Annex A

POST- AND TELECOM
ADMINISTRATION

– Market analysis —
Wholesale market for broadband access
(market 12)

13 March 2008

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Summary and conclusions

This document contains the Post and Telecom Administration (PTA) analysis of the wholesale market for broadband access (bitstream access), which is referred to as Market 12 in the EFTA Surveillance Authority (ESA) Recommendation. The market analysis is the foundation for the imposition of sector-specific obligations on electronic communications undertakings that are designated as having significant market power (SMP).

This document is based on a draft that was presented for consultation with a letter dated 20 August 2007, wherein electronic communications operators and other interested parties were invited to submit comments on the market analysis of Market 12 and the conclusions drawn from that analysis. A summary of comments and of PTA's position can be found in Annex B to the draft decision on Market 12. PTA invites the EFTA Surveillance Authority (ESA) to make comments on the market analysis and the conclusions that appear in this report.

Section 1 expounds on the regulatory framework to which the market analysis adheres, as well as a general description of the execution of the market analysis and the market definition.

In Section 2, the service market for broadband is examined and defined in accordance with the Recommendation and Guidelines issued by ESA. The section also reviews the status of the relevant market and gives account of the current operators in that market.

After having examined all of the technological methods used in Iceland to provide broadband services, PTA has come to the conclusion that the relevant wholesale market for broadband access includes only xDSL technology via copper local loops. With consideration given to supply-side and demand-side substitutability, it must be considered that adequate substitutability from other broadband access options – that is, microwave, fibre optic cable, and satellite – does not exist in the market. The technological options used to provide broadband access in this country are not considered to fall within the relevant market but are nonetheless examined in the part of the market analysis devoted to the assessment of potential competition.

It is therefore PTA's conclusion that the relevant market for wholesale broadband access should cover all of the internal and external sales and internal use of bitstream access and the undertakings that own and/or lease copper local loops in order to provide broadband access via xDSL technology at both the wholesale and the retail levels. Furthermore, the relevant market shall include all services that are necessary to the provision of such bitstream access.

In Section 3, the relevant service market is demarcated geographically, and it is PTA's conclusion that the market extends to the entire nation. As far as access network coverage is concerned, it is clear that copper local loops are available in nearly all of the settled communities in the country. In PTA's estimation, it is possible to provide over 95% of the residences in Iceland with ADSL on local loops. The legal jurisdiction of the Electronic Communications Act is the entire country, and the same

price list for xDSL applies to all parts of the country where it is technologically possible to apply it.

Section 4 contains an analysis of the relevant market and a discussion of the most important issues affecting the position of current operators in that market.

An undertaking's market share is often used to assess its power in the market. According to established case-law, very large market share - in excess of 50% - are in themselves, save in exceptional circumstances, evidence of the existence of dominant position. Conversely, an undertaking with a market share less than 25% will probably not be considered to dominate the market alone. Síminn has a roughly *[62%]*[1] market share of the total number of xDSL connections in the relevant market, which indicates a dominant market position according the above criteria. The fact that Síminn's market share in external sales at the wholesale level is over 90% further supports the company's dominant position. Furthermore, the market position of other undertakings does not indicate that they have a dominant position in the relevant market, as their market share is under 25% in all instances.[2]

The overall size of an undertaking based on, for example, its turnover or some other measure can be important in assessing significant market power. If an undertaking is substantially larger than its chief competitors, this can give that undertaking a competitive advantage. PTA believes that Síminn's overall size and experience in the electronic communications market strengthen its position in the relevant market. This information indicates that Síminn has significant market power in the relevant market because of its size.

When an undertaking has control over infrastructure, or facilities, that it is difficult and expensive to duplicate, this could constitute a considerable barrier for potential competitors. Local loops, distribution frames, space for DSLAM equipment (in a telephone exchange, in the vicinity of an exchange, or in a street cabinet), and fixed-line connections are examples of facilities that it could not be economically feasible for new electronic communications undertakings to duplicate, even though it is

[1] Figures omitted for confidentiality reasons.

[2] On March 5, 2008 The Competition Authority in Iceland was notified of the intended merger of Ódýra Símafélagið ehf. (SKO) and IP fjarskipti ehf. (Hive). Teymi hf., the parent company of Og fjarskipti ehf. (Vodafone) and SKO, will buy 51% share of IP fjarskipti ehf. (Hive). According to Article 17 of the Competition Act no. 44/2005 the Competition Authority may annul a merger that has already taken place if the Authority is of the opinion that a merger will obstruct effective competition by giving one or more undertakings a dominant position or by strengthening such a position. The Authority may also set conditions for such a merger that must be met within a given time. The Competition Authority shall notify the undertakings in question within thirty days if it sees reason for further investigation of the competitive impact of the merger. A decision on annulment shall be taken no later than three months after notification of further investigation has been sent to the undertakings in question. According to this the Competition Authority has up to 4 months to investigate the intended merger. As it is uncertain at this point in time whether the intended merger will go through or on which conditions PTA will not change its market analysis on the wholesale market for broadband access at this time. PTA will re-examine this view at the end of the time horizon for this analysis – that is, in 2-3 years – or sooner, if there is reason to do so. It is the PTA´s view that the current market analysis and the proposed specific obligations cannot be delayed until a final decision by the Competition Authority. Indeed, the market needs these measures as soon as possible and the simple consolidation of market shares on the part of Vodafone/Hive does not indicate, at this point, that it will be such as to eliminate of itself the competition problems identified in the current market analysis.

technologically possible. PTA's conclusion is that the substantial difference between Síminn's facilities and those of other electronic communications undertakings in rural Iceland constitutes a significant barrier for the latter operators. With its control over infrastructure erected in earlier times, Síminn has established a position that constitutes an entry barrier for new undertakings in the market. The fact that the local loop system is almost entirely owned by Míla (part of the Síminn group) and the fact that the Síminn group has, to a large extent, built up its electronic communications network in the shelter provided by exclusive rights in the electronic communications market indicate that Síminn has a strong position in the relevant market.

Entry barriers is a collective term for various factors that affect the market power of current operators and the entry of new undertakings into the market. If an undertaking wishes to enter the relevant market and bases its services on its own access network, it is likely that the sunk costs associated with the investment will constitute an entry barrier because of the existence of another network. This entry barrier could be eliminated if Míla ehf. were subjected to an obligation to grant access to its local loop network. It is PTA's conclusion that Síminn has a certain competitive advantage because of its knowledge of bitstream and IPTV. The company's technological knowledge is not considered an entry barrier in the relevant market, however, because its competitors also have access to such knowledge. Síminn group enjoys economies of scale and scope, which makes it difficult for new operators to compete with it, and this constitutes an entry barrier in the relevant market. PTA is of the opinion that Síminn's extensive service system requires that potential competitors operate equivalent systems, but that this does not constitute a substantial entry barrier for such new competitors.

Síminn is a vertically integrated undertaking that operates on the wholesale and retail levels with respect to broadband services. By not granting wholesale bitstream access to electronic communications undertakings and by excluding electronic communications undertakings from bulk discounts that have been granted to other corporate customers, Síminn has exercised its market power to its own benefit at both wholesale and retail levels. A recent change by Síminn, wherein electronic communications undertakings are offered resale agreements for bitstream, grants them limited supply and access and denies them bulk discounts for large numbers of connections. Síminn's bundling of IPTV and ADSL service is unique in Iceland, and the company's competitors in the relevant market have difficulty in duplicating it. PTA takes the view that Síminn's bundling of IPTV and ADSL broadband services gives the company a competitive advantage over other operators and functions as an entry barrier in the relevant market. It is PTA's opinion that access to capital is not so limited as to represent an entry barrier for new operators in the relevant market. In the Administration's assessment, the potential for growth at the wholesale level will exist in the market for bitstream access for the next several years despite widespread xDSL coverage; for example, due to population growth, technological advances, and increased diversity in product offerings.

This being the case, it is possible to draw the conclusion that there are entry barriers for new undertakings wishing to enter the relevant wholesale market.

The primary objective of the market analysis is to determine whether there is effective competition in the electronic communications markets and to respond with

appropriate measures if there is not. In the analysis of the wholesale market for broadband access, it is possible to identify four criteria for competition that determine undertakings' average long-term profitability. They are: 1) countervailing buying power of purchasers with a strong position, 2) potential competition, 3) pressure from substitute products, and 4) competition among current operators.

PTA takes the view that there is limited countervailing buying power among purchasers in the wholesale market for bitstream access and that such buying power does little to counteract the power of sellers in the market.

As regards potential competition for bitstream access along copper local loops, PTA has come to the conclusion that there are various entry barriers in the relevant market, which indicates that there is a shortage of potential competition. These entry barriers, together with the fact that new operators incur greater investment-related risk than Síminn, mean that competitors may demand higher returns on their investment because of Síminn's relative size and financial strength. Other factors that limit potential competition are, for example, Síminn's vertical integration, its economy of scale, and its broader operational foundation. Síminn's bundling of IPTV and ADSL service is unique in Iceland, and the company's competitors in the relevant market have difficulty in duplicating it. In addition, Síminn has not offered other electronic communications undertakings wholesale bitstream access or discounts on retail bitstream access; thus the company has used its market power to its own advantage in both the retail and the wholesale markets.

PTA is of the opinion that there is the potential for competition for wholesale bitstream access in the future despite the various entry barriers that will face Síminn's competitors.

It is clear that xDSL via copper local loop is by far the most common form of bitstream access in Iceland, and it is difficult to envision significant competition from other modes of transmission in the near future. Furthermore, other means of access – for example, xDSL via microwave or satellite – have had a tendency to yield to xDSL via copper local loop when that service is available; therefore, it is not possible to view these as substitutes for xDSL via copper local loop. Fibre optic cable connections seem fall into a different category, however, but that form of access is still being developed and, as yet, can only substitute for xDSL to a limited extent. Potential competition from transmission media other than xDSL could develop in the future but is not foreseeable in the near term. The conclusion is therefore that xDSL is the dominant form of access, and the form of access in the relevant market in Iceland; however, PTA reserves the right to re-examine this view at the end of the time horizon for this analysis – that is, in another 2-3 years – or sooner, if there is reason to do so.

Competition among current operators is characterised by Síminn's strong position and large market share, on a national level, for xDSL access via copper local loop. Síminn has not offered the lowest price for retail ADSL connections. As regards its prices for wholesale access for xDSL, Síminn has not offered other electronic communications undertakings a wholesale price list. In June 2007, Síminn announced that it would offer a resale agreement with a 5-10% discount off the retail price, depending on ADSL bit rate, but it did not offer any volume-linked discounts. On the other hand,

since the year 2000 Síminn has granted corporate customers other than electronic communications undertakings bulk discounts of up to 25% off its retail prices. PTA takes the view that this discriminatory practise diminishes competition between companies, both in the wholesale market for broadband access and in the retail market for broadband services.

The conclusion PTA has drawn from its analysis of the relevant market is that effective competition does not exist in that market and that Síminn alone possesses significant market power in the relevant market. It is also PTA's opinion that there are barriers obstructing the entry of new operators into the relevant market.

Section 5 contains the results of the market analysis and the designation of the undertaking or undertakings with significant market power (SMP) in the relevant market. Based on its analysis of the relevant market for wholesale broadband access, PTA has concluded that the market is not characterised by effective competition and that Síminn has significant market power in that market. In view of this, PTA intends to designate Síminn hf. with significant market power in the market for wholesale broadband access.

Section 6 contains a discussion of obligations. That section states that there are currently no obligations in effect in the relevant market. It contains a review of the competition problems that PTA has identified in the relevant market, and it presents suggestions for obligations that should be conducive to increased competition and that should be imposed on Síminn, which is designated as having significant market power in the relevant market.

The obligations that PTA intends to impose on Síminn in the relevant market are as follows:

1. Síminn shall comply with all reasonable requests by electronic communications undertakings for open access to specific network facilities via copper local loop. In this case, the facilities in question are high-frequency bitstream access on Síminn's copper local loops.

2. If requested, Síminn shall also transmit bitstream along its trunk line network to the location where the electronic communications undertaking in question connects to Síminn's network.

3. Síminn shall offer bitstream access for resale to electronic communications undertakings that provide broadband services.

4. Síminn is required to comply with requests for hosting of other electronic communications undertakings' equipment for bitstream access, as well as granting access to other necessary facilities, including access to infrastructure and information systems.

5. All electronic communications undertakings that purchase bitstream access from Síminn shall enjoy the same terms as Síminn's service departments, associates, or collaborators.

6. Síminn shall practise non-discrimination in the pricing of bitstream access.

7. The quality of bitstream access granted to other electronic communications undertakings shall not be less than that offered to Síminn's own service departments, associates, or collaborators.

8. Síminn shall make information on bitstream access and related services accessible to other electronic communications undertakings.

9. Síminn shall process applications from other electronic communications undertakings as quickly as it processes applications from its service departments and associates.

10. Síminn shall conclude service agreements with purchasers of bitstream access.

11. Síminn shall publicise accounting information concerning the performance of its bitstream access activities

12. Síminn shall publicise a reference offer for bitstream access and related facilities and services no later than six months following the publication of the decision on the relevant market.

13. In its accounting, Síminn shall separate all revenues, expenses, assets, and liabilities related to network operations and other costs for wholesale bitstream access, on the one hand, from those related to retail sales of broadband services, on the other. Síminn shall submit to PTA a report from an independent auditor stating that there is consistency between the descriptions the company has submitted to PTA concerning cost allocations and the execution of its accounting separation.

14. Before 1 April each year, Síminn shall submit to PTA a summary from its accounts in order to show how non-discrimination in pricing for bitstream access has been practised.

15. Síminn shall submit to price controls in the relevant market. The current price for bitstream access shall be based on the retail-minus method. Until a cost-oriented wholesale price list has been approved by PTA, Síminn shall offer registered electronic communications undertakings a discount of at least 35% off its retail prices for the ADSL connections it currently offers for resale, subject to a minimum of 75 connections.

16. Síminn shall present to PTA an approved wholesale price list for various types of bitstream access no later than six months following the publication of the decision on the relevant market. The cost-oriented price list for bitstream access shall be based on historical costs, using comparable, efficiently run services as a guideline PTA will also guarantee that prices are coherent with LLU access prices. PTA will also assess, based on the results of each cost

analysis, whether it is more suitable to use the LRIC method[3] than the historical cost method.

17. Síminn shall carry out cost accounting for the elements of electronic communications operations that are necessary in order to grant bitstream access.

18. All changes to Síminn's price list for the relevant market shall be reported to PTA, and no changes in price will take effect without PTA's prior approval. Síminn shall submit to PTA a report from an independent auditor describing the allocation of costs and the execution of its cost accounting system.

A discussion of the impact of the proposed obligations can be found in Section 7. On the whole, the obligations that PTA intends to impose on Síminn represent some burden for the company; however, the Administration considers them consistent with the principle of proportionality and does not believe they represent more of a burden than is necessary given the company's strong position in the relevant market and in the electronic communications market in general. The obligations are intended to promote increased competition and to safeguard the interests of consumers.

[3] Long-run incremental costs.

1 Introduction

1.1 General

1. This document contains the Post and Telecom Administration (PTA) analysis of the wholesale market for broadband access (bitstream access), Market 12, in Iceland. It begins with a definition of the service and geographical markets and continues with a definition of the relevant market. If circumstances warrant it, one or more operators are designated as having significant market power (SMP),[4] and appropriate remedies are imposed on them. The market analysis is the foundation for the imposition of sector-specific obligations on electronic communications undertakings that have been designated as having significant market power (SMP).

2. This document is based on a draft that was presented for consultation with a letter dated 20 August 2007, cf. Article 6 of the Act on the Post and Telecom Administration, no. 69/2003, wherein electronic communications operators and other interested parties were invited to submit comments on the market analysis of Market 12 and the conclusions drawn from that analysis. The following parties submitted comments on the preliminary draft: Inter, IP fjarskipti ehf. (Hive), Og fjarskipti hf. (Vodafone), the Competition Authority, Síminn hf., and TSC ehf. The analysis of the relevant market has been updated to reflect the comments that were considered. The comments are categorised according to content, sections, and paragraphs, and a response to them is contained in Annex B to the decision on Market 12. An attempt was made to analyse all of the comments that were meaningful and to respond to them. The comments that were received concerning the preliminary draft can be found on PTA's Internet website.[5]

3. Markets and market analyses are subject to change and will be reviewed regularly. Markets that change constantly and considerably must be re-evaluated within a reasonable time limit. Markets are analysed with respect to immediate future developments wherever possible. The time period that is used as a reference should reflect the characteristics of the relevant market and the estimated time until the next analysis of that market takes place.[6] In most instances, such as in this market analysis, it is reasonable to assume a time horizon of two to three years.

1.2 Electronic communications legislation

4. The Electronic Communications Act entered into force in Iceland on 25 July 2003. The new Act, no. 81/2003, implements four EU directives on electronic communications[7] and one directive on the protection of personal privacy in electronic

[4] In English: "significant market power (SMP)".
[5] See http://www.pfs.is/ [English page] Market Analysis, Consultation with Interested Parties.
[6] See Paragraph 20 of the EFTA Surveillance Authority Guidelines of 14 July 2004 on market analysis and the assessment of significant market power under the regulatory framework for electronic communications networks and services referred to in Annex XI of the Agreement on the European Economic Area, EEA Supplement no. 21 of 27 April 2006 (Icelandic version).
[7] Directive of the European Parliament and of the Council, no. 2002/19/EC, of 7 March 2002, on access to, and interconnection of, electronic communications networks and associated facilities (the Access Directive).

communications.[8] The Electronic Communications Act is intended to create homogeneous operating conditions for European electronic communications operators, limit entry barriers, and create conditions for sustainable competition for the benefit of users.

5. The Electronic Communications Act obliges PTA to define certain electronic communications markets, both in terms of service and product types and in terms of geographical demarcation, in accordance with the fundamental principles of competition law and the obligations pursuant to the European Economic Area (EEA) Agreement. Furthermore, PTA is required to analyse the defined markets and determine whether they are characterised by effective competition. If PTA comes to the conclusion that there is effective competition in the relevant market – that is, that no operator has significant market power – it is prohibited from imposing obligations on the operators in that market. If the Administration has previously imposed obligations on undertakings in the relevant market, these shall be withdrawn and no new obligations imposed. On the other hand, if PTA concludes that the relevant market is not characterised by effective competition because one or more operators has significant market power, the Administration is required to designate the operator(s) concerned as having SMP and to impose appropriate obligations on them. PTA is required to impose at least one obligation on any undertaking so designated. If the undertaking has previously been designated with SMP in accordance with previous electronic communications legislation, PTA shall re-examine the obligations that have been imposed and decide whether they shall be maintained, amended, or withdrawn.

6. The European Commission has published guidelines and a recommendation concerning market analysis. First, there are guidelines for market analysis and the assessment of SMP,[9] and second, there is a recommendation concerning the relevant markets.[10] The EFTA Surveillance Authority (ESA) has issued comparable guidelines (hereinafter referred to as "Guidelines"[11]) and a recommendation (hereinafter referred

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Directive of the European Parliament and of the Council, no. 2002/20/EC, of 7 March 2002, on the authorisation of electronic communications networks and services (Authorisation Directive).

Directive of the European Parliament and of the Council, no. 2002/21/EC, of 7 March 2002, on a common regulatory framework for electronic communications networks and services (Framework Directive).

Directive of the European Parliament and of the Council, no. 2002/22/EC, of 7 March 2002, on universal service and users' rights relating to electronic communications networks and services (Universal Service Directive).

[8] Directive of the European Parliament and of the Council, no. 2002/58/EC, of 12 July 2002, concerning the processing of personal data and the protection of privacy in the electronic communications sector (Directive on privacy and electronic communications).

[9] Commission Guidelines on market analysis and the assessment of significant market power under the Community regulatory framework for electronic networks and services, 2002/C 165/3.

[10] Commission Recommendation and Explanatory Memorandum on Relevant Product or Service Markets within the Electronic Communications sector susceptible to ex ante regulation in accordance with directive 2002/21/EC, 11/02/2003, C(2003)497. On November 13, 2007 the European Commission adopted revised Recommendation on relevant markets, listing candidate markets for ex ante regulation by national regulatory authorities under the EU electronic communications regulatory framework. The revised recommendation cuts from 18 to 7 the number of candidate markets. The wholesale broadband access market (Market 12) is market number 5.

[11] See Footnote 2.

to as "Recommendation"[12]), both of which PTA will take into consideration in carrying out its market analyses. In addition, the Administration will consider the ERG[13] report concerning remedies that may be imposed on electronic communications undertakings with significant market power in order to promote competition.[14]

7. The ESA Recommendation on relevant markets identifies 18 electronic communications markets that PTA is required to analyse pursuant to the Electronic Communications Act and Iceland's obligations according to the EEA Agreement. The Electronic Communications Act also requires that PTA define these markets in accordance with the conditions reigning in Iceland. In this respect, PTA's market definition may differ from that assumed in the Recommendation. Furthermore, PTA is authorised to investigate all relevant electronic communications markets for the purpose of its market analysis, whether these are identified in the Recommendation or not.

1.3 PTA's execution of the market analysis

8. As is stated in the PTA introductory document on market analyses, the implementation of a market analysis can be divided into three phases:[15]

1) Definition of the relevant service markets and geographical markets;
2) Analysis of each of the defined markets, assessment of whether there is effective competition in those markets, and decision on whether one or more undertakings has significant market power;
3) Decision on whether it is necessary to impose, maintain, amend, or withdraw obligations on undertakings with significant market power.

9. This document contains PTA's conclusions for all three phases. These conclusions are based on PTA's preliminary draft analysis of the relevant markets, which were presented for consultation with a letter dated 20 August 2007. The comments received have been summarised and are answered in Annex B accompanying the draft decision concerning Market 12.

10. Every six months, PTA compiles information on the relevant market from the undertakings operating in it. With a letter dated 8 July 2004, PTA sent registered electronic communications undertakings a questionnaire on Markets 7, 11, 12, 13, and 14 . Furthermore, all stakeholders were given the option of sending in comments. With a letter dated 29 August 2005, PTA gave all registered electronic communications undertakings a second opportunity to submit comments on Markets

[12] EFTA Surveillance Authority Recommendation of 14 July 2004 on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communication networks and services, as incorporated into the Agreement on the European Economic Area; EEA Supplement no. 21 of 27 April 2006 (Icelandic version).
[13] Abbreviation for "European Regulatory Group of National Regulatory Authorities".
[14] Revised ERG Common Position on the approach to appropriate remedies in the ECNS regulatory framework. Final Version May 2006. ERG (06) 33. The document can be found at: http://erg.eu.int/doc/meeting/erg_06_33_remedies_common_position_june_06.pdf
[15] Introductory document on market analysis, prepared by PTA, first published in October 2003 and updated in August 2005. See www.pfs.is and then Market Analysis.

11 and 12. The Administration has also compiled information by carrying out independent consumer surveys[16] on transparency, awareness, and consumer behaviour in the electronic communications market.

1.4 Market definition — general

11. Pursuant to Article 16 of the Electronic Communications Act, no. 81/2003, with subsequent amendments, PTA must define product and service markets[17] and geographical markets in accordance with the principles of competition law and obligations under the EEA Agreement. As has emerged, it is necessary that PTA assess whether the markets as they have been defined in the Recommendation reflect conditions in Iceland. It is necessary to define both the service market and the geographical market before it is possible to determine whether market conditions warrant the imposition of obligations.

1.4.1 Product and service markets

12. In Article 4 of the Competition Act, no. 44/2005, a market is defined as the sales area for a product and substitute product and/or the sales area for a service and substitute service. Substitutable products and services are defined as products or services that can, wholly or to a significant extent, take the place of other products or services, not only on the basis of the objective characteristics of the product in question, the purchaser's intended use of it, and its price, but also with respect to competition requirements and/or conditions relating to supply and demand. Products that can compete with one another are therefore called substitutable products, and each market consists of products that are mutually substitutable. Products that can substitute for one another only to a limited extent are not considered to belong to the same market.

13. Substitutability is assessed from two points of view: first, how readily customers believe that one product can substitute for another (demand-side substitutability); and second, how easily a competitor of a given undertaking can adapt his production so that his product falls within the market to which a product of the given undertaking belongs (supply-side substitutability).[18]

14. Demand-side substitutability is considered the foundation of the market definition, while supply-side substitutability is less meaningful and is often related instead to an assessment of potential competition. Potential competition is the third competition factor that affects undertakings' behaviour. The difference between potential competition and supply-side substitutability is that supply-side substitutability takes place on shorter notice than does potential competition. In addition, supply-side substitutability does not require as much investment as new undertakings must engage in when they enter a market. An assessment of potential

[16] PTA has already had IMG Gallup carry out two telephone surveys. The first was conducted 20 February – 10 March 2004, and the second took place 6 – 18 April 2005. The sample for both surveys included 1,350 people, from all over Iceland, who were chosen at random from the National Registry. A report containing the results of the surveys can be found on the PTA website: www.pfs.is.

[17] Hereinafter, the terms "product" and "service" will be used interchangeably.

[18] See also Paragraph 39 in the Guidelines and Explanatory Memorandum accompanying the Commission Recommendation, Section 3.1.

competition is made with the aim of determining whether there are entry barriers that obstruct normal competition in the market.

15. The SSNIP test[19] has been used to measure potential substitutability. According to the SSNIP test, there is substitutability between products or services A and B if a small (5-10%) but significant non-transitory price increase in product A results in customers' beginning, to a considerable degree, to purchase product B instead, so that the increase in the price of A proves unprofitable because of lost sales. If such a price increase proves profitable, however, it is possible to conclude that substitutability does not exist.

16. The above method requires a great deal of data compilation, which is often difficult to carry out. However, it is not required that the SSNIP test be used to define markets. Other methods can be used as well. It is possible to use econometrics of supply and demand in the market if such research is available. In assessing demand, it is also necessary to consider end users' access to information and to examine whether there are hindrances that prevent their switching service providers (lock-in effect). If an end user must incur significant switching costs in order to switch from service A to service B, the two services should not belong to the same service market. In assessing supply, it is also necessary to consider sellers' actual options in adapting their production, as well as possible regulatory conditions that could delay or hinder the entry of competitors into the market.

1.4.2 The geographical market

17. When the service market has been defined, the geographical market must be demarcated. This demarcation of an electronic communications market is generally based on the coverage of the electronic communications network and the legislative jurisdiction of the regulatory framework that applies to it. The definition of the geographical market is also based on an assessment of substitutability of the product or service in question, on the supply side and on the demand side, in case of a small but significant non-transitory price increase, as is described above.

18. The geographic market is the area where products or services are offered on sufficiently homogeneous competitive terms. In assessing demand-side substitutability, it is appropriate to consider customers' taste and geographical purchasing patterns. On the basis of this, it is possible to define markets as local, regional, national, or transnational; that is, extending to more than one country. PTA does not have the authority, however, to define transnational markets on its own. If a market is considered to extend to more than one country, European regulatory authorities collaborate on the market definition together with the European Commission and ESA, if appropriate.

19. Two factors are important in defining geographical markets: price and network coverage. If an electronic communications network reaches the entire country, this indicates that the geographical scope should be national. If the distribution of the network is regional and there is no overlapping of regions, this is an indication that

[19] SSNIP is the abbreviation of the English phrase "small but significant non-transitory increase in price." The SSNIP test is also called "the hypothetical monopolist test." See Paragraph 41 in the Guidelines, where this is explained in greater detail.

the geographical scope should be regional. If prices are the same for the entire country, this indicates that the geographical scope should be national. If prices differ according to region, this is a strong indication that supply- and demand-side substitutability do not exist and that the regions in question are distinct geographical markets.

1.4.3 Requirements for the definition of other markets

20. PTA may define markets other than those listed in the ESA Recommendation; for example, due to special circumstances in Iceland. In such instances, it is necessary to consult with ESA. When other markets are to be defined, the criteria listed below must be met in order for it to be possible to impose obligations:

1) There are barriers restricting entry into the market.
2) The characteristics of the market are such that it will not tend sufficiently towards effective competition.
3) The general principles of competition do not suffice to eliminate barriers or promote competition.

21. In the opinion of the European Commission and ESA, the above criteria exist in the market under scrutiny here.

2 Description and definition of the relevant service market

2.1 General

22. Wholesale broadband access, which is under scrutiny here, corresponds to Market 12 in the ESA Recommendation.[20] According to the ESA definition, this market includes "bitstream access", which can be used for broadband transmission of data in both directions, as well as for access through other technology that is sold at the wholesale level, if it is comparable to bitstream access. It also covers the market called "network access and special network access", which is mentioned in Item 2 of Annex I to the Framework Directive, but it covers neither Market 11 (wholesale access to copper local loops[21]) nor Market 18 (broadcasting transmission services to deliver broadcast content to end users[22]).

23. The European Commission bases its definition of the relevant wholesale market on the retail markets for access to data services and other comparable services via fixed connection.[23] The Commission considers that, in general, the supply of retail Internet services takes two forms: i) network or transmission service to and from the end user's location; and ii) Internet service, especially interconnection with other end users or web servers.

24. The most common Internet connection methods used in Europe are dial-in modems using telephone lines, broadband access (using digital user lines (xDSL[24]), cable system modems,[25] and wireless connections), and leased lines. Analogue dial-in modems are used on voice call local loops and provide access to a narrow-band Internet connection. Comparable services are provided with ISDN, which is an integration of voice call and data transmission wherein each of the two services controls a 64 kb/s bit rate, which is slightly more than a conventional telephone line with a dial-in modem; however, it is possible to use the entire bandwidth of 128 kb/s for data transmission. Cable systems with duplex modems and xDSL via copper local loops not only offer the possibility of greater bandwidth; they also offer the possibility of continuous connection, which is not feasible with analogue modems in the frequency range used by copper local loops. Satellites and fixed wireless access systems (FWA[26]) are also used to provide broadband services. Fibre optic cables laid into end users' businesses or residences are another option. Leased lines on local loops – both analogue and digital – are also available at various bit rates.

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[20] See Item 12 in the Annex to the ESA Recommendation on the relevant market *("Wholesale broadband access").*

[21] Page 8 in the ESA Recommendation: "*Wholesale unbundled access (including shared access) to metallic loops and sub-loops for the purpose of providing broadband and voice services".*

[22] Page 9 in the ESA Recommendation: "*Broadcasting transmission services, to deliver broadcast content to end users".*

[23] See page 21 in the Explanatory Memorandum accompanying the Commission Recommendation on relevant markets from 2003. The references to the Commission´s views in this draft measure are consistent with the current Commission´s views as set out in the now Explanatory Memorandum from 2007.

[24] DSL is the abbreviation for the English term: *Digital Subscriber Line.*

[25] It is possible to provide Internet and data transmission services via television cable network.

[26] Abbreviation for the English: *Fixed Wireless Access.*

25. The question could arise of whether Internet access and other data transmission represent a single retail market or more than one market, and the answer to that question could affect how the corresponding wholesale market for broadband access is defined. It is clear from the description above that access via dial-in modem along local loops is subject to limitations – including limitations concerning bandwidth – as ISDN offers a maximum bit rate of 128 kb/s. On the other hand, it is common to define broadband access as a bit rate greater than 128 kb/s, while a bit rate of 128 kb/s or less is defined as a narrow-band connection. There are factors other than bit rate that distinguish among the various types of access. For example, continuous connection is problematical in dial-in connections but is simple to achieve through xDSL and cable systems. The various services are priced in differing ways because transmission via the dial-in method is generally based on the price list for voice call services, while broadband access is priced with a fixed monthly charge for a given bit rate and a specified maximum amount of data transmitted. Given the above observations, it must considered clear that a dial-in connection is not a substitute product for users who need broadband access. In the opinion of the Commission, this narrow-band service constitutes a separate technological market and does not belong to the retail market for broadband access.[27] The download and upload speed offered via dial-in Internet connection is too limited for broadband services, which require substantial transmission capacity. The Commission defines broadband service as a service that assumes that the transmission capacity for download to the end user will exceed a bit rate of 128 kb/s.

26. Therefore, the Commission takes the view that leased lines are not part of the retail market for broadband services.[28] Leased lines are used, among other things, to establish connections for users and to offer them a given transmission capacity. It is possible to provide broadband service via leased lines in a manner similar to that for bitstream access. The principal difference between leased lines and bitstream is that, with a leased line, the lessee is guaranteed a given bandwidth and the quality of the connection is generally better. Furthermore, a leased line offers a symmetrical connection – that is, transmission capacity is the same in both directions – which is not always the case with bitstream access. The Commission has defined termination along leased lines as a separate market (Market 13).

27. Considering the above, it is clear that the above forms of Internet access represent separate retail markets, and only the retail market for broadband access can be considered a potential part of the related wholesale market for broadband access.

28. The market for wholesale broadband access includes bitstream access provided along copper local loops in a fixed-line network, but it is not limited to any particular technology. In the opinion of the Commission, other access methods also belong to this market, when and if technology comparable to bitstream is offered using these methods.[29] The Commission defines bitstream as a service that is partially dependent on access to a copper network and can also extend to other networks, such

[27] See page 22 in the Explanatory Memorandum accompanying the Commission Recommendation on relevant markets.
[28] See page 24 in the Explanatory Memorandum.
[29] See page 24 in the Explanatory Memorandum.

as an ATM[30] network. High-speed bitstream access refers to the set-up of a form of high-speed access for end users, which other electronic communications undertakings can purchase at the wholesale level in order to sell it to their users at the retail level.

29. The Commission defines the market for wholesale broadband access in a manner that excludes simple resale. The rationale is that simple resale is not considered sufficient to meet the market's need for broadband access.[31] An offer for resale that entails one electronic communications undertaking purchasing from another the same service that the latter sells to his end users is generally not considered to belong to the market for wholesale broadband access because the purchaser cannot change the content of the service that he purchases for sale to his end users. If purchasers are to be able to change and improve the broadband service that they purchase for sale to end users, they must have access to network termination points where they can control certain technical characteristics of the service to end users, and they must have full use of their own network elements so that they can improve the quality of the service provided. This is not the case with simple resale.

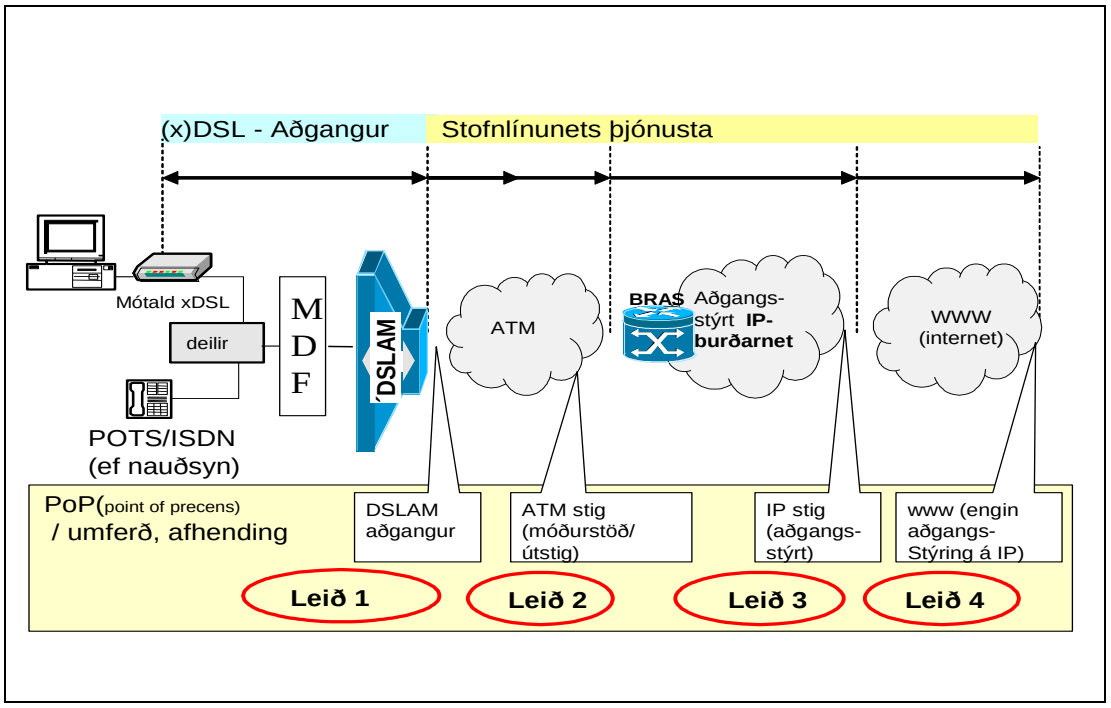
30. The Commission has come to the conclusion that access via copper local loops (both full and shared access) and broadband access represent two separate markets.[32] The chief difference between the two lies in control over DSLAM,[33] which is equipment that combines bitstream from a given number of xDSL lines. An electronic communications undertaking that uses shared access to copper local loops will not, under normal circumstances, consider bitstream access as a possible substitute, even though the latter service provides the option of rendering the same service as that available through shared access to copper local loops. In order for that to be the case, xDSL technology or other technology used on copper local loops would have to be compatible at all levels of the network. Even though such a synchronous technological arrangement existed, it would demand continuing synchronisation in the future, which makes it difficult to develop various services at the technological level. In the same manner, it is doubtful that an electronic communications undertaking that uses bitstream access to provide services to end users could switch easily to using shared access to copper local loops in order to provide those same services. A party that leases copper local loops only gains access to a pair of copper lines that lie from the telephone exchange to the end user, and he must set up the necessary equipment in the telephone exchange himself (including DSLAM) in order to offer retail broadband services. However, wholesale bitstream access gives the purchaser the option of offering broadband service at the retail level without large investments in equipment. The investment cost is therefore less for a purchaser of bitstream than for a party that leases copper local loops. Offsetting this is the fact that the latter has a much greater possibility of affecting the quality of the broadband service through transmission capacity (speed, strength, etc.) and supplementary services. This being the case, it must be considered as established that there is limited substitutability between access to local loops and wholesale broadband access, on both supply side and demand side.

31. Figure 1 illustrates the methods that could be available for the provision of bitstream access in various locations on user line and trunk line networks. There are

[30] Abbreviation for the English: *Asynchronous Transfer Mode.*
[31] See page 25 in the Explanatory Memorandum.
[32] See page 24 in the Explanatory Memorandum.
[33] Abbreviation for the English: *DSL Access Multiplexer*

four levels of access, and purchasers have varying levels of flexibility in rendering services, depending on where the bitstream access is provided; that is, which option is chosen. The higher up one goes, the less the possibility for the purchaser to distinguish himself from the seller.

Figure 1 Various options for bitstream access



Option 1: The seller sets up an xDSL connection for users and delivers bitstream to purchasers behind the DSLAM equipment. Purchasers handle the trunk line connection from the DSLAM via ATM and/or IP network to the service centre. This gives purchasers greater control over the quality of the service they sell, but it requires a substantial investment on their part.

Option 2: The seller provides an xDSL connection from an ATM/IP network over a trunk line connection from DSLAM. In this instance, the purchaser can control the quality of the transmission on the ATM network to a certain degree. Purchasers operate their own BRAS[34] and can therefore control the technological variables of the equipment and maintain information on users.

Option 3: In this instance, bitstream is delivered to the purchaser via IP network operated by the seller, who also operates DSLAM and is responsible for the quality of the service. It is conceivable that the purchaser could negotiate for various quality terms for his customers.

Option 4: This is a typical example of Internet subscription resale. The Internet connection that the seller sells to the purchaser is the same as that which he sells to his own retail customers. The purchaser operates no part of the network and is only responsible for selling the service unchanged. He does,

[34] Abbreviation for the English: *Broadband Remote Access server.*

however, have the option of sending his customers a single invoice for all services provided via high-speed connection.

32. As can be seen from this description, bitstream access according to Options 1-3 gives alternative operators the opportunity to change certain characteristics of the service they offer their customers, which gives them the opportunity to gain a larger margin of their turnover. This enables alternative operators to offer other retail services than the access provider does. This could involve, for example, changed technological characteristics, different quality, different prices, or special service offers for specific target groups. On the other hand, resale as described in Option 4 provides no such possibilities, and the competitor's success will depend solely on marketing. In this context, it is necessary to make a distinction between the potential for competition depending on the terms at which resale agents are offered the service. Should it be made possible for resale agents to purchase the service at wholesale prices, there could be an opportunity for them to compete with a company that controls shared access to copper local loops in geographical areas where the supply would otherwise be limited to one option. When resale agents must purchase services at retail prices, their margin for gaining a foothold in the market is extremely limited.

2.2 Assessment of the relevant service market for wholesale broadband access in Iceland

2.2.1 General

33. As is discussed above, the relevant market for wholesale broadband access includes bitstream access provided along copper local loops in a fixed-line network, but it is not limited to any particular technology. The objective of broadband access is to offer high-speed broadband connections at a bit rate greater than 128 kb/s for data transmission and Internet usage. As has emerged, these connections could be based on technology other than xDSL via copper local loop; for example, fibre optic cable connection to users, electrical wires, cable television systems, and wireless networks.

34. The definition of the relevant market is therefore not limited to a specific technological option as long as technology comparable to bitstream is offered via other methods. As has been stated previously, high-speed bitstream access refers to the set-up of a form of high-speed access for users, which other electronic communications undertakings can purchase at the wholesale level in order to sell it to their users at the retail level.

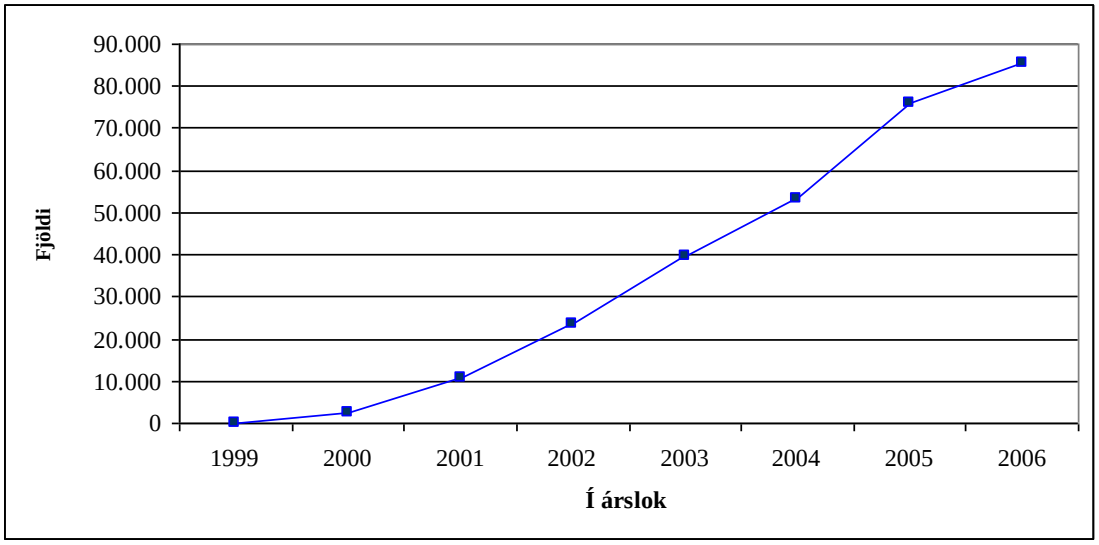
35. Because a wholesale market for broadband access has only been in existence in Iceland to a limited degree, it is necessary to assess substitutability in terms of conceivable business terms at the wholesale level and in terms of supply and demand for broadband access at the retail level. In order to define the relevant service market, it is necessary to examine possible substitute services and determine whether they belong to the relevant market. To begin with, it is necessary to scrutinise the technological options offered on the broadband market in Iceland, as well as accounting for the current operators in that market.

xDSL via copper local loop

36. In Iceland, most broadband connections are based on digital subscriber lines,

or xDSL, via copper local loops. These are available all over the Reykjavík area and in most municipalities in rural Iceland. Figure 2 shows the growth in the total number of xDSL subscriptions from the service's inception until year-end 2006.

Figure 2 High-speed connections (xDSL subscriptions) 1999 - 2006



Source: Post and Telecom Administration

37. From the outset, Síminn hf. (previously known as Landsíminn Íslands hf.) has been the largest electronic communications undertaking in Iceland. At the Annual General Meeting of Síminn hf., held on 15 March 2007, the company's shareholders approved a restructuring of the Síminn conglomerate. The company's electronic communications network was separated from other operations, and a separate parent company, Skipti hf., was established within the Síminn group. The division of Síminn was an element in the group's reorganisation, wherein the individual operational units - that is, Síminn, electronic communications networks, and real estate - are operated as subsidiaries of Skipti hf., which is a parent company engaged in no operations other than those pertaining to the administration of holdings in other companies and the representation of the Síminn group. The electronic communications operations within the Síminn group are now divided primarily between Síminn hf. and Míla ehf. Míla owns and operates all of the copper local loops in the country that belong to Market 11. These extend to a large majority of homes and business locations in Iceland. Síminn operates DSLAM equipment and sells xDSL connections to users and companies, leasing copper local loops from Míla in order to do so. Síminn is Míla's largest customer. Síminn has sold retail Internet access via xDSL along copper local loops since 2000. Since year-end 2003, Síminn has offered ADSL[35] connections in all communities with a population of 500 or more, as well as providing the service in many smaller communities.

38. Og fjarskipti ehf. (Vodafone) is Míla ehf.'s second-largest customer for leased access to copper local loops. Vodafone has set up ATM/IP ADSL systems in the Reykjavík area, Akureyri, Akranes, Borgarnes, Selfoss, Hveragerdi, the Westman Islands, Reykjanesbaer, Ísafjördur, Saudárkrókur, and Egilsstadir. According to information on the company's website, Grindavík, Dalvík and Húsavík will be added

[35] Abbreviation for the English: *"Asymmetric Digital Subscriber Line"*.

in 2007. In those locations where Vodafone has not considered it economical to set up its own network, it purchases access connections from Síminn so as to sell them to its own customers. Vodafone is owned by Teymi hf., which is listed on the OMX Securities Exchange and operates various companies in the electronic communications and information technology markets. In addition to Vodafone and others, Teymi hf. owns Ódýra símafélagid ehf. (SKO), Mamma ehf., Skýrr hf., and EJS hf.

IP-fjarskipti ehf. (Hive) leases shared access to copper local loops from Míla ehf. in order to offer ADSL services. Hive's IP ADSL system covers the entire Reykjavík area, with the exception of Álftanes and Kjalarnes, as well as extending to the Westman Islands. Hive also offers ADSL connections elsewhere in the country and purchases access from Síminn hf. in order to do so. In 2007, Wireless Broadband System ehf. purchased the electronic communications utilities IP-fjarskipti, Atlantssími and eMax, and it now operates them under the Hive brand.

39. A few companies, including Netsamskipti, Skýrr, Fjölnet, and Ábótinn, operate their own DSLAM systems outside the Reykjavík area and lease access to copper local loops from Míla ehf. These systems are small and quite localised. In addition, a number of companies purchase broadband access from Síminn, Vodafone, and Hive in order to sell xDSL connections to their customers. The largest of these is Hringidan ehf., which operates primarily in the Reykjavík area. Other purchasers are Skýrr hf., which operates all over Iceland but only sells to corporate customers; Tölvu- og rafeindathjónusta Sudurlands ehf. (TRS), which 1. October 2006 took over the operations of Toppnet ehf; Fjölnet hf., which operates in Skagafjördur; Snerpa ehf., which operates primarily in the West Fjords; and TSC ehf., which operates on the Snaefellsnes peninsula. Finally, there are operators that sell only Internet connections. Ódýra símafélagid ehf. (SKO), the largest of these, resells connections from its affiliate, Vodafone, all over Iceland.

Cable systems

40. Cable television networks with duplex modems can be used to provide broadband services. Síminn owns and operates one such network, called Breidband (the Broadband). Síminn's Breidband is a cable network for television, radio, and computers, with a bit rate of up to 512 kb/s to users, and up to 128 kb/s from users. Breidband has insignificant coverage, however, and is limited to a part of the Reykjavík area and certain localities in rural Iceland. Síminn has been the only company to offer Internet connections via the Síminn Breidband, and it has recently discontinued the service.

Wireless networks

41. In those areas where local loops have not been laid – for example, in vacation communities and in places where xDSL is not offered – it has been popular to set up wireless microwave networks. Several smaller companies offer wireless Internet connections via microwave in certain locations. The company eMax (which has now merged with Hive) is the largest of these providers, and it has offered such connections in the Reykjavík area, Akureyri, West Iceland, South Iceland, and several vacation home communities. Other companies that offer wireless Internet connections are Síminn hf. in Grímsnes; Ábótinn ehf., which operates in the rural parts of Árnessýsla and Rangárvallarsýsla counties; Snerpa; TRS; TAC; and Wireless

Broadband Systems (owner of Hive), which began offering this service in Grímsnes and Grafningshreppur district in 2006.

Fibre optic cable networks

42. A fibre optic cable network that lies directly to the user offers the possibility of more speed than can be achieved with xDSL via copper local loop, as well as offering video, audio, and voice transmission. The same speed is offered in both directions, which guarantees fibre optic cable customers a stable connection. Orkuveita Reykjavíkur (Reykjavík Energy, abbr. OR) has built a fibre optic cable network in part of the Reykjavík area, as well as in West Iceland and South Iceland, and intends to connect all of the residences in its territory to the network over the next 10 years. Beginning in 2005, OR operated its fibre optic cable as a separate division within the company. On 1 January 2007 that division became the private limited liability company Gagnaveita Reykjavíkur ehf. (Reykjavík Data Utility, abbr. GR). GR is a subsidiary of OR and now handles the operation of the fibre optic cable network. At present, the network is primarily a trunk line network, but in addition, some 5,000 households were connected to the GR network by year-end 2006. GR itself does not offer Internet connections to users; instead, it leases access to its fibre optic cable network to Hive, Hringidan, and Vodafone, which in turn offer Internet service via the GR fibre optic cable. At year-end 2006, there were *[...]*[36] such connections. In addition to the above, the GR fibre optic cable network offers phone (VoIP) and interactive television (IPTV) service. Several smaller operators offer Internet service via fibre optic cable, including Skýrr and Fjölnet, which operates a fibre optic cable network in Skagafjördur.

Satellite

43. Satellites are generally used to provide high-speed Internet connections when other technology is not suitable. In Iceland, this solution is very expensive and primarily desirable for ships and other seagoing vessels because other methods are not available. Snerpa offers satellite Internet connection, but the number of subscribers is limited; thus it seems as though this service is only available to ships and boats.

44. After examining the technological options available on the broadband market, it is interesting to note the distribution among them. Table 1 shows the number of Internet subscribers, by transmission medium, as of year-end 2006.

Table 1 Number of Internet subscribers, by transmission medium, at year-end 2006

Transmission medium	**Subscribers**	**Weight**
xDSL (copper local loop)	85,280	97.2%
Microwave	1,710	1.9%
Fibre optic cable	668	0.8%
Satellite	80	0.1%
Total	**87,738**	**100.0%**

Source: Post and Telecom Administration

[36] Figures omitted for confidentiality reasons.

45. Since 2000, when xDSL via copper local loops became available, the number of subscribers to untimed Internet access has increased very rapidly, and it is still increasing at the expense of other transmission media. As Table 1 shows, xDSL is the dominant transmission medium. Other options are limited and constitute less than 3% of the total number of subscribers in the market. Internet subscription by cable is no longer offered, as the number of cable subscribers has been dropping in recent years. The service has therefore been discontinued. Furthermore, it seems as though ships and other vessels are the only users of satellite connections, and given the way this option is structured, it must be considered impossible to provide wholesale access comparable to bitstream access to xDSL connections. Moreover, satellite users must invest in relatively expensive user equipment. Given the above, it is PTA's opinion that substitutability of both supply and demand is so limited that broadband connections via cable and satellite should not be considered to belong to the same market as xDSL connections. The competitive impact of these options will be examined, however, in the assessment of potential competition in the analysis of the relevant market.

46. As Table 1 illustrates, the number of fibre optic cable subscribers is still quite limited – only 0.8% - but this is up from 0.5% at year-end 2005. This small market share reduces the likelihood that fibre optic cable service will be considered to belong to the relevant market. Offsetting this, however, is the fact that wholesale access is available, and there are plans to expand the GR fibre optic cable network in coming years. In view of this, PTA considers it appropriate to examine whether fibre optic cable and wireless connections belong to the same market as xDSL. The first step is to demarcate the relevant retail market and determine its impact on the relevant wholesale market, based on substitutability between these options and possible competitive constraints.

2.2.2 Retail market for broadband access in Iceland

47. In accordance with the foregoing discussion, the retail market that is under scrutiny here and can be linked to the market for wholesale broadband access includes high-speed broadband connections for data transmission and Internet services. As is stated in Section 2.1, the Commission has concluded that so-called narrow-band access (dial-in access) does not belong to the same market as broadband access, as there are a number of important distinctions between them. There is a considerable difference in the possible bandwidth, broadband access offers continuous connection (which is problematical with a narrow-band connection), and prices are structured differently. The Commission defines broadband service as a service that assumes that the transmission capacity for download to the end user will exceed a bit rate of 128 kb/s. Access via dial-in modem along local telephone loops, however, does not offer bit rates greater than 128 kb/s; therefore, it cannot substitute for broadband access.

48. In PTA's estimation, narrow-band access is not a part of the market for broadband access; thus the Administration's opinion accords with that of the Commission. In addition to the above distinctions between broadband and narrow-band access, narrow-band access is provided using the voice call frequency range of the local loop and not on the high-frequency range, as is broadband access. This means that it is not possible to use the telephone line while the narrow-band Internet connection is active. With broadband access, the user is continuously connected and

can talk on the phone and transmit data simultaneously. PTA has carried out two independent consumer surveys[37] in order to compile information on electronic communications services. Among the questions asked in those surveys was whether respondents had an Internet connection and, if so, what type. According to the results of the surveys, 83% of respondents had an Internet connection. The number of ADSL connections had increased sharply between the two surveys, and the number of dial-in connections had dropped correspondingly. In the latter survey, 73% of respondents had an ADSL connection, while 58.2% had ADSL service in the previous survey. Only 14.7% of respondents had a dial-in connection in the latter survey, as opposed to 31.7% in the former. In addition, the number of customers with ISDN connection has dropped as well, from 8.1% to 4.6%. The number of wireless network users has increased, however, from 1.2% to 5.2%. Because of the increase in available services via broadband access – such as digital television and VoIP voice call services – there is a need for continuous connection, as well as greater speed, neither of which can be achieved with a narrow-band connection. That being the case, it must be considered as established that narrow-band access and broadband access do not belong to the same retail market.

49. As is stated above, there are available in Iceland broadband connections using xDSL along a copper local loop, fibre optic cable networks that extend directly to users, duplex cable systems for television, wireless networks, and satellite. In Section 2.2.1, PTA came to the conclusion that broadband connections via cable and satellite do not belong to the same market as xDSL via copper local loop, as there is extremely limited use of these options and it is unlikely that the supply of such solutions will exert any competitive restraint on the supply of xDSL connections. However, PTA considers it appropriate to examine whether fibre optic cable and wireless connections belong to the same market as xDSL.

50. There are various services and service packages available using these three transmission media, the most common of which is Internet access; however, digital television and VoIP voice call services have been offered as well. The wireless connections that are currently available in Iceland cannot accommodate digital television; however, xDSL and fibre optic cable can do so. Table 2 compares several Internet subscriptions that are available from various companies via these transmission media. This is not an exhaustive comparison but rather a rough juxtaposition of the subscriptions that are comparable. It is presented here only to provide an idea of what subscription options are being offered and how they are priced. Comparing subscriptions by transmission medium is difficult, as the services involved are frequently not offered in the same parts of the country. Initial fees charged to users vary according to transmission medium, and the amount of downloading included in each option differs as well. In addition, the amount of service included in each subscription option varies, which partially explains the differences in price. Because it is not possible to give account of this in Table 2, it is well to note the explanations accompanying the table.

[37] Telephone surveys conducted by IMG Gallup for PTA, 26 February – 10 March 2004 and 6 – 18 April 2005. The sample for both survey included 1,350 people from all over the country. Participants were chosen at random from the National Registry.

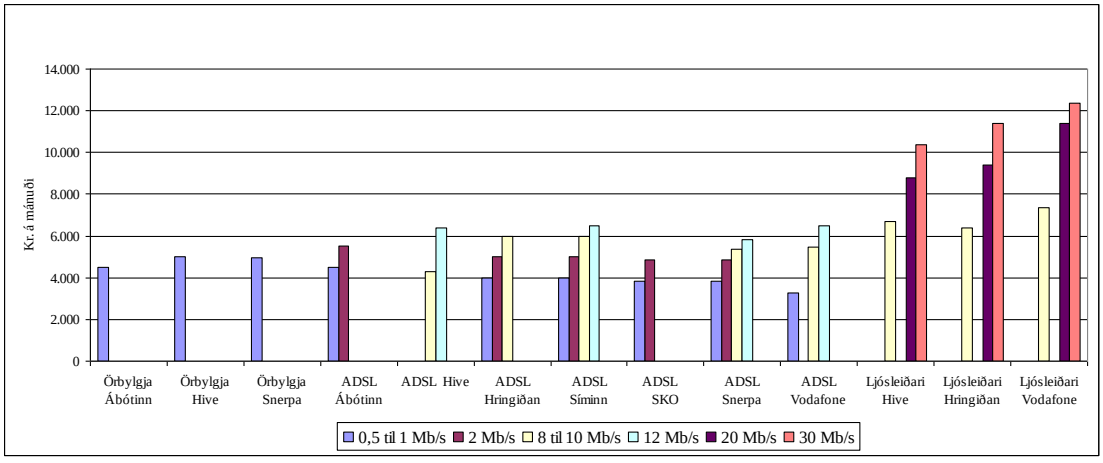
Table 2 Comparison of Internet subscription prices, by transmission medium and service provider[38]

Company	Microwave	ADSL				Fibre optic cable		
	0,8-1 Mb/s	0,5-1 Mb/s	2 Mb/s	8 Mb/s	12 Mb/s	8-10 Mb/s	20 Mb/s	30 Mb/s
Ábótinn	4.500 kr.	4.500 kr.	5.500 kr.	-	-	-	-	-
Hive	4.990 kr.	-	-	4.290 kr.	6.390 kr.	6.680 kr.	8.780 kr.	10.380 kr.
Hringiðan	-	3.990 kr.	4.990 kr.	5.990 kr.	-	6.380 kr.	9.380 kr.	11.380 kr.
Síminn	-	3.990 kr.	4.990 kr.	5.990 kr.	6.490 kr.	-	-	-
SKO	-	2.590 kr.	-	4.590 kr.	-	-	-	-
Snerpa	4.950 kr.	3.850 kr.	4.850 kr.	5.350 kr.	5.850 kr.	-	-	-
Vodafone	-	3.260 kr.	-	5.460 kr.	6.490 kr.	7.380 kr.	11.380 kr.	12.380 kr.

Source: Post and Telecom Administration

Explanation: For the above subscriptions, the following foreign download amount is included: A 1 Mb/s microwave connection from Ábótinn includes 100 MB; a 1 Mb/s microwave connection from Hive includes 2 GB. A 768 kbps microwave connection from Snerpa includes 250 MB of foreign download. A 1 Mb/s ADSL subscription from Hringidan and Vodafone includes 1 GB. A 1 Mb/s subscription from Síminn includes 4 GB of foreign download. An 8 Mb/s ADSL subscription with Hive includes 4 GB, while the same basic subscription from Hringidan includes 8 GB. All ADSL connections from Snerpa include 250 MB of foreign download. Unlimited download is included with 8 Mb/s and 12 Mb/s ADSL subscriptions from Síminn and Vodafone. The price comparison for fibre optic cable connections include the monthly fee of ISK 2,390, which is paid directly to GR, for access to the fibre optic cable network. An 8 Mb/s fibre optic cable connection through Hringidan includes 4 GB of foreign download, while connection speeds of 20 and 30 Mb/s include 10 GB. A 10 Mb/s fibre optic cable connection with Hive includes 4 GB, while 20 and 30 Mb/s connections include unlimited download. Home phone service is included in the fibre optic cable connection through Hive. An 8-10, 20, or 30 Mb/s fibre optic cable connection through Vodafone includes unlimited download.

Figure 3 Monthly costs by speed and type of connection



Source: Post and Telecom Administration

51. As is stated previously, xDSL connections are the most common in Iceland and are offered in most places where it is possible to do so. In the individual market, most xDSL service providers offer various versions of ADSL connections in specific subscription packages. The price difference depends primarily on the speed, data volume, and supplementary services that are included in the package. Less expensive ADSL subscriptions are based on a given amount of use per month, while the more expensive options permit unlimited use. In the corporate market, operators offer a large variety of network solutions, with differing speed, data volume, and security, to

[38] Prepared from information found on the companies' websites in November 2007, concerning individual subscriptions.

meet the needs of each customer. Also available, in addition to ADSL subscriptions, are SHDSL[39] connections for corporate customers wishing to have the same speed in both directions.

52. Table 3 shows retail market share by number of xDSL Internet connections as of year-end 2006.

Table 3 Market share by number of xDSL Internet connections at year-end 2006

Company	Number of connections	Market share
Síminn	X (omitted for confidentiality	Over 50%
Og fjarskipti (Vodafone), IP-fjarskipti (Hive), others	X (omitted for confidentiality	Less than 30% each
Total	**85.280**	**100%**

Source: Post and Telecom Administration

53. Wireless microwave connections are a popular option in locations where xDSL is not offered. Wireless networks are also available in some areas where xDSL is offered – for example, in the Reykjavík area – but is probably not as desirable an option because, as can be seen in Table 2, the price is somewhat higher than that for ADSL. Furthermore, the user's initial expenses for a wireless connection are very high as compared with ADSL and fibre optic cable connections. In PTA's estimation, there are a number of reasons why wireless access should not belong to the same retail market as xDSL. In addition to that which has already been stated, it is impossible to ignore the fact that wireless networks have very limited coverage and do not have the same potential for speed as do xDSL and fibre optic cable networks. In the opinion of PTA, there is limited substitutability between wireless connections and xDSL – both on the demand side and on the supply side – primarily because the two options are usually not offered in the same geographical areas, and also because the price and speed are not entirely comparable. Wireless networks based on WiMax technology can offer greater speed than the wireless networks that have been operated in Iceland hitherto, but WiMax network coverage is still quite limited. Given the foregoing, it must be concluded that wireless networks do not belong to the same retail market as xDSL connections.

54. A fibre optic cable network that lies directly to the user offers the possibility of more speed than can be achieved with xDSL via copper local loop, as well as offering video, audio, and voice transmission. The same speed is offered in both directions, which guarantees fibre optic cable customers a stable connection.

Gagnaveita Reykjavíkur ehf. (GR) owns most of the residential fibre optic cable connections in the country; however, it does not sell broadband service at the retail level but rather grants service providers access to fibre optic cable connections, and the service providers then sell retail broadband service via the GR fibre optic cable network. Given the above, the GR fibre optic cable network could be considered a potential substitute for bitstream access. As Table 1 shows, only 0.8% of subscribers had fibre optic cable connections as of year-end 2006. GR's share of that figure was

[39] Abbreviation for the English: *"symmetric transmission capacity"*

just under *[...]*.[40] Active internet connections via GR fibre optic cable totalled *[...]*[41] as of year-end 2006. In comparison, active xDSL connections via copper local loops numbered 85,280 at the same point in time. Owners of fibre optic cable local loops other than GR accounted for around *[...]*[42] active local loops as of year-end 2006.

In recent years, GR has concluded agreements for the connection of all households in Reykjavík, Seltjarnarnes, and Akranes, as well as a few other communities, by year-end 2012, but the actual set-up and adoption of services has proceeded much more slowly than planned. The total number of residential fibre optic cable local loops laid by GR was only around 5,000 at year-end 2006. This is far below previous estimates and is proportionally very low in comparison with the overall number of copper local loops in use, which totalled 147,000 at that time. The total number of households in Iceland is about 110,000; thus fibre optic cable coverage is still quite limited. Fibre optic cable connections could only substitute for xDSL connections in a very few, clearly demarcated areas. Based on figures from 2007, the estimates that PTA has at its disposal, and previous experience, the Administration believes that fibre optic cable coverage will remain very limited for the next two years.

GR offers connections of up to 100 Mb/s into residences with an installed fibre optic cable local loop. GR connects the loop and provides access to the fibre optic cable. The residential user pays GR a monthly fee of ISK 2,390, including VAT, for this access. Services are purchased directly from the service provider, however, and the customer pays the service provider for the services received. The service provider does not receive a share of GR's access revenues; however, GR does receive a share of the service provider's revenues. Actual use of fibre optic cable services is still very limited, both in comparison to ADSL and as a proportion of fibre optic cable local loops. Despite the fact that fibre optic cables offer more speed, it seems that, in most cases, there are price barriers in the market. Table 2 and Figure 3 show that the price for Internet service via fibre optic cable is considerably higher than with ADSL when the access fee to GR is included, and this limits potential substitutability, even though ADSL prices were to rise by 5-10%.

Despite the fact that GR intends to expand its fibre optic cable network in coming years, it is still unclear how much impact that expansion will have on the market share of xDSL connections over the next two years. Though it is possible to conclude that the supply of fibre optic cable connections could make a competitive impact on the supply and demand for xDSL in a few areas, PTA considers it inappropriate, due to the limited coverage of the fibre optic cable networks, to include fibre optic cable connections in the same retail market as xDSL at the present time.

55. Given the above, PTA considers that broadband access using xDSL along copper local loops is the only service belonging to the relevant retail market.

2.2.3 Wholesale market for broadband access in Iceland

[40] Figures omitted for confidentiality reasons.
[41] Figures omitted for confidentiality reasons.
[42] Figures omitted for confidentiality reasons.

56. Service providers that wish to sell broadband access to users but do not own their own network are faced with two options: building their own network or purchasing access to existing network facilities. It can be said that it is not financially feasible to build up numerous access networks in Iceland; therefore, it is possible to conclude that there are three options: leasing of copper local loops, wholesale broadband access, or wholesale terminating segments of leased lines. These three options require varying supplementary equipment, and the choice made depends to a large degree on what retail services the wholesale purchaser intends to offer and how much he is willing to invest in order to provide satisfactory retail services.

57. It is possible to call shared access to copper local loops a "naked" version of wholesale bitstream access, where the lessee only obtains access to the copper line pair between the telephone exchange and the user. Shared access to copper local loops therefore requires much more extensive investment by the lessee than does bitstream access. As has already been stated, the difference lies, among other things, in the DSLAM equipment that the owner of the local loop provides along with bitstream access. When leasing local loops, the lessee must furnish the DSLAM equipment. In order to determine whether there is substitutability between copper local loop leasing and bitstream access, it is useful to consider what would happen if the purchaser of bitstream access were faced with a 5-10% increase in the wholesale price of bitstream access and whether he would be willing to invest in DSLAM and the facilities necessary to continue offering broadband access. PTA believes that it is not impossible that some wholesale purchasers would be willing to switch to copper local loop leasing and therefore concludes that there is some potential substitutability between the two. On the other hand, it should be borne in mind that wholesale broadband access is not limited to a single technological solution or a given access point, while copper local loop leasing is based on a single technology and a given access point. The European Commission and ESA have defined the market for local loops as a separate market, Market 11. Given the above considerations, PTA sees no reason to define it differently than the Commission and ESA have done.

58. The Commission and ESA have also concluded that the market for leased lines is a different market than that for wholesale broadband access. In most instances, leased lines are used to build up electronic communications networks; for example, mobile phone companies use digital leased lines to connect telephone exchanges to radio transmitters. The principal difference between wholesale bitstream access and leased lines is that leased lines offer reliable bandwidth in both directions, and the quality is usually better than that achieved with bitstream access. Furthermore, bitstream access is usually an asymmetrical connection. The difference in the characteristics of leased lines, on the one hand, and bitstream access, on the other, prompts the conclusion that leased lines with dedicated transmission capacity cannot substitute for broadband access; that is, purchasers of bitstream access would probably not switch to leased lines even if the price of bitstream rose by 5-10%. A distinction that weighs heavily is that leased lines are delivered to users in a different form than, for example, bitstream access. In light of this, it can be considered likely that a party needing special transmission capacity in his electronic communications networks will not view bitstream access as a potential substitute product because, with bitstream access, one cannot guarantee users a given amount of bandwidth. Given the above considerations, PTA sees no reason to define the market differently than the Commission and ESA have done.

59. In accordance with the foregoing, only broadband access can be considered to belong to the wholesale market under scrutiny here. To begin with, the wholesale market for broadband access may be defined with reference to the retail market described above. If a user in a fixed location is to receive access to the Internet, VoIP, television services, and other data transmission, there is a need for a duplex transmission medium that suits the services required by that user. In view of this, PTA has come to the conclusion that narrow-band access does not belong to the same retail market as broadband access.

60. The relevant wholesale market is technologically neutral; therefore, it is necessary to assess what technological options are available and whether these can provide supply-side substitutability for xDSL via copper local loops. In other words, it is necessary to assess whether an undertaking that controls an access network other than xDSL via copper local loop could, if faced with a price increase for bitstream access, switch over and begin to offer wholesale broadband access comparable to bitstream, without a significant investment of capital or time. Access networks must have technological characteristics that enable operators to provide wholesale access to them in the same manner as that applying to bitstream access.

61. As is stated above, the broadband connections available in Iceland are based primarily on xDSL along copper local loops, though fibre optic cable networks, duplex television cable systems, wireless networks, and satellite connections are also in use. In Section 2.2.1, PTA came to the conclusion that broadband connections via cable and satellite do not belong to the relevant market because these solutions are either no longer offered or their use is very limited. In Section 2.2.2, the Administration concluded that wireless networks and fibre optic cable connections are not fully substitutable for xDSL in the relevant retail market. This is primarily because of the limited coverage of these two types of network.

62. As has emerged in this report, PTA considers it technologically difficult to provide wholesale access to a broadband connection via satellite that is comparable to bitstream access. That being the case, PTA considers that this solution does not belong to the relevant wholesale market. Broadband connections via cable were previously available through Síminn's Breidband; however, because Breidband has very limited coverage and the number of subscribers has dropped significantly in the past few years, Internet connections via Breidband are no longer offered. Wholesale access to the Síminn Breidband has not been offered hitherto, and although it could be technologically possible to provide such access, that fact alone is insufficient to support its inclusion in the relevant wholesale market.

63. Wholesale access to the wireless networks operated in Iceland is not offered, and there has been no known demand for such access. Despite the fact that such access can be considered a possibility, there is limited likelihood that it would be a satisfactory substitute for bitstream access, primarily because wireless microwave networks have limited coverage and are usually operated in locations where xDSL is not offered, such as vacation communities, where it is not considered financially feasible to lay local loops. At present, wireless connections cannot provide as much speed as xDSL and fibre optic cable, and this also limits the service that can be offered, such as television. In PTA's estimation, wireless connections can only

substitute for xDSL to a limited degree. Given the foregoing, and in view of the fact that wholesale access to wireless networks is not offered, it must be concluded that wireless connections do not belong to the relevant wholesale market.

64. Fibre optic cables laid directly to the user offer the possibility of more speed than does xDSL via copper local loop, as well as making it possible to offer transmission of images, sound, and voice. Fibre optic cable also offers the same speed in both directions, thus guaranteeing a constant, stable connection.

Gagnaveita Reykjavíkur ehf. (GR) owns most of the residential fibre optic cable connections in the country but does not sell retail broadband service; instead, it grants service providers access to the fibre optic cable network, and they in turn offer broadband service via GR fibre optic cable. That being the case, the GR fibre optic cable network could be considered substitutable for bitstream access. As Table 1 illustrates, only 0.8% of subscribers had a fibre optic cable connection as of year-end 2006, with GR accounting for less than *[...]*[43]. Active Internet connections via GR fibre optic cable totalled *[...]*[44] at year-end 2006, while active xDSL connections via copper local loops totalled 85,280 at the same time. Fibre optic cable owners other than GR accounted for *[...]*[45] active local loops at year-end 2006 and had limited plans for further network development.

In recent years, GR has concluded agreements to connect all residences in Reykjavík, Seltjarnarnes, and Akranes, as well as several smaller communities, before year-end 2012 – a total of 53,000 homes – but the execution of that plan and the adoption of services have proceeded much more slowly than originally projected. Fibre optic cable network coverage is still quite limited and can only substitute for xDSL in a very few, clearly defined locations. As of year-end 2006, the total number of fibre optic cable local loops laid by GR was around 5,000 of the above-mentioned 53,000 in the area. This is far below estimates and proportionally very small in comparison with the total number of copper local loops, which approached 147,000 at the same time, when households in Iceland numbered some 110,000. PTA draws the conclusion, based on the most recent information from GR, that fibre optic cable network coverage will still be very limited in two years' time.

As Table 2 and Figure 3 show, the price for Internet service via fibre optic cable is considerably higher than with ADSL if the GR access fee is included, and this further limits substitutability.

In view of the foregoing, it is PTA's opinion that fibre optic cable connections can only be considered to substitute for xDSL to a limited degree, and that it is not timely to conclude that fibre optic cable belongs to the relevant wholesale market. The Administration reserves the right to re-evaluate this opinion at the end of the time horizon of this analysis, which is 2-3 years from now, or to re-evaluate it sooner if it deems such a review necessary.

65. Given all these considerations, PTA has come to the conclusion that only xDSL connections via copper local loops fall within the relevant wholesale market for

[43] Figures omitted for confidentiality reasons.
[44] Figures omitted for confidentiality reasons.
[45] Figures omitted for confidentiality reasons.

broadband access. As is stated in Section 2.2.1, there are three parties – Síminn hf., Og fjarskipti ehf. (Vodafone), and IP-fjarskipti ehf. (Hive) – that lease the bulk of the access to copper local loops from Míla ehf. (these three operators account for nearly 99% of total leasing) and operate DSLAM equipment on them.

66. Síminn has maintained hitherto that it offers only ADSL at the retail level and has granted access to this service in excess of its legal obligation. Síminn has paid Internet service providers a single payment as a commission for each ADSL subscription that they sell for Síminn's retail services. Until June 2007, Síminn offered registered electronic communications undertakings ADSL bitstream access at the retail level without a discount; however, at that time, the company announced that it would offer a resale agreement for ADSL connections similar to Option 3 in Figure 1. Síminn has granted corporate customers a bulk discount off its ADSL price list for a large volume of business; however, electronic communications undertakings that do business with Síminn do not receive such a bulk discount.

67. Vodafone and Hive sell wholesale bitstream access to service providers and offer wholesale access according to Options 2 and 3 in Figure 1. Both companies believe that wholesale bitstream access to Síminn's network would stimulate competition in the retail market, as it would enable other operators to compete with Síminn in areas where it is not profitable to build up another network.

68. PTA wishes to point out that Síminn's sale of bitstream access to electronic communications undertakings is defined here as wholesale, though the price list is called a retail price list. Until recently, Síminn has taken the view that it does not offer wholesale bitstream access. Before the Síminn group was divided as is explained above, the company's data transmission department purchased shared access to the company's copper local loops and operated DSLAM equipment in order to offer broadband access according to its retail price list, which is based on xDSL on the upper frequency range of the copper local loops. By including its DSLAM equipment in the accounting for its data transmission department, Síminn could maintain that it did not sell wholesale bitstream access, either internally or to third parties. Following the recent organisational changes in the Síminn group, the fundamental change pertaining to the relevant market is that copper local loops now belong to another associated company, Míla, and not a separate department, as before. Ownership has not changed, however, and because of the close administrative and financial connections between the two companies, it is unavoidable to view them as a single unit. It is clear that the Síminn group controls the nation's largest access network for broadband service, as well as a majority of the Internet connections currently in use, as most of these connections are based on xDSL via Míla's copper local loops. In order to assess, at the wholesale level, the actual competitive impact of the company's own use of the network for the provision of retail services, it is necessary to include that use in the relevant wholesale market. Furthermore, PTA takes the view that an undertaking that bases its supply of retail broadband service on copper local loop leasing should have a position equal to that of a vertically integrated undertaking in the relevant market.

2.3 Conclusions regarding the demarcation of the relevant service market

69. After examining all of the technological solutions used to provide broadband service in Iceland, PTA has come to the conclusion that the relevant market for wholesale broadband access includes only xDSL via copper local loops; therefore, this is the market analysed in this report. It is necessary to conclude that other technologies used to provide broadband access – that is, microwave, fibre optic cable, and satellite – do not provide sufficient substitutability, either on the supply side or on the demand side. The technologies that are used to provide broadband service in Iceland but are not considered to belong to the relevant market are nonetheless examined in the part of the market analysis devoted to potential competition.

70. The relevant market for wholesale broadband access includes all external and internal sales or internal use of bitstream access, as well as those undertakings that own and/or lease copper local loops in order to provide broadband service via xDSL at the wholesale and/or retail levels. The relevant market shall also include all service that is necessary to make such bitstream access possible.

3 The geographic demarcation of the relevant market

71. According to the Guidelines,[46] the geographic market covers the land area where the pertinent operators participate in supply and/or demand for the relevant product or service and where the competitive conditions are sufficiently homogeneous that it is possible to distinguish the area from neighbouring areas due to dissimilar competitive conditions. In assessing demand-side substitutability, it is appropriate to consider customers' taste and geographical purchasing patterns. The Guidelines state, furthermore, that the traditional definition of a geographical market in the field of electronic communications is determined with reference to the coverage of the electronic communications network in question and to the legislative jurisdiction of the regulatory framework applying to the relevant market.

72. An examination of the coverage of the network under scrutiny reveals that copper local loops can be found in virtually all of the settled areas of Iceland. In PTA's estimation, it is possible to provide over 95% of Icelandic households with ADSL service via local loops. Furthermore, the legal jurisdiction of the Electronic Communications Act, no. 81/2003, is the entire country, operators' authorisations to operate xDSL networks extend to the entire country, and these authorisations are based on the same legislative framework in all locations. Moreover, the same xDSL price list applies to all parts of the country where it is technologically possible to offer such service. These three factors indicate strongly that the geographic demarcation of the relevant market is the entire country.

Figure 3 ADSL connections in Iceland

Source: Síminn Annual Report, 2006

[46] See Section 2.2.2. of the ESA Guidelines.

73. As regards the coverage of the electronic communications network under scrutiny here, PTA considers that, in view of the fact that the relevant market includes xDSL technology via copper local loop that should be able to serve over 95% of households in Iceland and virtually all corporate customers, it is appropriate to define the geographic market as the entire country. Fibre optic cable local loops reach roughly 5% of households and have been installed in certain areas where copper local loops already exist; therefore, there is no separate market due to the coverage of the network, nor is there genuine substitutability because of the limited coverage, both nationwide and within given areas.

74. The same price list for Síminn's ADSL service and Internet service applies to the entire country. Each of the principal Internet service providers in the market maintains the same price list for the entire country, and they all advertise their services nationwide.

75. An examination of demand-side substitutability reveals that, in the technology and electronic communications sectors, taste and purchasing patterns in the Reykjavík area are very similar to those in regional Iceland. This similarity is shown clearly in consumer surveys carried out by Statistics Iceland. Supply-side substitutability is less meaningful and relates more closely to an assessment of potential competition, which exists with respect to bitstream due to the substantial coverage of copper local loops.

76. Given these considerations, PTA has concluded that the relevant market for wholesale broadband access extends to the entire country, since it is not possible to distinguish land areas where the competitive conditions are sufficiently dissimilar to other areas.

4 Market analysis

4.1 Introduction

77. When the relevant market has been defined, it is necessary to analyse the competition in that market with reference to the criteria that affect market power, in order to determine whether one or more undertakings can be considered to have SMP. The criteria used to measure undertakings' market power depend on the characteristics of each market, and it is in the hands of regulatory authorities to determine what criteria are most appropriate in any given instance. This market analysis is based on the criteria that are discussed in the ESA Guidelines and in PTA's introductory document on market analysis.[47] The criteria that PTA considers important are discussed in the following sections.

78. The market under scrutiny here is a wholesale market. As has emerged, Síminn sells electronic communications undertakings ADSL connections at the retail level and has declared that it provides access to this service in excess of its statutory obligations. Síminn has paid Internet service providers a single payment as a commission for each ADSL subscription that they sell for Síminn's retail services. Such an arrangement does not fall under the definition of wholesale, as it actually entails pure resale. According to an announcement from Síminn in June 2007, the company now offers other electronic communications undertakings four different ADSL connections for resale. Prices are still retail prices, but they include a discount. Og fjarskipti ehf. (Vodafone) and IP-fjarskipti ehf. (Hive) sell service providers bitstream access at the wholesale level. It is therefore clear that it is also necessary to examine the status of the retail market for broadband access because Síminn, by far the largest operator in the bitstream market, has – insofar as is known – only provided bitstream to its own retail division. The ESA Guidelines[38] state that it is appropriate to begin a market analysis by describing the retail market over a specified period of time, with consideration given to supply-side and demand-side substitutability. When the analysis of the retail market is complete – that is, the markets for user supply and demand – it is possible to analyse the relevant wholesale market; e.g., the supply of and demand for service sold to a third party, who in turn sells it to consumers.

79. In PTA's estimation, the organisational changes that took place in the Síminn group in 2007 have no effect on Síminn's position in the relevant market. The parent company, Skipti hf., now owns approximately 99.9% in Síminn hf. and Míla ehf., while other companies include Sensa ehf. (information technology), Taeknivörur ehf. (wholesale), Radíómidun ehf. (wholesale), and Skjárinn midlar ehf. (TV station) The shareholder group remains the same as it was before the change, and the value of the shares is unchanged. Skipti is a parent company that has no other operations than those accompanying ownership of other companies and the representation of the Síminn group. PTA takes the view that the assessment of the Síminn conglomerate's market power in the electronic communications market has not changed overall, even though specific operational units now function as subsidiaries. The position of the electronic communications undertakings belonging to Skipti hf. will be assessed as a

[47] See Section 3.1. of the ESA Guidelines.

unit, as the administrative and financial connections between them are undeniable. In the sense of competition law Skipti hf., Síminn hf. and Míla ehf. are group of firms comprising a single economic unit.

80. The following sections contain an assessment of the competitive conditions in the relevant market, with consideration given to the chief criteria affecting those conditions. Following this, in Section 5, an assessment is made of whether any undertaking possesses significant market power.

4.2 Market share [48]

81. The market share of an undertaking is an important criterion in the market analysis. It alone does not determine whether an undertaking is considered to have significant market power, but it does give a strong indication of whether that undertaking has a dominant market position or not. A very large market share – that is, over 50% – suffices in and of itself, in accordance with accepted case law, to justify a ruling that an undertaking has a dominant position, except in unusual circumstances. According to the Guidelines, there is usually no suspicion that a single undertaking has a dominant position (single dominance) until its market share has reached at least 40%. This depends, however, on the size of the company in comparison with its competitors. In some instances, an undertaking with a market share under 40% could be considered to dominate the market. An undertaking with a market share under 25% would, in all likelihood, not be considered to dominate unless it were a case of joint dominance with other entities.

82. Developments in market share over a given period of time are also meaningful in the assessment of whether an undertaking has significant market power. If a company consistently has a large market share, this is an indicator of a dominant market position. On the other hand, a fluctuating or diminishing market share indicates the reverse. A large market share is a less compelling indicator of market power in a new and expanding market than it is in a market that is growing slowly. PTA follows closely the developments in market share in all areas of electronic communications in Iceland, including the relevant market for broadband access. PTA gathers detailed information from electronic communications undertakings at intervals of six months, in addition to compiling data as needed.

83. In this instance, only a short time has passed since xDSL first entered the market, and the broadband access based on xDSL is still in its formative stages. For this reason, developments in market share over time provide limited information, and it is most appropriate to consider market share according to the most recent figures on the number of xDSL connections, as is shown in Table 4. This approach is consistent with the discussion in Section 2, where the definition of the relevant market states that the market should include both internal and external broadband access for xDSL services. Síminn's market share dropped constantly from 2000 to 2005 because of the entry of new operators into the market. On the other hand, over the past two years Síminn's market share in xDSL service has remained rather constant, in the range of *[...]*.[49] Síminn's market share was *[...]*[50] at year-end 2006 and remained virtually

[48] This criterion corresponds to "market shares" in Paragraphs 76 and 77 of the Guidelines.
[49] Figures omitted for confidentiality reasons.
[50] Figures omitted for confidentiality reasons.

unchanged until mid-year 2007. The market share of Síminn's Internet services has developed similarly, as is described above, and remained around 51-53% from mid-2005 until the end of June 2007. Síminn has a roughly *[...]*[51] market share of the total number of xDSL connections in the relevant market, which indicates a dominant market position according the above criteria. The fact that Síminn's market share in external sales at the wholesale level is over 90% further supports the company's dominant position. Furthermore, the market share of other undertakings does not indicate that they have a dominant position in the relevant market.[52]

84. PTA considers that using the number of xDSL connections as a basis for the calculation of wholesale market share gives the most accurate view of the actual position and strength of the operators in the bitstream market. As has been stated previously, the wholesale market has not been able to develop normally in terms of factors such as price and access. This requires that wholesale turnover be estimated from data that are subject to interpretation, and such calculations are subject to uncertainty, especially because of internal sales and integration of offers to corporate and individual customers. Basing estimates of turnover on retail market prices can be complicated, as the services included in electronic communications undertakings' various package offers may vary greatly (bitstream, data transmission, e-mail addresses, virus protection, website space, etc.). If price lists are used as a criterion, it is likely that Síminn's market share will increase if it is calculated based on turnover rather than volume. Based on the foregoing, PTA concludes that it is most appropriate to use the number of xDSL connections as the basis for calculations of market share in the wholesale market, as it is a more accurate measure than estimated turnover for wholesale bitstream access.

85. Table 4 shows market share by number of xDSL connections based on bitstream alone. It includes both internal and external sales.

[51] Figures omitted for confidentiality reasons.

[52] On March 5, 2008 The Competition Authority in Iceland was notified of the intended merger of Ódýra Símafélagið ehf. (SKO) and IP fjarskipti ehf. (Hive). Teymi hf., the parent company of Og fjarskipti ehf. (Vodafone) and SKO, will buy 51% share of IP fjarskipti ehf. (Hive). According to Article 17 of the Competition Act no. 44/2005 the Competition Authority may annul a merger that has already taken place if the Authority is of the opinion that a merger will obstruct effective competition by giving one or more undertakings a dominant position or by strengthening such a position. The Authority may also set conditions for such a merger that must be met within a given time. The Competition Authority shall notify the undertakings in question within thirty days if it sees reason for further investigation of the competitive impact of the merger. A decision on annulment shall be taken no later than three months after notification of further investigation has been sent to the undertakings in question. According to this the Competition Authority has up to 4 months to investigate the intended merger. As it is uncertain at this point in time whether the intended merger will go through or on which conditions PTA will not change its market analysis on the wholesale market for broadband access at this time. PTA will re-examine this view at the end of the time horizon for this analysis – that is, in 2-3 years – or sooner, if there is reason to do so. It is the PTA´s view that the current market analysis and the proposed specific obligations cannot be delayed until a final decision by the Competition Authority. Indeed, the market needs these measures as soon as possible and the simple consolidation of market shares on the part of Vodafone/Hive does not indicate, at this point, that it will be such as to eliminate of itself the competition problems identified in the current market analysis.

Table 4 Market share by number of xDSL connections at year-end 2006

Company	Number of connections	Market share
Síminn	**X (omitted for confidentiality reasons)**	Over 60%
Og fjarskipti (Vodafone), IP-fjarskipti (Hive), others	**X (omitted for confidentiality reasons)**	Each 25% or less
Total	**85.280**	**100%**

Source: Post and Telecom Administration

86. It can also prove helpful to examine the level of concentration in the market. The indicators that is most often used in this context is the so-called concentration coefficient (the Herfindahl-Hirschman coefficient, or HHI).[53] The HHI index is derived by taking the square of the sum of the market share of all undertakings in the relevant market, and it gives a more precise view of the structure of the market than does simple market share. In a market characterised by monopoly, the concentration ratio will measure 10,000. The lower the concentration ratio is, the more competition there is in the market.

87. An examination of the market for xDSL Internet connections (Table 3) as of year-end 2006 reveals that the HHI concentration ratio is 3,773, which means that the market is highly concentrated and is characterised by oligopoly. The above highlights the great need to create conditions conducive to increased competition in the market.

4.3 Overall size of the undertaking[54]

88. The size of an undertaking based on, for example, its turnover or some other measure can be important in assessing significant market power. If an undertaking is substantially larger than its chief competitors, this can give that undertaking a competitive advantage. This advantage could involve better production methods, more economical purchasing, greater financial strength, enhanced access to capital, wider distribution, and more effective marketing. Such an advantage can also appear outside the relevant market but can be meaningful nonetheless.

89. An undertaking that has greater expert experience in the market than its competitors could have a similar advantage; for example, an advantage based on expert knowledge in technological matters or on knowledge of the market itself and the legal environment reigning there.

[53] To obtain the HHI coefficient, the market share of each undertaking in the market is squared and all of the results added together. The value of the coefficient lies between 0 and 10,000. As its value rises, market concentration is deemed greater. If the result is under 1000, no action is thought necessary. If the result is between 1000 and 1800, the market is moderately concentrated, and if it is over 1800, there is significant concentration.

[54] This criterion corresponds to "overall size of the undertaking" in Paragraph 79 in the Guidelines.

90. As is discussed in Section 2, Síminn, Vodafone, and Hive sell the bulk of the bitstream access based on xDSL via copper local loop. Of those companies, Síminn is the largest, and it has substantial experience of electronic communications. The recent organisational changes in the Síminn group do not change the overall size of the company or its experience in the electronic communications market. As before, the company is by far the largest electronic communications undertaking in the country, with its electronic communications division generating over ISK *[...]*[55] billion in revenues in 2006, which corresponds to roughly *[...]*[56] of the total turnover on the electronic communications market. Vodafone has operated in the electronic communications market in its current form since the year 2002. Its predecessors entered the market in 1998 and 2001. On the other hand, Vodafone has a broad-based collaboration agreement with the Vodafone Group concerning sales, marketing, and service, as well as the use of the Vodafone Group's brand name. This agreement can be expected to strengthen the company to some degree. Vodafone recorded revenues of ISK *[...]*[57] billion for 2006, or just over *[...]*[58] of the total turnover on the electronic communications market. Hive commenced operations at the beginning of 2005 and is by far the smallest of the three companies. It has approximately *[...]*[59] of total turnover and has been operation for the shortest time. Each of the other operators has less than *[...]*[60] of total turnover. On the other hand, it can be said that all of the operators have gained comparable experience in the retail sale of Internet connections, as the technology and the market are relatively new.

91. Because Síminn is substantially larger than its chief competitors, this could give the company a competitive advantage. In terms of financial strength and earnings, the Síminn group has a great advantage over its competitors in the electronic communications market, whether in comparison with individual companies or the conglomerates to which they belong. The Síminn group recorded nearly ISK 30 billion in net worth at year-end 2006, and its equity ratio was 0.33, while Teymi hf., the parent company of Vodafone, had a recorded net worth of nearly ISK 4 billion and an equity ratio of 0.11. At year-end 2006, Hive's equity totalled slightly more than ISK*[...]*[61] million. As regards operational performance, Síminn is strongest of the undertakings and/or conglomerates under scrutiny, in terms of both percentage of total turnover and total amounts in Icelandic krónas. The above arguments support PTA's conclusion that Síminn enjoys certain operational benefits because of its size and that these most likely emerge in the form of more economical purchasing, production methods, distribution, and marketing.

92. Access to capital, whether for operations or for investments, is much easier and is obtained on better terms as an undertaking becomes financially stronger and has demonstrate stable, profitable operations over a period of years. This is true of Síminn more than of other operators in the electronic communications market. Síminn has a staff of employees with long and extensive experience in the development and

[55] Figures omitted for confidentiality reasons.
[56] Figures omitted for confidentiality reasons.
[57] Figures omitted for confidentiality reasons.
[58] Figures omitted for confidentiality reasons.
[59] Figures omitted for confidentiality reasons.
[60] Figures omitted for confidentiality reasons.
[61] Figures omitted for confidentiality reasons.

operation of an electronic communications undertaking – experience that new operators in the market could require a long time to develop.

93. Given these considerations, PTA believes that Síminn's overall size and experience in the electronic communications market strengthens its position in the relevant market. This information indicates that Síminn has significant market power in the relevant market because of its size.

4.4 Control over facilities not easily duplicated[62]

94. When an undertaking has control over infrastructure, or facilities, that it is difficult and expensive to duplicate, this could constitute a considerable barrier for potential competitors. An example of such infrastructure is the voice call network. This must be examined in connection with the discussion of sunk costs in Section 4.5.1.

95. It is possible to reduce investment costs by collaborating with regard to electronic communications structures; that is, co-location or other joint utilisation of network facilities. This sort of arrangement can generate considerable savings. Joint utilisation can take place on the basis of voluntary contractual agreements, agreements that are required pursuant to Article 25 of the Electronic Communications Act, or agreements based on access obligations pursuant to Article 28 of the same Act.

96. New electronic communications undertakings wishing to gain a foothold in the wholesale market for bitstream access must have access to local loops and related facilities. In order to be able to offer wholesale bitstream access, the electronic communications undertaking in question must set up DSLAM equipment in the location where the local loop is laid into the telephone exchange and connected to the distribution frame. Distribution frames are located in telephone exchanges so that it is logical to set up DSLAM in the telephone exchange if there is space to do so. In some instances, it could be necessary to obtain space for the equipment in nearby buildings, and it could be possible for the electronic communications undertaking itself to provide its own premises. However, it is necessary to mention that the latter option is most likely very costly in comparison with the amount of equipment under discussion, in addition to fixed connections for fibre optic cables and cables. Míla is required to offer joint utilisation or co-location, which should guarantee electronic communications undertakings access to local loops, as well as space for DSLAM equipment in or near a telephone exchange, on terms of non-discrimination. In recent years, PTA has received various complaints regarding access to Síminn's local loops and related facilities, in addition to the comments resulting from the Administration's consultation with the undertakings concerned. There is, for example, a shortage of space for DSLAM equipment in various telephone exchanges in the Reykjavík area, and there are examples where Síminn is the only party that can offer service in the territory pertaining to the telephone exchange in question. PTA is of the opinion that a shortage of facilities, together with other factors such as delayed service or construction, could constitute a serious barrier to competition.

[62] This criterion corresponds to "control of infrastructure not easily duplicated" in Paragraph 81 in the Guidelines.

97. Another theoretical possibility for new electronic communications undertakings is to lay their own local loops from their own telephone exchanges. In so doing, they would be competing with Míla's copper local loops, which reach most companies and households in Iceland and have been, to a large degree, depreciated. It is also necessary to bear in mind that the cost of burying cables in densely populated areas has increased greatly in recent decades, as has the cost of finishing streets and sidewalks.

98. Iceland's sparse population makes it costly for new operators to set up the facilities needed to offer bitstream access outside the Reykjavík area. There are numerous reasons for this. First, there are relatively few users for each telephone exchange in a rural area, and the per-user cost of setting up xDSL and DSLAM equipment is high. Second, Síminn has set up ADSL in many locations, so the market in those places may be saturated to a degree. Third. the number of users in regional Iceland usually does not justify locating network servers for bitstream access (BRAS) elsewhere than in densely populated communities. This means that it is necessary to lease trunk lines from regional Iceland to Reykjavík, with the concomitant expense. There have also been complaints over hosting costs for Míla's telephone exchanges; however, in rural Iceland, other electronic communications undertakings have few other options. As regards these aspects of operations, Síminn as a distinct advantage because of its long history.

99. For the most part, Vodafone's offerings are limited to the areas in regional Iceland where Vodafone or Fjarski has laid fibre optic cables. Vodafone does not consider it profitable to set up equipment in other locations because of how costly the connections to Reykjavík are from the places where its BRAS equipment is situated. Hive confirms this point of view.

100. Local loops, distribution frames, space for DSLAM equipment in a telephone exchange, in the vicinity of an exchange, or in a street cabinet, and fixed-line connections are examples of facilities that it could be difficult for new electronic communications undertakings to duplicate. PTA's conclusion is that the substantial difference in Síminn's facilities and those of other electronic communications undertakings, both in the Reykjavík area and in regional Iceland, constitutes a barrier for the latter operators. With its control over infrastructure erected in earlier times, Síminn has established a position that constitutes an entry barrier for new undertakings in the market. The fact that the copper local loop system is owned entirely by Míla (that is, the Síminn group) and the fact that the Síminn group has, to a large extent, built up its electronic communications network in the shelter provided by exclusive rights in the electronic communications market indicate that Síminn has a strong position in the relevant market.

4.5 Entry barriers[63]

101. *Entry barriers* is a collective term for various factors that affect the market power of current operators and the entry of new undertakings into the market. If barriers to entry are few in a given market, the potential for profitability acts as a magnet for new undertakings wishing to gain market share from existing operators.

[63] This criterion corresponds to "barriers to entry" in Paragraph 81 in the Guidelines.

Potential competition from new parties can affect the behaviour of a dominant undertaking and can diminish the detrimental effects of that undertaking's behaviour on competition. On the other hand, entry barriers weaken or prevent competition.

102. There is a strong link between entry barriers and undertakings' profitability. The greater the number of entry barriers, the greater the returns that existing operators can expect, which often results from a shortage of competition rather than operational efficiency. It is most desirable for current operators that entry barriers be numerous and exit barriers few. Under such conditions, current operators could prevent new undertakings from gaining a foothold in the market, and unprofitable undertakings would discontinue operations readily.

103. The objective of PTA's market analysis and the possible measures taken as a result of that analysis is to promote competition in the market. This is done with the aim of stimulating innovation and development and promoting undertakings' ability to compete, for the benefit of consumers. One method of doing this is to reduce entry barriers, which may take various forms. The following sections contain a discussion of the principal entry barriers in the relevant market.

4.5.1 Sunk costs[64]

104. When an undertaking enters a new market, it must often carry out a given amount of preparatory work and incur a certain amount of initial expense. If entry into the market is not successful, it is sometimes possible to recover such expenses; for example, through the sale of investments or equipment. Sunk costs are the expenses that a new party must absorb as a loss if he is not successful in gaining a foothold in the market. Sunk costs are an entry barrier because undertakings that are already active in the market are not faced with them. In most instances, current operators have already paid those expenses.

105. Some expenses, such as those for marketing, are much higher at the beginning of operations. If a new party wishes to attract a significant portion of the customers of current operators, he must most likely engage in substantial and costly marketing efforts. Sunk costs can lie in investments in electronic communications equipment and business costs related to marketing, especially among young companies that are gaining a foothold in the market. In can be assumed that sunk costs will likely be high in Iceland due to geographical conditions and the sparse distribution of settlements.

106. Míla, which is part of the Síminn group, is the only undertaking that owns a network reaching virtually the entire country. That network was built up over a long period of time. Building up a comparable network would doubtless be extremely costly and time-consuming for a new operator. Investing in such a network, in addition to Míla's network, would most likely be accompanied by sunk costs if the new operator were unable to establish himself in the market. This risk is an entry barrier for potential new operators.

107. However, it is not necessary to own a network comparable to that owned by Míla in order to enter the relevant market. As long as Míla ehf. is required to grant

[64] This criterion corresponds to "sunk costs" in Paragraph 81 in the Guidelines.

access to its local loops and fixed connections, the initial expenses incurred by new operators in the relevant market will be substantially lower than if Míla were not required to grant access.

108. The initial expenses involved in the set-up of equipment for bitstream access are not insurmountable in and of themselves; furthermore, they are recoverable to some degree because the DSLAM equipment that is not utilised in a given location can be taken down and set up elsewhere. The same cannot be said, however, about the buildings that are constructed to house the equipment that cannot be accommodated in Míla's telephone exchanges. Likewise, the cost for laying wires between distribution frames and DSLAM equipment is often non-recoverable, though the amount of money involved is not large.

109. PTA takes the view that the sunk costs associated with offering bitstream access are usually not so high as to constitute a significant entry barrier, provided that Míla ehf. is required to grant access to its local loop network. However, if an undertaking wishes to enter the relevant market and base its services on its own access network, it is likely that the sunk costs associated with the investment will constitute an entry barrier because of the existence of another fully operational network.

4.5.2 Economy of scale[65]

110. Economy of scale exists in an undertaking's operations when increased production is accompanied by reduced costs per unit of product or service. This is a characteristic of technology companies with relatively high fixed costs and low variable costs. Economy of scale can function as both an entry barrier and an advantage over competitors. Network operators in the market attempt to operate their networks with an eye to optimum utilisation. New network operators need time to build up their operations and to attract customers and traffic; therefore, they cannot expect to benefit from economy of scale in the same manner as current operators with many years' experience.

111. The foregoing discussion shows that bitstream access and the retail services based on it are the results of new technology that facilitates better use of copper local loops, which were previously used only for voice call services, low-speed data transmission, or leased lines. Because the technology and the service have, for the most part, emerged in the marketplace after Síminn's monopoly was lifted, there is less of a difference in the status of the current operators than there is in other areas of electronic communications. This applies in particular to building up services, attracting customers, and developing infrastructure. Síminn is by far the largest undertaking on the market, both as a whole and in terms of individual aspects of operations, such as broadband service. Síminn has the greatest number of users and most likely incurs lower unit costs per user than its competitors. The fact that Síminn is more successful than its competitors supports PTA's conclusion that the company enjoys economy of scale in its operations. Such economy is most likely achieved through more advantageous purchasing, utilisation of electronic communications networks, and distribution and marketing.

[65] This criterion corresponds to "economies of scale" in Paragraph 79 in the Guidelines.

112. Síminn's ubiquitous presence all over the country is one of the results of the previous monopoly, and its size is also an advantage. This ubiquitous presence is demonstrated by Síminn's offering all of the principal forms of electronic communications services virtually all over Iceland. Customers establishing a new household or company are more likely to choose such a service provider for their electronic communications needs than they are to choose a competitor who is not as visible in the region in question.

113. PTA has concluded that Síminn enjoys economy of scale over and above its competitors as regards electronic communications operations, the existence of facilities from earlier times, the build-up of new facilities, and its ubiquitous presence all over the country. Given the foregoing, it must be assumed that the economy of scale enjoyed by Síminn is an entry barrier in the relevant market.

4.5.3 Economy of scope[66]

114. Economy of scope involves its being less expensive to manufacture two or more products or services together than to provide them separately. Lower costs are achieved through joint utilisation of production supplies. A good example of this is the utilisation of an electronic communications network wherein dissimilar services are offered to users. Economy of scope can function both as an entry barrier for new operators and as an advantage over competitors.

115. The Síminn group owns the largest portion of the electronic communications network in Iceland, including the fixed-line network, as well as a majority of the telephone exchanges, leased lines, and local loops. In 2004 Síminn purchased a large stake in Íslenska sjónvarpsfélagid hf., now under the aegis of Skjárinn midlar ehf., a subsidiary of Skipti hf., which operates the television station SkjárEinn, as well as offering foreign television stations (SkjárHeimur) and film downloads (SkjárBíó), or Video on Demand (VoD). In recent months, Síminn has made use of the interoperability between these systems by offering its users bitstream access together with Internet, television, and telephone services. These services could involve greater economy of scope in Síminn's operations than in those of its competitors in the relevant market. Míla sells access to copper local loops to its associate, Síminn, as well as to competitors. In addition, Síminn group operates ATM and IP networks that are used as infrastructure for bitstream access.

116. PTA is of the opinion that the description above shows that Síminn enjoys economy of scope as regards the possibility of offering bitstream access. Given the foregoing discussion, PTA concludes that the substantial economy of scope enjoyed by Síminn in the relevant market represents an entry barrier. Co-location and other joint utilisation of electronic communications infrastructure could, however, mitigate the impact of economy of scope as a barrier to entry.

4.5.4 Access to capital[67]

[66] This criterion corresponds to "economies of scope" in Paragraph 79 in the Guidelines.
[67] This criterion corresponds to "easy or privileged access to capital markets/financial resources" in Paragraph 79 in the Guidelines.

117. Access to capital can have a decisive effect on a company's performance in a competitive market. This is particularly the case if substantial initial investments are required. The difference in undertakings' access to capital can function as a barrier to entry. All other things being equal, financially sound undertakings with easy access to capital are in a better position and can better defend themselves against competitors than can undertakings whose access to capital is more limited.

118. Offering bitstream access requires access to local loops – primarily DSLAM equipment – as well as possible infrastructure. Given the price of such equipment, the rapidly growing use of retail services related to bitstream access, and the current financial climate, it can hardly be expected that access to capital will be difficult. The matter would be somewhat different if new operators in the market were required to construct new buildings for their equipment.

119. At this point in time, it is PTA's opinion that access to capital is not so limited as to represent an entry barrier for new electronic communications undertakings.

4.5.5 Technological advantages[68]

120. An undertaking's superiority with respect to technology or knowledge could constitute a barrier for new undertakings that wish to enter the market, and it can give established operators a competitive advantage. The financing of research and development is a non-recoverable expense, and a long period of time often elapses before the benefits of such investments become a salable product. The importance of a technological advantage is much greater in markets where there is little innovation and technological development.

121. The development of the technology behind xDSL has largely taken place since the electronic communications market was opened for competition. This means that Síminn's advantage is relatively less in terms of the technological side of xDSL and bitstream access than it is in other aspects of operations. Another factor that diminishes the importance of the technological knowledge of new undertakings is the fact that the platform on which xDSL is based is Míla's (previously Síminn's) copper local loops, for which the company is responsible. Nonetheless, Síminn has been in a position to lead the development of ADSL technology in Iceland and has had the possibility of preventing the use of other xDSL solutions. In other respects, Síminn enjoys an advantage over its competitors in terms of general knowledge of electronic communications and the possibility of financing research and development. This became clear when Síminn was the first operator in Iceland to open IPTV in its ADSL system, which gives the company's bitstream system a certain advantage.

122. Síminn won an award for its IPTV system, television via ADSL, as the "Best Broadband IP Service" at Cisco's annual technology conference. The prize was awarded for outstanding technological solutions and marketing success in interactive television services using ADSL. The judging panel, which included members from market analysis firms such as IDG and Current Analysis, as well as representatives from Cisco, said that Síminn was head and shoulders above all other competitors in

[68] This criterion corresponds to "technological advantages or superiority" in Paragraph 79 in the Guidelines.

interactive television (IPTV). When Síminn received the award, the company had by far the largest market share in the world in this field: approximately 24% of the households in the country had Síminn television, or just over 27,000 households. At that time Síminn's Video on Demand (VOD) film service, a part of the company's interactive television offering, had the widest distribution in Europe.

123. It is PTA's conclusion that Síminn has an advantage over its competitors in the form of technological expertise in the fields related to xDSL and IPTV equipment for bitstream access. The company's technological knowledge in this field is not considered an entry barrier for other operators in the relevant market, however, due to the accessibility of such knowledge.

4.5.6 Barriers to growth[69]

124. A market with significant potential for growth is much more attractive to new operators than is a stagnant, or mature, market. It is probable that undertakings contemplating entry into a stagnant market must lure customers away from established operators. If there are limits on a market's potential to grow and offer more extensive services, entry barriers may exist in the relevant market.

125. Relatively few years have passed since xDSL technology was included in the local loop networks. This technology has laid the foundation for new Internet connections, as well as for bitstream access at the wholesale level. The market for the service has grown substantially in the past few years. At the beginning of 2007, 84%[70] of Icelandic households had Internet connections. Of that group, some nine-tenths have an xDSL connection, usually ADSL, or approximately 75% of all households in the country. Because of the high percentage of households with ADSL connections, it is likely that growth in that retail market will slow over the medium term as the market becomes saturated; moreover, it is possible that some customers will switch to fibre optic cable service. Despite this, it can be assumed that the bitstream market will remain strong because of the switch from dial-in/ISDN, population growth, technological advances, and greater diversity of services offered; for example, VoIP (telephone) and IPTV (television). A healthy wholesale market for bitstream access is therefore a very important element in promoting competition from new and existing service providers in the retail market.

126. PTA's conclusion is that, despite the preponderance of xDSL connections, there is potential for growth in the wholesale market for bitstream access over the next few years. New operators are not limited to luring customers from existing undertakings, as population growth, technological advances, and product diversity all represent opportunities for growth.

4.5.7 Access to distribution and sales systems[71]

[69] This criterion corresponds to "barriers to expansion" in Paragraph 79 in the Guidelines.
[70] According to information from Statistics Iceland.
[71] This criterion corresponds to "a highly developed distribution and sales network" in Paragraph 79 in the Guidelines.

127. A developed and well-structured distribution and sales network can function as an entry barrier for new operators and can give the operators that are first on the market a competitive advantage. This applies especially to markets where the build-up of a sales and distribution system is costly, or where established electronic communications undertakings have concluded exclusive agreements with the largest and/or most important operators in the market.

The market under scrutiny here is a wholesale market, and the customers of the operators in that market are primarily other electronic communications undertakings. For this reason, there is not the same need for an extensive sales network as there is in the retail market. It is likely that an electronic communications undertaking intending to sell broadband service in the form of xDSL via copper local loop will take the initiative and purchase bitstream access at the wholesale level, so the seller should only need small-scale advertising and sales operations. The wholesale market under discussion here requires various types of infrastructure, as well as a sales network, and in the last decade Síminn has built up a sales and distribution system that gives the company an advantage. This need not be a serious entry barrier for other operators wishing to enter the market, however.

128. PTA has concluded that Síminn's position as regards the build-up of wholesale sales and distribution networks that new operators must establish for themselves is not a barrier for new undertakings entering the market, provided that these new operators have the opportunity to connect to basic systems such as line bookkeeping.

4.5.8 Vertical integration[72]

129. Vertical integration exists when the same party operates on more than one manufacturing and/or sales level; for example, when a party manufactures a product, sells it to others at the wholesale level, and sells it himself at the retail level. Because of his position in the wholesale or retail market, an undertaking that integrates dissimilar aspects of his operations in the value chain in this way can obstruct competition so as to strengthen his position with respect to competitors.

130. For a long time, Síminn has considered itself as not providing wholesale service in the bitstream market and has denied other electronic communications undertakings wholesale bitstream access to its DSLAM equipment. It has now been established that the DSLAM equipment is located at Síminn after the recent organisational changes in the Síminn group, while the local loop network is located at Míla and Síminn leases shared access to local loops from Míla. In PTA's estimation, this organisational structure does not change the fact that the company is a vertically integrated undertaking, as Síminn continues to provide bitstream access, in addition to acting as both wholesaler and retailer of bitstream service; furthermore, because Síminn and Míla are owned by the same party (Skipti), the ownership, administrative, and financial connection between them is undeniable.

131. From the viewpoint of an electronic communications undertaking, vertical integration offers certain benefits, as the company can merge all relevant services

[72] This criterion corresponds to "vertical integration" in Paragraph 79 in the Guidelines.

under the same entity and can use the same infrastructure for both wholesale and retail operations. Furthermore, a vertically integrated undertaking can discriminate among its competitors in the retail market rather easily because of its position in the wholesale market. This market analysis covers the wholesale market; therefore, the question is primarily whether the retail operations of an undertaking support its position in the wholesale market. Síminn maintained for a long time that it did not operate in the wholesale market for bitstream access.

132. According to PTA's information, Síminn has offered bulk discounts on ADSL connections to its corporate clients since 2000. These discount terms apply to the retail market, but registered electronic communications undertakings have not benefited from them. This has given Síminn's ADSL services a certain advantage because the company has offered its corporate clients discounts of up to 25% for a given number of connections. Síminn only offered electronic communications undertakings/Internet service providers a one-time payment (starting at ISK 2,500 per connection) as a commission for each ADSL subscription that they concluded for Síminn, but such an arrangement is not considered wholesale activity because it is an example of simple resale. Discounts need not be anti-competitive, but it appears that the above-described bulk discount has been used in order to bolster the position of Síminn's ADSL department in competition with other undertakings offering ADSL services. According to an announcement from Síminn to PTA on 1 June 2007, Síminn now offers electronic communications undertakings the option of reselling bitstream at a 5-10% discount, depending on the speed of the ADSL connection, but it does not offer bulk discounts. Resellers are responsible for invoicing the customers and rendering primary services. The resale agreements now offered to electronic communications undertakings continue to limit those undertakings' potential to compete with Síminn's retail sale of bitstream, especially as regards price, product offerings, and access.

133. In PTA's view, it is necessary to conclude that vertical integration has existed and still exists, despite the recent organisational changes in the Síminn group. The connection between Míla and Síminn is undeniable, and the joint position of these two undertakings in the market – or of Síminn alone – creates a vertical integration that constitutes an entry barrier for new operators wishing to gain a foothold in the relevant market.

4.5.9 Product diversification / bundling[73]

134. Product diversification refers to how the consumer defines a product and distinguishes between it and another comparable product. Clear product diversification in undertakings' offerings can generate loyalty in customers and can make it difficult for new operators to enter the market, unlike a situation where product offerings are more homogeneous. Strong brand names have a comparable effect.

135. An undertaking that dominates a particular market can utilise its position in order to bundle products in that market with products in another market, thus

[73] This criterion corresponds to "product/services diversification (e.g., bundled products or services)" in Paragraph 79 in the Guidelines.

providing offers that other competitors have difficulty duplicating. If those competitors do not have the opportunity to offer something comparable, this will strengthen the dominant position of the undertaking in the former market and can give that undertaking a competitive advantage in the latter market. Such a competitive advantage could be examined when market power in the latter market is assessed.

136. Síminn has been a leader in innovation in the data transmission, Internet, and television markets. For example, Síminn was first to offer ADSL service, MPLS service, digital television, and television via ADSL. Síminn's access network and trunk line system are extensive and reach virtually all households and communities in Iceland. Over the past two decades, Síminn has invested considerable capital in building up its copper, fibre optic cable, and microwave networks. The resulting networks can easily handle voice calling, mobile phone services, and data transmission, as well as television and radio.

137. In 2004, Síminn acquired a large stake in Íslenska sjónvarpsfélagid hf. The company is now a subsidiary of Skipti hf. and is called Skjárinn midlar ehf., and it operates the television station SkjárEinn. With this acquisition, Síminn took a decisive step towards further participation in the television and entertainment market. Through its collaboration with SkjárEinn, Síminn led the development of so-called content providing, which utilises the vast possibilities available as a result of recent developments in digital data transmission. Skjárinn midlar ehf. guarantees Síminn access to interesting data that are, among other things, distributed using current broadband channels and further enhance the advantage enjoyed by Síminn's ADSL network.

138. In 2004 Síminn commenced digital television broadcasting in its ADSL network, through which material from SkjárEinn, RÚV, and foreign television stations is distributed. This service was advertised in 10 communities in regional Iceland, none of which had access to SkjárEinn, since that time, Síminn has steadily increased the number of locations where it is possible to offer television via ADSL. Síminn has also increased the number of channels that are shown in the ADSL network. Furthermore, Síminn has offered interactive television solutions, such as, for example, Video on Demand (VoD) and Subscription Video on Demand, among others. The company now offers its customers free access to SkjárEinn in return for a 6-month binding ADSL service agreement. A free descrambler accompanies the ADSL connection.

139. Síminn has identified an opportunity to utilise digital and interactive electronic communications technology to offer improved television and entertainment services, a part of the electronic communications sector that is expected to grow substantially in the next few years. With interactive television, there is the possibility of utilising a television set to provide various services that, at present, are only available via Internet-connected computer or GSM phone. Furthermore, it can be expected that offerings will increase in the next few years, as various foreign parties have demonstrated interest in distributing data and materials through such a system.

140. At present Síminn has the world's highest rate of use of these services, as over 25% of households in the country have Síminn television. The film service called SkjárBíó, or Video on Demand (VoD), a part of the company's interactive television

offering, now has the widest distribution in Europe, as it reaches 20% of households in Iceland.

141. Some users want to receive these services via ADSL, such as ADSL television. The only way to provide IPTV is through Síminn's ADSL service. Therefore, other ADSL service providers have had to purchase ADSL at the retail level from Síminn and resell it in order to provide users with the services that consumers request. Many customers have subscribed to the new television service via copper local loop (IPTV), but until now only Síminn has offered such services.

142. This bundling of IPTV and ADSL service is unique in Iceland, and Síminn's competitors in the relevant market have difficulty duplicating it. PTA takes the view that Síminn's bundling of IPTV and ADSL broadband services gives the company a competitive advantage over other operators and functions as an entry barrier in the relevant market.

4.5.10 Conclusions concerning entry barriers in the relevant market

143. If an undertaking wishes to enter the relevant market and bases its services on its own access network, it is likely that the sunk costs associated with the investment will constitute a significant entry barrier because of the existence of another access network. This entry barrier could be eliminated if Míla ehf. were subjected to an obligation to grant access to its local loop network.

144. PTA has concluded that Síminn's technological expertise does not give the company a great advantage over its competitors despite the fact that Síminn has an advantage in terms of its knowledge of bitstream and IPTV because its competitors also have access to such knowledge. For this reason, the Administration does not consider the company's technological knowledge an entry barrier in the relevant market.

145. Síminn has economies of scale and scope, which makes it difficult for new operators to compete with it, and this constitutes an entry barrier in the relevant market.

146. PTA is of the opinion that Síminn's extensive service system requires that potential competitors operate equivalent systems, but that this does not constitute an entry barrier for such new competitors.

147. Síminn is a vertically integrated undertaking that operates on the wholesale and retail levels with respect to broadband services. By not granting wholesale bitstream access to electronic communications undertakings and by excluding electronic communications undertakings from bulk discounts that have been granted to its other corporate customers, Síminn has exercised its market power to its own benefit at both wholesale and retail levels. A recent change by Síminn, wherein electronic communications undertakings are offered resale contracts for bitstream, grants them limited supply and access and denies them bulk discounts for large numbers of connections.

148. Síminn's bundling of IPTV and ADSL service is unique in Iceland, and the company's competitors in the relevant market have difficulty in duplicating it. PTA takes the view that Síminn's bundling of IPTV and ADSL broadband services gives the company a competitive advantage over other operators and functions as an entry barrier in the relevant market.

149. It is PTA's opinion that access to capital is not so limited as to represent an entry barrier for new operators in the relevant market.

150. In PTA's assessment, the potential for growth at the wholesale level will exist in the market for bitstream access for the next several years despite extensive xDSL coverage; for example, due to population growth, technological advances, and increased diversity in product offerings.

151. This being the case, it is possible to draw the conclusion that there are entry barriers for new undertakings wishing to enter the relevant wholesale market. It can be considered that, if other electronic communications undertakings have access to bitstream from Síminn at wholesale prices, as well as having access to co-location, etc., this could play an important role in reducing the entry barriers in the relevant market.

4.6 Competition in the relevant market

152. The primary objective of the market analysis is to determine whether there is effective competition in the electronic communications markets and to respond with appropriate measures if there is not. In the analysis of the wholesale market for broadband access, it is possible to identify four criteria for competition that determine undertakings' average long-term profitability. They are: 1) countervailing buying power of purchasers with a strong position, 2) potential competition, 3) pressure from substitute products, and 4) competition among current operators.

4.6.1 Countervailing buying power among strong purchasers[74]

153. Customers with a strong negotiating position can make an impact on competition and restrict providers' potential to operate without concern for their competitors and their customers. A strong negotiating position exists primarily when a customer buys a large portion of an operator's production, is well informed of other offerings, can switch to another operator without significant expense, and even has the potential to commence production of a comparable product/service.

154. Potential countervailing buying power can exist only when large purchasers have the possibility of choosing other options when price increases are announced. It has been stated previously that Síminn, as part of the Síminn conglomerate, is the principal owner of copper local loops in Iceland and, until recently, did not provide other undertakings with wholesale services in the relevant market. For a long time, Síminn has only offered electronic communications undertakings bitstream access at retail prices without a discount; now it offers a 5-10% discount off retail prices, with

[74] This criterion corresponds to "absence of or low countervailing buying power" in Paragraph 79 in the Guidelines.

very limited access and product offerings, and without any bulk discount. Since 2000, however, Síminn has granted other large customers bulk discounts of up to 25% off its price list. The above discussion does not indicate that there is electronic communications undertakings have much countervailing buying power vis-à-vis Síminn, despite the fact that they are among Síminn's largest customers in the relevant market.

155. The fact that other electronic communications undertakings have not been able to obtain wholesale bitstream access from Síminn except very recently, and to a very limited degree, indicates the little countervailing buying power that purchasers of this service have. Based on these considerations, PTA concludes that there is limited countervailing buying power among purchasers in the wholesale market for bitstream access and that such buying power does little to counteract the power of sellers in the market.

4.6.2 Potential competition[75]

156. Potential competition depends on the opportunities for new undertakings to enter the market. Potential competition can affect established undertakings' prices and can make it difficult for them to maintain higher prices than they could sustain in an actively competitive market. The expectation of new competitors can reduce current operators' readiness to abuse their market power. It is necessary to examine this with reference to entry barriers; see Section 4.5. There is generally a correlation between entry barriers and a shortage of potential competition.

157. New undertakings often enter a market because they covet the market share and profits enjoyed by established entities. This risk acts to constrain current operators and provides them with competition that they respond to in various ways. An example of this is their attempt to increase their economy of scale and reduce unit costs. Increased diversity in quality or branding is also a means of responding to competition. Substantial investment costs provide resistance, especially if they are accompanied by reinvestment of existing assets (switching costs). Moreover, limited access to distribution channels could make things difficult for competitors. If costs are independent of economy of scale but are dependent instead on technological expertise and proficiency, there is the possibility that specialised knowledge will constitute a barrier. Undertakings that are first to enter the market can often utilise their experience and knowledge as a competitive advantage over operators entering the market later. Access to resources such as frequencies, regulatory measures adopted by the authorities, and technological advances can also affect new undertakings' ability and desire to commence operations.

158. Potential competition for bitstream access via copper local loops depends to some degree on the pricing of local loop leasing and shared access to local loops, but it also depends on an whether an undertaking can overcome the entry barriers existing in the relevant market. As is stated in Section 4.5, there are entry barriers in the relevant market, which indicates that there is a shortage of potential competition. First of these is control over facilities that competitors will find it difficult to duplicate. Local loops, distribution frames, and space for DSLAM equipment (in a telephone

[75] This criterion corresponds to "absence of potential competition" in Paragraph 79 in the Guidelines.

exchange, in the vicinity of an exchange, or in a street cabinet) are examples of facilities that it could be difficult for new electronic communications undertakings to duplicate. PTA's conclusion is that the substantial difference in Síminn's facilities and those of other electronic communications undertakings, especially in regional Iceland, constitutes a significant barrier for the latter operators. With its control over infrastructure erected in earlier times, Síminn has established a position that constitutes an entry barrier for new undertakings in the market. Furthermore, Síminn has economies of scale and scope in the relevant market; it will be difficult for new operators to compete with this and will likely hinder their entry into the market. PTA is of the opinion that Síminn's extensive sales and distribution network requires that potential competitors operate equivalent systems, but that this does not constitute an entry barrier for such new competitors. Síminn is a vertically integrated undertaking that operates on the wholesale and retail levels with respect to broadband services.

159. By not granting wholesale bitstream access to electronic communications undertakings and by denying electronic communications undertakings the bulk discounts that it grants to other corporate purchasers of retail ADSL connections, Síminn has used its power to its own advantage at both wholesale and retail levels. According to PTA's information, Síminn has been granting bulk discounts on ADSL to its corporate customers since 2000. These discount terms apply to the retail market, but electronic communications undertakings in competition with Síminn have not benefited from them. This has given Síminn's ADSL services a certain advantage because the company has offered its corporate clients discounts of up to 25% for a given number of connections. In June 2007, Síminn announced that it had decided to offer electronic communications undertakings a resale agreement for wholesale bitstream access for ADSL, but with a 5-10% discount, with the exact amount of the discount dependent on bit rate but not the number of connections, and with certain requirements concerning level of services, etc. Discounts need not be anti-competitive, but it appears that the discrimination entailed in the above-described discount has been used in order to bolster the position of Síminn's ADSL department in competition with other undertakings offering ADSL services. Síminn's bundling of IPTV and ADSL service is unique in Iceland, and the company's competitors in the relevant market have difficulty in duplicating it. PTA takes the view that Síminn's bundling of IPTV and ADSL broadband services give the company a competitive advantage over other operators and functions as an entry barrier in the relevant market.

160. As is stated earlier in this report, there are entry barriers in the relevant market, which indicates that there is a shortage of potential competition. These entry barriers, together with the fact that new operators incur greater investment-related risk than Síminn, mean that competitors may demand higher returns on their investment because Síminn benefits to some degree from economy of scale. Other factors that limit potential competition are, for example, Síminn's vertical integration, its ability to purchase equipment on more favourable terms, and its broader operational foundation. Síminn has a strong position in the relevant market, especially outside the Reykjavík area, as is described in Section 4.4, and other undertakings' possibility of competing with Síminn are extremely limited.

161. PTA is of the opinion that there is the potential for competition for wholesale bitstream access in the future despite the various entry barriers that will face Síminn's

competitors. In this context, the pricing of full and shared access to copper local loops is quite important. PTA concludes also that Síminn's position outside the Reykjavík area is strong and will remain so in the foreseeable future.

4.6.3 Pressure from substitute products

162. The possible transmission media for provision of Internet services in the retail market in Iceland are xDSL via copper local loop, cable modem (coax), fibre optic cable, microwave, and satellite. xDSL via copper local loop is by far the most common form of access, with a market share of over 97% of all subscribers in Iceland. As is stated in the Guidelines, it is necessary to consider how developed other high-speed Internet solutions are, and how much coverage they have, so as to justify including them in the relevant market. In this context, it is appropriate to discuss cable modem, fibre optic cable, microwave, and satellite service.

163. Figures on the number of xDSL connections for the provision of broadband access show that as yet there is no genuine competition from other data transmission service options, no matter what may happen in the future (see Table 1). GR is in the process of laying fibre optic cables all the way into buildings and homes in OR's operational territory, but the actual electronic communications services rendered by fibre optic cable will be in the hands of other companies. This service is still in the developmental stage and has not yet achieved enough coverage that it is possible to view it as a substitute for Síminn's xDSL service via copper local loop. Microwave connections are provided primarily in very clearly demarcated areas where Síminn's xDSL via copper local loop is not offered, but elsewhere it is generally considered less desirable than xDSL because of the difference in price and quality. For this reason, it is not possible to view microwave as a substitute for xDSL via copper local loop. Further developments in microwave technology could possibly compete with xDSL in the future, but that development has not yet taken place in Iceland. A few ships and other vessels have utilised satellite for broadband service, but that service is much more expensive and the quality poorer than that obtained with xDSL; therefore, it is clear that satellite connections cannot substitute for xDSL in Iceland.

164. In PTA's estimation, potential competition from transmission media other than xDSL could develop in the future but is not foreseeable in the near term. The conclusion is therefore that xDSL is the dominant form of access, and the form of access belonging to the relevant market in Iceland; however, PTA reserves the right to re-examine this view at the end of the time horizon for this analysis, which is approximately two to three years.

4.6.4 Competition among operators in the market

165. Competition among current operators is characterised by Síminn's strong nationwide position in the market for xDSL access via copper local loop. Síminn had a market share of *[...]*[76] as measured in number of xDSL connections at year-end 2006, while Vodafone had a market share of *[...]*,[77] Hive had *[...]*,[78] and other

[76] Figures omitted for confidentiality reasons.
[77] Figures omitted for confidentiality reasons.
[78] Figures omitted for confidentiality reasons.

operators had less than *[...]*[79] each. ADSL service accounts for 99% of xDSL services, and the retail price charged to users for ADSL Internet services, based on 1Mb/s and 12Mb/s transmission speed, is lowest at Vodafone, while Hive charges the lowest price for 8 Mb/s. This comparison does not take into account how much foreign download is included in the price, a factor that somewhat offsets the price difference between operators. As regards its prices for wholesale access for xDSL access, Síminn has not offered other electronic communications undertakings a wholesale price list. In June 2007, Síminn announced that it would offer a resale agreement with a 5-10% discount off the retail price, depending on ADSL bit rate, but it did not offer any volume-linked discounts. However, since 2000 Síminn has offered corporate clients other than electronic communications undertakings a bulk discount of up to 25% off its retail price for 75 or more connections, despite the fact that, in 2001, the company notified PTA of the discount but specified no exceptions.

166. PTA takes the view that this discriminatory practise diminishes competition between companies, both in the wholesale market for broadband access and in the retail market for broadband services.

4.6.5 Conclusions concerning competition in the relevant market

167. The fact that other electronic communications undertakings have not been able to obtain wholesale bitstream access from Síminn indicates how little countervailing buying power purchasers of this service have vis-à-vis Síminn. Based on these considerations, PTA concludes that there is limited countervailing buying power among purchasers in the wholesale market for bitstream access and that such buying power does little to counteract the power of the seller in the market.

168. As regards potential competition for bitstream access along copper local loops, PTA has come to the conclusion that there are entry barriers in the relevant market, which indicates that there is a shortage of potential competition. These entry barriers, together with the fact that new operators incur greater investment-related risk than Síminn, mean that competitors may demand higher returns on their investment because Síminn benefits to some degree from economy of scale. Other factors that limit potential competition are, for example, Síminn's vertical integration, its ability to purchase equipment on more favourable terms, and its broader operational foundation. Síminn's bundling of IPTV and ADSL service is unique in Iceland, and the company's competitors in the relevant market have difficulty in duplicating it. PTA takes the view that Síminn's bundling of IPTV and ADSL broadband services give the company a competitive advantage over other operators and functions as an entry barrier in the relevant market. In addition, Síminn has not offered other electronic communications undertakings wholesale bitstream access or discounts on retail bitstream access; thus the company has used its market power to its own advantage in both the retail and the wholesale markets. PTA is of the opinion that there is the potential for competition for wholesale bitstream access in the future despite the various entry barriers that will face Síminn's competitors. In this context, the pricing of full and shared access to copper local loops is quite important. PTA concludes also that Síminn's position outside the Reykjavík area is strong and will remain so in the foreseeable future.

[79] Figures omitted for confidentiality reasons.

169. It is clear that xDSL via copper local loop is by far the most common form of bitstream access in Iceland, and it is difficult to envision significant competition from other modes of transmission in the near future. Furthermore, other means of access – for example, xDSL via microwave or satellite – have had a tendency to yield to xDSL via copper local loop when that service is available; therefore, it is not possible to view these as substitutes for xDSL via copper local loop. Fibre optic cable connections seem fall into a different category, however, but that form of access is still being developed and, as yet, can only substitute for xDSL to a limited extent. Potential competition from other from transmission media other than xDSL could develop in the future but is not foreseeable in the near term. The conclusion is therefore that xDSL is the dominant form of access, and the form of access belonging to the relevant market in Iceland; however, PTA reserves the right to re-examine this view at the end of the time horizon for this analysis, which is approximately 2-3 years.

170. Competition among current operators is characterised by Síminn's strong position and large market share, on a national level, for xDSL access via copper local loop. Síminn has not offered the lowest price for retail ADSL connections. As regards its prices for wholesale access for xDSL access, Síminn has not offered other electronic communications undertakings a wholesale price list. In June 2007, Síminn announced that it would offer a resale agreement with a 5-10% discount off the retail price, depending on ADSL bit rate, but it did not offer any volume-linked discounts. On the other hand, since 2000 Síminn has granted companies other than electronic communications undertakings bulk discounts of up to 25% off its retail prices. PTA takes the view that this difference diminishes competition between companies, both in the wholesale market for broadband access and in the retail market for broadband services.

4.7 Results of the analysis of the relevant market

171. An undertaking's market share is often used to assess its power in the market. According to established case-law, very large market share - in excess of 50% - are in themselves, save in exceptional circumstances, evidence of the existence of dominant position. In the same way, an undertaking with a market share less than 25% will probably not be considered to dominate the market alone. Síminn has a roughly *[...]*[80] market share of the total number of xDSL connections in the relevant market, which indicates a dominant market position according the above criteria. The fact that Síminn's market share in external sales at the wholesale level is over 90% further supports the company's dominant position. Furthermore, the market position of other undertakings does not indicate that they have a dominant position in the relevant market, as their market share is under 25% in all instances.

172. The overall size of an undertaking based on, for example, its turnover or some other measure can be important in assessing significant market power. If an undertaking is substantially larger than its chief competitors, this can give that undertaking a competitive advantage. PTA believes that Síminn's overall size and experience in the electronic communications market strengthen its position in the

[80] Figures omitted for confidentiality reasons.

relevant market. This information indicates that Síminn has significant market power in the relevant market because of its size.

173. When an undertaking has control over infrastructure, or facilities, that it is difficult and expensive to duplicate, this could constitute a barrier for potential competitors. Local loops, distribution frames, space for DSLAM equipment (in a telephone exchange, in the vicinity of an exchange, or in a street cabinet), and fixed-line connections are examples of facilities that it could not be economically feasible for new electronic communications undertakings to duplicate, even though it is technologically possible. PTA's conclusion is that the substantial difference in Síminn's facilities and those of other electronic communications undertakings, both in regional Iceland and in many parts of the Reykjavík area, constitutes a barrier for the latter operators. With its control over infrastructure erected in earlier times, Síminn has established a position that constitutes an entry barrier for new undertakings in the market. The fact that the local loop system is almost entirely owned by Míla (that is, the Síminn group) and the fact that the Síminn group has, to a large extent, built up its electronic communications network in the shelter provided by exclusive rights in the electronic communications market indicate that Síminn has a strong position in the relevant market.

174. *Entry barriers* is a collective term for various factors that affect the market power of current operators and the entry of new undertakings into the market. If an undertaking wishes to enter the relevant market and bases its services on its own access network, it is likely that the sunk costs associated with the investment will constitute a significant entry barrier because of the existence of another access network. This entry barrier could be eliminated if Míla ehf. were subjected to an obligation to grant access to its local loop network. It is PTA's opinion that Síminn's technological expertise gives the company an advantage over its competitors, especially as regards knowledge of bitstream and IPTV. The company's technological expertise is not considered an entry barrier in the relevant market, however, because its competitors have access to such knowledge. Síminn has economies of scale and scope, which makes it difficult for new operators to compete with it, and this constitutes an entry barrier in the relevant market. PTA is of the opinion that Síminn's extensive service system requires that potential competitors operate equivalent systems, but that this does not constitute an entry barrier for such new competitors.

175. Síminn is a vertically integrated undertaking that operates on the wholesale and retail levels with respect to broadband services. By not granting wholesale bitstream access to electronic communications undertakings and by excluding electronic communications undertakings from bulk discounts that have been granted to other companies that do business with Síminn, Síminn has exercised its market power to its own benefit at both wholesale and retail levels. A recent change by Síminn, wherein electronic communications undertakings are offered resale contracts for bitstream, grants them limited supply and access and denies them bulk discounts for large numbers of connections. Síminn's bundling of IPTV and ADSL service is unique in Iceland, and the company's competitors in the relevant market have difficulty in duplicating it. PTA takes the view that Síminn's bundling of IPTV and ADSL broadband services gives the company a competitive advantage over other operators, but that this is not a significant entry barrier in the relevant market. It is PTA's opinion that access to capital is not so limited as to represent an entry barrier

for new operators in the relevant market. In PTA's assessment, the potential for growth at the wholesale level will exist in the market for bitstream access for the next several years despite widespread xDSL coverage; for example, due to population growth, technological advances, and increased diversity in product offerings.

176. This being the case, it is possible to draw the conclusion that there are entry barriers for new undertakings wishing to enter the relevant wholesale market.

177. The primary objective of the market analysis is to determine whether there is effective competition in the electronic communications markets and to respond with appropriate measures if there is not. In the analysis of the wholesale market for broadband access, it is possible to identify four criteria for competition that determine undertakings' average long-term profitability. They are: 1) countervailing buying power of purchasers with a strong position, 2) potential competition, 3) pressure from substitute products and 4) competition among current operators.

178. PTA takes the view that there is limited countervailing buying power among purchasers in the wholesale market for bitstream access and that such buying power does little to counteract the power of sellers in the market.

179. As regards potential competition for bitstream access along copper local loops, PTA has come to the conclusion that there are entry barriers in the relevant market, which indicates that there is a shortage of potential competition. These entry barriers, together with the fact that new operators incur greater investment-related risk than Síminn, mean that competitors may demand higher returns on their investment because Síminn benefits to some degree from economy of scale. Other factors that limit potential competition are, for example, Síminn's vertical integration, its ability to purchase equipment on more favourable terms, and its broader operational foundation. Síminn's bundling of IPTV and ADSL service is unique in Iceland, and the company's competitors in the relevant market have difficulty in duplicating it. In addition, Síminn has not offered other electronic communications undertakings wholesale bitstream access or discounts on retail bitstream access; thus the company has used its market power to its own advantage in both the retail and the wholesale markets. PTA is of the opinion that there is the potential for competition for wholesale bitstream access in the future despite the various entry barriers that will face Síminn's competitors.

180. It is clear that xDSL via copper local loop is by far the most common form of bitstream access in Iceland, and it is difficult to envision significant competition from other modes of transmission in the near future. Furthermore, other means of access – for example, xDSL via microwave or satellite – have had a tendency to yield to xDSL via copper local loop when that service is available; therefore, it is not possible to view these as substitutes for xDSL via copper local loop. Fibre optic cable connections seem fall into a different category, however, but that form of access is still being developed and, as yet, can only substitute for xDSL to a limited extent. Potential competition from other from transmission media other than xDSL could develop in the future but is not foreseeable in the near term. The conclusion is therefore that xDSL is the dominant form of access, and the form of access belonging to the relevant market in Iceland; however, PTA reserves the right to re-examine this

view at the end of the time horizon for this analysis, which is approximately 2-3 years.

181. Competition among current operators is characterised by Síminn's strong position and large market share, on a national level, for xDSL access via copper local loop. Síminn has not offered the lowest price for retail ADSL connections. As regards its prices for wholesale access for xDSL access, Síminn has not offered other electronic communications undertakings a wholesale price list. In June 2007, Síminn announced that it would offer a resale agreement with a 5-10% discount off the retail price, depending on ADSL bit rate, but it did not offer any volume-linked discounts. On the other hand, since 2000 Síminn has granted corporate customers other than electronic communications undertakings bulk discounts of up to 25% off its retail prices. PTA takes the view that this discriminatory practise diminishes competition between companies, both in the wholesale market for broadband access and in the retail market for broadband services.

182. The result of PTA's analysis of the relevant market is that Síminn alone has significant market power in the relevant market. It is also PTA's opinion that there are various barriers obstructing the entry of new operators into the relevant market.

5 Assessment of significant market power in the relevant market and designation of SMP operators

5.1 General

183. The assessment of significant market power (SMP) is based on Section 3.1 of the ESA Guidelines and on the criteria discussed in Section 4 of this document. In keeping with Paragraph 76 in the ESA Guidelines and considering the current market conditions, PTA bases its assessment on the analysis of the relevant markets as they are today, with consideration given to the developments of the past few years and the coming months.

184. Article 18, Paragraph 1 of the Electronic Communications Act, no. 81/2003, cf. Article 12 of Act no. 78/2005 Amending the Electronic Communications Act, states the following: *"An undertaking shall be deemed to have significant market power if it, either individually or jointly with others, holds a position of economic strength on a certain market which enables it to prevent effective competition and to operate to a substantial extent without concern for competitors, customers and consumers."*

185. This is an important point of departure in the market analysis, and PTA wishes to emphasise that significant market power is the appropriate measure, not abuse of a dominant position. Thus the consideration of whether a dominant position has been abused or not is not the fundamental point of the market analysis. The above provision shows that it is only necessary to demonstrate that the possibilities are extant, not that they have been utilised. This does not mean, however, that an undertaking's behaviour in the market does not make any difference in the assessment of SMP. Even though the formal aspects of the market are most meaningful in the market analysis, behaviour that promotes a dominant position or maintains a dominant undertaking's competitive advantage can diminish competition in the market.

186. As was revealed in Section 4 on market analysis, an assessment of market share is not sufficient, in and of itself, to determine whether an undertaking should be designated with SMP in a market. It is necessary to examine all appropriate criteria. A determination of SMP cannot be based entirely on one criterion; instead, it must be founded on a number of criteria and their interplay with one another.

187. A company can be designated as having SMP by itself (single dominance) or together with one or more other companies (joint or collective dominance). If the conclusion is that one undertaking has significant market power, it is usually unnecessary to ponder the question of joint dominance. If, on the other hand, the conclusion is that no single undertaking possesses significant market power, it is necessary to examine whether the conditions for joint dominance exist. In addition, an undertaking that has SMP in a relevant market may also be considered to have SMP in a related market if the links between the markets are such that the undertaking can use its power in one market to enhance its power in the other, cf. Article 18, Paragraph 2 of the Electronic Communications Act.

5.2 Assessment of significant market power in the wholesale market for broadband access

188. In the relevant wholesale market for broadband access, there are actually only three operators: Síminn hf., Og fjarskipti ehf., (Vodafone), and IP-fjarskipti ehf. (Hive).

189. In general, an undertaking is considered to have a dominant market position if it possesses more than a 50% market share. Based on the information PTA has compiled,[81] Síminn's market share in terms of total number of xDSL connections is approximately *[...]*[82] of the wholesale market. It is therefore clear that Síminn's market share in the sale of xDSL connections is well over the limit indicating a dominant market position. Furthermore, Síminn's market share in external sales at the wholesale level is over 90%. Moreover, Síminn is by far Iceland's largest electronic communications undertaking, with *[...]*[83] of total turnover in the electronic communications market.

190. In Section 4.2 it is stated that market share alone does not determine whether an undertaking has significant market power; however, it is considered highly likely that a operator with a market share of 50% has a dominant market position. A market share over 60%, Síminn's overall size in the electronic communications market, a lack of substitute services, and the entry barriers faced by other operators in the relevant market, as described in Section 4, indicate strongly that Síminn has significant market power in the relevant market.

191. Section 4 of the market analysis discusses the competitive position of undertakings in the relative wholesale market for broadband access. That section also states that, despite the presence of a new market for future development, it is not possible to conclude otherwise than that electronic communications undertakings wishing to gain a foothold in the relevant market are faced with various entry barriers. The entry barriers that are mentioned specifically are a shortage of potential competition, control over facilities not easily duplicated, economies of scale and scope, vertical integration, and bundling of services. Given that the copper local loop network that Síminn and other operators use to provide xDSL services is owned by Síminn's associate, and that there are considerable ownership, administrative, and financial connections between the two companies, one must assume that collaboration between the two will strengthen Síminn's position vis-à-vis its competitors in the market.

192. Based on the above, and on its analysis of the relevant market for wholesale broadband access, PTA has concluded that the market is not characterised by effective competition and that Síminn has significant market power in that market, cf. Article 18, Paragraph 1 of the Electronic Communications Act. In view of this, PTA intends to designate Síminn as having significant market power in the market for wholesale broadband access.

[81] See Table 3.
[82] Figures omitted for confidentiality reasons.
[83] Figures omitted for confidentiality reasons.

193. Given the conclusions drawn above, PTA is of the opinion that there is no need to consider the question of joint dominance.

6 Imposition of obligations

6.1 Remedies — general

194. Pursuant to Article 17, Paragraph 2 of the Electronic Communications Act, the market analysis shall provide the basis for decisions as to whether PTA shall impose, maintain, amend, or withdraw obligations on undertakings with significant market power. If a market analysis reveals that there is not effective competition in the relevant market and that one or more electronic communications undertakings in that market possess significant market power, PTA is required, in accordance with Article 18 of the Electronic Communications Act, to impose at least one specific obligation on the operators designated with SMP. If PTA has previously imposed specific obligations on operators pursuant to the previous Telecommunications Act, these shall be reviewed and either maintained, amended, or withdrawn in accordance with the results of the market analysis.

195. Article 27 of the Electronic Communications Act states that, when an electronic communications undertaking is designated with significant market power, PTA may impose on it obligations concerning transparency, non-discrimination, accounting separation, open access to specific network facilities, price controls and cost accounting, as necessary for the purpose of promoting effective competition.[84] These obligations are described more fully in Articles 28 – 32 of the Electronic Communications Act.

196. In selecting obligations to be imposed in order to solve defined competition problems, it is necessary to use several fundamental principles as guidelines.[85] All remedies that are imposed shall take into account the nature of the defined competition problem and shall be designed to solve it. They shall be transparent, justifiable, reasoned, and in line with the objectives they are designed to achieve – that is, to promote competition – as well as contributing to the development of the internal market and safeguarding users' interests. Obligations must be proportionate and may not impose heavier burdens on operators than is considered necessary.

197. In the previously mentioned report on remedies issued by the European Regulatory Group of National Regulatory Authorities (ERG), emphasis is placed on promoting infrastructure-based competition through the replication of electronic communications facilities or networks where this is considered desirable. In such cases, imposed obligations should promote such build-up. When infrastructure-based competition is not considered desirable due to significant and constant economies of scale and scope or other barriers to entry, it is necessary to guarantee sufficient access to electronic communications networks and equipment at the wholesale level. In this context, it is necessary to ensure two things: first, to encourage service-based competition; and second, to guarantee a sufficient fee for access to existing electronic communications networks, thus providing an incentive for further investment in such networks, as well as renovation and maintenance of them.

[84] See also Articles 9 – 14 of the Access Directive.
[85] See Article 8 of the Framework Directive.

198. For the long term, service-based competition that has its foundation in steered access to a cost-oriented price can be a tool for generating competition through the restructuring of electronic communications networks. This refers to that which is called "the investment ladder," and its objective is to create conditions that make it possible for new operators to build up their electronic communications networks step by step.

199. In selecting the obligations that are best designed to promote competition in a given market, it is often beneficial to consider the position that would exist if obligations were not imposed on undertakings in the relevant market and whether it would be sufficient to use competition legislation alone to guarantee effective competition.

6.2 Competition problems

6.2.1 General

200. The term *competition problems* refers to conditions resulting from the dominant position held by one or more undertakings and the measures used by dominant undertakings to force competitors out of the market, deter potential competitors from entering the market, or abuse their position vis-à-vis consumers. The conditions that can develop when an undertaking has significant market power are discussed above, in Section 4 of the market analysis. The following discussion centres on the various measures that a dominant undertaking can adopt in order to force its competitors out of the market or hinder potential competition.

201. A dominant undertaking in the wholesale market could deny access or refuse business from undertakings that operate in the wholesale or retail market and compete with its retail operations. Refusal to grant access or rejection of business can actually close markets — for example, in cases where the wholesale product is a necessary supply for the retail market — and can, in the end, lead to higher expenses for the competitor. Barriers to entry can also appear in forms other than direct rejection; e.g., as unfair terms or prices.

202. Dominant undertakings could also abuse their position through predatory pricing — that is, by pricing their products below cost — and thereby have a detrimental effect on competition. In this manner, an undertaking could force smaller competitors out of the market and/or keep others from entering it.

203. Even when it is required to grant access at a cost-oriented price, a dominant undertaking can discriminate against other undertakings for the benefit of its own operations. This can be done through means other than pricing; for example, by withholding information, discriminating with regard to quality, using delaying tactics, setting unfair terms, employing strategic product design, and misusing information. These factors can affect the quality of competitors' services, raise their expenses, or hinder sales.

204. Further discussion of obligations can be found in the previously mentioned ERG report on the remedies that can be imposed on electronic communications undertakings with SMP and in PTA's summary of that report.[86]

6.2.2 Competition problems in the relevant market

205. The discussion above and the analysis of the relevant market for broadband access indicate clearly that various competition problems exist in the market. At present, the relevant market is based on shared access to copper local loops. The Regulation on Shared Access to Local Loops, no. 199/2002, enables all electronic communications undertakings to obtain access to copper local loops so as to offer broadband services. Síminn's competitive position is nonetheless demonstrably better than that of its competitors, in part because the copper local loops, street cabinets, distribution frames, telephone exchanges, and trunk lines owned by the Síminn group are already installed and form a contiguous whole, while competitors must invest in DSLAM equipment and obtain connections from the Síminn group to their own telephone exchanges, or lease such connections from others. This could lead to a shortage of competition, especially outside the Reykjavík area.

206. Section 4 discusses the entry barriers facing electronic communications undertakings that wish to enter the relevant market for broadband access. These entry barriers reduce competition and create competition problems in the relevant market. Furthermore, Síminn has refused to lease bitstream access to other operators at the wholesale level, so they must lease this access from Síminn at the retail level and even resell it without a mark-up so as to provide their customers with comprehensive service and not be forced to send them elsewhere. Síminn has maintained that it does not provide wholesale bitstream access. However, it is clear that, under the current arrangements, Síminn's service departments have the option of obtaining both wholesale and retail bitstream access according to the definition of these markets.

207. In the wholesale market for broadband access, there are competition problems stemming from Síminn's vertical integration in the relevant wholesale market and the related retail market. This means that the company discriminates against other electronic communications undertakings with respect to wholesale prices in order to reduce potential competition in the retail market for broadband service, as well as in the relevant wholesale market.

208. A vertically integrated undertaking could attempt to transfer market power in the wholesale market over to the related retail market in an attempt to strengthen its position in the latter market. The retail market consists primarily of broadband services to users, such as Internet access; Síminn offers retail services in competition with various other operators. An undertaking in such a position could be tempted to limit or refuse bitstream access at the wholesale level in order to curtail competition and increase its own market share at the retail level. This is the status of the market in a nutshell because Síminn only grants its own sales department access to its DSLAM equipment.

[86] See www.pfs.is: [English page] Telecom affairs/Market analysis/Market analysis and obligations. See now „Revised ERG Common Position on the approach to the Appropriate remedies in the Electronic Communications Network & Service regulatory framework", Final version, May 2006.

209. Even though it may not refuse others bitstream access, an undertaking engaged in competition in the retail market can engage in a number of anti-competitive practises at the wholesale level. Such practises could include refusing requests for equipment or for access to infrastructure, discrimination in processing applications, delayed processing of applications from competitors, and unsatisfactory information disclosure. Such an undertaking could also affect competitors' selection of technological solutions and equipment. There can also be the risk that a vertically integrated undertaking will disturb the competitive position of other operators by giving its own retail departments priority access to innovations in the market. The measure listed here could increase the costs incurred by competitors, reduce their sales potential, and cause them problems related to pricing of services.

210. Examples of other actions that affect competition in the bitstream market are delayed contractual negotiations, technological difficulties associated with the processing of applications, and unfair demands such as the presentation of bank guarantees, market forecasts, and other information. Another such measure is discrimination with regard to service quality, such as response time to breakdowns and misuse of information on competitors. Still another example of transfer of market position is wholesale and retail pricing that aims at diminishing a competitor's sales in the retail market, increasing the competitor's expenses, or making it difficult for a competitor to price his services appropriately.

211. As regards the price of wholesale access for xDSL, Síminn has not offered other electronic communications undertakings a wholesale price list but has charged them according to its retail price list without discounts until recently. Since June 2007 Síminn has offered electronic communications undertakings a 5-10% discount off its retail price for ADSL connections, depending on bit rate but not on the number of connections; however, this discount is accompanied by limited access and product offerings. Síminn has offered corporate clients other than electronic communications undertakings a discount of up to 25% off its retail price, depending in the number of connections, despite the fact that, in 2001, the company notified PTA of the discount but specified no exceptions. PTA takes the view that this discriminatory practise diminishes competition between companies, both in the wholesale market for broadband access and in the retail market for broadband services, and strengthens Síminn's position in the relevant market. Discrimination in bitstream access prices that favours Síminn's sale department could have a negative effect on the competitive position of Síminn's competitors. This could happen if Síminn were to charge a high price for bitstream access and a low price for Internet access, thereby making it difficult for competitors to price their services.

212. The Icelandic government has emphasised the desirability of making broadband services accessible to sparsely settled communities. Síminn's overwhelmingly dominant position in the market for bitstream access, together with the company's position on selling that access, makes it difficult for its competitors to participate in this nationwide broadband offering. Even though it would be desirable for new operators to set up their own bitstream equipment, it is necessary to consider this a long-term objective. A part of that objective is to provide them with an equal competitive position as regards the possibility to sell services and to prevent Síminn from excluding them from the market in regional Iceland by refusing them access and

facilities. Complaints that have been submitted to PTA as a result of the sort of discrimination mentioned here give reason to believe that Síminn has been doing this in recent years. PTA has come to the conclusion that the complaints it has received demonstrate the existence of problems in these matters and that it is justifiable to impose non-discrimination obligations in order to prevent the repetition of this sort of conduct in the future.

213. The analysis of the relevant market has revealed that entry barriers exist in the wholesale market for broadband access and that there is a shortage of potential competition. The market is characterised by Síminn group vertical integration, which meets the company's needs from the wholesale level to the retail level.

214. In the opinion of PTA, there is a significant likelihood that Síminn will refuse to sell other undertakings wholesale broadband access or will hinder such access in order to protect its own retail operations from competition if appropriate remedies are not imposed on the company.

215. PTA is of the opinion that competition in the relevant market could become much more effective if the conditions were created for more service-based competition. The access of independent service providers to existing electronic communications networks on fair terms is an auspicious means of stimulating competition and increasing consumer options. Increased service-based competition would probably improve services in the relevant market and reduce prices to end users; however, it would probably stimulate competition for the build-up of electronic communications infrastructure only to a limited degree. However, under the current conditions, PTA considers it appropriate to promote increased service-based competition in the relevant market.

216. In PTA's estimation, the situation in the relevant market will not change unless there is active promotion of increased service-based competition. In this context, PTA considers it important to facilitate the entry of independent service providers into the market.

6.3 Obligations currently in effect

217. The previous Telecommunications Act, no. 107/1999, did not provide for the authorisation to require undertakings to provide bitstream access to their networks. Article 17 of the Act contained a general provision designed to increase supply in public electronic communications networks and/or public electronic communications services; that provision stated that all those requesting it should be permitted access to public electronic communications networks and public electronic communications services, subject to certain terms and conditions. Article 20 of the Act stated that licence holders with significant market power in public fixed-line networks and voice call services must comply with all legitimate and reasonable requests from electronic communications undertakings for access to local loops or facilities related to such access. It also stated that fees charged for access and facilities shall be cost-oriented, including a reasonable rate of return on capital employed.

218. The purpose of the previous Telecommunications Act was to pave the way for access to copper local loops, as is further discussed in the Regulation on Shared

Access to Copper Local Loops, no. 199/2002. On the basis of this Act, Síminn was designated as having significant market power and required to offer wholesale access to its copper local loops, as well as publishing a reference offer for such access. These obligations did not include a requirement that Síminn offer bitstream access at the wholesale level.

219. In Decision no. 10/2005, the Competition Council concluded that, unless measures were taken, the merger of Landssími Íslands and SkjárEinn would strengthen Síminn's dominant market position in the electronic communications markets under scrutiny;[87] therefore, the merger was subjected to certain conditions. PTA's decision on bitstream access does not make any impact on the conditions that were set by the Competition Council in Decision no. 10/2005, dated 11 March 2005.

6.4 Proposed remedies

220. In its analysis of the relevant market for wholesale broadband access, PTA has come to the conclusion that competition is not effective enough and that this situation is primarily a result of Síminn's strong position in the relevant market and related markets, especially that for copper local loops. PTA concluded in Section 5 that Síminn has significant market power in the relevant wholesale market and that this is not expected to change unless appropriate remedies are imposed on Síminn. This section contains PTA's proposals for obligations to be imposed on Síminn for the purpose of resolving the competition problems in the relevant market and paving the way for more effective competition. The obligations have the primary objective of increasing competition in the relevant market and creating conditions conducive to the entry of independent service providers.

221. Considering the competition problems discussed in Section 6.2.2, PTA is of the opinion that the following obligations are best designed to address the conditions in the relevant market:

1) Access to networks and related infrastructure.
2) Non-discrimination.
3) Transparency.
4) Accounting separation.
5) Price controls.

222. In the opinion of PTA, these obligations are consistent with the objectives set forth in the Framework Directive, the Access Directive, and the provisions of the Electronic Communications Act, and are appropriate for the time horizon of the market analysis. Below is a more detailed discussion of the remedies described above and the obligations that PTA intends to impose on Síminn in the relevant market.

6.4.1 Access to networks and related infrastructure.

223. Article 28, Paragraph 1 of the Electronic Communications Act states that PTA may instruct electronic communications undertakings with significant market power

[87] The markets in question were the market for television and radio distribution, the market for Internet connections, and the market for Internet services.

to meet normal and reasonable requests for open access to public electronic communications networks, network elements, and associated facilities under certain conditions prescribed by the Administration. Paragraph 2 of that Article contains a list of the requirements that may be made of electronic communications undertakings with significant market power on the basis of the obligation to grant access.

224. In imposing an obligation to grant access, it is necessary to consider whether the access in question encourages investments in the network and promotes innovation, efficiency, and sustainable competition. Article 28, Paragraph 3 of the Electronic Communications Act states that, in deciding to impose obligations pursuant to Paragraph 1, PTA shall consider whether it is:

a. technically and financially realistic to use or install competing facilities in view of market developments and the nature and type of interconnection and access involved;
b. feasible to provide the access proposed;
c. justifiable, in view of the original investment by the owner of the facility and the risk taken in making the investment;
d. to the advantage of competition in the longer term;
e. inappropriate, in view of intellectual property rights;
f. conducive to increasing the supply of services.

225. Síminn's current strong position in the market for ADSL connections via copper local loop entails certain entry barriers in the relevant market. The build-up of a new, national bitstream network would require substantial investment, and in PTA's estimation it would not be easy to build up such a network in addition to Síminn's network, which reaches virtually all settled areas of Iceland. Examples of this are other data transmission media, which have only achieved very limited coverage[88] in comparison with xDSL via copper local loop. In PTA's estimation, entry barriers will persist in the market for wholesale bitstream access unless obligations are imposed on Síminn. The Administration is of the opinion that increased access, whether it is obtained through resale agents or network operators relying in part on access to Síminn's network, is in the best interests of consumers.

226. In imposing obligations, PTA has examined whether the access requirement is technologically and financially realistic, and whether it would be realistic for a competitor to set up his own infrastructure in competition with Síminn, considering market developments and the nature of the access in question. PTA considers it quite feasible for Síminn to grant the access that is proposed here; furthermore, it considers it justifiable with respect to Síminn's initial investment. PTA considers the obligations conducive to long-term competition and increased supply of services. In imposing obligations, PTA has considered the obligations already imposed on Síminn and Míla, its associate, as well as the obligations proposed for Míla in the wholesale market for access to copper local loops (Market 11), which include obligations concerning access to local loops, distribution frames, space for DSLAM equipment, etc.

227. PTA intends to require that Síminn comply with all fair and reasonable requests by other electronic communications undertakings for open access to particular network facilities via copper local loop. The network facilities in question

[88] See Table 1.

include access to bitstream along the upper frequency range of the copper local loop, for the purpose of enabling other electronic communications undertakings to provide their users access to various types of broadband service. Síminn shall also, upon request, transmit bitstream along its trunk line network to the location where the electronic communications undertaking in question connects to Síminn's network. In the interest of promoting the development of the market, PTA intends also to require that Síminn offer electronic communications undertakings that provide broadband services – including Internet services – with bitstream access for resale; cf. Option 4 below. Electronic communications undertaking shall have the possibility of having bitstream delivered at various points along the network, as specified below, and shall have the option of changing those delivery options as needed (see Figure 1):

1) In the DSLAM or equivalent equipment at the location where the copper local loop connects to the distribution frame of the telephone exchange. (Option 1)
2) After ATM/IP transmission in Síminn's trunk line network; that is, Síminn handles the transmission of signals from the DSLAM equipment to the other electronic communications undertaking's connection point at the IP/ATM trunk line network. (Option 2)
3) After transmission via ATM/IP on Síminn's trunk line network to another electronic communications undertaking's connection point at the latter network. (Option 3)
4) Through the resale of Síminn's broadband services in the form of Internet connection. (Option 4)

228. In addition to the obligation to provide bitstream access, Síminn is required to host equipment from other electronic communications undertakings and to grant those undertakings access to other facilities that are necessary in order that the bitstream access can be fully utilised and will serve the intended purpose.

229. Any rejection of a request for bitstream access or for access to facilities shall be communicated in writing and shall be supported with reasoned arguments. Contractual agreements for access to Síminn's leased bitstream network shall be concluded within normal time limits and without unnecessary delays. Síminn is prohibited from delaying contract negotiations without due reason. In order to diminish Síminn's possibilities for delaying contract negotiations, it is necessary to impose obligations concerning non-discrimination and transparency, as well as the obligation to publish a reference offer. Access that Síminn has previously granted to its bitstream network may not be discontinued.

230. Pursuant to Article 28, Paragraph 2, Subparagraph (i) of the Electronic Communications Act, it is permissible to require that an electronic communications undertaking with significant market power grant access to other essential facilities.

231. Síminn shall grant access to infrastructure and information that are necessary so that the customer can have full benefit from bitstream access. Such access could include:

1) Operational support.
2) A database for the purpose of gathering information before ordering.
3) Delivery.
4) Orders.

5) Maintenance.
6) Handling of malfunctions.
7) Invoicing.

232. In PTA's opinion, the access obligation is both appropriate and fair, given the situation in the relevant market.

6.4.1.1 Summary

233. Based on the authority in Article 28 of the Electronic Communications Act, PTA intends to impose on Síminn the obligation to comply with reasonable and appropriate requests for access to specialised network infrastructure related to copper local loops at the wholesale level. If requested, Síminn shall also transmit bitstream along its trunk line network to the location where the electronic communications undertaking in question connects to Síminn's network.

234. Síminn shall, among other things, respond to reasonable and appropriate requests for the following access:

1) In the DSLAM or equivalent equipment at the location where the copper local loop connects to the distribution frame of the telephone exchange. (Option 1)
2) After ATM/IP transmission in Síminn's trunk line network; that is, Síminn handles the transmission of signals from the DSLAM equipment to the other electronic communications undertaking's termination point at the IP/ATM trunk line network. (Option 2)
3) After transmission via ATM/IP on Síminn's trunk line network to another electronic communications undertaking's connection point at the latter network. (Option 3)
4) Through the resale of Síminn's broadband services in the form of Internet connection. (Option 4)

235. Síminn shall offer bitstream access for resale to electronic communications undertakings that provide wholesale broadband services. Síminn is required to provide both hosting for equipment belonging to other electronic communications undertakings and access to other facilities that are necessary so that bitstream access can be fully utilised. Síminn shall also grant other electronic communications undertakings the same access to its infrastructure and information systems as that enjoyed by its own departments.

236. In order to diminish Síminn's possibilities for delaying contract negotiations, it is necessary to impose obligations concerning non-discrimination and transparency, as well as the obligation to publish a reference offer.

6.4.2 Non-discrimination

237. Pursuant to Article 30 of the Electronic Communications Act, PTA may impose on electronic communications undertakings with significant market power the obligation to practise non-discrimination in approving requests for interconnection or access. Such obligations should ensure, in particular, that an electronic communications undertaking applies equivalent conditions in equivalent

circumstances to other undertakings offering electronic communications services, and that it provides services and information to others on the same terms and of the same quality as those it provides to its own service departments, subsidiaries, associates, partners or other related parties.

238. In order for this to be successful, the obligation to grant access must be imposed together with an obligation concerning non-discrimination. The non-discrimination obligation is intended to prevent a vertically integrated undertaking with significant market power from engaging in conduct that has a negative impact on competition. It is intended to prevent an undertaking from discriminating, for example, with regard to price and quality of service; that is, selling less expensive and better services to its own retail departments than to other parties. Fair, moderate, and reasonable requirements for access are a fundamental element in the attempt to promote competition. The non-discrimination obligation does not, however, entail the requirement that all undertakings operate under exactly the same conditions; instead, all differences in terms shall be based on objective considerations.

239. Access obligations do not, in all instances, guarantee an equal competitive position among undertakings operating in the relevant market. This is especially the case when an undertaking provides its own retail department with wholesale bitstream access. For example, an undertaking could discriminate against its competitors as regards quality of service, terms of service, requirements that other services be purchased simultaneously, information concerning new services, and application processing time. PTA considers it necessary to promote competition in the bitstream market by imposing non-discrimination obligations that cover these points, at a minimum.

240. Article 30 of the Electronic Communications Act, no. 81/2003, contains twofold provisions on non-discrimination. First, PTA may require that an undertaking with significant market power practise non-discrimination in approving applications for interconnection or access; that is, that it not discriminate among electronic communications undertakings. Furthermore, obligations should ensure, in particular, that an electronic communications undertaking applies equivalent conditions in equivalent circumstances to other undertakings offering electronic communications services, and that it provides services and information to others on the same terms and of the same quality as those it provides to its own service departments, subsidiaries, partners or other related parties.

241. PTA intends to impose on Síminn the obligation that all electronic communications undertakings purchasing bitstream access shall enjoy, with consideration given to current conditions, the same terms as those enjoyed by Síminn's service departments, associates, and other related companies or collaborators. The discounts that Síminn grants to its own departments, or to its retail customers, shall also apply to other electronic communications undertakings, so that, at a minimum, those electronic communications undertakings are not subjected to less advantageous terms than other retail customers.

242. PTA intends to require that Síminn practise non-discrimination in the pricing of its bitstream services and that it charge the same price to all customers, whether

they be competitors, its own service departments, associated companies, other related companies, or collaborators.

243. PTA also intends to require that the quality of bitstream access granted to other electronic communications undertakings must not be less than that offered to Síminn's own service departments, associates, or collaborators.

244. Information related to bitstream access and related services shall be accessible to other electronic communications undertakings to the same degree as it is accessible to Síminn's, own service departments and related parties, and the same shall apply to proposed new services. Síminn's wholesale department shall be prohibited from granting the company's service departments or related parties access to information from other electronic communications undertakings' applications for bitstream access.

245. Síminn shall ensure that it processes applications from other electronic communications undertakings as quickly as it processes applications from its service departments and associates. If there are problems related to the processing of an application, this shall be reported to the applicant immediately, in writing or by electronic means, and the reasons for the delay explained therein. Síminn is prohibited from making inappropriate demands of applicants in connection with the handling of applications.

246. PTA intends to reserve the right to require that service agreements be concluded with purchasers of bitstream access, and that these agreements include provisions concerning quality and other aspects of non-discrimination that are listed in this section.

247. With authority based in Article 30 of the Electronic Communications Act, PTA intends to impose on Síminn an obligation to practise non-discrimination with respect to price and other criteria that have been mentioned. PTA intends to impose on Síminn the obligation that all electronic communications undertakings purchasing bitstream access shall be offered the same price and quality as those offered to Síminn's service departments, associates, subsidiaries, and other related companies or collaborators. Information on bitstream access and related services shall be accessible to other electronic communications undertakings. It shall be prohibited to provide Síminn's service departments or related parties access to information from applications filed by other electronic communications undertakings; furthermore, applications from other undertakings shall be processed as quickly as those filed by Síminn's or related parties service departments. Before 1 April each year, Síminn shall send PTA a written summary demonstrating the observation of non-discrimination with respect to price.

248. In PTA's opinion, the non-discrimination obligation is both appropriate and fair, given the situation in the relevant market.

6.4.3 Transparency

249. Provisions on transparency can be found in Article 29 of the Electronic Communications Act, no. 81/2003. Paragraph 1 of that Article states that, in order to increase the level of transparency related to interconnection or access to facilities,

PTA may require that an electronic communications undertaking with significant market power make public specified information; e.g., accounting information, technical specifications, information on network characteristics, terms and conditions for supply and use, and price lists. It is permissible to grant exemptions from the requirement to make information public if the electronic communications undertaking can demonstrate that such publication involves important financial or commercial interests that it is reasonable and appropriate to keep secret. Article 29, Paragraph 2 of the Act states that when an electronic communications undertaking is required to practise non-discrimination, PTA may require that it publish a reference offer that includes an itemised description of the interconnection or access, together with terms and conditions, including price lists. PTA may prescribe changes to the reference offer. PTA is authorised to set rules concerning the contents of interconnection agreements and reference offers.

250. Terms that apply to access to networks and services are important for new operators and can have a decisive effect on their possibility of gaining market share. It is clear that the competitive position of these operators is at risk if they must be subjected to unequal terms. Furthermore, it facilitates the entry of new parties into the market if potential new operators can foresee the terms that are available for access and for the services that they need to purchase, and if they can determine the basis for pricing and other terms.

251. The publication of a reference offer gives all parties in the market the option of seeing what is offered, and it ensures that undertakings will not be required to pay for services and facilities that they do not need. PTA considers it necessary for the entry of independent service providers that reference offers for wholesale bitstream access be available. In this way, interested parties can see how it is possible to operate such services, and on what terms.

252. It is stated above that PTA considers it necessary to impose a non-discrimination obligation on Síminn. In this context, it is important to state that, in order for the non-discrimination obligation to be truly effective, it is also necessary to impose a transparency obligation on Síminn. This is done in order to prevent attempts to discriminate between parties.

253. PTA considers it appropriate to base imposed obligations on the provisions of the Electronic Communications Act relating to transparency, so as to guarantee that the obligations concerning access and non-discrimination will be successful. The Administration is of the opinion that transparency of information can facilitate and shorten contract negotiations for bitstream access, particular if terms and conditions are established at the outset.

254. PTA intends to impose on Síminn the obligation to make public a reference offer for bitstream access and related facilities and services, and the reference offer must be itemised to a degree that guarantees that other electronic communications undertakings are not forced to purchase facilities and services for which they have no need. The reference offer shall also be itemised to reflect the needs of the market, and it shall contain a description of Síminn's terms and conditions, together with the pertinent price list.

255. The reference offer for bitstream access shall contain the following information, at a minimum:

a. General information on the contractual agreement (parties, objectives, definitions, criteria).
b. A description of the bitstream access being offered, cf. Options 1-4 in Figure 1.
c. Information on prices for bitstream access and transmission of bitstream in Síminn's networks, including information on discounts and bit rates of xDSL connections.
d. Information on prices for facilities and services related to bitstream access.
e. A list of geographical areas where access is available.
f. Invoicing and payment.
g. Security of networks and announcements.
h. Quality of access and related services.
i. Limitations of transmission capacity on networks, and other limitations.
j. A list of locations where there may be difficulty in providing co-location.
k. Technological requirements, particularly with respects to interfaces and standards.
l. Arrangements for maintenance services to be provided.
m. Non-compliance (rights to improvements, cancellation, compensatory damages).
n. Disclosure requirements and intellectual property provisions.
o. Confidentiality.
p. Guarantee of payment.
q. Technological proficiency.
r. Transfer of rights and responsibilities to third parties.
s. Auditing.
t. Force majeure.
u. Entry into force, period of validity, and termination of agreement.
v. Discrepancies.
w. Representatives of the parties.
x. Venue and resolution of disputes.

256. PTA intends to require that Síminn submit the reference offer to the Administration for approval and that it publish the reference offer no later than six months after the decision on the market for wholesale broadband access takes effect. Síminn shall maintain and review the reference offer as needed, in consultation with PTA.

257. Síminn shall send PTA a copy of all contractual agreements that it concludes for bitstream access.

258. Based on the authority contained in Article 29 of the Electronic Communications Act, PTA intends to impose on Síminn the obligation to make public an itemised reference offer for bitstream access and related services and facilities. The offer shall contain a description of Síminn's terms and conditions, as well as a price list. Síminn shall submit the reference offer or changes of the offer to the Administration for approval and that it publish the reference offer no later than six months after the decision on the market for wholesale broadband access takes effect

or no later than week after PTA approval of changes in the reference offer. Síminn shall also publicise accounting information concerning the performance of its bitstream access activities.

259. In PTA's opinion, the transparency obligation is both appropriate and fair, given the situation in the relevant market and the competition problems which have been detected and described earlier in chapter 6.2.2.

6.4.4 Accounting separation

260. Provisions on accounting separation can be found in Article 31 of the Electronic Communications Act, no. 81/2003. That Article states that PTA may impose on an electronic communications undertaking with significant market power the obligation to practise accounting separation between operations related to interconnection and access and other operations, so that it is possible to allocate revenues and expenses to operational units that can be linked to various services. Furthermore, the Administration may demand of an undertaking that operates both electronic communications networks and electronic communications services that its wholesale prices and its internal transfer prices be transparent in order to prevent unfair cross-subsidy, among other things. PTA may determine what bookkeeping methods shall be used. To ensure transparency and non-discrimination, PTA may require that the Administration be provided with accounting records, including data on revenues received from third parties.

261. The Regulation on Accounting and Financial Separation in Electronic Communications Operations, no. 960/2001, contains a list of the objectives of accounting separation and the methods for practising it. Among other objectives, accounting separation is intended to make it possible to see revenues, expenses, and capital employed for various operational units, and to make it possible to show that services are rendered to external customers on the same terms as those offered to other departments of the electronic communications undertaking concerned.

262. In PTA's opinion, it is necessary to impose on Síminn an obligation to practise accounting separation in the relevant market, in order to guarantee non-discrimination and transparency, among other things, and so that it is possible to reveal the actual costs involved, where appropriate.

263. The purpose of accounting separation is, among other things, to allow the analysis of accounting information in order to show, as accurately as possible, the performance of individual parts of operations, as though these parts were separate companies. This makes it possible to see an itemisation of the costs arising from the granting of wholesale bitstream access. Such itemisation of costs limits Síminn's possibility of charging for costs that are not related to specified services. Accounting separation between wholesale and retail activities is therefore a premise for non-discrimination among the various parties that purchase wholesale bitstream access.

264. Accounting separation can be the premise for the use of cost analysis and for finding the cost basis for the wholesale access that Síminn is required to offer pursuant to Article 28 of the Electronic Communications Act. It is also important that Síminn's wholesale operations be kept separate from its retail operations in order to

assess performance, with regard to determining whether the pricing of wholesale services is appropriate and whether there is cross-subsidy, and ensuring that all parties receive equal treatment regarding prices and terms.

265. As regards the execution of the accounting separation, Article 5 of the previously mentioned Regulation states that electronic communications undertakings shall carry out their accounting in a manner that makes it possible to allocate all revenues and expenses to operational units related to various services. Electronic communications undertakings that operate public electronic communications networks shall separate the expenses on their networks so that it is possible to allocate network expenses to various services, including network access. This shall apply equally to network access by the service departments in the undertaking concerned and to other electronic communications undertakings. The cost of operating networks and/or services shall be allocated to operational units through a work-based cost analysis that is consistent with Annex 1 of the Regulation and with further rules set by PTA.

266. PTA intends to impose on Síminn the obligation to separate, in its accounting data, all costs generated by network operations and other costs related to wholesale bitstream access, on the one hand, from costs related to retail broadband services, including Internet connection and television. Síminn will be required to submit to PTA, for the Administration's approval, a description of the expense types that are to be classified in the company's accounts as falling under wholesale bitstream access, on the one hand, and under retail broadband services, on the other. Accounting separation shall be carried out with respect to revenues, expenses, assets, and liabilities for these operations.

267. Based on the authority in Article 31 of the Electronic Communications Act, PTA intends to impose an accounting separation obligation on Síminn. Such separation shall involve, at a minimum, the separation of accounting for wholesale bitstream, on the one hand, and retail bitstream and broadband services, on the other, from other activities. Síminn's internal transfer prices at the wholesale level shall be transparent for the purpose of preventing unfair cross-subsidy, among other things. If Síminn's accounting separation should prove insufficient, PTA reserves the right to impose obligations for further separation at a later date. In its accounts, Síminn shall separate revenues, expenses, assets, and liabilities for bitstream access and for broadband services. Síminn is required to submit to PTA, on an annual basis, a specially itemised profit and loss account and balance sheet for its wholesale and retail operations, together with a summary of the division of indirect expenses that cannot be categorised through comparison with other expense items. The above-described summary for the prior year must be received by PTA by 1 April each year.

268. At the same time, Síminn shall submit to PTA a report from an independent auditor stating that there is consistency between the descriptions the company has submitted to PTA concerning cost allocations and the execution of its accounting separation.

The opinion must contain the following, at a minimum:

a) The conclusions drawn by the party who carries out the examination.

b) A summary of all instances where inconsistency can be found.
c) The examiner's proposals for improvements and their impact.
d) A detailed description of how the examination was carried out.
e) Summarised financial and accounting information (for example, conclusions regarding distribution of joint costs and changes in the value of assets to the business).

269. In PTA's opinion, the accounting separation obligation is both appropriate and fair, given the situation in the relevant market and the competition problems which have been detected and described in chapter 6.2.2.

6.4.5 Price controls

270. Article 32 of the Electronic Communications Act, no. 81/2003, states that, when a market analysis indicates that a lack of effective competition means that an electronic communications undertaking with significant market power is demanding excessively high prices or that the difference between wholesale and retail prices is abnormally small, PTA may impose on an electronic communications undertaking obligations concerning cost orientation of prices, as well as obligations concerning cost accounting systems for the provision of specific types of interconnection or access. Consideration shall be shown for investments made by the electronic communications undertaking and for a reasonable rate of return on capital employed, taking into account the risks involved. Where an electronic communications undertaking has an obligation that its prices be based on cost plus a reasonable profit, the burden of proof shall lie with the undertaking concerned.

271. The same provision also states that PTA may require that the electronic communications undertaking prepare a cost model for the purpose of calculating prices. PTA may, for the purpose of calculating costs, take into consideration the operating costs for similar services regarded as efficiently operated, take into consideration prices on comparable competitive markets and use cost accounting methods independent of those used by the undertaking.

272. The conclusion drawn from the above-specified market analysis for wholesale broadband access is that competition is not effective enough and that Síminn has significant market power in the relevant market. With reference to Article 18, Paragraph 1 of the Electronic Communications Act, this indicates that Síminn could prevent effective competition and could, to a substantial extent, operate without concern for competitors, customers, and consumers. Therefore Síminn has the possibility of maintaining abnormally high prices and/or exerting price-based pressure. In the same manner, PTA considers that Síminn's position in the relevant market gives the company the opportunity to maintain excessively high prices at the wholesale level in order to deter new operators from entering the market.

273. Prices are, in many instances, the primary cause of competition problems; therefore, it must be considered that a price control obligation is the most effective way to address such a problem. In the opinion of PTA, obligations concerning transparency and non-discrimination alone are not sufficient to solve competition problems such as cross-subsidy, price discrimination, and excessive pricing. PTA is of the opinion that an obligation concerning price controls is necessary to establish

competition in the relevant market and to promote competition at the retail level. PTA considers it necessary to facilitate independent service providers' access to the relevant market and is of the opinion that it is necessary to impose an obligation concerning price controls on Síminn in order to ensure that the price charged for access is fair, appropriate, and cost-oriented.

274. There are various methods that can be used for price controls and for determining access prices. According to Article 32 of the Electronic Communications Act, PTA may require an electronic communications undertaking to prepare a cost model for calculation of prices. PTA may, for the purpose of calculating costs, take into consideration the operating costs for similar services regarded as efficiently operated, take into consideration prices on comparable competitive markets, and use cost analysis methods independent of those used by the undertaking in question. In selecting a method, PTA considers it appropriate to emphasise that the method offer the possibility of yielding a result within a relatively short time; that it yield a result that is appropriate and fair to both parties; and that it yield a price that is not greatly in excess of real cost yet guarantees a fair return on investment.

275. The following are the chief methods used to determine wholesale prices:

- Historical costs: Until the present time, PTA has used this method primarily; it is based on analysing historical costs according to the accounts of the undertaking in question.
- Methods based on the analysis of long-run incremental cost (LRIC): This method is based on the preparation of a cost model, with the aim of analysing actual long-run production costs by taking into account economy in operations.
- Price comparison: Prices in comparable competitive markets are compared, and a price is determined on the basis of this comparison. The price is determined with reference to a specific sample taken from the comparison group.
- Retail-minus: The retail-minus method involves determining the wholesale price by subtracting a given percentage from the retail price. The difference that is subtracted from the retail price is for the expense that would otherwise have been incurred by the company at the retail level.

276. In selecting the best method for determining access prices, it is important to keep two things in mind: first, which method is least onerous for Síminn, and second, the creation of acceptable terms for undertakings that may wish to request wholesale access to the relevant market.

277. It can be assumed that cost analysis is an onerous obligation that should only be imposed if other methods are unsuccessful. Cost analysis involves determining prices based on cost information that is obtained from a cost model and/or cost accounting. To allocate costs to specific aspects of operations and services is a complicated and difficult project that can be addressed in various ways. PTA can employ the LRIC method for cost analysis, which is a method recognised by, among others, the European Commission and ESA. The method guarantees transparency, and the regulatory authority is not dependent on information from the electronic

communications undertaking's bookkeeping. On the other hand, this method can prove costly and time-consuming.

278. By their very nature, cost analyses can take a considerable length of time. It is therefore PTA's opinion that it is possible to use methods other than pure cost analysis as a temporary means of guaranteeing electronic communications undertakings normal wholesale access to bitstream as soon as possible. PTA intends to use the retail-minus method in order to guarantee electronic communications undertakings normal access to Síminn's bitstream for the short term.

279. The retail-minus method does not involve significant extra expense for Síminn, which must only take into account its own price lists in determining access prices and need not engage in other work related to cost analysis. In its simplest form, the method can be described as follows:

$Av = Sv - Sá$

Av is the access price, *Sv* is the retail price, and *Sá* represents retail-level costs (that is, the costs related to sales, marketing, collection, etc.) and the mark-up that generates a profit from sales. The costs that an electronic communications undertaking incurs due to retail operations is not added to the wholesale price, as the company avoids it in selling access to the service provider. The expense categories that are avoided are various, and they depend on how much access the service provider purchases.

280. In order to determine a temporary retail-minus percentage, PTA intends to use the discounts that Síminn currently gives at the retail and wholesale methods as a guideline, so as to minimise the work that Síminn would have to carry out in order to define precisely the expense items that would be transferred from Síminn; that is, invoicing costs, marketing costs, etc. This method is therefore designed to simplify and reduce the work that must be done in order to define the retail-minus percentage.

281. According to an announcement made by Síminn in March 2001 and confirmed later, Síminn currently grants corporate clients other than electronic communications undertakings a discount of up to 25% from its retail prices. The bulk discount increases from 5% to 25%, depending on the number of ADSL connections purchased by the customer in question, and there are no conditions concerning the customer's location. Bulk discounts off Síminn's retail price list for ADSL connections are as follows:

- 5 to 19 connections 5%
- 20 to 34 connections 10%
- 35 to 49 connections 15%
- 50 to 74 connections 20%
- 75 or more connections 25%

In June 2007, Síminn announced that it would begin offering a resale agreement and would grant resellers discounts of 5% to 10% off the same retail price list, depending on the bit rate of the ADSL connection. The company offers four types of ADSL connections, based on bit rate and access according to Option 3 in Figure 1.

Table 5 Síminn's ADSL connections
Prices represent monthly charges per connection, 1 Jan. 2008.

Type of connection	Retail price incl. VAT	Reseller discount
ADSL 1000 kb/s	2.750	5,0%
ADSL 2000 kb/s	3.850	5,0%
ADSL 4000/8000 kb/s	4.400	7,5%
ADSL 6000/12000 kb/s	4.950	10,0%

282. In assessing what wholesale price it is appropriate to charge electronic communications undertakings, it is necessary to bear in mind that electronic communications undertakings that become resellers for Síminn must, more than other Síminn retail customers, incur the following expenses, in addition to making an appropriate profit.

- Sales and marketing, including costs due to bulk discounts granted to larger customers, equipment, advertising, and marketing materials.
- Invoicing relationship with customers and financing of billing and claims.
- Write-off of claims.
- Primary services to customers, (service desk, malfunction analysis, etc.).
- Information systems.
- Other retail sales costs, including management, office facilities, salaries, and housing.
- Interconnection of networks.

It is necessary to assume that Síminn allows for direct retail expenses plus the retail division's share in indirect costs and profits. Internal transfer pricing between the wholesale level and the retail level will take account of the above. It is also necessary to bear in mind that, apart from Síminn's own retail division, electronic communications undertakings are among the company's largest customers for bitstream – some customers have well over 2,000 ADSL connections – yet at the same time other customers have been offered maximum discounts for purchasing 75 or more ADSL connections. PTA therefore considers it far that Síminn grant other electronic communications undertakings the bulk discounts it has offered its large retail customers, in addition to offering a discount to resellers for their expenses and profit.

283. Given the foregoing, PTA proposes that the price for resale access should be calculated using the retail-minus method until a cost-oriented price list is available and has been approved by PTA. The retail-minus percentage shall be at least 35% of Síminn's retail price list, assuming that electronic communications undertakings resell a minimum of 75 ADSL connections from Síminn. Prices and other terms shall be based on the current retail price list and Síminn's resale agreement according to Option 3 in Figure 1. Electronic communications undertakings with 74 connections or fewer shall be offered, at a minimum, the current discounts according to Table 5. Prices for services related to bitstream access shall be wholesale prices, and the service shall be offered where it is technologically possible. Wholesale prices will then be reviewed when the results of the cost analysis are available.

284. With reference to Article 32 of the Electronic Communications Act, PTA intends to impose on Síminn the obligation to submit, for approval by the Administration, a wholesale price list for bitstream access at various network locations, in accordance with Section 6.3.1,[89] no later than six months following the publication of the decision on the wholesale market for broadband access. Prices shall be calculated from annual operating expenses, which shall be based on historical costs and shall apply as the average price for the entire country. PTA intends to require that the difference between Síminn's wholesale and retail prices not be inappropriately small, as this could obstruct normal competition; furthermore, the Administration intends to require that resale prices be based on competitors' being able to distinguish themselves from Síminn by selling service options that are different from those offered by Síminn. If Síminn has not submitted a price list for bitstream access by the above-specified deadline, PTA will either carry out a cost analysis for bitstream access or use other methods to determine a price list. PTA's decision concerning a cost-oriented price list for bitstream access shall be based initially on historical costs, using comparable, efficiently run services as a guideline. PTA will also guarantee that prices are coherent with LLU access prices. PTA will also assess, based on the results of each cost analysis, whether it is more suitable to use the LRIC method[90] than the historical cost method. In order to monitor changes in price lists, PTA considers it appropriate to require that all changes to Síminn's price list be reported to the Administration, and to stipulate that the changes will not take effect unless approved by the Administration.

285. Pursuant to Article 32 of the Electronic Communications Act, PTA may impose an obligation concerning cost accounting with respect to given types of interconnection or access, in accordance with the historical cost method. Pursuant to Article 11 of the Regulation on Accounting and Financial Separation in Electronic Communications Operations, no. 960/2001, an SMP operator that has been subjected to obligations pursuant to the Electronic Communications Act shall inform PTA of how accounting separation is carried out with respect to revenues and expenses for, among other things, user networks and trunk networks.

286. So as to make it possible to calculate wholesale costs for bitstream access in accordance with Section 6.4.1, and considering the fact that accounting separation pursuant to Regulation no. 960/2001 does not specifically include the equipment on which bitstream access is based, PTA intends to impose on Síminn the obligation to carry out cost accounting for the aspects of electronic communications operations that are required in order to provide bitstream access.

287. Cost accounting is necessary when an obligation concerning price controls has been imposed on an electronic communications undertaking with significant market power. Therefore, because PTA intends to impose on Síminn an obligation concerning price controls, the Administration also intends to impose a cost accounting obligation on the company. The cost accounting obligation supports the obligation concerning cost-oriented prices, is necessary for the implementation of accounting separation, and could assist PTA in monitoring non-discrimination.

[89] Options 1-4 in Figure 1.
[90] Long-run incremental costs.

288. In order that Síminn can demonstrate that its price list for a given type of service or product is based on costs, it is necessary to introduce cost accounting that includes, identifies, assesses, and allocates the appropriate costs to the pertinent services or products in accordance with recognised principles; that is, cause and effect.

289. No later than six months after the publication of the decision on the relevant market, Síminn shall submit to PTA a description of its cost accounting for bitstream access and shall publicise its principal expense categories, as well as the rules used to allocate costs. At the same time, Síminn shall submit to PTA a report from an independent auditor stating that there is consistency between the descriptions the company has submitted to PTA concerning cost allocations and the execution of its cost accounting system.

290. PTA is of the opinion that, without an obligation to maintain cost accounting, Síminn could price its services in the relevant market in excess of costs or could have an abnormally small (or non-existent) difference between wholesale and retail prices, which could have a detrimental effect on users. Without the obligation to practice cost accounting, PTA cannot ensure that prices are based on costs and will therefore be unable to prevent problems of this sort.

291. PTA intends to impose on Síminn an obligation concerning cost accounting for those aspects of electronic communications operations that are necessary in order to provide bitstream access. Síminn shall submit to PTA a description of the cost accounting system for bitstream access and shall publicise expense categories, expense items, and their relationship to cost generators.

292. In PTA's opinion, the price controls obligation is both appropriate and fair, given the situation in the relevant market and the competition problems which have been detected and described in chapter 6.2.2. This is both for the obligation itself and the temporary obligation.

6.4.5.1 Summary

293. Based on the authority in Article 32 of the Electronic Communications Act, PTA intends to impose on Síminn an obligation concerning price controls for bitstream access. Síminn shall offer registered electronic communications undertakings a discount of at least 35% (retail-minus) off its retail prices for the ADSL that Síminn currently offers for resale, subject to the electronic communications undertaking's reselling a minimum of 75 ADSL connections, until a cost-oriented price list has been prepared and approved by PTA. Síminn shall submit, for approval by the Administration, a wholesale price list for bitstream access at various network locations, in accordance with Options 1-4 in Figure 1, no later than six months following the publication of the decision on the wholesale market for broadband access.

294. Síminn shall maintain cost accounting for wholesale bitstream access so that it can demonstrate that its price list for a given type of service or product is based on historical costs. It is therefore necessary to introduce cost accounting that includes, identifies, assesses, and allocates the appropriate costs to the pertinent services or

products in accordance with recognised principles; that is, cause and effect. Síminn shall submit to PTA a description of the cost accounting for bitstream access and shall publicise the principal expense categories and the rules that are used to allocate costs. Síminn shall also at same time submit to PTA a report from an independent auditor stating that there is consistency between the description and the execution of its cost accounting system. All changes to Síminn's price list for the relevant market shall be reported to PTA. No changes in price will take effect without PTA's prior approval.

6.5 Conclusions concerning the imposition of obligations on undertakings with significant market power

295. The discussion above covers the various obligations that can be imposed on an electronic communications undertaking with significant market power in accordance with Articles 27-32 of the Electronic Communications Act. In Section 5, which focuses on market power, the conclusion is reached that Síminn possesses significant market power in Market 12. The conclusions drawn from that discussion are that PTA intends to impose the following obligations on Síminn in connection with the wholesale market for broadband access, Market 12:

1. Based on the authority in Article 1 of the Electronic Communications Act, PTA intends to impose on Síminn the obligation to comply with reasonable and appropriate requests for access to specific network facilities related to copper local loops.

Síminn shall, among other things, respond to reasonable and appropriate requests for access:

1) In the DSLAM or equivalent equipment at the location where the copper local loop connects to the distribution frame of the telephone exchange. (Option 1)
2) After ATM/IP transmission in Síminn's trunk line network; that is, Síminn handles the transmission of signals from the DSLAM equipment to the other electronic communications undertaking's termination point at the IP/ATM trunk line network. (Option 2)
3) After transmission via ATM/IP on Síminn's trunk line network to another electronic communications undertaking's connection point at the latter network. (Option 3)
4) Through the resale of Síminn's broadband services in the form of Internet connection. (Option 4)

Síminn shall offer bitstream access for resale to electronic communications undertakings that provide wholesale broadband services. Síminn is required to provide both hosting for equipment belonging to other electronic communications undertakings and access to other facilities that are necessary so that bitstream access can be fully utilised. Síminn shall also grant other electronic communications undertakings the same access to its infrastructure and information systems as that enjoyed by its own departments or related parties.

2. With authority based in Article 30 of the Electronic Communications Act, PTA intends to impose on Síminn an obligation to practise non-discrimination

with respect to price and other criteria that have been mentioned. PTA intends to impose on Síminn the obligation that all electronic communications undertakings purchasing bitstream access shall be offered the same price and quality as those offered to Síminn's service departments, associates, subsidiaries, and other related companies or collaborators. Information on bitstream access and related services shall be accessible to other electronic communications undertakings. It shall be prohibited to provide Síminn's service departments or related parties access to information from applications filed by other electronic communications undertakings; furthermore, applications from other undertakings shall be processed as quickly as those filed by Síminn's service departments or related parties. Before 1 April each year, Síminn shall send PTA a written summary demonstrating the observation of non-discrimination with respect to price.

3. Based on the authority contained in Article 29 of the Electronic Communications Act, PTA intends to impose on Síminn the obligation to make public an itemised reference offer for bitstream access and related services and facilities. The offer shall contain a description of Síminn's terms and conditions, as well as a price list. Síminn shall submit the reference offer to the Administration for approval and that it publish the reference offer no later than six months after the decision on the market for wholesale broadband access takes effect. Síminn shall submit changes in the reference offer to PTA for approval and publish the reference offer no later than one week after the Administration approval of changes in the offer. Síminn shall also publicise accounting information concerning the performance of its bitstream access activities.

4. Based on the authority in Article 31 of the Electronic Communications Act, PTA intends to impose an accounting separation obligation on Síminn. Such separation shall involve, at a minimum, the separation of accounting for wholesale bitstream, on the one hand, and retail bitstream and broadband services, on the other, from other activities. Síminn's internal transfer prices at the wholesale level shall be transparent for the purpose of preventing unfair cross-subsidy, among other things. If Síminn's accounting separation should prove insufficient, PTA reserves the right to impose obligations for further separation at a later date. In its accounts, Síminn shall separate revenues, expenses, assets, and liabilities for bitstream access and for broadband services. Síminn is required to submit to PTA, on an annual basis, a specially itemised profit and loss account and balance sheet for its wholesale and retail operations, together with a summary of the division of indirect expenses that cannot be categorised through comparison with other expense items. The above-described summary for the prior year must be received by PTA by 1 April each year.

5. Based on the authority in Article 32 of the Electronic Communications Act, PTA intends to impose on Síminn an obligation concerning price controls for bitstream access.

Síminn shall offer registered electronic communications undertakings a discount of at least 35% (retail-minus) off its retail prices for the ADSL that Síminn currently offers for resale, subject to the electronic communications

undertaking's reselling a minimum of 75 ADSL connections, until a cost-oriented wholesale price list has been prepared and approved by PTA.

Síminn shall submit, for approval by the Administration, a wholesale price list for bitstream access at various network locations, in accordance with Options 1-4 in Figure 1, no later than six months following the publication of the decision on the wholesale market for broadband access. Prices shall be calculated from annual operating expenses, which shall be based on historical costs and shall apply as the average price for the entire country. Síminn shall maintain cost accounting for wholesale bitstream access so that it can demonstrate that its price list for a given type of service or product is based on historical costs. It is therefore necessary to introduce cost accounting that includes, identifies, assesses, and allocates the appropriate costs to the pertinent services or products in accordance with recognised principles; that is, cause and effect. Síminn shall submit to PTA a description of the cost accounting for bitstream access and shall publicise the principal expense categories and the rules that are used to allocate costs. In order to monitor changes in price lists, PTA considers it appropriate to require that all changes to Síminn's price list be reported to the Administration, and to stipulate that the changes will not take effect unless approved by the Administration. At the same time, Síminn shall submit to PTA a report from an independent auditor stating that there is consistency between the descriptions the company has submitted to PTA concerning cost allocations and the execution of its cost accounting system.

PTA's decision concerning a cost-oriented price list for bitstream access shall be based initially on historical costs, using comparable, efficiently run services as a guideline. PTA will also guarantee that prices are coherent with LLU access prices. PTA will also assess, based on the results of each cost analysis, whether it is more suitable to use the LRIC method[91] than the historical cost method.

[91] Long-run incremental costs.

7 Assessment of the effects of obligations

7.1 The necessity for the obligations

297. In accordance with the principle of proportionality, it is appropriate to assess the need for the obligations described in Section 6. The obligations are conducive to achieving the objectives set forth in the Electronic Communications Act, no. 81/2003, concerning effective competition and cost-efficient electronic communications. In view of the competition problems that exist in the market, Síminn's strong position on the relevant market and the position of the Síminn group in general, PTA considers it necessary to impose all of the above-mentioned obligations on Síminn in order to promote increased competition and safeguard consumer interests. Section 6 contains a detailed discussion of why PTA considers each individual obligation necessary. In its examination of the relevant market, PTA has come to the conclusion that there are no other measures that could be as effective in resolving the competition problems in the market.

298. The obligation to grant wholesale access is a necessary premise for effective competition in the broadband market. It is not possible to solve the competition problems described above without imposing an obligation to grant access. Entry barriers prevent competitors from being able to build up an extensive broadband network; therefore, it is a prerequisite for effective competition that competitors be able to obtain access to Síminn's nationwide network.

299. The non-discrimination obligation is necessary to enable other undertakings to compete with Síminn in the markets for broadband access. The obligation should enable all electronic communications undertakings that purchase wholesale broadband access from Síminn to receive comparable services, thus resolving the competition problem described above, which stems from Síminn's vertical integration.

300. In PTA's estimation, the publication of a reference offer is an extremely important element in promoting competition in the market for broadband services. It is necessary that undertakings considering entering the electronic communications market be able to evaluate the terms available for wholesale access to broadband services. The transparency obligation is also necessary in order to ensure compliance with the non-discrimination obligation.

301. PTA considers it necessary to require accounting separation because, among other things, accounting separation is a prerequisite for a satisfactory analysis of the cost of operating the broadband network. PTA does not consider it possible to use other, less stringent, methods if the cost analysis is to be based on historical costs. Furthermore, the obligation is necessary in order to ensure that Síminn practises non-discrimination with respect to the prices it charges its retail division and related parties, on the one hand, and unrelated companies, on the other.

302. PTA is of the opinion that the price controls obligation is absolutely necessary, as Síminn has no incentive to offer appropriate prices on its own initiative because it

is by far the largest operator in this market and, in some locations, the only operator that can offer broadband access. PTA considers that the price controls obligation will result in more efficient operation of the broadband network, as well as lower prices for wholesale broadband access, which will ultimately result in lower prices charged to consumers.

7.2 Effects of the obligations

303. In keeping with the principle of proportionality, it is also appropriate to assess the effects and consequences of the obligations that PTA intends to impose on Síminn in the relevant market. It is necessary to assess whether the impact of the obligations that PTA intends to impose on Síminn in the relevant market is justifiable in view of the objectives the obligations are meant to achieve. On the whole, the obligations that PTA intends to impose on Síminn represent some burden to the company. On the other hand, PTA considers the obligations to be consistent with the principle of proportionality and does not believe that they represent a greater burden than necessary.

304. The obligations are conductive to achieving the objectives set forth in the Electronic Communications Act, no. 81/2003, concerning effective competition and cost-efficient electronic communications. In view of Síminn´s strong position on the relevant market and the position of the Síminn group in general, PTA considers it necessary to impose all of the above-mentioned obligations on Síminn in order to promote increased competition and protect consumer interests. Because other obligations are not better suited to achieving the set objectives, PTA considers, given the initial investment and the risk that was taken with that investment, that this is not an unreasonable requirement.

305. The obligation to grant access represents some burden for Síminn; however, it is a prerequisite for the introduction of effective competition in the broadband market. It is not possible to solve the competition problems described above without imposing an obligation to grant access. Síminn will have to incur some expense and inconvenience as a result of this obligation; however, the company will receive an appropriate price for the access granted, and the obligation could result in better utilisation of the equipment in which it has invested.

306. PTA does not view a non-discrimination obligation as particularly onerous, since it is a normal obligation on undertaking with significant market power.

307. The obligation to observe transparency, including the publication of a reference offer, involves some inconvenience for Síminn. The burden that this entails for Síminn is not overly onerous, however, in light of the fact that this obligation is necessary to promote competition.

308. PTA does not consider the obligation concerning accounting separation too onerous given the objective it is designed to achieve, as it is a normal part of modern business operations to separate production/operation costs for the various products or services that a company sells.

309. PTA believes the obligation concerning price controls is somewhat onerous, and that enforcing it will generate some expense for both Síminn and PTA. Though the obligation will generate some cost and inconvenience, however, PTA considers that it will not exclude Síminn's chance to earn an appropriate profit on the operation of its broadband networks and related facilities.

310. The obligations will not obstruct the build-up of broadband networks, as the price of access will be based on costs plus a reasonable return on capital employed. Therefore, price controls should not diminish the will to invest over the longer term, whether in Síminn´s network or in that of potential competitors.

311. In PTA's estimation, the above-described obligations are both appropriate and necessary in order to promote effective competition, and they should not prove unnecessarily onerous. PTA is of the opinion that these obligations are in the interest of long-term competition and are designed to increase the supply of services in the market for broadband services, and in the electronic communications market as a whole. The burden that the obligations represent for Síminn should not single-handedly be the determining factor in their imposition. It is the overall assessment of the electronic communications undertakings and consumers interests which is the determining factor here.