 5 can also be modelled. In the 2014 decision, reference is made to how the development of any such model would require a lot of time and resources, and that it therefore will not be relevant to use such a model as the basis for price regulation in this wholesale market before in the next round of analysis and decisions in the broadband markets.

335. As stated above, Nkom has now developed a model that can form the basis for the calculation of price caps for Broadband access in Market 3b. This model combines calculations from Nkom's LRIC models for Telenor's fixed access network and core network, both of which have been further developed after the decision in the former Markets 4 and 5 in 2014. For a more detailed description of how the further developed LRIC models can now be used to

calculate price caps for central copper-based access in Market 3b, reference is made to Annex F in “Documentation of Nkom’s vAcc2.2 model”, and the actual model²⁶. These documents are included in Annex 5.

336. Annex F of “Documentation of Nkom’s vAcc2.2 model” states that only costs associated with the Basic variants of Telenor’s copper-based Broadband access products can be calculated using this model. Since the model, in its current form, does not provide a basis for modelling QoS elements that are necessary to calculate costs for the Proff and Premium variants of Telenor’s copper-based Broadband access products, Nkom has concluded that the price cap for the Proff and Premium variants of Broadband access ADSL and VDSL can be modelled on the basis of the percentage difference between Telenor’s current prices for the Basic and Proff variants, and the Basic and Premium variants, respectively. This approach is based on the differences in the estimated costs associated with the core network. These costs are estimated on the basis of the prices without telephony, less the current price of the Operator access product (NOK 85). The percentage difference between the Proff/Premium price and the equivalent Basic price is added to the modelled core costs. The costs of the access element are then added to find the costs of the service without telephony. An example is shown in table 1 below.

		ADSL Proff 6080/640 kbit/s	ADSL Basis 160-7200/128-736 kbit/s
Monthly price without telephony	NOK	359	222
Monthly price without telephony, less LLU	NOK	274 (359-85)	137 (222-85)
Ratio	#	2.00 (274/137)	
Cost from core model	NOK	204 (102x2.00)	102
Cost including access	NOK	278 (204+74)	176 (102+74)

Table 1: Example of estimation of the cost of ADSL Proff on the basis of the calculated cost of ADSL Basic.

337. Any such approach to determining price caps for the Proff og Premium variants of Broadband access ADSL and VDSL will ensure that today’s relative price differences between these variants and the basic variants of the same wholesale products are continued. Nkom believes that this is the most appropriate way to model price caps for the Proff and Premium variants of Broadband access ADSL and VDSL in the coming regulation period.

338. Since the model developed to calculate price caps for Telenor’s copper-based Broadband access products does not provide a basis for modelling QoS elements, the model may not be used to calculate price caps for SHDSL Broadband access, since this wholesale product is only found in Proff and Premium variants and here there is no Basic price as the

²⁶ Annex 5: Documentation of Nkom’s vAcc2.2 model, Marked.xls, Network Design-BSA.xls, Service Costing – BSA.xls and PUBLIC Pricing.xls.

starting point. SHDSL accounted for only 7.5% of Telenor's overall sale of Broadband access products in the first half of 2018, and the SHDSL share has been declining in recent years. Nkom expects this development to continue in the coming regulation period.

339. On this basis, Nkom has concluded that there is no basis for modelling a price cap for SHDSL Broadband access in the same way as for ADSL and VDSL Broadband access. Nkom has furthermore concluded that it is not very appropriate to continue separate price regulation for SHDSL Broadband access based on cost orientation, since this wholesale product constitutes a small part of the overall Broadband access turnover, and this proportion is decreasing²⁷. Nkom also believes that there is no basis for removing the price regulation of SHDSL Broadband access, since this may have unintended competitive effects. Nkom will therefore, for the coming regulation period, require Telenor to set prices for SHDSL Broadband access products that do not deviate significantly from today's level. Any price changes will be considered from case to case. If necessary, Telenor must document and justify price changes based on objective criteria. Changes in underlying, relevant costs will be central to such an assessment.

7.3.2.4 Setting price caps for Broadband access

340. Nkom has calculated modelled costs per month for ADSL and VDSL Broadband access in accordance with the assumptions and principles described above. The modelled costs will increase over the next three years. On this basis, Nkom has assessed whether the price caps for Broadband access must be adjusted annually in the coming regulation period, or whether a price cap must be determined for the entire regulation period, reflecting the average price level for the period in question.

341. Since, in this decision, modelled costs are the basis for the determination of the price cap, and the modelled costs will increase in the next few years, Nkom has concluded that it is most appropriate that the price caps for the coming regulation period reflect the annual, modelled cost increase. Nkom applies the same principle to price caps for local, physical access in Market 3a.

342. On this basis, maximum prices for ADSL and VDSL Broadband access are determined, as shown in table 2 to table 7, for the period from 2019 to 2021. For practical reasons, the date of the first change in the price cap is set as 1 February 2019. The maximum prices are for full access, i.e. without telephony being offered via the same access line.

²⁷ Telenor's wholesale sales of SHDSL declined by 20% from the end of the first half of 2017 until the end of the first half of 2018. In the same period, SHDSL's share of Telenor's total wholesale sales of broadband access fell from 8.3% to 7.5%.

ADSL Basis		ADSL Premium		ADSL Proff	
Product	Price cap	Product	Price cap	Product	Price cap
7200-24000/480-1728	227	7200-24000/480-1728	281	19200/864	367
160-7200/128-736	176	160-7200/128-736	209	14432 / 800	356
		160-2464/128-448	209	9600 / 800	350
				7232 / 704	338
				6080 / 640	278
				4864 / 640	269
				3616 / 512	261
				2464 / 448	244
				1856 / 448	244
				1248 / 384	244
				864 / 2562	227
				480 / 256	227
				RA 864-160 / RA 256- 128	227

Table 2: Price caps, without telephony, for ADSL Basis, ADSL Premium and ADSL Proff. From 1 February 2019 until 31 December 2019.

VDSL Basis		VDSL Premium		VDSL Proff	
Product	Price cap	Product	Price cap	Product	Price cap
32000-63500	296	32000-63500	366	52544/12544	433
22016-36000	250	22016-36000	306	40000/10048	429
12960-27008	235	12960-27008	279	30016/10048	367
				25024/5056	351
				20000/1000	351

Table 3: Price caps, without telephony, for VDSL Basis, VDSL Premium and VDSL Proff. From 1 February 2019 until 31 December 2019.

ADSL Basis		ADSL Premium		ADSL Proff	
Product	Price cap	Product	Price cap	Product	Price cap
7200-24000/480-1728	229	7200-24000/480-1728	283	19200/864	369
160-7200/128-736	178	160-7200/128-736	211	14432 / 800	358
		160-2464/128-448	211	9600 / 800	352
				7232 / 704	340
				6080 / 640	280
				4864 / 640	271
				3616 / 512	263
				2464 / 448	246
				1856 / 448	246
				1248 / 384	246
				864 / 2562	229
				480 / 256	229
				RA 864-160 / RA 256- 128	229

Table 4: Price caps, without telephony, for ADSL Basis, ADSL Premium and ADSL Proff. 2020.

VDSL Basis		VDSL Premium		VDSL Proff	
Product	Price cap	Product	Price cap	Product	Price cap
32000-63500	298	32000-63500	368	52544/12544	435
22016-36000	252	22016-36000	308	40000/10048	431
12960-27008	237	12960-27008	281	30016/10048	369
				25024/5056	353
				20000/1000	353

Table 5: Price caps, without telephony, for VDSL Basis, VDSL Premium and VDSL Proff. 2020.

ADSL Basis		ADSL Premium		ADSL Proff	
Product	Price cap	Product	Price cap	Product	Price cap
7200-24000/480-1728	231	7200-24000/480-1728	285	19200/864	371
160-7200/128-736	180	160-7200/128-736	213	14432 / 800	360
		160-2464/128-448	213	9600 / 800	354
				7232 / 704	342
				6080 / 640	282
				4864 / 640	273
				3616 / 512	265
				2464 / 448	248
				1856 / 448	248
				1248 / 384	248
				864 / 2562	231
				480 / 256	231
				RA 864-160 / RA 256- 128	231

Table 6: Price caps, without telephony, for ADSL Basis, ADSL Premium and ADSL Proff. 2021.

VDSL Basis		VDSL Premium		VDSL Proff	
Product	Price cap	Product	Price cap	Product	Price cap
32000-63500	300	32000-63500	370	52544/12544	437
22016-36000	254	22016-36000	310	40000/10048	433
12960-27008	239	12960-27008	283	30016/10048	371
				25024/5056	355
				20000/1000	355

Table 7: Price caps, without telephony, for VDSL Basis, VDSL Premium and VDSL Proff. 2021.

343. Prices for establishment, co-location and access to information and support systems are not subject to this price-cap regulation, cf. Section 7.3.5 below.

7.3.2.5 Rule for pricing of shared access

344. The modelled price caps shown in Section 7.3.2.4 are based on calculations of the costs of access to Telenor's Broadband access products when telephony is not offered via the same access line, i.e. full access. In the same way as for local, physical access in Market 3a, and with the same justification, Nkom believes that there should be different price caps for full and shared access, respectively, to the Broadband access products in Market 3b.

345. In previous decisions concerning local access to Telenor's access network (decisions concerning LLU access in 2002, 2006, 2009 and 2014, respectively), the principle for distribution of the access line's costs between the telephony and broadband service, if both services use the same access line, has been based on a 50/50 division rule, with correction for special costs. See these decisions for further details of the grounds for this. The decision in

Market 3a shows that Nkom cannot see that anything in the justification for this pricing rule that has changed since the previous decisions, and therefore considers the same principle to be appropriate going forward for the product variants that can be characterised as shared access in Market 3a. This entails that wholesale customers still pay a lower price for shared access than for full access in this market. If the retail user cancels the telephone service, on the other hand, the form of access will be converted to full access at an appurtenant higher price.

346. On this basis, Nkom has assessed whether the price cap for full and shared access, respectively, to Broadband access products in Market 3b should follow the same 50/50 distribution rule as in Market 3a. Since the price regulation of the Broadband access products in the current decision in former Market 5 from 2014 is not based on price caps, the relationship between the pricing of full and shared access was not taken into account in that decision. Nkom registers that the difference between Telenor's prices for full and shared access, respectively, to the Broadband access products in recent years deviates somewhat from the difference that Telenor has calculated for full and shared access for the LLU products on the basis of the 50/50 distribution rule set in the decision in the former Market 4. Nkom believes that it is natural to consider the 50/50 distribution rule from Market 3a when, in this Market 3b decision, a new rule is to be set for the ratio between the price caps for full and shared access to Broadband access.

347. On this basis, Nkom has concluded that, for the coming regulation period, it is appropriate that the price caps for the various product variants for shared access to Broadband access in Market 3b are calculated on the basis of the modelled price caps for full access, cf. Section 7.3.2.4 above, and that an amount is deducted that is equivalent to the difference between full and shared access for local, physical access to copper-based access networks in Market 3a.

7.3.2.6 ESA's comments

348. In its comments concerning Nkom's notification of a draft decision in Markets 3a and 3b, ESA refers to how Nkom uses historical costs as the basis in the LRIC model. With this background, ESA calls on Nkom to monitor how the selected price adjustment affects investments and infrastructure competition. ESA writes:

«...the Authority calls on Nkom to monitor the impact of the proposed wholesale copper access prices closely and to be prepared to review its price control remedy if investment incentives and infrastructure competition do not develop in the direction envisaged.»

349. Nkom will monitor market developments closely and, among other things by obtaining half-yearly statistics and annual cover surveys, will have a good basis for assessing the development in investments and infrastructure competition. If the selected price regulation appears to affect development negatively, Nkom will reconsider the method of determining the

price caps for central access to copper-based access networks in the form of Broadband access.

7.3.3 Central access to copper-based access networks in the form of VUA copper

7.3.3.1 Assessment of the need for price regulation

350. In Section 7.3.2, Nkom has referred to how the price setting for central access to copper-based access networks in the form of broadband access is still of great importance for the terms of competition in the related retail market, and has concluded that it is necessary to continue an obligation for Telenor concerning price regulation of such access in Market 3b.

351. In areas where the copper network is being upgraded, providers that use local, physical access to the copper network might be forced to buy a substitute product, e.g. central access in the form of VUA copper. Providers using broadband access might also be affected. In connection with upgrading, too, the pricing of the wholesale product will be of great significance to the terms of competition in the related retail market.

352. On the basis of the market analysis, cf. Annex 1, and the competition problems described in Chapter 5, including potential competition problems in the absence of regulation related to discriminatory and establishment-impeding behaviour which might lead to e.g. price squeezes and surcharges for Telenor's competitors in the downstream market, Nkom has concluded that it is necessary to introduce an obligation for Telenor concerning the price regulation of central access to copper-based access networks in the form of VUA copper in Market 3b.

353. Below, Nkom will assess which method must be used as the basis for price regulation of VUA copper in Market 3b.

7.3.3.2 Choice of price regulation method

354. VUA copper must, as a minimum, be offered in the parts of the copper network that Telenor upgrades, so as to be able to offer significantly higher transmission capacity to end users, while broadband access must be offered in the remaining parts of the copper network. An upgraded copper network requires significant investments, among other things as a consequence of fibre routing, and has the potential for considerably higher capacity. The starting point for the choice of price regulation method therefore differs for traditional broadband access and VUA copper. In the light of a technology-neutral market definition, Nkom therefore deems it appropriate to consider the regulation of other types of NGA networks on determining the method of price regulation of VUA copper.

355. The use of remedies in this regulation is intended to maintain the competition for services and also to support the aim of infrastructure-based competition through commercial development of high-speed broadband. It is therefore necessary to assess how various types

of price regulation of VUA copper affect the developers' investment incentives and the access buyers' competitiveness.

356. Strict price regulation in the form of cost-oriented prices and price caps will entail that the access is priced at a level that corresponds to Telenor's long-term marginal costs and thereby supports the competition for services concerning the access. At the same time, any such price regulation might adversely affect Telenor's investment incentives and cause the extent of the upgrading of the copper network to be reduced. This relationship has also been put forward by Telenor in the Broadband Forum. Nkom considers it appropriate to impose price obligations that are investment-neutral to the greatest possible extent. The choice of price regulation method for VUA copper therefore should not, as such, affect Telenor's incentives in the choice between offering NGA in the form of an upgraded copper network, or via another infrastructure such as fibre. The goal of investment-neutral price regulation advocates that VUA copper follows the same principles as the regulation of Telenor's fibre network.

357. An opposite extreme, in the form of no or very moderate price regulation, would entail that insufficient consideration is made of the access buyers. Nkom therefore does not consider such regulation to be relevant.

358. The competition between different broadband access technologies in Norway is increasing. This entails that, in some cases, a customer that is offered an upgraded, copper-based broadband connection will also be able to choose to buy a broadband connection via other access technologies. The retail prices for upgraded, copper-based broadband are to some extent assumed to be indirectly disciplined by the retail prices for broadband via alternative access technologies.

359. To some extent, any such disciplining effect will also be exercised from increased competition to offer content and related services via the Internet connection. The emergence of OTT operators represents a form of competition on the services side in the broadband market, and entails that the access owners' offering of content and other services via the broadband connection is exposed to greater competition than was previously the case. In practice, this especially concerns the offer of TV services, but also broadband telephony. Use of the broadband connection for TV services requires that the broadband connection has relatively high capacity. There is therefore reason to assume that the threat from retail users' opportunity to move parts of their purchase of content and associated services to one or more OTT operators has a greater disciplining effect on the pricing of such services in an upgraded copper network.

360. Over-pricing in the retail market therefore appears to be a smaller potential competition problem for the part of the copper network that is being upgraded and where achievable speeds are so high that the OTT operators can deliver all types of services.

361. With regard to over-pricing as a competition problem in the wholesale market, Nkom refers to how Telenor has indicated in the Broadband Forum that the company in principle

plans to only upgrade the copper network in areas where there is reason to assume that the development of alternative NGA networks will not take place. Furthermore, in connection with the notification of decisions in Markets 3a and 3b, Telenor has stated that the upgrading of the copper network will be significantly more limited than was originally planned. In isolated terms, the lack of potential for infrastructure-based competition indicates a strict form of price regulation. As referred to above, on the other hand, a strict form of price regulation could make it less attractive to implement the upgrade. Furthermore, it cannot be ruled out that Telenor is changing its ambitions related to the upgrading of the copper network in the light of how the market is evolving differently to what Telenor expects at this time. Telenor might nonetheless find it appropriate to also upgrade the copper network in more central areas where the competition from alternative infrastructures is stronger.

362. The competition for services can be taken into account by ensuring that effective access buyers can profitably replicate services equivalent to those offered by Telenor through its own retail activity. Any such type of margin-based regulation might entail that the access prices are somewhat higher than when cost orientation and price cap requirements are made, and thereby support the possibility of upgrading the copper network in several areas.

363. In its recommendation concerning consistent non-discrimination obligations and cost methodologies²⁸, the Commission has maintained that a requirement for cost-oriented prices for access to NGA networks under certain conditions is not necessary. The assumption is that the non-discrimination obligation is sufficiently effective, and entails that the access buyers must be ensured “Equivalence of Access”.²⁹ According to the Commission, this can be achieved by setting requirements for both an economic replicability test and a technical replicability test. According to this recommendation, any such regulation is suitable to balance the consideration of giving incentives for investments in high-capacity broadband with the consideration of ensuring competition for services, for the benefit of the retail users.

364. In Section 7.4, Nkom has concluded that an order with the tighter requirement concerning EoO, including the technical replicability test requirement, is sufficient for the access buyers to achieve “Equivalence of Access.” The requirement applies to all access forms covered by the regulation.

365. On this basis, Nkom concludes that it is not appropriate to impose strict price regulation in the form of price caps or cost-orientation of VUA copper in Market 3b. On the other hand, Nkom believes that an obligation for Telenor to offer access prices which entail that the access buyer is not subject to margin squeeze is appropriate. Any such requirement entails that Telenor may offer access to external providers at a price that enables access buyers to replicate Telenor's products in the retail market and achieve positive margins. Nkom believes that price regulation in the form of a prohibition of margin squeeze for VUA copper is

²⁸ Cf. Section 7.1

²⁹ See <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:251:0013:0032:En:PDF>, item 58.

appropriate in order to take into account that price regulation of various types of NGA networks must be investment-neutral, and to balance the consideration of investments against the consideration that access buyers must be able to compete effectively.

366. In order to ensure that the prohibition against offering access prices which make the access buyer subject to margin squeeze is observed, Nkom will perform margin squeeze tests. As far as possible, Nkom will apply the same method and principles to the margin squeeze test for VUA copper in Market 3b as apply to the margin squeeze test for central access to Telenor's fibre-based access network (VUA fibre), cf. Section 7.3.4.3 and Annex 3. Nkom will make a separate decision on the concrete design of the margin squeeze test for VUA copper. Nkom has the objective that principles and the margin squeeze test for VUA copper must be completed before any launch of new wholesale products from Telenor.

367. If the margin squeeze test is not passed, i.e. does not give a positive result, Nkom will require rectification of Telenor's access prices, cf. Section 4-9 of the Electronic Communications Act. In the rectification decision, Nkom will state by how much Telenor's total wholesale costs must be reduced. Nkom believes that it is important that the access prices are reduced to a correct level as quickly as possible, since excessively high access prices reduce the access buyers' opportunity to compete in the retail market. On the other hand, Telenor must have some time to assess how the company will comply with the decision, including which wholesale prices the company will reduce. Nkom has assessed it to be reasonable that the wholesale prices must normally must be rectified within ten business days from the rectification decision being made.

368. If the margin squeeze test is not passed and the access buyers have thus paid an excessively high price in relation to the price obligation, access buyers may require repayment of the excessive price, cf. Section 10-12 of the Electronic Communications Act. On request, in each individual case, Nkom will make a concrete assessment of whether individual decisions on repayment of the excessive price should be made. In order to calculate the size of the repayment amount, Nkom will have to consider for which period an excessive price has been charged, and how high the excessive price has been during this period.

7.3.4 Central access to fibre-based access networks (VUA fibre)

7.3.4.1 Assessment of the need for price regulation

369. Nkom has assessed the necessity and proportionality of price regulation for central access to fibre-based access networks in Market 3b, in the light of the authority's approach to the regulation principle for Market 3b, cf. Section 6.1.

370. In the current decision in former Market 5, Nkom has not imposed price regulation for fibre-based Broadband access. Instead, Telenor was subject to an accounting separation obligation that would contribute to ensuring follow-up on the non-discrimination requirement. In addition, in August 2015, Nkom adopted a decision on the use of margin squeeze tests as a

tool to follow up on the requirement of non-discrimination with regard to the price of fibre-based Broadband access.

371. On the basis of the market analysis, cf. Annex 1, and the competition problems described in Chapter 5, including potential competition problems in the absence of regulation related to discriminatory and establishment-impeding behaviour which might lead to e.g. price squeezes and surcharges for Telenor's competitors in the downstream market, Nkom has concluded that it is necessary to introduce an obligation for Telenor concerning the price regulation of central access to fibre-based access networks in the form of VUA fibre in Market 3b.

372. Below, Nkom will assess which method must be used as the basis for the price regulation of VUA fibre in Market 3b.

7.3.4.2 Choice of price regulation method

373. While price regulation of central access to copper-based access networks in the form of broadband access entails price regulation of access to a fully developed nationwide access network, any price regulation of central access to fibre-based access networks will entail price regulation of access to an access network that is being developed. The basis for the choice of price regulation method therefore differs between central access in the form of broadband access, and central access in the form of VUA fibre. In the light of a technology-neutral market definition, Nkom therefore deems it appropriate to consider the regulation of other types of NGA networks on determining the method of price regulation of VUA fibre.

374. The use of remedies in this regulation is intended to maintain the competition for services and also to support the aim of infrastructure-based competition through commercial development of high-speed broadband. It is therefore necessary to assess how various different types of price regulation of VUA fibre affect the developers' investment incentives and the access buyers' competitiveness.

375. A strict form of price regulation of VUA fibre, e.g. in the form of price caps or cost-orientation, might adversely affect the fibre developers' investment incentives. Even though such a price regulation obligation will only be directed at Telenor, as the only provider with significant market power in this market, there is reason to assume that a strict form of price regulation of Telenor's wholesale fibre offering might also affect the future investment decisions of other fibre developers. Nkom does not wish to impose obligations in this market that affect the scope and speed of the development of fibre to any significant degree.

376. An opposite extreme, in the form of no or very moderate price regulation, would entail that insufficient consideration is made of the access buyers. Nkom therefore does not consider any such regulation to be relevant.

377. The competition between different broadband access technologies in Norway is increasing. This entails that, as a rule, an end user who is offered fibre-based broadband

access can choose between both copper-based and mobile-based broadband access. In some cases, HFC-based access is also an alternative for end-users who are offered fibre-based broadband access. This competition among various different technologies is assumed to have a disciplining effect on the retail prices for fibre broadband, even after the end user has selected access technology and connected to a fibre access provider.

378. To some extent, any such disciplining effect will also be exercised from increased competition to offer content and related services via the Internet connection. The emergence of OTT operators represents a form of competition on the services side in the broadband market, and entails that the access owners' offering of content and other services via the broadband connection is more exposed to competition than was previously the case. In practice, this especially concerns the offer of TV services, but also broadband telephony. Use of the broadband connection for TV services requires that the broadband connection has relatively high capacity.

379. On this basis, over-pricing in the retail market appears to be a smaller potential competition problem for VUA fibre than for central access to copper-based access networks in the form of Broadband access in Market 3b.

380. With regard to over-pricing as a competition problem in the wholesale market, Nkom finds reason to emphasise that the terms of competition on the access side within fibre-based broadband are completely different than for copper-based broadband. For a potential wholesale consumer in Market 3b that wishes to offer fibre-based broadband in the retail market, there will generally be an option to invest in own fibre accesses if the wholesale terms are perceived as not being very attractive. Broadnet, the Altibox partners and a number of local and regional fibre developers have already chosen such a strategy. This entails that the terms of competition for fibre-based broadband access in Norway are not directly comparable with the situation in many other European countries, which makes the dynamics of the Norwegian market for wholesale fibre access appear different from the market for wholesale copper access, where it is not likely that Telenor's de facto monopoly position will be challenged in the years ahead.

381. The competition for services can be taken into account by ensuring that effective access buyers can profitably replicate services equivalent to those offered by Telenor through its own retail activity. Any such type of margin-based regulation might entail that the access prices are somewhat higher than when cost orientation and price caps are required, and thereby support opportunities to invest in NGA networks.

382. In its recommendation of consistent non-discrimination obligations and cost methodologies³⁰, the Commission has maintained that a requirement for cost-oriented prices for access to NGA networks under certain conditions is not necessary. The assumption is that

³⁰ Cf. Section 7.1

the non-discrimination obligation is sufficiently effective, and entails that the access buyers must be ensured “Equivalence of Access”.³¹ According to the Commission, this can be achieved by setting requirements for both an economic replicability test and a technical replicability test. According to this recommendation, any such regulation is suitable to balance the consideration of giving incentives for investments in high-capacity broadband with the consideration of ensuring competition for services, for the benefit of the end-users.

383. In Section 7.4, Nkom has concluded that an order with the tighter requirement concerning EoO, including the technical replicability test requirement, is sufficient for the access buyers to achieve “Equivalence of Access.” The requirement applies to all access forms covered by the regulation.

384. On this basis, Nkom concludes that it is not appropriate to impose strict price regulation in the form of price caps or cost-orientation of VUA fibre in Market 3b. On the other hand, Nkom believes that an obligation for Telenor to offer access prices which entail that the access buyer is not subject to margin squeeze is appropriate. Any such requirement entails that Telenor may offer access to external providers at a price that enables access buyers to replicate Telenor’s products in the retail market and achieve positive margins. A margin squeeze prohibition will in the given circumstances attend to investment incentives for Telenor and at the same time ensure that effective access buyers can compete in the retail market.

385. In order to ensure that the margin squeeze prohibition for central access to fibre-based access networks in Market 3b is complied with, Nkom will therefore undertake margin squeeze tests and gross margin tests, see Section 7.3.4.3 below.

386. In order for the margin squeeze regulation to effectively promote the purpose of the regulation, Nkom believes that it is important to achieve transparency and predictability for involved operators. It is therefore necessary that the regulation adequately clarifies in advance how a breach of the margin squeeze regulation will be enforced.

387. Section 2 of Annex 3 states that a margin squeeze test is passed if the end user income is greater or equal to the sum of wholesale costs and downstream costs. Whether a margin squeeze exists will thus depend on the relative relationship between revenue and costs in the margin squeeze model. It is thus necessary to determine which prices Telenor can adjust if the margin squeeze tests have failed. Specifically, the question is whether Telenor will be granted a right to increase retail prices as a remedy to an ascertained margin squeeze.

388. Nkom’s choice of margin squeeze model as a pricing tool is based on an overall assessment of a number of factors, including that the margin squeeze regulation should promote the purposes of the regulation. The recommendation on consistent non-discrimination obligations and cost methodologies argues that price regulation in the form of an economic replicability test, on specific terms, is an alternative to cost orientation. Which scope of action Telenor should have in terms of remedying a reported breach of the margin squeeze

³¹ See <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:251:0013:0032:En:PDF>, item 58.

regulation, is part of Nkom's assessment of whether margin squeeze regulation will function adequately efficient as a price regulation tool.

389. In the market analysis, Nkom has shown that Telenor has almost 100% market share in Market 3b, measured on sales of access to external buyers, see Section 3.3.2 of Annex 1. Telenor thus has no competitors in this part of the access market. If Telenor is allowed to increase end-user prices, this will in isolation help Telenor to pass the margin squeeze test. To allow such behavior, however, will not in Nkom's assessment address the underlying competition problem in the wholesale market. Nkom refers to that both vertical transfer of market power, including through pricing, and single market dominance, including exploitative behavior, have been identified as current competition issues in the wholesale market, cf. Sections 5.2 and 5.3. The need for the enforcement of a possible breach of the margin squeeze regulation to remedy the competition problems in the wholesale market, supports in Nkom's assessment that Telenor must be required to correct the margin squeeze by reducing wholesale prices.

390. In Annex 3, Nkom has justified the choice of flagship products and the aggregation level that will be the basis for the margin squeeze tests. If the margin squeeze tests show that the requirements of the regulation are not met, it is important that this situation can be remedied effectively. If, in such a situation, Telenor is able to fulfill the requirement to pass the margin squeeze test by increasing the retail prices, it follows that such rectification may only have effect by increasing the retail prices on one or more of the products covered by the margin squeeze test. Within the products covered by the test, there will be a proportion of end users who are in the binding period of the contract with an agreed price. Furthermore, the Electronic Communications Act, Section 2-4, requires that changes to or termination of an agreement on the purchase of electronic communications services shall not enter into force before one month after the notice has been sent to the end user. The provision also provides end users who do not accept the new terms of agreement, a right to cancel the agreement at no additional cost. Overall, Nkom believes that these conditions are in disfavour of allowing Telenor to correct the margin squeeze by increasing end-user prices, as such allowance will not provide sufficiently effective price controls.

391. The margin squeeze regulation on Telenor implies that Nkom periodically conducts margin squeeze tests. The test is carried out after each period and thus has a limited backward perspective. A more intrusive form of margin squeeze regulation is to require that a margin squeeze test shall be passed before end-user products can be offered in the market. If the regulator finds in connection with the test that the margin requirement in question is not met, there are no end users who will be directly affected if the regulated provider is allowed to increase the retail prices to remedy the margin squeeze situation. However, in the case of margin squeeze tests of products that end users have already signed a purchase agreement on, this does not apply. Nkom believes that, the interest of end-users indicates that Telenor

should not be granted the right to increase retail prices to remedy an ascertained margin squeeze.

392. On the basis of the above, Nkom believes that allowing Telenor to increase its retail prices to remedy an ascertained margin squeeze would normally not be a sufficiently good option, compared to requiring Telenor to reduce its wholesale prices for central access in Telenor's fibre-based access network.

393. A requirement for an ascertained margin squeeze to be remedied by reducing wholesale prices implies a limitation of Telenor's freedom of action. However, in Nkom's view, such a restriction is necessary to ensure that the margin squeeze regulation is sufficiently effective to promote the purpose of the regulation and thus be a suitable form of price regulation. Nkom can not see that the purpose of the regulation can be achieved in a less intrusive manner. The alternative would be to impose another and more intrusive form of price regulation. In view of this, Nkom concludes that it is proportionate to impose requirements on Telenor to rectify breaches of the margin squeeze regulation by reducing wholesale prices.

394. If the margin squeeze tests and/or the gross margin tests are not passed, i.e. they do not give a result of at least zero, Nkom will normally impose on Telenor, pursuant to the Electronic Communications Act, Section 10-6, to correct the company's wholesale prices for access in this market to a level that Nkom based on the margin squeeze tests considers to provide economic replicability. Nkom will in the rectification decision state how much Telenor's wholesale costs need to be reduced.

395. The portfolio approach to the completion of margin squeeze tests implies that an imposed reduction of wholesale costs could be distributed among multiple access products. A question is then whether Telenor should be given the freedom to choose how the reduction is to be distributed between different access products included in the margin squeeze test. A key element behind the choice of a portfolio approach is that the margin squeeze regulation must ensure some flexibility for Telenor regarding pricing of various retail products. In the event of a finding of breach of the margin squeeze regulation, Nkom believes that this concern can not be weighted equally strongly. Nkom therefore refers to the assesment above where we express that Telenor will be required to reduce wholesale costs to a level deemed to provide economic replicability. Nkom nevertheless sees no reason to go as far as to demand that the reduction of wholesale costs be distributed proportionally to the access products included in the margin squeeze test.

396. On any actual breach of the margin squeeze regulation, Nkom considers it important that the wholesale prices are reduced to an appropriate level as quickly as possible, in order to restore the access buyers' opportunity to compete effectively in the retail market. On the other hand, it is reasonable to give Telenor some time to assess how the company will implement the ordered rectification. Experience from previous orders to rectify actual breaches of the margin squeeze regulation has also shown that in such cases there will be a need to consider

any request for the rectification order to be subject to deferred execution. After a specific overall assessment, Nkom upholds that a rectification order as a consequence of actual breach of the margin squeeze regulation will normally enter into force 15 business days after the decision is taken.

397. For a requirement for rectification after failing to pass a margin squeeze and/or gross margin test to function effectively, Nkom finds it appropriate that Telenor submits a proposal to Nkom for how Telenor will execute the rectification. Any such proposal would be appropriate to streamline the implementation of the rectification decision in that any clarifications that might be required can be discovered and undertaken before the rectification order enters into force. Accordingly, Nkom concludes that on any requirement for rectification as a consequence of failing to pass a margin squeeze or gross margin test, Telenor must send Nkom a proposal for how Telenor will undertake the required rectification. The proposal must be sent within five business days after the rectification decision is communicated to Telenor.

398. In connection with a requirement to reduce wholesale prices, there may be questions as to whether Telenor shall be entitled to increase wholesale prices in the period up to the subsequent conduction of a margin squeeze test. In order for the margin squeeze regulation to be sufficiently effective to achieve the objective, Nkom emphasizes that the rectified wholesale prices will, as a clear starting point, act as a price cap until the next conduct of the margin squeeze test. If Telenor can demonstrate that there is a need to increase access prices during this period and that economic replicability will be safeguarded despite the rise in prices, Telenor could still be allowed to increase wholesale prices before the next completion of the margin squeeze test, subject to approval by Nkom.

399. If the margin squeeze tests and/or gross margin tests are not passed and the access buyers have thus paid an excessively high price in relation to the price obligation, access buyers may require repayment of the excessive price, cf. Section 10-12 of the Electronic Communications Act. On request, in each individual case, Nkom will make a concrete assessment of whether individual decisions on repayment of the excessive price should be made. In order to calculate the size of the repayment amount, Nkom will have to consider for which period an excessive price has been charged, and how high the excessive price has been during this period. The data collected in connection with the conduction of a margin squeeze test will be somewhat older than the point in time for a possible order to rectify the margin squeeze. If these data have not been changed in the period up to the rectification decision, Nkom will take as a starting point that the margin squeeze has existed at the latest from the date the data were obtained.

400. The margin squeeze test pursuant to the decision in former Market 5 from 20 January 2014 is regulated by Section 4-7 of the Electronic Communications Act concerning non-discrimination. Over time, Telenor has maintained that the non-discrimination provision does not justify the current arrangement of the margin squeeze test in the 2014 regulation. Telenor has furthermore maintained that since the margin squeeze model is sanctioned in non-

discrimination, Telenor is free to choose to exercise any claim for rectification, in full or in part, by increasing the retail prices. In its appeal decision of 25 October 2017, the Ministry of Transport and Communication has not upheld Telenor's position in this assessments, but has maintained Nkom's assessments of the issue of the legal basis and the rectification competence. Section 4-9 of the Electronic Communications Act provides a basis to impose "specific price regulation methods", including margin squeeze test requirements. Nkom maintains that the margin squeeze test in the 2014 regulation is sufficiently justified, but has, after an overall assessment, found it appropriate to require Telenor to offer access prices which ensure that the access buyer is not subject to margin squeeze, in accordance with Section 4-9 of the Electronic Communications Act.

7.3.4.3 More details concerning the implementation of margin squeeze tests and gross margin tests

401. As shown by Nkom's decision of 20 January 2014 in the former Market 5, Nkom saw a need to develop a margin squeeze test for fibre-based Broadband access, in order to follow up on the non-discrimination obligation concerning price between Telenor's own retail activity and external access buyers. After the development of the test, Nkom took a decision on 27 August 2015 concerning follow-up of the non-discrimination requirement by using margin squeeze tests for fibre-based Broadband access. Nkom has also performed margin squeeze tests and imposed rectification of Telenor's fibre-based wholesale prices in the decision of 9 May 2016, the decision of 21 February 2017, and the decision of 20 April 2018.

402. Nkom's starting point is the principles and margin squeeze test stated in the decision of 27 August 2015. Based on experience from the performance of the margin squeeze test, Nkom believes, however, that there is a need to make a few adjustments to the principles, in order to ensure more effective and predictable performance of the margin squeeze tests. The updated principles are stated in Annex 3.

403. As a general rule, Nkom will perform margin squeeze tests twice a year. However, Nkom will also be able to perform margin squeeze tests at its own initiative where appropriate; for example if new wholesale products are introduced in Market 3b. The prohibition on offering access prices that subject the access buyer to margin squeeze will be an ongoing requirement, however, and will thus not be limited to the times when the margin squeeze tests are performed.

404. In connection with the margin squeeze tests, Nkom will obtain relevant information from Telenor and relevant alternative providers. Reference is made to Section 10-3 of the Electronic Communications Act concerning the disclosure obligation. Nkom will normally give a deadline of two months for the submission of the requested information.

405. The margin squeeze test will be performed as soon as possible after the requested information has been received, and normally within 30 days. Nkom will consider the result of a margin squeeze test without undue delay. The general principles for case consideration will be

applied. Nkom assumes that the assessment of the results arising from the margin squeeze test might normally be completed within the time frames stipulated in Section 11-2 of the Electronic Communications Act.

406. The margin squeeze test will ensure that an effective, alternative provider can replicate a portfolio with Telenor's commercially most attractive fibre-based retail products. The portfolio approach gives Telenor flexibility in determining the prices for retail and wholesale products. This entails that, ultimately, Telenor will be able to set individual wholesale prices so that the access buyers' wholesale costs are not covered. This will apply especially to the fibre-based retail products that are not included in the margin squeeze test, but a portfolio approach entails that this might also be the case for fibre-based retail products included in the margin squeeze test.

407. To ensure that access buyers are not excluded from parts of the retail market, Nkom believes that it is necessary to set requirements of a positive gross margin for all of Telenor's individual fibre products that are sold in the retail market. That entails that Telenor's total monthly income associated with each individual fibre product in the retail market at any time must be greater than or equal to the corresponding total monthly wholesale costs. Telenor must pass a gross margin test for all individual fibre products in the retail market. Individual fibre products are all of Telenor's retail products where the customer only buys broadband; in other words not products that include TV or broadband telephony.

408. Nkom will ask Telenor to document that the gross margin test is passed in connection with data retrieval for the margin squeeze test, i.e. normally twice a year. On performing the gross margin tests, Telenor will calculate the income for each individual fibre product in the same way as the income is calculated for the flagship products in the margin squeeze test. Monthly subscription income, as well as a share of one-off income, must be included. Furthermore, promotions and discounts must be taken into account in the same way as in the margin squeeze test. On calculating the wholesale costs for each individual fibre product, Telenor will apply the same method as in the margin squeeze test. This means that both monthly wholesale costs and a share of the one-off costs must be included. Telenor must also assume the same volume discount as for the previous margin squeeze test.

409. The gross margin test must also include ODP-related wholesale costs. These costs will depend on the price per ODP, speed per ODP, and the number of ODPs. In the gross margin tests, Telenor must add a percentage mark-up on the remaining wholesale costs, in order to take account of ODP-related costs. The percentage mark-up will be calculated on the basis of ODP-related wholesale costs as a ratio of the total wholesale costs in the previous margin squeeze test.

410. Infringement of the margin squeeze prohibition by Telenor possibly failing to pass the margin squeeze test or gross margin test might, in Nkom's view, be an indication that the adopted regulation is not sufficiently effective for its purpose. Any such outcome will thereby

make it relevant to change the regulation and possibly impose a requirement of cost-oriented prices on Telenor.

7.3.5 Homes passed

411. In Section 7.2, Nkom has instructed Telenor to grant access to “homes passed”. The issue that Nkom must consider here is whether there is a need for price regulation associated with such access, and in such case how the price regulation should be designed.

412. The connection of “homes passed” entails an extension of Telenor’s fibre access network. On a par with the initial establishment of the relevant fibre access network, the expansion will entail costs for Telenor, including for trenching, laying ducts, blowing fibre cables and connecting the terminal equipment. The costs which this entails will typically be covered by establishment fees and the sale of retail services or wholesale access. The period for the coverage of these costs will coincide with the fibre network’s lifetime.

413. Nkom cannot see any basis to charge the access buyer a higher monthly access price for the purchase of access that has previously been “homes passed”. The question is whether and, if so, to what extent, Telecom must be able to charge the access buyer a fee for the establishment of drop cables to “homes passed”. Below, Nkom will assess various potential methods for the price regulation of drop cables to “homes passed”.

414. Nkom first assesses whether cost orientation is a suitable method for the price regulation of the establishment of drop cables to “homes passed”. By its nature, cost-oriented price regulation entails that the access price must cover costs. This price regulation method will therefore be appropriate to ensure the consideration of the covering of Telenor’s costs.

415. The pricing of the establishment of fibre accesses in the retail market will be affected by the competition for the establishment of such infrastructure. The market price for establishment in the Norwegian market has been at a level which entails that the establishment price for end users is normally lower than the cost of establishing the individual fibre access. The establishment price has thus to a great extent been subsidised by the provider that establishes the access. For Telenor as the infrastructure owner, the cost of establishment could be covered by establishment revenue and monthly revenue from the sale of retail or wholesale services across the fibre’s lifetime.

416. The market price for the establishment of infrastructure will also determine the price that an access buyer would be able to charge for the establishment of a drop cable to “homes passed”. The access buyer would not be able to continue a cost-oriented establishment price for drop cables out to end users in full if it entailed an establishment price higher than the market price. A cost-oriented wholesale price for the establishment of drop cables might thereby entail that the access buyer must subsidise the establishment price.

417. The access buyer would be able to cover the wholesale costs of establishment from establishment revenue and sale of retail services. Since the retail revenue for the access buyer

is based on services produced across an infrastructure subject to competition and the access buyer will not achieve wholesale revenue in cases where it does not achieve retail revenue, it is possible that the access buyer will not be able to recover the wholesale cost associated with the establishment of the drop cable. The access buyer will thus run a higher risk than is the case for Telenor, on such subsidisation, that the cost associated with the subsidisation may not be recovered. The higher the degree of subsidisation, the greater the risk must be deemed to be. In Nkom's assessment, the choice of cost orientation as the price regulation method for access to the establishment of "homes passed" thus entails a risk that the access obligation will not be effective.

418. On this basis, Nkom believes that price regulation of drop cables to "homes passed" in the form of cost orientation will not be appropriate and will not be suitable to achieve the purpose of the access obligation.

419. An alternative form of price regulation might be not to allow Telenor to charge a higher wholesale price for the establishment of "homes passed" than the establishment price which Telenor otherwise charges at wholesale level in cases where the end customer is already connected to Telenor's fibre access network. Any such establishment fee does not apply to accesses that have already been established. The price can thus be considered to be set to at zero. Any such price regulation method will fulfil the access buyer's need to be able to compete with Telenor on the establishment of drop cables to households that are subject to the access obligation for "homes passed".

420. In the same way as the initial establishment of the current fibre access network, the connection of "homes passed" will entail costs for Telenor. When the access buyer uses the access obligation for the establishment of drop cables to "homes passed", Telenor will not be able to forward this cost to the end user. If Telenor is furthermore not able to charge a higher price for the establishment of a drop cable to "homes passed" than the ordinary establishment price paid by the access buyer for an access that has already been established, these costs will have to be covered from sale of retail or wholesale services. In isolated terms, this may indicate a higher monthly price for wholesale access to drop cables established at the initiative of remote access buyers, than for other fibre accesses. Nkom cannot see that any such price structure would be appropriate and believes that the price regulation should make it possible for Telenor to cover part of the cost of the establishment of the drop cable to "homes passed" in the form of an establishment fee at wholesale level.

421. The price regulation of access to Telenor's fibre access networks is designed on the basis of the principle of ensuring access buyers economic replicability, cf. Section 7.3.4.. The regulation is thus not cost-based, but oriented towards ensuring that the margin between Telenor's retail prices and wholesale prices is sufficient to cover relevant downstream costs. The price regulation thereby requires increased price flexibility for Telenor.

422. In Nkom's assessment, it will be appropriate to apply the same price regulation principle to the price regulation of the same infrastructure, irrespective of how the infrastructure was established. This indicates that the price regulation of the access obligation for the establishment of drop cables to "homes passed" should also be based on ensuring access buyers economic replicability. The consideration of non-discrimination between access buyers and Telenor's own retail activity indicates that the remuneration that the access buyer may have to pay for connection of "homes passed" households must not exceed the price for Telenor's own retail activity in the same circumstances. However, Telenor does not operate with any internal settlement price between its wholesale and retail activities, so that it is not possible to use a specific settlement price as the starting point.

423. Besides cost coverage for Telenor, Nkom believes that it is also necessary to design the price regulation so that it does not counteract the purpose of the "homes passed" access obligation. Drop cables that are established when connecting "homes passed" are the property of Telenor. Above, Nkom has referred to that Telenor will be able to earn revenue from establishment through the sale of retail services or wholesale services during the lifetime of the fibre accesses, while an access buyer that sells connection to "homes passed" will only earn revenue from the sale of retail services during the lifetime of the customer relationship. If the establishment fee is set high and the access buyer cannot transfer the high establishment fee to the end-user, this will increase the possibility that the access buyer will not be able to recover the costs associated with the establishment of the customer relationship and thus entail an increased risk for the access buyer.

424. Price regulation with a price cap that depends on Telenor's retail price is, in Nkom's view, comparable with price regulation in the form of margin squeeze tests and price-minus, which are also forms of price regulation whereby the wholesale price is directly related to the retail price for the regulated provider. On any reduction of the retail prices, a provider that is subject to such price regulation will also have to reduce the corresponding wholesale price. The need to consider the access buyer's opportunity to compete with Telenor on the establishment of drop cables to households that are subject to the access obligation for "homes passed" will therefore be considered.

425. As referred to above, Telenor's pricing of the establishment of drop cables to "homes passed" will be influenced by the competition in the retail market for the establishment of relevant infrastructure. It is thus not certain that the price charged by Telenor for the establishment of access to "homes passed" will cover the cost of establishment. Nkom cannot see that price regulation of the establishment of drop cables to "homes passed" which entails equal treatment of Telenor's own retail activity and remote access buyers would in itself entail disproportionate limitation of Telenor's opportunity to achieve cover of costs on any such access.

426. Nkom has assessed how price-cap regulation of drop cables to "homes passed" linked to Telenor's retail prices for access to establishment might affect pricing flexibility in the retail

market. Any such price regulation will entail that Telenor's wholesale price must reflect the price they charge themselves in the retail market. Nkom cannot see that this in itself restricts Telenor's scope for manoeuvre on determining prices in the retail market. Nkom furthermore cannot see that any such price regulation would have any such effect to a greater extent than other forms of price regulation whereby the wholesale price is linked to the retail price. Nkom furthermore cannot see that any such form of price regulation would actually limit the access buyer's price flexibility in the retail market to a greater extent than other relevant price regulation methods, such as cost orientation. Here, Nkom also refers to how access buyers that achieve equal access to establish drop cables to "homes passed" will to a great extent be able to choose which retail price they set for such establishment. With regard to pricing flexibility for broadband providers that do not offer broadband services via Telenor's infrastructure, Nkom cannot see that the current price regulation method would restrict these providers' price flexibility in the retail market, or the opportunity to compete with Telenor on the establishment of new infrastructure.

427. On this basis, Nkom concludes that the access to establish drop cables to "homes passed" must be based on a price cap on the price charged by Telenor for such establishment of their own retail activity.

428. On its websites, Telenor operates with a fixed establishment fee for fibre (hereinafter referred to as the listed price). The price is currently NOK 4,990 (including VAT). Nkom believes that Telenor's fixed establishment fee can be used as an estimate of Telenor's internal settlement price and considers it appropriate to use this price as the starting point when determining the price regulation for "homes passed". The fixed establishment fee (excluding VAT) will in principle be regarded as a price cap on the price that Telenor may charge the access buyer for the establishment of drop cables to "homes passed".

429. Even though Telenor as mentioned above operates with a fixed establishment fee offer on its websites, it cannot be ruled out that in some cases Telenor may be able to charge a higher establishment fee. For the access buyer, predictability concerning the costs associated with the establishment of drop cables to "homes passed" will be necessary in order for the access buyer to be able to decide whether to make use of the access. It is therefore necessary to have transparency concerning establishment fees.

430. In the access regulation, Telenor is required to maintain updated, transparent and readily available information about households included in Telenor's list of "homes passed". To ensure transparency and notoriety concerning current establishment fees, the lists of "homes passed" must be updated at all times with the current establishment fee that Telenor's own retail activity will charge on any densification sale.

431. In principle, the current establishment fee for the relevant connection will be Telenor's listed price for the connection of "homes passed", cf. above. If Telenor's retail activity for some potential customers can offer connection to "homes passed" at price below the listed price, this

must be stated on the “homes passed” list. If any potential customers are to be charged a higher price than the listed price, this must also be stated on the aforementioned list. In such cases, Nkom will be able to ask Telenor to justify and document the higher establishment fee. Nkom will also be able to ask Telenor to justify and document any increases in the establishment fee for specific potential connections.

432. In order to contribute to increased clarity concerning the content of the price regulation of access to “homes passed”, Nkom makes it clear that Telenor’s own retail activity may not undertake densification sale with the offer of a lower establishment fee than shown by the “homes passed” list at the time when connection is offered to the end user. Such conduct will be deemed to be breach of this price regulation.

433. Telenor may have the incentive to undertake densification sale itself in areas where an access buyer is already undertaking densification sale. If Telenor is able to reduce the establishment fee during this phase, Telenor will not as such offer a lower establishment fee than shown by the “homes passed” list. Such conduct will, nonetheless, lead to unequal terms of competition for the access buyer and Telenor’s retail activity. This potential competition problem could be resolved by setting the requirement that price changes must be notified with a certain time limit.

434. Telenor could furthermore have the incentive to reduce the prices in the “homes passed” list shortly before Telenor itself undertakes densification sale in the area affected by the price reduction. Systematic densification sale assumes that there is sufficient time to undertake the necessary preparations. In this way, Telenor will be able to effectively prevent the access buyer from undertaking densification sale on equal terms with Telenor’s own retail activity. This potential competition problem could also be resolved by setting the requirement that price changes must be notified with a certain time limit.

435. In the light of the aforementioned points, Nkom believes that it is necessary to set requirements for notification of changes in the establishment fee for “homes passed”, and refers to Section 7.5.5.4. below. In order to contribute to increased clarity concerning the content of the price regulation of access to “homes passed”, Nkom makes it clear that Telenor’s own retail activity is not able to undertake densification sale during the notice period, and with the offer of the notified lower establishment fee. Such conduct will be deemed to be breach of this price regulation.

436. In its comments on Nkom’s notification of the draft decision in Markets 3a and 3b, ESA has invited Nkom to reconsider the proposed price regulation for the establishment of drop cables to “homes passed”. Among other things, ESA believes there is a risk that the proposed approach may limit price flexibility in the retail market. ESA states the following:

“The Authority invites Nkom to reconsider its proposal to set its proposed wholesale price cap for the establishment of the drop cable to homes passed based on Telenor’s own retail charge for this component. The Authority has concerns that the proposed

approach risks limiting retail pricing flexibility, as well as potentially reducing overall competitive uncertainty and tension on an important cost factor in the retail market. The Authority therefore asks Nkom to assess if alternative wholesale pricing mechanisms may be more appropriate and justified in that regard.”

437. On the basis of ESA’s comment, above Nkom has made a renewed assessment of other possible forms of price regulation of drop cables to “homes passed”. After the renewed assessment Nkom has maintained the conclusion that price-cap regulation of drop cables to “homes passed” based on Telenor’s retail prices for establishment will best observe the need for cover of Telenor’s costs and also contribute to the use of the access obligation for “homes passed” by the access buyer. As described above, Nkom cannot see that this price regulation significantly affects other broadband providers’ price flexibility in the retail market. Price regulation is thereby not suitable either to reduce the competitive pressure associated with the establishment price in the retail market. Nkom thus believes that the price regulation is appropriate, but does not go further than its purpose indicates. Nkom furthermore cannot see that the purpose sought to be achieved can be achieved with less intervention, and concludes that the price regulation is proportional.

7.3.6 Establishment, access to information and support systems, and co-location.

438. Even though Telenor’s prices for the establishment of access to access lines, access to information and support systems, and co-location do not normally account for the largest share of the total costs for buyers of wholesale products in Market 3b, these prices are still of great significance. In Nkom’s view, these price elements can lead to potential competition problems, especially related to over-pricing. The prices may be increased significantly, for example, thereby increasing the costs for providers requiring access.

439. The establishment costs for copper based Broadband access are not included in the costs that are calculated within Nkom’s LRIC model, and thereby not in the price-cap regulation either. In Nkom’s view, it is thereby necessary to regulate the prices for the establishment of copper-based Broadband access and other relevant supplementary services. Telenor is subject to a requirement that these prices, including access to information and support systems, must be cost-oriented, based on fully distributed, historical costs.

440. Since Nkom is now imposing an access obligation for central access to copper-based access networks in the form of VUA copper, it is necessary to assess whether related services for VUA copper, such as establishment and access to information and support systems, must be subject to special price regulation.

441. The margin squeeze test for VUA fibre includes establishment costs and other relevant price elements. There will thus be no need for further price regulation of establishment, access to information and support systems, etc.

442. VUA copper will also be subject to a margin squeeze test, cf. Section 7.3.3, and it is natural that establishment fees and other relevant price elements will be included in this test, in

the same way as for VUA fibre. Nkom therefore believes that there is no need for further price regulation of establishment, and access to information and support systems, etc.

443. In many cases, the purchase of wholesale products in Market 3b requires co-location in Telenor's network. Nkom believes that it is still necessary to have price regulation of co-location that is required in connection with the purchase of access products in Market 3b. Co-location will not be subject to the price-cap regulation for copper-based Broadband access, nor to the margin squeeze assessments for VUA copper.

444. The pricing of co-location must continue to be based on the principle of cost orientation. Since co-location is a service that is used across various markets and that to a great extent is shared for both copper- and fibre-based access, Nkom believes that the requirement of cost orientation for co-location must apply in relation to both copper- and fibre-based access networks. In its follow-up of the cost orientation requirement for co-location, Nkom will give emphasis to the cost accounts for co-location from Telenor. It may also be relevant to request additional reporting in connection with specific cases.

7.3.7 Supplementary backhaul/transport services

445. Telenor's product sheet for DSL Broadband access states that copper-based Broadband access can only be provided together with the E-line supplementary service or equivalent service. E-line is thereby a service that the access buyer is obliged to purchase in order to be able to provide services based on copper-based Broadband access to its own retail customers. E-line is priced separately from Broadband access and the prices are divided into establishment and subscription. In the same way as for other necessary supplementary services, the pricing of E-line or equivalent service can lead to potential competition problems, especially related to over-pricing. The prices may be increased significantly, for example, thereby increasing the costs for providers requiring access.

446. Nkom therefore considers it necessary to have price regulation of E-line or similar service in line with subscription for and establishment of copper-based Broadband access. Such supplementary services are not modelled within Nkom's LRIC models, and Nkom considers it therefore appropriate that the pricing of such services is cost-oriented, based on fully-distributed, historical costs.

7.3.8 Cost accounting

447. Pursuant to Section 4-9 of the Electronic Communications Act, Nkom may require providers with significant market power to use specific systems for cost accounting. The provision specifies the following obligations in connection with cost accounting:

“A description of the systems required for cost accounting, including an overview of the main cost categories and the cost allocation rules that are used, shall be made public. Confirmation that the cost accounts are in accordance with the system laid down for

compiling the cost accounts shall be prepared by an external auditor and published annually.”

448. Annex 1 of the NGA Recommendation states:

“In order to enforce cost-orientation obligations, NRAs should impose accounting separation pursuant to Article 11 of Directive 2002/19/EC. Separated accounts for the NGA infrastructure and/or service elements to which access is mandated should be set up in such a manner that the NRA can (i) identify the cost of all relevant assets for the determination of access prices (including depreciation and valuation changes) and (ii) monitor effectively whether the SMP operator grants access under the same conditions and prices to other market participants as to its own downstream arm. Such monitoring should include the performance of margin-squeeze tests. Costs should be allocated on the basis of objective criteria amongst the various wholesale and retail products which rely on such inputs, to avoid double counting.”

449. For several years, Nkom has assumed that the main purpose of accounting separation is to monitor compliance with an obligation of non-discrimination. Nkom has also assumed that the main purpose of cost accounting will usually be monitoring compliance with an obligation of cost-oriented prices. There are a number of similarities between accounting separation and cost accounting, but also some differences, which are discussed in Nkom's remedy document.

450. With this decision, the price cap for copper-based Broadband access is based on modelled costs from Nkom's LRIC model. Previously, copper-based broadband access was subject to a cost-orientation requirement, with follow-up based on cost accounting. Even though the price regulation method has now been changed, the information that cost accounting provides will be important for Nkom when, in a few years' time, an updated market analysis is to be performed, with possible associated assessment of specific obligations in this relevant market.

451. Other price elements than the monthly prices for copper-based Broadband access are subject to the cost-orientation requirement. Costs related to the establishment of copper-based Broadband access are not included in the modelled costs from Nkom's LRIC model. Nkom therefore considers it necessary that Telenor prepares cost accounts for copper-based Broadband access. Furthermore, Nkom considers it necessary that Telenor provides a supplementary report to the cost accounts, with a split between subscription and establishment/other products/services for copper-based Broadband access.

452. For VUA copper, Nkom has concluded that price regulation in the form of a margin squeeze test for Telenor is necessary. Costs related to subscription and establishment will be included in this margin squeeze test. Nkom believes that there will be no need to impose cost accounting for VUA copper.

453. In the same way, Nkom has concluded that price regulation in the form of a margin squeeze test for VUA fibre is necessary. In this case too, the costs associated with

subscription and establishment will be subject to the calculations. Nkom therefore believes that there will be no need to impose cost accounting for VUA fibre.

454. Nkom believes that it is necessary for Telenor to continue to prepare cost accounts for co-location in fixed networks, in line with current practice. Co-location related to both copper- and fibre-based access in Market 3b must be included in the overall cost accounts for co-location in fixed networks.

455. In order to give Nkom a basis for effective follow-up of price regulation for E-line or similar service, it is necessary that Telenor also prepares cost accounts for this service, based on fully-distributed historical costs.

456. In connection with the reporting of cost accounting, Telenor shall account for any significant changes in reported figures compared to the previous reported cost accounting.

7.3.9 Proportionality

457. Nkom believes that in this case there is no entirely satisfactory alternative to price regulation of central access to the copper- and fibre-based access networks, in order to resolve any problems associated with over-pricing in this market.

458. In principle, price regulation is considered to be a burdensome obligation. In practice, Nkom has faced a choice between the use of cost orientation or price-cap regulation for copper-based Broadband access. Determining a price cap can be resource-intensive. When the price cap has been determined, however, price-cap regulation as a method will generally not be very resource-intensive for the regulated provider to comply with and not very resource-intensive for the authority to oversee. In this respect, the price-cap regulation will seem less onerous, both for the regulated provider and for the supervisory authority, than a cost-orientation requirement.

459. Nkom has concluded that it is necessary to impose an obligation on Telenor to pass a margin squeeze test for VUA copper. Nkom believes that any such requirement is proportional, since the test sufficiently safeguards Telenor's incentives to invest in an upgraded copper network, while also protecting the access buyer by preventing margin squeeze. Nkom believes that in overall terms the benefits exceed the drawbacks which this obligation imposes on Telenor.

460. The same also applies to VUA fibre, where the price regulation in the form of margin squeeze tests in practice is a continuation of the margin squeeze test used in the former Market 5.

461. Nkom has concluded that Telenor must offer the establishment of drop cables to "homes passed" households subject to the access obligation in this decision. The fee for such establishment will be determined according to the principles stated in Section 7.3.5. Nkom believes that this obligation is necessary and proportional to ensure that access buyers also have access to densification sales in established fibre access networks.

462. Furthermore, Nkom believes that requirements for cost-orientation of establishment, access to information and support systems and other supplementary services related to Broadband access are necessary and proportional.

463. In the same way, Nkom believes that cost-orientation of co-location is necessary and proportional. This is a continuation of the regulation in the former Market 5.

464. Since the E-line service is a required supplementary service to which no alternatives exist for access buyers, Nkom believes that it is necessary and proportional that Telenor is subject to a cost orientation requirement for this service.

465. For Nkom to be able to follow up the requirement concerning cost-oriented prices, it is necessary to impose a commitment to maintain cost accounts. The cost accounting obligation is primarily a continuation of the existing obligation in the former Market 5, and is therefore a less onerous obligation than if Telenor were to be required to develop a system for cost accounting for the relevant products. The requirement of E-line cost accounting is new, but is not considered to be particularly onerous for Telenor, in the light of how the company already has a schedule for the cost accounting of related services.

466. On this basis, Nkom believes that the proposed cost orientation and cost accounting obligations for Telenor are proportional. In this respect, reference is also made to the assessment in Section 7.7.

7.3.10 Special obligations related to prices and accounts

467. Nkom refers to the aforementioned assessments concerning which special obligations concerning prices and accounts must be imposed on Telenor in Market 3b. The special obligations imposed on Telenor ASA (in the remainder of the chapter referred to as Telenor) are stated in this chapter.

468. Pursuant to Section 4-9 of the Electronic Communications Act, Nkom requires Telenor to set prices per month for copper-based broadband access, in line with the price caps stated in Section 7.3.2.4. The price caps for the period from 2019 to 2021 are shown in tables 8 to 13 below. If Nkom does not take a new decision in this market before 31 December 2021, the price caps set for 2021 will apply until further notice.

ADSL Basis		ADSL Premium		ADSL Proff	
Product	Price cap	Product	Price cap	Product	Price cap
7200-24000/480-1728	227	7200-24000/480-1728	281	19200/864	367
160-7200/128-736	176	160-7200/128-736	209	14432 / 800	356
		160-2464/128-448	209	9600 / 800	350
				7232 / 704	338
				6080 / 640	278
				4864 / 640	269
				3616 / 512	261
				2464 / 448	244
				1856 / 448	244
				1248 / 384	244
				864 / 2562	227
				480 / 256	227
				RA 864-160 / RA 256- 128	227

Table 8: Price caps, without telephony, for ADSL Basis, ADSL Premium and ADSL Proff. From 1 February 2019 until 31 December 2019.

VDSL Basis		VDSL Premium		VDSL Proff	
Product	Price cap	Product	Price cap	Product	Price cap
32000-63500	296	32000-63500	366	52544/12544	433
22016-36000	250	22016-36000	306	40000/10048	429
12960-27008	235	12960-27008	279	30016/10048	367
				25024/5056	351
				20000/1000	351

Table 9: Price caps, without telephony, for VDSL Basis, VDSL Premium and VDSL Proff. From 1 February until 31 December 2019.

ADSL Basis		ADSL Premium		ADSL Proff	
Product	Price cap	Product	Price cap	Product	Price cap
7200-24000/480-1728	229	7200-24000/480-1728	283	19200/864	369
160-7200/128-736	178	160-7200/128-736	211	14432 / 800	358
		160-2464/128-448	211	9600 / 800	352
				7232 / 704	340
				6080 / 640	280
				4864 / 640	271
				3616 / 512	263
				2464 / 448	246
				1856 / 448	246
				1248 / 384	246
				864 / 2562	229
				480 / 256	229
				RA 864-160 / RA 256- 128	229

Table 10: Price caps, without telephony, for ADSL Basis, ADSL Premium and ADSL Proff. 2020.

VDSL Basis		VDSL Premium		VDSL Proff	
Product	Price cap	Product	Price cap	Product	Price cap
32000-63500	298	32000-63500	368	52544/12544	435
22016-36000	252	22016-36000	308	40000/10048	431
12960-27008	237	12960-27008	281	30016/10048	369
				25024/5056	353
				20000/1000	353

Table 11: Price caps, without telephony, for VDSL Basis, VDSL Premium and VDSL Proff. 2020.

ADSL Basis		ADSL Premium		ADSL Proff	
Product	Price cap	Product	Price cap	Product	Price cap
7200-24000/480-1728	231	7200-24000/480-1728	285	19200/864	371
160-7200/128-736	180	160-7200/128-736	213	14432 / 800	360
		160-2464/128-448	213	9600 / 800	354
				7232 / 704	342
				6080 / 640	282
				4864 / 640	273
				3616 / 512	365
				2464 / 448	248
				1856 / 448	248
				1248 / 384	248
				864 / 2562	231
				480 / 256	231
				RA 864-160 / RA 256- 128	231

Table 12: Price caps, without telephony, for ADSL Basis, ADSL Premium and ADSL Proff. 2021.

VDSL Basis		VDSL Premium		VDSL Proff	
Product	Price cap	Product	Price cap	Product	Price cap
32000-63500	300	32000-63500	370	52544/12544	437
22016-36000	254	22016-36000	310	40000/10048	433
12960-27008	239	12960-27008	283	30016/10048	371
				25024/5056	355
				20000/1000	355

Table 13: Price caps, without telephony, for VDSL Basis, VDSL Premium and VDSL Proff. 2021.

469. Pursuant to Section 4-9 of the Electronic Communications Act, Nkom requires Telenor to set the prices for shared access on the basis of the modelled prices for full access, cf. Sections 7.3.2.5 and 7.3.2.4, and to deduct an amount equivalent to the difference between full and shared access for local, physical access to copper-based access networks in Market 3a.

470. Pursuant to Section 4-9 of the Electronic Communications Act, Nkom requires Telenor to ensure that the pricing of SHDSL broadband access products does not deviate significantly from the current level. Pursuant to Section 4-9 of the Electronic Communications Act, Nkom requires Telenor not to withdraw SHDSL broadband access products already sold.

471. Pursuant to Section 4-9 of the Electronic Communications Act, Nkom requires Telenor to offer the establishment of agreements on access to copper-based broadband access, the management of agreements on access to copper-based broadband access, operator change, access to information and support systems, and other relevant services related to central

access to the copper-based access network, at cost-oriented prices. The cost-orientation must be based on fully-distributed historical costs.

472. Pursuant to Section 4-9 of the Electronic Communications Act, Nkom requires Telenor to offer access to VUA copper at prices which ential that the access buyer is not subject to margin squeeze, in line with Section 7.3.3. Telenor must pass a margin squeeze test for VUA copper. Nkom will, as far as possible, apply the same principles as apply to the margin squeeze test for VUA fibre in Annex 3b, but will make a separate decision on the specific design of the margin squeeze test at a later date.

473. Pursuant to Section 4-9 of the Electronic Communications Act, Nkom requires Telenor to offer access to VUA fibre at prices which ential that the access buyer is not subject to margin squeeze, in line with Section 7.3.4. Telenor must pass a portfolio-based margin squeeze test of fibre-based retail products and a gross margin test of individual, fibre-based retail products, in line with Section 7.3.4.3 and Annex 3.

474. Pursuant to Section 4-9 of the Electronic Communications Act, Nkom imposes price caps on Telenor for access to establish drop cables to “homes passed” based on the price that Telenor can be deemed to charge its own retail activity for any such establishment, cf. Section 7.3.5. The price cap applies to access level and the prices must be kept updated at all times. An equivalent transparency requirement is stated in Section 7.5.4.1.

475. Pursuant to Section 4-9 of the Electronic Communications Act, Nkom requires Telenor to offer co-location in connection with copper-based and fibre-based broadband access in Market 3b, at cost-oriented prices, cf. Section 7.3.6. The cost-orientation must be based on fully-distributed historical costs. The cost-orientation requirement must apply in relation to both copper- and fibre-based access networks. The follow-up on the cost-orientation requirement will emphasise cost accounting, and any special reporting.

476. Pursuant to Section 4-9 of the Electronic Communications Act, Nkom requires Telenor to offer the E-line supplementary service, or equivalent service for backhaul and transport, at cost-oriented prices, based on fully distributed historical costs, cf. Section 7.3.7.

477. Pursuant to Section 4-9 of the Electronic Communications Act, Nkom requires Telenor to keep cost accounts for copper-based broadband access based on fully distributed historical costs, at an aggregated level, cf. Section 7.3.8. Telenor will prepare an additional report to the cost accounts showing the cost accounts for subscription and establishment/other products/services individually.

478. Pursuant to Section 4-9 of the Electronic Communications Act, Nkom requires Telenor to keep cost accounts for co-location based on fully distributed historical costs, cf. Section 7.3.8. The total cost accounting for co-location in a fixed network must include both copper- and fibre-based broadband access

479. Pursuant to Section 4-9 of the Electronic Communications Act, Nkom requires Telenor to keep cost accounts for E-line or similar service based on fully distributed historical costs, cf. Section 7.3.8.

480. Telenor's obligation to keep cost accounts based on fully distributed historical costs concerns copper-based broadband access, co-location and backhaul services in the form of E-line or equivalent service. In this decision, Nkom applies the same principles as were assumed in the decision of 21 December 2006 on elaboration and clarification of principles for cost accounting.

481. Pursuant to Section 4-9 of the Electronic Communications Act, Nkom requires Telenor to keep cost accounts according to the following principles:

- Operating revenue, operating expenses (including depreciation), imputed interest payments and capital employed for copper-based Broadband access in Market 3b must be separated from other activities and appear as a separate profit unit.
- Costs/capital employed that are not directly attributable shall be allocated to the profit unit on the basis of an analysis of the causal relationship to the extent this is possible. Remaining costs/capital employed shall be distributed proportionally on the basis of previously attributed costs/capital employed.
- The cost accounts will be based on the financial accounts, with the exception of the financial items to be replaced by an imputed interest rate on the book capital employed. Imputed interest payments shall consist of a weighted average of interest on debt and a reasonable return on equity multiplied by book capital employed. A reasonable rate of return on capital is in principle equal to the level expected from equivalent investments. Telenor will use the prevailing interest rate set by Nkom for the fixed network markets. Book capital employed is the same as the book value of assets less non-interest-bearing liabilities. The cost accounts are to be reconciled with the financial accounts, and any discrepancies must be explained.
- The cost accounts are to be reviewed by an auditor in accordance with the standard for a limited review. Among other things, the auditor shall prepare a confirmation of whether or not the cost accounts comply with the stipulated system of cost accounting, including verification of the reconciliation with the audited financial accounts. In addition, a verification shall be conducted of whether selected distribution keys meet the requirements for activity based costing. The auditor shall be given access to all relevant documentation in order to express an opinion about the cost accounts

482. It is stipulated in Section 4-9, third paragraph, of the Electronic Communications Act that Telenor must publish a description of the systems imposed for running cost accounts, including an overview of the main categories of costs and which distribution keys are used.

483. Pursuant to Section 10-3 of the Electronic Communications Act, Nkom requires Telenor to report the above mentioned cost accounts to Nkom before 1 July of the following year. The first reporting according to this decision must be for the 2019 financial year and must be sent to Nkom before 1 July 2020. In connection with the reporting of cost accounting, Telenor shall account for any significant changes in reported figures compared to the previous reported cost accounting.

484. Nkom may issue supplementary provisions in a separate decision regarding the obligation of cost accounting, cf. also Nkom's decision of 21 December 2006 on elaboration and specification of principles for cost accounting.

7.4 Non-discrimination

7.4.1 Regulatory basis

485. Chapter 5 identified the fact that Telenor can discriminate between different providers with regard to price or other conditions as a potential competition problem.

486. Non-discrimination requirements are also discussed in the NGA Recommendation. In respect of non-discrimination based on price, it is stated in Annex I:

“Under the principle of non-discrimination, the price charged to the SMP operator's downstream arm should be the same as the price charged to third parties.”

487. In the recitals, the Recommendation also mentions non-discrimination more generally:

“(17.) [...] non-discrimination obligations are required to ensure the effectiveness of access to the terminating segment.”

488. Section 4-7 of the Electronic Communications Act authorises Nkom to impose an obligation of non-discrimination. The first paragraph of the provision authorises the imposition of an obligation on a provider with significant market power to treat external users equally. The second paragraph of this provision authorises imposition on a provider with significant market power of an obligation to offer the same or equivalent quality and terms to competing providers as to its own or associated operations.

489. Non-discrimination does not necessarily imply that all businesses are to be given identical terms, but that any differences in terms that are imposed are based on objective criteria. The main point of non-discrimination is that providers with significant market power must treat similar situations in a similar manner with regard to price, information and other terms and conditions, regardless of the operations they pertain to.

7.4.2 Assessment of the need for an obligation of non-discrimination

490. To a certain degree, discriminatory behaviour can be redressed through price controls and/or transparency obligations. For example, an obligation of cost-oriented prices could make

it difficult to discriminate on price. A transparency obligation can make it more difficult to maintain discriminatory practices, partly because it makes this kind of behaviour more visible. Nevertheless, Nkom finds that price controls and transparency obligations alone would not be sufficient to prevent price discrimination and other discriminatory behaviour between in-house and external providers.

491. An obligation of non-discrimination could prevent the leveraging of market power from the wholesale to the retail market, as the scope to engage in exclusionary behaviour is reduced. In this context, exclusionary behaviour means attempts to deny access to and shut out competitors from markets by operating with prices, quality differences or access terms that favour the provider's own operations.

492. In the decision of 20 January 2014 in former Market 5, Telenor was imposed an obligation of non-discrimination for access to both copper and fibre-based access networks, as well as for set-up, co-location and other associated services (cf. Section 4-7 of the Electronic Communications Act).

493. Chapter 5 identifies the possibilities for various forms of differentiation of prices and/or price structures between different categories of customer and between internal and external access buyers. Other discrimination between an SMP provider's own retail operations and external provision, for example related to delaying tactics, undue requirements and quality discrimination, could result in the leveraging of market power from the wholesale to the retail market (see Chapter 5).

494. Furthermore Telenor may have an incentive to discriminate against external operations with regard to price and other terms. For example, it is conceivable that Telenor could grant less favourable terms to providers that pose the greatest competitive threat to Telenor in related retail markets.

495. Nkom therefore finds that an obligation on non-discrimination regarding access should be imposed on Telenor in Market 3b. The obligation of non-discrimination applies between internal use and external provision, as well as between different external buyers of access. On the basis of the discussion of competition problems for various access forms in Chapter 5 and the design of the access and price controls above, the obligation shall apply to wholesale products based on both copper and fibre in Telenor's access networks. Furthermore, Nkom finds that Telenor should continue to be subject to an obligation of non-discrimination for co-location, etc., in connection with wholesale products based on both copper and fibre in Telenor's access networks.

7.4.3 Assessment of whether obligations of non-discrimination should be based on EoI or EoO

496. Obligations of non-discrimination can be designed in a variety of ways. In previous decisions in the wholesale markets for broadband access, obligations of non-discrimination have not usually contained specific requirements regarding Telenor's use of systems and

supply chains for the company's internal retail operations and external access buyers respectively, based on an assessment of an Equivalence of Inputs (EoI) or an Equivalence of Output (EoO) approach. However, on the basis of the Commission's Recommendation on consistent non-discrimination obligations and costing methodologies from 2013, it is natural to assess whether obligations of non-discrimination should be based on an EoI or an EoO regime.

497. In the Commission's Recommendation on consistent non-discrimination obligations and costing methodologies from 2013 (the 2013 Recommendation), EoI and EoO are defined as follows:

“Equivalence of Inputs (EoI) means the provision of services and information to internal and third-party access seekers on the same terms and conditions, including price and quality of service levels, within the same time scales using the same systems and processes, and with the same degree of reliability and performance. EoI as defined here may apply to the access products and associated and ancillary services necessary for providing the ‘wholesale inputs’ to internal and third-party access seekers.

Equivalence of Output (EoO) means the provision to access seekers of wholesale inputs comparable, in terms of functionality and price, to those the SMP operator provides internally to its own downstream businesses albeit using potentially different systems and processes.”

498. In other words, EoI means that the products, prices, systems and processes used for the regulated provider's internal retail operations are also offered to external buyers of access, while EoO means that the wholesale offering to external buyers of access is comparable with the provision to the regulated provider's internal retail operations in respect of functionality and pricing, even though different systems and processes may be used.

499. The aim of the Commission's 2013 Recommendation is to promote increased competition, strengthen the internal market for electronic communications networks and services, and promote investments in NGA networks. The Commission considers it important that obligations of non-discrimination are designed to ensure equal terms of competition, and in the 2013 Recommendation stated that the following elements should be taken into account in the formulation of obligations of non-discrimination:

- Ensure equivalent access through requirements of EoI or EoO
- Secure technical replicability for access buyers when the regulated provider launches new retail products
- Ensure that the regulated provider complies with obligations of non-discrimination by monitoring and following up KPIs with related service level agreements (SLA) and compensation arrangements in the form of service level guarantees (SLG)

500. As a point of departure, the Commission finds that EoI is the most effective approach to ensure non-discrimination. At the same time, the Commission points out that, based on national circumstances, it may be disproportionate to impose an EoI obligation. If EoI is not considered proportionate from a cost–benefit point of view, the regulatory authority should ensure that the regulated provider offers access products based on an EoO approach. In this case, the regulator must ensure that the obligation of non-discrimination entails that access buyers can use systems and processes with the same level of reliability and quality or performance as the systems and processes used by the regulated provider’s internal retail operations.

501. The Commission points out that if an EoO basis is chosen, it is especially important to ensure equal terms of competition for access buyers through technical replicability and associated tests. In order to create increased transparency and confidence in the wholesale market, and to ensure that the SMP provider complies with the obligations of non-discrimination in an EoO regime, the Commission states further that monitoring and follow-up of KPIs, with associated SLAs and SLGs, should be included as part of the obligation of non-discrimination.

502. Against this backdrop, Nkom has assessed whether to impose on Telenor an obligation of non-discrimination based on EoI in Market 3b. According to the 2013 Recommendation, an assessment of the proportionality of an EoI obligation should be based on a cost–benefit assessment where the regulated provider’s costs associated with compliance with an EoI obligation, including costs associated with system and process changes to existing IT systems and supply chains, are weighed up against the benefits for competition afforded by EoI. The assessment must at the same time take into account the objective defined in the 2013 Recommendation that regulation should promote investments in NGA networks.

503. The attached market analysis refers to complaints and appeals Nkom has processed in recent years relating to the obligation of non-discrimination in former Markets 4 and 5. Experience from these complaints and appeals suggests that there may be a need to impose EoI in order to prevent discrimination between Telenor’s internal retail operations and external buyers of access in Market 3b in the years ahead. EoI will restrict Telenor’s ability to exercise discriminatory behaviour and thereby contribute to increased trust among the access buyers in this market.

504. At the same time, an EoI obligation may entail significant development and/or change costs for Telenor. These kinds of costs must be weighed up against potential positive effects for innovation and competition in the retail market as a result of an obligation of EoI. In this context, Nkom believes that it must also be assessed whether the positive competition effects of an EoI regime can also be achieved by clarifying and sharpening the non-discrimination requirements in an EoO regime.

505. In the 2013 Recommendation, the Commission assumes that obligations of non-discrimination in Market 3b based on EoI will have significant positive effects for NGA competition and innovation linked to NGA services. Nkom also holds that requirements that effectively ensure non-discrimination in Market 3b are important for NGA competition in Norway, but at the same time finds that the relatively high degree of infrastructure competition in the Norwegian broadband market suggests that an obligation of EoI is not as important for innovation associated with NGA services in Norway as in countries with weaker infrastructure competition. The degree of infrastructure competition is also referred to by the Commission as a factor that should be taken into account when assessing the benefits and usefulness of EoI.

506. Information that Nkom has obtained from Telenor about systems and supply chains for internal and external sales channels indicates that there is already a high degree of use of the same systems and supply chains and that planned system improvements apply to both internal and external systems. This implies that there are already elements of EoI in Telenor's wholesale offering, as was also pointed out in the decision in former Market 5 from 2014. This argues in favour of the view that it will not be proportionate to impose EoI.

507. In light of this, Nkom has concluded that, from a cost–benefit perspective, it is neither necessary nor proportionate to impose an obligation of non-discrimination based on EoI in Market 3b. However, based on the experiences from the aforementioned complaints and appeals relating to the obligation of non-discrimination in former Markets 4 and 5, Nkom finds it is necessary to clarify and partially sharpen the requirements regarding documentation of non-discrimination in an EoO regime in Market 3b. This kind of clarification and the sharpening of the documentation requirements will make it easier for both Nkom and external buyers of access to assess whether Telenor is complying with the obligation of non-discrimination in this market.

7.4.4 Non-discrimination based on EoO

508. Non-discrimination based on EoO means that Telenor's wholesale operations can continue to use different systems and processes for provision to its internal retail operations and sales to external buyers of access. According to the Commission's 2013 Recommendation, however, obligations of non-discrimination in an EoO regime should be designed to ensure that the systems and processes used for the external access buyers have the same level of reliability, functionality and quality or performance as the systems and processes used for the regulated provider's internal retail operations.

509. In its comments on Nkom's notification of the draft decision in former Markets 4 and 5, prior to the current decision of 20 January 2014, ESA highlighted the importance of access buyers being ensured input factors equivalent to those available to Telenor's own retail operations. ESA stated:

“Against this background, the Authority invites the NPT to ensure that access seekers can use the wholesale access systems and processes relevant to markets and with the

same degree of reliability and performance as Telenor's own downstream retail arm. This includes ensuring effective access to the same technical and commercial wholesale information, as well as to ordering, delivery and repair inputs necessary for an efficient operator to develop or adapt its own systems and processes, in sufficient time to compete with the corresponding retail offers of the SMP operator.”

510. Using this as a starting point, Nkom has undertaken a comprehensive assessment of which obligations should be included in an obligation of non-discrimination based on EoO in Market 3b. Since Nkom has concluded that EoI is neither necessary nor proportionate in this market, Nkom finds that the sum of the obligations in an EoO regime must ensure equal terms of competition and non-discrimination between external buyers of access and Telenor's internal retail operations.

511. A key element of an obligation of non-discrimination is that access buyers should be able to offer similar products as Telenor in the retail market and launch new products at the same time as Telenor. To ensure that this is possible, Nkom concludes below that it is necessary to impose on Telenor an obligation to perform technical replicability tests as a part of the non-discrimination obligation in Market 3b.

512. In addition, Nkom regards the preparation and publication of KPIs related to key activities in the supply chain as an important means to detect any potential discriminatory behaviour. KPIs are intended to measure different parameters that have been determined beforehand in a service level agreement (SLA) between the regulated provider and the access buyers. Nkom finds that it is also necessary for an effective EoO regime to impose on Telenor SLA requirements that can form the basis for monitoring and follow-up of published KPIs. In addition, Nkom holds it is necessary that the SLAs include service level guarantees (SLG) in the event of non-compliance with agreed quality levels in order to ensure non-discrimination based on EoO in Market 3b.

513. The obligation to perform technical replicability tests is part of the obligation of non-discrimination and is justified and described in more detail below. The requirement to prepare and publish KPIs related to key activities in the supply chain and the requirements for SLAs and SLGs relating to the same quality parameters as the KPIs were part of obligation of transparency and reference offers in the current decision in former Market 5. In this decision, the requirements regarding SLAs and SLGs are described in Section 7.2.13, while the requirements regarding KPIs are described in Section 7.5.4.

7.4.5 Content of the obligation of non-discrimination

514. The obligation of non-discrimination shall apply to all the wholesale products covered by the obligation of access in Market 3b (cf. Section 7.2 above).

515. The obligation of non-discrimination applies both to Telenor's offerings to various external buyers of access and between external access buyers and Telenor's internal retail operations.

516. Non-discrimination between different external buyers of access means that Telenor will offer the same terms, functionality and pricing to all external access buyers that request wholesale products in Market 3b, unless the difference can be justified by objective criteria. Examples of aspects where there must not be differential treatment between external buyers of access include system availability, delivery, fault correction and migration.

517. In the appeal decision of 9 March 2018 concerning Nkom's decision on the designation of providers with significant market power and the imposition of special obligations in the market for access to and call origination in public mobile communications networks (formerly Market 15), the Ministry of Transport and Communications has, among other things, further explained the content of the requirement of non-discrimination between remote access buyers, and how this will be followed up. In Section 6.4.6, the Ministry writes the following:

“In order to control whether the requirement of non-discrimination between remote access buyers is complied with, Nkom will undertake a comparison of the various agreements. If the agreements cannot be compared directly, Nkom can make assumptions that make it possible to compare the agreements. It cannot be specified in advance which assumptions will be made in the individual case, because this will depend on the structure and design of the agreements. The conditions must be realistic for the access buyers that are compared, and suitable for the purpose. If there is any doubt about how the obligation is to be complied with, Telenor will be able to contact Nkom for further guidance.

The Ministry refers to how volume discount, volume commitment and binding time, for example, may be objective reasons for different prices. Whether such conditions constitute an objective reason must be determined in the individual case. Reference is made to section 237 and Nkom's elaboration of how, when a competing provider achieves better terms, equivalent terms must be offered to other competing providers. This entails that it must be possible for the terms to result in a lower price for all access buyers, for this to be considered to be an objective reason for different prices.

The fact that terms have a value for Telenor will not necessarily mean that this is an objective reason for different prices. It is actual cost savings that are central to the assessment of what is considered to be an objective reason. The cost savings must be documented and, to a certain degree, quantified in order to constitute a objective reason for different prices. This is in line with the Electronic Communications Act's preparatory work, which sets the requirement that the terms must be clear and verifiable, so that it is possible to control compliance.”

518. Nkom believes that the Ministry of Transport and Communications' assessment is also relevant in this context and applies the assessments to the content of the non-discrimination requirement in this decision.

519. Non-discrimination between external buyers of access and Telenor's internal retail operations means that Telenor must offer wholesale products to external access buyers with the prices and conditions, and with the same functionality, as apply to Telenor's internal retail operations. Examples of aspects where there must not be differential treatment between Telenor and external buyers of access include system access, delivery, fault correction and migration.

520. In its comments on Nkom's notification of the draft decision in Markets 3a and 3b ESA has acknowledged Nkom's assessment that it is not proportionate to impose non-discrimination based on EoI. ESA also emphasises the importance of Nkom ensuring that the non-discrimination obligation functions effectively, and e.g. writes:

"The Authority acknowledge NKOM's view that the imposition of EoI in the Norwegian context would be disproportionate. At the same time, NKOM's reply to the Authority's first RFI demonstrates that, even in the presence of existing non-discrimination and KPI reporting obligations, the assessment of Telenor's systems and routines in 2017 indicated that its channels/interfaces still had more full-handeling functionality and were more automated than those available to access buyers. In this regard, the Authority invites Nkom to make sure that the apporiate safeguards and monitoring processes are in place to confirm an effective operation of the non-discrimination obligation (and that Nkom acts swiftly in the event of any disputes) such that technical replicability of Telenor's offers is ensured for the forthcoming regulatory period."

521. To ensure that the non-discrimination obligation functions effectively, Nkom has made several clarifications and changes compared with the market decisions from 2014. Nkom refers to how, among other things, it is stated above that Telenor is to offer wholesale products to remote access buyers at such prices and terms, and with the same functionality, as applies to Telenor's internal retail activity. Nkom furthermore refers to how Telenor must prepare more detailed service level agreements (SLAs) with related compensation schemes (SLGs) and key performance indicators (KPIs), cf. Sections 7.2.15 and 7.5.4.2. Nkom has also required Telenor to conduct a technical replicability test before the company launches new or modified retail products, cf. Section 7.4.5.1 below. This will contribute to effective monitoring of the non-discrimination obligation in order to ensure the technical replicability of Telenor's retail offer.

522. If, despite these specifications and changes, the non-discrimination obligation nonetheless proves not to function sufficiently effectively, this will provide a basis for a new assessment of whether it is proportionate to impose non-discrimination based on EoI.

523. The requirement that access buyers must have access to the same functionality as Telenor's internal retail activity entails that adjustments must be made in several of Telenor's systems. Before the end of Q1 2019, Nkom therefore requires Telenor to send Nkom an overview showing the areas/systems in which Telenor's internal retail activity and remote access buyers have the same functionality, and in which areas/systems the functionality is

different. For each of the areas/systems for which the functionality is different, Nkom also requires a detailed description of what is needed for the functionality to be the same, as well as an estimated time schedule for this work.

524. Nkom believes that it is appropriate for remote access buyers to have the opportunity to comment on any such overview. To the extent that Telenor's description of the overview concerns trade secrets, Nkom therefore requests that Telenor also submits a public version of the overview and ensures that the public version is suitable for the purpose, as far as this is possible.

525. Within an EoO regime, it is not decisive to the non-discrimination obligation how Telenor defines, structures and organises the relationship between its own retail and wholesale activities, including which systems and processes are used between the retail and wholesale activities. However, the systems and processes used by remote access buyers must have the same degree of reliability, functionality, and quality/performance as the systems and processes used by Telenor's internal retail activity. Since future changes in Telenor's IT systems and supply chains might be of significance to the non-discrimination obligation based on EoO, in Section 7.5.5 Telenor is required to notify Nkom as soon as possible about major changes in IT systems and supply chains.

526. The obligation of non-discrimination between external buyers of access and Telenor's internal retail operations also implies that all the wholesale products covered by the obligation of access in Market 3b must be made available to the access buyers within a reasonable period of time and in a way that allows the access buyers to offer retail products that correspond to Telenor's retail products (technical replicability).

527. Telenor must furthermore make all wholesale products subject to the access obligation available to the access buyer within a reasonable period of time. The requirement entails, among other things, that Telenor must ensure that the access buyers are given sufficient time to develop and adapt their IT systems and processes in order to be able to launch equivalent retail products at the same time as Telenor's own retail activity, irrespective of whether the retail products are based on new or modified wholesale products. Telenor therefore cannot make new or changed wholesale products available to remote access buyers at a later time than when they are made available to the company's internal retail activity.

528. The technical replicability requirement relates to new and modified retail products that Telenor launches. This requirement implies an obligation for Telenor to provide a reasonable amount of time for external buyers of access to use the same technical and commercial information pertaining to relevant wholesale products and processes as Telenor's internal retail operations have access to. This means, among other things, that Telenor must offer the same SLAs to external buyers of access as it does to its in-house retail arm regarding, for example, system access, deliveries, fault management and correction times, and migration, and the same terms and conditions for access to relevant wholesale products.

529. The obligation to offer wholesale products with the conditions, and with the same functionality, as Telenor uses internally also implies that the systems that Telenor makes available to external buyers of access must be applicable and sufficient to ensure non-discrimination linked to orders and order handling processes, etc. This means, for example, that in the event of system changes or updates in Telenor's internal ordering systems to improve or streamline the order flow, corresponding system changes and updates must also be implemented in Telenor's ordering systems for external buyers of access.

530. Access agreements often contain provisions on volume discounts. The volume discounts are often split up into increments whereby the discount increases as the volume increases. Operations with high volumes will thus have an advantage over providers with smaller volumes. In order to ensure that the volume discounts are non-discriminatory, the increments in the discount scale must be objectively justified.

531. Clauses in standard access agreements that entitle Telenor to unconditional and one-sided permission to make changes, creates unpredictability for an access buyer that does not similarly apply for Telenor's internal retail business. Nkom is therefore of the view that such a right for Telenor to make changes involves the favouring of Telenor's own retail business and is therefore liable to create different opportunities to compete for access buyers and Telenor's own operations. The non-discrimination obligation entails that requirements for unconditional and one-sided permission to make changes cannot be included in agreements relating to regulated access. Reference is made to Section 7.5.3.2 regarding the prohibiting of unconditional and one-sided permission to make changes in reference offers.

7.4.5.1 Technical replicability test

532. The obligation of non-discrimination in Market 3b entails, among other things, that the regulated access products must provide access buyers with the same opportunity as Telenor's own retail operations to offer new and modified retail products. Telenor may have an incentive and the opportunity to favour its own retail operations through the technical design of the access products. It is therefore necessary to consider obligations that ensure that this aspect of the non-discrimination obligation becomes effective.

533. In Nkom's opinion, requiring that Telenor itself verifies that the access products provide equivalent opportunities for external access buyers to develop and offer corresponding retail products as the company's own retail operations will promote compliance with the obligation of non-discrimination. This kind of verification is also called a technical replicability test. In order for an obligatory technical replicability test to be effective, Nkom finds it will be necessary to set a supplementary requirement to document that the test has been performed and passed.

534. Nkom concludes that it is necessary to impose on Telenor an obligation to perform a technical replicability test in order to promote compliance with the obligation of non-discrimination. Nkom cannot see that there are less invasive ways of ensuring that the obligation of non-discrimination is sufficiently effective. The more detailed requirements

regarding the content etc. of the technical replicability test are described in Section 7.4.5.1.1, while the requirements regarding deadlines for submission etc. are specified in Section 7.4.5.1.2.

7.4.5.1.1 Test content and documentation requirements

535. Before Telenor launches new or modified retail products that are wholly or partly based on wholesale products covered by the access obligations in Market 3b, Telenor must conduct a test in accordance with the requirements laid down in this section. This requirement means that Telenor must not launch these kinds of retail products until the time limits defined in Section 7.4.5.1.2 have expired, unless Nkom, before expiry of these time limits, states in writing that the technical replicability test has been passed.

536. The purpose of the test is to promote compliance with the obligation of non-discrimination by ensuring that the access products Telenor offers enable external buyers of access to technically replicate the retail products Telenor itself offers in the retail market. To support this purpose, Telenor must communicate with access buyers in product development processes that trigger a requirement for technical replicability tests. The contents of this dialogue must be documented as part of the test that must be submitted to Nkom.

537. In order to assess whether the requirement for technical replicability is met, the technical replicability test must also as a minimum include the following information:

- a) Description of the retail product(s) for which the replicability test has been carried out. This description must contain the same information as will be included in Telenor's sales and marketing materials in connection with the launch of the new or modified retail product. In addition, the description must include any other information relevant to the issue of technical replicability. The description must also include the planned release date for the retail product.
- b) Specification of which wholesale products in Market 3b, including sub-elements of relevant wholesale products, are necessary to develop and offer a retail product corresponding to the retail product that Telenor is planning to launch.
- c) Documentation showing that if any of the wholesale products specified in b) are either a new product or a product that has been modified within the last six months before the deadline for submission of the replicability test (cf. Section 7.4.5.1.2), notification has been provided of the changes, and new or modified wholesale products have been made available to external access buyers within a reasonable time and with adequate information about technical and commercial aspects to ensure that the access buyer is able to replicate the retail product in question.
- d) Documentation showing that access has been established to the ordering systems for the new or modified wholesale products that enables replicability of the relevant retail product and that the access complies with the non-discrimination requirement between Telenor's own retail operations and external access buyers. In addition, it must be

documented that access buyers have had the opportunity to test these ordering systems.

7.4.5.1.2 Time limit for submission and assessment of documentation related to technical replicability

538. In order for the technical replicability test to fulfil its purpose, Nkom finds it necessary to set a time limit for submission of the test to Nkom. The time limit should strike a balance between Nkom's needs to assess whether the technical replicability requirement has been met before new or modified retail products are launched and Telenor's potential need to make changes and adaptations to the products involved in the test. Nkom concludes that 20 working days is an appropriate balance between these considerations. Telenor must thus submit the technical replicability test to Nkom 20 days before the date on which Telenor plans to launch a retail product that triggers a requirement to conduct a technical replicability test (cf. Section 10-3 of the Electronic Communications Act).

539. Nkom will assess the technical replicability of the retail product based on the documentation that Telenor has submitted. If Nkom concludes that the submitted documentation does not provide sufficient basis to assess whether the obligation of technical replicability has been met, Nkom will inform Telenor about this without undue delay. The time limit of 20 working days will be extended accordingly by the number of working days from Nkom informing Telenor that the documentation is inadequate until Nkom has received adequate documentation.

540. Telenor must not launch any new or modified retail products that are wholly or partially based on wholesale products that are covered by the access obligations in Market 3b before the time limits ensuing from this section have expired, unless Nkom, before expiry of these time limits, states in writing that the technical replicability test has been passed.

541. If Nkom concludes that the replicability test has not been passed, Nkom may impose on Telenor an obligation to rectify the matter by offering a wholesale product that complies with the non-discrimination obligation and providing the access buyer with the information that is necessary and sufficient to replicate Telenor's retail product. The situation may also be rectified by Telenor postponing or refraining from offering the retail product in question. In addition, it will be appropriate to sanction non-compliance with the obligation of non-discrimination through infringement fees pursuant to Section 10-13 of the Electronic Communications Act.

7.4.6 Proportionality

542. Nkom finds that imposition of an obligation of non-discrimination on Telenor in Market 3b is proportionate. Nkom finds that non-discrimination is a relatively unburdensome obligation. The obligation of non-discrimination is essentially a continuation of the regulation of former Market 5, except that Nkom is now imposing a new obligation to conduct technical

replicability tests (cf. Section 7.4.5.1). This kind of test is important to ensure that access buyers are able to offer retail products that are equivalent to Telenor's retail products and that the products can be offered from the same time. Nkom finds that it is not particularly burdensome for Telenor to perform the test and that the documentation requirements are manageable.

543. Nkom finds that the advantages for competition of an obligation of non-discrimination clearly outweigh the burdens for Telenor. Moreover, Nkom cannot see that there are other suitable remedies that will adequately redress the competition problems that Nkom has identified related to price and non-price discrimination.

544. Nkom therefore concludes that the above-mentioned obligations of non-discrimination are proportionate.

7.4.7 Special obligations related to non-discrimination

545. Nkom refers to the aforementioned assessments concerning which special obligations associated with non-discrimination are to be imposed on Telenor in Market 3b. The special obligations imposed on Telenor ASA (in the remainder of the chapter referred to as Telenor) are stated in this chapter.

546. Pursuant to Section 4-7 of the Electronic Communications Act, Nkom requires Telenor to give access as specified in Section 7.2, on non-discriminatory terms, in line with Section 7.4.2. The non-discrimination requirement applies between internal use and external provision, as well as between different external buyers of access. The obligation applies to wholesale products based on both copper and fibre in Telenor's access network.

547. Pursuant to Section 4-7 of the Electronic Communications Act, Nkom imposes a non-discrimination obligation on Telenor concerning co-location, backhaul and other similar services intended to facilitate access, in connection with wholesale products based on both copper and fibre in Telenor's access networks, in line with Section 7.4.2.

548. Pursuant to Section 4-7 of the Electronic Communications Act, Nkom requires that Telenor's non-discrimination obligation must be based on "Equivalence of Output", in line with Sections 7.4.3, 7.4.4 and 7.4.5.

549. Pursuant to Section 10-3 of the Electronic Communications Act, before the end of Q1 2019, Nkom therefore requires Telenor to send Nkom an overview showing the areas/systems for which Telenor's internal retail activity and remote access buyers have the same functionality, and for which areas/systems the functionality is different. For each of the areas/systems for which the functionality is different, Telenor must also provide a detailed description of what is needed for the functionality to be the same, and an estimated time schedule for this work. The overview must be sent to Nkom at avtaler@nkom.no and firmapost@nkom.no.

550. Pursuant to Section 4-7 of the Electronic Communications Act, Nkom requires that Telenor shall conduct a technical replicability test prior to the launch of new or modified retail products, and send Nkom documentation that the product is technically replicable for remote access buyers, in line with Section 7.4.5.1.

7.5 Publication and reference offers

7.5.1 Regulatory basis

551. Pursuant to Section 4-6, first paragraph, of the Electronic Communications Act, Nkom may impose an obligation on a provider with significant market power to publish specified information or prepare and publish reference offers for electronic communications networks and services.

552. It furthermore follows from Section 4-6, first paragraph, that the obligation to publish specific information may, among other things, include accounting information, technical specifications, network characteristics and other terms and conditions for delivery and use.

553. Pursuant to Section 4-6, second paragraph, of the Electronic Communications Act Nkom may require that offers pursuant to the first paragraph are sufficiently unbundled into individual elements with associated terms based on market needs so that the user is not bound to accept services, functions or outputs that have not been requested.

554. Nkom may, pursuant to Section 4-6, fourth paragraph, of the Electronic Communications Act, determine where, how and on what conditions the specified information and the reference offer shall be made publicly available. Pursuant to the same provision, Nkom may order that changes be made to the offer and, pursuant to Section 4-6, first paragraph, of the Electronic Communications Act (cf. fourth paragraph) may set requirements in advance regarding the content of the reference offers.

555. Obligations related to the publication of specified information and reference offers are also discussed in the Commission's NGA Recommendation and the Recommendation on consistent non-discrimination obligations and costing methodologies. The latter specifies that key performance indicators (KPIs) will enhance transparency with respect to the quality and delivery of the regulated provider's wholesale products. It also states that KPIs are the most appropriate tools to detect discriminatory behaviour and that publication of KPIs is considered necessary to ensure a level playing field.

556. In the following, obligations for a provider with significant market power to publish specified information and reference offers are referred to as transparency obligations.

557. Pursuant to Section 10-3 of the Electronic Communications Act, Nkom may require information that is necessary for, among other things, the implementation of the Electronic Communications Act and decisions made pursuant to the Act. At the request of the Authority,

service providers must submit information, including classified information concerning electronic communications networks and services, and related facilities, and concerning infrastructure connected to the operating and control systems. This also concerns information on future changes in electronic communications networks and services that may be of significance for services offered to competitors.

7.5.2 Transparency obligations

558. Although transparency obligations on their own are rarely sufficient to remedy competition problems, they play a key role in streamlining and ensuring compliance with other obligations, such as the obligation of access and the obligation of non-discrimination. For example, as regards access issues, it will help to simplify and speed up negotiations if the key terms and conditions for access follow a reference offer that is publicly available. Ensuring that access buyers have access to relevant and necessary information through the requirements regarding reference offers and access to specified information will also help redress the power asymmetry between Telenor and the access seeker. Furthermore, requirements for transparency will make it easier for other providers and Nkom to monitor compliance with obligations of access and non-discrimination. Transparency obligations also increase confidence that access is being offered on non-discriminatory terms.

559. In the above, Nkom has imposed on Telenor an obligation to grant access and set requirements regarding non-discrimination. It is thus appropriate to impose proportionate transparency obligations to support compliance with these obligations.

7.5.3 Reference offers

7.5.3.1 Requirements regarding the preparation and publication of reference offers with appurtenant standard agreements

560. Nkom finds it necessary to require that Telenor must prepare and publish reference offers and accompanying standard agreements for the wholesale products covered by the obligation of access pursuant to this decision. Nkom is of the view that reference offers that are available for all access buyers that submit a reasonable request are important to streamline the obligation of access and the obligation of non-discrimination in Market 3b.

561. Nkom considers the burden for Telenor of having to prepare and update reference offers to be relatively limited. In addition, Nkom is of the view that the competition benefits of requiring that Telenor prepares and publishes reference offers will outweigh the disadvantages such requirements may have for Telenor. Nkom thus finds it proportionate to impose on Telenor an obligation to prepare and publish reference offers for products covered by the obligation of access in this wholesale market.

562. Telenor's reference offers shall provide access to wholesale products in Market 3b on non-discriminatory terms. This entails, among other things, that Telenor's reference offers

must be in line with the obligation of non-discrimination between external access buyers and Telenor's own retail operations (cf. Section 7.4).

563. Publication of reference offers with appurtenant standard agreements on Telenor's website is considered a satisfactory form of publication. In order to simplify negotiation processes and prevent delaying tactics in connection with negotiation processes, Telenor's reference offers must to the greatest extent possible constitute a complete agreement.

564. Within three months of this decision entering into force, Telenor must publish on the company's website updated reference offers that comply with the requirements of this decision. At the same time, Telenor must send the updated reference offers to Nkom at avtaler@nkom.no and firmapost@nkom.no.

7.5.3.2 Requirements regarding the content of reference offers

565. In accordance with Section 4-6, first paragraph, of the Electronic Communications Act, Nkom may set requirements concerning the content and publication of reference offers for providers with significant market power in a relevant market.

566. The decision concerning Market 3a refers to how, for this wholesale market, certain requirements are made directly under the Electronic Communications Act and the Electronic Communications Regulation concerning the content of published reference offers. There are no equivalent transparency obligations as a direct consequence of the statutory and regulatory provisions for Market 3b. Since the competition issues justifying the order of transparency obligations in these two wholesale markets are primarily identical, Nkom believes that it is both necessary and proportional to impose the same requirements of the content of reference offers arising from statutory and regulatory provisions for Market 3a, as part of the transparency obligation in this Market 3b decision.

567. On this basis, Nkom requires that published reference offers in Market 3b must, among other things, include the following items, which for Market 3a follow directly from Section 2-5, first paragraph, of the Electronic Communications Regulation:

- a. information concerning infrastructure and associated facilities to which it is relevant to offer access
- b. information concerning location for where access pursuant to no. 1 can be offered
- c. technical conditions for access to and use of the fixed access network
- d. procedures for orders and performance
- e. information on restrictions of use
- f. terms of supply for full and shared access to fixed access networks, including:
 - i. delivery date
 - ii. compensation for failure to meet agreed delivery date

- iii. service level
- iv. fault handling procedures
- v. quality parameters
- vi. standard contractual terms
- vii. prices for each service, function, infrastructure or other items covered by the offer.

568. In addition, pursuant to Section 2-5, second paragraph, of the Electronic Communications Regulation, a provider with significant market power in Market 3a must publish information on the terms and conditions for access to information and support systems pursuant to Section 2-4 of the Electronic Communications Regulation. On the basis of the same grounds as above, Nkom imposes an equivalent obligation for Market 3b as part of this decision.

569. Regarding the duty of access to co-location, Section 2-6 of the Electronic Communications Regulation contains certain requirements of the information to be published in Market 3a. Nkom believes that it is necessary and proportional to impose the same requirements for information about co-location as are to be published in Market 3b. This means that the following information must be published:

- where co-location can be offered, and if practically possible, the free capacity
- which form of co-location can be offered, including:
 - a) physical co-location
 - b) co-location in close-lying structures
 - c) virtual co-location
- any restrictions on equipment which can be co-located
- security procedures
- access control procedures for representatives from competing providers
- security standards
- guidelines for the allocation of space if space is limited
- conditions for the contracting party's right to inspect the premises, if co-location is requested.

570. The decision in Market 3a shows that Nkom believes that in some areas there is a need to specify the requirement of the content of thereference offers beyond the terms of the aforementioned provisions in the Act and regulation for Market 3a, in order to ensure that the transparency obligation contributes to improving the efficiency of and ensuring compliance with the obligations concerning access and non-discrimination. Nkom believes, on the same

grounds, that equivalent specification is also necessary and proportional in this Market 3b decision.

571. On this basis, Nkom has found it necessary to make the following clarifications of the requirements regarding the content of reference offers in this decision:

1. The starting point for imposition of specific obligations is that Telenor has significant market power in the relevant market and can thus behave independently of competitors, customers and consumers to an appreciable extent. For regulation to function as intended, Nkom holds it is vital that it remedies the asymmetrical relative strength between Telenor and the external buyers of access by facilitating that the access agreements are of the type that could be expected to be found if the market was characterised by competition. This means that the reference offers should to a reasonable extent balance the respective interests of Telenor and buyers of access. Based on this, Nkom finds there is a need to specify that reference offers should not include terms and conditions that are unreasonable, cf. Section 7.2.12 where Nkom concluded that Telenor shall be prohibited to set unreasonable requirements or use unreasonable terms in contract in connection with accommodating a reasonable request for access. Therefore, Nkom imposes on Telenor a general obligation not to set unreasonable terms in its reference offers.
2. An unconditional right for Telenor to unilaterally implement changes to the company's reference offers will, in Nkom's opinion, be liable to create clear unpredictability for an access buyer in comparison with Telenor's internal retail business. In Nkom's view, such commercial uncertainty is to be deemed an expense the buyer of access will have to take into consideration when it will price its services in competition with Telenor. Since corresponding unpredictability does not apply for Telenor, Nkom finds that such a provision is liable to restrict the access buyer's opportunity to compete with Telenor on equal terms and thereby favours Telenor's own retail business. Nkom is therefore of the opinion that provisions that grant Telenor unconditional and one-sided permission to make changes are unreasonable and discriminating contract terms. Nkom refers to the discussion in Section 7.4.5.
3. Reference offers shall include detailed, clear descriptions of all the wholesale products that Telenor is required to provide access to in accordance with this decision, with the corresponding price list for all the access products in this wholesale market.
4. As regards the technical conditions for access to and use of wholesale products in this market, the reference offer must contain, among other things, technical specifications for possible interconnection points in the network. In addition, Telenor, as part of the reference offer in Market 3b, must provide access buyers with information about equipment that can be used in the network, including end-user equipment in connection with the upcoming modernisation of the copper network. Through its ownership of the

copper network, Telenor will have better insight than access buyers into which end-user equipment is compatible with Telenor's network equipment. This could provide Telenor with an advantage by the company being in a better position to plan procurement of end-user equipment compatible with vectoring and/or G.fast in Telenor's copper network than access buyers that do not have this knowledge. In order to ensure that Telenor and access buyers can compete in the retail market on an equal footing, Nkom therefore finds it necessary to impose on Telenor an obligation to prepare and publish a list ("vectoring whitelist") of end-user equipment that is compatible with vectoring and/or G.fast in Telenor's copper network. The list must, at a minimum, include all relevant equipment that Telenor uses, plans to use, or that Telenor in some other way knows is compatible with Telenor's own network equipment, linked to the upgrading of the copper network. The list must be up-to-date at all times and take into account relevant technological developments.

5. Information on special terms and conditions for access to co-location must be stated in the reference offer, including information about options for co-location at different locations, which equipment can be co-located, the rules for allocation of space if there is limited co-location space, access rules, and safety and security requirements, etc.
6. Ordering procedures for all wholesale products included in the obligation of access in accordance with this decision must be included in reference offers, as must payment terms, including invoicing procedures.
7. Reference offers must also include terms and conditions and procedures for:
 - Deliveries, with appurtenant service level agreements (SLA)
 - Fault correction, with appurtenant service level agreements (SLA)
 - Migration, with appurtenant service level agreements (SLA)
 - Compensation arrangements in the form of service level guarantees (SLGs) for failure to provide the agreed service levels. Nkom specifies that Telenor must provide reasonable compensation on any deviation from both the agreed quality level and agreed delivery times in SLAs.

See Section 7.2.12 for a more detailed description of the requirements regarding SLAs and SLGs in this decision.

8. In addition, reference offers must include provisions on:
 - Agreement period, renegotiation and termination
 - Price negotiations during the agreement period
 - Consequences of any breach of agreement
 - Dispute resolution arrangements

9. Any requirements in Telenor's reference offers regarding provision of security should be proportionate. Nkom would specify that this entails that Telenor cannot set requirements regarding provision of security beyond the commercial risk the company is subjected to by providing the specific access. In Nkom's view, terms requiring a company requesting co-location to both pay in advance for leasing and provide bank guarantees will not normally be a proportionate requirement.
10. Reference offers must include the guidelines and terms and conditions for coexistence in the network that ensure that, for example, the agreed quality level is maintained.
11. Reference offers must contain dates showing when the offer was last modified and dates for any other changes within the current decision period.

7.5.3.3 Process in connection with preparation of and major changes to reference offers

572. Agreements on access in this relevant market will largely conform to Telenor's reference offers. Reference offers thus play a central role in that in practice they almost exhaustively define the terms and conditions of the access agreements. For this reason, it is especially important that, in the event of preparation of new reference offers and in connection with major changes to Telenor's existing reference offers, transparent processes are employed whereby access buyers are involved and their needs are taken into account before major changes of this kind are implemented. In this context, major changes are changes that might substantially affect the access buyers' investments and/or choice of business model, which the access buyers have made based on Telenor's current reference offers for access in this wholesale market. Changes to the reference offers that reduce access buyers' right to get faults in the network repaired by Telenor on Telenor's account, cf. Section 7.5.5.3, will also be considered a major change that means that Telenor must involve access buyers.

573. Nkom finds it appropriate that, in connection with any major changes to the reference offers, Telenor obtains feedback from the access buyers and involves the access buyers in the change process. In this context, Nkom finds that the Norwegian Broadband Forum, established in 2016, is a suitable forum for obtaining feedback. Nkom therefore holds that any major changes made to Telenor's reference offers should be discussed with the access buyers in the Broadband Forum a reasonable amount of time before any such major changes are implemented.

7.5.4 Access to specified information

574. In addition to the obligation to prepare and publish reference offers, Nkom holds it is necessary and proportionate to impose on Telenor an obligation to provide access to specified information as part of the transparency obligation in this decision.

575. As a starting point, the obligation to grant access to specified information applies to any information that is relevant and necessary in connection with access in this wholesale market

and that is not readily available by other means. The information must be transparent and provided in a manner that is appropriate for the purpose of the exchange of information. Telenor may not refuse to grant access to this kind of information on the grounds that the information in question has not been systematised in a way that can be forwarded to the access buyers.

576. Nkom would clarify that it is not a prerequisite for the obligation to grant access to specified information that Telenor's internal retail operations use the information provided, if the information can be regarded as necessary in order for access buyers to be able to take advantage of Telenor's obligation of access in the relevant wholesale market in an appropriate manner.

577. In the following Nkom has found it appropriate to define in more detail the obligation to provide specified information relating to two areas: namely information about Telenor's infrastructure covered by the obligation of access, and key performance indicators (KPIs).

7.5.4.1 Access to information about Telenor's infrastructure covered by the obligation of access

578. Telenor shall provide access buyers with the following information about the company's infrastructure covered by the obligation of access in this decision:

1. The geographical coverage of the current infrastructure, including information about where the infrastructure is located, based on location data.
2. Interconnection points where an access buyer can connect its equipment to Telenor's network.
3. Potential customer base for various locations in Telenor's access network, including homes passed in Telenor's fibre access network that are potential retail customers for access buyers based on access covered by the obligation of access in this decision (cf. Section 7.3.5).

579. Telenor may require the access buyer to enter into a security agreement with Nkom as a condition for the access buyer to be granted access to this kind of information about the company's infrastructure, if access to this type of information requires security clearance pursuant to the Security Act and the provider requesting the relevant information is not subject to the Security Act. Nkom refers to the assessments of this in Section 7.2.4.3.3 of the Market 3a decision. Nkom does not see any basis for this to be assessed differently in Market 3b.

7.5.4.2 Publication of key performance indicators (KPIs)

580. In the current decision in former Market 5 of 20 January 2014, Telenor was required to prepare and publish KPIs. This obligation was based on recommendations from BEREC, which, in addition to specifying which indicators should be included in the KPI requirements, also stressed the importance of preparing and publishing KPIs for both the wholesale

provider's internal retail operations and external buyers of access. This was considered important to make it possible for the external wholesale customers to assess whether there is any discrimination between different external access buyers, as well as between external access buyers and the wholesale provider's own retail operations.

581. With reference to the discussion above regarding KPIs as part of a holistic EoO regime for non-discrimination in Market 3b (cf. Section 7.4), Nkom finds there is also a need to impose on Telenor an obligation to prepare and publish KPIs as part of the obligation of transparency in Market 3b. Nkom considers it necessary that the obligation to publish KPIs is formulated so that it is possible to compare quality and service levels for Telenor's own retail operations and external buyers of access in this wholesale market. Nkom believes this is important in order to detect any discrimination between external and internal providers in the associated retail market and will therefore impose on Telenor an obligation to prepare two sets of KPIs in Market 3b.

582. Section 7.2.12 describes the correlation between requirements regarding SLAs and KPIs. It is clear from this description that the purpose of KPIs is to measure the quality level of the same key activities for which SLAs have been prepared in the reference offers for wholesale products covered by the obligation of access in Market 3b.

583. The Commission's Recommendation from 2013 states that KPIs are information that can enhance transparency with respect to deliveries and quality in the relevant markets. The Commission also points out in the Recommendation that KPIs should be related to key activities in the supply chain and cover the entire chain, including the ordering process, the delivery or provision of the service, quality parameters linked to fault management and fault repair times, and migration between different access products. This is also taken into account in the formulation of the obligation of SLAs (cf. Section 7.2.12).

584. In light of this, Nkom finds it necessary to impose on Telenor an obligation to prepare and publish KPIs for the following key activities:

- System access (uptime and response time)
- Deliveries
- Fault management and fault correction times
- Migration between different access products

585. KPIs for each of these key activities must be designed so that they are suitable to measure the degree of fulfilment of SLA goals for the same key activities set out in Telenor's reference offers for wholesale products in Market 3b.

586. To ensure that KPIs for the external wholesale provision and Telenor's internal use of the equivalent input factors are comparable, the bases for calculation must be comparable. It is therefore necessary that Telenor discloses which methods it uses to calculate the KPIs. If Telenor's own retail operations do not use the same products, systems, and/or processes as

the external buyers of access, the differences in the basis or method of calculation must be highlighted as part of the publication of KPIs. Nkom considers this necessary in order to detect any discrimination between external buyers of access and Telenor's own retail operations. If there are differences in the calculation basis and/or methods, it must be demonstrated that the calculation basis for the external and internal KPIs as a minimum relates to:

- The same calculation interval (that is, the number of days, weeks, or months)
- The same calculation period (i.e. week x or month y)
- Measurement of the corresponding level in the delivery process

587. In the current decision in former Market 5 of 20 January 2014, Telenor was required to publish KPIs on a monthly basis. Based on experience with monthly publication in recent years, Nkom finds it appropriate to change the publication frequency to quarterly for the coming decision period in Market 3b. This frequency will make the obligation less burdensome for Telenor and in Nkom's opinion will be sufficient to serve the purpose. A slightly lower publication frequency will also enable a more thorough analysis of the published data.

588. Telenor must notify Nkom each time it publishes the quarterly KPIs in Market 3b and at the same time send Nkom a brief account of Telenor's assessment of the relationship between the published KPIs and compliance with the obligation of non-discrimination in Market 3a. This notification and the description should be sent to avtaler@nkom.no and firmapost@nkom.no.

7.5.5 Obligation to give notice

7.5.5.1 Assessment of the need for an obligation to give notice

589. Discrimination based on factors other than price between Telenor's own retail operations and external buyers of access is a potential competition problem in the relevant market and may have major negative consequences for access buyers' ability to compete. The fact that Telenor's retail operations receive information about changes to existing infrastructure and establishment of new infrastructure earlier than external buyers of access is a potential source of this kind of discrimination. The same is true if Telenor's own retail operations receive more detailed information or information of better quality than access buyers. Both could give Telenor a clear advantage in that the company will be better and earlier able to make necessary adjustments to business models and strategies in the broadband market. It is therefore necessary to assess proportionate obligations to give notice in order to redress this competition problem.

590. Failure to provide sufficient advance notice of changes in prices or other terms and conditions is also a potential competition problem and could give Telenor an advantage in the competition in the retail market. It is therefore necessary to assess proportionate remedies to redress this competition problem.

591. The need to require notification of changes to the establishment price for “homes passed” is assessed above in Section 7.3.5.

592. Future technology and/or structural changes in Telenor’s access network might be of significance to access and other conditions governed by this decision. Nkom therefore believes that there is a need to require that Telenor notify such changes to Nkom.

7.5.5.2 Requirements regarding the notice period for changes to existing infrastructure

593. The challenges associated with the notification obligation have mainly been related to the previous Market 4. As referred to above in Section 1.1, Nkom assumes an updated market delineation. The updated market delineation is based on local and central access to fixed access networks.

594. As stated below, Nkom considers it appropriate to have more detailed and operational notification requirements. This is based on experience gained during the current regulatory period.

595. In Nkom’s assessment, the potential competition problems which indicate notification deadlines in Market 3a will also be applicable to Market 3b. Nkom therefore believes that Telenor’s notification obligation in Market 3b must be the same as in Market 3a. This applies irrespective of whether the assessments below are made on the basis of experience during the regulation of the former Market 4.

596. Experience from the current regulation period supports the view that failure to provide sufficient advance notice of changes to the copper access network is still a competition problem. If Telenor’s competitors do not obtain access to information on planned changes to the copper network at the same time as Telenor, this will also clearly constitute a breach of the obligation of non-discrimination. In Nkom’s opinion, experience from the current regulation period also suggests that it is appropriate to establish more detailed rules regarding notice in order to rationalise the obligation of non-discrimination.

597. The fact that access buyers do not receive information about changes in sufficient time or at the same time and with the same quality as Telenor’s own retail operations is a potential competition problem also in relation to fibre access networks. In the current regulation period, Nkom has been made aware that Telenor has made changes to its GPON-based fibre access network. The changes have been of such a nature that they might affect the profitability of access buyers that buy fibre-based broadband access. Nkom has not received any formal complaints about the changes, but regards this as a reason to assess the need to further specify the obligation to provide notice in connection with changes to Telenor’s fibre-based access network.

598. Who is to be notified and with which deadline will have to be decided on the basis of affected interests. The central interests in this assessment are, in Nkom’s opinion, Telenor’s interest in having control over its own access network, including predictability regarding its own

freedom of action in this regard, the access buyer's interest in predictability of investments made in connection with Telenor's access network, including predictability of the framework conditions for the provision of broadband in the retail market and the objective of achieving sustainable competition. In some areas, the interest of sustainable competition will overlap with the interests mentioned above.

599. The need for a notice period in connection with discontinuation of access is discussed in the Commission's NGA Recommendation:

"39. [...] NRAs should ensure that alternative operators are informed no less than 5 years, where appropriate taking into account national circumstances, before any decommissioning of points of interconnection such as the local loop exchange. This period may be less than 5 years if fully equivalent access is provided at the point of interconnection."

It follows from the quoted passage that the Commission acknowledges that the notice period may be made shorter on the basis of national circumstances and if access is offered that is fully equivalent to the decommissioned access.

600. The main reason for the current three-year notice period for the decommissioning of copper access lines or main connections is that access buyers that wish to invest in Telenor's copper access network need predictability to know that their investments will have a certain duration. At the same time, a longer notice period might preclude further development of the service offerings in the copper access network. The notice period pursuant to the current regulation is shorter than the five-year period recommended by the Commission in the NGA recommendation, as a result of two factors. One is that the notice period should not unnecessarily restrict Telenor's ability to further develop the copper access network, and the other is, as mentioned above, that the deadline was set in consultation with both Telenor and access buyers.

601. The issue of potential disadvantages for the further development of the service offering entailed by longer notice periods has come to the fore through new possibilities for upgrading copper-based access networks afforded by technologies such as vectoring and G.fast. Efficient use of these technologies requires that only one provider can control the upgraded copper accesses and provides grounds to consider imposing on the provider that has such control an obligation to offer access to external access seekers. In this connection, Nkom refers to Section 7.2.3 of the Market 3a decision.

602. In the event of a possible upgrade of the copper access network, participants in the Broadband Forum agreed that it is necessary to be able to perform the upgrade relatively quickly after the decision to upgrade is taken. This is necessary in order for it to be realistic to complete the upgrade. A long notice period in connection with upgrading the copper access network, for example 3 years, would be problematic. Although Nkom has not maintained the conclusion that there should be equal opportunities for Telenor and the access buyers to use

exclusionary technology in the copper network, Nkom believes that the need for short notice is still applicable in the event of a possible upgrade of the copper network under the responsibility of Telenor.

603. In the current regulation period, Telenor has expressed that the company would like to invest in an extensive upgrading of the copper access network and, more recently, that the company sees it as more appropriate to largely limit this upgrade to more rural areas. Telenor would prefer to invest in increasing its establishment of other infrastructure for high-capacity broadband, primarily fibre-based access networks. Nkom also understands that Telenor wants to avoid having parallel fixed access networks as far as is possible.

604. In the aftermath of the national consultation, Nkom has asked Telenor about the plans the company now has to upgrade the copper network. In its response, Telenor made reference to what the company has communicated in the market about mobile and fibre being its priority investment areas. However, Telenor could neither confirm nor deny the existence of concrete plans to upgrade the copper network. Accordingly, Nkom believes that changes to and decommissioning of copper access networks, with potential loss of existing access, will be a relevant issue in the lifecycle of this market decision.

605. Based on the above, Nkom finds it necessary to impose on Telenor an obligation to provide three years' notice of changes to its copper access network in cases where the company is going to make changes that result in the loss of accesses. Nkom would specify that the obligation to provide three years' notice only applies if Telenor makes changes that result in a loss of access that an access buyer is actually using, or where it can be demonstrated that an external access buyer has provided Telenor with information through Telenor's ordering systems that it is going to start using the access.

606. It seems less likely that Telenor will make changes to the fibre access network that will have the effect of discontinuation of access to the fibre accesses to which access has been given. In the event that this should nevertheless happen, the considerations that indicate that a three-year notice period is required (cf. the previous paragraph) will apply in full. Telenor must therefore, in the same way as for the copper access network, notify the access buyers of any changes to the fibre access network that will result in the access buyer no longer being able to use accesses currently in use by the access buyer.

607. Upgrades or other changes to the access network that result in loss of a granted access, but where the access is replaced by another kind of access, may also entail disadvantages for access buyers because the change will reduce predictability for the access buyer. This implies that in these kinds of cases too, access buyers should be entitled to receive reasonable advance notice of changes. However, the disadvantage for the access buyer is limited if a relevant replacement product is offered, and the replacement product is offered in sufficient time not to adversely affect the existing service production. In this case, the

disadvantage for the access buyer will be limited to perhaps not being able to make use of the investments in Telenor's infrastructure for as long as originally thought.

608. A balance must be struck between predictability for the access buyer in this area and Telenor's ability to exploit the access network to offer competitive broadband services in the retail market. It is also relevant to take into account the fact that the access buyer will also benefit from changes to the access network, as the changes will enable the access buyer to offer higher capacity to its end users, as long as Telenor provides the opportunity to offer broadband services in the upgraded network using a relevant replacement product.

609. In Section 7.2.5 of the Marked 3a decision Nkom has imposed on Telenor an obligation to meet all reasonable requests for local, virtual access to copper-based networks and expressed that this kind of access should be offered in those parts of Telenor's copper access network that are upgraded. In Nkom's opinion, the access product should be regarded as a relevant substitute product for the loss of physical access to Telenor's copper-based access network. An access buyer that uses access that lapses as a result of Telenor upgrading the copper access network will therefore be ensured an access product that meets the need for continuity in service production. In addition, Nkom refers to the fact that there was consensus among the participants in the Broadband Forum who expressed an interest in upgrading the copper access network that this kind of upgrade ought to be able to happen reasonably quickly once a development decision had been made.

610. In light of the assessments above, Nkom finds that a notice period of six months is sufficient in connection with Telenor upgrading and making other changes to the copper access network that cause access to be lost, as long as the access buyer is offered a relevant replacement product. In Nkom's opinion, a notice period of this duration will also be sufficient in connection with changes to fibre-based access networks that have the same impact on access. In cases where Telenor makes changes to access networks covered by access obligations that entail that access may be lost, Telenor may therefore give six months' notice, provided the access buyer is offered a relevant replacement product.

611. To be considered to be a relevant substitute product, it is necessary that this can be considered to belong to the same wholesale market as the product it is to replace. This entails, among other things, that the substitute product must provide the same opportunity to control different characteristics of the retail service as the product which lapses. The substitute product must thereby make it possible to continue existing retail services that use the product which lapses as an input factor. Nkom refers to the assessments in Section 2.4.4 of the market analysis concerning key characteristics of products in Market 3b.

612. Telenor will occasionally need to make systematic changes to its access networks. If these changes do not affect access products that are in use, it is reasonable that changes may be made with a shorter notice period. However, the fact that the changes do not affect access does not mean that the changes are of no significance at all to access buyers. In addition, the

fact that the changes have been planned supports the view that it will not be burdensome for Telenor to give access buyers slightly longer notice. On this basis, Nkom concludes that Telenor must provide notice of planned changes that do not affect the access granted with a three-month period of notice.

613. In some cases, there may be a need to make adjustments and adapt the access networks so quickly that a three-month notice period is disproportionate, even though this might have negative short-term effects on the access granted. These kinds of changes may be necessary for technical, maintenance or operational reasons and may be due to faults. These kinds of changes may be carried out with a shorter period of notice than three months. Nkom stresses that in these kinds of cases Telenor is not exempt from notifying access buyers about the change and that Telenor must notify with as long a notice period as possible based on the nature and impact of the relevant work. Furthermore, Telenor must be able to document on request that the work performed cannot be regarded as normal maintenance, but was necessary and justified in concrete events.

614. If Telenor makes changes to parts of the network covered by the obligation of access, but where there is no access buyer taking advantage of this access, Nkom finds there are grounds to conclude that no provider is significantly affected by the change. In line with Nkom's views expressed above, Nkom regards an access as in use if it can be demonstrated that an external access buyer has provided Telenor with information through Telenor's ordering systems that it is going to start using an access that will be affected by the change. The fact that at the time in question no-one is using the access that will be affected by a given change does not imply that the change is of no significance at all for the access buyers. For example, these kinds of changes could be of significance to the access buyer's planning for the future use of access. Nkom also holds that it is essential to ensure widespread knowledge of these kinds of changes to the access network that affect the scope of accesses covered by access requirements. Moreover, Nkom finds it difficult to see that Telenor might have a legitimate reason for making changes that affect the access covered by the obligation of access without providing some kind of notice to access buyers.

615. Nkom therefore concludes that Telenor must provide notice of changes to the access networks that will entail that the access buyer will no longer be able to make use of the obligation of access, even in cases where no access buyer is taking advantage of Telenor's obligation to grant access. One month's notice shall be given and can be given on Telenor's website, as long as the notice is easy to access. Telenor must also notify Nkom that notice has been given by sending an email to avtaler@nkom.no and firmapost@nkom.no.

616. For the record, Nkom would clarify that Telenor will be able to make changes with a shorter notice period than follows from this regulation, if Telenor has consent from providers that are entitled to receive notice pursuant to this decision. In this case, Telenor must be able to document that consent has been given.

617. It will be possible, in some cases, that Telenor must make changes to the access network due to circumstances beyond Telenor's control. Such changes might, for example, be mandatory orders from public authorities or landowners, and would make it difficult or impossible for Telenor to comply with the notification deadlines that are otherwise laid down in this decision. On the other hand, any circumstances beyond Telenor's control, will not reduce the access buyer's need for predictability. In such cases, too, there will thus be a need for the notification rules to, as far as possible, take account of the need for predictability for the access buyer.

618. On this basis, Nkom finds it necessary to grant Telenor an exemption from the notification rules in cases where changes in the access network are necessary due to conditions beyond Telenor's control. In such cases, Telenor will therefore be able to notify changes in the access networks entailing that access buyers will no longer be able to use the access obligation, with shorter notice than is otherwise provided by this decision. In such cases, the notification deadline must not be reduced by more than is justified by the conditions lying beyond Telenor's control.

619. In order for access buyers to receive notification as early as possible, Nkom believes that there is a need to make the requirement of Telenor that notification with a shorter notification time must be given without undue delay from when the conditions justifying the shorter notification time arise.

620. At the same time as access buyers are notified in accordance with the exemption concerning a shorter notification time, Telenor must document and justify to Nkom that the conditions for the exemption are fulfilled, including that notification with a shorter deadline is necessary, and that the notification time is not reduced by more than necessary in the specific case. The documentation must include information about the time when Telenor received information about the conditions justifying the exemption.

7.5.5.3 Telenor's fault correction policy

621. Telenor is required to provide access to the company's copper-based access network. Changes in the access network leading to a loss of the access which the access buyer has actually taken into use, or where it can be verified that an external access buyer has given Telenor information through Telenor's ordering systems that it is going to start using the access, must be notified in accordance with the notice periods stated in Section 7.5.5.2. Key considerations behind the notification obligation are the access buyers' need for predictable access and predictability for the investments in Telenor's network.

622. Telenor has a "fault correction policy" for the copper-based access network. Telenor's standard agreements include a provision that allows Telenor to demand that the access buyer terminate the access agreement with own end customers with immediate effect on "failure of

the telecom network that it is not technically or financially justifiable to rectify".³² Furthermore, Telenor will be able to terminate the access agreement with the access buyer with one month's notice when "... it is not commercially reasonable to correct the error".³³ These rights for Telenor are elaborated on in the fault correction policy, inter alia by setting upper cost limits for repairs. The content of the policy will therefore have a major impact on the extent of cases that can be terminated with short notice. By comparison, in accordance with Section 7.5.5.2 of this resolution, Telenor shall notify changes in the access network that lead to the loss of access which the access buyer has actually taken into use, 6 months and 3 years respectively. Accordingly, Nkom believes that the fault correction policy can intervene in the rights and obligations of this decision.

623. The policy states that if the fault correction has an estimated cost that exceeds the fixed cost limits for repairs "Telenor will seek to find alternative solutions", and furthermore that "if it is not possible to do this, Telenor will terminate the accesses concerned on the basis of applicable agreements". In cases where Telenor chooses to terminate an access in accordance with the fault correction policy, the policy provides for the access buyers and end-customers to be able to cover all costs of the fault correction. Nkom is not aware that access buyers who use this opportunity to maintain access achieve any timely warranty against the fact that the access once again can be notified terminated due to subsequent errors.

624. In more recent years Telenor has gradually reduced the cost limits for fault correction of single accesses. In 2015, for example, the cost limits for private customers was NOK 20,000 (for both telephony and broadband). This limit is now NOK 3,300³⁴ for telephony and NOK 8,500 for broadband. One consequence of the lower cost limits will be that relatively minor faults on the access lines could lead to termination of the accesses concerned.

625. The reduced cost limits for fault correction means that the fault correction policy can potentially have a significant practical impact on access. In this context, Nkom points out that the cost limits for fault correction could be further reduced and that there appears to be limited transparency related to Telenor's assessment of whether the cost limits are exceeded. Nkom therefore believes that there is a risk that the considerations, on which the notification rules are based on, will not be adequately addressed.

626. Nkom can see, however, that there may be good reasons to accept that Telenor has a fault correction policy for separate individual customer accesses. The copper access network is old and is gradually being replaced by new technology. It would therefore be unreasonable for Telenor to have to correct faults on individual accesses in the copper access network without taking the costs into consideration. Nkom therefore believes that it can be accepted that Telenor has a fault correction policy, provided if some requirements for the policy are set,

³² Cf. item 16.5 in the Operator Access Agreement

³³ Cf. item 16.6.3 in the Operator Access Agreement

³⁴ With effect from 1 December 2018, see <https://www.telenorwholesale.no/2018/09/endret-feilrettingspolicy-01-12-18/>

cf. below. Nkom makes the proviso, however, that this standpoint can be reconsidered if the fault correction policy and the exercising of the policy become too extensive in practice.

627. Nkom believes that it is unfortunate that the fault correction policy is determined outside the framework of the standard agreements. In order to ensure transparency and that the access buyers can be involved in changes to the policy, cf. Section 7.5.3.3, the policy must be included in the standard agreements for access in this wholesale market.

628. The policy must specify upper cost limits for fault correction of a single access line. To ensure non-discrimination, the cost framework must be the same for copper access lines where external access buyers have existing end-customer agreements as for copper access lines in which Telenor's own end-user activity has the customer relationship. The cost limits must not be set at an unreasonably low level. This implies that the cost must not be set at a level that could undermine the purpose of the notification obligations in Section 7.5.5.2. It further implies that the cost limits are to be set so that the amounts are high enough to cover the cost of rectifying faults that can be considered common or predictable.

629. The policy shall facilitate that the access buyers can request Telenor to document the basis for termination of the access line. This applies both to the cost calculation which is the basis for determining that the fault correction will exceed the cost limits and the assessment determining that it will not be possible to implement "alternative solutions". Replies to requests for such documentation must be given without undue delay.

630. The policy must include provisions regarding the access buyers' right to require reasonable compensation on the termination of the access line. If Telenor's end-user activity offers compensation to end-customers who lose the opportunity for copper-based broadband access because it is not deemed prudent to correct faults in order to maintain the current access line, Telenor will be obliged to offer access buyers compensation which gives the same opportunity as Telenor's own end-user activity to offer compensation to the end-user concerned.

631. In cases where Telenor offers its own end customers access to alternative infrastructure instead of the discontinued copper access line, such as the fibre network, Telenor must give the access buyers information on how any access buyers' customers can get access to alternative infrastructure, such as by purchasing an access product or through agreement-based access.

632. In cases where Telenor chooses to terminate the access concerned due to repair costs exceeding the limit, the policy must enable the access buyers to cover the costs that exceed the cost limit. The policy must furthermore include procedures for the access buyers themselves to be able to cover some of the costs of the fault correction. In such cases, the access buyer must have the right to have access to the relevant access line for a period that is at least in line with the access buyer's right after the notification obligations in Section 7.5.5.2.

633. In Section 7.5.3.3, Nkom has set requirements concerning the process in connection with preparation of, and major changes to, standard agreements. Since Nkom now requires the fault correction policy to be part of the standard agreement, the aforementioned requirements must also be applied in connection with future changes in the said policy.

7.5.5.4 Notification of changes in the establishment price for “homes passed”

634. In Section 7.3.5, Nkom concluded that it is necessary to set requirements for the notification of changes in the establishment price for “homes passed”.

635. Nkom believes that it may be appropriate to have the same notification deadline for changes in the establishment price as for changes in prices in general, cf. the deadline of two months set out in Section 4-6, first paragraph no. 5, of the Electronic Communications Act. Nkom believes that a deadline of two months will give the access buyers sufficient predictability with regard to the costs which must be expected for the establishment of drop cables to “homes passed”.

7.5.5.5 Requirements regarding the content of and other common requirements regarding notice of changes to existing infrastructure

636. In Section 7.4, Nkom has imposed on Telenor an obligation of non-discrimination. Telenor might have an incentive and the opportunity to notify the access buyer of a change using information that is of lower quality than the information Telenor gives to its own retail operations. In order to reduce the possibility of this kind of discrimination, Nkom finds there is a need to specify in greater detail the requirements regarding the content of the notice Telenor has an obligation to provide in accordance with this decision. This kind of specification will further help streamline the obligation to provide notice and, in Nkom’s opinion, may also help reduce potential conflicts between Telenor and access buyers linked to providing notice.

637. The obligation of non-discrimination entails that buyers of access should receive notification of any changes to Telenor’s copper access with the same quality and at the same time as Telenor notifies its own retail operations. In terms of the quality of the notice, this implies that the notice must as a minimum include information about:

1. Which existing accesses and, as applicable, other parts of Telenor’s network will be affected by the change.
2. All information related to the affected accesses and any other parts of Telenor’s network that is relevant and necessary for the access buyer to receive in order to be able to safeguard its interests on equal terms with Telenor’s retail operations. This includes information that is relevant and necessary both for the purchase of wholesale access and to operate existing end-user service offerings. The fact that Telenor’s retail operations will not be directly affected in a specific case does not curtail the requirements regarding Telenor’s notification pursuant to this section.
3. When the change will be started and when it will be completed.

638. With a view to ensuring clarity regarding the content of the obligation to give notice, Nkom finds it appropriate to specify more precisely the requirements regarding advance notice of changes that will result in a loss of access that is in use. In these kinds of cases, Telenor must as a minimum provide information about:

1. An offer of access to relevant replacement products.
2. A plan for any forced migration to the new replacement product.
3. Information about what types of equipment will be used at the point being upgraded and reference to compatible end-user equipment (see Section 7.5.3 on Telenor's reference offers).

639. For the record, Nkom would point out that the minimum requirements above do not imply any curtailment in Telenor's obligation to notify access buyers with the same quality as Telenor's own retail operations.

640. As regards the requirement that access buyers must receive notification at the same time as Telenor's own retail operations, Nkom will consider that the internal service provider has been notified of a given change at the latest at the time when the internal service provider, including parties representing this, has gained knowledge that a decision has been made to make a given change. Nkom will further deem that the access buyer has received notification on the day a notice that meets the requirements of this decision has been sent to the correct person at an access buyer that is entitled to receive notice pursuant to this decision, or has been communicated in some other way as prescribed in this decision. The access buyer is responsible for ensuring that Telenor is provided with correct and up-to-date information about whom the notice should be addressed to.

641. For the sake of clarity, Nkom would point out that provision of notice that does not meet the requirements in this decision or is not sent to the correct person will not be regarded as sent, with the effect that the notice period does not start running. It will nevertheless still be possible for Nkom to conclude, after a concrete assessment, that the notice is sufficient if the defect is regarded as minor and non-recurring. Nkom would further point out that the assessment of whether notice is regarded as having been sent applies in relation to the individual provider that is entitled to receive notice.

7.5.5.6 Changes in the matter notified

642. Telenor may have legitimate reasons for making changes compared with what has been notified before the period of notice expires. In principle, these kinds of changes may be to the access buyer's advantage or disadvantage. It may also be that the change benefits some access buyers, but creates problems for others. Changes in a notified matter may also create uncertainty regarding what is actually going to happen. This kind of uncertainty may weaken the access buyer's ability to make rational adaptations to the matter that has been notified and could thus weaken the access buyer's ability to compete.

643. To promote clarity regarding the access buyer's framework conditions, Nkom therefore finds it necessary to impose on Telenor an obligation to provide new notice, with the same deadline as the original notice, if Telenor changes a matter it has already notified it is going to change. Since it is not necessarily clear whether a change is to the advantage or disadvantage of all the affected access buyers and because it is not necessarily clear whether a change to a notified change will be an advantage or disadvantage, Nkom finds that the obligation to provide new notice must in principle apply in all cases of change in a notified change. The new notice should be given in the same format as the original notice. To ensure that this kind of obligation is not disproportionate compared with its purpose, Nkom finds that the obligation to provide new notice should nevertheless not apply to insignificant changes. To avoid any uncertainty, Nkom specifies that this is a narrow exception and that the clear main rule is still an obligation to provide new notice.

7.5.5.7 Relationship to Telenor's reference offers

644. The notification rules for changes to Telenor's copper access network differ somewhat from those in Nkom's decision from 2014 and are formulated slightly differently than in the aforementioned decision. In order to avoid confusion regarding the content of Telenor's obligation to give notice, Telenor must ensure that the reference offers draw the access buyers' attention in an appropriate manner to the requirements the company is subject to in respect of providing notice.

7.5.5.8 Extended notice period in connection with changes that entail a disadvantage

645. Failure to provide sufficient notice of changes in prices or other terms and conditions may also be a potential competition problem. One transparency obligation that might remedy this competition problem is to require that Telenor gives notice of these kinds of changes with sufficient time for affected access buyers to be able to reflect the change in their end-user agreements. Pursuant to Section 4-6, first paragraph, of the Electronic Communications Act (cf. fourth paragraph), Nkom may stipulate an extended notice period, if this is necessary.

646. Pursuant to Section 2-4, third paragraph, of the Electronic Communications Act, the notice period for changes in retail agreements is one month:

"Providers of public electronic communications services must notify end-users of changes to or termination of the agreement. Changes to or termination of the agreement may only enter into force a minimum of one month after the notification is sent to the end-user."

647. In order for providers that purchase access products from Telenor that are covered by this decision to have enough time to adapt their own terms and conditions to reflect changes to Telenor's products or terms and conditions, Nkom finds it necessary to expand the general obligation to give notice pursuant to Section 2-4, third paragraph, of the Electronic Communications Act. On the basis of this and pursuant to Section 4-6, first paragraph, of the

Electronic Communications Act (cf. fourth paragraph), Nkom will impose an obligation on Telenor to notify buyers of regulated access of any changes in existing services that are to the disadvantage of the other party to the agreement and/or its end users no later than two months before the change is implemented. Without an expanded obligation to give notice of this nature, buyers of regulated access would not have sufficient time to take account of the changes in their own retail agreements and at the same time discharge the general obligation to give notice to their own end users. Nkom finds that an expanded obligation to give notice is not disproportionately burdensome for Telenor.

648. An obligation is therefore imposed on Telenor to notify other providers of any changes to existing offers, including prices, delivery times, fault correction times and routines, functionality, quality, etc. that are to the disadvantage of other providers, and thereby also their end users, no later than two months prior to implementation of the change. In order for the obligation to be sufficiently effective, Nkom finds it is sufficient that the change is to the disadvantage of *some* of the access buyers or their end users for the change to be regarded as triggering an extended notice period. By changes that entail a disadvantage, Nkom means changes that would normally be perceived as a burden for the wholesale customer and/or their end users, such as price increases, longer delivery times, lower quality, restrictions in the service, etc.

649. To avoid any misunderstanding, Nkom would clarify that price reductions and other changes that are to the advantage of the access buyer and/or its end users are not subject to the extended notice period requirement. These kinds of changes may therefore take effect immediately.

7.5.5.9 Notification of technology changes and changes in IT systems and supply chains to Nkom

650. Telenor's choice of technology and network structure could be of very great importance for the type of access that can be offered to remote access applicants and for the development necessary to offer the relevant access. The choice of technology and network structure might thus affect the opportunity for remote access buyers that use Telenor's infrastructure to compete effectively in the end-user market.

651. The costs related to offering a certain type of access will furthermore be included in Nkom's assessment of the proportionality of imposing a given type of access. Major costs associated with offering a certain type of access will, in isolated terms, indicate that it is not proportional to impose the relevant access. On assessing the proportionality of imposing access, it will also be relevant to consider which alternatives Telenor has to choose solutions that limit the costs associated with offering remote access. To the extent that Telenor chooses solutions which entail that the relative costs of offering access are high, it could still be proportional to impose access.

652. On this basis, Nkom believes that there is a need for Telenor to notify Nkom of technology changes that might affect the opportunity to offer access to remote access buyers, cf. Section 7.5.5.1. One example of such a technology change is to upgrade the copper access network with excluding technology.

653. In Section 7.4.3, based on a cost/benefit analysis, Nkom has concluded that it is not proportionate to impose non-discrimination based on EoI in Market 3b. This entails that Telenor can continue to use different systems and processes for deliveries to internal retail activities and sales to remote access buyers (EoO), respectively. However, the systems and processes used by remote access buyers must have the same degree of reliability, functionality, and quality/performance as the systems and processes used by Telenor's internal retail activity.

654. Nkom also acknowledges the Commission's point of departure that EoI is the most effective approach to ensuring non-discrimination. Telenor's choice of IT systems and supply chains might have great significance for whether the access buyers can compete on non-discriminatory terms compared to Telenor's own retail activity, and for the possibility of ensuring non-discrimination through EoI.

655. On this basis, Nkom believes that there is a need for Telenor to notify Nkom of major changes in IT systems and supply chains. Any such notification obligation will give Nkom a basis to assess the effect of new or changed system solutions on non-discrimination requirements and, in Nkom's assessment, will be appropriate to support development towards systems common to Telenor and remote access buyers, and thereby EoI in more areas. In the same way as expressed by Nkom above in relation to technology changes, the development of changed IT systems and supply chains could be of significance to Nkom's assessment of the proportionality of setting non-discrimination requirements in the form of EoI.

656. In light of the fact that the two conditions named above could be of great significance to obligations and rights under this decision, it is of central importance that Nkom receives early notification of technology changes and major changes in IT systems and supply chains. With early notification, Nkom aims at a time which precedes Telenor's key choices that are of significance to the access that Telenor can offer remote access buyers, including with which functionality and in which systems access can be offered. The nature of any such changes would vary, and it is therefore difficult to set an absolute deadline for such notice. Nkom therefore requires Telenor to notify Nkom of technology changes and major changes in IT systems and supply chains as early as possible. In view of the fact that Telenor's assessments of wholesale customers' needs in the event of technology changes and changes in IT systems and supply chains might affect Nkom's proportionality assessments, Telenor itself also has an interest in such changes being notified at an early stage.

657. In Nkom's assessment, an obligation for Telenor to notify technology changes and changes in IT systems and supply chains cannot be deemed to be particularly onerous.

7.5.6 Proportionality

658. Nkom finds it is necessary to impose on Telenor obligations of transparency related to the obligation to prepare and publish reference offers, access to specified information and notice requirements in order to rationalise the obligation of access and the obligation of non-discrimination in Market 3b. Nkom finds that the above-mentioned transparency obligations are suitable to remedy potential competition problems in this wholesale market and considers that the benefits of these transparency commitments far exceed the inconvenience the obligations entail for Telenor.

659. In the formulation of the transparency obligations, Nkom has attached importance to striking a balance between the access buyers' needs for information and predictability in order to be able to compete on equal terms with Telenor's own retail operations in the downstream market, on the one hand, and the principle of minimum regulation, such that the obligations are not more invasive than the purpose requires, on the other. Nkom holds that the obligations entailed by the obligation to prepare and publish reference offers, the obligation to grant access to specified information and obligation to give notice are designed such that they preserve this balance.

660. Nkom has found it appropriate to specify the transparency obligations in Market 3b in greater detail than in the current decision in former Market 5. Nkom holds that these clarifications are necessary to ensure compliance with the imposed obligations of access and non-discrimination. In Nkom's opinion, the competition-promoting effect of these specifications cannot be achieved in a less invasive manner.

661. Regarding the obligation to publish reference offers, Nkom believes that it is important that the imposed obligation includes requirements relating to the preparation and publication of reference offers, requirements regarding the content of reference offers, and requirements on transparent processes in connection with the preparation of and major changes to reference offers. This could help simplify and expedite negotiations in connection with the conclusion and amendment of access agreements, and make it easier to monitor compliance with the obligations of accessibility and non-discrimination.

662. The obligation to prepare and publish KPIs is part of a holistic EoO regime for non-discrimination in Market 3b (cf. Section 7.4). Nkom finds it proportionate to set requirements that ensure that the obligation to publish KPIs provides a basis for comparing quality and service levels provided to Telenor's own retail operations and external buyers of access respectively. This is important in order to detect any discrimination between external and internal providers in the associated retail market.

663. In respect of access to specified information about Telenor's infrastructure covered by the obligation of access, Nkom finds that the content of the obligation is necessary to ensure that external access buyers can compete on equal terms with Telenor's own retail operations in the downstream market. At the same time, Nkom finds that this obligation takes into account

Telenor's security needs in that access buyers may be required to enter into a security agreement as a condition for the access buyer to be granted access to this kind of information about the company's infrastructure, to the extent that access to this type of information requires security clearance pursuant to the Security Act and the provider requesting the relevant information is not subject to the Security Act.

664. The transparency obligation's requirements regarding provision of notice are deemed necessary to prevent discrimination between Telenor's own retail operations and external buyers of access. Nkom holds it is important to ensure that Telenor's own retail operations do not receive information about changes to existing infrastructure and establishment of new infrastructure earlier than external buyers of access. It is also important to ensure that Telenor's own retail operations do not receive more detailed information or information of better quality than access buyers. In addition, Nkom finds that the requirements regarding notification are necessary to ensure access buyers have the same opportunities as Telenor's own retail operations to make adjustments to their business models and strategies in the broadband market.

665. In light of this, Nkom concludes that the above-mentioned transparency obligations are proportionate.

7.5.7 Special obligations relating to publication and reference offers

666. Nkom refers to the aforementioned assessments concerning which special obligations relating to publication and reference offers must be imposed on Telenor in Market 3b. The special obligations imposed on Telenor ASA (in the remainder of the chapter referred to as Telenor) are stated in this chapter.

667. Pursuant to Section 4-6, first paragraph, of the Electronic Communications Act, Nkom requires Telenor to prepare and publish reference offers and accompanying standard agreements for the wholesale products covered by the access obligation pursuant to this decision, cf. Section 7.5.3.1. The reference offer must include the aforementioned wholesale products, access to backhaul services, co-location, information and support systems and other relevant services requested in connection with the access to Telenor's access network. Publication of reference offers with appurtenant standard agreements on Telenor's website is considered to be a satisfactory form of publication, cf. Section 4-6, fourth paragraph, of the Electronic Communications Act.

668. Pursuant to Section 4-6, first paragraph, of the Electronic Communications Act, Nkom requires Telenor to break down the reference offer sufficiently so that the access requester does not pay for services, functions or benefits that are not requested.

669. Pursuant to Section 4-6, first paragraph, and Section 4-7, first paragraph, of the Electronic Communications Act, Nkom requires Telenor to draw up a reference offer with the content stated in Section 2-5 of the Electronic Communications Regulation and the specifications stated in Sections 7.5.3.2 and 7.5.5.3.

670. Pursuant to Section 4-6, first paragraph, of the Electronic Communications Act, Nkom requires Telenor to publish information on the terms of access to information and support systems, cf. Section 2-5, second paragraph, of the Electronic Communications Regulation.

671. Pursuant to Sections 4-6 and 4-7 of the Electronic Communications Act, Nkom requires Telenor to conduct transparent processes involving access buyers and taking account of the access buyers' needs in the preparation of new standard agreements, as well as on major changes in standard agreements, in line with Section 7.5.3.3.

672. Pursuant to Section 4-6 of the Electronic Communications Act, Nkom requires Telenor to publish on the company's website updated reference agreements that comply with the requirements of this decision, and within 3 months of the entry into force of this decision.

673. Pursuant to Section 10-3 of the Electronic Communications Act, at the same time as publication Nkom requires Telenor to send the updated reference agreements to Nkom at avtaler@nkom.no and firmapost@nkom.no.

674. Pursuant to Section 4-4, eighth paragraph, of the Electronic Communications Act, Nkom requires Telenor to provide access to information on Telenor's infrastructure that is subject to the access obligation, in line with Section 7.5.4.1. Among other things, access must be granted to geographical coverage information for the relevant infrastructure, connection points and potential customer base for various locations in Telenor's network. Telenor may require the access buyer to enter into a security agreement with Nkom as a condition for the access buyer to be granted access to this kind of information about the company's infrastructure, if access to this type of information requires security clearance pursuant to the Security Act and the provider requesting the relevant information is not subject to the Security Act.

675. Pursuant to Section 4-6, first paragraph, of the Electronic Communications Act, Nkom requires Telenor to make the information in accordance with Section 7.5.4.1 available to the access seeker. The information must be updated at all times. With regard to information concerning the potential customer base for densification sales, these must include the same establishment price as Telenor's own retail activity may face at any time. Other conditions attached to the establishment price are set out in Section 7.3.5.

676. Pursuant to Section 4-6, first paragraph no. 5, of the Electronic Communications Act, Nkom requires Telenor to publish key performance indicators (KPIs) for the key activities of system access, deliveries, error handling, and error correction times, and migration between various different access products, cf. Section 7.5.4.2. Telenor will ensure comparable KPIs for external and internal activities, among other things by publishing the calculation basis/methods applied by Telenor to the KPIs, in line with Section 7.5.4.2. The KPIs will be published quarterly, as from and including January 2019. The KPIs must be published no later than within 15 days of the end of the quarter.

677. Pursuant to Section 10-3 of the Electronic Communications Act, Nkom requires Telenor to notify Nkom each time it publishes the quarterly KPIs and at the same time to send Nkom a brief account of Telenor's assessment of the relationship between the published KPIs and compliance with the non-discrimination obligation in Market 3a, cf. Section 7.5.4.2.

678. Pursuant to Section 4-6, first paragraph no. 5, and Section 4-7 of the Electronic Communications Act, Nkom requires Telenor to give 3 years' notice of changes in its access network in cases where the company is making changes that result in the loss of accesses, cf. Section 7.5.5.2. If Telenor in such cases offers the access buyer a relevant replacement product, 6 months' notice will be sufficient.

679. Pursuant to Section 4-6, first paragraph no. 5, and Section 4-7 of the Electronic Communications Act, Nkom requires Telenor to give 3 months' notice of changes in the access network that do not affect the access provided, cf. Section 7.5.5.2. This applies with the exception of changes that it is necessary to implement more quickly, due to technical, maintenance-related or operational conditions. In such cases, Telenor will notify access buyers with as long a deadline as possible, based on the nature and effect of the relevant work. Furthermore, on request Telenor must be able to document that the work performed cannot be regarded as planned maintenance, but was necessary on objective and concrete grounds.

680. Pursuant to Section 4-6, first paragraph no. 5, and Section 4-7 of the Electronic Communications Act, Nkom requires Telenor to give one month's notice of changes if Telenor makes changes to the access network subject to the access obligation, but where no access buyer makes use of the access opportunity. This notice can be given on Telenor's website, provided that the notice is easily accessible. Telenor must also notify Nkom at avtaler@nkom.no and firmapost@nkom.no that such notice has been made available.

681. Telenor will be able to make changes with a shorter notice period than the aforementioned, if Telenor has consent from providers that are entitled to receive notice pursuant to this decision. In this case, Telenor must be able to document that consent has been given.

682. Telenor may make changes with shorter notification deadlines than are provided for above, on the basis of circumstances beyond Telenor's control. At the same time as access buyers are notified in accordance with the exemption concerning a shorter notification time for conditions beyond Telenor's control, Telenor must document and justify to Nkom that the conditions for the exemption are fulfilled, in line with Section 7.5.5.2. Telenor must send the documentation and justification to Nkom at avtaler@nkom.no and firmapost@nkom.no.

683. Pursuant to Section 4-6, first paragraph no. 5, and Section 4-7 of the Electronic Communications Act, Nkom requires Telenor to draw up notifications of changes to existing infrastructure in accordance with the minimum requirement in Section 7.5.5.5.

684. Pursuant to Section 4-6, first paragraph no. 5, and Section 4-7 of the Electronic Communications Act, Nkom requires Telenor to notify changes in the notice given, in line with Section 7.5.5.6.

685. Pursuant to Section 4-6, first paragraph no. 5, of the Electronic Communications Act, Nkom requires Telenor to ensure that the reference agreements draw the access buyers' attention in an appropriate manner to the requirements the company is subject to in respect of providing notice, in line with Section 7.5.5.7.

686. Pursuant to Section 4-6, first paragraph no. 5, of the Electronic Communications Act, Nkom requires Telenor to give notice of any changes in prices or other terms to the disadvantage of the access buyers, including for their end users, no later than two months before the change is made, in line with Section 7.5.5.8.

687. Pursuant to Section 4-6, first paragraph no. 5, of the Electronic Communications Act, Nkom requires Telenor to notify changes in the establishment price for "homes passed" no later than two months before the change is made, in line with Section 7.5.5.4.

688. Pursuant to Section 10-3 of the Electronic Communications Act, Nkom requires Telenor to notify technology changes and major changes in IT systems and supply chains to Nkom as early as possible, in line with Section 7.5.5.9.

7.6 Accounting separation

7.6.1 Regulatory basis

689. Section 4-8 of the Electronic Communications Act has provisions regarding accounting separation. The first paragraph reads:

"The Authority may order a provider with significant market power to put in place accounting separation between different business areas or between specified activities connected to interconnection and access."

690. In addition, Section 4-8, fifth paragraph, of the Electronic Communications Act further indicates that the Authority may impose obligations on the accounting methods and principles to be applied, while the sixth paragraph stipulates that providers must make accounting information available upon request.

691. Annex 1 of the NGA Recommendation states:

"In order to enforce cost-orientation obligations, NRAs should impose accounting separation pursuant to Article 11 of Directive 2002/19/EC. Separated accounts for the NGA infrastructure and/or service elements to which access is mandated should be set up in such a manner that the NRA can (i) identify the cost of all relevant assets for the determination of access prices (including depreciation and valuation changes) and (ii) monitor effectively whether the SMP operator grants access under the same conditions

and prices to other market participants as to its own downstream arm. Such monitoring should include the performance of margin-squeeze tests. Costs should be allocated on the basis of objective criteria amongst the various wholesale and retail products which rely on such inputs, to avoid double counting.”

692. For several years, Nkom has assumed that the main purpose of accounting separation is to monitor compliance with an obligation of non-discrimination. Nkom has also assumed that the main purpose of cost accounting will usually be monitoring compliance with an obligation of cost-oriented prices. There are a number of similarities between accounting separation and cost accounting, but also some differences, which are discussed in Nkom’s remedies document.

7.6.2 Assessment of the need to impose an obligation of accounting separation for central access to Telenor’s copper-based access network in the form of Broadband access

693. Accounting separation can help identify and highlight any discrimination between Telenor’s external wholesale customers and Telenor’s internal operations. However, this is an issue that can also normally be remedied through various forms of price controls, possibly in combination with cost accounting. Nkom has concluded that it will be necessary and proportionate to impose an obligation concerning price controls and cost-oriented prices for Broadband access in Telenor’s copper-based access network, in addition to cost accounting.

694. Since Broadband access is subject to price regulation, an obligation of non-discrimination for this kind of access will not be the only remedy aimed at Telenor’s prices. Nkom is aware that price controls do not guarantee that Telenor will not still be able to discriminate on price. However, as mentioned, in Nkom’s view the price obligation will have a dampening effect on Telenor’s incentives to discriminate on price. In addition, the obligation of transparency is being maintained, which will help promote compliance with the obligation of non-discrimination. The imposed price obligation in the form of a price cap and cost-oriented prices is also a strict form of price regulation, rendering an obligation of accounting separation unnecessary.

695. In light of this, Nkom has concluded that there is no need to impose an obligation of accounting separation for central access to Telenor’s copper-based access network in the form of Broadband access.

7.6.3 Assessment of the need to impose an obligation of accounting separation for central access in Telenor’s copper-based access network in the form of VUA copper

696. As mentioned above, accounting separation can help identify and highlight any discrimination between Telenor’s external wholesale customers and Telenor’s internal operations. However, this is an issue that can also normally be remedied through various forms of price controls, possibly in combination with cost accounting. Nkom has concluded that

Telenor is to have price controls imposed in the form of a margin squeeze test on a portfolio of all the retail products, in areas where Telenor offers VUA copper.

697. Since VUA copper is going to be subject to price controls in the form of a margin squeeze test where all Telenor's retail products are included, an obligation of non-discrimination for this kind of access will not be the only remedy targeting Telenor's prices. Nkom is aware that price controls do not guarantee that Telenor will not still be able to discriminate on price. However, as mentioned, in Nkom's view the price obligation will have a dampening effect on Telenor's incentives to discriminate on price.

698. On this basis, Nkom has concluded that it is neither necessary nor proportionate to impose an obligation of accounting separation for VUA copper.

7.6.4 Assessment of the need to impose an obligation of accounting separation for central access in Telenor's fibre network (VUA fibre)

699. As already mentioned, accounting separation can help identify and highlight any discrimination between Telenor's external wholesale customers and Telenor's internal operations. However, this is an issue that can also normally be remedied through price controls. Nkom has concluded that Telenor is to have price controls imposed for VUA fibre in the form of a margin squeeze test for the commercially most attractive products in the retail market (flagship products). However, as some of Telenor's products in the retail market are not necessarily included in the margin squeeze test, Nkom nevertheless finds it necessary to impose an obligation of accounting separation for VUA fibre, in order to monitor compliance with the obligation of non-discrimination. This kind of accounting separation will apply to Telenor's fibre-based products in the retail market.

700. The purpose of accounting separation is to clarify whether access buyers can operate in the retail market for fibre-based broadband with a positive result based on the current access prices, given that they are equally efficient in their operations as Telenor.

7.6.5 Accounting separation for central access in Telenor's fibre network (VUA fibre)

701. In Nkom's opinion, it will be most appropriate to impose accounting separation for VUA fibre by dividing Telenor's value chain linked to VUA fibre up into wholesale operations and retail operations. Accounting separation shall show Telenor's income and expenses in its fibre-based retail operations if the retail operations had to purchase VUA fibre from Telenor at the same rates as external wholesale customers. Accounting separation must be based on fully allocated historical costs. In general, the individual items in the accounts ought to include the elements specified in Section 7.6.7 below.

702. This kind of accounting separation will make it easier to monitor compliance with the obligation of non-discrimination regarding prices between Telenor's own fibre operations and buyers of VUA fibre.

703. The system and principles for accounting separation must be sufficiently documented to allow verification. The documentation must include an overview of what cost categories have been allocated to the fibre-based retail operations, as well as the prices and volumes related to the purchase of local, physical access to Telenor's fibre network.

704. The accounting distinction will be a supplement to the margin squeeze test imposed for VUA fibre (cf. Section 7.3).

7.6.6 Proportionality

705. In Nkom's opinion, it will not be particularly burdensome to establish accounting separation for VUA fibre in accordance with the principles outlined in Section 7.6.7; furthermore the obligation is appropriate in that it meets Nkom's needs to be able to monitor compliance with the obligation of non-discrimination and enables rapid, effective intervention as and when necessary.

706. Through Nkom's decision in former Market 5, Telenor had an obligation imposed to establish accounting separation for fibre-based broadband access, which corresponds to VUA fibre in Market 3b, and has therefore already established a system for this.

707. Although a system for accounting separation has already been established, there will be some resource usage related to the preparation of each report, and Nkom has therefore assessed the need for such reporting thoroughly for each individual wholesale product. Nkom finds that Telenor's resource input required to prepare reports based on accounting separation for VUA fibre will be fairly small, relative to the benefits it will yield.

708. Against this backdrop, Nkom believes that an obligation for Telenor to report accounting separation in line with the description in this decision is proportionate.

7.6.7 Special obligations related to accounting separation

709. Nkom refers to the aforementioned assessments concerning which special obligations associated with accounting separation must be imposed on Telenor in Market 3b. The special obligations imposed on Telenor ASA (in the remainder of the chapter referred to as Telenor) are stated in this chapter.

710. Pursuant to Section 4-8, first paragraph, of the Electronic Communications Act, Nkom requires Telenor to prepare accounting separation for central access to fibre-based access networks (VUA fibre), in line with Section 7.6.5. The accounting separation will provide a basis for verifying that the prohibition of price discrimination towards external buyers of central access to Telenor's fibre network is complied with, cf. Section 4-7, second paragraph, of the Electronic Communications Act.

711. Pursuant to Section 4-8, fifth paragraph, of the Electronic Communications Act, Nkom requires Telenor to divide the value chain into wholesale activities and retail activities, and to show Telenor's income and expenses in its fibre-based retail activities if Telenor's retail

activities had to purchase VUA fibre from Telenor's wholesale activity at the same prices as external wholesale customers.

712. Pursuant to Section 4-8, fifth paragraph, of the Electronic Communications Act, Nkom requires Telenor to base the accounting separation for VUA fibre on fully distributed historical costs, on the basis of Telenor's financial accounts. All the items must be distributed between the residential segment and the business segment based on relevant statistics on the delivered technology. Below are the principles for the preparation of the financial statement for Telenor's retail operations and the auditing principles:

- **Revenue** shall include all relevant revenues from services invoiced to Telenor's retail customers delivered via fibre-based broadband. In general, revenue figures should be taken directly from the financial statement, but may under special circumstances be collated with data from, for example, invoicing systems. The revenues must be reconcilable against the financial statements. The revenues from the retail market must be allocated to the relevant wholesale products.
- **The costs of the wholesale operations** shall include the costs that Telenor's retail operations would have paid to Telenor's wholesale operations if there was a reference offer between them for VUA fibre. The wholesale operations' costs should be calculated by summing up the set-up and subscription volumes for VUA fibre and the associated trunk products required to produce the retail products, multiplied by the standard list prices. If standard list prices have been changed during the current period, a weighted average price shall be used. It must be shown how the wholesale operations' costs have been calculated, including a specification of which wholesale products have been included and the relevant prices, volumes and discount rates³⁵.
- **External cost of sales** shall include costs related to inputs that are bought from others and that are included in the production of the services linked to the relevant retail revenues specified above. This item must be specified.
- **The retail operations' internal costs** shall encompass all costs incurred by the retail operations in order to enable the sale and provision of the service linked to the relevant retail revenues specified above. Typical activities and processes will include sales, marketing, customer services, invoicing, operation of service platforms, operation of IT systems and relevant support systems, financial management, administration, etc. Internal costs are to be allocated according to the activity-based costing (ABC) method. Remaining costs shall be split proportionately based on costs already recorded.

The principles for allocating costs between the wholesale and the retail operations must be described and explained in the first report. Any changes in the principles for

³⁵ The discount rates must not exceed the highest volume discount offered to an access buyer, in line with paragraph (19) of the Commission's Recommendation on consistent non-discrimination obligations and costing methodologies of 11 September 2013.

allocating costs between the wholesale and the retail operations must be described and explained in the report for the period in question. It follows from the principle of fully allocated costs that the internal costs should include a reasonable share of the common costs, including corporate overheads. The retail operations' internal costs should be specified for all major cost categories.

- **Imputed interest rate** shall be included in the accounting statement in order to factor in a reasonable return on the investments included in the retail operations. Capital employed related to equipment used by both the wholesale and the retail operations must be allocated according to the activity-based costing (ABC) method. Remaining capital employed is to be allocated as already allocated capital employed.

Telenor shall use the imputed interest rate defined in Nkom's current decision for imputed interest rate for the fixed network markets.

713. Pursuant to Section 4-8 of the Electronic Communications Act, Nkom requires Telenor to publish a description of the system for accounting separation, including an overview of cost categories and the distribution keys used.

714. Pursuant to Section 4-8, cf. Section 10-3, of the Electronic Communications Act, Nkom requires Telenor to submit accounting separation reports for VUA fibre to Nkom for each year before 1 July of the following year. The first report will be for the 2019 financial year and must be sent to Nkom before 1 July 2020.

7.7 Assessment of the overall impact of the remedies

715. Above, Nkom has made an individual assessment of the proportionality of each of the obligations imposed. Hereafter, Nkom will assess the proportionality of the use of the remedies on an overall basis.

716. On the basis of the market analysis and the competition problems identified in the relevant market, Nkom has assessed which obligations will be best suited to rectify actual and potential competition problems. Nkom believes that the obligations imposed are suitable for the purpose, which is to facilitate sustainable competition.

717. In Nkom's assessment, a relatively comprehensive and detailed regulation of Telenor in Market 3b is necessary in several areas. In Nkom's assessment, the obligations are necessary in order to promote adequate competition intensity in downstream markets which use products in this market as an input factor. Nkom furthermore believes that the remedies do not go further than necessary, and therefore that the current competition problems can not be remedied with less intrusive remedies. Nkom refers to the proportionality assessment of the individual remedies ordered.

718. The remedies in this decision entail both clarifications and changes to the obligations imposed on Telenor pursuant to Nkom's decision of 20 January 2014. In Nkom's assessment,

the clarifications and changes are suitable and necessary to achieve the purpose of the regulation.

719. With regard to the access obligation, the decision entails that existing obligations are generally continued. This applies with regard to central access to Telenor's copper access network in the form of Broadband access, and to central access to Telenor's fibre access network in the form of VUA fibre. The need for VUA fibre will, however, have to be reconsidered when the requirements of the VULA fibre product in Market 3a are determined. The decision furthermore entails the introduction of a new access obligation in connection with Telenor's possible upgrading of the copper network, with the effect that access in use will lapse. Telenor must then offer VUA copper as the replacement product.

720. With regard to price and accounting regulation, the decision entails that existing obligations are generally continued. In some areas, the decision entails new or changed obligations for Telenor. This includes price regulation in the form of price caps for Broadband access, based on the LRIC model. If Telenor upgrades the copper network with the effect that access which is in use will lapse, Telenor must also offer a replacement product that will be price-regulated in the form of a margin squeeze test. Nkom has also introduced a cost-orientation obligation with related cost accounting for backhaul services. In Nkom's assessment, the aforementioned access obligations would not function sufficiently effectively with less intrusive pricing requirements.

721. With regard to the non-discrimination obligation, the decision entails a new obligation to perform technical replicability tests. Nkom cannot see that there are any less intrusive alternatives to ensure that the non-discrimination obligation is sufficiently effective. Nkom furthermore believes that the obligation is in proportion to the purpose which it is intended to achieve. In Nkom's assessment, the test and the documentation requirement cannot be considered to be particularly onerous for Telenor.

722. The transparency requirements are specified to a greater extent than in the current decision in the former Market 5. In Nkom's assessment this is necessary in order to contribute to increased predictability for all parties and for the requirements to function as intended. In this respect, Nkom refers to how further specification is necessary to ensure compliance with the obligations concerning access and non-discrimination that are imposed. In Nkom's assessment, the competition-promoting effect of the transparency obligations cannot be achieved less intrusively.

723. With regard to accounting separation, the decision entails that existing obligations are generally continued. In Nkom's assessment, the purpose of the accounting separation could not be achieved with a less intrusive remedy.

724. Nkom believes that the obligations imposed will effectively remedy the competition problems identified. The decision entails that the combined regulatory burden will be somewhat greater for Telenor than under the current regulation. Nkom believes, however, that

the obligations are also proportional in overall terms, viewed in the light of experience from the current regulation period, the expected competition benefits, and the goal of achieving sustainable competition. The fact that the overall effect may be burdensome for Telenor cannot be assigned decisive importance for as long as no less burdensome forms of regulation exist that are equally suitable to achieve the regulatory objective. Nkom has not been able to identify any such alternatives.

7.8 Relationship with ordinary competition legislation

725. In the decision of 20 January 2014 in the former Market 4, Nkom concluded that ordinary competition law will not provide an adequate degree of protection against the competition problems that have been identified in this market. Nkom believes that this conclusion still applies to Market 3b.

726. In Nkom's assessment, the provisions of the Competition Act will not be sufficiently effective to safeguard the considerations behind the special obligations in the relevant market. A key reason for this is that the ban in the Competition Act against undue exploitation of a dominant position is a general ban. This entails, among other things, that it would normally take a significantly longer time for the Norwegian Competition Authority to determine whether a specific instance of e.g. access denial or price discrimination can be regarded as misuse under Section 11 of the Competition Act, than the time necessary to determine whether conduct is in conflict with a specific access obligation that is imposed through sector-specific competition regulation under the Electronic Communications Act. Since the time factor is of central importance to achieving the objectives of the sector-specific regulation, ordinary competition law will be less appropriate than the sector-specific regulation to promote sustainable competition.

727. The sector-specific regulation gives the opportunity to impose detailed obligations in advance. Imposing sector-specific obligations could thereby entail increased clarity and predictability concerning the nature of the various obligations. In Nkom's assessment, this predictability will facilitate investments and thereby support development towards sustainable competition. Increased clarity concerning the nature of the obligation would furthermore facilitate faster intervention, ensuring effective regulation.

728. Nkom hereafter concludes that ordinary competition legislation will not adequately meet the need for predictability, for detailed regulations and for rapid intervention when needed. Nkom furthermore concludes that supplementary sector-specific advance regulation of Market 3b is necessary, in order to achieve the purpose of the sector-specific regulation.

8 Relationship with current decisions

729. Unless otherwise determined below, on the entry into force of this decision, Nkom's decision of 20 January 2014 concerning special obligations in the market for wholesale Broadband access (formerly Market 5) is withdrawn. The same also applies for Nkom's decision of 27 August 2015 concerning follow-up of the non-discrimination requirement by using margin squeeze tests for fibre-based Broadband access.

730. Under the decision of 20 January 2014, Telenor must report cost accounts for copper-based Broadband access, based on fully distributed historical costs, at an aggregated level, for up to and including the 2018 financial year. The report must be sent to Nkom before 1 July 2019.

731. Under the decision of 20 January 2014, Telenor must report cost accounts for co-location access for up to and including the 2018 financial year. The report must be sent to Nkom before 1 July 2019.

732. Telenor must report accounting separation for fibre-based Broadband access for up to and including the 2018 financial year. The report must be sent to Nkom before 1 July 2019.

733. Under the decision of 20 January 2014, Telenor must publish key performance indicators (KPIs) for up to and including December 2018.

9 Entry into force and appeals

734. This decision and the associated obligations in the wholesale market for central access to fixed access networks will enter into force on 1 January 2019. Nkom draws attention to the fact that certain obligations in the decision are subject to specific deadlines for when the obligations must be fulfilled. These deadlines are stated in the sections concerning special obligations.

735.

736. The decision may be appealed, cf. Section 11-6 of the Electronic Communications Act, and Section 28 of the Public Administration Act. The deadline for appealing decisions is normally three weeks, cf. Section 29, first paragraph, of the Public Administration Act. Due to the coming Christmas period and public holidays, Nkom believes that there are grounds for an extended appeal deadline, cf. Section 29, fourth paragraph, of the Public Administration Act. The deadline for appeal is therefore set at five weeks from the decision date.

737. Appeals must be addressed to the Ministry of Transport and Communications, but should be sent to the Norwegian Communications Authority. 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. If, during any appeal process, the implementation of the decision is deferred, the withdrawal of existing obligations will be deferred until a final decision has been made concerning the appeal.