Post- og teletilsynet
Norwegian Post and Telecommunications Authority

Annex 1

Analysis of the market for wholesale (physical) network infrastructure access (including shared or fully unbundled access) at a fixed location (LLU market) and the market for wholesale broadband access (Broadband Access market) (Market 4 and Market 5)

20 January 2014

Summary

This document contains updated market analyses that the Norwegian Post and Telecommunications Authority (NPT) had undertaken of the wholesale market for (physical) network infrastructure access (including shared or fully unbundled access) at a fixed location (LLU market) and the wholesale market for broadband access (Broadband Access market).

For practical reasons NPT continues to find it appropriate to coordinate the analyses of these two relevant markets in a joint document. The first three chapters of the document are common to both analyses.

The market analyses will provide the basis for employing sector-specific measures in the various markets in which an operator/operators with significant market power are identified.

Chapter 1 contains a description of the background and legal framework for the analyses as well as a summary of the market definition from the previous analysis.

Chapter 2 is a summary of the history of, and developments in, the markets. In Chapter 3 the relevant product markets are assessed and defined on the basis of the EFTA Surveillance Authority (ESA)'s two predefined markets for wholesale broadband access. Based on these assessments, NPT has concluded that there are no national circumstances indicating that, in Norway, relevant markets for wholesale broadband access should be defined differently from the ESA recommendation.

The LLU market is analysed in Chapter 4. First, the relevant product market, which includes full and shared access to the fixed access network, is described. The market is technologically neutral. This means the market is not defined as only including wholesale provision of broadband access to LLU over copper, but also includes potential wholesale provision of LLU offered via access networks other than the copper-based one.

Telenor ASA (Telenor) revenue has still a large share of the revenue in the LLU market, though it has declined somewhat since the previous analysis. Telenor's share in this relevant market is now 64 per cent, measured by the number of accesses. This is a decline of 18 percentage points from the previous analysis. Despite this decline, the market share assessment indicates that Telenor still has significant market power in the LLU market.

Furthermore, NPT has concluded that there are considerable entry barriers in the LLU market. At the same time countervailing buying power that is weakening Telenor's market power to a considerable degree cannot be said to exist in this market. In NPT's opinion, the existence of

potential competition will also not serve to weaken Telenor’s market power in the LLU market to a substantial degree in the near future.

The market analysis concludes that Telenor still has significant market power in the LLU market.

The market for Broadband Access is analysed in Chapter 5. The market includes broadband access services at the wholesale level. The Broadband Access market is technologically neutral and therefore includes wholesale provision of broadband access via access networks other than the copper-based one, which has traditionally been used when offering such products.

Given the way in which the relevant market for Broadband Access is defined and delineated, Telenor has a market share of 49 per cent, measured by number of accesses. This is a decline of ten percentage points compared to the previous analysis. Despite this decline, the market share assessment indicates that Telenor still has significant marked power in the Broadband Access market.

The entry barriers in the market for Broadband Access are somewhat lower than in the LLU market. At the same time, it cannot be said to exist buying power in this market that will significantly weaken Telenor`s market power. In NPT`s view, the existence of potential competition will not significantly weaken Telenor`s market power in the Broadband Access market in the coming years.

The analysis of the market for Broadband Access therefore concludes that Telenor still has significant market power in this relevant market.

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1 Introduction

1.1 Background and framework for the analysis

1. The regulatory framework for electronic communication is based on five directives adopted by the European Union (EU)[1]. These directives have been implemented in Norwegian law through the Act of 4 July 2003 No. 83 relating to electronic communications (Electronic Communications Act) and associated regulations, including the Regulations of 16 February 2004 No. 401 on electronic communications networks and services (Ecom Regulations).

2. The framework shall lay the foundation for the harmonisation of regulation in the EU/EEA, limit entry barriers and facilitate sustainable competition to the benefit of users.

3. NPT will undertake market analyses based on the pre-defined markets as stipulated in the EFTA Surveillance Authority (ESA) Recommendation on relevant markets (the Recommendation[2]). It follows from Norway's obligations under the EEA Agreement that identification of undertakings with significant market power is to be carried out in accordance with the guidelines and recommendations prepared by ESA under the new Framework Directive for electronic communications services:

- Guidelines on market analysis and assessment of significant market power ("the Guidelines"[3])
- Recommendation on relevant markets ("the Recommendation")

4. According to the Guidelines an assessment of relevant markets and significant market power must be based on a market analysis. The assessment is to accord with competition law methodology. The Guidelines and the Recommendation, together with the provisions of the Act on Electronic Communications, particularly Sections 3-1 to 3-3, will therefore form the legal framework for the market analysis.

5. The Electronic Communications Act's definition of significant market power in Section 3-1 reads:

> *"A provider has significant market power when the provider individually or jointly with others has economic strength in a relevant market affording the provider the power to behave to an appreciable extent independently of competitors, customers and consumers.*

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

[2] EFTA Surveillance Authority Recommendation 05/11/2008 with the Commission's Explanatory Note

[3] EFTA Surveillance Authority Guidelines 14/07/2004.

Significant market power in one market may result in a provider having significant market power in a closely related market."

6. The term significant market power in the Electronic Communications Act is very close to the competition law standard "dominant position" ("dominance").

7. In the document "Methodology for market analysis" (the methodology document) NPT has elaborated on the Guidelines' criteria for market analysis on a number of points. The methodology document is not legally binding, but expresses NPT's understanding of the guidelines to which NPT is obliged to adhere. The market analyses will therefore be undertaken in accordance with the views and assessments expressed in the methodology document. Should there prove to be discrepancies between the methodology document and the Guidelines or the Recommendation, the Guidelines or the Recommendation will take precedence. The document in no sense limits the Norwegian Competition Authority's assessments in accordance with the Competition Act. The methodology document is updated as the Guidelines and the Recommendation are amended. This analysis is based on the methodology document dated 11 June 2009.

8. The market analysis work may be divided naturally into three phases:

1) Define relevant markets by defining relevant product markets and defining geographic markets.
2) Carry out market analyses of each of the relevant markets, with a view to uncovering whether any undertakings have significant market power.
3) Impose obligations on undertakings designated as having significant market power.

9. This analysis contains the Norwegian Post and Telecommunications Authority's (NPT) assessments in phases 1) and 2) of the wholesale market for full and shared access to fixed access networks (LLU market) and the wholesale market for broadband access services (Broadband Access market). In the Recommendation, the markets are Market 4 and Market 5, respectively.

10. The market analysis is an annex to decisions in which NPT notifies specific obligations on the (or those) provider(s) considered to have significant market power. Pursuant to Section 3-4 of the Electronic Communications Act and Norway's obligations under the EEA Agreement, NPT is obliged to impose at least one specific obligation on an undertaking with significant market power.

11. The market analyses will be subject to regular review. In markets with frequent and comprehensive changes such reviews will have to be carried out relatively frequently. The market analyses are therefore limited in the extent to which they are forward-looking; see paragraph 20 of the Guidelines. This analysis has a time horizon of two to three years.

1.2 The previous analysis of the LLU and Broadband Access markets

12. This is NPT's third analysis of the LLU and Broadband Access markets.

13. The previous analysis was dated 3 April 2009, and used the applicable ESA recommendation regarding the relevant market as a starting point. In the previous analysis, NPT reached the following market definition:

- The LLU and Broadband Access markets constitute separate wholesale markets. Both markets are technologically neutral.
- Both wholesale markets include all external and internal sales, or use, of broadband access products via all access technologies used to offer broadband access in the retail market.
- The Broadband Access market covers all speeds/DSL variants offered by the wholesale provider’s retail business.
- Leased lines are not a substitute for LLU or Broadband Access, and are therefore not a part of these relevant markets.
- The retail market for mobile network-based broadband access is not included in the same relevant market as fixed network-based broadband access. Wholesale provision of mobile network-based broadband access is thus not included in the LLU or Broadband Access market. However, fixed radio access (point-to-point and point-to-multipoint connections) are a part of these relevant markets.

14. In the analysis, NPT concluded that Telenor had significant market power in both wholesale markets.

15. The relevant geographic markets were both defined as Norway.

2 History and market developments

16. The wholesale markets for LLU and Broadband Access were established around the turn of the millennium. Broadband Access at the wholesale level in the form of bitstream access was introduced in connection with Report no. 24 (1998-99) to the Storting “Regarding certain regulatory issues in the telecom sector”, when Telenor proposed it as an alternative to LLU. LLU was established as a product in the wholesale markets at a later date, as a result of the LLU Regulation that EU adopted on 18 December 2000. The LLU Regulation was implemented in Norwegian law through amendments of the Public Telecommunications Networks and Services Regulations of 6 February 2001.

17. NPT has previously issued two decisions about the regulation of the relevant markets. These decisions are dated 20 February 2006 and 3 April 2009.

18. The LLU and Broadband access wholesale markets have the same associated retail market. On this basis, NPT has chosen to give a joint description of the retail market.

19. The largest providers of fixed broadband access via Telenor's copper network (xDSL) is, in addition to Telenor, Broadnet (previously Ventelo), NextGenTel and TDC. Tele2 was also a significant operator until the company sold its broadband portfolio to NextGenTel in 2009. Additionally, Lyse is a large operator in broadband over fibre, while Get has a relatively large market share in access based on cable TV networks[4]. Until 2011, Telenor has been an insignificant operator with regard to offering broadband access over fibre, but has, via Canal Digital, had a stable market share of more than 50 per cent for broadband access over cable TV networks.

20. Both the LLU and Broadband Access wholesale markets and the associated retail market had high levels of growth in the years after the markets were established. The number of subscriptions in the retail market based on fixed broadband access over the copper network (xDSL) increased from about 1,500 in 2000 to about 1,100,000 in 2008. Since 2008, there has been a decline in copper-based broadband accesses, and at the end of June 2013 there were about 820,000 retail customers who subscribed to broadband access over the copper network.

21. The number of broadband subscriptions in the residential market is still growing, though at a lower rate than previously. In the business market, the number of broadband subscriptions has been stable since 2008. However, as mentioned above, the number of broadband subscriptions based on copper accesses has declined in recent years. This is because many customers have moved to purchasing broadband over cable TV networks or fibre-optic accesses, which enable higher transmission capacities. However, the introduction of VDSL, which makes it possible to achieve higher transmission capacities over the copper network, may have helped slow the decline in the number of copper-based accesses. We also see some increase in services that require a larger upload capacity, such as the use of a home office, online backup and uploads of images and video. Furthermore, there has been a clear increase in the number of terminals, which in turn sets bandwidth requirements.

22. As mentioned above, the number of subscriptions in the business market has been stable in recent years. At the end of June 2013, the business market constituted about 7 per cent of the subscriptions and 22 per cent of the revenue. It is more difficult to say something general about the business market, as companies have more heterogeneous capacity requirements than private broadband users, and there is less available data about the business market. However, a report[5] Nexia submitted to NPT about capacity requirements and

[4] In this context, by cable TV networks NPT is referring to networks that have, as a starting point, been constructed for distribution of TV/radio signals, however which have since been upgraded to handle two-way communication to be able to also provide broadband services. In practice, these types of networks often consist of a combination of fibre and coaxial cable and are often referred to as HFC networks..

[5] "Broad enough? Capacity requirements and development trends in broadband communication". Report submitted by Nexia to NPT in December 2011.

development trends in broadband communication[6] assumes that the growth in capacity in the business market will be somewhat lower than in the residential market. Norsk Telecom AS, which provides market analyses, shares this view. In a report from February 2012, Norsk Telecom AS shows that entertainment services for the residential market are the primary drivers for increased network capacity.

23. A variety of broadband access products is offered in the retail market. Most providers in the residential market operate with differentiated monthly charges for broadband access. The price differences reflect the various bandwidths and various degrees of additional services. Several providers in the residential market also offer product packages which in addition to Internet access include VoIP, TV packages and video on demand services.

24. The business market for broadband access also has a number of different products covering a variety of customer needs. In addition to different speed classes, the products in the business market are distinct from each other with regard to application areas. For example, some of the products and solutions are adapted to small businesses, others are more suitable for businesses with several branch offices, whilst still others are specially adapted businesses that want to establish closed networks between home offices and the workplace. Such closed networks also often have characteristics that mean that, in accordance with the Recommendation, they are defined as dedicated capacity. The current Recommendation regulates dedicated capacity in Market 6.

25. About 99.9 per cent of Norwegian households have a basic broadband service with a minimum of 2 Mbit/s downstream capacity. Of these, about 95 per cent are covered by fixed, cable-based access technologies based on copper, fibre and cable TV networks, while the rest are covered by radio-based access technologies[7].

26. At the end of June 2013, there were over 1.7 million residential subscriptions for fixed broadband in Norway. This means that around 75 per cent of households subscribed to broadband. There has been continuous growth in the number of subscriptions in the residential market in recent years, though the growth has levelled out somewhat. From the end of June 2012 to the end of June 2013, there was an increase of about 53,000 subscriptions in the residential market, down compared with an increase of 78,000 a year earlier. The number of business subscriptions has been stable at about 140,000 since 2007, but from 2010 there has been a gradual decrease to 136,000 by the end of June 2013.

27. At the end of June 2013, broadband subscriptions were divided by 44 per cent via the copper access network (xDSL), 31 per cent via cable TV networks, 23 per cent via fibre network and 2 per cent via fixed radio access. Though the copper access network remains by far the most common form of access, the number of xDSL subscriptions has declined by about

[6] "Do we need superfast broadband?". Report from Norsk Telecom AS, February 2012.

[7] According to the "Broadband coverage 2013" report, prepared by Nexia on commission from the Ministry of Government Administration, Reform and Church Affairs.

57.000 from the end of June 2012 to the end of June 2013. However, this decline is more than compensated by the increase in the number of subscriptions over cable TV and fibre networks.

28. The largest growth in the number of subscriptions from the end of June 2012 to the end of June 2013 has been in fibre access networks, with an increase of about 77,000 subscriptions. In the same period, broadband via cable TV networks increased by just over 37,000 subscriptions.

29. Figure 1 shows the evolution in the number of broadband subscriptions in the retail market divided into the various access technologies from the end of 2000 and to the end of June 2013.

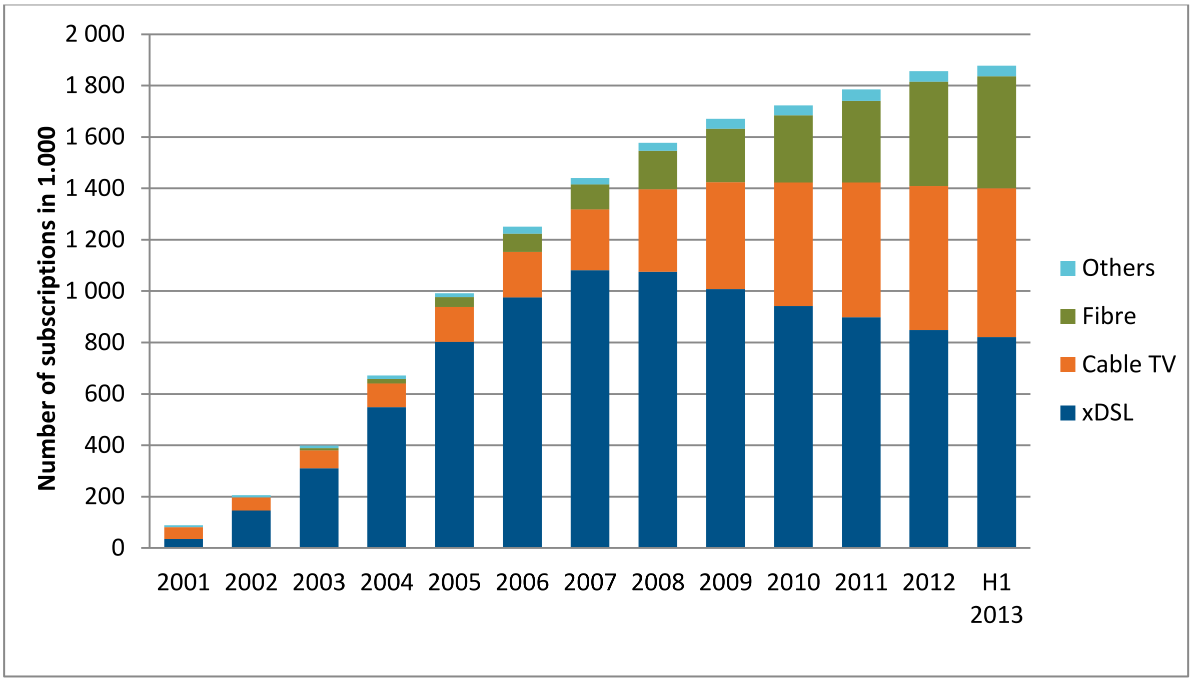


Figure 1: Broadband in the retail market (residential and business) divided by different forms of access
(Source: NPT's ecom statistics for first half of 2013)

30. With regard to the different companies' shares of the retail market, we look at both the number of broadband accesses and revenue.

31. Figure 2 shows that Telenor's market share in the retail market for broadband access has been just under 50 per cent in recent years if the number of broadband accesses is used for the market share estimate[8]. Telenor's market share at the end of June 2013 was 45.4 per cent. At the same time, Get and NextGenTel had market shares of 12.3 and 8.8 per cent, respectively. However, if we see Lyse and its partners as one[9], this group is the second

[8] Canal Digital is a wholly owned subsidiary and is included in Telenor's market shares.
[9] Lyse and partners include 31 providers in Norway (according to http://www.altibox.no/omaltibox/leverandorer)

largest, with a market share of about 15.4 per cent. "Others" consist of a number of smaller operators, none of whom have a market share above two per cent.

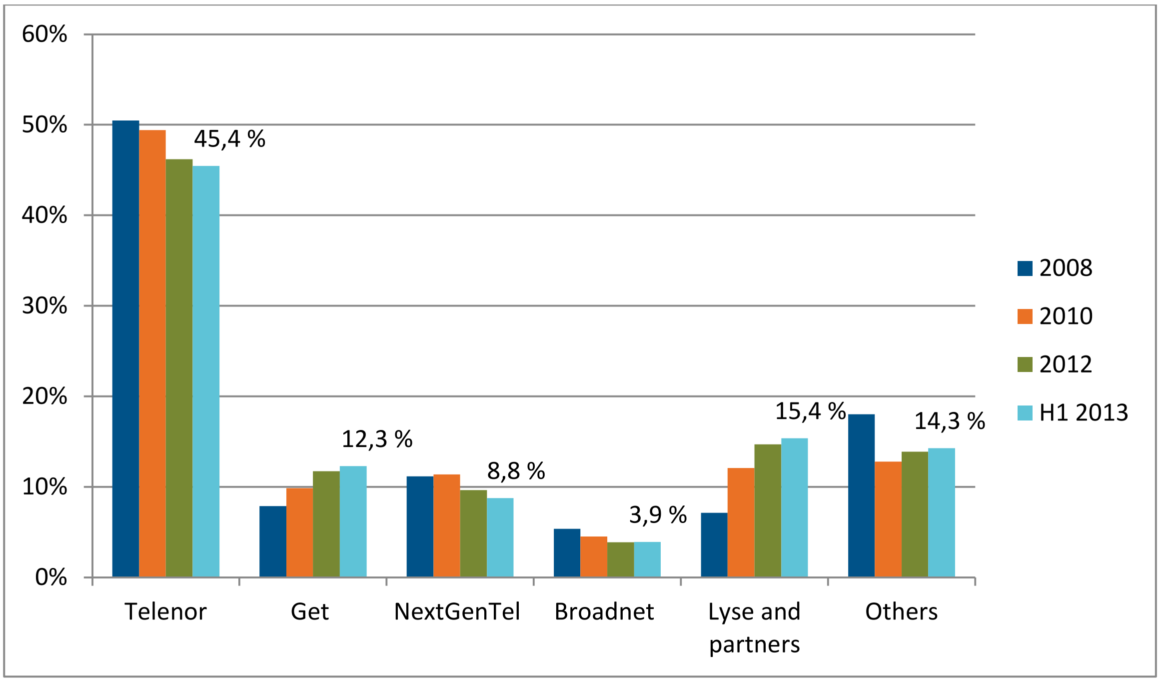


Figure 2: Market share in the retail market, based on the number of broadband accesses.[10] *(Source: NPT's ecom statistics for first half of 2013).*

32. Though there do not seem to have been any major fluctuations in the market shares in recent years, there have been some changes. There seems to be a clear tendency to move from ADSL to forms of access that allow higher transmission capacities. NextGenTel[11] and Broadnet (formerly Ventelo)[12], whose market shares measured in the number of subscriptions are falling, largely base themselves on Telenor's copper access network. Lyse and partners and Get, which have increasing market shares, base themselves on fibre and cable TV networks, respectively. Telenor, which has had slightly declining market shares in recent years, has elements of all forms of access, but bases itself mainly on copper and cable TV networks.

33. However, Telenor is increasingly focused on fibre-optics. At the end of 2008, Telenor had less than 0.3 per cent of the broadband subscriptions that are supplied by fibre access networks. Increased rollout and the acquisition of LOS Bynett AS and Bynett Privat AS has caused that Telenor according to NPT's calculations now has 11.8 per cent of fibre-based broadband subscriptions.

[10] Telenor's figures do not include the customers of LOS Bynett and Bynett Privat.

[11] NextGenTel acquired Tele2's broadband portfolio in 2009, and thus increased its market share (see figure 2). However, NextGenTel's market share fell again in subsequent years.

[12] In early 2012, Ventelo combined its broadband and transmission capacity products under the brand name Broadnet. NPT has found it expedient to take this into account in the calculation of market shares for the end of 2011.

34. Telenor's share of broadband subscriptions via cable TV networks has been stable and was 50.4 per cent at the end of June 2013.

35. Figure 3 shows the market shares in the retail market if revenue, rather than the number of broadband accesses, is the basis for the calculation.

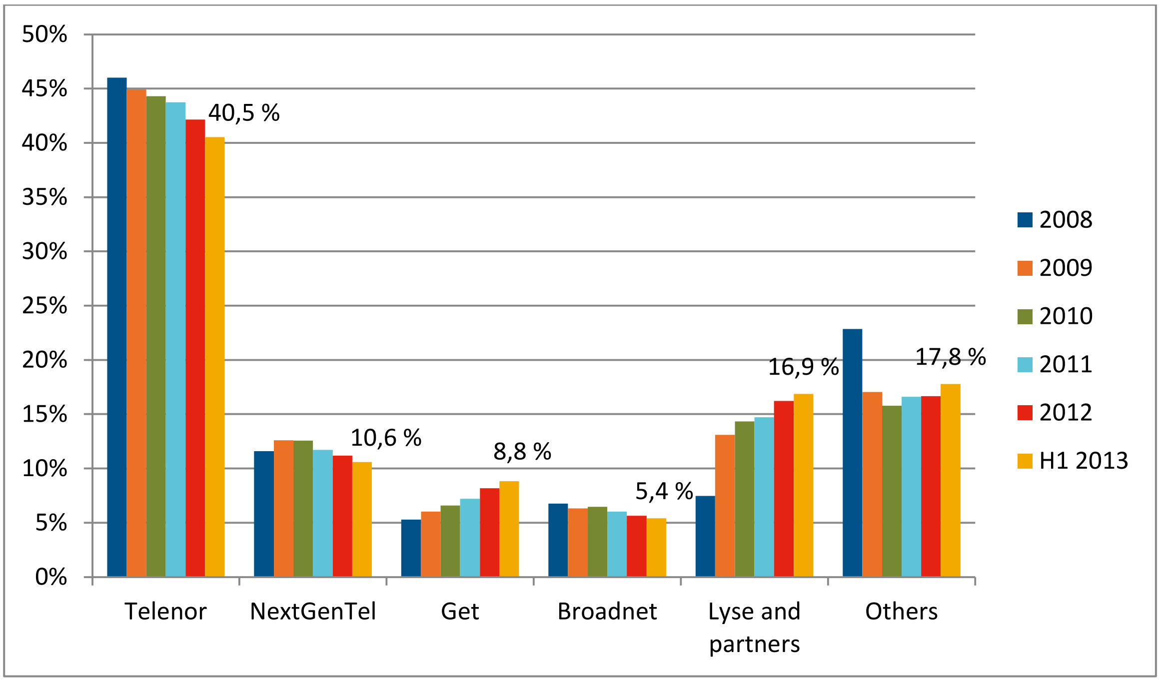


Figure 3: Market share in the retail market (residential and business combined), based on revenue.
(Source: NPT's ecom statistics for first half of 2013).

36. Telenor gets a somewhat smaller market share (40.5 per cent) measured by revenue, while the "Other" group, for example, gets a higher market share. One reason for this is presumed to be that "Other" consists of a large number of small operators that to a large extent direct their offerings to the business market, where revenues per broadband access are somewhat higher than for the residential market. However, there can be many reasons, including that some operators market and sell broadband accesses with higher bandwidths (which will normally result in higher revenues per broadband access) to a greater degree than Telenor. That Lyse and partners have a higher share of revenues than of the number of subscriptions may support this explanation. The development in market shares based on revenue over time roughly corresponds to the development in market shares based on the number of subscriptions.

3 Market definition

3.1 General - Market definition

37. The market analyses are based on the pre-defined markets contained in ESA's Recommendation on relevant markets. However, NPT must make an assessment of whether ESA's pre-defined markets fit the Norwegian context.

38. A market definition is made both in terms of which products are to be included in the relevant markets and the geographic area of the market. The definition of relevant markets must use the same procedure as the market definition within competition law. However, in some cases, markets defined by competition authorities may deviate from markets defined in the Recommendation or by national supervisory authorities in accordance with Article 15, no. 3 of the Framework Directive.

39. A relevant product market is made up of products or services for which adequate substitutes can be found. The starting point for the definition of a relevant product market is an assessment of demand-side substitutability. However, substitutability may also exist on the supply side, and may then be relevant in the definition of the relevant market.

40. Once the relevant product markets are determined, the geographic market is defined. The geographic market may be defined as the area in which the relevant product is offered on approximately similar and sufficiently homogeneous competitive terms. Geographic markets within electronic communication have traditionally been defined based on the relevant network's propagation, and the jurisdiction of the legal regulation of the market.

41. According to the Electronic Communications Act Section 1-3, cf. Regulation 4 July 2003 No. 882, the Electronic Communications Act applies to Svalbard, Jan Mayen, the dependencies and Antarctica. However in regard to Svalbard, exceptions have been made for Chapter 3 (significant market power), Chapter 4 (access) and Section 9-3 (consultation procedure). However, electronic communications on Jan Mayen, the dependencies and Antarctica are assumed to have very little significance for the market analyses NPT carries out in accordance with the Electronic Communications Act.

3.2 Definition of the product market

3.2.1 General comments on the product market

42. Demand-side substitutability exists when two or more products in the market are, in the perception of the end user, mutually exchangeable or substitutable on the basis of characteristics, price and area of utilisation.

43. Supply-side substitutability exists when providers of other (non-substitutable) products, as a response to a marginal price change in the short term, can change their production or

distribution and offer substitutable products without incurring significant additional costs or substantial risk.

44. An acknowledged method of analysing substitutability is the so-called “hypothetical monopolist test” (SSNIP test), where one endeavours to find the best-defined market in which a hypothetical monopolist can exercise market power. This test assesses the effect of a small, but significant (in practice 5-10 per cent) and lasting price increase of the relevant product, based on the assumed price level in a market with effective competition. All other prices are assumed to be unchanged. The effect of the price increase in the relevant market and the overall effect on the producer’s revenues are then assessed. The key factor is to determine whether the price increase will be profitable for the producer..

45. The Recommendation does not make use of the SSNIP test an absolute requirement in the market definition. Similar methods may therefore also be used. Regardless of method, the hypothetical assessment should be supplemented by factual information on behaviour on the supply and demand sides to the extent that such information is available.

3.2.2 ESA's Recommendation on relevant markets

46. ESA's Recommendation on relevant markets defines Market 4 and 5 in the following manner:

- Market 4: *”Wholesale (physical) network infrastructure access (including shared or fully unbundled access) at a fixed location”*
- Market 5: *”Wholesale broadband access. This market comprises non-physical or virtual network access including "bit-stream" access at a fixed location. This market is situated downstream from the physical access covered by market 4 listed above, in that wholesale broadband access can be constructed using this input combined with other elements”*.

47. ESA's definitions of the relevant markets have not changed since the previous analysis of the broadband markets.

48. It follows from the Recommendation that dedicated capacity (including leased lines) is not a part of the markets for LLU and broadband access.

3.2.3 Description of the wholesale market for LLU

49. Telenor offers a product called Operatøraksess in the LLU market. Operatøraksess gives other providers access to access lines in Telenor's network by hiring copper pairs. Operatøraksess is offered in various forms, depending on the type of use (PSTN, ISDN, ADSL, VDSL and SHDSL). A more technically detailed description of the various operator access versions can be found in Telenor's product portfolio for the operator market (www.jara.no). The target group for the operator access product is providers that have their own equipment in connection with Telenor's access points, and that want to rent one or more copper pairs from this point to an end-customer. The Operatøraksess product is therefore offered together with

the co-location product Telelosji. The schematic diagram in Figure 4 is taken from Telenor's Operatøraksess product sheet.

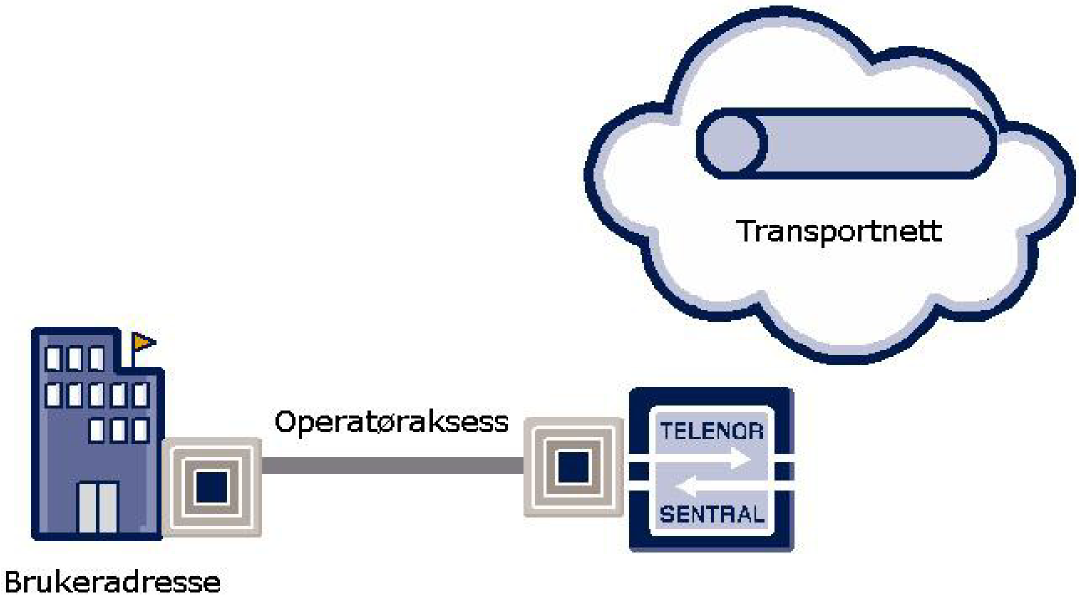


Figure 4: Schematic diagram Operatøraksess
(Source: Telenor)

50. After NPT's decision of 20 February 2006, the price for Operatøraksess has been subject to price caps for monthly subscription charges and an obligation of cost orientation for one-off fees and prices for co-location and associated services.

51. Information that NPT received from the operators in the broadband market in 2009 showed that actual wholesale provision of broadband access services from providers other than Telenor is very limited. We have not received any new information to suggest that this has changed significantly with regard to the copper network. On this basis this description of the existing LLU market is limited to Telenor's offering.

3.2.4 Description of the wholesale market for Broadband Access

52. Telenor's offering in the wholesale market for Broadband Access, including bitstream access, is here referred to as Broadband Access. These products target national, regional and local broadband providers that want to offer broadband to the residential and business markets without investing heavily in their own equipment. These products are also used as a supplement to operator access in areas where providers that otherwise purchase operator access do not want to invest in their own equipment.

53. Telenor offers the products Jara ADSL, Jara DSL and Jara SHDSL for Broadband Access via the copper network. These Broadband Access products must be combined with a transport/aggregation product (backhaul) from Telenor, such as for example the IP Connect, IP Total and E-line products.

54. Jara ADSL, Jara VDSL and Jara SHDSL are defined between the interface for end users and the interface for broadband access points (BAP) in Telenor's network, cf. Figure 5. A BAP has previously been an ATM switch, but in Telenor's new IP-based network it will be an IP router (ERX). This change also means that some products that were adapted to the old network, such as BAP direct access and BAP Connect, are being phased out.

55. Figure 5 shows a schematic diagram of Telenor's broadband access product Jara ADSL.

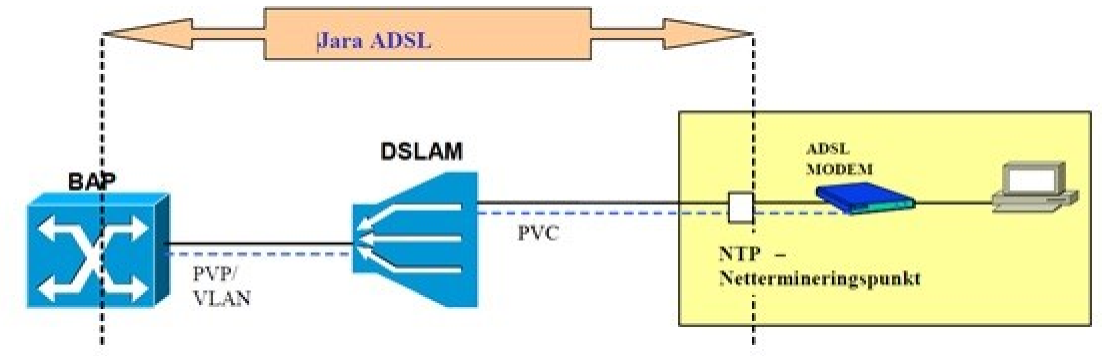


Figure 5: Reference figure for Telenor's Jara ADSL product
(Source: Telenor)

56. Telenor offers Jara ADSL and VDSL in three so-called profiles (Proff, Premium and Basis), while SHDSL is offered in two profiles (Proff and Premium). Each of these three profiles contains different quality parameters and capacities that the wholesale customer can offer in the retail market. A more technically detailed description of the different products and profiles can be found in Telenor's product portfolio for the operator market (www.jara.no).

57. Information that NPT received from the operators in the broadband market in 2009 shows that actual wholesale provision of broadband access services from providers other than Telenor is very limited. NPT has not received information that suggests that this has changed significantly with regard to the copper network. For this reason, this description of the existing market for wholesale broadband access services is limited to Telenor's offering.

3.2.5 Assessment of the division between the LLU market and the Broadband Access market

58. Technically speaking, the difference between LLU and Broadband Access relates to where the interface for access for the wholesale customer is localised in the network and which network elements the wholesale customer installs and operates. When purchasing LLU the wholesale customer only receives access to the line between a subscriber exchange and the end user and must install and operate network elements itself in the subscriber exchanges (including a DSLAM - Digital Subscriber Line Access Multiplexer) in order to produce broadband access services offered in the retail market.

59. Broadband Access is characterised by the use of unique subscription lines where a separate connection of a specific quality can be set up from the subscription to an access point (known in Telenor's network as a BAP), where the access offered to the wholesale customer. The broadband access products currently offered by Telenor means that Telenor carries traffic over the copper line, installs and operates the necessary xDSL equipment, and ensures transmission up to the BAP.

60. Broadband Access enables an operator to offer broadband access services in the retail market without making a major investment in its own infrastructure. Consequently, the investment risk is lower than with the purchase of LLUB. However, since Broadband Access means that the wholesale customer does not install its own DSLAMs in the subscriber exchanges, the wholesale customer's flexibility with respect to WLR service differentiation will be limited when compared with an operator that bases its operations on LLU and can affect the quality of the broadband service through capacity (speed, concentration factor etc.) and supplementary services.

61. Parts of the demand side of the market for wholesale broadband access products in Norway use both LLU and Broadband Access as wholesale inputs for its retail offerings. The number of end-users per subscriber exchange is often crucial to the choice between LLU and Broadband Access. For these wholesale customers, having more customers per subscriber exchange will, when seen in isolation, suggest using LLU, as the investment in their own DSLAMs can then be distributed among more customers.

62. This indicates that there will be a certain degree of demand-side substitutability between Broadband Access and LLU if the starting point is a wholesale customer who buys Broadband Access. However, if the starting point is a wholesale customer who buys LLU, and has already invested in its own DSLAM equipment and built up an organisation to use LLU as a wholesale input for retail services, only using broadband access as the form of connection will not be very attractive. For these wholesale customers, there will therefore normally be limited substitutability between LLU and Broadband Access. This may change if the customer basis for each subscriber exchange is reduced. This might make it less attractive to offer LLU-based broadband. We may then see that wholesale customers who have made investments in order to be able to offer services based on LLU access will prefer to offer their services based on Broadband Access. Additionally, more customers may choose to not invest in their own infrastructure if it is possible to buy access to existing next-generation networks.

63. Though there may be some degree of substitutability on the demand side, NPT has nevertheless concluded that the different opportunities to differentiate the retail product in relation to the wholesale provider's retail business, different degrees of investment risk and different access points in the network indicate that there are no grounds for concluding that LLU and Broadband Access are part of the same relevant market.

64. NPT therefore finds no reasons to depart from the Recommendation with respect to the boundary between the LLU market and the market for Broadband Access.

3.2.6 Assessment of which services to be included in the wholesale markets for LLU and Broadband Access

LLU market

65. ESA's recommendation on relevant markets is technologically neutral and includes all relevant physical infrastructures that can provide the end-customer with broadband access as part of the LLU market.

66. In the Commission's Explanatory Note to the Recommendation, it explains the principle of technology neutrality further. There, the Commission states that the national supervisory authorities should make concrete assessments of substitutability, but that the starting point must be that the different broadband technologies, including copper, cable TV and fibre accesses, belong to the same product market.

> *”Experience under the market analysis and Article 7 review procedures so far indicates that at retail level broadband access services over these platforms, where available, generally belong to a single product market. Likewise, within the category of DSL-based services, there is no evidence suggesting that retail broadband services using ADSL, ADSL2, ADSL2+, VDSL or other DSL technologies would not be part of a single product market. However, when defining markets taking into account this Recommendation, NRAs should analyse on a case-by-case basis substitutability of services provided using these various technologies, thereby taking the principle of technology-neutral regulation as a starting point”.*

67. In the 2009 market analysis, the result of this assessment was that all relevant access technologies for fixed broadband connections should be included in the LLU market.

68. Since 2009, the number of broadband accesses delivered by ADSL has declined, while the number of end-users that have broadband delivered by cable TV networks and fibre networks has increased. VDSL has also been introduced to the wholesale and end-user markets. This is in line with the general development in Europe and is one of the starting points for the technologically neutral market definition in ESA's Recommendation. Nevertheless, the changes raise the question of whether ADSL and forms of access with higher transmission capacities belong to the same product market. Telenor also raises this question, for example in connection with the Norwegian Competition Authority's evaluation of Telenor's acquisition of LOS Bynett and Bynett Privat.

69. In its decision dated 23 March 2012[13] , the Norwegian Competition Authority concluded that the product market for the sale of internet access to private customers is defined as technologically neutral, and that ADSL thus belongs to the same product market as, for example, VDSL, cable TV networks and fibre. In its justification, the Norwegian Competition Authority emphasised among other things that based on Telenor's marketing it is difficult to see significant differences in the uses of ADSL and VDSL. Further, the Norwegian Competition Authority pointed out that the copper access products that are sold in the market are offered at different capacities/speeds and at different prices, in order to compensate lower capacities by lower prices. The Norwegian Competition Authority therefore saw the different products on offer over the different access technologies as differentiated products in terms of price and quality, but nevertheless as part of the same product market.

70. The different access technologies set parameters for capacity, symmetry in the upload and download capacities and the content services that can be offered to end-users. The question thus becomes whether characteristics, price and the use of the products that are offered based on the different access technologies suggest that the products are substitutes from the point of view of the end user. In the operator meetings, for example, Telenor has emphasised the flexibility of so-called super-fast accesses, in particular the possibility of using broadband access as the primary platform for television, and indicated that ADSL is inappropriate for this usage.

71. To illustrate the differences in products based on the different forms of access, table 1 provide some examples of products that are offered in the residential market as of 29 August 2013.

Form of access	***MBit/s down/up***	***Subscription price****
ADSL	2/0.4	259
ADSL	20/1	295
VDSL	40/10	579
VDSL	40/20	504
Cable TV networks	12/5	480
Cable TV networks	50/5	657
Fibre	25/25	491
Fibre	100/100	1007

*Table 1: *Listed monthly subscription rate including any discounts for the monthly rate but without any additional costs such as line rental.*

[13] The Norwegian Competition Authority's decision in the Telenor/LOS case, 23 March 2012: http://www.konkurransetilsynet.no/ImageVaultFiles/id_5557/cf_5/2011-0650_Vedtak_V2012-8_-_Offentlig_versjon.PDF

72. As of today, ADSL is offered in the end-user market with up to 20 Mbit/s downloading capacity, while VDSL is offered at up to 40 Mbit/s. Cable TV networks give significantly higher downloading capacities, and are offered at up to 200 Mbit/s, though the products in the above table are more representative of what customers select. There is a great deal of asymmetry for the products currently offered over ADSL, VDSL and cable TV networks, which means that the uploading capacity is significantly lower than the downloading capacity. Fibre accesses give large transmission capacities and a large degree of symmetry between downloading and uploading capacities.

73. VDSL, cable TV networks and fibre accesses allow greater transmission capacities than ADSL, both for uploading and downloading. This gives end-users greater flexibility and more possibilities. However, the end-user prices are generally higher for higher transmission capacities, so that each end user must balance their need for higher capacity against a higher cost.

74. For customers in the end-user market, the extent to which different access technologies provide access to the same services will be a central issue. Despite the development of new content services, all forms of access (including ADSL) appear in the main to provide sufficient capacity to use the services that are currently in demand from the typical end user and with a quality that is seen as satisfactory. A possible exception is the use of broadband access as a primary platform for television and some other services requiring high capacities.

75. Broadband access as the primary platform for television competes with television on other platforms, such as the digital terrestrial network (Riks-TV) and satellite television. High-capacity broadband is thus not crucial for the consumer to get sufficiently good television service[14]. According to NPT's report "Kabel-TV og fiber som aksess" ("Cable TV and fibre as access") dated 16 February 2011, as of the end of 2010, 53 per cent of cable TV customers only received television over their access. At the same time, 68 per cent of customers who had fibre accesses received both broadband and television services over the same access. This means that in practice, the customers see receiving television and internet over two different platforms as a real option. Therefore, it is NPT's assessment that television as a driver for the selection of a form of access cannot be given decisive weight in the product market definition.

76. Hence, a sufficient degree of demand-side substitutability in the retail market is deemed to exist so that broadband accesses based on various access technologies can be said to belong to the same relevant market.

77. There is also some degree of substitutability on the supply side. If end-users demand more bandwidth, Telenor can move from supplying ADSL to supplying VDSL. This also applies to Telenor's wholesale customers in the LLU market. The transition to VDSL has already been

[14] The Norwegian Competition Authority also makes this point in its decision in the Telenor/LOS case

made to some extent for customers who are sufficiently close to Telenor's exchanges. For customers who are located further away from the exchanges, a transition to VDSL will require larger investments per customer and will therefore be more challenging to execute. In recent years, fibre has also expanded significantly, and cable TV networks have been upgraded in several locations to enable them to be used for two-way communication. Telenor has provided NPT with an overview that shows that a large share of the company's cable TV accesses have already been upgraded, and most of those that have not been upgraded can be if the demand is large enough. Telenor has also decided[15] to invest heavily in fibre, and the copper network will consequently be less prioritised as there will be fewer resources for maintenance. It is therefore likely that an increasing share of broadband subscriptions for end users will be offered via technologies other than copper.

78. With respect to demand-side substitutability at the wholesale level between broadband supplied via the various access technologies, in practice no such substitutability exists today because there is very little external offering of LLU-like products delivered via alternative access technologies. It is NPT’s understanding that this is because up to now owners of alternative access networks have wanted to have control over all retail business via their own access networks. Some exceptions do exist, such as Infiber's sale of accesses to NextGenTel. In cases where there is an alternative wholesale offering from other providers, NPT believes that it is likely that such a service will be substitutable with the copper-based LLU service for the demand side of this wholesale market. However, substitutability will be somewhat limited since a switch from the current copper-based LLU to an LLU-like access product based on a different access technology is assumed to entail certain switching costs for the wholesale customers. Further, as mentioned in chapter 7 of NPT's decision in the LLU market, there may be technical challenges related to LLU-like access to alternative access networks. NPT nonetheless finds that if any technical challenges can be overcome, the switching costs would not necessarily be so large that existing wholesale customers in the LLU market might not to view an LLU-like access product based, for example, on fibre as a substitute for the existing LLU service.

79. In terms of whether the cable TV network could be a substitute on the demand side, it is unclear whether, in the time horizon of this decision, it will be possible to offer a saleable access product over the cable TV network. It is therefore difficult to say whether it would have been possible for a wholesale customer to switch between access products based on DSL and a cable TV network, respectively. In the previous analysis, NPT concluded that this uncertainty would not affect the outcome of the analysis and the finding of a provider with strong market power. Therefore, it was not necessary to determine the exact boundaries of the relevant market. NPT believes that this remains applicable, especially as it is still technically difficult to develop a wholesale product based on cable TV networks. NPT's view is thus that such

[15] Source: Letter from Telenor to NPT dated 30 January 2012.

uncertainty does not affect the outcome of the analysis and has therefore not seen any reason to review this question further in this analysis.

80. On the basis of ESA's definition of relevant markets, and with a starting point in the above assessments of substitutability, NPT has found that all relevant access technologies for fixed broadband connections shall still be included in the LLU market.

81. Telenor`s external wholesale offer of copper-based LLU access, must be seen in the context of Telenor's duty over many years to provide such access. There are very limited degree equivalent wholesale offers from other vertically integrated broadband providers, and there is little reason to believe that Telenor had opened its copper network for access without the existence of regulatory pressure. In NPT's view the defining of relevant product markets at the wholesale level, should not be solely based on existing products in the wholesale market. In order to assess the real competitive effect at the wholesale level of vertically integrated companies' own use of inputs in the production of retail services, inclusion of internal sale or use of own access lines should also be considered included in the relevant wholesale market. Operators that rely on their own access lines in production of retail services should in principle be treated equally to operators that have an external offer of LLU.

82. In its comments to NPT`s notification of draft decision for markets 4 and 5, ESA has expressed doubts about the inclusion of self-supply of access lines in the market definitions. ESA states, inter alia, the following:

> "*ESA considers that the NPT has not provided sufficient evidence to demonstrate that indirect constraints from self-supply by all vertically-integrated competitors in Norway are sufficiently strong to warrant inclusion in the same relevant markets as externally provided wholesale access input."* …
>
> "*ESA also notes that the wholesale market definition exercise should be carried out assuming the absence of ex ante regulation in respect of the relevant products under examination, including the absence of any non-discrimination obligations in the markets concerned.*" …
>
> "*Nevertheless, ESA strongly urges the NPT to substantiate its proposed market definitions thoroughly in each case and to carefully weigh the impact of any constraints stemming from self-supply on wholesale market behaviour in its final measure.*"

83. NPT refers to Section 3.1 on self-supply in the Commission`s Explanatory Note[16] to the Recommendation and to BEREC`s report of March 2010[17] on the same subject. BEREC`s report notes that vertically integrated companies' self-supply are taken into account by a majority of regulators in Europe when they analyse the markets. The NRA`s will take vertically integrated companies' retail service offers based on different technologies as a starting point,

[16] https://ec.europa.eu/digital-agenda/sites/digital-agenda/files/sec_2007_1483_2_0.pdf
[17] http://berec.europa.eu/eng/document_register/subject_matter/berec/reports/?doc=171

and make an assessment of the indirect price disciplining effects these have on the wholesale level. Most NRA`s that are covered in BEREC`s report, takes into account these indirect price disciplining effects when defining the wholesale market and in the assessment of significant market power.

84. According to BEREC`s report, the Commission has been critical to take indirect price disciplinary effects into account when defining the relevant market and believes this only belongs in the assessment of significant market power. With regard to this point, however, BEREC's predecessor (I/ERG) expressed disagreement and pointed out that the purpose of defining a relevant market is to analyse various competitive disciplinary effects related to a specific product. I/ERG said that such an assessment should therefore take into account all relevant disciplinary effects (including indirect disciplinary effects). NPT agrees with this view.

85. If one should assume in the course of delimitating the market that there is no ex ante regulation in markets 4 and 5, as ESA suggests, the result would probably be that no wholesale offer from Telenor would exist. The two relevant wholesale markets would thus not exist either. NPT therefore believes it will be misleading to assume that there exists a wholesale offer from Telenor and also assume that this is not subject to any form of regulation, including the requirement of non-discrimination.

86. Taking into account Telenor's external turnover of LLU separately, Telenor would have a market share of almost 100 per cent, and this situation is expected to persist. In NPT`s opinion, such an approach involve a great risk of underestimating the competitive effect of vertically integrated operators offer in the retail market.

87. In the LLU market any sale of broadband access products in the retail market, regardless of the underlying access technology, is matched by an external sale or internal sale or use of own access lines at the wholesale level. Thus, there is a close connection between the wholesale market and the corresponding end user market.

88. The Commission has described a test[18] national regulators can perform to calculate the significance of indirect price disciplinary effects on the wholesale level resulting from the retail sales of vertically integrated companies. I/ERG was, however, critical to the test, because the test assumes that there is already a wholesale offer. I/ERG pointed out that a test to calculate the significance of indirect price disciplinary effects should be performed using a "modified greenfield approach" to avoid circular reasoning as a result of the existing designation of undertakings with significant market power. However, it will be impossible to use the test described by the Commission if a "modified greenfield approach" is assumed. NPT has consequently chosen not to emphasize this test.

89. After many years of monitoring the Norwegian market, NPT has a clear understanding that vertically integrated companies' offer in the retail market has significant indirect price

[18] Se http://berec.europa.eu/eng/document_register/subject_matter/berec/reports/?doc=171, side 9.

disciplining effects at the wholesale level. For example, Telenor adjusted in 2007 the monthly price of LLU access to a level under the NPT's fixed price cap. This action is difficult to explain without looking at the indirect price disciplinary effects resulting from the ever-growing vertically integrated companies with own infrastructure, especially players with own fibre and cable TV networks.

90. Both Get (cable TV) and Lyse and partners (fibre) are vertically integrated companies that compete with Telenor in the retail market. These companies offer broadband in many parts of the country. In addition, there exist a large number of providers of fibre based services with more limited coverage. These companies have collectively experienced a significant growth in the number of customers in recent years. The decrease in the number of xDSL-based subscriptions in the same period shows that many customers switch from using Telenor's copper network to using fibre or cable TV networks from other operators as the basis for their broadband subscription.

91. On this basis, it is NPT's view that vertically integrated companies self-supply should be included in the LLU market. This is a continuation of the practice of the previous analysis of the LLU market and the market participants have not objected to the inclusion of self-supply in the market..

92. To be clear, NPT will underline that the assessment of specific obligations for each form of access must be based on a discussion of competition problems and on the principles used for the regulation of the relevant market. This is discussed further in NPT's decision on specific obligations in the LLU market.

Market for Broadband Access

93. Telenor offers various Broadband Access products (ADSL, VDSL and SHDSL) to external wholesale customers. These products are all based on the company's copper network. As for LLU, Telenor has for many years had a regulatory obligation to offer these wholesale products.

94. In NPT's view it will be possible to also offer similar products through access networks other than the copper-based one, where the wholesale customer gains access to the traffic stream from the retail customers at a suitable access point. The cost of offering such access on different types of access networks will vary somewhat based on the topology and technical configuration. In this context, NPT refers to the fact that broadband access is offered over fibre access networks and to a certain extent over cable TV networks in other Nordic and European countries.

95. Given the way the relevant market for Broadband Access is defined, the interface for access is not specifically set. It is clear from the Commission's Explanatory Note to the Recommendation that bitstream access may also contain an element of conveyance. In other words, access in the form of Broadband Access need not necessarily be provided at the same

level in the various access networks, but can be adapted to the individual network's structure and configuration. This also suggests that the market for Broadband Access is not limited only to including Telenor's actual wholesale products.

96. With regard to the degree of substitutability between the different forms of access in the end-user market, both on the demand and supply sides, the same assessments as those made above regarding LLU apply.

97. With respect to demand-side substitutability at the wholesale level between broadband delivered via the various access technologies, as covered above under the discussion of the LLU market, there is in practice no such substitutability at present because there is very little external offering of a wholesale interface of broadband access delivered via alternative access technologies. It is NPT's understanding that this is because up to now owners of alternative access networks have wanted to have control over all retail business via their own access networks. There are some exceptions, such as owners of fibre access networks that offer third-party access for the provision of broadband services. In cases where such an external wholesale offering delivered via an alternative access network exists, there is in NPT's opinion much to suggest that this offer may be substitutable on the demand side with Telenor's Broadband Access offering.

98. On this basis, NPT has concluded that the market for Broadband Access includes wholesale provision of broadband access products supplied via all relevant fixed access networks, including the copper-based network, cable TV networks, fibre accesses and fixed radio access networks.

99. Also in the market for Broadband Access any sale of broadband access products in the retail market will, irrespective of underlying access technology, be matched by an external or internal sale or use of Broadband Access at the wholesale level.

100. In NPT`s view, the delimitation of relevant product markets at the wholesale level can't solely be based on existing products in the wholesale market. In order to assess the real competitive effect at the wholesale level of vertically integrated companies own use of inputs in the production of retail services, inclusion of internal sales or internal use of broadband products delivered over different access technologies and various interfaces should be considered. Operators that rely on LLU in the production of broadband services for the retailmarket, should in principle be treated equally to vertically integrated operators.

101. NPT refers to the similar assessment of the LLU market, where practice in Europe for assessing the internal sale or use of inputs in the analysis and the Commission's and BEREC's respective views on whether this should be taken into account when defining the relevant market, are discussed. In NPT`s opinion the same conditions apply in the market for Broadband Access as in the market for LLU, as to whether vertically integrated companies' offers in the retail market have significant indirect price disciplining effects at the wholesale level.

102. On this basis, NPT believes that the internal sale or use of Broadband Access at wholesale level for the provision of broadband services in the retail market should be included in the wholesale market for Broadband Access.

3.2.7 Assessment of whether mobile network-based broadband access is included in the wholesale markets for LLU and Broadband Access

103. In the previous analysis of the wholesale markets for LLU and Broadband Access, NPT concluded that mobile network-based broadband access via EDGE/UMTS/HSDPA networks and CDMA networks should not be included in these wholesale markets. As there have been significant technological and market developments within mobile broadband since 2009, NPT finds it natural to make a new assessment of the substitutability between broadband access based on fixed and mobile networks.

104. Mobile network-based broadband access makes it possible for end users to consume broadband content, and to send and receive data traffic, even when they do not have access to fixed broadband accesses. This can be done via a mobile broadband subscription and a USB modem for computers, which is supplied with the subscriptions. Alternatively, the customer can use their mobile phone as a modem or get access to mobile broadband directly on a mobile phone or tablet.

105. The development since the previous market analysis is highlighted by, among other things, the amount of data traffic for mobile telephony and mobile broadband, which has increased more than eight-fold from the first half of 2008 and to the first half of 2013[19]. The price of mobile broadband has also decreased significantly in this period.

106. Furthermore, there has been significant technological development, for example with a further expansion of the 3G network and the development of an LTE network. Telenor is advertising a so-called mobile super-broadband with download capacity of up to 40 Mbit/s based on LTE. NetCom offers equivalent products based on LTE with download capacity of up to 80 Mbit/s. Other mobile providers such as Tele2, Chess and One Call also offer mobile broadband based on 3G/LTE.

107. Additionally, the CDMA operator Ice offers mobile network-based broadband access in the retail market. According to the Ice homepage, the theoretical download capacity is 9.4 Mbit/s, while typical download capacity in practice is between 300 Kbit/s and 5 Mbit/s.

108. For all types of mobile networks, the actual speed will vary with the distance to the base station and the terrain. Furthermore, the speed will vary depending on the number of simultaneous users in the same geographic area.

109. The coverage area, capacity and consumption of mobile data have increased significantly since the previous market analysis in 2009. Nevertheless, NPT is under the clear impression that the end users who have access to fixed network-based broadband access

[19] Source: NPT's ecom statistics for first half of 2013.

primarily view mobile broadband access as a supplement to, rather than replacement for, the fixed broadband access. NPT finds that most providers share this view. The fact that the number of fixed broadband subscriptions continue to increase, while the mobile broadband penetration increases sharply, also indicates that most people consider mobile broadband as a supplement to fixed broadband access.

110. An important explanation for this is assumed to be that fixed broadband accesses provide higher bandwidth in most areas. A fixed broadband subscription will likely also be more stable than a mobile broadband, as the transmission capacity is not similarly dependent on the amount of other use in the same area and the distance from relevant infrastructure. Additionally, mobile broadband products generally have limitations in terms of the amount of data that can be downloaded every month, especially in the residential market. Ice offers different pricing models in which the customer only pays for the weeks in which the broadband access is used. Such pricing models may suggest that mobile broadband access is used irregularly, and primarily in situations where fixed network-based broadband access is not available.

111. The numbers NPT has obtained as part of its 2013 user survey also indicate that consumers in the residential market do not see mobile broadband as a substitute for fixed broadband accesses. The figure below shows the distribution of different types of internet subscriptions. 70 per cent say that they have internet subscriptions via fixed broadband or dial-up, while only 4 per cent have mobile broadband only (those who responded "don't know" or did not respond are not included in these numbers or in the figure).

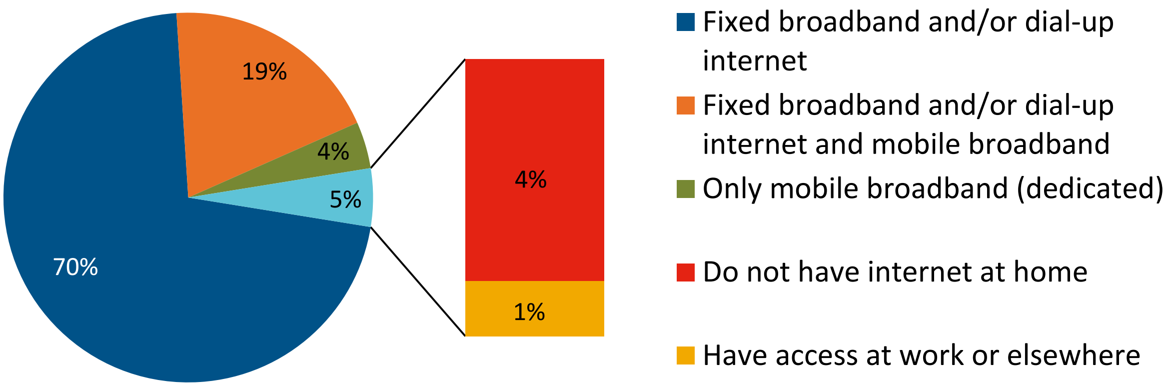


Figure 6: Distribution of different types of internet subscriptions. (Source: NPT's user survey 2013)

112. Conversely, a fixed broadband access cannot be a substitute for a mobile broadband access, since a fixed broadband access does not enable access to broadband content from other locations than where the broadband connection is established. One of the most important reasons why end users choose to buy a mobile network-based broadband subscription is the desire to be able to consume broadband content, and send and receive data traffic, regardless of where they are. An evaluation of demand-side substitution in the retail market indicates on this basis that mobile network-based and fixed network-based broadband access constitutes different relevant product markets.

113. For the record, NPT must emphasise that fixed radio access (point-to-point and point-to-multipoint connections), is different from broadband access via the mobile networks. Fixed radio access is indeed also wireless, but a fixed radio access has a local application like the cable-based access technologies (copper, fibre and coax). Being wireless per se is not decisive for substitutability. Due mainly to different applications, different pricing models and different capacity for mobility, mobile network-based and fixed network-based broadband access are not very substitutable products in the retail market. In the end user's view, fixed radio access has in this connection the same characteristics as the cable-based access technologies, and NPT therefore considers broadband access based on fixed radio access to be part of the relevant wholesale markets for LLU and Broadband Access.

114. For this reason, NPT has concluded that mobile network-based broadband access via EDGE/UMTS/HSDPA/LTE networks and CDMA networks within the time frame for this analysis are, in the view of the end user, not sufficiently substitutable with fixed/local broadband accesses for mobile network-based broadband access to be included in the wholesale markets LLU and Broadband Access. However, fixed radio access (point-to-point and point-to-multipoint connections) are a part of these relevant markets.

3.2.8 Definition of the markets for LLU and broadband access versus the markets for wholesale leased lines

115. In the market analysis of 3 April 2009, assessments were made of the definition of Markets 4 and 5 against Market 6 (formerly Market 13) and the former Market 14. The Authority cannot see that any substantial changes have taken place since the previous analysis and refer to the assessment in that analysis.

116. On this basis, NPT has concluded that LLU and Broadband Access do not belong to the same relevant market as leased lines.

3.3 Definition of the relevant geographic market

117. In the previous market analysis of the wholesale market for LLU and Broadband Access from 4 April 2009, NPT concluded that the geographic market should be defined nationally.

118. In accordance with the Guidelines, paragraph 57, the geographic market may be defined as that area in which the relevant product is offered on approximately similar and sufficiently homogeneous conditions of competition. The degree of substitutability both on the supply and the demand side may be taken into consideration in the assessment of the geographic market and, as a part of such a substitutability assessment on the demand side, preferences and geographic purchase patterns should be taken into account. However, paragraph 60 of the Guidelines points out that geographic markets in electronic communications have traditionally been defined by reference to the relevant network's area of coverage as well as the effective boundaries (jurisdiction) of the legal regulation of the market.

119. Further reference to Norway as a jurisdiction should be taken to mean mainland Norway, in accordance with the description of the geographical scope of the Electronic Communications Act in Chapter 3.1.

120. It might make sense in the case of some product markets to divide them into geographic markets smaller than the national market, since there are local providers of electronic communication services covered by the relevant product market. In October 2008, the ERG published "Common Position on Geographic Aspects of Market Analysis (definition and remedies)" (ERG Common Position). The ERG recommends a step-by-step process for geographic definition of the market. The first step in this process is to identify whether it is necessary to undertake a detailed geographic analysis. "Preliminary analysis", paragraph 1, page 2 of the ERG Common Position reads:

"Before going into the details of geographic analysis, NRAs should look at a number of criteria which are easily accessible and indicate whether competitive conditions are such that a national approach to market definition, market analysis and the implications of remedies is justified. Indicators pointing in this direction are:

- *The hypothetical monopolist test suggests that there is sufficient demand- and/or supply-side substitution between different areas.*
- *Competitive conditions are sufficiently homogenous:*
    - *Alternative networks either have small coverage and market shares or have (close to) national coverage with similar prices;*
    - *There is a uniform price of the incumbent operator and similar prices of alternative operators;*
    - *There are no significant geographical differences in product characteristics."*

121. As stated in the ERG Common Position regarding broadband markets, it is unlikely that a sufficient amount of consumers would move their homes to neighbouring areas in response to a 5-10 per cent price increase. It is also unlikely that an operator from a neighbouring area would start to roll out its own network in response to such a price increase. A pure SSNIP test could thus result in a very large number of geographic markets and would therefore not be very practical.

122. It will therefore be necessary to assess whether competitive conditions are sufficiently homogeneous throughout the country.

123. The cable TV-operators that offer broadband access in the retail market do not have nationwide networks and therefore do not offer broadband access throughout the country. The same applies to the locally/regionally-based providers of broadband access that have entered the market in recent years. These are providers who are often wholly or partly owned by electric utilities, local governments and/or counties. For the majority of these operators it will make sense to limit the retail supply of broadband services to the geographic area where the owners are based. This can in principle indicate that an assessment of supply-side substitution may suggest a split into many relevant geographic markets.

124. However, clear and stable boundaries do not exist between geographic areas with different competitive conditions. The roll-out of new broadband access networks is dynamic. For example, the growth of Lyse Tele's partner network in recent years shows that increasingly more local and regionally based providers of own access infrastructure are entering the market. The fact that there are no clear and stable boundaries between geographic areas with differentiated competitive conditions favours keeping the entire country as the relevant geographic market. Even though the annual percentage growth is largest for broadband via fibre and cable TV networks, it is still the case that operators who build separate alternative access networks have relatively small market shares.

125. Furthermore, it is not the case that clear boundaries between different parts of the country or municipalities and counties can be drawn with respect to differences in competitive conditions in this market. For example, it is not the case that competing access networks have been established only in the most densely populated areas of the country or in the biggest cities. This means that no clearly defined geographic areas where competitive conditions are vastly different from the rest of the country are manifest so that it makes sense to define smaller geographic markets than the country as a whole.

126. Another factor that weighs against splitting into different geographic markets is that the competitive conditions in relatively small geographic areas can vary. Among other things, this is because many of the providers who rely on new roll-outs of fibre or radio access networks often make investment decisions limited to certain parts of town or housing developments. This means there can be big variations in the competitive conditions within one and the same city or municipality. This makes it difficult to draw clear boundaries between geographic units with differentiated competitive conditions.

127. According to Nexia's report to the Ministry of Government Administration, Reform and Church Affairs[20], about 99.9 per cent of Norwegian households have a basic broadband service (minimum 2 Mbit/s downstream bandwidth), while 99.2 per cent have access to at least

[20] See footnote 7.

12 Mbit/s. Degree of coverage is therefore not a factor weighing in favour of a split into several relevant geographic markets. Moreover, the remaining “white spots” on the broadband map are not concentrated on defined geographic areas. This means that the households that cannot get fixed broadband access are rather spread out throughout the country.

128. Telenor has a nationwide copper access network, and its continuing obligation to offer the wholesale product LLUB is not limited to certain geographic areas. Telenor also offers LLUB at the same prices and terms throughout the country. In other words, there is no price discrimination based on geographic conditions in the LLU market. This also applies to the Broadband Access market, where the price list does not show any differentiation based on geographical conditions. Retail prices for broadband connections vary somewhat between the different providers, including for products that must be supplied with the same leased lines and based on the same access technology. However, each provider, including Telenor, appears to offer the same retail prices in different geographical areas. Even Lyse and partners, which consists of multiple companies, do not appear to significantly differentiate prices based on geography and different levels of competition. This is a factor that favours keeping the country as a whole as the relevant geographic market.

129. Varying product quality is another factor weighing in favour of a division into many geographic markets. In NPT’s assessment, there are no significant differences in product quality in geographic areas with different competitive conditions in this market. This factor also weighs in favour of keeping the entire country as the relevant geographic market.

130. In connection with the evaluation of Telenor's acquisition of LOS Bynett and Bynett Privat, the Norwegian Competition Authority evaluated the geographical market definition and concluded that there are local markets in the same markets that NPT is currently evaluating. The Norwegian Competition Authority's evaluation was a snapshot of the market based on the range of LOS Bynett and Bynett Privat's existing networks. This means that the Norwegian Competition Authority based its definition of the markets on an ex-post evaluation. As previously mentioned, NPT makes ex-ante evaluations of these markets. As these two evaluations are based on different assumptions it will not be unnatural for NPT to reach a different conclusion in our evaluation of the geographical market than the conclusion the Norwegian Competition Authority reached in its ex-post evaluation.

131. On this basis, NPT can, already at this stage of the preliminary analysis in relation to the ERG Common Position, conclude that a more detailed geographic analysis should not be necessary and that a national approach to market definition and analysis is justified. In NPT’s opinion, different competitive conditions indicating that a geographic division of the market is necessary does not exist in stable and clearly defined parts of the country. NPT therefore believes that the relevant geographic markets for LLU and Broadband Access are still Norway.

3.4 Conclusion on market definition

132. The LLU market and the Broadband Access market are separate wholesale markets. Both markets are technologically neutral.

133. Both wholesale markets include all external and internal sales, or use, of broadband access products via all fixed access technologies used to offer broadband access in the retail market.

134. The Broadband Access market covers all speeds offered by the wholesale provider's retail business.

135. Leased lines are not a substitute for LLU or Broadband Access, and are therefore not a part of these relevant markets.

136. The retail market for mobile network-based broadband access is not included in the same relevant market as fixed network-based broadband access. Wholesale provision of mobile network-based broadband access is thus not included in the LLU or Broadband Access market. However, fixed radio access (point-to-point and point-to-multipoint connections) are a part of these relevant markets.

137. Further, the LLU and Broadband Access markets are defined geographically as Norway.

4 Analysis of Market 4

4.1 Definition of the relevant product market

138. This relevant product market corresponds to Market 4 in ESA's Recommendation:

> *"Wholesale (physical) network infrastructure access (including shared or fully unbundled access) at a fixed location".*

139. This is a wholesale market covering full and shared access to fixed access networks. NPT has chosen to retain the term of this market from the previous analysis: LLU market (i.e. the market for "local loop unbundling").

140. The LLU market is technologically neutral, cf. Chapter 3. This means the market is not defined as only including Telenor's existing wholesale provision LLU over copper, but also includes potential wholesale provision of LLU offered via access networks other than the copper-based one.

141. See Chapter 3 for other definitions of this relevant product market.

4.2 General comments about significant market power

142. The assessments that are used to designate a provider with significant market power shall, according to paragraph 76 of the Guidelines, be based on a forward-looking market analysis on the basis of existing market conditions.

143. NPT emphasises that the relevant subject of assessment is the existence of significant market power and not anti-competitive abuse of market dominance. It is therefore not central to the SMP assessment whether any market power/dominance is actually misused or not. However, it does not mean that a provider's behaviour in the market is irrelevant to the assessment of significant market power. Even if structural factors are accorded the greatest weight in the assessment, behaviour that serves to create or maintain competitive advantages may bolster the conclusion of significant market power.

144. The analysis of significant market power is based on the Guidelines and NPT's methodology document.

4.3 Market shares

145. Assessing market share is a natural starting point for analyses of significant market power, cf. paragraph 76 of the Guidelines. In the Guidelines, ESA points out that the Commission assumes that single dominance will normally be found at providers with more than a 40 per cent market share. ESA furthermore writes:

> *"According to established case-law, very large market shares - in excess of 50 % - are in themselves, save in exceptional circumstances, evidence of the existence of a dominant position. An undertaking with a large market share may be presumed to have SMP, that is to be in a dominant position, if its market share has remained stable over time."*

146. Market share can be measured by revenue, volume or number of customers. The characteristics of the relevant market will determine the choice of criteria for measuring market share, cf. paragraphs 77 and 78 of the Guidelines.

147. Apart from Telenor's copper-based unbundled loops, NPT has recorded only a very limited number of copper-based unbundled loops. This means that Telenor accounts for close to 100 per cent of the actual sales of copper-based unbundled loops in this wholesale market.

148. The demand side of the copper-based LLU market consists of some 50 operators. NextGenTel is clearly the largest of these operators, and it alone accounted for about 47 per cent of the LLU accesses Telenor had sold by the end of June 2013. Broadnet (formerly Ventelo) is an as-clear number 2 operator in this market, measured by the number of accesses. Broadnet accounts for approximately 23 per cent of the LLUB accesses from Telenor. The remaining 30 per cent is distributed among the other operators on the demand side.

149. However, given the way in which the relevant market is defined, it is not only the existing external wholesale sales of LLU that are to be used in the calculation of market shares. In addition, the broadband accesses that the various access network owners' retail operations sell or use internally are also considered to be part of the relevant LLU market. With such an approach internal sale or use of broadband accesses at Telenor will also have to be included in the market share estimate.

150. Since NPT lacks data on internal sales and use of broadband access products at the wholesale level, market share at the retail level is used as an indicator of market share at the wholesale level. As a starting point, NPT has chosen to look at the volume of broadband access services sold in the retail market. Such an approach is considered justifiable since there is virtually a one-to-one ratio between the number of broadband accesses sold in the retail market and the number of broadband accesses sold or used at the wholesale level.

151. The market share at the retail level for providers who base their operations on purchasing LLU and Broadband Access from Telenor indicates how large a market share external sales of broadband access services represent at Telenor. Telenor's own market share in the retail market indicates the market share Telenor has from internal use or sales of broadband access. Telenor's market share at the wholesale level is then the sum of external LLU and Broadband Access sales and internal use/sale of broadband access services.

152. The inclusion of internal use of broadband access services in this relevant market furthermore means that retail sales from the market units of operators that base their broadband service in the retail market on their own access network (i.e. Get and Lyse Tele and partners) indicates the market share these providers have in the wholesale LLU market.

153. Based on this approach, at the end of June 2013 Telenor had a market share of about 64 per cent[21] of the LLU market, while it was about 82 per cent in the previous analysis (as of the first half of 2008) based on volume/number of broadband accesses. The development since the previous analysis is shown in figure 7 below.

[21] Since Canal Digital is a wholly owned Telenor company, Canal Digital's sale of broadband accesses via its cable TV network is included in Telenor's market share.

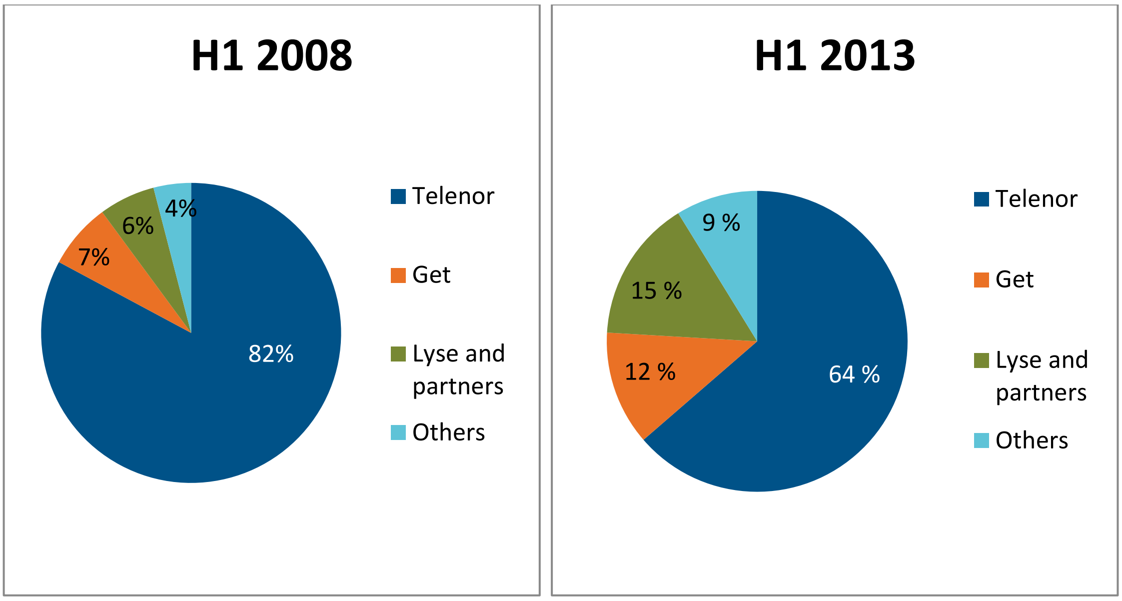


Figure 7: The development of market shares in the LLU market, based on the number of accesses.
(Source: Numbers submitted in connection with NPT's ecom statistics for the first half of 2008 and first half of 2013).

154. In certain situations it is considered more appropriate to calculate market share based on revenue instead of volume (number of units sold). This is also assumed to be the case for this relevant market, inter alia, as the price of broadband access services varies significantly between the residential and business market. Even so, it is not easy to calculate market share based on revenue, given the way in which this relevant market is defined. This is because Telenor's competitors do not operate with internal wholesale prices. An assessment of market share based on Telenor's wholesale revenue and the other operators' retail revenue will not provide a correct picture of the relative strength of the operators on the wholesale level.

155. Another possible method of calculating market share is to estimate internal wholesale prices for the operators who do not operate with such prices, although such an approach would be subject to great uncertainty. Consequently, NPT has chosen to compare market share based on volume in the wholesale market, cf. Figure 7, with market share based on revenue in the retail market, cf. Figure 8. In order for these amounts to be comparable, the retail revenue of the operators who purchase LLU and broadband access from Telenor is included in Telenor's market share in Figure 8.

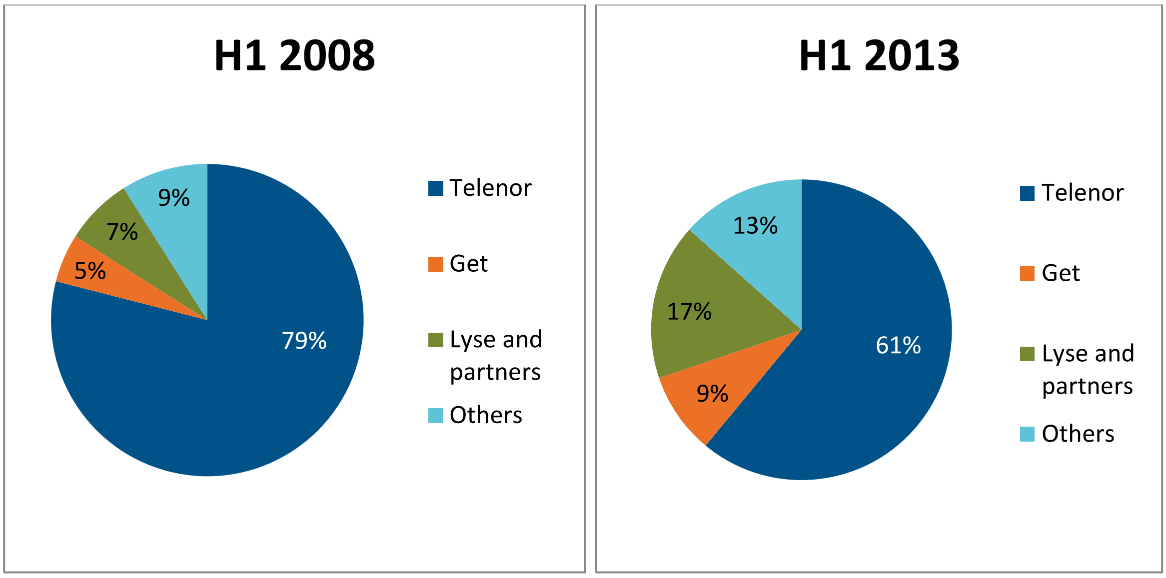


Figure 8 The development of market shares for the LLU market, based on revenue. (Source: Numbers submitted in connection with NPT's ecom statistics for the first half of 2008 and first half of 2013).

156. A comparison of market shares in Figures 7 and 8 shows that Telenor's market share based on these two calculation methods is not significantly different (64 per cent versus 61 per cent in the first half of 2013). The calculations of market share based on volume/number of broadband accesses, cf. Figure 7, thus appears to give a relatively accurate picture of the relative strength of the providers in this relevant wholesale market.

157. On this basis, Telenor is deemed to have a market share of 64 per cent in this relevant market. Though Telenor's market share has fallen significantly, and the figures and methods of calculation are subject to some uncertainty, in NPT's view this nevertheless clearly indicates that Telenor has significant market power in this relevant market, in accordance with paragraph 76 of the Guidelines.

158. However, market share alone is insufficient to determine whether a provider has significant market power, but must be viewed in context with the other relevant assessment criteria, cf. the Guidelines, paragraph 79.

4.4 Entry barriers[22]

159. Potential competition from new operators will normally affect a dominant operator's behaviour in the market, including price setting. Various forms of entry barriers may, however,

[22] Cf. the Guidelines, paragraph 81.

weaken or remove the basis for potential competition. Possible entry barriers related to this relevant market are discussed below[23].

4.4.1 Control of infrastructure not easily duplicated[24]

160. If an operator controls infrastructure that is difficult to duplicate, and this infrastructure represents an important input factor in the relevant market, this could represent a substantial entry barrier for potential competitors.

161. Without taking a view on whether the relevant infrastructure in this market may be seen as an 'essential facility' in relation to competition law, NPT has assessed whether control of infrastructure that is difficult to duplicate can be seen as an entry barrier in this relevant market.

162. Technically, it is probably possible to establish a parallel physical copper access network to Telenor's national access network. In other words Telenor does not have control over infrastructure in this market that is impossible to duplicate in technical terms. In practice, however, establishment of an adequate alternative to Telenor's copper-based access network would require such an investment of resources and time that it is considered completely improbable that this network will be duplicated.

163. Since alternative access networks for broadband services based on access technologies other than copper have expanded significantly in the current decision period, the assessment of duplicability must be nuanced somewhat in relation to previous market analyses, cf. the discussion of potential competition in the chapter below. Since it will require considerable investment for other access network owners to establish an LLU service covering equally large parts of the country as Telenor's existing services, Telenor's control of the nationwide copper access network is still considered to represent a significant entry barrier in this relevant market. This contributes to maintain Telenor's strong position in the LLU market.

4.4.2 Sunk costs

164. Unrecoverable fixed costs ("sunk costs") are costs attributable to an irreversible investment, i.e. a provider cannot expect to recover the investment once it has been made, for example through the sale of an investment item, if the provider wishes to exit the market. Unrecoverable fixed costs mean that a potential newcomer faces higher decision-relevant costs than the (or those) operator(s) already established. This cost difference can constitute an entry barrier to a potential entrant.

165. If entry into a market requires high sunk costs, the established operator may have an incentive to make a more extensive investment than it otherwise would have done. This can send a signal to potential newcomers that it would not be profitable to attempt to enter the

[23] Among other places, entry barriers are discussed in the Guidelines, paragraph 81: *"In fact, the absence of barriers to entry deters, in principle, independent anti-competitive behaviour by an undertaking with a significant market share."*

[24] The criterion corresponds to "control of infrastructure not easily duplicated" in paragraph 79 of the Guidelines.

market. Sunk costs can therefore give rise to strategic behaviour among the established operators, further raising the entry barrier.

166. Telenor is the only operator to own a nationwide access network, which has taken decades to construct. There is little doubt that it would be extremely resource and cost-intensive for a potential competitor to establish a competing access network regardless of the technology that is used. There is furthermore little doubt that such an investment would largely have to be viewed as irreversible and thereby represents an entry barrier as described above.

167. However, NPT has the impression that many of the operators with local and regional access networks are trying to relate sunk costs to actual customer growth by not rolling out an access network in a given geographic area until a certain number of customer contracts have been signed in the respective geographic market. This suggests that sunk costs are not necessarily viewed as a significant entry barrier for operators of this type.

168. NPT therefore finds that compared to a few years ago, sunk costs today represent a more minor entry barrier in this relevant market than prior to the last analysis. At the same time it is assumed that potential wholesale providers other than Telenor, which has a geographically limited service, will be a less attractive provider of LLU for wholesale customers who wish to offer broadband access to end users in the entire country.

169. It is further worth noting that a newcomer is free to choose newer and more cost-effective technology than Telenor's copper-based access network[25], and to undertake investments in areas where the potential profit is greatest. This can reduce some of the asymmetry they face in relation to Telenor.

170. Intangible investments can also be unrecoverable and represent an entry barrier. Investment in brand building (for example through advertising and other marketing) is an example of such investments. Another example is costs relating to research and development (R&D).

171. In NPT's view, costs relating to advertising and brand building in the wholesale LLU market do not represent an entry barrier. This is in part because customers in the wholesale market are largely competitors to Telenor. Experience has shown that these generally prefer to choose a different provider than Telenor where possible. Furthermore, the wholesale market will be relatively orderly. A potential competitor in the wholesale market for LLU will therefore expect to devote far fewer resources on advertising and marketing than would be the case in the retail market.

172. With respect to costs relating to research and development, NPT is of the opinion that the development of new services in this relevant market does not constitute any appreciable entry barrier because the products in this market are largely standardised and relatively homogeneous.

[25] See section 4.5 on potential competition and innovation.

173. Though it is possible to limit sunk costs when setting up as a provider in this relevant market, after a comprehensive assessment NPT has nevertheless concluded that sunk costs will normally not be a significant entry barrier. Still, this is not a factor that can be said to indicate that Telenor does not have significant market power in the LLU market.

4.4.3 Economies of scale[26] and scope[27]

174. Economies of scale exist when an increase in production brings a fall in average unit cost. This is characteristic of production based on technology with relatively high fixed costs and low variable costs.

175. Economies of scope are reductions in average unit cost when more than one service is produced using common means of production, for example common infrastructure or common administrative systems.

176. Economies of scale and scope can work both as entry barriers for new potential operators and as a competitive advantage for established competitors in the market.

177. There are undoubtedly significant economies of scale associated with establishing LLU services nationwide. Furthermore, it is assumed that given its broad portfolio of products, Telenor enjoys greater economies of scope than its competitors. Such Telenor products as leased lines, nationwide telephone services, Broadband Access and LLU all use in part the same underlying infrastructure. It is doubtful whether any of Telenor's competitors will have the capability to achieve equally large economies of scope in the short or medium term. Telenor will also have other economies of scope within sales, billing and customer service, for example.

178. On the other hand, it is not a given that these economies of scale and scope represent an equally significant entry barrier for all potential providers in this relevant market. First, as mentioned earlier, it is not necessarily decisive to offer service nationwide in this market. Second, there is reason to assume that many of the new operators in the broadband market can also benefit from economies of scope to a not insignificant degree. This is particularly the case for the electric utilities that have established wholly or partly owned broadband companies. For example, it will make sense for these broadband companies to utilise conveyance routes, access to buildings/masts and invoicing and customer service systems already used in connection with the utilities' main enterprise.

179. However, for potential providers without a comparable main enterprise it is assumed that Telenor's economies of scale and scope can act as an entry barrier.

180. On the basis NPT finds that Telenor's economies of scale and scope do not constitute entry barriers in this relevant market. However, NPT would like to note that Telenor's

[26] The criterion corresponds to "economies of scale" in the Guidelines, paragraph 79.
[27] The criterion corresponds to "economies of scope" in the Guidelines, paragraph 79.

economies of scale and scope can nevertheless provide the company with a competitive advantage that can help maintain its strong position in the market in the near future.

4.4.4 Access to financial resources[28]

181. Access to financial resources is important to an operator's opportunity to enter markets requiring major initial investment. Differences between operators relating to access to financial resources may constitute an entry barrier. In addition, everything else being equal, it will be expected that an operator with market power and good financial standing will be less exposed to competition than an operator with market power without good access to financial resources. Besides, an operator with market power and good access to financial resources will be better able to defend his market share if new competitors enter the market than an operator with market power without good access to financial resources.

182. It will require extensive capital to establish an adequate alternative to Telenor's nationwide infrastructure. However, as mentioned above, it is not necessary to have a nationwide service to enter this relevant market. If one looks at the operators that have entered the broadband market with their own infrastructure in the past couple years, the majority are locally and regionally based operators.

183. Another factor than what is associated with financing of new projects concerns financial strength in connection with price wars/price dumping (the so-called "long purse argument"). Telenor undoubtedly has the financial strength to price many of the small national broadband operators out of the market, but will not necessarily have a much better financial position than existing and potential foreign operators, as well as regionally based broadband operators that are fully or partly owned by large electric utilities.

184. On this basis, access to financial resources cannot be viewed as a significant entry barrier in the LLU market.

4.4.5 Access to distribution and sales channels[29]

185. In markets in which the established operators have a well-developed distribution and sales network this may function as an entry barrier for potential new operators. This applies in particular in markets in which there are major costs associated with establishing distribution and sales channels, or where the established operators have concluded exclusive agreements with the largest/most important distribution channels in the market.

186. It is NPT's assessment that lack of access to distribution and sales channels will mainly be a problem in retail markets. The wholesale customers in this relevant market consist of operators who themselves are providers of electronic communication networks and services. Such operators usually have a good overview of the market and will make choices based on

[28] The criterion corresponds to "easy or privileged access to capital markets/financial resources" in the Guidelines, paragraph 79.
[29] The criterion corresponds to "a highly developed distribution and sales network" in the Guidelines, paragraph 79.

their knowledge of it. It is therefore unlikely that potential newcomers in this relevant market will not enter the market because they consider it difficult to gain access to sales channels.

187. Based on the above, NPT concludes that access to distribution and sales channels does not represent an entry barrier in this relevant market.

4.4.6 Barriers to expansion[30]

188. A market with large growth potential is as a rule more attractive to potential new operators than markets in which the total units sold and/or the number of customers has stagnated or is on the way down (known as 'mature' markets). Operators considering entry into a 'mature' market must generally aim to capture customers from the established operators. If there are barriers to growth in a market, these may therefore be looked upon as a possible entry barrier.

189. The retail market for broadband access services has been a growth market in recent years. This is discussed in depth in chapter 2. It has therefore also been natural to view this relevant wholesale market as a growth market. Up to now, any new providers in this market have not been forced to rely solely on capturing customers from existing wholesale providers, but have had the opportunity to try to expand the overall market for broadband access services through new product concepts and new distribution channels.

190. Figure 1 shows that the number of xDSL subscriptions is declining. Yet there is still growth in the total number of broadband accesses even though growth has stagnated somewhat; see chapter 2 for more information about this. Although there are signs indicating that the growth in retail sales of broadband accesses is slowing compared to a few years ago, NPT finds that the market cannot yet be characterised as a mature market. This supported by the fact that about 75 per cent of Norwegian households had chosen to purchase fixed broadband access at the end of June 2013.

191. On this basis, NPT finds that barriers to expansion do not constitute an entry barrier in this relevant market.

4.4.7 Regulatory entry barriers

192. Regulatory entry barriers exist when market access is limited by regulatory conditions. Examples are requirements concerning licences, resource restrictions or restrictions relating to health, safety and the environment (direct regulatory restrictions). Furthermore, various forms of price controls may also act as an entry barrier, cf. paragraph 11 in the preface of the Recommendation.

193. Uncertainty regarding future regulation can function as an entry barrier because uncertainty in itself can yield lower expected profitability at market entry and can thereby lead to potential challengers either dropping or delaying plans to enter the market. This aspect will

[30] The criterion corresponds to “barriers to expansion” in the Guidelines, paragraph 79.

naturally be particularly important during a period of new regulations. Regulatory uncertainty can, however, be reduced if the regulatory authority clearly informs the market operators about how the regulations will be practised and is consistent at the same time in the actual implementation of these rules.

194. Price controls, or expectations of future price controls, can function as an entry barrier in the market for electronic communication in general, including this relevant market. Furthermore, price controls, or expectations of future price controls, can affect the behaviour of operators already in the market.

195. If a potential new operator in the LLU market believes it is possible that it will be subject to price control, if, for example, this operator is designated by the regulatory authorities as having significant market power in this market (or in a limited geographic area), this will affect expected future earnings and will thus act as a potential entry barrier. Such an expectation, or fear of, being subject to obligations as an undertaking with significant market power can affect the degree to which existing operators plan to expand in the market. However, NPT believes that there are few potential new operators in this market that attach much weight to this factor. This is due to the fact that it would be difficult for a new operator to gain status as an undertaking with significant market power in a market like this.

196. Expectations of price control being imposed on the dominant provider(s) can also act as an entry barrier if potential new entrants regard the regulated price as being, or potentially being, so low that it would be impossible to compete in the market. In this relevant market, expectations of strict controls being imposed on Telenor's prices may to some extent cause competitors to refuse to enter the market at all or particular sectors of it.

197. On the other hand, expectations of strict regulation of Telenor in the LLU market could have a positive effect on the entry possibilities in this relevant market. For example, a possible extension or tightening of Telenor's LLU obligations, combined with the absence of regulation for new operators, could encourage potential providers to enter the market. This may for example be the case if they for the foreseeable future will depend on LLU access from Telenor in order to supplement service provision based on their own infrastructure.

198. Other forms of regulation than price controls may also affect the opportunities to enter the relevant market. Obligations regarding co-location and access to networks or network elements in other markets could have a positive effect on the entry possibilities in this relevant market.

199. Based on a complete assessment, NPT finds that expectations of future regulation do not appear to constitute any particular entry barrier in this relevant market.

4.5 Potential competition and innovation

200. Potential competition relates to whether the operators not in the current market can help to create market dynamics within the forthcoming regulatory period. Potential competition will also, among other things, be able to discipline pricing in the retail market, because high prices make entering the market more attractive.

201. As a rule, in markets with a high degree of innovation the opportunity to exercise market power will be more limited than in markets with little innovation. Technological development may therefore be of significance for potential competition in the market. Innovation resulting from technological development can therefore contribute to weakening an operator's position in the market in relation to potential competitors.

202. Technological development is one of the key forces driving the broadband market. Both in the case of copper-based access and alternative access technologies, technological development makes it possible to offer an ever-growing list of new and more bandwidth-intensive retail services and applications.

203. With respect to copper-based broadband access in the retail market, ADSL has been supplemented with products such as VDSL. Telenor launched VDSL commercially in the residential market in 2011, and this can give broadband customers higher bandwidths up to 40 Mbit/s (Telenor's offer). At the same time, there are more limitations with respect to the distance between the subscriber exchange and the customer with VDSL than with ADSL. This means that actual bandwidth for customers who live some distance from the subscriber exchange often will be lower than the theoretical bandwidth made possible by these new xDSL variants.

204. Fibre-optic cable can provide virtually unlimited capacity. Building fibre access networks is costly, but the reach of these networks has nevertheless grown considerably in recent years. This is connected with, among other things, the fact that many electric utilities, local governments and counties in recent years have started broadband projects, often under the direction of wholly or partly owned broadband companies.

205. Even though many locally and regionally based broadband operators rely on a combination of fibre, radio, xDSL and cable TV networks, most of the business models of these broadband operators are based on fibre access networks. Further, Telenor's rollout of fibre accesses has increased in recent years. There is much to suggest that the growth will continue in the years ahead. Both Telenor[31] and Altibox (Lyse and partners)[32] have signalled that they have growth ambitions. Through its acquisition of LOS Bynett and Bynett Privat, Telenor has already shown that it is implementing its strategy of growth in the fibre segment.

[31] Telenor's letter to NPT dated 30 January 2012
[32] http://www.dagensit.no/article2131722.ece, and statements made during a meeting with NPT in 2011

206. In recent years, cable TV networks have also been upgraded in several areas so that they can now be efficiently used to connect to the internet. New protocols mean that upload speeds have increased and in this way cable TV networks have become a clear alternative to copper and fibre-based accesses.

207. Developments in radio access technology (point-to-point and point-to-multipoint) also appear to enable increasingly higher speeds. This allows increased use of fixed wireless access in conjunction with broadband. Radio access technology is particularly interesting with respect to broadband service in sparsely populated areas and in areas where people live too far from Telenor's subscriber exchanges to have an xDSL connection.

208. Technologies that enable broadband services via the electricity grid, so-called power line communication (PLC) have been known for several years, but their coverage has been very limited. This is partly due to technical regulation and partly due to problems with interference for other users of the relevant frequency spectrum. However, the technology is under continuous development, and it cannot be ruled out that in a few years PLC may represent an important supplement to fibre and radio access technology for the electric utilities entering the broadband market.

209. Even though mobile network-based broadband access is preliminarily not considered sufficiently substitutable with fixed network-based broadband access so that fixed and mobile broadband access can be said to be a part of the same relevant market, cf. Section 3.2, the trend toward ever larger bandwidths via mobile broadband networks is a factor that eventually could affect the assessment of significant market power in the LLU market. Since Telenor is one of the trendsetting providers of mobile network-based broadband access, it is not a given that this change will help weaken Telenor's market power in this relevant market.

210. NPT also wants to point out that at the end of June 2013, about 820,000 of about 1,880,000 fixed broadband accesses were based on the copper-based access network. This shows that Telenor's access network and possibility for LLU access to this network is still of great importance for competition in the retail market for broadband access.

211. All in all, the above factors indicate a high degree of innovation in the retail market for broadband access in the near future. This is also creating the basis for potential competition in the related wholesale market. This potential competition can eventually contribute to limiting Telenor's possibility to exercise market power, but is not considered as weakening Telenor's position in the LLU market to a significant degree within the time frame of this analysis.

4.6 Provider behaviour

4.6.1 Bundling of products/product differentiation[33]

212. "Product differentiation" means a strategy that aims to give a provider's own products characteristics that distinguish them from the products of competing providers. Product differentiation can take place both in the wholesale and retail market. A high degree of product differentiation by a provider may provide a basis for strong customer loyalty and reduce competition in the market. Strong brands can have similar effects.

213. Bundling of products is a variation of product differentiation. An operator with market power in a relevant market can link (tie together) services or products in this market with services or products in another market, so that the operator can provide a bundle of services/products that are differentiated from the competitors' offering and that the competitors have a limited opportunity to copy. In this way, the bundling of services/products can contribute to market power in one market creating competitive advantage in another market. Such competitive advantages may be relevant to the assessment of significant market power in the latter market.

214. Different forms of switching costs when changing provider can reduce the competition at both the retail and wholesale levels. Restrictions or costs associated with the end user switching providers increase the opportunity for a provider with market power to behave independently in the market. Such restrictions may be of a practical, technical or financial nature, or may be a result of the end user having greater confidence in existing and well-established operators in preference to new operators and being unwilling to take the risk that a switch could involve.

215. LLU is a wholesale product demanded by providers who want to develop and offer broadband services in the retail market without purchasing more wholesale inputs from Telenor than absolutely necessary. This means that product bundling is not very relevant in this connection seen from a wholesale customer's point of view.

216. On this basis NPT has concluded that product differentiation in the form of product bundling is not a factor that helps strengthen Telenor's market power in this relevant market.

4.6.2 Leverage of significant market power to closely related markets[34]

217. Significant market power in one market may help strengthen a provider's market position in a closely related market. Such leveraging of market power can take place vertically, i.e. between a wholesale market and a retail market, or horizontally, i.e. between different product markets at the same level in the value chain.

Vertical integration[35]

[33] The criterion corresponds to "product/services diversification (e.g. bundled products or services)" in the Guidelines, paragraph 79.
[34] Cf. the Guidelines, paragraph 84.

218. A vertically integrated provider is characterised by the provider's activities comprising more than one link in the relevant value chain. Typically a vertically integrated provider will be present both in infrastructure markets ('upstream markets') and end user markets ('downstream markets'). Through a strong position in the upstream market vertically integrated providers can try to keep competitors in the downstream market out of this market, for example through the pricing of products in the upstream market or by not offering products in the 'upstream market' to competing providers in the downstream market at all. In this way a vertically integrated provider with a strong position in the upstream market can strengthen his position in the downstream market.

219. Telenor is vertically integrated in the broadband market. The company has a nationwide access network forming the basis for both wholesale and retail provision of broadband services.

220. In general, vertical integration can in many ways have a streamlining effect when the integrated provider internalises several levels in the value chain in the same company or group, thereby realising different efficiency gains such as better use of support systems, more coordinated planning of production and lower transaction costs.

221. As mentioned above, a vertically integrated company will have the opportunity to exclude competitors from the retail market if the company has a strong position in the wholesale market.

222. However, since the relevant market analysed here is a wholesale market, the fact that Telenor is vertically integrated cannot by itself serve to strengthen Telenor’s position in this relevant market.

Horizontal integration

223. A provider is horizontally integrated when the provider through ownership has control of different parallel infrastructures that may be used to supply competing products to the end user. In this case the provider can strengthen his market power in a market by preventing competition from an alternative infrastructure over which he has control.

224. In addition to owning and operating the national copper-based telecommunication network, Telenor is a major operator in alternative electronic communication networks, including fibre, cable TV networks, other broadcasting networks and wireless access networks (for example WLANs). In particular, Telenor’s ownership of cable TV networks (through Canal Digital) and a digital terrestrial broadcasting network (through Norkring and part-ownership of Norges Televisjon) may contribute to limiting the competition from alternative infrastructures, thereby to a certain extent helping to maintain Telenor’s strong market position in this relevant market.

[35] The criterion corresponds to “vertical integration” in the Guidelines, paragraph 79.

4.6.3 Price developments

225. The development of prices over time may indicate something about the degree of competition, possibly the degree of potential competition, and can thereby provide an indication of whether a provider has market power.

226. Telenor's prices for LLU (copper) have been subject to a cap, and the set-up price and related services have been subject to cost orientation. This makes it less interesting to look at price developments as an indicator of competition and market power.

227. In the previous decision period, Telenor voluntarily lowered the LLU price from NOK 105 to NOK 95 monthly. In other words, Telenor chose to set the price below the then-price cap. In the current regulatory period, the price has been identical to the price cap.

228. In summary, it is NPT’s view that since prices have been regulated, price developments per se are less suitable as an indicator of market power.

4.7 Conditions on the demand side

4.7.1 Market power/countervailing buyer power[36]

229. The presence of customers with negotiating strength can restrict a provider's opportunity to behave independently in the market. Such countervailing buying power may be the result of a customer's size, purchasing volume or the customer having something to offer, for example better market access to other markets.

230. The demand side of this relevant market can be viewed as relatively concentrated since the two largest operators on the demand side together claim about 70 per cent of the market. In principle, this can provide a basis for a certain degree of countervailing buying power.

231. Another factor that may indicate a certain degree of countervailing buying power in this market is that the associated retail market cannot yet be considered as being a mature market. Wholesale providers in growth markets will normally wish to create a situation where wholesale customers can contribute to continued growth in the retail market.

232. Even so, NPT finds that countervailing buying power that can serve to significantly weaken Telenor's market power cannot be said to exist in this relevant market. In the first place, this is because Telenor's wholesale business is not dependent on demand-side operators in this relevant market to achieve growth in the retail market. Both the Telenor companies operating in the retail market and external demand-side operators in the relevant market for broadband access are in direct competition with demand-side operators in the LLU

[36] The criterion corresponds to the criterion “absence of or low countervailing buyer power” in paragraph 79 of the Guidelines.

market. This factor contributes to weaken the bargaining power these operators could theoretically have had.

4.7.2 The customers' options and any costs of switching provider/lock-in effects

233. Restrictions or costs associated with the switching of providers on the demand side increase a provider with market power's possibility to behave independently in the market. Such restrictions may be of a practical, technical or financial nature, or may be a result of the demand-side having greater confidence in existing and well-established operators in preference to new operators and being unwilling to take the risk that a switch could involve.

234. It is natural to distinguish between the external and internal wholesale customers. With respect to the internal wholesale customers, they have in practice no real choices with regard to changing provider since they are part of vertically integrated broadband operators.

235. The picture is somewhat different for the external wholesale customers. They will be more open to switching suppliers if there are alternatives. There is still reason to believe that technical conditions can be an obstacle to Telenor's wholesale customers in the LLU market in switching to a different wholesale provider. The switching costs will probably be significant in the event of a transition to wholesale providers who rely on access network technologies other than Telenor.

236. Furthermore, the limited scope of alternative providers' access networks could make it difficult for wholesale customers who have built up a geographically scattered customer base in the retail market to rely on a wholesale service that is more geographically limited than Telenor's LLU service. This could limit customers' freedom of choice to a certain degree in this wholesale market.

237. External wholesale customers who buy LLU can choose to build their own infrastructure instead of using Telenor's LLU service. However, the roll-out of own infrastructure is time consuming and will normally be associated with significant financial risk. It is therefore reasonable to assume that Telenor's wholesale customers who purchase LLU and have built a geographically spread customer base in the retail market, will depend on Telenor's LLU service even if some geographic areas choose to build their own infrastructure.

238. In NPT's opinion, factors relating to customers' freedom of choice are not weakening Telenor's market power in this relevant market.

4.7.3 Customers' access to information

239. In order to be able to make effective choices between providers in a market customers must have access to information that makes it possible to compare the various offers. Complicated price structures and various bonus and discount schemes can restrict the opportunities for effective choices and may contribute to strengthening an already dominant operator's position in the market.

240. In the previous decision, and prior to that decision, Telenor has been subject to a requirement to prepare official price lists for services concerning broadband access, and it has therefore historically speaking not been a problem for customers to gain access to information. The transparency requirement in the previous decision period only applies to copper. There has been no equivalent requirement for other technologies. This means that fibre and cable TV networks may be somewhat more complex in terms of access to information.

241. Nevertheless, NPT deems it unlikely that customers in the LLU market lack information about prices and services to an extent that can strengthen Telenor's position in the market.

4.8 Conclusion - single dominance

242. In this relevant market, Telenor had a market share at the end of June 2013 of about 64 per cent, measured by the number of accesses. At the same time Telenor's largest competitor had a market share of 12 per cent. According to the Guidelines, paragraph 76, this provides a clear indication that Telenor has significant market power in this market.

243. Various forms of entry barriers exist in this market. In NPT’s opinion, it is particularly Telenor’s control of a nationwide access network that is difficult to duplicate, and this, in combination with a lack of a power of negotiation on the demand side, are issues that help strengthen the conclusion that Telenor has significant market power.

244. Even though the technological advances may eventually cause changes in the competitive situation, it is NPT’s assessment that such developments at the present time indicate that there will be only limited changes in the competitive situation in this market.

245. Based on the discussions concerning provider behaviour and demand-side conditions, NPT has concluded that these criteria taken together do not provide grounds to affect a possible conclusion that Telenor has significant market power.

246. Following an overall assessment, NPT has determined that Telenor has significant market power (single dominance) in the wholesale market for LLU.

5 Analysis of Market 5

5.1 Definition of the relevant product market

247. This relevant product market corresponds to Market 5 in ESA’s Recommendation:

”Wholesale broadband access”

248. The market includes broadband access services at the wholesale level, and is referred to in this analysis as the Broadband Access market.

249. The Broadband Access market is technologically neutral, cf. Chapter 2. This means the market is not defined as only including Telenor's existing wholesale provision of broadband access services other than LLU, but also includes potential wholesale provision of Broadband Access offered via access networks other than the copper-based one.

250. See Chapter 3 for other delimitations of this relevant product market.

5.2 General comments about significant market power

251. The assessments that are used to designate a provider with significant market power shall, according to paragraph 76 of the Guidelines, be based on a forward-looking market analysis on the basis of existing market conditions.

252. NPT emphasises that the relevant subject of assessment is the existence of significant market power and not anti-competitive abuse of market dominance. It is therefore not central to the SMP assessment whether any market power/dominance is actually misused or not. However, it does not mean that a provider's behaviour in the market is irrelevant to the assessment of significant market power. Even if structural factors are accorded the greatest weight in the assessment, behaviour that serves to create or maintain competitive advantages may bolster the conclusion of significant market power.

253. The analysis of significant market power is based on the Guidelines and NPT's methodology document.

5.3 Market shares

254. Assessing market share is a natural starting point for analyses of significant market power, cf. paragraph 76 of the Guidelines. In the Guidelines, ESA points out that the Commission assumes that single dominance will normally be found at providers with more than a 40 per cent market share. ESA furthermore writes:

> *"According to established case-law, very large market shares - in excess of 50 % - are in themselves, save in exceptional circumstances, evidence of the existence of a dominant position. An undertaking with a large market share may be presumed to have SMP, that is to be in a dominant position, if its market share has remained stable over time."*

255. Market share can be measured by revenue, volume or number of customers. The characteristics of the relevant market will determine the choice of criteria for measuring market share, cf. paragraphs 77 and 78 of the Guidelines.

256. Based on information NPT has collected from the operators in the market, Telenor has up to 100 per cent market share of the existing external wholesale market for broadband

access services. Together, the other access network owners have reported only a very limited number of broadband accesses as external wholesale sales.

257. However, given the way in which this relevant market is defined, it is not only the existing external wholesale sales of broadband services that are used in the calculation of market share. In addition, the broadband accesses that the various access network owners and LLU purchasers sell or use internally are also considered to be part of the relevant market for Broadband Access.

258. As for the LLU market, NPT believes it is appropriate to include vertically integrated companies' internal sale or use in the calculation of market shares in the Broadband Access market, and thus in the basis for the assessment and designation of undertaking with significant market power. Since buyers of LLU have an internal sale or use of Broadband Access, market shares for these operators will also be calculated.

259. Since NPT lacks data on internal use of broadband access services at the wholesale level, market share at the retail level is used as an indicator of market share at the wholesale level. As a starting point, NPT has chosen to look at the volume of broadband services sold in the retail market. Such an approach is considered justifiable since there is virtually a one-to-one ratio between the number of broadband accesses sold in the retail market and the number of broadband accesses sold or used at the wholesale level.

260. The market share at the retail level for providers who base their operations on purchasing Broadband Access from Telenor indicates how large a market share external sales of Broadband Access represent at Telenor. Telenor’s own market share in the retail market indicates the market share Telenor has from internal use or sales of Broadband Access. Telenor’s market share at the wholesale level is then the sum of external sales and internal use/sale of Broadband Access.

261. The inclusion of internal use of broadband accesses in this relevant market furthermore means that retail sales from the market units of operators that base their retail services on purchases of LLU products from Telenor (i.e. NextGenTel, Broadnet etc.) gives an indication of the market share of these providers in the market for wholesale Broadband Access. Similarly, the retail market share of other providers that base their broadband services on other access technologies, (Get, Lyse, etc.) indicates the market share these providers have in the market for wholesale Broadband Access.

262. Based on this approach, at the end of June 2013 Telenor had a market share of about 49 per cent[37] in the market for Broadband Access, based on the volume/number of broadband accesses. The development since the previous analysis is shown in figure 9 below.

[37] Since Canal Digital is a wholly owned Telenor company, Canal Digital’s sale of broadband accesses via its cable TV network is included in Telenor’s market share.

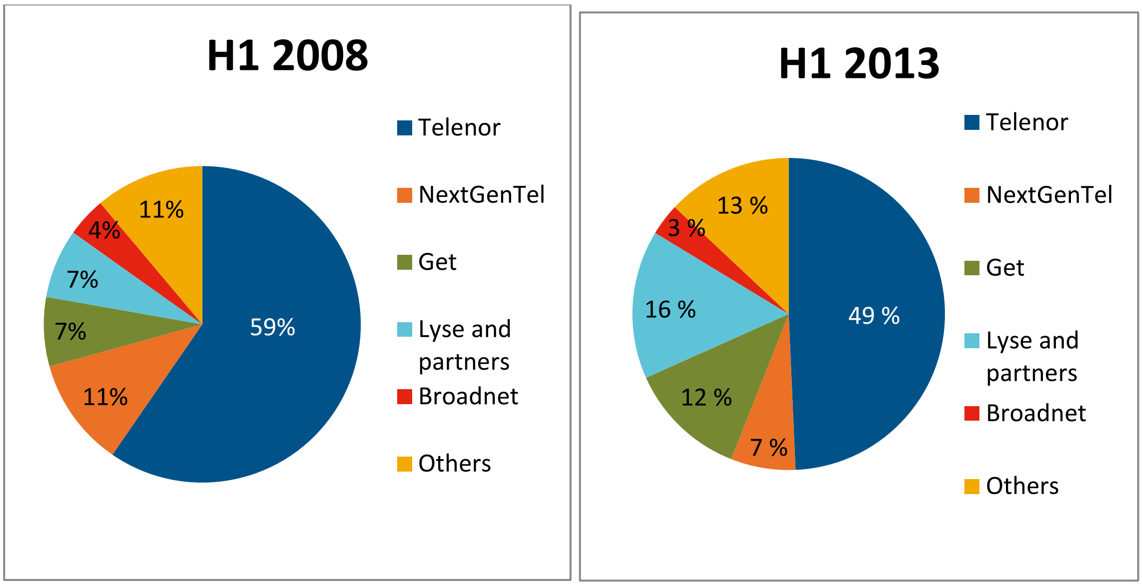
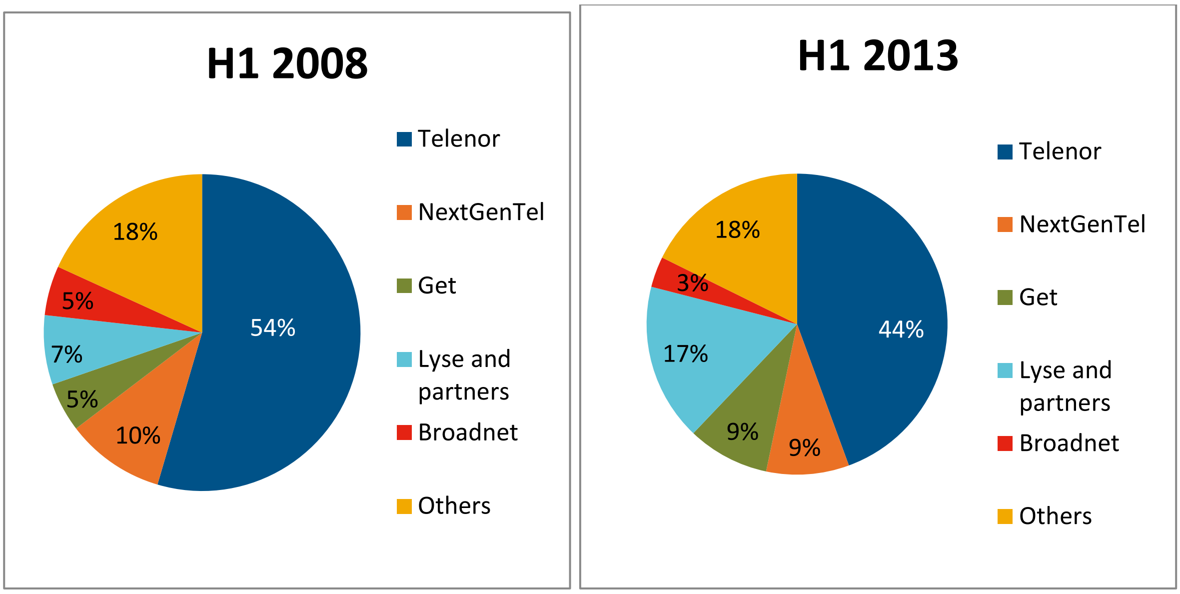


Figure 9: The development of market shares for the Broadband Access market, based on the number of accesses. (Source: Numbers submitted in connection with NPT's ecom statistics for the first half of 2008 and the first half of 2013).

263. Telenor's market share fell from about 59 per cent at the end of June 2008 to about 49 per cent at the end of June 2013. We also see that NextGenTel's market share has declined, while Lyse and partners as well as Get have increased their market shares during the same period.

264. In certain situations it is considered more appropriate to calculate market share based on revenue instead of volume (number of units sold). This is also assumed to be the case for this relevant market, in part because the price of broadband accesses varies significantly between the residential and business market. Even so, it is not easy to calculate market share based on revenue, given the way in which this relevant market is defined. This is because Telenor's competitors do not operate with internal wholesale prices. An assessment of market share based on Telenor’s wholesale revenue and the other operators’ retail revenue will not provide a correct picture of the relative strength of the operators on the wholesale level.

265. Another possible method of calculating market share is to estimate internal wholesale prices for the operators who do not operate with such prices, although such an approach would be subject to great uncertainty. Consequently, NPT has chosen to compare market share based on volume in the wholesale market, cf. Figure 9, with market share based on revenue in the retail market, cf. Figure 10. In order for these amounts to be comparable, the retail revenue of the operators who purchase Broadband Access products from Telenor is included in Telenor’s market share in Figure 10.



Figur 10: The development of market shares for the Broadband Access market, based on revenue. (Source: Numbers submitted in connection with NPT's ecom statistics for the first half of 2008 and first half of 2013).

266. Based on this approach, Telenor's share of the revenues in the market has declined somewhat since the previous analysis of this relevant market, while Lyse and partners and Get have increased their market shares.

267. A comparison of market shares in Figures 9 and 10 shows that Telenor's market share based on these two calculation methods is not significantly different (49 per cent versus 44 per cent in the first half of 2013). The calculations of market share based on volume/number of broadband accesses, cf. Figure 9, thus appears to give a relatively accurate picture of the relative strength of the providers in this relevant wholesale market.

268. On this basis, Telenor is deemed to have a market share of 49 per cent in this relevant market. Even if the figures and method of calculation are subject to some uncertainty, it is NPT's opinion that this still gives an indication that Telenor has significant market power in the Broadband Access market, cf. the Guidelines, paragraph 76.

5.4 Entry barriers[38]

269. Potential competition from new operators will normally affect a dominant operator's behaviour in the market, including price setting. Various forms of entry barriers may, however,

[38] Cf. the Guidelines, paragraph 81.

weaken or remove the basis for potential competition. Possible entry barriers related to this relevant market are discussed below.[39]

5.4.1 Control of infrastructure not easily duplicated[40]

270. If an operator controls infrastructure that is difficult to duplicate, and this infrastructure represents an important input factor in the relevant market, this could represent a substantial entry barrier for potential competitors.

271. Without taking a view on whether the relevant infrastructure in this market may be seen as an 'essential facility' in relation to competition law, NPT has assessed whether control of infrastructure that is difficult to duplicate can be seen as an entry barrier in this relevant market.

272. Operators wishing to enter the market for wholesale Broadband Access can base their services on either Operatøraksess from Telenor (LLU) or their own access network. Potential providers in this market therefore do not necessarily have to establish their own physical access lines to be able to compete with Telenor. Since Telenor basically sets the terms for competitors based on LLU, the competition from such providers could potentially be weakened if Telenor sets unfavourable access terms. So far, however, LLU has been subject to price controls, and this must be assumed to have limited Telenor's capability to weaken the competition of providers who purchase LLU.

273. Operators who choose to base their broadband access service on LLU must, in the same way as Telenor, invest in equipment in the subscriber exchanges to be able to offer broadband access. This is largely standard 'off the shelf' equipment and therefore cannot be said to be difficult to duplicate.

274. Technically, it is furthermore possible to establish physical infrastructure in parallel with Telenor's copper access network, in order to offer broadband access. In other words, Telenor does not have control over infrastructure that is impossible to duplicate in technical terms. Developments in recent years show that it is possible to build an alternative network based on fibre, coax cable and hybrid cables in addition to the existing copper network. With regard to fibre networks, regional operators rather than Telenor have been in the lead up to now.

275. The biggest difference between the existing copper network and the emerging networks is that the regional operators generally build their networks in their regions, and thus there is no immediate nation-wide coverage. In practice, the establishment of an adequate alternative to Telenor's nationwide copper access network would be so resource intensive and time consuming that there still are grounds to assume that Telenor's nationwide access network is not easily duplicated. Telenor's control of a nation-wide copper access network is

[39] Among other places, entry barriers are discussed in the Guidelines, paragraph 81: *"In fact, the absence of barriers to entry deters, in principle, independent anti-competitive behaviour by an undertaking with a significant market share."*

[40] The criterion corresponds to "control of infrastructure not easily duplicated" in paragraph 79 of the Guidelines.

nevertheless not seen to be an absolute barrier to entry in this relevant market, as it is still possible for other operators, through their own investments, to build a solid position in this national market.

5.4.2 Sunk costs

276. Unrecoverable fixed costs ("sunk costs") are costs attributable to an irreversible investment, i.e. a provider cannot expect to recover the investment once it has been made, for example through the sale of the investment item, if the provider wishes to exit the market. Unrecoverable fixed costs mean that a potential newcomer faces higher decision-relevant costs than the (or those) operator(s) already established. This cost difference can constitute an entry barrier to a potential entrant.

277. If entry into a market requires high sunk costs, the established operator may have an incentive to make a more extensive investment than it otherwise would have done. This can send a signal to potential newcomers that it would not be profitable to attempt to enter the market. Sunk costs can therefore give rise to strategic behaviour among the established operators, further raising the entry barrier.

278. Telenor is the owner of a nationwide access network, which was built up over many years. There is little doubt that it would be extremely resource and cost-intensive for a potential competitor to establish a competing access network on an equally large scale. There is furthermore little doubt that such an investment would largely have to be viewed as irreversible and thereby represents an entry barrier.

279. However, as previously stated, it is not necessary to own a nationwide copper access network to become established as a provider in the relevant market for Broadband Access. As long as Telenor is obliged to offer LLU, the sunk costs for potential providers in this relevant market will be significantly lower than without such an obligation.

280. Furthermore, NPT has the impression that several broadband operators that establish their own local or regional access networks are trying to relate sunk costs to actual customer growth by not rolling out an access network in a given geographic area until a certain number of customer contracts have been signed in the respective geographic market. This suggests that sunk costs are not necessarily viewed as a significant entry barrier for operators of this type.

281. All in all, this means that compared to a few years ago sunk costs today represent a minor entry barrier in this relevant market. At the same time it is assumed that wholesale providers with a geographically limited potential provision of broadband access will be a less attractive provider than Telenor to wholesale customers who wish to offer broadband access to end users in the entire country.

282. It is further worth noting that a newcomer is free to choose newer and more cost-effective technology than Telenor's copper-based access network[41], and to undertake investments in areas where the potential profit is greatest. This can reduce some of the asymmetry they face in relation to Telenor.

283. Intangible investments can also be unrecoverable and represent an entry barrier. Investment in brand building (for example through advertising and other marketing) is an example of such investments. Another example is costs relating to R&D.

284. In NPT's view, costs relating to advertising and brand building in the wholesale market for broadband access do not represent a significant entry barrier. This is in part because customers in the wholesale market are largely competitors to Telenor. Experience has shown that these generally prefer to choose a different provider than Telenor where possible. Furthermore, the wholesale market will be relatively orderly. A potential competitor in the wholesale market for Broadband Access can therefore likely expect to devote far fewer resources on advertising and marketing than would be the case in the retail market.

285. With respect to costs relating to research and development, NPT is of the opinion that the development of new services in this relevant market does not constitute any appreciable entry barrier because the products in this market are largely standardised and relatively homogeneous.

286. Following an overall assessment of the above factors, NPT finds that sunk costs do not represent a major entry barrier in this relevant market. Still, this is not a factor that can be said to indicate that Telenor does not have significant market power in the Broadband Access market.

5.4.3 Economies of scale[42] and scope[43]

287. Economies of scale exist when an increase in production brings a fall in average unit cost. This is characteristic of production based on technology with relatively high fixed costs and low variable costs.

288. Economies of scope are reductions in average unit cost when more than one service is produced using common means of production, for example common infrastructure or common administrative systems.

289. Economies of scale and scope can both work as entry barriers for new potential operators and as a competitive advantage for established competitors in the market.

290. There are undoubtedly significant economies of scale associated with establishing a nationwide supply of Broadband Access. Furthermore, it is assumed that given its broad portfolio of products, Telenor enjoys greater economies of scope than its competitors. Such

[41] See section 5.5 on potential competition and innovation.
[42] The criterion corresponds to "economies of scale" in the Guidelines, paragraph 79.
[43] The criterion corresponds to "economies of scope" in the Guidelines, paragraph 79.

Telenor products as leased lines, nationwide telephone services, LLU and Broadband Access all use in part the same underlying infrastructure. It is doubtful whether any of Telenor’s competitors will have the capability to achieve equally large economies of scope in the short or medium term. Telenor will also have other economies of scope within sales, billing and customer service, for example.

291. On the other hand, it is not a given that these economies of scale and scope represent an equally significant entry barrier for all potential providers in this relevant market. First, as mentioned earlier, it is not necessarily important to offer service nationwide in this market. Second, there is reason to assume that many of the new operators in the broadband market can also benefit from economies of scope to a not insignificant degree. This is particularly the case for the electric utilities that have recently established wholly or partly owned broadband companies. For example, it will make sense for these broadband companies to utilise conveyance routes, access to buildings/masts and invoicing and customer service systems already used in connection with the utilities' main enterprise.

292. However, for potential providers without a comparable main enterprise it is assumed that Telenor's economies of scale and scope can act as an entry barrier.

293. On the basis NPT finds that Telenor’s economies of scale and scope do not constitute entry barriers in this relevant market. However, NPT would like to note that this does not imply that Telenor’s economies of scale and scope cannot provide the company with a significant competitive advantage in this market that can help to maintain Telenor’s strong position in the market in the near future.

5.4.4 Access to financial resources[44]

294. Access to financial resources is important to an operator’s opportunity to enter markets requiring major initial investment. Differences between operators relating to access to financial resources may constitute an entry barrier. In addition, everything else being equal, it will be expected that an operator with market power and good financial standing will be less exposed to competition than an operator with market power without good access to financial resources. Besides, an operator with market power and good access to financial resources will be better able to defend his market share if new competitors enter the market than an operator with market power without good access to financial resources.

295. It will require extensive capital to establish an adequate alternative to Telenor's nationwide infrastructure. However, as mentioned above, it is not necessary to have a nationwide service to enter this relevant market. If one looks at the operators that have entered the broadband market with their own infrastructure in the past couple years, the majority are locally and regionally based operators.

[44] The criterion corresponds to “easy or privileged access to capital markets/financial resources” in the Guidelines, paragraph 79.

296. Another factor than what is associated with financing of new projects concerns financial strength in connection with price wars/price dumping (the so-called “long purse argument”). Telenor undoubtedly has the financial strength to price many of the small national broadband operators out of the market, but will not necessarily have a much better financial position than existing and potential foreign operators, as well as regionally based broadband operators that are fully or partly owned by large electric utilities.

297. On this basis, access to financial resources cannot be viewed as a significant entry barrier in the market for broadband access.

5.4.5 Access to distribution and sales channels[45]

298. In markets in which the established operators have a well-developed distribution and sales network this may function as an entry barrier for potential new operators. This applies in particular in markets in which there are major costs associated with establishing distribution and sales channels, or where the established operators have concluded exclusive agreements with the largest/most important distribution channels in the market.

299. It is NPT’s assessment that lack of access to distribution and sales channels will mainly be a problem in retail markets. The wholesale customers in this relevant market consist of operators who themselves are providers of electronic communications networks and services. Such operators usually have a good overview of the market and will make choices based on their knowledge of it. It is therefore unlikely that potential newcomers in this relevant market will not enter the market because they consider it difficult to gain access to sales channels.

300. Based on the above, NPT concludes that access to distribution and sales channels does not represent an entry barrier in this relevant market.

5.4.6 Barriers to expansion[46]

301. A market with large growth potential is as a rule more attractive to potential new operators than markets in which the total units sold and/or the number of customers has stagnated or is on the way down (known as 'mature' markets). Operators considering entry into a 'mature' market must generally aim to capture customers from the established operators. If there are barriers to growth in a market, these may therefore be looked upon as a possible entry barrier.

302. The retail market for broadband access services has been a growth market in the past decade. This is discussed in depth in chapter 2. It has therefore also been natural to view this relevant wholesale market as a growth market. Up to now, any new providers in this market have not been forced to rely solely on capturing customers from existing wholesale providers, but have had the opportunity to try to expand the overall market for broadband access services through new product concepts and new distribution channels.

[45] The criterion corresponds to “a highly developed distribution and sales network” in the Guidelines, paragraph 79.
[46] The criterion corresponds to “barriers to expansion” in the Guidelines, paragraph 79.

303. Though there are signs that suggest that the growth in the retail sale of broadband accesses is not as great as previously (see figure 1), NPT does not consider the market to have the characteristics of a mature market. This is supported by the fact that as of the end of June 2008, nearly 65 per cent of Norwegian households had chosen to purchase broadband access, while at the end of June 2013 this number had increased to over 75 per cent.

304. On this basis, NPT finds that barriers to expansion do not constitute an entry barrier in this relevant market.

5.4.7 Regulatory entry barriers

305. Regulatory entry barriers exist when market access is limited by regulatory conditions. Examples are requirements concerning licences, resource restrictions or restrictions relating to health, safety and the environment (direct regulatory restrictions). Furthermore, various forms of price controls may also act as an entry barrier, cf. paragraph 11 in the preface of the Recommendation.

306. Uncertainty regarding future regulation can function as an entry barrier because uncertainty in itself can yield lower expected profitability at market entry and can thereby lead to potential challengers either dropping or delaying plans to enter the market. This aspect will naturally be particularly important during a period of new regulations. Regulatory uncertainty can, however, be reduced if the regulatory authority clearly informs the market operators about how the regulations will be practised and is consistent at the same time in the actual implementation of these rules.

307. Should a potential new provider in the market for Broadband Access consider it possible, or even likely, that it will be subject to price control, this could affect expected future earnings and thus act as an entry barrier.

308. Expectations of price controls being imposed on the dominant operator(s) can also act an entry barrier if potential newcomers regard the regulated price as being, or potentially being, so low that it is unattractive to compete in the wholesale market. NPT assumes that a possible expectation of a strict regulation of Telenor’s prices for broadband access products to some extent may have entry-barring effects in this relevant market.

309. On the other hand, expectations of strict regulation in the LLU market could have a positive effect on the entry possibilities in this relevant market. For example, a possible extension or tightening of Telenor's LLU obligations could encourage potential providers to enter the market for Broadband Access.

310. The operators are divided in their assessment of whether a regulation in this market could affect the willingness to invest in the market. There are clear differences in the operators' views of whether they want to invest in their own infrastructure or whether they want to continue to purchase access from other owners of infrastructure. NPT believes that seen in isolation, regulation may dampen investments in new infrastructure by the regulated operator(s), but that this effect will be limited.

311. Based on a complete assessment, NPT finds that expectations of future regulation do not appear to constitute any particular entry barrier in this relevant market.

5.5 Potential competition and innovation

312. Potential competition relates to whether the operators not in the current market can help to create market dynamics within the forthcoming regulatory period. Potential competition will also, among other things, be able to discipline pricing in the retail market, because high prices make entering the market more attractive.

313. As a rule, in markets with a high degree of innovation the opportunity to exercise market power will be more limited than in markets with little innovation. Technological development may therefore be of significance for potential competition in the market. Innovation resulting from technological development can therefore contribute to weakening an operator's position in the market in relation to potential competitors.

314. Technological development is one of the key forces driving the broadband market. Both in the case of copper-based access and alternative access technologies, technological development makes it possible to offer an ever-growing list of new and more bandwidth-intensive retail services.

315. With respect to copper-based broadband access in the retail market, ADSL has been supplemented with products such as ADSL2+ and VDSL. Telenor launched VDSL in the residential market in 2011. There are more limitations with respect to the distance between the subscriber exchange and the customer with VDSL than with other xDSL varieties. This means that actual bandwidth for customers who live some distance from the subscriber exchange often will be lower than the theoretical bandwidth made possible by these new xDSL variants.

316. Fibre-optic cable can provide virtually unlimited capacity. In recent years, many electric utilities, municipalities and county authorities have built broadband based on a combination of fibre, radio, xDSL and cable TV networks. In many such cases fibre has been the preferred technology, while other access technologies are considered to be primarily a supplement to fibre in geographic areas where the settlement pattern indicates that it would not be profitable to establish fibre-based accesses.

317. Telenor is also rolling out fibre infrastructure continually closer to end users. As previously mentioned, Telenor has stated that in the times ahead it will increase its activities considerably in terms of supplying fibre accesses in the residential market.

318. Operators that provide broadband via cable TV networks are offering ever-increasing speeds due to technological advances. In recent years, a large proportion of cable TV networks has been upgraded to make it possible to offer broadband via this infrastructure.

319. Developments in radio access technology (point-to-point and point-to-multipoint) also appear to enable increasingly higher speeds. This allows increased use of fixed wireless

access in conjunction with broadband. Radio access technology is particularly interesting with respect to broadband service in sparsely populated areas and in areas where people live too far from Telenor's subscriber exchanges to have an xDSL connection or another type of cable-based broadband.

320. Mobile broadband is experiencing strong growth and increasing speeds. Even though mobile network-based broadband access is preliminarily not considered sufficiently substitutable with fixed network-based broadband access so that fixed and mobile broadband access can be said to be a part of the same relevant market, cf. Section 3.2, the trend toward ever larger bandwidths via mobile broadband networks is a factor that eventually could affect the assessment of significant market power in the Broadband Access market. Since Telenor is one of the trendsetting providers of mobile network-based broadband access, it is not a given that this change will help weaken Telenor's market power in this relevant market.

321. All in all, the above factors indicate a continued high degree of innovation in the retail market for broadband access in the near future. This is also creating the basis for potential competition in the related wholesale market. This potential competition can eventually contribute to limiting Telenor's possibility to exercise market power, but is not considered as weakening Telenor's position in the Broadband Access market to a particular degree within the time frame of this analysis.

5.6 Provider behaviour

5.6.1 Bundling/product differentiation[47]

322. "Product differentiation" means a strategy that aims to give a provider's own products characteristics that distinguish it from the products of competing providers. Product differentiation can take place both in the wholesale and retail market. A high degree of product differentiation by a provider may provide a basis for strong customer loyalty and reduce competition in the market. Strong brands can have similar effects.

323. Bundling of products is a variation of product differentiation. An operator with market power in a relevant market can link (tie together) services or products in this market with services or products in another market, so that the operator can provide a bundle of services/products that are differentiated from the competitors' offering and that the competitors have a limited opportunity to copy. In this way, the bundling of services/products can contribute to market power in one market creating competitive advantage in another market. Such competitive advantages may be relevant to the assessment of significant market power in the latter market.

[47] The criterion corresponds to "product/services diversification (e.g. bundled products or services)" in the Guidelines, paragraph 79.

324. Different forms of switching costs when changing provider can reduce the competition at both the retail and wholesale levels. Restrictions or costs associated with the end user switching providers increase the opportunity for a provider with market power to behave independently in the market. Such restrictions may be of a practical, technical or financial nature, or may be a result of the end user having greater confidence in existing and well-established operators in preference to new operators and being unwilling to take the risk that a switch could involve.

325. Telenor offers Broadband Access services virtually nationwide, and has a broader product spectrum than its competitors and potential competitors in this wholesale market. To a greater degree than other providers in this market, Telenor therefore has the opportunity to be a total supplier at the wholesale level, for instance by bundling access and trunk products in the same delivery. In NPT's view, this can serve to strengthen Telenor's market power in this relevant market.

326. For customers in this relevant market it will often be an important criterion for choosing a wholesale supplier that the supplier can offer an integrated solution adapted to the needs of the wholesale customer. Telenor's bundling of access and trunk network services through products such as IP Connect and IP Total can therefore be said to imply a competitive advantage for Telenor in this market compared with wholesale providers who cannot offer such forms of bundling of access and trunk services to the same degree.

327. On this basis, NPT has concluded that without regulatory intervention, product differentiation in the form of product bundling may help strengthen Telenor's market power in this relevant market.

5.6.2 Leverage of significant market power to closely related markets[48]

328. Significant market power in one market may help strengthen a provider's market position in a closely related market. Such leveraging of market power can take place vertically, i.e. between a wholesale market and a retail market, or horizontally, i.e. between different product markets at the same level in the value chain.

Vertical integration[49]

329. A vertically integrated provider is characterised by the provider's activities comprising more than one link in the relevant value chain. Typically a vertically integrated provider will be present both in infrastructure markets ('upstream markets') and end user markets ('downstream markets'). Through a strong position in the upstream market vertically integrated providers can try to keep competitors in the downstream market out of this market, for example through the pricing of products in the upstream market or by not offering products in the 'upstream market' to competing providers in the downstream market at all. In this way a

[48] Cf. the Guidelines, paragraph 84.
[49] The criterion corresponds to "vertical integration" in the Guidelines, paragraph 79.

vertically integrated provider with a strong position in the upstream market can strengthen his position in the downstream market.

330. Telenor is vertically integrated in the broadband market. The company has a nationwide access network forming the basis for both wholesale and retail broadband services.

331. In general, vertical integration can in many ways have a streamlining effect when the integrated provider internalises several levels in the value chain in the same company/group, thereby realising efficiency gains such as better use of support systems, more coordinated planning of production and lower transaction costs.

332. However, a vertically integrated company with a strong position in the wholesale market will also have the capacity to attempt to exclude competitors from the retail market or limit market access. Since the relevant market in this analysis is a wholesale rather than a retail market, the fact that Telenor is already vertically integrated will not serve in principle to strengthen Telenor's position in the market analysed here.

333. The fact that LLU operators have been defined as being part of the supply side of this relevant market, means that the vertical integration of Telenor can nevertheless be viewed as a factor that can consolidate Telenor's position in the market. This is connected with the fact that the relation between Telenor's prices and terms for LLU access and internal and external bit-stream prices respectively are of major significance for how competitive the LLU operators can be as providers in the relevant market for Broadband Access. In NPT's view, much of the core of Telenor's market power lies in its ownership of the fixed access network. In principle, Telenor will therefore have the greatest incentive to exploit its significant market power in the LLU market. However, if the prices in Market 4 are strictly regulated, Telenor could have incentives to transfer market power (downstream) to the Broadband Access market. However, this could be remedied to a certain extent by an obligation of non-discrimination for LLU access.

Horizontal integration

334. A provider is horizontally integrated when through ownership he has control of different parallel infrastructures that may be used to supply competing products to the end user. In this case the provider can strengthen his market power in a market by preventing competition from an alternative infrastructure over which he has control.

335. Telenor is a significant operator in electronic communication networks, including the copper network, cable TV networks, other broadcasting networks and an increasing amount of fibre networks. In particular, Telenor's ownership of cable TV networks (through Canal Digital) and a digital terrestrial broadcasting network (through Norkring and part-ownership of Norges Televisjon) may contribute to limiting the competition from alternative infrastructures, thereby to a certain extent helping to maintain Telenor's market position in this relevant market.

5.6.3 Price developments

336. The development of prices over time may indicate something about the degree of competition, possibly the degree of potential competition, and can thereby provide an indication of whether a provider has market power. In its previous decision, NPT chose to not impose price regulation on Telenor's offerings in the Broadband Access market.

337. Telenor adjusted the prices related to SHDSL Proff in in the reference offer for Jara Jara Broadband Access downwards, effective from 1 February 2012. Telenor issued a notification of a harmonisation of the prices for ADSL and SHDSL Premium and Proff. The change reduced the difference between SHDSL Premium and Proff, which was adjusted to be the same as the difference between ADSL Premium and Proff. Subscription prices, set-up fees and other costs were affected by this change. According to Telenor, the change in the prices related to SHDSL was a result of a wish to meet the market and the customers with consistent pricing regimes.

338. Telenor increased, with effect from 1 July 2013, wholesale prices for establishing which seen in isolation - very likely - will lead to increased retail prices. Furthermore, the potential increased costs as a result of Telenor's adjusted error correction policy, where wholesale customers can choose to make error correction for own account could contribute to an increase of retail prices.

339. NPT does not know whether market evaluations (external conditions) or cost analyses (internal assessment) were the primary reason for the price reduction in 2012 in the Broadband Access market. It is therefore difficult to draw a clear conclusion with respect to whether the price reduction indicates a weakening of Telenor’s market power in this market. It is nevertheless NPT’s opinion that a non-regulated price reduction in the market for Broadband Access indicates to a certain degree that the potential competition in the market has had a disciplinary effect on Telenor’s pricing. Yet these lower prices have only affected a small share of the broadband access products, and the price level has been maintained for the largest volume of these products. The price reduction may indicate that Telenor’s strong position in this market may be in the process of weakening. However, NPT will underline at the same time that this weakening is not considered as being of such a scope so as to have an impact on the assessment of significant market power in this relevant market.

5.7 Conditions on the demand side

5.7.1 Market power/countervailing buyer power[50]

340. The presence of customers with negotiating strength can restrict a provider's opportunity to behave independently in the market. Such countervailing buying power may be

[50] The criterion corresponds to the criterion “absence of or low countervailing buyer power” in paragraph 79 of the Guidelines.

the result of a customer's size, purchasing volume or the customer having something to offer, for example better market access to other markets.

341. Customers in the wholesale market are themselves providers of electronic networks and/or services. Several of these customers purchase considerable volumes, and in general the demand side in the wholesale markets is more concentrated than the case is in the equivalent retail market. The two largest customers in this market purchase 80 per cent of the total volume based on the number of accesses. However, to NPT's knowledge, there is no single customer or group of individual customers in this market who purchase a sufficiently large volume for the customer or group of customers to achieve negotiating power in a manner that will curb possible significant market power on the supply side. Furthermore, there is no single customer or group of individual customers in the market who can offer market access in other markets in a way that can reduce market power on the supply side in this relevant market.

342. Based on the above, NPT has concluded that it is unlikely that countervailing buying power could appreciably reduce Telenor's possible significant market power.

5.7.2 The customers' options and any costs of switching provider/lock-in effects

343. Restrictions or costs associated with switching of provider by the demand side increase the capacity of a provider with market power to behave independently in the market. Such restrictions may be of a practical, technical or financial nature, or may be a result of the demand-side having greater confidence in existing and well-established operators in preference to new operators and being unwilling to take the risk that a switch could involve.

344. In for this point too, it makes sense to distinguish between the external and internal wholesale customers. With respect to the internal wholesale customers, they have in practice no real choices with regard to changing provider since they are part of vertically integrated broadband operators.

345. The picture is somewhat different for the external wholesale customers. For example, there is little reason to believe that technical factors should hinder Telenor's wholesale customers in the market for broadband access to switch to one of the LLU operators if one of them offers a wholesale product similar to bit-stream. The switching costs are probably somewhat higher when changing to wholesale providers who are based on other access network technologies, but these costs are also not assumed to represent any absolute barrier to switching provider.

346. In wholesale agreements with Telenor, any possible lock-in periods, or minimum purchase requirements over the course of a defined period, can limit external wholesale customers' freedom of choice. While NPT is not aware of the existence of lock-in periods capable of limiting wholesale customers' freedom of choice in this market, there is a 12-month period of notice for the agreement, which can have a similar lock-in effect. With regard to

discounts, these are calculated in arrears on the basis of the previous month's revenue. There is a minimum revenue requirement for the discount. This may have some lock-in effects.

347. Furthermore, the limited scope of alternative providers' access networks could make it difficult for wholesale customers who have built up a geographically scattered customer base in the retail market to base themselves on a wholesale service that is more geographically limited than Telenor's broadband service. This could limit customers' freedom of choice to a certain degree in this wholesale market.

5.7.3 Customers' access to information

348. For customers to be able to make effective choices between providers in a market they must have access to information that makes it possible to compare the various offers. Complicated price structures and various bonus and discount schemes can restrict the opportunities for effective end user choice and may contribute to strengthening an already dominant operator's position in the market.

349. In the previous decision, and prior to that decision, Telenor has been subject to a requirement to prepare official price lists for services concerning Broadband Access, and it has therefore historically speaking not been a problem for customers to gain access to information. The transparency requirement in the previous decision period only applies to copper. There has been no equivalent requirement for other technologies. This means that fibre and cable TV networks may be somewhat more complex in terms of access to information.

350. Nevertheless, NPT deems it unlikely that customers in the Broadband Access market lack information about prices and services to an extent that can strengthen Telenor's position in the market.

351. In NPT's opinion, factors relating to customers' freedom of choice are not weakening Telenor's market power in this relevant market.

5.8 Conclusion - single dominance

352. At the end of June 2013, Telenor had a market share in this relevant market of about 49 per cent, measured by the number of accesses. At the same time Telenor's largest competitor had a market share of 12 per cent. According to the Guidelines, paragraph 76, this provides a clear indication that Telenor has significant market power in this market.

353. In NPT's opinion, it is particularly Telenor's control of the nationwide access network that is significant. Though this is not an absolute barrier to entry in this market, it strengthens the conclusion that Telenor has significant market power.

354. Even though technological advances and development of new products may eventually cause changes in the competitive situation, it is NPT's assessment that such developments at

the present time indicate that there will be only limited changes in the competitive situation in this market.

355. Based on the discussions concerning provider behaviour and demand-side conditions, NPT has concluded that these criteria taken together do not provide grounds to affect a conclusion that Telenor has significant market power.

356. Following an overall assessment NPT has therefore concluded that Telenor has significant market power in the relevant market for wholesale Broadband Access.