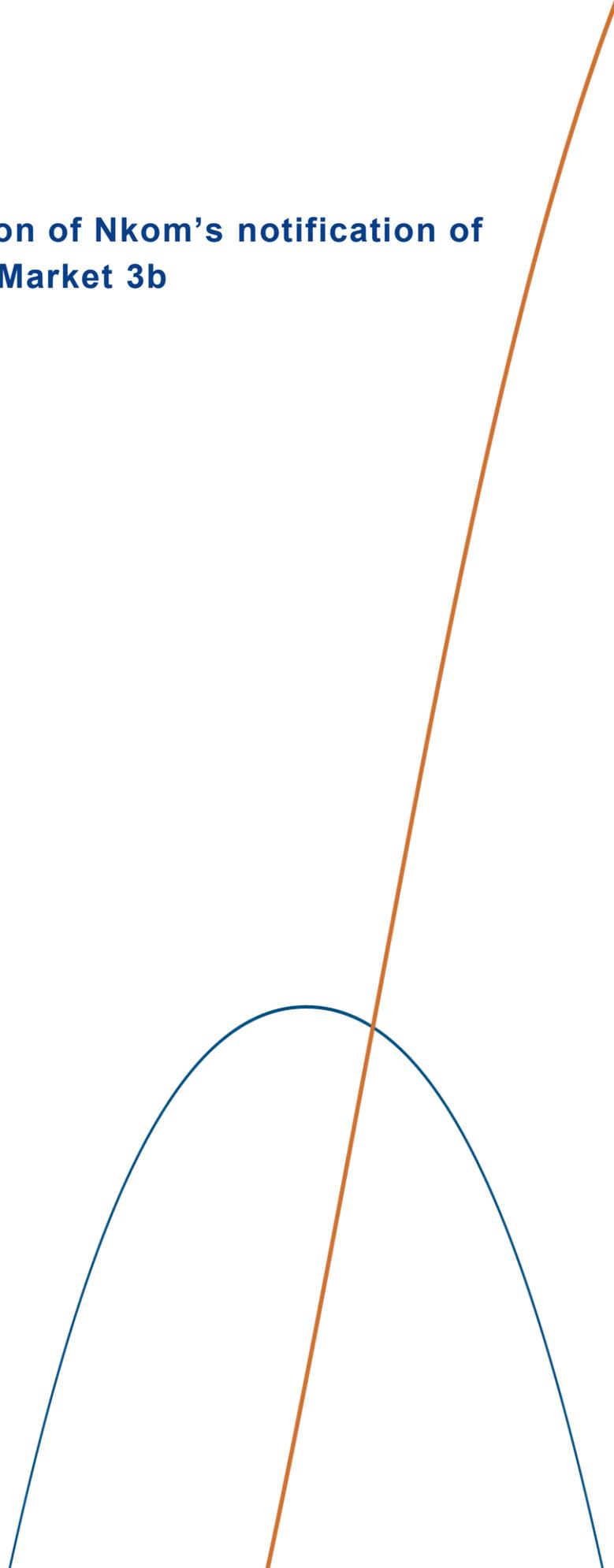


Annex 2

Results from the consultation of Nkom's notification of decisions in Market 3a and Market 3b

20 December 2018



Contents

1	Introduction.....	4
2	Market analysis.....	4
2.1	General.....	4
2.2	Market delineation.....	7
2.2.1	The end-user market for standardised broadband access.....	7
2.2.2	The wholesale markets for local and central access to fixed access networks.....	11
2.2.3	Delineation towards high-quality wholesale products	13
2.2.4	Geographical delineation	14
2.3	Analysis of significant market power (Market 3a and Market 3b).....	18
2.4	Reports from Foros/Kind and Oslo Economics commissioned by Telenor	23
3	Comments on the choice of special obligations.....	25
3.1	General comments on the choice of special obligations	25
3.2	Geographical differentiation of remedies.....	28
3.3	Access.....	29
3.3.1	Overall comments on the access obligation.....	29
3.3.2	Local, physical access to copper-based access networks.....	30
3.3.3	Regime for upgrading the copper network.....	32
3.3.4	Local, virtual access to copper-based networks.....	36
3.3.5	Local, physical access to fibre-based networks.....	38
3.3.6	Local, virtual access to fibre-based networks	39
3.3.7	When the access obligation in Telenor’s fibre network applies	41
3.3.8	Access for connection to “homes passed” in Telenor’s fibre access network.....	41
3.3.9	Access to backhaul services.....	44
3.3.10	Central access to copper-based access networks	45
3.3.11	Central access to fibre-based access networks.....	47
3.3.12	Central access to HFC networks	47
3.3.13	Access to information and support systems	50
3.3.14	Obligation to have service level agreements (SLA) and associated compensation arrangements (SLG).....	51
3.4	Price and accounting regulation.....	53
3.4.1	Overall comments on the price regulation	53
3.4.2	Price regulation of physical access to copper and broadband access	54
3.4.3	Margin squeeze test, gross margin test and hybrid model (VULA/VUA copper and VULA/VUA fibre).....	61
3.4.4	Maximum price for insert cable (“homes passed”).....	66

3.4.5	Cost-oriented price and cost accounts for establishment, co-location, backhaul, E-line, etc.	67
3.5	Non-discrimination.....	68
3.5.1	Eol or EoO.....	69
3.5.2	Technical replicability test.....	71
3.6	Publication and reference offers.....	74
3.6.1	Reference offers and access to specified information.....	74
3.6.2	Notification requirement.....	76
3.7	Accounting separation.....	79

1 Introduction

This annex summarises the consultation responses to and subsequent comments on the notification by the Norwegian Communications Authority (Nkom) of a decision in the wholesale markets for local access to fixed access networks (Market 3a) and central access to fixed access networks (Market 3b). The notification was submitted for consultation in the period from 12 January 2018 to 12 March 2018. Nkom has received responses from Broadnet AS (Broadnet), NextGenTel ASA (NextGenTel) and Telenor Norge AS (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 (Get TDC), NextGenTel and Telenor.

Nkom has also had meetings with each of the aforementioned players in order to shed light on certain aspects of the comments received. The meetings took place on 24 April 2018 and 3 May 2018.

In addition, during the period from 8 June to 6 July 2018, Nkom conducted an extra consultation concerning adjustments to the data basis for the LRIC model, including changes in price caps for copper-based LLUB, SLU and broadband access.

The statements from the various consultation respondents are summarised by topic and in accordance with the individual items of the notification. The most important and most frequent comments are stated here. Nkom also states its views on the relevant comments and how we have processed this input. Nkom has noted all of the input and, like verbal feedback from operator meetings and similar, this input has been taken into account in the work on the decisions in these markets. The individual consultation responses are available on Nkom's website.¹

2 Market analysis

2.1 General

Assessment in the notification of decision

In the market analysis, Nkom has given a description of the market and competition situation in the end-user market for fixed access. Furthermore, Nkom has delineated the product market for standardised broadband access at end-user level and the derived product markets at wholesale level.

¹ <https://www.nkom.no/marked/markedregulering-smp/anbefaling-2016/marked-3a>

Consultation comments

Telenor believes that Nkom's approach to market delineation and the lack of application of competition law methodology leads to incorrect delineation of the markets. This has consequences for all of the ongoing analysis and use of remedies.

Telenor believes that Nkom's description of the Norwegian end-user market for fixed access is characterised as being selective in the aspects highlighted and emphasised. This means that Nkom's assessments in the market delineation of what is described as the end-user market for standardised broadband access are incomplete and incorrectly delineated in the product dimension. In Telenor's opinion, particularly the trends of a persistent decrease in copper-based accesses and the growth and expansion dynamic for fibre-based and mobile accesses, as well as the development stage of these products, are not considered sufficiently by Nkom.

Telenor also refers to how a fundamental point of departure for assessment of whether there is still a need for sector-specific access regulation will be an analysis of the competition in the end-user market. If the competition functions downstream, there will be no basis for sector regulation, and if the competition has strengthened since the last market decision, this should indicate an easing of the regulation. It is only in cases where market failures in the end-user markets can be identified in a forward-oriented perspective that this may form the basis for regulation of the related wholesale markets. This analysis methodology is missing from Nkom's notification. No competition issues, which the proposed regulation should remedy, have been defined in the end-user market.

In Telenor's view, the shortcomings in Nkom's market delineation indicate that Nkom should perform a new assessment with regard to the delineation of both the product market and the geographical market.

Broadnet disagrees with Telenor and refers to how the Norwegian Electronic Communications Act assumes that Nkom considers the current methodology, which Nkom has also done. Telenor is incorrect in its argument concerning the use of competition law methodology. The market delineation and designation of the provider with significant market power are regulated by Chapter 3 of the Norwegian Electronic Communications Act, and not the Norwegian Competition Act. Nkom's methodology use is correct, according to the applicable framework. Broadnet assumes that Telenor's motivation for calling for new analyses is to delay the adoption of new regulation, and requests that Nkom rejects the request.

Get TDC disagrees with Telenor that Nkom's approach to market delineation is incorrect and believes that Telenor's criticism is unfounded. Get TDC agrees with Nkom's analyses and overall conclusions for both Market 3a and Market 3b. Nkom has analysed the markets in line with Chapter 3 of the Norwegian Electronic Communications Act, current recommendations and other relevant guidance. The regulations require Nkom to consider the sector-specific framework that is based on competition law principles, and not the competition law methodology directly.

Nkom's assessment

Nkom does not agree with Telenor's claim that Nkom's approach to market delineation and the lack of application of the competition law methodology leads to incorrect delineation of the markets. It is evident from Section 2.1 of the market analysis that Nkom's starting point is the predefined markets set out in ESA's Recommendation of relevant markets and that it has made a separate assessment of whether the predefined markets are suitable for Norwegian market conditions. The delineations of relevant markets are based on the same procedure as the market delineations within competition law. This entails that they are based on assessments of substitutability on both the demand and supply sides of the market in question. On this basis, Nkom believes that Telenor's assertion of the absence of the application of the competition law methodology as a basis for the market delineations is not correct.

In Section 2.2 of the market analysis, Nkom has described the market and competition situation in the Norwegian end-user market for fixed access for both households and businesses. The description includes separate sections for, respectively, 1) coverage and number of customers, 2) customer development distributed on various access technologies, 3) development in broadband customers' choice of access products/speeds, 4) different customer segments, 5) the providers' market shares, and 6) development features on both the demand and supply sides of this market. Nkom therefore disagrees with Telenor that the market analysis' description of the Norwegian end-user market for fixed access is characterised as being selective in the aspects that are highlighted and emphasised. On the contrary, Nkom believes that there is a comprehensive description of the market and competition situation in the end-user market as the basis for the notified decisions in Markets 3a, 3b and 4.

Telenor claims in particular that the trends for a persistent decrease in copper-based accesses and the growth and expansion dynamic for fibre-based and mobile accesses are not considered sufficiently by Nkom. Nkom disagree with this. The decrease in copper-based accesses and the growth in fibre-based accesses are described and quantified in Section 2.2.2 of the market analysis. In addition, the expected further development in the years ahead is described in Section 2.2.6. The development for mobile broadband, including substitutability between fixed and mobile broadband access, is described and discussed in Section 2.3.3.

Nkom shares Telenor's belief that an analysis of the competition in the end-user market is an important point of departure for the assessment of whether there is still a need for sector-specific access regulation. Nkom also points to how the assessment of the easing of regulation based on changes in the competitive situation is not performed as part of the market delineation, as Telenor seems to advocate, since this comment is related to Nkom's market delineations in the market analysis. Competition problems as the basis for the notified regulation are discussed in the notification of a decision for Markets 3a and 3b, respectively, and not as part of the market analysis' Chapter 2 on the delineation of the relevant market.

On this basis, Nkom cannot see that Telenor's initial comments on the market analysis necessitate changes in the market analysis.

2.2 Market delineation

2.2.1 The end-user market for standardised broadband access

Assessment in the notification of decision

Nkom has defined the end-user market for standardised broadband access to be technology-neutral. The market comprises all fixed access technologies, including copper, fibre, HFC and fixed radio access.

Consultation comments

Telenor believes that Nkom bases the market delineation on the various different media/technologies and does not consider which end-user services are delivered and sold via the network connections. The market delineation should be based on an analysis of how close substitutes the different products and services are for the end-users.

Telenor refers to how Nkom does not conduct an SSNIP test and considers the principles behind the SSNIP test to be central to the survey of the relevant market. Telenor also refers to how in many competition cases it is difficult in practice to perform such SSNIP tests, not least due to short deadlines, but sees no reason to deviate from this in the present analysis. In practice, more than 2-3 years pass between each market analysis and decision on significant market power, and this implies that Nkom must be subject to a higher requirement with regard to which analyses they perform. If the SSNIP test is too demanding, there are easier alternatives that are feasible in practice. Telenor refers to how the analysis of critical loss and diversion rates is a much-used approach to operationalising the principles in an SSNIP test. Questionnaire surveys are used to reveal customers' second choice. Churn data is often used as an alternative or supplement to find diversion rates. This analysis will reveal whether end-customers consider fibre-based and copper-based access to be in the same market.

Telenor furthermore believes that Nkom's forward-oriented analysis of the market appears to be unnecessarily diffuse. Telenor believes that weight should be given to the observed and expected development in the mobile, copper and fibre areas. The most important development trends are still the expansion of fibre in all areas and a reduction in the number of xDSL accesses, which are expected to accelerate and lead to the re-development of parts of the copper network, especially where mobile-based accesses will be able to deliver a better broadband product.

Telenor also believes that Nkom is not consistent in the analysis of substitution conditions. Nkom's assertion in item 496 of the notification of the decision in Market 3a that the price level of LLUB does not affect the profitability of fibre (and thereby the development of fibre) is in

conflict with Nkom's conclusion concerning the market delineation, which claims that broadband via copper and fibre is part of the same market. Both of these cannot be correct at the same time.

Telenor furthermore refers to how the actual VDSL stock is well below 10% of the households, although 57% of the households have access to VDSL. This illustrates how customers assess this product's attractiveness to be low if customers can choose another type of network connection. Telenor also claims that the continued operation of an established copper network becomes unprofitable in areas with a superstructure of alternative high-speed networks because the copper network is emptied of customers, and this is sufficient evidence that copper-based products in Norway cannot be considered to be part of the same market as the high-speed market. Even a significant price reduction will not change customers' views.

Telenor believes that it is a weakness that Nkom fails to assess such observable conditions and relies on the argument of a chain of substitutes. Telenor refers to how the analysis made of the substitution conditions is characterised by claims that, in Telenor's assessment, are not correct, very imprecise or irrelevant. In Telenor's view, Nkom has not proved that there is sufficient reciprocity to be able to determine chain substitution.

Get TDC agrees with Nkom's delineation of the relevant product markets at end-user level.

Nkom's assessment

Nkom does not agree with Telenor that the market delineation does not consider which end-user services are delivered across various access media/technologies, and how close substitutes different products and services are for end-users. Nkom has assessed this in Section 2.3.2 of the market analysis. Based on this comment from Telenor, Nkom nonetheless finds reason to extend the discussion of substitutability between various access media/technologies for standardised broadband access in Section 2.3.2 of the market analysis, in order to further substantiate the conclusion that all relevant access technologies for fixed broadband connection must be included in this end-user market.

With regard to Telenor's reference to how Nkom has not performed an SSNIP test, Nkom remarks the following:

- Nkom refers to Section 2.1.1 of the market analysis which states that the Guidelines do not set an absolute requirement for the use of SSNIP tests in the market delineation.
- No full SSNIP tests have ever been performed in conjunction with market delineations as the basis for ex-ante regulation of electronic communications markets in Norway during the around 15 years in which the Norwegian Electronic Communications Act has been in force. Nor has the absence of SSNIP tests resulted in the rejection of the market delineations by ESA or the Norwegian Ministry of Transport and Communications, or a request for Nkom to perform new delineations based on an SSNIP test.

- Nkom is aware that analyses of critical loss and diversion rates may be alternatives or supplements to SSNIP tests, as referred to by Telenor. Nkom also points out that SSNIP tests or analyses of critical loss and/or diversion rates are not methods which necessarily give a better and more accurate basis for the assessment of substitutability in the end-user market for standardised broadband access than the assessments and analyses which already underpin the market delineation in Nkom's market analysis. This is inter alia apparent from Section 4.6 of "*Konkurransopolitikk - Rettslig og økonomisk analyse*" (Hjelmeng and Sørgård, 2014) concerning methodological challenges associated with the use of such quantitative tests and analyses in practical market delineation. The following citation from "*Konkurransopolitikk - Rettslig og økonomisk analyse*" provides a good illustration of how SSNIP tests, or alternative methods to operationalise SSNIP tests based on information retrieval through questionnaire surveys, do not automatically give a more correct assessment of substitutability, as Telenor appears to believe:

"The SSNIP test is a very abstract concept, and it is not given that respondents have really understood what is meant by the hypothetical question of how they will respond to a price increase. Also, it is possible, even though they have understood the question, that they do not think about the question thoroughly enough, and answer something that deviates from what they would actually have done if the price had actually increased." (page 178)

On this basis, and according to a cost/benefit assessment, Nkom has concluded that it is not necessary to undertake either an SSNIP test or analyses of critical loss and/or diversion rates in order to delineate the end-user market for standardised broadband access. Reference is also made to Nkom's aforementioned comment that the discussion of substitutability between various different access media/technologies for standardised broadband access in Section 2.3.2 of the market analysis has been expanded somewhat in order to further substantiate the conclusion that all relevant access technologies for fixed broadband connection must be included in this end-user market.

Telenor believes that Nkom's forward-oriented analysis of the market appears to be unnecessarily diffuse, without Telenor pinpointing more closely what they perceive as diffuse in the forward-oriented analysis. Nkom cannot see that Telenor's input contains elements associated with development trends in the market that have not already been addressed and taken into account in the market analysis, and therefore does not find any reason to make changes to the analysis on the basis of this comment from Telenor.

Telenor claims that Nkom is not consistent in the analysis of substitution conditions and refers to how Nkom's claim that the price level of LLUB does not affect the profitability of fibre (and thereby the development of fibre) is in conflict with Nkom's conclusion concerning the market delineation, which claims that broadband via copper and fibre is part of the same market. In response to this, Nkom first of all points out that it is not correct, as Telenor claims, that Nkom

asserts that the price level of LLUB does not affect the profitability of fibre. Nkom refers to how the expansion of fibre in the Norwegian broadband market during the last decade indicates that “build or buy” decisions have only been little influenced by the level of this price cap regulation. In other words, it is *decisions* about fibre expansion, and not the *profitability* of fibre, which Nkom believes have been little influenced by the price cap regulation of copper-based LLUB. Nkom maintains that this price cap regulation does not seem to have had unintended negative consequences for decisions on fibre expansion in Norway during the past decade. Secondly, Nkom disagrees with Telenor that if the wholesale price of copper-based access to a small degree has affected expansion decisions among fibre operators in Norway during the past decade, it can be ruled out that an assessment of the substitutability between copper and fibre-based broadband access in the end-user market can lead to broadband access via these two media/technologies being included in the same relevant product market. Nkom therefore does not share Telenor’s view that these conditions are mutually exclusive.

Telenor refers to how the actual VDSL portfolio is well below 10% of households, even though 57% of households have access to VDSL, and appears to believe that this indicates that copper and fibre-based access are different relevant product markets. Nkom believes that a comparison of the coverage and purchase of VDSL does not provide the basis for such any such conclusion. On the contrary, Nkom’s opinion is that these figures illustrate that there is real competition between the various media/technologies for broadband access , and that end-users in this market choose access technology and broadband speed on the basis of their own needs and Individual cost/benefit assessments associated with the alternative fixed broadband access offerings available in the market.

Telenor claims that the ongoing operation of an established copper network becomes unprofitable in areas with a superstructure of alternative high-speed networks because the copper network is emptied of customers, and this is sufficient evidence that copper-based products in Norway cannot be considered to be part of the same market as the high-speed market. Nkom remarks in this respect that not all customers in a geographical area that are offered fibre-based broadband access switch from copper-based to fibre-based access. On the contrary, the general rule in fibre expansion areas appears to be that some end-users choose to continue with copper-based broadband, while others switch to fibre-based broadband. Expansion decisions among fibre operators often require a certain penetration ratio in the relevant geographical area. It is therefore not unnatural that the fibre ratio may be relatively high in some areas where fibre access has been developed. At the same time, Nkom points out that it only exceptionally seems to be the case that all end-users in a geographical area with the opportunity for fibre access will replace copper access with fibre access. Nkom therefore does not agree with Telenor that the customer development in the copper network is sufficient evidence that the copper-based access products in Norway cannot be considered to be part of the same relevant product market as fibre access for standardised broadband access.

Telenor believes it to be a weakness that Nkom fails to assess observable conditions and relies on the argument concerning a chain of substitutes, and claims that Nkom's analysis of the substitution conditions is characterised by claims which, in Telenor's assessment, are not correct, very imprecise or irrelevant. Nkom disagrees with Telenor that the market analysis' assessment of relevant markets does not assess observable conditions in the market and cannot see that Telenor's consultation response contains new factual information or new market insight that Nkom has not assessed during the preparation of the market analysis. As stated above, Nkom has nonetheless expanded the substitutability assessments in the market analysis, including further substantiation of the chain substitution between copper and fibre access in the end-user market for standardised broadband access.

2.2.2 The wholesale markets for local and central access to fixed access networks

Assessment in the notification of decision

On the basis of the end-user market for standardised broadband access, Nkom has derived two relevant product markets at wholesale level. Market 3a comprises access to physical wholesale products in the copper and fibre networks, and equivalent or comparable virtual wholesale products in the copper and fibre networks that have the following characteristics: 1) local access, 2) control of the connection, 3) service independence, and 4) "uncontended" connection. Market 3b comprises wholesale access at central level via copper networks, fibre networks, HFC networks and fixed radio access networks.

Consultation comments

Telenor believes that there is a need for the same distinction between copper- and NGA-based accesses in the wholesale markets 3a and 3b as in the end-user market for standardised broadband access. If there are competition issues that cannot be remedied by other means than ex ante regulation, the derived product markets at the wholesale level should be:

- Market 3a: copper-based local wholesale access
- Market 3a: fibre-based local wholesale access
- Market 3b: xDSL- and wimax-based central wholesale access
- Market 3b: NGA-based (HFC, fibre and fixed LTE) central wholesale access
- Market 4: High-quality access products

Broadnet overall agrees with Nkom's delineation of the relevant product markets. Broadnet nonetheless believes that the boundary between which products are to be included in Markets 3a and 3b is unclear. It has not been determined where in the network/infrastructure the boundary lies for the delivery of traffic/accesses between Market 3a and Market 3b. The notification also does not make any clear distinction between "uncontended" and "contended"

traffic quality. Nkom surveys existing wholesale products against the two markets, but says little about how any future products will fit in. Broadnet believes that Telenor can exploit the unclear boundary between Market 3a and Market 3b by delivering traffic to their own end-user activity at 3a level as “uncontended” and at the same time delivering traffic to wholesale customers at 3b level (“contended”). Following up on costs and prices will also be problematic if there is an unclear boundary between Market 3a and Market 3b.

Get TDC agrees with Nkom’s delineation of the relevant product markets at wholesale level.

Nkom's assessment

With regard to Telenor's comment concerning the number of wholesale markets for local and central access to fixed access networks, Nkom remarks that the relevant wholesale markets are derived from the defined end-user markets. Substitutability assessments in the end-user market for standardised broadband access do not provide a basis for differentiating copper- and fibre-based accesses in various relevant product markets, cf. the market analysis and Nkom’s response to Telenor’s above input on substitutability between various access technologies. Nkom believes that there is no basis for such a distinction at wholesale level either. On the basis of Telenor’s comment, Nkom has nonetheless updated the substitutability assessments at the wholesale level.

Concerning Broadnet’s comment that the boundary between which products are to be included in Markets 3a and 3b appears unclear, Nkom points out that in Section 2.4 of the market analysis there is a very detailed and exhaustive delineation and description of these two wholesale markets . In addition to general assessments and conclusions related to the delineation between Market 3a and Market 3b, the market analysis has separate sections specifying how existing regulated products in previous markets 4 and 5 are covered by Markets 3a and 3b, respectively. Should any doubt arise as to which of these markets any future wholesale products belong, there must be a concrete assessment of the characteristics of the future product compared with the criteria for Market 3a products. Nkom has described what each of these criteria entails, and has made some clarifications of these criteria in the market analysis. Nkom also believes that it would be unfortunate if, on the launch of new/modified wholesale products in Markets 3a and 3b, there is any doubt or disagreement as to whether the new/modified product falls under Market 3a or 3b regulation. In the decisions for Markets 3a and 3b, Nkom has therefore specified as part of the access obligation that prior to the launch of new/modified wholesale products, Telenor must clarify with Nkom whether this concerns a Market 3a or 3b product.

With regard to Broadnet’s comment that Telenor may exploit an unclear boundary between Markets 3a and 3b by delivering traffic to their own end-user activity at 3a level as “uncontended” and at the same time delivering traffic to wholesale customers at 3b level (“contended”), Nkom remarks that if such a situation were to arise, this would be a matter that

could be assessed in relation to the obligations imposed concerning non-discrimination in these two markets.

2.2.3 Delineation towards high-quality wholesale products

Assessment in the notification of decision

On the basis of the distinction between the end-user markets for standardised broadband access and high-quality access products, respectively, Nkom has derived various different associated wholesale markets, as Markets 3a and 3b and Market 4, respectively. Nkom has assumed that end-user products in the market for high-quality access products will mainly be based on wholesale products in Market 4, but has also acknowledged that it is also possible to use wholesale products in Market 3a/3b as part of the end-user offering in the market for high-quality access products.

Consultation comments

Telenor refers to how, in the Explanatory Note, Nkom and the Commission have given weight to specific product characteristics for the classification of products included in the wholesale market for high-quality access. However, this distinction does not appear to be reflected in practice, since there is a certain overlap between the wholesale products' area of application. Telenor also refers to how Nkom previously and in draft new market analyses has distinguished between proactive, systematically developed fibre networks and individual fibre accesses that have been established reactively. Telenor supports this approach as a practical solution to the challenge of partly overlapping application areas which in principle belong to various different wholesale markets.

Telenor furthermore believes that it is not appropriate to set limits to how advanced the end-user services that it must be "permitted" to offer should be, based on a standardised wholesale product intended for the mass market, or to access regulate individual high-quality fibre accesses used to offer a standardised broadband access service to an end customer. Telenor's individual fiber accesses are used mainly to deliver advanced business market services.

Nkom's assessment

With regard to Telenor's comment that a distinction between the wholesale market for high-quality access products (Market 4) and the two wholesale markets for standardised access products (Markets 3a and 3b), based on defined product characteristics, does not appear to be reflected in practice since there is a certain overlap between the wholesale products' area of application, Nkom refers to Section 2.4.6 of the market analysis, in which this matter is described and assessed. Nkom cannot see that this comment from Telenor makes further specification of the delineation of Market 4 from Markets 3a and 3b necessary, other than as already described in Section 2.4.6 of the market analysis.

Nkom does not share Telenor's view that the market delineations set limits to how advanced the end-user services offered on the basis of Market 3a/3b products may be. Wholesale customers in Market 3a/3b can offer the end-user services they wish to, based on Market 3a/3b products. Section 2.4.6 of the market analysis states that it is the individual end-user's need for quality/functionality that determines whether Telenor's wholesale customers base their end-user offerings in the market for high-quality access products on Market 4 products and/or Market 3a/3b products. On the basis of Telenor's comment, Nkom has nonetheless found it appropriate to clarify this in the market analysis.

Concerning Telenor's comment that it is not appropriate to access regulate individual high-quality fibre accesses that are used to provide a standardised broadband access service to an end-customer, Nkom refers Section 2.4.7 of the market analysis, where it is concluded that individual fibre accesses that are not part of a systematically developed access network are not included in Market 3a or 3b. In the market analysis, Nkom has assumed that individual fibre accesses will primarily be established for use as the basis for services in the end-user market for high-quality access products. Telenor confirms this through its input that the individual fibre accesses are mainly used for the delivery of advanced business market services, and not for the delivery of standardised "best effort" broadband. On this basis, Nkom cannot see that it is necessary to make changes to Section 2.4.7 of the market analysis based on this comment from Telenor.

2.2.4 Geographical delineation

Assessment in the notification of decision

Nkom has carried out a geographical analysis of the competition development in the end-user market for standardised broadband access. The analysis shows that there are no clear differences in the competitive conditions in the end-user market in stable, clearly delimited parts of the country, which indicates that geographical division of the associated wholesale markets is necessary. Nkom therefore regards Markets 3a and 3b as national markets.

Consultation comments

Telenor points out that the Nkom does not take the demand side substitution as the starting point, as required under the competition law methodology. Nkom also appears to assume more stringent criteria in the assessment of whether there are regionally or locally varying geographical markets nationally than as stated in the Explanatory Note and competition law as such.

Furthermore, Telenor considers it remarkable that Nkom concludes that there are no geographical differences in prices or product offerings for different speed classes, when the fact is that Nkom reveals substantial price variation (e.g. 40% in several speed categories). Telenor believes that the standard analysis, with Nkom's random selection of listed prices, is not appropriate to assess the competition for the development of new high-speed networks,

which is quite clearly local for both providers and affected end-customers. In Telenor's view, Nkom's findings in the analysis indicate that the competition to build and deliver NGA connection must be very effective, albeit varied, at local level. Nkom's conclusion concerning the finding of relatively homogeneous listed prices for ongoing subscriptions and establishment from a small selection of operators does not say very much either about local adaptations and offerings that can be made as a consequence of various competitive conditions in various different areas where there is competition to build new NGA networks.

Telenor furthermore believes that it is not the case that a market becomes national by an operator being present in all regions, or that prices do not vary significantly between regions. The fact that a large number of small local operators have become established in the fibre market provides a clear indication that there are no significant major economies of scale and/or scope that indicate competitive advantages for operators with a large geographical footprint.

Telenor believes that geographical delineation will be easier if the product markets are delineated correctly. For copper networks and wimax, the starting point can be the network's geographical extent. For fibre and other NGA networks, the analysis should be based on the number of operators and other competitive conditions within geographical units.

Broadnet agrees with Nkom in that the markets are national. Broadnet's own market data supports that there are significant differences concerning network and coverage, but that price and product offerings indicate that there are sufficiently uniform offerings at national level. Broadnet disagrees with Telenor's presentation with regard to the assumed geographical differences.

Get TDC agrees with Nkom's delineation of the geographical markets.

Nkom's assessment

Section 2.5.1 of the market analysis shows that Nkom's methodological starting point for the delineation of geographical markets is based on BEREC's "Common Position on Geographical Aspects of Market Analysis" (BEREC Common Position) from 2014. Nkom has referred to how it is recommended in the BEREC Common Position that the geographical analysis commences with an assessment of the competitive development in the market, and that BEREC believes that 1) geographical differences in various providers' network and coverage, 2) the number of providers in the end-user market, and their market shares, in different geographical markets, and 3) geographical differences in price and product offerings are the most relevant indicators when national authorities are to determine whether there is a need to conduct a full geographical analysis in order to assess whether it is appropriate to define local markets. In the market analysis, Nkom has applied BEREC's recommended methodology for the delineation of relevant geographical markets, cf. Sections 2.5.2-2.5.5. When Telenor refers to how this methodology is not based on demand substitution, as required by the competition law methodology, and that this entails that the delineation is not correct, Nkom points out that

BEREC's methodology has been developed for the sector-specific ex-ante competition regulation in the electronic communication sector. Nkom is aware that the methodical starting point for an ex-post assessment under competition law may deviate from BEREC's recommended methodology, including by giving greater weight to demand substitution when the geographical market in a specific case is to be defined according to competition law. However, Nkom disagrees with Telenor that in this respect it is incorrect to apply the methodology for the delineation of relevant geographical markets, as recommended in the BEREC Common Position.

Telenor claims that Nkom applies more stringent criteria to the assessment of whether there are regional or local geographical markets than stated in the Explanatory Note and in competition law as such. Telenor does not specify which criteria in Nkom's assessment they consider to be more stringent than stated in the Explanatory Note and in competition law as such, and it is therefore difficult for Nkom to comment on this assertion by other means than to refer to how Nkom's delineation of relevant markets is based on the criteria and the methodology under the BEREC Common Position, and that this methodology cannot be said to deviate from the Explanatory Note.

Nkom disagrees with Telenor's claim that Nkom has concluded that there are no geographical differences in prices or product offerings for different speeds. Nkom has assessed whether there are distinct differences in prices and product offerings between areas with limited competition, compared with areas with a greater degree of competition, since in such case this will weigh in favour of defining various different geographical markets on the basis of different degrees of competition. This assessment is based on an analysis of the price and product offerings of selected broadband providers that represent various business models and access technologies, and which constitute a mix of national, regional and local providers. In this analysis, Nkom has included a certain number of providers that operate in areas where there is reason to assume that competition is limited, in order to compare the prices and offerings of these operators with the prices and offerings of operators that also operate in areas exposed to greater competition. Based on this analysis, Nkom has concluded that there is no clear pattern in terms of local and regional providers in areas with assumed limited competition operating with significantly higher prices than national providers that also offer broadband access in areas subject to greater competition.

Telenor points out that within several of the speed categories there is approximately 40% price variation, referring to information concerning monthly prices for Internet capacities between 10 and 25 Mbit/s. Nkom remarks in this respect that, even though such price variations can be found within a capacity category, Nkom cannot see that this provides any basis to change the conclusion that the comparison of the selected broadband providers' prices does not indicate a clear distinction in terms of end-user prices between areas with assumed limited competition and areas with a greater degree of competition. Nkom maintains that the analysis and the tables for the various speed categories show a complex picture, where for some capacities

operators in areas with assumed limited competition have rather higher prices than national operators, but where it is also the case that some of the local/regional providers have lower prices than national operators for given capacities. In Nkom's view, the price difference in the 10-25 Mbit/s speed class, cited by Telenor, does not give any reason to alter the conclusion that the price comparison made by Nkom does not show clear and unambiguous price differences between geographical areas with assumed limited competition and areas subject to a higher degree of competition, which makes it necessary to define different geographical markets for broadband access at wholesale level in Norway. For the sake of good order, Nkom remarks that this is not the same as Nkom having concluded that there are no geographical differences in prices for different speed classes, as Telenor claims.

Concerning Telenor's comment that the price comparison which Nkom has undertaken is not suitable to assess the expansion competition for new high-speed networks, Nkom points out that this has not been the purpose of the price comparison either. As stated in the market analysis, the purpose of the price comparison has been to survey whether there are distinct differences in prices and product offerings between areas subject to limited competition compared with areas subject to a greater degree of competition. This is in line with the BEREC Common Position, where geographical differences in price and product offerings are described as a relevant indicator when national authorities are to determine whether there is a need to perform a complete geographical analysis to assess whether it is appropriate to define local markets.

Telenor believes that listed prices of a small, and random, selection of operators do not say very much about local adjustments and offerings that can be given as a consequence of varying competition conditions in different areas, and that Nkom has performed a superficial analysis of listed prices, so that the analysis of the competitive conditions locally is not very pertinent. Nkom points out that the operators are not randomly selected. Nkom has compared prices published by the operators on their websites, and assumes that these are comparable standard prices. At the same time, Nkom is aware that campaign prices can deviate from the prices published on the operators' websites. However, Nkom does not agree with Telenor that a comparison of the standard prices published on the operators' websites may not be used as the basis for an analysis of geographical price differences between areas subject to varying degrees of competition.

Nkom agrees with Telenor that a market does not become national by an operator being present in all regions, or by prices not varying significantly between regions. Section 2.5 of the market analysis states that Nkom's conclusion that Markets 3a and 3b are delineated geographically to Norway is based on more elements than that Telenor is present in all regions and that the prices do not vary significantly between regions. Nkom therefore cannot see that this comment from Telenor necessitates changes in the market analysis.

Telenor states the absence of significant economies of scale and/or scope for fibre operators with a large geographical footprint as an argument for a different delineation of geographical

markets than Nkom has arrived at. Nkom notes that, according to the Guidelines, we have assessed economies of scale and/or scope as part of the analysis of significant market power, cf. Section 3.10 of the market analysis. Nkom does not agree with Telenor that this is an element to which greater weight should be given in the assessment of the geographical market delineation.

With regard to Telenor's input that the geographical delineation will be easier if the product markets are delineated correctly, Nkom refers to the aforementioned comments that we do not agree with Telenor that the product markets are not delineated correctly.

2.3 Analysis of significant market power (Market 3a and Market 3b)

Assessment in the notification of decision

Nkom has assessed whether one or more providers have significant market power in Market 3a and Market 3b, respectively. Nkom has assessed market shares and a number of other criteria and has concluded that Telenor has significant market power in both Market 3a and Market 3b.

Consultation comments

Telenor believes that Nkom should perform a new analysis of significant market power on the basis of Telenor's proposed delineation of the wholesale markets. This analysis will reveal vital nuances and differences in the competitive conditions in the various wholesale markets. Telenor's market shares will then be lower in some of the sub-markets and there will be no basis for the designation of Telenor as a provider with significant market power in these sub-markets.

Furthermore, Telenor believes that Nkom must ensure the equal treatment of ownership in the analysis. Telenor believes, among other things, that there is a lack of any exhaustive, consistent assessment of TDC's, Lyse's and EQT's ownership in this analysis.

Telenor also points to how Nkom must ensure an objective approach to the expected market development. Telenor believes that Nkom's analysis of copper upgrading in particular is influenced by Nkom's own requirements, expectations and views on appropriate market development. It is obvious that in recent years there has been a considerable reduction in DSL's market share, and it seems most obvious that this will continue. Even though it cannot be completely excluded that a copper upgrading may cause this trend to turn, the market development and empirical history indicate the opposite. End-users request and prefer fibre access, regardless of the speed at which Telenor can offer copper. Nkom's statement concerning an altered development in the strongly decreasing trend for Telenor's market share due to copper upgrading therefore does not seem to represent the actual conditions.

Telenor believes that Nkom's analysis of other criteria beyond market shares appears to be superficial and without real assessments and anchoring in economic theory and empiricism. For example, Nkom concludes that Market 3a is characterised by economies of scale and/or scope. Nkom argues that Telenor has economies of scale due to nationwide networks and many customers. At the same time, irrevocable costs associated with fibre expansion appear to be very locally driven, which is supported by the fact that many small operators gain a foothold. Nkom's own finding is thus not consistent with Nkom's own argument. In Telenor's view, the criteria can describe any provider, and it is unclear what might be the competition issue.

Furthermore, Telenor believes that it is irrelevant to highlight the number of appeals and the conflict level concerning the current regulation in order to assess competition in the wholesale market. Telenor also believes that the number of operators building new infrastructure illustrates that there are no prohibitive establishment barriers, and that the market is characterised by technological convergence and a high degree of innovation.

Telenor refers to how Nkom concludes that Markets 3a and 3b are separate markets. Nevertheless, Telenor's internal sales are included for copper-based and fibre-based accesses in both Market 3a and Market 3b. Telenor believes that this is inconsistent. If the markets are separate, internal sales may only be included in one of the two markets. Alternatively, the markets must be combined.

Broadnet agrees with Nkom's conclusion that Telenor has significant market power in both Market 3a and Market 3b and, among other things, points to how Telenor has a market share of almost 100% in both markets, disregarding internal sales. The markets are characterised by high establishment barriers and the absence of any buying power on the demand side. The other structural conditions support the fact that Telenor has significant market power.

Broadnet disagrees with Nkom's assessment of the OTT operators' significance to competition and believes that Nkom is not able to document the assumptions that are gained from objective market data. It is unfortunate that Nkom designs the regulation based on assumed competition from OTT operators, when it is not possible to prove that such operators e.g. influence pricing. Broadnet also refers to how ESA pointed to equivalent shortcomings in Nkom's analyses in 2013 and encourages Nkom to re-assess this part of the analysis.

Broadnet believes that the real motivation behind Telenor's input on new analyses is a wish to defer the regulation. Broadnet cannot see that the elements requested by Telenor will affect the outcome of the analysis. The analysis clearly shows that Telenor has a dominant position for the foreseeable future.

Get TDC does not agree with Telenor that there are weaknesses in the methodology used by Nkom to find that Telenor has significant market power in Markets 3a and 3b. Telenor holds significant market shares and, over time, has been the clearly largest provider in the overall Norwegian electronic communication market. Telenor is also considerably larger than its

competitors, and the price development that has taken place at wholesale level indicates that Telenor has not been particularly disciplined by other operators.

Nkom's assessment

Since Nkom has not found any reason to change the delineations of the wholesale markets 3a, 3b and 4 based on the consultation responses, Nkom cannot see that it is necessary to perform a new analysis of significant market power on the basis of new market delineations, which Telenor advocates.

Nkom agrees with Telenor that the treatment of ownership should be equal in the analysis, and that ownership/control should be the basis for the assessments of the providers' market positions, regardless of internal organisation. On the basis of Telenor's comment that there is a need for a more thorough and consistent assessment of TDC's, Lyse's and EQT's ownership, Nkom has made some adjustments and clarifications related to this in the market analysis.

Nkom agrees with Telenor that the market analysis' approach to expected market development must be objective and based on actual trends and development trends in the broadband market. Nkom does not, however, share Telenor's view that Nkom's analysis of the copper upgrading is influenced by requirements, expectations and viewpoints related to the market development that do not correspond to the actual conditions. Like Telenor, Nkom expects continued growth in fibre-based broadband access in the coming years, and in the market analysis, Nkom does not assume that the trend for a falling number of copper accesses will be reversed as a consequence of the copper upgrading, as Telenor suggests. At the same time, Nkom assumes that copper upgrading will be able to influence how quickly and to what extent the reduction of copper accesses will take place in the years ahead, and considers it important that the wholesale regulation in Markets 3a and 3b enables the copper upgrading to take place in a way that ensures effective competition based on access to Telenor's copper-based access network, also in the years to come. On the basis of Telenor's comment that Nkom's approach to the expected market development takes too little account of the decline in the number of copper-based accesses, Nkom has made some adjustments to the description of the market development, so that there can be no doubt that Nkom has assumed an approach to the expected market development that is objective and based on actual trends and development trends in the broadband market.

Telenor believes that Nkom's analysis of other criteria beyond market shares appears to be superficial and without real assessments and anchoring in economic theory and empiricism, and illustrates this by referring to parts of the assessment concerning economies of scale and economies of scope in the market analysis. Nkom disagrees that the existence of economies of scale and/or scope in electronic communication networks in general, and broadband networks in particular, is not anchored in economic theory and empiricism. The extent to which such economies of scale and/or scope constitute a competitive advantage in these wholesale markets can be discussed, but in this context Nkom maintains the conclusion that Telenor's

nationwide infrastructure and large customer base strengthen the presumption of significant market power for Telenor in both Market 3a and Market 3b. As stated in the market analysis, Nkom has, however, assessed Telenor's economies of scale and economies of scope compared to other competitors as lower in Market 3b than in Market 3a. If the analysis had been superficial, as Telenor claims, it would not have been natural to point to such a difference in the assessment of this criterion for the two wholesale markets. On this basis, Nkom cannot see that this comment from Telenor makes it necessary to change Section 3.10 of the market analysis.

Concerning Telenor's claim that it appears irrelevant to highlight the number of grievances and the conflict level concerning the current regulation in the assessment of significant market power, Nkom maintains that many grievances and a high conflict level in these wholesale markets in recent years indicate that Telenor can to a great extent act independently of competitors and customers in these markets. Nkom points out that the absence of alternative wholesale products for the access buyers in these markets entails that the access buyers to a great extent depend on purchasing wholesale products from Telenor in order to maintain and further develop the end-user offering in the broadband market, at any rate in the short and medium term. From this starting point, Nkom believes that the number of grievances raised by access purchasers to Nkom, with a related high conflict level which means that Nkom often has to make a decision in these cases in order to achieve a solution, is an element which underpins how Telenor can to a great extent act independently of the access buyers in this market, and thereby have significant market power.

Nkom shares Telenor's view that other operators' fibre expansion illustrates that there are no prohibitive establishment barriers in the broadband access market, and that this market is characterised by technological convergence and a high degree of innovation. At the same time, in Section 3.15 of the market analysis, Nkom has described and discussed the potential competition at wholesale level from operators competing with Telenor at end-user level, based on their own access infrastructure, and concluded that to a very limited extent such potential competition will be a disciplining factor for Telenor's opportunity to act independently of competitors and customers in the relevant wholesale markets. Moreover, in Section 3.17 of the market analysis, Nkom has discussed how the competitive pressure from the end-user market may influence Telenor's market position at wholesale level. In this case too, Nkom concludes that this is not an element that to a particular extent will have a disciplining effect on Telenor's opportunity to exercise market influence in the wholesale Markets 3a and 3b. On this basis, Nkom has noted that there are no sufficiently disciplining effects from potential competition or competitive pressure from the end-user market to provide a basis to assess that Telenor does not have significant market power in the wholesale markets for local and central access to fixed access networks. Nkom cannot see that Telenor's consultation input contains new elements that Nkom has not taken into consideration in these assessments and therefore does not consider it necessary to change the market analysis in this respect.

Telenor believes that it is inconsistent to include internal sales for copper-based and fibre-based accesses in both Market 3a and Market 3b when Nkom has concluded that these are two separate wholesale markets, and believes that internal sales can only be included in one of the two wholesale markets, if the markets are not combined. Nkom remarks to this that internal sales are considered and taken into account in the calculation of market shares in Markets 3a and 3b in the same way as in equivalent market analyses in previous markets 4 and 5. Even though the delineation between Markets 3a and 3b is somewhat different to between the previous markets 4 and 5, Nkom cannot see that this gives any basis to deviate from the previous practice of including internal sales in the calculation of market shares in both wholesale markets. Nkom cannot see that Telenor's comments on this item contain information to suggest that it is not natural to continue the established calculation methodology from equivalent market analysis in the previous markets 4 and 5 with regard to how internal sales are to be processed and taken into account in the calculation of market shares in Markets 3a and 3b. Nkom also remarks that neither ESA nor the Norwegian Ministry of Transport and Communications has objected to this calculation method in equivalent market analysis of the previous markets 4 and 5.

Broadnet refers to items in the market analysis and notifications of decisions where Nkom has referred to the development in the OTT offering in the broadband market. Broadnet disagrees with Nkom's assessment of the OTT operators' significance to competition and believes that Nkom is not able to document the assumptions that are gained from objective market data. With regard to Broadnet's reference to the assessment in the market analysis, Nkom does not agree that the reference to OTT offerings and OTT operators is based on assumptions that cannot be documented. Here, Nkom describes actual development trends in the market and cannot see that Broadnet's consultation response contains any new market insight indicating that the market analysis should be changed. With regard to Broadnet's comments related to Nkom's reference to OTT operators in the notification of the decisions in Market 3a and Market 3b, Nkom will maintain that the emergence of OTT operators represents a form of competition on the service side in the broadband market, which entails that the access owners' offering of content and other services via the broadband connection is exposed to greater competition than previously. Nkom also points out that it is not correct, as Broadnet claims, that Nkom has designed the regulation based on assumed competition from OTT operators. As one of several elements of the assessment of price regulation as a remedy in Markets 3a and 3b, Nkom has pointed out that increased competition to provide content and related services via the Internet connection to some extent may have a disciplinary effect on the pricing in end-user markets, especially in relation to television and telephony services. Nkom cannot see that Broadnet's comment on the aforementioned items contains information to indicate that Nkom's reference to the competition from OTT operators should be re-assessed, as Broadnet requests.

2.4 Reports from Foros/Kind and Oslo Economics commissioned by Telenor

Consultation comments

Professors Øystein Foros and Hans Jarle Kind have been commissioned by Telenor to write the report “Markedet for bredbånd hjemme - Markedsavgrensning og konkurranseanalyse” (The market for broadband at home - Market delimitation and competition analysis). Nkom received the report on 29 May 2018.

The report presents an expert economic assessment of Nkom’s analysis of the relevant market, the designation of providers with significant market power, and the use of instruments. The report solely concerns the private market. On the basis of supply and demand substitution assessments, the report concludes that there are two separate product markets for Internet connectivity in the private market. The first market consists of Internet connectivity based on fibre and cable TV networks. The second market consists of Internet connectivity based on copper networks. On the basis of an assessment of, among other things, market shares, the level of irrevocable costs related to the establishment of fibre, and the expected development in the market, the report concludes that no competition problems exist in the retail market for Internet connectivity based on fibre and cable TV networks that can justify regulation in the derived wholesale markets. With regard to the wholesale market for copper, the report concludes that it seems reasonable to impose regulation of Telenor in view of Telenor’s strong position in the copper segment, and to ensure predictability for operators that base themselves on copper-based access products, such as NextGenTel and Broadnet.

Oslo Economics has been commissioned by Telenor to prepare the report “Substitusjon mellom fiberbredbånd og andre aksesessformer” (Substitution between fibre broadband and other access forms”. Nkom received the report on 16 August 2018. The report contains an analysis of the extent to which households assess other forms of broadband access as alternatives to fibre broadband, and is based on a questionnaire survey.

In the questionnaire survey, existing fibre customers are asked what they would have done if the relative price of fibre had been higher at the time of taking out the fibre subscription. The relative price increase for fibre is set at NOK 50, which for the majority of the households in the survey would amount to 5-10% of the retail price. The survey makes a distinction between consumers that previously had broadband via DSL or HFC networks, and consumers that have taken out fibre subscriptions in conjunction with relocation. The results of the questionnaire survey show that a large proportion of consumers would have retained the current fibre broadband even if the relative price were to increase by NOK 50. Based on the results of the survey, Oslo Economics concludes that in overall terms the households do not consider other access forms to be close substitutes for fibre broadband and, in particular, that the households do not consider DSL access to be a substitute for fibre access. Oslo

Economics therefore concludes that DSL and fibre cannot be included in the same relevant market.

Nkom's assessment

As Nkom sees it, both reports focus on the question of what is appropriate product market delimitation at end-user level. Nkom remarks first of all that both reports solely assess the situation in the broadband for households segment. However, the end-user market for standardised broadband, which is the starting point for wholesale markets 3a and 3b, not only includes broadband for households, but also standardised broadband delivered to businesses. In Nkom's view, the lack of assessment related to the standardised broadband used by businesses is a fundamental shortcoming of the reports.

Nkom does not agree with the conclusion of the report from Foros and Kind that there are two separate product markets for Internet connectivity in the private market. Nkom believes that a shortcoming of the report is that chain substitution is not discussed to any greater extent, given the sliding bandwidth requirements between different customer segments, while there are no clear use patterns within a customer segment. In the market analysis, Nkom has given weight to the considerable diversity in use patterns and service consumption via standard broadband access, and sliding transitions between extremes that can be characterised as low-capacity and high-capacity users. In Nkom's assessment, this entails that no clear and unique boundaries can be drawn between different product markets where customers in the various markets do not consider various access technologies that provide for approximately the same capacities to be substitutable on selecting broadband subscription.

The survey conducted by Oslo Economics is solely directed at households that had fibre-based broadband at the time that the survey was conducted. In other words, households that have been offered fibre, but have chosen to retain broadband via another access technology, and customers who have not been offered fibre, are not included in the survey. The survey is thus solely directed at a selective element of the broadband market. Nkom believes there is reason to assume that this may have affected the assessments and conclusions.

A key assumption in both reports is that the assessments concerning demand substitution are based on broadband supplied via fibre. Broadband supplied via fibre is thus chosen as the "focal product". The reason for this is that the number of fibre subscriptions has increased in recent years, and fibre is now the technology with the most broadband subscribers, and that, according to the reports, end-users have a preference for broadband delivered via fibre.

Nkom does not agree that it is obvious that fibre should be selected as the focal product. Even though fibre has grown and now has a higher market share than copper, Nkom believes that it is appropriate to use copper as the focal product. In this respect, Nkom refers to the assessments concerning the choice of focal product in Section 2.4.5 of the market analysis, where this is elaborated on.

After assessment of the two reports, Nkom has concluded that there is no basis to change the delimitation of the relevant product markets at end-user level. However, Nkom has adjusted and in some cases elaborated on the text in the market analysis, on the basis of the assessments made in the two reports.

3 Comments on the choice of special obligations

3.1 General comments on the choice of special obligations

Assessment in the notification of decision

Nkom has concluded that the use of remedies in Markets 3a and 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 entails that Nkom does not find it appropriate to draw any absolute conclusion regarding whether to base regulation of Markets 3a and 3b on regulatory principle 2 or regulatory principle 3.

The special obligations imposed must be proportional. However, the principle of proportionality may not be cited in support of the argument that Nkom should not or cannot impose burdensome obligations on providers with significant market power. This would be necessary when other less burdensome obligations are not considered sufficient to achieve the purpose of the regulation.

Consultation responses

Telenor refers to how any special obligations must reflect the findings of the market analysis, be appropriate for the purpose and proportional, and contribute to promoting the aim of the Electronic Communications Act for economic effectiveness and sustainable competition. Telenor believes that Nkom overlooks these important aspects with respect to the proposal for special obligations.

Another central deficiency in the notification is that Nkom only to a small extent takes account of the regulation in Market 3a in the assessment of the need for regulation and remedies in Market 3b.

Telenor refers to how the competition in the market for standardised broadband access is increasing rapidly and how Telenor's market share is diminishing strongly. Nkom's proposal for stricter regulation of Telenor compared to the current regulation therefore corresponds poorly with the market development.

Telenor believes that Nkom has put decisive emphasis on service-based competition and little or no emphasis on infrastructure-based competition. Telenor furthermore believes that Nkom has not made a realistic assessment of the positive effects of the regulation proposal compared to its negative effects, e.g. for the infrastructure-based competition.

In Telenor's view, the requirements for several new access products are more a consequence of the actual regulation than of real commercial demand for such products in the wholesale markets.

Telenor believe that it will be disproportional to make extensive requirements of product development in the copper network, in view of the expected strong decrease in copper-based solutions during the regulatory period. Furthermore, Nkom's proposal for more detailed requirements concerning e.g. publication and transparency is not in harmony with the principle of minimum regulation.

Telenor furthermore points to how Nkom's proposal appears to give different value to investments, depending on the investor. Telenor believes that the regulation must also safeguard Telenor's incentives for investments in the high-speed network, and also ensure that Telenor's previous investments in the copper network are protected in the same way as investments in the copper network from the access buyers.

Broadnet believes that it is positive that in several instances Nkom expresses a wish to identify effective remedies to ameliorate the current competition problems in the notified regulation. On the basis of experience from appeal cases in recent years, Broadnet believes, however, that there is a clear need for clearer requirements, with less scope for doubt and differing discretionary judgement than Nkom assumes in the notifications. Broadnet refers to how the proposed regulation gives operators such as Broadnet and Telenor little predictability. In addition, Telenor is given an opportunity to interpret the regulation to the disadvantage of the access buyers. Broadnet emphasises that the consideration of disagreements and appeals in relation to the market decisions and the content of the specific obligations have proved to take a long time and that this could have been avoided by imposing concrete obligations without scope for any doubt.

Broadnet also refers to how the development in the telecom industry is accelerating and is driven by the technological development. The regulation and the remedies must adapt to this reality. According to Broadnet, the regulation and remedies have given the dominating operator considerable advantages in terms of a continuous deferral and delay strategy. Broadnet mentions some examples of this, including the introduction of SHDSL.bis, which took almost 3 years because Telenor was opposed, access to location data on remote nodes, which took around 2.5 years, and the attempt to upgrade the copper network. Broadnet believes that the Nkom should ensure that the remedy apparatus puts far greater weight on the timeline dimension, in order to ensure that the regulation is relevant in view of the rapid pace of change in the market to be regulated.

Comments on the consultation responses

Telenor agrees with Broadnet's proposal that the regulation should be "based on objective criteria" and that the "time axis must be more prominent in the remedy apparatus". However, Telenor does not recognise Broadnet's assertion that the current cases cited are examples of deferral or delay by Telenor. Telenor remarks in conclusion that Broadnet deviates from its requirement of the use of objective terms rather than estimates with regard to Nkom's price fixing of maximum prices.

Broadnet disagrees with Telenor's assessment that the proposed obligations are not consistent with the proportionality requirement, etc. Broadnet believes that the tightening of the specific obligations is a direct and necessary consequence of how the preceding regulation has not been sufficiently effective.

NextGenTel rejects Telenor's submissions that there is no connection between the market situation and the extent of the specific commitments that have been notified. NextGenTel believes that Telenor's market shares clearly support the need to impose tighter access regulation on the company in the fixed broadband markets.

Get TDC endorses Broadnet's consultation response that discretionary terms should be replaced by objective terms, and that the deadlines must be determined as sufficiently short and specific deadlines in the notified regulation.

Nkom's assessment

Nkom does not agree with Telenor that the proposed obligations do not reflect the findings of the market analysis, and that Nkom has not adequately assessed the need for regulation in Market 3b, in the light of Market 3a. Nkom refers to how the remedies were prepared on the basis of the market analysis and the competition problems revealed. Nkom has considered Market 3a and Market 3b in combination and has assessed the need for remedies in Market 3b in the light of any obligations imposed in Market 3a. At the same time, Nkom has taken consideration that different types of access buyers may have different needs, which indicates that there will be a need for different types of access products in both markets.

Telenor furthermore refers to how Nkom's proposal for stricter regulation of Telenor does not correspond to the fact that the competition in the market for standardised broadband access is increasing, and that Telenor's market share is declining rapidly. In this respect, Nkom points out that the assessment of significant market power involves more than just market shares, and that in some areas Nkom sees grounds to introduce new and to some extent tighter obligations, based on the experience from the current regulation.

Concerning Telenor's comment that Nkom has given decisive weight to competition for services, and little weight to infrastructure competition, Nkom refers to the assessment that it is not appropriate to draw any final conclusions with respect to regulation principle 2 or 3. Nkom believes that it is important to safeguard both the investment incentive and service competition

considerations, and disagrees with Telenor that Nkom has given decisive weight to competition for services. Nkom refers, among other things, to how the decisions facilitate investments in high-speed broadband in that Telenor is subject to relatively mild regulation in the form of margin squeeze assessments for fibre-based access networks.

With regard to Telenor's comments concerning product development in the copper network and different valuations of investments, Nkom refers to how on the basis of new information, Nkom has made extensive changes to the regime for the upgrading of the copper network, cf. Section 3.3.3 below. This includes that the requirements concerning product development in the copper network only apply in areas where Telenor itself takes the initiative to upgrade the copper network.

Nkom agrees with Broadnet and Get TDC that it is important to clarify individual requirements, so that there is less room for doubt and differing application of discretion. At several places in the decisions Nkom has therefore further specified the requirements made, including in Section 7.4.5.1 in both decisions concerning technical replicability tests. At the same time, Nkom believes that it is not possible to specify everything in detail, and that it is also appropriate to have some flexibility in certain areas, in view of the changing nature of the market.

Nkom also agrees with Broadnet and Get TDC that the time dimension is important to ensure that the regulation is relevant. In Nkom's opinion, the most precise regulation possible will help to reduce the potential for conflicts between Telenor and access buyers. At the same time, it must be taken into account that conflicts may arise, and it must be possible to process these in accordance with legal-administrative rules, with sufficient opportunity for contradiction and appeal of any decisions.

3.2 Geographical differentiation of remedies

Assessment in the notification of decision

Nkom has concluded that it is more appropriate to continue national obligations for Telenor in Markets 3a and 3b than to introduce geographically differentiated use of remedies based on multiple uncertain assumptions concerning future infrastructure competition and market share developments in different geographical areas.

Consultation responses

Telenor refers to the European Commission's Explanatory Note and believes that varying local terms of competition must be reflected in the use of remedies. Telenor cannot see that Nkom has analysed and taken account of this in the notified obligations.

Broadnet refers to Nkom's assessment of the need for geographical differentiation of remedies and supports Nkom's conclusion that it is appropriate to continue national obligations

in Markets 3a and 3b. Uniform use of remedies will ensure both incentives for innovation and competition in the best possible way.

Get TDC cannot see that there is any basis to claim that different local competition exists that should be reflected in the use of remedies, as Telenor contends in its consultation response. Get TDC supports Nkom's assessment that the use of remedies in Markets 3a and 3b should not differentiate geographically.

Nkom's assessment

Nkom does not agree with Telenor that Nkom has not analysed whether there is a basis for differentiating the use of remedies on the basis of different conditions for local competition. We refer to the assessments in Section 6.3 in both decisions and maintain the conclusion that it is more appropriate to continue national obligations for Telenor in Markets 3a and 3b.

3.3 Access

3.3.1 Overall comments on the access obligation

Consultation responses

Telenor believes that in the notification Nkom imposes an obligation on Telenor to develop several new wholesale products without assurance that they will be adopted or create new business in the wholesale market. Furthermore, Telenor believes that Nkom has not undertaken a further assessment of how burdensome it is for Telenor to develop the new wholesale products. The fact that access buyers should be able to have the most flexibility in their choices cannot be decisive for the new access obligations imposed on Telenor. Only access necessary to ensure effective competition can be imposed.

Telenor points out that the order to develop several new copper-based products and introduce a number of new administrative requirements fits poorly given the fact that this is in a rapidly declining part of the market. The aforementioned orders will mean increased costs for Telenor and could therefore be counterproductive and represent an obstacle to upgrading the copper network. Many of the new copper access obligations lapse completely if Telenor chooses not to upgrade its own copper network. In reality, this introduces a new regulatory barrier for Telenor's upgrade. At the same time, all of the obligations for other operators that are upgrading are milder.

Telenor furthermore believes that it is a paradox that Telenor is ordered to offer more fibre-based wholesale products even though the company has a comparatively low market share in the fibre market and potential wholesale buyers are very few in number. Telenor's network has too few customers to expect effective competition among suppliers of services. Even more forms of access will make it even less likely that it will be profitable to be a wholesale customer. Nkom puts too much emphasis on service-based competition in Telenor's fibre

network and marginally acknowledges the actual infrastructure-based competition in the Norwegian market.

Get TDC believes that the decisions must require Telenor to offer access and transport services separately. Get TDC points out that the company has its own transport network in many geographic areas and that the company only needs access services from Telenor in these areas.

Nkom's assessment

Nkom agrees that the greatest possible flexibility for access buyers with respect to selection of an access product cannot by itself be decisive for the access obligations imposed on Telenor. However, Nkom believes that the new access obligations that were notified are proportionate and conducive to contributing to the goal of sustainable competition, and will uphold them.

With respect to Telenor's comment that the access obligations must create new business, Nkom believes that such a requirement cannot be made in the absolute sense. What is key in this respect is, in Nkom's assessment, that the access products are suited to meeting the need for access, and that access is suited to achieving sustainable competition in that the access enables external access buyers to compete effectively with Telenor in the retail market.

Nkom's further assessments related to the specific access obligations are set out in the sections below. Nkom therefore sees no reason to comment on Telenor's arguments connected with specific access obligations here.

With respect to Get TDC's comment that Telenor must be ordered to offer access and transport services separately, Nkom believes that this is accomplished to a large extent by requiring Telenor to offer several local-level wholesale products, and both local, physical access and local, virtual access. It will thus be possible for access buyers to connect to Telenor's network at a local level in most areas.

3.3.2 Local, physical access to copper-based access networks

Assessment in notification of decisions

Nkom gave notice in Market 3a that Telenor shall continue to be obliged to accommodate any reasonable request for local, physical access to copper-based networks. This applies to full and shared access to the copper-based access network (LLUB), including access to shared access lines (SLU).

Consultation responses

Broadnet considers that a particular need exists for the product Operator Access to be continued as it is known today, even in areas where no copper network upgrades are taking place. Broadnet encourages Nkom to provide an account of how this can be ensured by Telenor.

NextGenTel emphasises that it is important that physical access to the copper access network is continued. The company believes that access to the copper-based access network in the time ahead will continue to constitute a prerequisite for ensuring that other providers can compete with Telenor.

Telenor refers to Nkom's proposal to continue access to shared access lines (SLU) and that other providers will be able to use exclusionary technology at the SLU level on certain conditions. Telenor notes that Nkom has not assessed situations such as that Telenor will lose opportunities to monitor operations automatically on such shared access lines, that the responsibility for electrical safety in the copper network must be transferred and that there will be a need to upgrade the point with new surge protection prior to takeover. Telenor also believes that new manual processes and procedures to safeguard security aspects will result in increased costs.

Telenor furthermore believes that it is natural that an access buyer that takes over an area also takes all migration costs by taking over the customer base and asking Nkom to clarify this in the decision. Telenor is also entitled to protection of its previous investment in line with others who have invested in the copper network.

Telenor believes that it must be emphasised in the decision that the company must be able to redevelop the copper access network in accordance with established notification rules or freely sell the copper where others want to build based on SLU access.

Telenor emphasises in conclusion that all operators offering services over SLU must have a common definition and solution for the technical interface.

Nkom's assessment

LLUB

With respect to the request from Broadnet that Nkom shall give an account for how LLUB access is to be secured in areas where no copper network upgrades are taking place, Nkom points out that Telenor's obligation to provide LLUB access applies throughout Telenor's copper access network. Furthermore, the quality of the wholesale product (Operator Access) shall be ensured by Telenor's obligation to have service level agreements and associated compensation arrangements. The access buyers are furthermore assured of predictability for their investments since Telenor is required to give notice of the closure of copper access lines in advance. This is to be done according to the notification deadlines specified in Section 7.5.5

of the decision. On this basis Nkom cannot see that there is a need for Nkom to further clarify this in the decision.

SLU

Telenor's arguments that SLU access is mainly related to the use of such access in combination with the use of VDSL with vectoring or G.fast without shaping. This use of SLU access will no longer be relevant in view of the fact that Nkom has concluded that there is no basis for establishing a regime for upgrading the copper network, cf. Section 3.3.3 below. Nkom therefore sees no need to assess Telenor's arguments in further detail.

For the record, Nkom calls attention to the fact that there will be no changes in the decision with respect to the other uses of SLU access. Telenor will therefore be obliged to accommodate requests for SLU access in combination with use of VDSL and SLU access in combination with use of VDSL with vectoring or G.fast with frequency filtering.

3.3.3 Regime for upgrading the copper network

Assessment in notification of decisions

Nkom gave notice that both Telenor and other providers shall have opportunities to upgrade the copper access network with exclusionary effect for others. By virtue of its ownership of the network, Telenor will be given an opportunity to have first choice on the points the company is to upgrade. Nkom also gave notice of a process for allocating points that can be upgraded by other providers. Providers with the most number of end users on the remote node will be able to choose first. In the event that Telenor or providers with the most number of end users on the remote node do not take advantage of their right of choice, the principle of first in time, first in right will apply.

To the extent that Telenor upgrades the copper network, Telenor will, instead of LLUB and SLU, offer a substitute product that ensures the access buyers local, virtual access to copper-based access networks (VULA copper). To the extent that there are providers other than Telenor that are upgrading the copper network, they shall also offer a virtual replacement product. Nkom has given notice that this replacement product shall provide other providers central, virtual access to copper-based access networks (VUA copper).

Consultation responses

Telenor believes that Nkom has no authority under section 4-1 of the Electronic Communications Act to order Telenor to provide access to the copper access network in such a way that Telenor de facto loses the right of use to parts of the network. The question can also be asked whether Nkom has the authority to impose access obligations by agreement on the operator that is granted the right of use over parts of Telenor's network.

Telenor believes it will be costly to establish interfaces towards the SLU operator and replace the end-user equipment as a result of new technology. Nkom has not assessed the

proportionality of this. Nor has Nkom taken a position on who is covering the change costs and the consequences if the SLU operator rolls out more or less than planned.

Telenor finds it odd that in the Market 3a notification, Nkom has disregarded countries where copper does not play a central role. In light of the market analysis, Nkom should have looked to countries with high FTTH development. There is a clear connection between FTTH development and HFC coverage on the one hand and the potential for upgrading the copper network on the other hand.

Telenor points out that Nkom has justified the access buyers' ability to upgrade the copper access network by citing the need to give them investment-neutral framework conditions. Telenor believes that the logic surrounding this rationale falls short on several counts. For example, Telenor disagrees with Nkom that a vertically separated network company would have been completely neutral to the investment strategy of various access buyers. In the long term, such a company will prefer to invest in the most future-oriented technology. Telenor furthermore believes that the starting point for any access obligation should be the technologies and products that Telenor uses in its own retail business. Requirements beyond this subjects Telenor to disproportionate costs, complexity and inefficiencies. Such requirements must be specifically justified, and it must be documented that the requirements are efficiency-enhancing in a socio-economic sense.

Telenor furthermore believes that the regime that is proposed seems unfinished, something Nkom itself acknowledges in the notification in some areas.

Telenor furthermore points out that a number of unforeseen events can occur and that it is difficult in advance to set deadlines for when and whether an investment must be carried out. Telenor also believes that long lead times and information about plans may affect local competition. Strong local competition could make the copper upgrade plan unprofitable.

Telenor believes that it is very unclear how information security is to be safeguarded and believes that an obligation to offer security agreements to operators not subject to the Security Act may entail that Telenor is at risk of acting in violation of the Security Act.

In addition, Telenor believes that the proposed regime for upgrading the copper access network has additional shortcomings and weaknesses that mean that the notified solution is unfinished, disproportionate and unclear:

- Effects for Telenor's future costs and income are not considered to a sufficient degree. Telenor specifically highlights the consequence of a lack of replacement products when others upgrade and the restructuring and product development costs new access obligations place on Telenor.
- Negative effects for end customers outside upgraded areas must be taken into consideration. Facilitating upgrading as Nkom proposes can result in a further forced redevelopment of the copper network.

- The rights and obligations of third parties that upgrade must be clarified to improve predictability. Among other things, Telenor believes that it must not be possible to build with exclusivity in areas where leased lines are supplied on copper. Furthermore, distortions in terms of requirements, depending on whether Telenor or others build, must be removed.
- Responsibility for the allocation process must be clarified. Telenor believes Nkom itself should have executive responsibility for the process for allocating points for upgrading.

Telenor believes NextGenTel's and Broadnet's proposals in the consultation responses for shorter deadlines in connection with upgrading the copper access is not practically feasible. Telenor refers to the fact that NextGenTel, Broadnet and other operators in the Broadband Forum are of the opinion that a number of conditions must be in place before upgrading of the copper access network can be carried out, such as the transitional systems for SHDSL, value chains for purchasing replacement products, a "whitelist" for equipment and time for procurement of modems. Telenor believes it will not be possible to get these conditions in place within the short deadlines NextGenTel and Broadnet propose.

At a meeting with Telenor on 24 April 2018, Nkom asked about the company's specific plans for upgrading the copper network to date. In its response, Telenor made reference to what the company has communicated in the market about mobile and fibre being its priority investment areas. At the meeting, Telenor could neither confirm nor deny the existence of concrete plans to upgrade the copper network.

NextGenTel is in principle positive to Nkom's proposals for the regime for upgrading the copper network. At the same time, NextGenTel is of the opinion that the regime should have been in place a long time ago. Due to the time that has elapsed the regime will scarcely have much impact in practice when it takes effect. NextGenTel therefore does not envision that the company will take the initiative to upgrade the copper network when this becomes possible according to Nkom's proposal.

NextGenTel points out that it should be made clear in the decision that Telenor's information and support systems must be upgraded in order to handle the proposed scheme. Such an upgrade must be completed so that the three-month time limit from the date of the decision until announcement of available points can be complied with. NextGenTel is furthermore of the opinion that development costs connected with this must not be passed onto access buyers.

NextGenTel believes that short deadlines must be set for the completion of allocated points, regardless of how many points the individual provider is to upgrade to avoid hoarding. Exceptions from the deadline must be limited to special circumstances, which must be practiced strictly.

Broadnet supports Nkom's proposals that access buyers should be able to upgrade the copper network where Telenor does not want to do so. However, Broadnet points out that the framework for the regime does not have tight enough deadlines. The timeline from notification

of desired development to completion should not extend beyond three months. A time frame beyond this will entail a risk that fibre operators will offer fibre in the same area. This risk is further heightened by the fact that Telenor itself has announced that they will only invest in fibre investments and not the upgrading of the copper network. If the regime sets tight enough deadlines, it may be relevant for Broadnet to build the remote nodes sporadically.

Broadnet is furthermore of the opinion that the decision must set stricter requirements concerning Telenor's clarification of what the company intends to upgrade.

Broadnet believes that an important prerequisite for commencing the upgrade is that Telenor's IT development/product development is as short as possible. If this takes about 18 months as Telenor has suggested, no upgrade is likely to take place.

Broadnet otherwise supports the principles that Nkom has proposed concerning allocation of points for upgrading between providers.

In its comments on Telenor's consultation response, Broadnet disagrees with Telenor's submission that the directive package and the Electronic Communications Act do not provide sufficient authority to order Telenor to provide SLU access, which gives access buyers the right to utilise all available spectrum on the point. Nor does Broadnet agree that it will be costly to establish interfaces towards the SLU operator and replace the end-user equipment as a result of new technology. Furthermore, Broadnet questions Telenor's argument that the decisions should not impose predictable and fixed deadlines. Experience shows that the absence of specific deadlines made it possible for Telenor to drag out the upgrading process.

Nkom's assessment

Nkom believes that it is practical to distinguish between Telenor's and the access buyers' upgrading of the copper-based access network in its assessment of the consultation responses.

Nkom considers that it will still be probable that Telenor will upgrade parts of the copper access network, but with less scope than previously assumed. Without a regime for upgrading, Telenor's ability to upgrade will be limited. This will particularly be due to the fact that Telenor is obliged to notify changes in the access network within certain time limits. Furthermore, in the event that Telenor should still be allowed to upgrade the copper network with exclusionary effect, it will be necessary to safeguard the access buyers' interests, cf. the negative effects of the upgrade on physical access. Nkom believes on this basis that there is still a need for a regime for Telenor's upgrading of the copper access network.

In the Broadband Forum, the access buyers expressed relatively high interest in upgrading the copper access network. The work of the Broadband Forum to find a common solution to problems connected with upgrading the copper access network was completed in October 2017. Nkom's work on the notification in Market 3a started immediately afterwards and Nkom found that the access buyers, especially Broadnet and NextGenTel, were still interested in

upgrading the copper access network. Now, however, the responses from Broadnet and NextGenTel in the consultation process suggest that there is relatively little interest in upgrading the copper network.

Given the low specific interest, there does not appear, in Nkom's assessment, to be a basis for establishing a comprehensive regime for upgrading the copper access network. In Nkom's view, consultation responses have therefore been submitted that provide a basis for changes in the regime for upgrading the copper-based access network. Nkom has consequently made significant changes in Section 7.2 of the decision.

3.3.4 Local, virtual access to copper-based networks

Assessment in the notification of decision

Nkom has notified that in connection with the upgrading of copper access networks, Telenor must offer a replacement product for physical access. The replacement product must ensure access buyers local, virtual access to copper-based access networks (VULA copper).

Consultation responses

Telenor understands the need for a virtual replacement product that has characteristics equivalent to physical access, if the physical product is no longer available. However, Telenor questions whether it is necessary and proportional to require Telenor to offer both VULA and VUA copper.

Telenor furthermore points out that the solution for VULA copper that was outlined in the Broadband Forum was more extensive and costly than minimum regulation would indicate. The connection points proposed by Nkom deviate from the solution outlined in the Broadband Forum. Facilitating access to HK will be a cost driver. Telenor therefore maintains the solution from the Broadband Forum that access should be at BNG level. In the meeting with Nkom on 24 April 2018, Telenor expressed how the estimate of nine months' development time for the VULA Cu product must be viewed in the light of the discussions in the Broadband Forum. Telenor furthermore agreed with Nkom that the company will have an incentive to develop this wholesale product more quickly if the full frequency spectrum, and thereby higher capacities for end-users, cannot be taken into use before a replacement product is available.

Telenor believes that the requirement that VULA copper must be offered on the underlying exchange increases the complexity significantly and should be removed. If the requirement is maintained, it must apply to all operators that upgrade.

With reference to the discussions in the Broadband Forum, **NextGenTel** believes that VULA Cu in the "uncontended" version will be a satisfactory replacement product on the lapse of LLUB access. However, NextGenTel believes that Telenor should be able to operationalise the VULA product in far less time than nine months. NextGenTel will be able to contribute to this, for example through a pilot.

NextGenTel believes that real local access is ensured by imposing an obligation to provide access at the level of the remote nodes and at the level of the exchange/HK. Delimitation of the obligation to solely apply to access at the level of BNG will limit access buyers' options.

Get TDC believes that Nkom must define the access points for new access products, and these must safeguard historical investments. With regard to VULA copper, Get TDC refers to how the company has made significant investments in central points for operator access. If the regulation requires access points that deviate from this, the aforementioned investment will be unprofitable.

Broadnet believes that the regulation must be predictable, which would indicate that Broadnet must be able to deliver traffic on HK. Broadnet also takes a positive view of Nkom's proposal for access at two ports on HK. Reference is also made to Broadnet's comments related to the fact that there are blurred dividing lines between Markets 3a and 3b, and between VULA and VUA. These are assessed above in Section 2.2.2.

Nkom's assessment

In Nkom's view, none of the consultation responses received provide a basis for significant changes with regard to the obligation concerning VULA copper. However, Nkom has made a few changes to the M3a decision's Section 7.2.5.6 concerning when Telenor must be obliged to offer VULA copper. The background to this is the uncertainty associated with Telenor's plans to upgrade the copper network. The obligation to offer VULA copper is therefore made conditional on Telenor actually upgrading the copper access network. The access buyers' need for predictability is further safeguarded by how Telenor must clarify specifications and prices for the new wholesale product by no later than at the same time as Telenor notifies changes in the access network which entail the lapse of any access that has been given.

Concerning connection points for VULA copper, Nkom refers to how the access at BNG level deviates in principle from the local connection requirement. In this regard reference is made to the Commission's Explanatory Note which states that local connection is typically given at the level of switchboard/HK or gate cabinets/remote nodes. Nkom does not require Telenor to provide access at the level of gate cabinets/remote nodes. However, Nkom has proposed that Telenor must have a limited access obligation at the switchboard/HK level. Nkom believes that such an access obligation in a good way balances the considerations of Telenor's need for cost effective solutions in the form of access at BNG level with individual access buyers' need for more local access. Telenor's input concerning removing the obligation to grant access at switchboard/HK level is therefore not upheld.

With regard to Telenor's input to impose an equivalent obligation on other operators that upgrade the copper access network, reference is made to how Nkom no longer requires an extensive regime for upgrading the copper access network, cf. Section 3.3.3. It will therefore no longer be relevant to impose access obligations on other operators.

3.3.5 Local, physical access to fibre-based networks

Assessment in the notification of decision

In Market 3a, Nkom has notified that Telenor will still be obliged to accommodate any reasonable request for local, physical access to fibre-based point-to-point networks.

Consultation responses

NextGenTel believes that it is important to continue Telenor's obligation to give access to point-to-point networks. NextGenTel buys such access today and refers to how it cannot be excluded that the ratio of point-to-point networks in Telenor's fibre network portfolio may increase in the years ahead as a consequence of any acquisition by Telenor of local or regional fibre network operators.

NextGenTel believes that access to PON fibre networks based on the wavelength division multiplexing (WDM) technology could become available during the coming regulation period. The company believes that the regulation will be not very forward-looking if Telenor is not obliged to accommodate reasonable requests for such access in the forthcoming decision.

Broadnet believes that Nkom must strengthen the notified obligations concerning physical and virtual access to fibre. Today's regulation is so deficient that few or no access buyers are able to make use of the services. The notified regulation does not appear to rectify these shortcomings.

Get TDC believes that the notified access obligations do not take account of the access buyers' needs related to, among other things, geographical coverage, price and functionality, in order to be able to offer the required services in the business market. Get TDC refers to Broadnet's consultation comments and requests that Nkom extends the notified obligations to provide physical and virtual access to fibre in all areas with structured development from the time of the establishment of the infrastructure. This also includes areas with business activity.

Nkom's assessment

In Nkom's view, none of the consultation responses received provide any basis for significant changes in relation to Nkom's conclusions concerning local, physical access to fibre-based networks.

Based on the input from NextGenTel that WDM might become available during the regulation period, in the decision Nkom has opened up the opportunity to re-assess this access form if the technology becomes standardised and is made commercially available within the time frame of the decision.

3.3.6 Local, virtual access to fibre-based networks

Assessment in the notification of decision

In the notification, Nkom has referred to how it is expedient to have an access product in Telenor's fibre access network that to a sufficient degree provides an increased opportunity for access buyers to differentiate their service offerings and thereby strengthen their competitiveness. It is uncertain, however, whether there will be any demand for such a product. Nkom therefore concluded that Telenor should be required to offer a local, virtual fibre-based access product, provided that it can be proved that there will be sufficient demand for any such product.

Consultation responses

Telenor questions whether there is a real need for local, virtual access to fibre-based access networks (VULA fibre). Telenor refers to how the access buyers have the opportunity to choose different speeds and can offer competing services, including TV, with the current fibre-based access product. Requirements for "uncontended" capacity primarily appear to be related to the business market, and Telenor's GPON infrastructure is primarily built for the private market.

Telenor furthermore refers to how for various reasons a requirement for "uncontended" capacity in GPON infrastructure cannot be implemented. Telenor refers, among other things, to how by its nature GPON is a shared medium and that major, cost-intensive network renovations must take place if requirements for "uncontended" capacity are made.

On the basis of Broadnet's and NextGenTel's consultation responses, Telenor cannot see that any real need/demand for VULA fibre exists.

Telenor refers to how it is challenging to offer both shared and dedicated VLAN on the same access. Today, this is possible by purchasing the "VULA Proff" product. Telenor has not taken offering multiple single VLANs in parallel besides this into account.

NextGenTel in principle supports Nkom's proposal for an access obligation for VULA fibre. NextGenTel refers to how low demand for today's VULA product is related to an excessively high price. NextGenTel believes that the customer base for a fibre-based VULA product at both central and local level will increase in the future, in step with the expansion of fibre networks and the customer flight from copper to fibre. Telenor should therefore be subject to an access obligation, irrespective of whether a demand can be shown at the present time, or not.

NextGenTel wishes to have an uncontended VULA product. It does not need to be a purely uncontended product, but a product with a greater degree of freedom, especially with regard to speed, is important for NextGenTel.

Broadnet believes that Nkom must strengthen the notified obligations for physical and virtual access to fibre. In Broadnet's comments on Telenor's consultation input, Broadnet refutes that no demand exists for regulated products such as VULA fibre. In Broadnet's view, the low demand until now can be explained by how Telenor has overpriced this input factor.

Broadnet requests fibre access as a defined product in M3a, with delivery of traffic on the current ODP or further out, and as a defined product in M3b with central delivery of the traffic.

Get TDC shares Broadnet's view that the notified obligations concerning fibre access must be strengthened and requests that Nkom extends the notified obligations to provide physical and virtual access to fibre in all areas with structured expansion from the time of the establishment of the infrastructure. This also includes areas with business activity.

Get TDC is interested in an uncontended VULA product in the PON network. Get TDC assumes that Telenor's structured, extended fibre access networks also have connections for businesses and that these connections have characteristics which businesses demand.

Nkom's assessment

The access buyers, especially Broadnet, have called for a clarification of, among other things, connection points for potential fibre-based wholesale products in Markets 3a and 3b.

Furthermore, NextGenTel has called for a virtual access product based on fibre that gives greater opportunities for product differentiation. For its part, Telenor has pointed out a number of technical limitations in its GPON network that make it difficult to offer access with a higher degree of product differentiation for the access buyers in addition to the current fibre-based wholesale product, VULA, from Telenor.

On the basis of the input, Nkom has obtained further information from Telenor about the GPON network. The purpose of obtaining the information has been to assess possible local access points in the GPON network and whether virtual network access fulfils technical requirements that allow the access to be regarded as a functional substitute for physical access. In this context, Nkom has among other things considered the technical requirements as a consequence of BEREC's "Common Position on Layer 2 Wholesale Access Products" (BoR (16) 162). On the basis of an overall assessment, Nkom believes that there is a need to have an industry dialogue in order to further develop the current fibre-based wholesale product from Telenor so that it fulfils the criteria for virtual access in Market 3a. The purpose of the industry dialogue will be to arrive at requirements for a product that to the greatest possible extent must also fulfil the requirements in BEREC's Common Position.

On this basis, Nkom has maintained the requirement concerning virtual local access to fibre-based networks. The decision has been updated, among other things with information concerning industry dialogue to determine final requirements of any such product.

Nkom believes that the current fibre-based wholesale product VULA from Telenor fulfils the access obligation for VUA fibre in Market 3b. Since the differences in the access obligation for

VULA fibre in Market 3a and VUA fibre in Market 3b can be assumed to be relatively small, Nkom will assess the need to maintain or adjust the obligation to give access in Market 3b for VUA fibre when the requirements concerning virtual local access in Market 3a have been determined. Nkom has included information about this in both decisions.

3.3.7 When the access obligation in Telenor’s fibre network applies

Assessment in the notification of decision

Nkom concluded in the notification that the access obligation for Telenor’s fibre-based access network must apply from the time of the establishment of the access network, i.e. when it is used to offer broadband services to end-users.

Consultation responses

Broadnet believes that Nkom must strengthen the notified obligations concerning access to fibre and contends that if the access obligation had applied during the establishment of a fibre network, in this phase the access buyer could have established end-customer agreements and have had the right to receive the information necessary to offer broadband services on equal terms with Telenor's own end-user activity.

NextGenTel believes that access buyers should have been able to compete with Telenor in the sales process prior to the establishment of fibre access networks, but at the same time says that this issue should not be re-opened at this time.

Nkom’s assessment

Nkom cannot see that the comments imply any new arguments and maintains that out of consideration for the investment incentives, the access obligation for Telenor’s fibre-based access network must apply as from the establishment of the access network. We refer to the discussion in the Market 3a decision, Section 7.2.8, and have not found any basis for changing this.

3.3.8 Access for connection to “homes passed” in Telenor’s fibre access network

Assessment in the notification of decision

Nkom concluded in the notification that Telenor must accommodate reasonable requests concerning access for the connection of “homes passed” in established, systematically developed, fibre access networks. Such requests will normally be considered reasonable in cases where the relevant building is located within Telenor’s defined expansion area for the fibre access network in the relevant area and was subject to Telenor’s offer of fibre access in the sales process prior to the establishment of the systematically expanded fibre access network in the relevant area. The same applies if the relevant customer has received an offer of connection to Telenor’s fibre access network in subsequent sales processes. In addition,

Nkom believed that requests for connection for “homes passed” would normally be reasonable if they were made after at least 12 months had elapsed from the establishment of the fibre access network in the relevant area.

Consultation responses

Telenor believes that the proposal concerning “homes passed” access increases the risk in the sales process, increases the risk for the delivery process and presents a new risk for fibre investments, and believes that the proposal has not been adequately investigated. Nkom has not taken sufficient account of the consequences of any such order for the investment incentives. Telenor believes that the order is disproportionate since Telenor may lose the right to control its own investment assets, nor has it been identified which competition issue this would resolve.

Telenor furthermore believes that it is important that Nkom acknowledges that Telenor in the first instance gives priority to project expansion with fibre in new areas, and that most of Telenor’s investment funds are thus budgeted for project expansion. Telenor refers to three different forms of subsequent expansion of fibre accesses that were not built in connection with the original project expansion and believe that regulatory requirements set for “homes passed” must respect the realities associated with Telenor’s own expansion of such accesses.

Telenor furthermore states that orders concerning “homes passed” access will adversely affect the expansion rate for new networks. Access to “homes passed” would direct limited investment resources away from the development of new areas and towards densification sales. This would entail a smaller coverage area for fibre in Norway and thereby reduce competition in the long term.

Telenor refers to how the “homes passed” access obligation may cause Telenor to lose the right to control their own investment assets, which would entail the risk that in future expansion projects Telenor will not facilitate the delivery of insert cables at a later time. This might entail that fewer customers would be able to have fibre delivered subsequent to project expansion.

Telenor points out that many changes might be made during the sales and expansion process; households being added to the project or households being removed from the project. After a project is completed, a “homes passed list” (HP list) must be made available, stating households where the right infrastructure has been added, for subsequent delivery. The HP list will not necessarily include all households that have previously received an offer from Telenor.

Telenor furthermore states that if other access buyers are to have access to sell to addresses on the HP list, this will entail significant development costs for Telenor. Telenor refers to how expansion and delivery to households on the HP list today are coordinated between Telenor (delivery department), contractor and customer. Since no interface exists for such coordination towards other access buyers, it will therefore be necessary to establish a development project

in order to establish such an interface. Telenor also points out that this will lead to increased requirements for coordinated communication between the parties involved.

Telenor refers to how the expansion of new fibre access does not adhere to standardised delivery times and points to various different conditions which affect the time it takes to lay new cables. Telenor believes that requirements for delivery times for such densification sales cannot be established.

Broadnet believes that Nkom must strengthen the notified obligations concerning access to fibre and refers, among other things, to how the access obligation for “homes passed” only applies to fibre networks that have already been established. Furthermore, Broadnet finds it difficult to understand Telenor’s argument regarding increased complexity and uncertainty concerning fibre investments and delivery to the end-customer in connection with the access obligation for “homes passed”, with the associated requirements concerning the notification deadline.

NextGenTel states that it is not particularly conducive to competition that access buyers may not start densification sales earlier than 12 months after the fibre access network has been established. NextGenTel believes that it will be in everyone's interest, and also Telenor's, that other parties can commence this as early as possible after the fibre network in a specific area has been established and commissioned.

Furthermore, NextGenTel believes that Telenor has misunderstood the proposed obligation or deliberately chosen to overlook that the proposal applies to densification sales where a fibre access network has already been established. The proposed regulation is not likely to influence Telenor’s investment incentives but, on the contrary, improve the profitability of the investment made.

Nkom’s assessment

Nkom maintains that the non-discrimination consideration indicates that access buyers must have the same opportunities as Telenor’s own end-user activity to operate densification sales for “homes passed” in Telenor’s systematically expanded fibre access network. On the basis of Telenor's comment that any such obligation would entail increased risk in the sales process, increased risk for the delivery process and new risk for fibre investments, Nkom has nonetheless concluded that it is appropriate to make certain adjustments to the decisions in Markets 3a and 3b concerning the implications of this obligation. Nkom believes that it is both appropriate and proportional that access buyers can enter into the same regime for densification sales as Telenor's own end-user activity relates to, with the opportunities and limitations which this entails, compared with sales processes prior to the fibre expansion in a geographical area.

On the basis of Telenor’s description of the current regime for densification sales, Nkom has designed the “homes passed” access obligation so that it facilitates equal opportunities for

densification sales for access buyers such as Telenor's own end-user activity. Equal opportunities entail, among other things, that access buyers must consider the same authorisation limits for establishment costs, and terms for "mini-development", as Telenor's own end-user activity on any customer enquiries concerning connection after the fibre network has been established in a geographical area. At the same time, any such authorisation limits and mini-development terms must be transparent and comparable, to ensure non-discrimination between access buyers and Telenor's own end-user activity. Equal opportunities also entail that, if Telenor's own end-user activity has to consider limitations with regard to densification sales, including any limitations in the initial period after an expansion project has been concluded in a geographical area, it is reasonable that access buyers have to consider equivalent limitations. This is specified in the decisions concerning Markets 3a and 3b.

With regard to NextGenTel's comment relating to the period of time before densification sales can begin, Nkom has concluded that it is not appropriate to set a defined period of time after the establishment of the fibre access network in an area as a criterion for when the "homes passed" obligation arises. Based on the consideration of equal opportunities, Nkom believes that it is better to connect the possibility of "homes passed" access for access buyers to the opportunities open to Telenor's end-user activity to operate densification sales during the immediate period after the initial sales and expansion phase has been completed in a geographical area. In the decision, Nkom has therefore replaced the 12-month deadline with criteria for the start-up time for access buyers' "homes passed" sales which correspond to equivalent criteria that Telenor's own end-user activity must consider in conjunction with densification sales.

3.3.9 Access to backhaul services

Assessment in the notification of decision

Nkom has notified that Telenor will still be required to provide access to backhaul services, in order to ensure effective competition based on local access in Telenor's network and predictability for access buyers' investments related to such access.

Consultation responses

Telenor cannot see that Nkom documents an independent need for regulation of access to backhaul services.

In connection with third-party upgrading of the copper access network, Telenor refers to how it is unreasonable to require Telenor to offer backhaul. It is not given that Telenor has fibre infrastructure on the relevant section, and Telenor assumes that the obligation solely applies to established networks/capacity. Telenor furthermore remarks that fibre to be built for backhaul will often take other routes than the copper lines up to the micronode. It is not given that it is reasonable that the fibre end of the transport ends on existing HK. Telenor believes that the requirement is unreasonable and disproportional; Nkom cannot assume that it is always

existing network topologies that are expanded, but should take into account that often more optimal solutions will exist, to meet the need for backhaul.

Telenor believes as a minimum that Telenor must not be subject to an obligation to give access to backhaul services where there are also other suppliers.

NextGenTel in principle supports Nkom's proposal concerning access to backhaul services, without any further remarks.

Broadnet supports the notified regulation of access to backhaul services.

Nkom's assessment

Nkom disagrees with Telenor's claim that no independent regulatory need for access to backhaul services has been documented. Even though in some areas there are alternative backhaul solutions from other providers, Nkom believes that there is still a need for access to backhaul services from Telenor, in order to ensure effective competition in this market. The consultation responses from NextGenTel and Broadnet support Nkom's assessments that there is a need for access to backhaul services. On this basis, Nkom has found no basis to make any changes to the decision.

With regard to Telenor's comments concerning a third-party's upgrading of the copper access network, Nkom refers to how significant changes have been made to the regime for upgrading the copper access network, cf. Section 3.3.3. The issue will therefore be less relevant than appeared from the notification.

3.3.10 Central access to copper-based access networks

Assessment in the notification of decision

Nkom has notified that it is still necessary to require Telenor to offer central access to copper-based access networks in the form of broadband access. Telenor must also facilitate related services, such as multicast, to ensure equal opportunities for competition in the end-user market. In areas where Telenor upgrades the copper access network, Telenor must offer central access in the form of VUA copper. The access obligation concerning broadband access lapses in areas where Telenor offers VUA copper.

Consultation responses

Telenor remarks that Nkom appears to have inadvertently required Telenor not to withdraw access to SHDSL broadband access products already-sold. Telenor believes that this must be related to Nkom's lack of any basis to model the price of SHDSL. A delivery obligation for an indefinite period does not make sense.

Telenor furthermore refers to how Nkom has required Telenor to facilitate related services, such as the functionality for multicast of broadband access. Telenor expects that any new

orders will follow an assessment of the reasonableness of the request, especially if Telenor itself does not use such functionality.

Telenor also points out that today's DSL broadband access with E-line as broadcasting service does not include IP addressing/routing, but comprises Ethernet transmission at layer 2 of the OSI model.

Telenor questions the need to offer VUA copper when the same need can be met with broadband access, or possibly VULA copper. It appears to be disproportionate to impose an access obligation for VUA copper.

Broadnet believes that it is important to have clear transitional schemes for SHDSL broadband access. In particular this must be viewed in the light that SHDSL is an important precondition for effective competition in the business market. Any lapse, or substantial commercial deterioration, in the access to purchase SHDSL broadband access from Telenor will entail irreparable damage to the ability to compete in this market for other operators than Telenor.

Nkom's assessment

The notified obligation not to revoke access to SHDSL broadband access products already sold is linked to Telenor's right to upgrade the copper access network, and the dialogue in the Broadband Forum showed that VULA copper would not necessarily be an adequate replacement product for SHDSL. Nkom refers to how the notified right for Telenor to upgrade the copper access network by using excluding technology is subject to the condition that Telenor offers relevant replacement products and that this right entails an exemption from the notification rules that would otherwise apply. At the same time, the participants in the Broadband Forum were clear that the need for SHDSL was limited to fulfilling existing obligations related to the delivery by using SHDSL. In Nkom's assessment, there was thus a need to ensure further access to SHDSL for accesses already sold.

It can be seen from the decision in Market 3a that Nkom believes that the potential for the copper access network to be upgraded has been reduced compared to what was assumed in the notification. This in itself could reduce the need for secure access to accesses that use SHDSL products. The decisions in both Markets 3a and 3b also show that Telenor must give three years' notice in cases where the company makes changes that result in the lapse of accesses to which access is given. After a new assessment, Nkom has concluded that the notification obligation to a sufficient extent takes account of the access buyer using SHDSL access. The specific requirement not to revoke access to SHDSL broadband accesses already-sold is thus not maintained.

Telenor believes that the company cannot be required to facilitate related services without further assessment of the reasonableness of the request, especially if Telenor itself does not use any such related service/functionality. Telenor believes that it is necessary to make an

order to facilitate related services, such as the functionality for multicast of broadband access. In this respect, Nkom also refers to BP24 in BEREC's "Common Position" on the regulation of the former Market 5. Whether a specific request for access to broadband access with related services would be reasonable will have to be assessed in the light of the considerations stated in Section 4-1, second paragraph, of the Electronic Communications Act. Nkom therefore finds no basis to change the decision in this respect.

Nkom does not agree with Telenor that it would be disproportionate to impose an access obligation for VUA copper. Nkom refers to how it would not be costly to develop VUA copper in parallel with VULA copper. The obligation to develop VUA copper will furthermore be subject to the same conditions as for VULA copper with regard to when the obligation arises, cf. Section 7.2.5.6 in the Market 3a decision. Nkom therefore finds no basis to change the decision in this respect.

In Nkom's view, none of the consultation responses received provide a basis for changes related to the obligation to offer central access to Telenor's copper access network.

3.3.11 Central access to fibre-based access networks

Assessment in the notification of decision

Nkom has notified that Telenor will still be required to provide central access to fibre-based access networks (VUA fibre) in Market 3b.

Consultation responses

Telenor understands Nkom's notification to mean that Telenor's existing VULA product fulfils this obligation and asks Nkom to clarify whether the current connection point for Telenor's VULA product is to be considered to be a central access.

Nkom's assessment

Nkom can confirm Telenor's understanding with regard to how the existing VULA product fulfils the obligation to offer VUA fibre. With regard to the request to prepare connection points, Nkom refers to Section 2.4.2 of the market analysis, which specifies the technical connection level in the network for various wholesale services.

3.3.12 Central access to HFC networks

Assessment in the notification of decision

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

Consultation responses

NextGenTel believes that Telenor must be obliged to provide access in the HFC network. Access to Telenor's HFC network is technically possible to achieve, provided the required upgrading of the network. The explanation that such access was technically complicated to achieve, cf. the decision in the previous Market 5, no longer applies.

NextGenTel does not doubt that Nkom's coverage survey shows that most households connected to Telenor's HFC network can theoretically be offered fixed broadband via other access technologies. NextGenTel emphasises that there is considerable difference between theory and practice in terms of other providers' opportunities to compete to deliver offers to the customers in Telenor's HFC network. It is not normally considered to be profitable for others to establish parallel infrastructure where Telenor has already established an HFC network. It is not possible either to reach these customers through access to Telenor's copper- or fibre-based access network. Telenor normally avoids areas where they have already established an HFC network when modern new infrastructure is to be built up. NextGenTel is rather surprised that Nkom in this respect refers to "homes passed". Households which receive offers via Telenor's HFC network will not normally receive offers from Telenor prior to the establishment of a new, systematically developed fibre network, and with the proposed regulation of access to "homes passed", NextGenTel will thus be prevented from being able to use this access form in attempts to compete for Telenor's HFC customers.

NextGenTel believes that the argument that a relatively limited number of accesses will be available appears to be rather strange. For NextGenTel, the 117,000 HFC customers of Telenor are a significant customer base that it is of great interest to compete for.

Nkom's assessment

With regard to NextGenTel's comment that it is technically possible to grant access to HFC networks, provided that the network is upgraded, Nkom remarks the following: 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. 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. Furthermore, there are some technical challenges related to granting access to Telenor's HFC network. For access

buyers, there are e.g. technical challenges involved in providing linear TV via the HFC network. NextGenTel confirmed this at the meeting with Nkom on 24 April 2018. Access buyers will, however, be able to deliver broadband alone or in combination with streamed TV.

NextGenTel argues that it is not possible to reach customers in Telenor's HFC network through access to copper- or fibre-based access networks. Telenor's HFC networks are mainly located in densely-built residential areas. As Nkom's coverage survey shows and as Telenor has also confirmed, these areas are to a great extent covered by Telenor's copper network. It is thus possible to offer customers in these areas DSL broadband via the copper network. The extent to which broadband via the copper network is a real alternative for the retail users will depend on the speed that can be achieved. Achievable speed will, among other things, depend on the length of the copper access or the distance to the nearest exchange. Since Telenor's HFC network is located in densely-built residential areas, there is reason to believe that the length of most copper accesses is not particularly long and that relatively high speeds can be achieved over at least some of the accesses. Nkom thereby assumes that broadband via the copper network is a real alternative to broadband via the HFC network for some of the customers in Telenor's HFC network, and that these customers can be reached via access to copper-based access networks.

With regard to NextGenTel's comment that the 117,000 HFC customers of Telenor are a significant customer base that it is of great interest to compete for, Nkom remarks as follows: As stated above, it is technically challenging for NextGenTel and other access buyers to deliver linear TV via HFC networks. At a meeting with Nkom on 24 April 2018, NextGenTel notified that the company mainly wants to be able to 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 NextGenTel is thus significantly lower than the 117,000 broadband customers in Telenor's HFC network. Nkom's statistics show that the majority of buyers of broadband via Telenor's HFC network also require 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.

At a meeting with Nkom on 24 April 2018, NextGenTel notified that access to HFC networks is especially important if the number of broadband customers via the network will be stable going forward. If there proves to be convergence from HFC networks to fibre networks, such access will not be as important. 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 networks. 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. This is supported by Nkom's statistics, which show a reduction of just below 13,000 in the total number of broadband subscriptions via HFC networks from full-year 2016 to full-year 2017. During the same period, the number of broadband subscriptions for Telenor delivered via HFC networks decreased by around 8,500. At meetings with Nkom, individual providers have expressed an expectation that the HFC networks in Norway will probably be replaced by fibre networks in the long term.

On this basis, and according to a proportionality assessment, Nkom has concluded that there is no basis to impose an access obligation for Telenor's HFC network. Nkom thus does not uphold NextGenTel's comment, but maintains the conclusion from the notification of its decision. However, Nkom has made a few updates to the text concerning HFC networks in the decision.

3.3.13 Access to information and support systems

Assessment in the notification of decision

In the notification, Nkom has specified the content of the obligation to offer access to information and support systems in a number of respects. Nkom has done this in order to ensure that remote access buyers are not discriminated against in respect of access to information and support systems, and that the access obligation concerning these systems is effective.

Consultation responses

In its consultation response, **Broadnet** refers to the appeal concerning various matters from 2015, which among other things concerned Telenor's information and support systems. The appeal is described in Section 3.6.7 of the market analysis. Among other things, the appeal concerned defects and deficiencies in the KAPAKS system and the test opportunities in the systems. Broadnet believes that Nkom has taken too little account of Broadnet's appeals in the notified regulation and requests Nkom to make a new assessment of the aforementioned points of appeal.

NextGenTel in principle supports the proposal without further remarks.

Nkom's assessment

Nkom has already specified the content of the obligation to offer access to information and support systems in Section 7.2.13 of the M3a decision and in Section 7.2.11 of the M3b decision.

Nkom believes that the proposed specifications accommodate the points of appeal upheld by Broadnet in 2015, and thereby sees no reason to include any further specifications in the decision on the basis of Broadnet's input.

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

Assessment in the notification of decision

An obligation to prepare service level agreements (SLA) and associated compensation arrangements in the form of service level guarantees (SLG) will give Telenor an incentive to safeguard the quality of the company's wholesale products. In the notification, Nkom has proposed specification of which key activities in the supply chain the SLAs must be related to. This is in order to strengthen the relation to the requirement for publication of key performance indicators (KPIs). Nkom has furthermore proposed minimum requirements concerning the specific SLA targets that will be included in Telenor's standard agreements. Nkom has also proposed specifying the compensation provisions to be included in Telenor's standard agreements.

Consultation responses

Telenor generally believes that Nkom assumes excessively detailed regulation of the company's standard agreements. Concerning the specific requirements, Telenor remarks that in particular the SLA/SLG requirements concerning migration present a challenge, since this also requires a lot of cooperation between the parties. Telenor believes that requirements of only one of the parties might disrupt incentives to execute the project.

Telenor furthermore believes that the requirement drawn up for response time in the ordering system is not trivial and may possibly be undertaken as random sampling from inside the firewall.

Telenor refers to Nkom's proposal that the required compensation amount should reflect the individual access buyer's lost income and/or increased costs. Telenor believes that any such requirement would be unfortunate since it might cause access buyers to receive different compensation for the same error. Telenor therefore believes that any compensation amount must be standardised.

NextGenTel had expected that Nkom would have chosen a more active approach with regard to the content of the SLAs/SLGs, for example based on what is stated about SLAs/SLGs in the current standard agreement. NextGenTel believes that the current standard agreement and quality objectives therein do not reflect the actual delivery times, which means that Telenor only rarely or never faces compensation requirements. Telenor's standard agreement must, as NextGenTel views it, be adapted to reality, and the compensation arrangements must be tightened up to ensure compliance in practice.

Broadnet points out that there are weaknesses associated with the average delivery time, and that different practices exist for the calculation of delivery time. Broadnet refers to how Nkom does not require the use of a specific method of calculation that would have created increased predictability for the wholesaler customers and clear frameworks for Telenor to relate to, and asks Nkom to assess the inclusion of a requirement for the use of a specific method.

Nkom's assessment

Nkom disagrees with Telenor that the regulation of the company's standard agreements is too detailed. Among other things, Nkom refers to how this is important in order to streamline and ensure compliance with other imposed obligations such as the access obligation and non-discrimination. Nkom furthermore refers to the more detailed assessment of this requirement in Section 7.5.3.2 of the decisions.

Telenor states in the consultation response that as of today the company does not have systems to measure response times in the ordering system and that this may need to be based on random samples from inside the firewall. Nkom considers that this may be technically challenging, but in Nkom's assessment it is important to maintain the requirement in the decision that SLAs must be drawn up for response times in Telenor's ordering systems with related support systems. It will be more difficult to ensure that Telenor complies with the access obligation and non-discrimination requirements without any such SLA. There will be nothing to prevent the measurements being based on random samples for as long as these give a representative picture of the response time in Telenor's ordering systems.

Nkom can see that requirements for SLA/SLG on migration may be more challenging than other SLAs/SLGs because this requires greater cooperation between the parties. However, Nkom disagrees with Telenor that there is no need to set requirements of SLA/SLG on migration. If, for example, no SLA is set for the maximum migration time between various wholesale products, Telenor's incentive to ensure migration within what is deemed to be a reasonable deadline will be weakened. Since it may be the wholesale customer that is considered responsible for the migration taking a long time, this should not, on the other hand, have negative consequences for Telenor. Nkom believes that it should be possible to regulate such conditions in the SLA agreement between the parties. In this context, reference is made to how, also in the current SLA agreement for operator access, Telenor has set the requirement that certain preconditions must be fulfilled for the SLAs to apply between the

parties². Nkom believes that, in the same way, Telenor should be able to require that certain conditions must be fulfilled by the access buyer in connection with migration between various wholesale products, in order for the SLAs to apply. In Nkom's assessment, this will give the access buyer sufficient incentive to complete the project.

Telenor believes that Nkom's requirement that compensation amounts must reflect the individual access buyer's lost revenue/increased costs might give the access buyers different compensation for the same fault. On the basis of the response, Nkom has made a few changes to the notified compensation scheme. Nkom no longer sets specific requirements for how the compensation amount is to be determined. Instead, Nkom gives weight to how Telenor and the access buyers must achieve agreement concerning what the compensation should be. Reference is made to Nkom's more detailed assessment of this in Section 7.2.15 of the Market 3a decision and Section 7.2.13 of the Market 3b decision.

Nkom believes that the specified requirements for SLAs and SLGer give Telenor sufficient incentive to ensure the quality of the company's wholesale products and therefore cannot see any basis to tighten this up further, as NextGenTel requests.

With regard to the delivery time calculation method used, Nkom agrees with Broadnet that it is important that this is clarified between Telenor and access buyers, in order to ensure predictability and a shared understanding of the implications of the delivery time requirements in the standard agreement. At the same time, Nkom believes that this is something that Telenor and access buyers should in principle be able to agree on, without any need to specify a particular method in Nkom's decision.

3.4 Price and accounting regulation

3.4.1 Overall comments on the price regulation

Assessment in the notification of decision

Nkom has notified that Telenor will be subject to price regulation in a number of areas, in the form of price caps, requirements not to subject access buyers to margin squeeze, or cost orientation requirements.

Consultation responses

Telenor believes that Nkom goes a long way towards regulating in order to ensure the profitability of the market operators, rather than promoting competition in the markets in order to maximise economic effectiveness. Telenor furthermore believes that Nkom has not shown that the terms in Section 4-9 of the Electronic Communications Act are fulfilled for each of the price obligations imposed. Nkom has not shown either that the lack of effective competition in

² https://www.telenorwholesale.no/wp-content/uploads/2016/12/OA_Bilag-3_-SLA_gyldig-fra_2013-05-01-1.pdf

the markets entails that a provider with significant market power can maintain a disproportionately high price level, or establish price squeezes.

Broadnet disagrees with Telenor that the terms for price regulation in Section 4-9 of the Electronic Communications Act are not fulfilled. All available information indicates that the existing operator access and broadband access prices are too high.

Get TDC believes that the pricing of the access services and associated access points should reflect the actual access costs, and not be bundled with transport elements already established by Get TDC.

Nkom's assessment

Nkom disagrees with Telenor that the notified regulation is more likely to ensure the market operators' profitability, rather than promoting competition and economic effectiveness. Nkom has concluded that it is not appropriate to draw clear conclusions with regard to regulation principle 2 or 3. The notified price regulation of local and central access to the copper network is appropriate to ensure continued competition for nationwide services based on access to Telenor's copper network. Nkom assumes that it is not realistic that Telenor's nationwide copper network will be duplicated. This advocates relatively strict price regulation via the selected method of using modelled costs.

Furthermore, the notified price regulation for NGA (fibre and upgraded copper networks) is set up to provide incentives for investments in the NGA infrastructure, at the same time as access buyers must not be exposed to margin squeeze.

Nkom believes that the notified regulation ensures effective use of Telenor's copper network, while maintaining dynamic efficiency through predictability and incentives for investments in high-speed broadband.

Get TDC believes that the pricing of the access services and associated access points should reflect the actual access costs, and not be bundled with transport elements already established by Get TDC. Nkom emphasises that the price regulation for the various access forms is linked to where in the network access is given. If access is given at the local level, e.g. in the form of copper-based LLUB, the price regulation will be linked to the access part of the network. If access is given at central level, e.g. in the form of VUA fibre, there will be transport elements in the access product that will be reflected in the current price regulation.

3.4.2 Price regulation of physical access to copper and broadband access

Assessment in the notification of decision

Nkom has further developed the LRIC model for access networks and used the model as the basis for the determination of price caps for copper-based LLUB and SLU in Market 3a, and copper-based broadband access in Market 3b.

Consultation input on the notification of decision

Telenor believes that it is problematic to use historical cost to determine the value of reusable infrastructure. Telenor believes that this infringes the EU's recommendation (2013) for how models for fixed access networks should be designed. This approach leads to under-compensation of Telenor's access lines, as well as incorrect price signals in the market ("build-or-buy"). Telenor believes that the EU's recommendation is clear that the method to determine the value of reusable infrastructure in the Regulatory Asset Base (RAB) must be the replacement cost, and the recommendation also specifies that the index method must be applied in order to calculate the replacement cost. Telenor believes that Nkom acknowledges this in the notification. Nkom nonetheless chooses to deviate from the recommendation. This is justified by how Telenor has historically been regulated on the basis of historical cost and that a transition to replacement cost will entail over-compensation for Telenor.

Telenor believes that it is only during the period 2006-2009 that LLUB has been priced on the basis of historical cost. From 2009, the regulation has been based on a subjective assessment by Nkom, where compliance with historical cost is vague. The period in which LLUB was priced on the basis of historical cost was very short, also shorter than the period with replacement cost. This must be viewed in the context of a long lifetime at underlying infrastructure level, typically 30 or 50 years. The period of using historical cost is also short if it is accepted that the prices during the 2009-2017 period were based on historical cost.

Telenor agrees with the premise that historical cost (HCA) and replacement cost (CCA) give the same present value of cost coverage and that a shift during the life cycle can result in over-compensation. However, Telenor believes that in this case the premise that the network owner has received high compensation through HCA in the past does not exist. Telenor points to how the LLUB product has only been available at the end of the assets' (average) life cycle, i.e. the part of the life cycle in which HCA compensates less than CCA. As a consequence, Telenor has not received the high compensation in the past which would entail that a transition from HCA to CCA would give over-compensation. This might have had to be obtained before LLUB came as a product. Telenor believes that a transition from HCA to CCA does not represent over-compensation, but on the contrary, a partial reversal of the under-compensation that followed from the previous method change from 2006. Since the valuation method has already been altered several times during the LLUB product's existence, the use of HCA in future regulation will not result in any improved consistency.

Telenor furthermore refers to how a main objective of regulatory intervention in markets that are not believed to function is to strive for the outcomes that would arise in a functioning market. This indicates that CCA must be used, rather than HCA, since CCA better reflects the costs and financial decisions to be considered by operators in a market. Among these decisions is the decision to buy access or invest itself ("build or buy"). Telenor believes that Nkom argues that correct "build/buy" signals should not be given weight in the Norwegian broadband market. Nkom justifies this with how the price cap on LLUB has little impact on the

development of fibre and underpins the claim by referring to how the fibre development has continued steadily throughout the period after price-cap regulation based on HCA was introduced in 2006. Telenor believes that continued fibre development does not indicate that the LLUB price does not affect “build/buy” decisions. There is nothing to indicate that the fibre development rate would not have been higher in a scenario where the LLUB price was based on CCA. Telenor also finds it unfortunate that, through regulation, Nkom has favoured copper rather than other access technologies and will furthermore continue with such favouring in future regulation.

Telenor furthermore believes that Nkom, apparently systematically, has made method choices which reduce the current cost results from the model. This includes choices that are internally inconsistent and choices that breach the EU recommendation, e.g. inclusion of copper cable in RAB, use of HCA to calculate the value of the infrastructure network in RAB, and the use of CCA to calculate compensation in future years for the infrastructure in RAB. Telenor also refers to how, in the notification, Nkom has considered the Commission’s 2013 recommendation and given weight to how access for LLUB in copper networks in Europe should lie in the range of EUR 8-10. It can thereby seem that Nkom has taken the required result as the starting point, and then sought to adapt the methods so as to achieve this result. Telenor believes that the Commission only sets out a prediction that the methodology that is recommended will give average prices in a given interval. The purpose of specifying any such interval is to give an indication of how quickly models that follow the recommendation should be implemented, and it is not the Commission's intention to require national regulators to set LLUB prices that are within the range of EUR 8-10.

In its comments on the consultation responses, Telenor refers to how Broadnet believes that the LRIC model is unsuitable, since it applies the replacement cost to a dying access technology. Telenor refers to the Commission's recommendation and points out that Nkom’s model makes a significant write-down of reusable infrastructure. The replacement cost is not used on this part of the cost base, and Nkom goes considerably further than the recommendation by including copper cables in this write-down.

Telenor furthermore believes that Broadnet’s and NextGenTel’s assumption that the copper network’s costs should be reduced as the copper network decreases and is partly replaced by fibre is only correct if we consider absolute dimensions of this cost-base for the copper network. On considering unit costs, the declining customer base entails a steadily increasing copper length/track length per copper customer, and the costs per customer increase. Replacement of copper with fibre does not entail lower costs either. On the contrary, new fibre replacing written-down infrastructure will increase the costs per unit.

Telenor refers to how Broadnet believes that Telenor’s intention not to make larger investments in the copper network in the future indicates that the cost results must become lower. Telenor believes that this is irrelevant, since Nkom’s model uses annuities that only reflect investments already made, and not future investments.

Telenor also believes that several of the statements made by Broadnet and NextGenTel are based on incorrect understanding of the facts and regulations with regard to supposedly super profits, excessive cost input from Telenor, and EEA harmonisation. Telenor refers, among other things, to how the article in Telecom Revy is based on speculation and relies on linear depreciation of historical cost. Furthermore, Telenor does not have any own LRIC model. Nkom's cost model was prepared by an external consultant and has been subject to open consultation. Telenor considers it unreasonable that the costs in Norway must be as low as an average for the EU. Norway's topography, dispersed population and high price levels indicate that it is very likely that the costs of access networks in Norway might exceed the average in Europe. There are no legal requirements either for the harmonisation of EU/EEA prices in this area. The harmonisation objective applies exclusively to the modelling method to be used.

Broadnet disputes that there are grounds to increase the copper prices. This will cause irreparable damage to competition in the short and medium term. If the price increase is maintained, it must be phased in over time.

Broadnet believes that, for various reasons, the LRIC model is not suitable to calculate the level of price caps for local, physical access to the copper network. Fully distributed historical costs for copper do not make sense for a dying technology that will not be replaced by new copper. The size of the copper network is declining year by year. Accesses are being replaced with fibre or LTE, and transport from access level is being replaced with fibre. An ever-declining copper network has to be replaced and maintained. The cost base from 2006 is outdated. Telenor has signalled that they will not upgrade in the form of G.fast or vectoring, so that no new investments will be added that could have entailed a higher replacement cost/increased cost basis.

Broadnet furthermore believes that the cost level on which the regulation is based is not accurate. The model provides for interpretation of which costs are to be included, and Telenor may include a number of costs which may lead to an excessively high price. Broadnet refers to equivalent problems in the UK and highlights that both the UK and France have moved away from the LRIC model for reasons based on specific assessments of the national markets. There are no good reasons that the LRIC model should give an outcome which indicates that it is much more costly to operate a copper network in Norway than in other European countries. Both commercial and technical conditions indicate that the price of copper accesses should decline, not rise, in the immediate future.

Broadnet believes there is no actual or judicial basis to increase prices for the lease of copper. The copper network is diminishing, and there is no reinvestment. The high and increasing price cap does not give Telenor sufficient incentives to reduce costs and operate effectively. Sufficient consideration is not made of access buyers and the terms of competition in the access market. The price cap makes it very difficult for the access buyers to operate profitably, and to offer the lowest possible prices in the retail market. Telenor already operates the copper network with billion-kroner surpluses. Price increases mean an excessive enrichment of

Telenor at the expense of access buyers and their opportunity to compete. Uncertainty related to future price setting should result in the lowest possible price cap being used, out of consideration for access buyers and competition. The price caps should be set on an annual basis.

Broadnet refers to Nkom's notification of a significant increase in the broadband access prices compared to the current level. The LRIC model should not solely be used to raise a price cap, since the model does not ensure an appropriate cost level. Nkom does not give any explanation for why prices should be increased. Broadnet requests an explanation for the notified increase and requires the regulation to be adjusted, if such documentation is not available.

Broadnet takes a positive view of how price regulation of SHDSL broadband access is anticipated.

NextGenTel believes that local, physical access to the copper network should be subject to strict price regulation and supports regulation based on price caps/maximum prices. However, NextGenTel believes that, also in the immediate future, price caps should be set on the basis of a concrete assessment in which weight should be given to other elements than just the LRIC result. It can be questioned whether the result from the LRIC model is sufficiently robust. It is unclear whether the model takes account of cost-rationalising changes that have taken place in recent years, including the replacement of copper-based infrastructure with more effective fibre-based infrastructure. It is difficult to have confidence in a model result which shows that the price must be increased and not reduced, over the coming years.

Referring to an article in Telecom Revy, NextGenTel furthermore believes that today's price apparently gives Telenor super profit from the copper network, and there is much to indicate that the current price cap has not been too low, at any rate. The LLUB price in Norway is well above the average in the EU, and the harmonisation consideration indicates that prices should be reduced rather than increased.

NextGenTel refers to how Nkom assumes significant increases in regulated prices for broadband access in the coming years. No explanation is given for the reason for increased prices. NextGenTel believes that, also in the case of broadband access, prices must be determined on the basis of an overall assessment. Moreover, the method used for the pricing of Premium and Proff is somewhat random and inadequate as a basis. Proposed regulation of SHDSL is unclear and may lead to conflict. Either a specific price must be set, or it must be decided that today's price level is to be continued.

In its comments on Telenor's consultation response, NextGenTel warns strongly against using the replacement cost to determine the maximum price for LLUB. NextGenTel agrees with Nkom that the consideration of stable and predictable prices indicates that historical costs should form the basis for the maximum price regulation of local, physical access to the copper network. However, NextGenTel believes that the maximum price must be determined on a

broader basis than the modelled costs alone. Price regulation based on an overall assessment, as in current regulation, will contribute better to predictable and stable maximum prices.

Get TDC believes that there is no basis to increase the prices for local, physical access to copper. The infrastructure has been written off and Telenor has notified that they do not wish to invest in upgrading the copper network. Telenor discontinues copper networks where overlapping fibre networks are built. Get TDC's experience indicates that the maintenance costs are stable. If Nkom maintains the notified price adjustment, TDC believes that the increase is excessive and refers to the consultation responses from Broadnet and NextGenTel.

Get TDC also considers it unfortunate that the price level in Norway is above the EU level. The notified regulation indicates that Nkom is not harmonising the use of remedies, even though Telenor has had and still has very high margins for the relevant services.

TDC believes that the notified regulation only takes account of securing access that makes it possible to compete with Telenor in the private markets, and that it is important to create a framework that prevents the re-monopolisation of the enterprise market. TDC asks Nkom to adjust several of the notified commitments, so that they can continue to compete for business customers in the future, while ensuring that investments are not lost.

Additional consultation on adjustment of the data base in the LRIC model

After the consultation period, Nkom has reviewed the LRIC model in order to ensure that it is as updated and correct as possible. An update of demand data was performed on the basis of the electronic communications statistics for 2017. A new assessment was also made of the purchase history profile for assets with 20/25 years' lifetime. In overall terms, the changes led to a reduction of the modelled costs for LLUB and SLU from those in the notification, and this was reflected in new notified price caps for LLUB and SLU. The adjustments to the data basis also led to Nkom notifying new price caps for broadband access.

In connection with the consultation, Nkom received consultation responses from Telenor and Broadnet.

Telenor considers it natural to update the model with updated figures from the electronic communications statistics. Telenor also assesses that Nkom's use of the age profile for copper assets with lifetimes of 20-25 years is accurate. However, Telenor is critical concerning the procedure and emphasises that this change should have been part of the consultation in 2015-16, so that it could be considered more comprehensively by all parties.

Broadnet supports the proposed adjustments. Broadnet believes that the price cap for LLUB should be lower in Norway than in other EU countries and believes this can be justified by national conditions. In a supplementary comment, Broadnet refers to how the current price regulation of LLUB, with an emphasis on historical cost, has not negatively affected the fibre

investments. The most important argument is that LLUB has become a far more important input factor in Norway than in other EEA countries. This is due to the fact that, since the first decisions were taken, the authorities have not imposed effective regulation of broadband access prices on Telenor. As a consequence, LLUB has accounted for a larger share of the accesses of access buyers than in other comparable countries.

Nkom's assessment

Nkom's assessments below respond to some of the comments related to price regulation of physical access to copper and broadband access. Other comments related to the use of modelled costs for the calculation of price caps for local and central access to the copper-based access network are answered in Annex E to the model documentation³ for Nkom's LRIC model for fixed access networks.

With regard to Telenor's comments that the use of historical cost to determine the value of reusable infrastructure infringes the EU's recommendation for how to design models for fixed access networks, Nkom believes that this argument is identical with previous comments that Telenor has made concerning the principled choice of LRIC model. Nkom therefore refers to the document "Modelling the costs of copper networks in the Norwegian context" of 15 December 2017 and, in particular, Chapters 4 and 6.

Telenor believes that the use of CCA better reflects the costs and economic decisions to which operators in a market must relate, including with regard to decisions on buying access or themselves investing in infrastructure. Telenor also believes that there is nothing to indicate that the fibre development rate would not have been higher in a scenario where the LLUB price was based on CCA. Nkom again refers to how existing regulation has not had unintended negative consequences for the investments in fibre. Nkom notes that the fibre investments are high in Norway, and the assessments related to competition problems in the broadband market indicate that the proposed regulation will be the most effective approach for society. Nkom also points out that the development in the price of LLUB may have effects that draw in different directions when it comes to investments in fibre.

In its comments, Telenor refers to how, in the notification, Nkom has considered the Commission's 2013 recommendation and given weight to how access for LLUB in copper networks in Europe should lie in the range of EUR 8-10. It can thereby seem that Nkom has taken the required result as the starting point, and then sought to adapt the methods so as to achieve this result. Nkom refers to how the modelling of the costs is independent of any predefined result and cannot see that Telenor documents any such relation. However, Nkom has made some adjustments to the text based on Telenor's comment.

Broadnet disputes that there is any basis to increase the copper prices. Nkom believes that the modelled costs give a correct picture of the costs of the relevant access products in the copper

³ Documentation of Nkom's vAcc2.3 model, 19 July 2018.

network. After the last adjustments, the price caps for LLUB and SLU will be lower than the current price caps in Markets 4 and 5.

With regard to NextGenTel's comment that, also in the coming period, the price caps should be determined on the basis of a concrete assessment of several elements besides modelled results from the LRIC model, the LRIC model has been developed further from the model on which the 2014 decision was based. In contrast to before, there is now a basis to apply modelled results directly to determine price caps for local and central access to the copper-based access network. We also refer to the description in Section 7.3.2 in the decision in Market 3a.

NextGenTel believes that the price caps for Premium and Proff are rather randomly set and are not a very suitable basis for the determination of price caps. Nkom emphasises that the method uses cost calculations from the LRIC model as the basis, and also includes the historical relationship between the prices for Basic and Premium/Proff products. Nkom believes that these calculations are not random. The notified price caps entail a price decrease for the majority of the broadband access products.

NextGenTel believes that the prices for SHDSL should either be set very concretely or that the current level should be continued. In the notification, Nkom has proposed that the prices must not essentially deviate from the current level. This entails that the current price level is continued to a great extent.

The comments on Nkom's revised notification of price caps for copper-based LLUB, SLU and broadband access do not indicate any basis for further changes to the data basis for the LRIC model, and Nkom has therefore concluded that price caps are determined in line with the terms of the revised notification. Nkom agrees with Telenor that the change regarding the age profile for copper assets with lifetimes of 20-25 years should ideally have taken place earlier in the process, but also believes that the key consideration is that the assumptions on which the model is based are as correct as possible.

3.4.3 Margin squeeze test, gross margin test and hybrid model (VULA/VUA copper and VULA/VUA fibre)

Assessment in the notification of decision

Nkom has notified that Telenor will be obliged to offer access prices which ensure that the access buyer is not subject to margin squeeze, for local virtual access and for central access to copper-based and fibre-based access networks (Markets 3a and 3b). To ensure compliance with the obligation, Nkom will perform margin squeeze tests in accordance with established principles. Telenor must also document a positive gross margin for all of Telenor's individual fibre products in the retail market.

Consultation responses

Telenor believes that it must be clarified how other providers will be able to price their VUA product if there is no benchmark based on a margin squeeze test of Telenor's VULA copper product.

Through the development of the margin squeeze model for VULA fibre and several appeal cases concerning follow-up on this model, Telenor has pointed to problematic aspects of Nkom's choice of method in this respect, including the lacking annualisation of sales costs. Telenor stands by these objections. Telenor believes that it appears unclear whether Nkom agrees or disagrees with Telenor that acquisition costs must be covered during the customer's average lifespan. Nkom refers to the Commission's recommendation without arguing against its principles, while Nkom reaches a conclusion on principle 7 without including all the elements of the recommendation. Telenor does not see what justification Nkom might have to possibly deviate from the recommendation.

Telenor points to how some of the fibre products have very few customers and believes that Nkom has not made it clear which competition problem is to be resolved by these few fibre products being ensured a positive gross margin. The requirement of a positive gross margin for all of Telenor's individual fibre products on sale appears to be redundant and insufficiently justified. Telenor's fibre products consist of a combination of different data speeds, an optional TV product, and an optional broadband telephony product. It is not likely that another combination of these three elements than what is defined as the most attractive fibre-based retail products would have a negative gross margin, as long as Telenor passes Nkom's gross margin test for the most attractive fibre-based retail products.

Broadnet supports the introduction of margin squeeze testing of copper-based products. The company believes that such a model must cover all relevant products, also in Market 3b for VUA copper. Broadnet believes that regulation should provide sufficiently good incentives for compliance, e.g. by requiring Telenor to pass the margin squeeze test before significant changes in the product portfolio and the launch of new products.

Broadnet furthermore points out that in the light of the dynamic market development and ongoing upgrading, a key aspect is that the regulation is technology-neutral. Equally stringent requirements of profitability based on access to copper-based and fibre-based services are a prerequisite in this respect.

Broadnet believes that the quality of the broadband services will gain far greater significance with the introduction of a clear distinction between regulation of the services that are "contended" and "uncontended". It is important that the margin squeeze test takes this into account, so as to compare qualitatively similar wholesale services.

NextGenTel agrees that VULA copper should be subject to price regulation. NextGenTel believes, however, that the margin squeeze regulation is not a very transparent and predictable regulation for the access buyers, and a regulation that gives the regulated provider considerable opportunities to delay and to exert influence. NextGenTel therefore believes that

a different price regulation method should be selected, e.g. price caps or cost orientation. The same applies to VUA copper.

NextGenTel points out that if margin squeeze regulation is maintained, the margin squeeze test must be designed and adopted at the latest at the same time as the new regulation takes effect. If this test is not in place, the price regulation will in reality have little or no effect.

NextGenTel furthermore emphasises the need for a decision to set out clear provisions regarding refund if the margin squeeze test shows that a regulated provider has operated with access prices that have subjected the wholesale buyers to margin squeeze, including clear provisions for how rectification will take place in future.

NextGenTel believes that there is a need for frequent testing, e.g. quarterly. In NextGenTel's view, frequent testing will not be particularly onerous since it will gradually become a routine for Telenor to contribute to this.

Get TDC believes that it is unfortunate to use margin squeeze testing as the starting point for price regulation of fibre and endorses the consultation comments from NextGenTel and Broadnet in this respect.

Nkom's assessment

Nonetheless, the decision does not provide for access buyers to upgrade the copper network with excluding effect for others. There is therefore no need to impose access buyers to provide a VUA product. Telenor's comment that it needs to be clarified how other operators will be able to price their VUA product if there is no benchmark based on a margin squeeze test of Telenor's VULA copper product is therefore no longer relevant.

With regard to Telenor's comment that it is unclear whether Nkom agrees or disagrees with Telenor that acquisition costs must be covered during the customer's average lifetime, and that Nkom refers to the Commission's recommendation without arguing against its principles, while Nkom draws a conclusion concerning principle 7 without including all elements from the recommendation, Nkom remarks the following: In the margin squeeze tests in Markets 3a and 3b, Nkom will consider sales and acquisition costs in the same way as in the margin squeeze test in the former Market 5. The sales and acquisition costs will thus not be annualised over the course of their lifetime, but will be covered in the year in which the costs are incurred. Nkom does not consider this treatment of sales and acquisition costs to infringe the recommendation. However, Nkom has made certain updates to the text regarding principle 7 in appendix 4 in Market 3b.

With regard to Telenor's comment that the requirement of a positive gross margin for all of Telenor's individual fibre products on sale appears to be redundant and to have little justification, Nkom refers to how the requirement of a positive gross margin solely applies to Telenor's individual (stand alone) fibre products, and not to all of Telenor's fibre products, which consist of a combination of different data speeds, an optional TV product and an

optional broadband telephony product. The requirement of a positive gross margin is thus far less extensive than Telenor has assumed in its consultation response. The margin squeeze test, which tests a portfolio of flagship products, gives Telenor flexibility in its pricing of products. The requirement of a positive gross margin sets a limit to this flexibility, by ensuring a positive gross margin for all individual fibre products. In Nkom's assessment, any such requirement is necessary to ensure the purpose of the regulation. Nkom points out that the requirement of a positive gross margin is a continuation of the current requirement in the Market 5 decision and is thus not a new obligation. On the basis of Telenor's response, Nkom has made certain clarifications in the text regarding the requirement of a positive gross margin in the decision.

Nkom shares Broadnet's view that the margin squeeze model must cover all relevant products, even in Market 3b for VUA copper, if such a product becomes relevant. As far as possible, Nkom will apply the same 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. Appendix 3. Further details of this may be provided in connection with a separate decision on principles and the specific design of the margin squeeze test for VUA copper at a later date. In such case it will be possible for providers to provide a consultation response.

Nkom shares Broadnet's view that, in the light of the dynamic market development, a key aspect is that the regulation is technology-neutral and that there are thus equally strict profitability requirements for access based on copper-based and fibre-based services. Nkom thus refers to how the regulation is technology-neutral. As far as possible, Nkom will apply the same 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). Nkom will assume equally stringent requirements of profitability (positive margin) for copper- and fibre-based services. Furthermore, the same weighted average cost of capital (WACC) will be used.

Nkom also shares Broadnet's perception that it is important that the relevant margin squeeze tests take account of whether the wholesale products are "contended" or "uncontended". The margin squeeze tests will take account of how different access products may entail different network configurations.

Concerning Broadnet and NexGenTel's comments that regulation should provide sufficient good incentives for compliance, as well as the need for frequent tests, Nkom remarks the following: Nkom agrees that the regulation should provide sufficiently good incentives for compliance. Experience shows that Telenor's wholesale prices for today's VUA fibre product are not frequently changed. The cost data in the margin squeeze model is mainly taken from Telenor's product accounts, which are prepared once a year based on full-year figures. On this basis, Nkom believes that there is no basis for a general rule which calls for more frequent tests than twice a year. However, Nkom will be able to perform margin squeeze tests at its own

initiative if this is appropriate; e.g. if new wholesale products are introduced in Market 3b, or there are significant changes in the retail prices for fibre.

With regard to NextGenTel's comments that the margin squeeze regulation is a not very transparent and predictable regulation for the access buyers, that the regulation gives the regulated provider considerable opportunities to delay and to exert influence, and that another price regulation method should be selected, Nkom remarks the following: Nkom has concluded that it is not appropriate to impose strict price regulation in the form of price caps or cost orientation, but that it is appropriate to impose an obligation on Telenor to offer access prices which ensure that access buyers are not subject to margin squeeze. The principles for margin squeeze tests for VUA fibre in Market 3b are prepared on the basis of the principles for margin squeeze tests for VULA fibre in the former Market 5. Based on experience from the implementation of the margin squeeze tests in the former Market 5, Nkom has, however, seen a need to make some adjustments to the principles in order to ensure more effective and predictable implementation of the margin squeeze tests. Section 3.1 in "Principles for use of margin squeeze tests for central access to Telenor's fibre access network in Market 3b (VUA fibre)" contains a more detailed description of the method for running the margin squeeze test and which scale adjustments must be made. Before running the margin squeeze test, Telenor and access buyers will, among other things, be informed of which items Nkom believes there is a basis to adjust, based on how access buyers do not have the same economies of scope and scale as Telenor, with equivalent percentage rates. Nkom believes that the method of implementing margin squeeze tests described in the principles document ensures that the margin squeeze test is performed in an effective and predictable way for both Telenor and access buyers. Nkom has made some adjustments to the principles document and the decision in Market 3b.

Regarding NextGenTel's comment that the margin squeeze test must be designed and adopted by no later than at the same time as new regulation comes into force, Nkom remarks the following: Nkom will prioritise developing and adopting margin squeeze tests for VULA fibre as quickly as possible. It is not possible, however, for the margin squeeze test to be designed and adopted when the new regulation enters into force. Nkom has the objective that the principles and margin squeeze test must be completed before the launch of the new wholesale products. When it comes to developing and adopting new margin squeeze tests for VULA and VUA copper, this will depend on any upgrading of the copper network by Telenor. If Telenor upgrades the copper network so that the company needs to develop access products, Nkom will start the development of margin squeeze tests. Nkom has the objective that principles and margin squeeze tests for VULA and VUA copper must be completed before the launch of any new wholesale products.

With regard to NextGenTel's comment that the decision should include clear provisions regarding refund and rectification, on the basis of NextGenTel's input Nkom has included a description of how rectification will be implemented in the decision. If the margin squeeze tests

are not passed, i.e. do not produce a positive result, Nkom will require rectification of Telenor's access prices, cf. Section 4-9 of the Electronic Communications Act. With regard to refund, at the request of access buyers, Nkom will have to make a concrete assessment of whether a individual decision on the refund of the excess price should be made in each individual case. Nkom has included a description of the process on any request for refund in the decision.

3.4.4 Maximum price for insert cable (“homes passed”)

Assessment in the notification of decision

Nkom has notified that Telenor may charge the access buyer a fee for the establishment of branch lines to “homes passed” households connected to Telenor's fibre access network. The upper limit for the fee will be the establishment fee offered to the relevant household by Telenor's retail activity during the initial sales process prior to the development of the fibre access network.

Consultation responses

Telenor points out that in the case of densification sale, the economic assumptions made in the original development project are obsolete, and the picture will be re-assessed. There is no correlation between which offer the customer received on the initial development and the offer received by the customer in connection with outgoing densification sale. In the case of ingoing densification sale, the indicative price is the norm. If an opportunity is given for sale to “homes passed”, the access buyer should pay a fixed establishment fee that is independent of the historical establishment fee, plus further invoicing of contractor costs. The individual access buyer itself should be able to decide its establishment fee for the end-user, regardless of the wholesale price of establishment.

Nkom's assessment

Nkom assumes that the price regulation of “homes passed” is designed so as to allow equal opportunities for access buyers and for Telenor's own retail activity,

On the basis of Telenor's comments, Nkom has adjusted the proposed price regulation for the establishment of branch lines in the decisions. The change entails that Telenor's fixed establishment fee for fibre in the retail market (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 branch lines to “homes passed”. Telenor must also maintain the lists that describe the potential customer base for various locations in Telenor's access network, so that they also include the current establishment fee that Telenor's own retail activity will incur in connection with any densification sale. This will give opportunities to make adjustments if there are changes in the relevant costs. This will also ensure equal and non-discriminatory terms between the access buyer and Telenor's own retail activity.

3.4.5 Cost-oriented price and cost accounts for establishment, co-location, backhaul, E-line, etc.

Assessment in the notification of decision

Nkom has notified that Telenor will be subject to the requirement of cost-oriented prices for a number of additional services, including establishment, co-location, backhaul and E-line. Telenor must also prepare cost accounts for the relevant services.

Consultation responses

Telenor believes that the need to prepare cost accounts is not well-justified in view of Nkom's design of the notified price regulation (maximum price based on LRIC model and extensive use of different margin squeeze tests). Nkom's grounds solely point to the deficiencies in their own model. Furthermore, Telenor believes that proportionality assessments are missing for these obligations. The requirements for cost accounts for products regulated on another basis must be removed.

Telenor also refers to how Nkom imposes a requirement of a cost-oriented price for backhaul services. In Telenor's view, tighter regulation imposes strict requirements for Nkom to document the actual regulation requirement and stricter requirements of the proportionality assessment.

Broadnet believes that it is unclear what the products of Telenor will cost in total, including additional products that Telenor is expected to bundle into its products. It is also impossible in practice to follow up or test the cost orientation requirement. Nkom has shown little willingness to verify existing requirements. Furthermore, this overall remedy gives Telenor excessive flexibility to allocate costs between services that are exposed to competition and those that are not. Broadnet calls on Nkom to make pricing more predictable, and mechanisms must be established that allow authorities and competitors to examine whether the requirement is followed.

Broadnet supports the notified regulation which is based on how access to backhaul services, co-location, routing, and information and support systems, must be given at cost-oriented prices. Broadnet emphasises, however, that there will be a need to review the prices.

NextGenTel in principle endorses the notified regulation of backhaul, co-location, routing, and information and support systems, without further remarks.

Nkom's assessment

Telenor's submission concerns the price commitments in both markets. In the market analysis, Nkom has concluded that there is no sustainable competition in the market for local access to fixed access networks (Market 3a). The same conclusion also applies to the market for central access to the fixed access network (Market 3b).

In Chapter 5 of the decisions, for both Market 3a and Market 3b, Nkom has assessed potential competition problems, especially those related to prices. Nkom has concluded that Telenor has opportunities and incentives to maintain a disproportionately high price level, or establish price squeezes. In connection with each of the price obligations imposed, Nkom has assessed and shown that the terms of the Electronic Communications Act are fulfilled. Nkom therefore disagrees with Telenor's comment. With regard to backhaul services, Nkom believes that the access obligation will be more effective and support related obligations by imposing price regulation on these services. On the basis of Telenor's comment, Nkom has nevertheless made some clarifications in the decision, in order to make it clear that the terms in Section 4-9 of the Electronic Communications Act are fulfilled.

Broadnet supports the notified regulation, but believes that there will be a need for review of the prices. Nkom believes that any such review will be undertaken by requiring cost accounts for the services which are subject to the cost-orientation requirement. Broadnet also encourages Nkom to make pricing more predictable. Nkom has proposed that the price regulation for the additional services should be based on the same principles, including how Telenor must report to Nkom. The regulation of prices for establishment and co-location has also been consistent over time. Nkom therefore believes that the price regulation is sufficiently predictable for all parties.

3.5 Non-discrimination

Assessment in the notification of decision

Nkom has notified that Telenor will continue to be subject to a non-discrimination obligation for local and central access to fixed access networks (Markets 3a and 3b). The obligation applies between internal use and external offers, as well as between different external access buyers. The requirement also applies to co-location and other associated services.

It can be seen from the notifications in Markets 3a and 3b that Nkom does not consider it necessary and proportional to impose non-discrimination based on "Equivalence of Input" (EoI). Nkom does, however, consider it necessary to clarify, and to some extent tighten, the requirements for documentation of non-discrimination in an "Equivalence of Output" regime (EoO). To ensure that access buyers will be able to offer equivalent products to Telenor in the retail market, Nkom believes that it is necessary to require Telenor to conduct technical replicability tests. This entails that before launching a new or substantially modified retail product, Telenor must send documentation to Nkom proving that a test has been carried out to show that the retail product can be technically replicated for external access buyers.

3.5.1 EoI or EoO

Consultation responses

Broadnet believes a continuation of non-discrimination based on EoO is particularly unfortunate and by far the greatest weakness in the proposed new regulation. In the light of the appeals related to non-discrimination in the current regulation period and the dialogue with Nkom in 2017, Broadnet requests Nkom to revise the proposed remedies so that Telenor's competitors achieve the same access to the necessary input factors as Telenor's retail activity. Broadnet refers to how equal access to information, equal processing of information, equal system support and equal processing to achieve timing efficiency, are matters which strongly advocate that Nkom should impose non-discrimination based on EoI in the coming regulation of Markets 3a and 3b.

Broadnet also refers to how the Commission believes that EoI is the most effective approach to ensuring non-discrimination and that EoO is considered to be an alternative solution reserved for the cases where it is not considered to be proportional to EoI, based on national conditions.

Broadnet also refers to the many appeal cases referred to in the notification, and believes that EoO has caused concrete and irreparable damage to the competitiveness of access buyers. The problem will intensify in the years ahead, seen in the light of Telenor's ongoing upgrading of their own infrastructure and IT systems. EoI will restrict Telenor's opportunity to exercise discriminatory behaviour and thereby contribute to increased trust and competition between the access buyers and Telenor.

Broadnet believes that an order for non-discrimination based on EoI is proportionate and refers to how EoO-based regulation is not suitable to prevent discriminatory behaviour. There are no alternatives, and the measure is proportional to the objective. Broadnet has longstanding experience from using some of the same tools as Telenor and cannot see that it will be particularly cost-intensive to upgrade and integrate the solutions so that the access buyer is able to use the same systems as Telenor's own retail activity.

Broadnet also refers to how Nkom's obtaining of information from Telenor regarding shared systems and supply chains, as well as external sales channels, should be verified by an external third party in order to obtain an objective response to whether the situations are satisfactory for the access buyers or not, since Telenor does not have incentives to uncover any weaknesses in the system.

In the event that Nkom maintains the EoO requirement, Broadnet requests that the decision gives a detailed description of how the discrimination prohibition is to be followed up.

NextGenTel finds it difficult to understand why Nkom has concluded that the non-discrimination obligation notified to Telenor must be based on an EoO regime and not an EoI regime. NextGenTel experiences how Nkom uses two core arguments against imposing EoI.

One is that there is a high degree of infrastructure competition in the Norwegian broadband market, and the other is that Telenor's internal retail activity already employs common systems and supply chains with external access buyers. NextGenTel believes that the arguments are not sustainable.

NextGenTel refers to Section 3.3.2.5 of the market analysis, which states that Nkom expects that Telenor will be able to maintain a market share exceeding 50% at wholesale level within the time perspective of the analysis. NextGenTel thus believes that what is stated in the Market 3a notification concerning a high degree of infrastructure competition in the Norwegian broadband Market is not consistent with what is stated in the analysis.

NextGenTel furthermore refers to item 629 of the Market 3a notification, which among other things states that Nkom has obtained data from Telenor concerning systems and supply chains for internal and external sales channels, respectively, which indicates that shared solutions are already used to a high degree, and that planned system improvements concern both internal and external systems. NextGenTel believes that this is in contrast to the market analysis, which shows that in some cases Telenor's retail activity has had access to more information about the access network, or better information and support systems, than the access buyers.

In this light, NextGenTel believes that there is a need to impose Eol in order to prevent discrimination between Telenor's own retail activity and external access buyers in Market 3a.

Telenor refers to how both NextGenTel and Broadnet believe there is a need to impose Eol in order to prevent discriminatory conduct between Telenor's own retail activity and external access buyers. Telenor does not recognise itself in the description from NextGenTel and Broadnet, and refers to how the companies' argument is based on the operators' own claims, a brief assessment by Nkom in connection with its account of the appeal cases in the market analysis, and a very selective understanding of the EU recommendation from 2013.

Telenor believes that the number of appeal cases from Telenor and the access buyers does not in itself constitute evidence of any alleged need to separate out Telenor's wholesale activity in accordance with an Eol/functional distinction. Furthermore, Telenor refers to how the EU recommendation from 2013 is a softening of previous recommendations for regulatory remedy use, whereby price regulation was considered to be mandatory, irrespective of the type of infrastructure. The new aspect in the 2013 recommendation is an approach that is based more on non-discrimination, in which the concept of economic and technical replicability was introduced, while the requirement of price regulation for NGA products on specific terms could be removed. Even though the Commission can be said to emphasise the benefits of Eol, Telenor believes that the advantages must be assessed in terms of the actual situation and proportionality, on any new requirement for Eol. Telenor also refers to how very few European countries have chosen to impose functional separation. This also applies in European countries with far less infrastructure competition than in Norway.

Get TDC supports Broadnet and NextGenTel with regard to how the non-discrimination obligation that is notified must be based on the principle of EoI, and not on the principle of EoO. Get TDC refers to how recent years' experience has shown that EoO does not prevent competition-reducing behaviour, and that the Commission believes that EoI is the preferred alternative. Get TDC cannot see that there is any documented information concerning costs or other aspects which might indicate that it is not proportional to impose EoI.

Nkom's assessment

Nkom refers to the submissions of Broadnet, Get TDC and NextGenTel that, in the light of the appeals related to non-discrimination in the current regulation period, Nkom must revise the proposed remedies so that Telenor's competitors achieve the same access to the necessary input factors as Telenor's retail activity. After the consultation period, Nkom has held operator meetings with all of the companies that provided consultation responses. On the basis of the operator meetings and consultation responses, Nkom finds reason to make certain clarifications in the decision text, in order to ensure an effective non-discrimination obligation, based on EoO.

Nkom believes that the clarifications in the decision text, in conjunction with the tighter documentation requirements, will be sufficient to ensure an effective non-discrimination obligation based on EoO. Nkom thus believes that there is no basis to impose non-discrimination based on EoI. It is not necessary or appropriate either to have a third party verify Telenor's shared systems, supply chains and external sales channels.

3.5.2 Technical replicability test

Consultation responses

Telenor cannot see that Nkom justifies why the requirement to perform a technical replicability test prior to the launch of a new or significantly modified retail product is necessary. In Telenor's view, the criteria for what requires submission of documentation are unclear. Telenor also refers to how the requirement of documentation of technical replicability tests should be on a standardised template, so that it will not be too extensive. It is absolutely necessary that this communication is confidential between the parties. Furthermore, Telenor believes that Nkom must have an obligation to provide feedback on the test within a few working days.

Broadnet is uncertain of whether the introduction of an order for technical replicability tests, as it is designed in the notified regulation, will have any practical effect. Broadnet believes that experience shows that Telenor does not take account of input from the access buyers. The test may therefore be used by Telenor to show that they have been in dialogue with the access buyers. This becomes even more problematic if there are no clear delineations between Markets 3a and 3b. Broadnet therefore encourages Nkom to assess whether other requirements may be introduced to ensure compliance with the non-discrimination obligation.

Like Broadnet, **Get TDC** is uncertain of whether the technical replicability test will have any practical effect, as it is designed. Get TDC refers to how Telenor itself also points out that the criteria for what requires submission of documentation are unclear.

Nkom's assessment

Concerning Telenor's comment regarding insufficient grounds, Nkom refers to the fact that the notice of decisions in both Market 3a and Market 3b show that Nkom believes that the implementation of technical replicability tests is necessary to ensure equal terms of competition for external access buyers and Telenor's internal retail activity in the retail market for standardised broadband access. Nkom maintains that as part of the non-discrimination obligation in Market 3a and Market 3b it is necessary to set requirements for the documentation of technical replicability before Telenor launches new or changed products in the retail market, and on the basis of Telenor's comment has justified this further in the decisions. As part of the grounds, among other things the purpose of the test and what it is to be used for has been clarified.

With regard to the criteria for which documentation is required to be submitted, Nkom refers to the fact that the notice of decisions in both Market 3a and Market 3b show that the criterion which triggers the obligation to submit documentation is that Telenor launches new or significantly modified retail products, which are either fully or partly based on wholesale products that are subject to the access obligations in Market 3a/3b. It is also shown that the obligation to conduct a technical replicability test only applies in the cases where replication of the current retail product necessitates adjustments to the underlying wholesale process. Based on a more detailed assessment, Nkom agrees with Telenor that the criteria for what requires submission of documentation could have been clearer. Firstly, there may be doubt as to what *significantly* changed retail products might entail. It may also be unclear what is meant by *replication of the current retail product necessitates adjustments to the underlying wholesale process*. Nkom has therefore concluded that the obligation to perform technical replicability tests is triggered when Telenor launches new or modified retail products, which are either wholly or partly based on wholesale products subject to the access obligation in Market 3a and Market 3b, respectively. Nkom believes that additional criteria are not necessary and that it is important to avoid any lack of clarity with regard to what releases this obligation. This change is evident from both decisions.

Telenor believes that the requirement of documentation of technical replicability tests should be on a standardised template, so that it will not be too extensive. As Nkom sees it, how extensive the documentation must be for it to be sufficient to substantiate that external access buyers have had the opportunity to provide retail products equivalent to Telenor's retail products, and that the products can be offered from the same time, may vary from product to product. Nkom therefore does not consider it very appropriate to prepare a standardised template for how Telenor must provide the information necessary to document non-

discrimination. Nkom would also like to point out that after Telenor has completed the first technical replicability tests to document replicability for access buyers, this documentation can be seen as a template for subsequent tests.

With regard to Telenor's comment that it is absolutely necessary that communication on technical replicability tests is confidential between the parties, for the sake of good order Nkom remarks that any information that is considered to be business- or competition-sensitive in the communication between Telenor and Nkom will be exempt from public access, and possibly access by the parties, if the criteria for this are fulfilled.

Telenor believes that Nkom must have an obligation to provide feedback on the test within a few working days. In the notifications, Nkom has set a deadline for submitting technical replicability tests of 20 working days prior to Telenor's planned launch of the retail product. Nkom point outs that there is nothing to prevent Telenor from submitting the test at an earlier time, well before the launch. At the same time, Nkom finds reason to point out that Nkom's processing time may depend on the accuracy of Telenor's documentation. Nkom furthermore remarks that Telenor will receive feedback from Nkom without undue delay. Nkom has concluded that it is appropriate to maintain the deadline of 20 business days before Telenor's scheduled launch of the retail product, to ensure sufficient time for appropriate assessment of technical replicability.

Both Broadnet and Get TDC are uncertain as to whether the technical replicability test will have any practical effect, as it is designed. Broadnet believes that experience shows that Telenor does not take account of input from the access buyers, and that the test may therefore be used by Telenor to show that they have been in dialogue with the access buyers. To this Nkom remarks that it is not sufficient for Telenor to refer to how there has been dialogue with the access buyers, as Broadnet states. Through the requirements in the test, Telenor must document equal opportunities for access buyers on non-discriminatory terms. If the submitted documentation of the dialogue between Telenor and access buyers indicates that the relevant retail product is not replicable for access buyers, this indicates that Nkom will conclude that the submitted documentation does not fulfil the technical replicability requirement. Nkom therefore does not agree with Broadnet and Get TDC that technical replicability tests, as they are designed in the notification of decision, will not have any practical effect. Nkom has also concluded that it is necessary to specify this requirement further in the decisions, in order to ensure that the documentation from Telenor provides sufficient basis for assessment of replicability.

Broadnet encourages Nkom to assess whether other requirements may be introduced to ensure compliance with the non-discrimination obligation. Nkom refers to the fact that the notice of decisions in both Market 3a and Market 3b state that based on an overall assessment, and in line with the recommendations from the Commission, Nkom has concluded that a combination of technical replicability tests and the preparation and publication of KPIs, with the associated SLA/SLG requirements, is the best way to ensure non-

discrimination in an EoO regime. Nkom maintains that the combination of these obligations is appropriate and proportional to ensure non-discrimination in an EoO regime and cannot see that other requirements would have been better suited to ensure compliance with the non-discrimination obligation.

3.6 Publication and reference offers

3.6.1 Reference offers and access to specified information

Assessment in the notification of decision

Nkom has an obligation to prepare and publish standard agreements. In some areas, Nkom has specified the requirement of the content of the standard agreements beyond what is stated in the Electronic Communications Act and the Electronic Communications Regulation. Telenor must also give access to specific information concerning Telenor's infrastructure that is covered by the access obligation.

Consultation comments

Telenor believes that Nkom does not have the authority to impose a general obligation on Telenor for the terms of the standard agreements to be "reasonable and fair". Chapter 4 of the Electronic Communications Act does not give Nkom the authority to screen the general reasonableness of access agreements. Furthermore, Telenor believes that the level of detail of the regulation of Telenor's standard agreement is too high.

With regard to the reports described in Section 7.5.4 in the notification of decision concerning access to specific information, Telenor believes these are too comprehensive. The delimitation made towards the security legislation leaves the challenge of fulfilling the security requirements associated with Telenor's infrastructure to Telenor. It is not satisfactory that Nkom imposes an obligation that can put Telenor in a difficult situation with regard to compliance with other legislation.

Telenor believes that it is strange to impose a special obligation on Telenor to make reports to Nkom concerning statistics that are to be presented regularly, when the information is publicly available on Telenor's website and Nkom can download it from there.

NextGenTel generally gives its support to the regulation that is notified regarding disclosure and standard offers. With regard to the process for the preparation of and major changes to Telenor's standard agreements, NextGenTel has previously expressed the wish for involvement in such processes. The company agrees that the Broadband Forum is an appropriate place to discuss new and changed standard agreements from Telenor.

Nkom's assessment

Nkom disagrees with Telenor that there is no authority in the Electronic Communications Act to require the terms of the standard agreement to be reasonable. Nkom refers to the decision of the Ministry of Transport and Communications in the appeal case in Market 15 dated 9 March 2018. In the appeal decision, the Ministry concluded that “*the Electronic Communications Act empowers the authority to make the advance requirement that reasonable requests to enter into or change the agreement concerning access must be accommodated with reasonable terms, cf. Section 4-1, first paragraph, cf. Section 3-4, third paragraph*”. Nkom maintains the requirement that the terms of the standard agreement must be reasonable. However, Nkom has adjusted the text of the decision from requiring “reasonable and fair” to “reasonable” terms in the standard agreement, so that the requirement is the same in the fixed and mobile markets.

In the notification of decision, Nkom has specified that if access buyers' access to information concerning Telenor's infrastructure entails access to information that requires security clearance pursuant to the Security Act, and the access buyer is not subject to the Security Act, Telenor may require the access buyer to enter into a security agreement with Telenor before such information is given. Nkom cannot see that, as Telenor contends, this requirement as such entails that Nkom imposes an obligation that can put Telenor in a difficult situation with regard to compliance with other legislation. In view of Telenor's comments, Nkom has been in dialogue with Telenor. Based on the dialogue, Nkom has made certain changes to the regime associated with the security agreement. The changes entail, among other things, that the access buyer enters into the security agreement with Nkom. The changed regime entails that the access buyer's needs are safeguarded. At the same time, Nkom understands that Telenor also supports the changed regime.

Nkom assumes that Telenor's comment regarding an obligation to make reports is related to clause 688 of the notification in Market 3a, which states that Telenor must notify Nkom every time the quarterly KPIs are published, 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 non-discrimination obligation. Nkom remarks that Telenor is not required to submit the same information to Nkom as the information that is publicly available on Telenor's website. On the contrary, Telenor is required to *notify* Nkom when the quarterly KPIs are published, and to send a *brief account* of Telenor's assessment of the relationship between the published KPIs and the non-discrimination obligation. Nkom maintains that such notifications and reports in conjunction with the publication of the quarterly KPIs are necessary as part of the follow-up on the non-discrimination obligation. Nkom furthermore cannot see that any such obligation would be particularly onerous for Telenor.

3.6.2 Notification requirement

Assessment in the notification of decision

Nkom has notified that Telenor will be required to give three years' notice of changes in its copper access network in cases where the company makes changes that result in the loss of accesses to which access is given. If the access buyer is offered a relevant replacement product in connection with upgrades or other changes in the copper access network that cause access to lapse, six months' notice will be sufficient, however. Planned changes that do not affect the access granted will require three months' notice. On the planned connection of several "homes passed", Telenor must give three months' notice to access buyers.

Consultation comments

Telenor questions the level of detail in the requirements set by Nkom concerning notifications (content, formality, changes).

Telenor believes that the tightening to three years' notice for all discontinuation of points with established wholesale accesses is not justified by Nkom. Any such requirement would significantly curtail the degree of freedom to make changes in any area required to be streamlined. This will prevent the achievement of cost effectiveness in Telenor's network. Telenor especially highlights that it is very strange that Nkom tightens the notification rule in Market 3b to six months and three years, respectively. In this respect, Telenor refers to how access buyers have only invested in equipment in Market 3b to a small extent.

Furthermore, Telenor believes that extended notification at exchanges where only Telenor has investments will be detrimental to upgrading because it illustrates a risk for all subsequent investments (you cannot get rid of old technology).

With regard to upgrading, Telenor considers the deadline of six months' notice to be reasonable. The requirements should apply symmetrically, even in cases where other parties than Telenor wish to upgrade. Clearer requirements for notification times must be set when others build, and there are no fully adequate replacement products. In this case, Telenor must approve whether expansion is to be possible. For Telenor's part, the six-month deadline will probably be too short if Telenor has to create new value chains for purchases in relation to various third parties. For the sales situation too, there should be equal treatment whereby the requirement that no sales activities may be launched before all operators have been notified applies to both Telenor and to other parties that upgrade.

Telenor also upholds that the company's degree of freedom with regard to restructuring, discontinuation and disposal is unaffected by other operators' choice with regard to upgrading, and that the notification rules concerning planned changes and changes in parts of the network that are subject to the access obligation, but where no access buyer uses the opportunity for access, remain unchanged in relation to what has been notified.

Telenor furthermore refers to how Nkom will require Telenor to notify the access buyer no less than three months before the planned connection of additional “homes passed”. However, it is unclear what Nkom means by planned connection. “Homes passed” are not planned to be connected before a sale has taken place. If Nkom believes that Telenor must give three months’ notice before starting densification sales, this will impose disproportional business and practical problems on Telenor. Telenor rarely plans densification sales three months in advance. In several areas there are parallel high-speed networks. If Telenor has to give several months’ notice before commencing sale, competitors in the same area will launch a sales campaign first, and possibly enter into new binding terms with existing customers. If the advance notice requirement is introduced, the requirement must also apply to the access buyer.

Telenor states that under the conditions that are possibly proposed, Telenor will reduce outgoing densification sales due to the excessive risk for the company's investments.

NextGenTel believes that the proposed notice rules appear to be balanced with regard to preventing discrimination between Telenor’s own sales activity and remote access buyers, and in terms of ensuring predictability equivalent to Telenor’s own end-user activity. NextGenTel particularly emphasises the significance of the three-year rule, including that this must apply equally to the copper- and fibre-based access networks.

NextGenTel also refers to Telenor’s consultation response, in which it is stated that the requirement of three years’ notice of all discontinuation where access products are sold will result in significantly less freedom to make changes in an area that needs to be streamlined, and that this will prevent the achievement of cost effectiveness in the network. NextGenTel refers to how the Commission’s NGA recommendation in principle operates with a five-year deadline, and that the three-year deadline proposed to be continued was originally set in consultation between Telenor and the access buyers. NextGenTel believes that the three-year deadline gives a good balance between Telenor’s and the access buyers’ interests, and that a shorter notification deadline will create imbalance in Telenor’s favour, at the expense of the access buyers’ need for predictability.

Broadnet refers to Telenor’s consultation response regarding an extended notice period of three years on all discontinuation of DSLAMs with broadband access, and the level of detail for the regulation of Telenor’s standard agreement. Broadnet believes that Telenor’s consultation response is a good illustration of why there is a need to both extend the notification deadline and to make it more detailed. The current regulatory period has shown that the dominant operator has incentives to misuse the scope for manoeuvre resulting from unclear rules to, for example, discontinue infrastructure at short notice, or introduce new replacement products at other prices/with other functionality. Broadnet points out that precise and predictable notification rules make it more complicated to use such anti-competitive practice. Broadnet requests Nkom to adopt stricter notification rules with the changes stated in the consultation response.

Nkom's assessment

Nkom disagrees with Telenor that there is no need for detailed notification rules. Nkom considers that it is still a relevant competition problem that changes in the access network are not subject to sufficient advance notice and that experience from the current regulation period indicates a need to set more detailed notification rules.

Telenor believes that Nkom has not justified the requirement for three years' notice of any changes that result in the lapse of access that has been granted. Telenor refers to how the requirement is made in general, irrespective of whether the scope is great or small. Nkom believes that this requirement is justified and refers to how this depends on a weighing of Telenor's and the access buyers' interests, cf. Section 7.5.5.2 of the decisions. Nkom believes that consideration of the access buyers' investments in Telenor's access network must carry most weight in this case.

Telenor furthermore cannot see any reason to tighten the notification rules in Market 3b. The access buyers in this market will not have any need to make substantial investments in equipment, so that they do not need the same degree of predictability for the investments as in Market 3a. Nkom believes that there is no reason to give access buyers in Market 3b poorer protection with regard to notification than enjoyed by access buyers in Market 3a. Even if access buyers invest less in equipment in Market 3b compared to Market 3a, the access buyers will have a need for predictability, since the changes can affect their business model and contracts entered into with their own end-users. The latter will apply particularly to customers in the business market, since these will normally have contracts with a longer duration than customers in the private market. Nkom also refers to the NGA recommendation which in principle does not distinguish between the previous Markets 4 and 5 with regard to the notification requirement (Section 39 of the recommendation). On this basis, Nkom maintains that Telenor must notify access buyers in Market 3b on a par with access buyers in Market 3a.

Telenor believes that it would entail disproportionate business-related and practical problems if Telenor had to notify access buyers a minimum of three months before connection of "homes passed". Nkom refers to Section 3.3.8, in which Nkom has assessed the consultation responses concerning access for connection to "homes passed". Nkom concluded that there was a basis to specify the access obligation, among other things by access buyers being able to enter into the regime used by Telenor for its own end-user activity with regard to business sales. This entails that access buyers must have access to the same "homes passed" list (the HP list) as used by Telenor's own end-user activity. The list must furthermore be made available at the same time as for Telenor's end-user activity, and be of the same quality. On the basis of these clarifications, Nkom does not see any reason to maintain the notification requirement of minimum three months before a connection of "homes passed".

Nkom construes the consultation responses from NextGenTel and Broadnet to mainly support Nkom's proposed notification rules. Nkom therefore cannot see any need for changes to the decisions on the basis of these responses.

At its own initiative, Nkom has found reason to assess Telenor's fault correction policy in relation to the notification rules. This assessment can be seen in Section 7.5.5.3 of both decisions.

3.7 Accounting separation

Assessment in the notification of decision

Nkom has notified that an accounting separation obligation is imposed on Telenor, in order to follow up on the non-discrimination obligation between external wholesaler customers of Telenor and Telenor's retail activity. The obligation applies to the products fibre based LLUB and VULA fibre in Market 3a and VUA fibre in Market 3b.

Consultation responses

Telenor believes that there is neither a need for nor proportionality to impose requirements for accounting separation for all virtual copper replacements and regulated fibre accesses, given the requirements for margin squeeze tests and new gross margin test requirements, in order to follow up that prices are not discriminatory. Nkom seems to be of the opinion that for as long as a set-up for accounting separation has already been established, limited resources will be required for future reporting. Telenor believes that this is not the case and refers to how the resources used for each report are considerable, since many details need to be assessed and analysed, to ensure correct reporting.

Broadnet believes that there is a need for clearer accounting separation in the form of cost accounting for the wholesale and retail activities. This must be reconciled with the notified margin squeeze test and followed up in parallel.

Nkom's assessment

In the notices in Market 3a and Market 3b, Nkom has assessed whether there is a need to impose accounting separation requirements for all virtual copper replacements and regulated fibre accesses. The notices show that Nkom believes that there is sufficient price regulation in the form of margin squeeze tests for virtual copper replacements (VULA/VUA copper) and that it is not necessary to impose an accounting separation obligation for these products. Telenor's consultation response is thus not consistent with the content of the notices in this respect.

Furthermore, Nkom has assessed the need to impose accounting separation for virtual fibre accesses (VULA/VUA fibre). Nkom has concluded that Telenor will be subject to price regulation in the form of a margin squeeze test for the commercially most attractive fibre

products in the retail market (flagship products). Since some of Telenor's fibre products are not necessarily included in the margin squeeze test, Nkom has also found it necessary to impose an accounting separation obligation for VULA/VUA fibre, in order to follow up on the requirement of non-discrimination concerning prices at overall level. Nkom still believes that this is necessary.

With regard to fibre-based LLUB, Nkom has concluded that it is not necessary or proportional to impose price regulation, but that there is a need to impose an accounting separation requirement on Telenor, in order to follow up on the non-discrimination requirement. Nkom has also concluded that it will not be particularly onerous to prepare accounting separation for the regulated fibre accesses, but agrees with Telenor that some resources will be required to prepare each individual report. However, Nkom believes that the resources required will be relatively limited, compared to the benefit value, and does not see any reason to change the conclusion that it is necessary and proportional to impose accounting separation for VULA/VUA fibre and fibre-based LLUB. However, Nkom has made certain clarifications in the text of the decisions.

With regard to Telenor's comment that Nkom has imposed a new requirement for gross margin tests, Nkom refers to how Telenor was also subject to a positive gross margin requirement for fibre-based access products in accordance with the regulation in the former Market 5. This is thus not a new requirement.

With regard to Broadnet's comment that clearer accounting separation is needed in the form of cost accounting for the wholesale and retail activities, Nkom refers to how Telenor's preparation of accounting separation is based on the principles on which Telenor's cost accounting is based. Since adjustments are made to the margin squeeze model as a consequence of Telenor's economies of breadth and scale (adjusted EEO approach), it will not be appropriate to reconcile against accounting separation.