Annex A

POST- AND TELECOM ADMINISTRATION

– Market analysis–

Wholesale market for broadcasting transmission services to deliver broadcast content to end users

(Market 18)

8 December 2008

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Summary and conclusions

In this analysis, the Post and Telecom Administration (PTA) discusses the wholesale market for broadcasting transmission services to deliver broadcast content to end users. The analysis examines the definition of the relevant market (Market 18) as set forth in the ESA Recommendation and the applicability of that definition to market conditions in Iceland. PTA has come to the conclusion that, given the conditions reigning in Iceland, this market consists of several distinct service markets. PTA considers it appropriate to define five separate service markets for broadcasting transmission services:

1) Broadcasting transmission services for analogue radio via wireless networks
2) Broadcasting transmission services for analogue television via wireless networks
3) Broadcasting transmission services for digital radio and television via wireless networks
4) Broadcasting transmission services for digital radio and television via fixed-line networks
5) Broadcasting transmission services for digital radio and television via satellite

PTA is of the opinion that all of the service markets except the satellite market extend to the entire country, as it is not possible to distinguish individual areas where competitive conditions differ substantially from those in other areas. The market for broadcasting transmission services via satellite, however, is not limited to Iceland. The marketing area of undertakings engaged in such operations is much larger; therefore, this is a transnational market and is not within PTA's jurisdiction.

PTA conducted further examination of the service markets it had defined, with the exception of the satellite market, with the aim of determining whether they met the criteria for the possible imposition of obligations on undertakings in those markets. The criteria are as follows:

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 law do not suffice to eliminate barriers or promote competition.

The market for broadcasting transmission services for analogue radio on wireless networks was not considered to fulfil the first criterion, as entry barriers to this market are not significant.

The market for broadcasting transmission services for analogue television on wireless networks was considered to fulfil the first two criteria but not the last, as the provisions of competition law were considered sufficient to solve any problems that

could arise in that market. Furthermore, it was considered of diminishing significance to intervene in this market, as the service is obsolescent.

The market for broadcasting transmission services for digital radio and television on wireless networks was considered to fulfil the first criterion, as there are significant entry barriers in this market. As regards competition, it was not considered likely that effective competition would be established in this particular service market in the near future; however, it is conceivable that competition from distribution systems on fixed-line networks could affect this market. PTA was of the opinion that the provisions of competition law would suffice to solve any problems that might arise in this market, as disputes concerning access to distribution systems are rare or even non-existent.

The market for broadcasting transmission services for digital radio and television on fixed-line networks was considered to fulfil the first criterion. As regards competition, it was considered highly likely that competition could be established in this market, but it is difficult to say when this might happen. The Administration was of the opinion that the provisions of competition law would suffice in this market. Disputes concerning access to distribution systems are rare, and the competition authorities have already begun to set conditions pertaining to access, transparency, and non-discrimination in the operation of the largest distribution system in the decision on the merger of Síminn and Skjárinn.

Pursuant to the Electronic Communications Act, various types of rules are in effect concerning access to distribution systems and related infrastructure. These are explained further in Section 5. Among these are the provisions of Article 55 of the Electronic Communications Act, which states that it is possible to oblige electronic communications undertakings to broadcast television programming. It has not proven necessary to enforce these so-called must-carry provisions with an administrative decision; thus it is not considered necessary to impose further obligations on market participants at the present time.

It is a characteristic of the broadcast transmission markets that content providers and distribution systems are mutually dependent, and this encourages the parties concerned to come to an agreement on the distribution of content.

In the new Commission Recommendation on the relevant markets, no. 2007/879/EC, the market for broadcasting transmission services has been removed from the list of markets that regulatory authorities in the electronic communications sector are required to analyse. This Recommendation has not yet been incorporated into the EEA Agreement. For this reason, PTA is still required to analyse this market, both because it is still part of the applicable ESA Recommendation and because this market has not previously been analysed in Iceland, and it is assumed that all markets specified in the original Recommendation will be analysed before the new Recommendation is implemented.

The Commission's grounds for excluding this market from the list in the Recommendation can be found in Section 4.4 in the Explanatory Note accompanying

the new Recommendation,[1] which gives consideration, among other things, to the fact that the reception options for television are constantly increasing in number with the advent of digital transmission, and that this tends to promote effective competition. Furthermore, it is stated that must-carry provisions can be used to guarantee user access to television programming when such access is in the public interest. It is pointed out that the Electronic Communications Act contains provisions concerning joint utilisation of infrastructure, irrespective of market analysis. Finally, it is emphasised that the competition authorities have actually been able to address the problems that have arisen with respect to broadcast distribution systems.

PTA intends to follow developments on the relevant markets closely and, if circumstances change significantly, it will consider carrying out a new analysis of these markets.

[1]EXPLANATORY NOTE Accompanying document to the Commission Recommendation on Relevant Product and Service Markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services (Second edition) {(C(2007) 5406)} http://ec.europa.eu/information_society/policy/ecomm/doc/library/proposals/sec2007_1483_final.pdf

1.0 Introduction

1.1 General

This document contains the Post and Telecom Administration (PTA) analysis of the wholesale market for broadcasting transmission services to deliver broadcast content to end users in Iceland (Market 18).

1. This document is based on a preliminary draft, submitted to local consultation, pursuant to Article 6 of the Act on the Post and Telecom Administration, no. 69/2003, in a letter dated June 25 2008, where registered electronic communication service operators, television service operators and other interested parties where invited to provide their comments. The following undertakings commented: Og Fjarskipti ehf (Vodafone) and the Competition Authority. The analysis has been updated according to the comments considered. The comments have been organized by subject, chapter and paragraph and answered in the Annex B attached to the decision. On November 4 2008, PTA sent EFTA Surveillance Authority (ESA) an updated draft of the market analysis for consultation, according to the 1. paragraph of article 7 of the Act on Post- and Telecom Authority, no. 69/2003 and the 7. article of the ESA Recommendation of 2004. In a letter, dated December 4., 2008 PTA received ESA's opinion, where ESA makes no material comments to the analysis or its findings. Following are the results of the market analysis PTA has made on the relevant markets.

2. Markets are subject to change, and market analyses are neither permanent nor static. For this reason, markets must be re-evaluated on a regular basis. 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.[2] In most instances, it is reasonable to assume a time horizon of two to three years.

1.2 The Electronic Communications Act, no. 81/2003

3. On 25 July 2003, new legislation on electronic communications entered into force in Iceland. The new Electronic Communications Act, no. 81/2003, implemented four EU directives on electronic communications[3] and one directive on the protection

[2] 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).

[3] 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).
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).

of personal privacy in electronic communications.[4] 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.

4. 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.

5. The European Commission has published guidelines and a recommendation concerning market analysis. First, there are guidelines for market analysis and the assessment of SMP,[5] and second, there is a recommendation concerning the relevant markets.[6] The EFTA Surveillance Authority (ESA) has issued comparable guidelines[7] (hereinafter referred to as "Guidelines") and a recommendation[8] (hereinafter referred to as "Recommendation"). PTA will take these and the guidelines and recommendation from the European Commission into consideration in carrying out its market analyses. In addition, the Administration will consider the report by the

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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).

[4] 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).

[5] 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.

[6] 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.

[7] See Footnote 2.

[8] 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).

European Regulatory Group of National Regulatory Authorities (ERG[9]) concerning remedies that may be imposed on electronic communications undertakings with significant market power in order to promote competition.[10]

6. The ESA Recommendation on relevant markets identifies 18 electronic communications markets that PTA is required to analyse pursuant to the Electronic Communications Act of 2003 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

7. As is stated in the PTA introductory document on market analyses, the implementation of a market analysis can be divided into three phases:[11]

1) The 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 have significant market power.
3) Decision on whether it is necessary to impose, maintain, amend, or withdraw obligations on undertakings with significant market power.

8. This document contains PTA's conclusions concerning the definition of the relevant market and its assessment of whether it is appropriate to impose obligations in this market based on the authority contained in the Electronic Communications Act. PTA bases its analysis largely on official data on broadcasting services. However, the Administration has also directed demarcated queries to individual market participants. Furthermore, PTA uses information obtained through its regular compilation of statistical data. Capacent carried out a survey for PTA with the objective of determining by what means users receive radio and television broadcasting. The survey was carried out by telephone during the period 5 to 19 September 2007. The survey was conducted among a sample of 1,350 persons from all over Iceland. The sample included persons aged 16-75 years, chosen at random from the National Registry, and the response ratio was 61.9%.

9. The preliminary draft analysis of the relevant market was presented for comment on 25 June 2008, and the final deadline for submitting comments was 3 September 2008. PTA gives account of the comments in an annex to this analysis. The Administration has revised the market analysis in consideration of these

[9] Abbreviation for "European Regulatory Group of National Regulatory Authorities".
[10] 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
[11] Introductory document on market analysis, prepared by PTA, first published in October 2003 and updated in August 2005. See www.pfs.is, then Telecom Affairs, and then Market Analysis.

comments and the most recent data available. The revised analysis is now presented to ESA for comment. If ESA does not present comments on the draft of the decision, it will be sent to the operators in question and others.

1.4 Market definition - general

10. Pursuant to Article 16 of the Electronic Communications Act, no. 81/2003, with subsequent amendments, PTA must define product and service markets[12] and geographical markets in accordance with the principles of competition law and Iceland's 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

11. 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 competitive conditions 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.

1.4.2 The geographical market

12. When the service market has been defined, the geographical market must be demarcated. This demarcation is generally based on the extent 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.

13. 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

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

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.

14. 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 coverage of the network is regional and there is no overlapping of regions, this is an indication that 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

15. 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 law do not suffice to eliminate barriers or promote competition.

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

2.0 Description of the broadcasting market

2.1 Definition of broadcasting (radio – television)

17. The definition of the term broadcasting can be found in the Broadcasting Act, no. 53/2000. Article 1, Paragraph 1 (a) of the Act states as follows:

> *'Broadcasting', by radio or television, refers to any transmission of programme content within the area of Icelandic jurisdiction, whether in the form of speech, music or images, that is intended for direct reception by the general public and distributed by means of electromagnetic waves, by wire or over the air, in encoded or unencoded form.*

18. According to the Broadcasting Act, a 'broadcaster' is the natural or legal person who has been granted a broadcast license and who has the editorial responsibility for the composition of schedules of broadcasting programmes and who transmits them or has them transmitted by a third party. 'Programming' includes the content broadcast in its entirety.

19. The service that uses a broadcast distribution system is not limited to Icelandic broadcast programming as defined in the Broadcasting Act. The direct, full-length and unaltered retransmission of the entire programming of foreign television stations is also transmitted via the broadcasting system to end users in this country; furthermore, broadcast systems are used to sell content that is not part of scheduled programming (for example, video-on-demand, or VoD).

2.2 Broadcast distribution systems[13]

2.2.1 Broadcast distribution systems – general

20. Broadcasting content can be distributed by numerous means. As is described in greater detail later in this document, many types of networks can be used for such distribution. In recent years, there has been a trend toward using the same networks for conventional electronic communications services (telephone and data transfer) and distribution of broadcast content. In the Electronic Communications Act, no. 81/2003, networks that are used for broadcast distribution are defined for the first time as electronic communications networks, cf. Article 3, Item 12.

21. Even though various types of networks and various technologies are used to distribute broadcast content, it is still possible to identify certain common characteristics among broadcast distribution systems. Broadcast distribution systems can be divided into four main segments on the route from the seller of broadcast content to the end user's receiving equipment. Some networks – for example, local

[13] In this analysis, the term "distribution system" is used to denote an electronic communications network that is used for broadcast transmission.

radio stations – are simpler in structure, however, and feature only one or two of these elements.

22. The contribution network is the portion of the network that transmits broadcast content; for example, from the recording/production location to the video or sound studio.

23. The feeder network is the part of the network that lies from the radio station to the first connection point in the distribution system or trunk network. This part of the system can use various types of technology but most often utilises a fibre optic cable or wireless connection.

24. The trunk network is the portion that transmits radio signals from the feeder network to the access network, which connects to end users. In general, the trunk network has considerable carrying capacity and is usually a fibre optic cable or wireless connection.

25. The access network is the last portion of the network on the route to the end users. This portion is also called the distribution system. Various types of technology are used in this portion of the network, such as terrestrial wireless networks, satellite connections, cable systems, xDSL networks, etc.; further discussion of the possible options can be found in Section 2.2.2.

26. Through the years, networks for broadcast transmission have been separate from networks from telephone and data transmission, particularly access networks. More recently, however, these two types of networks have merged so that cable networks used to distribute television content have been capable of providing data transmission and telephone services, and conventional electronic communications networks – such as copper local loop networks – have become capable of transmitting television broadcast content.

2.2.2 Distribution options

27. Today there are various ways to distribute broadcast content to end users, and the number of options is constantly increasing. For a very long time, the majority of broadcast transmission took place through terrestrial wireless systems that used conventional radio frequencies (FM, long-wave) and television frequencies (UFH, VHF) and transmitted broadcast content in analogue form.

28. Analogue cable systems did exist, but they have not been widely used in Iceland, with the exception of the Síminn Breidvarp, which was an analogue system for its first years of operation.

29. Satellite transmission has available in Iceland, and some Icelanders have utilised this option for receiving broadcast content from foreign television stations. One television station in Iceland, Omega, has broadcast religious programming, to

some degree via satellite, since 2002. In 2007 the Icelandic National Broadcasting Service (RÚV) began using this means of transmission.[14]

30. With the advent of digital transmission, the number of possible options for transmission of radio signals increased dramatically, and today it is possible to use various types of fixed-line networks and a large number of frequency ranges for transmission of broadcast content.

31. As before, it is possible to divide the broadcast networks into three broad categories: terrestrial wireless networks, satellites, and fixed-line networks. Each of these categories can also be divided into analogue and digital systems. Analogue systems are on the wane, however, with the exception of radio services.

2.2.2.1 Terrestrial wireless networks

32. The frequency ranges most commonly used are UHF (470-862 MHz) or VHF (174-230 MHz). For a long time, these frequency ranges were the only ones used in Iceland for analogue television broadcasting. In order to receive transmissions on these frequencies, an antenna comb is necessary. Such combs have been installed in the vast majority of buildings in Iceland. UHF frequencies are now used for digital television broadcasting as well.

33. The MMDS frequency range extends from 2500-2684 MHz (184 MHz bandwidth), for a total of 23 television channels (8MHz/channel). Of these, 21 have been considered useable for broadcasting in Iceland. In Europe, this frequency range is only used for television in Iceland and Ireland. In other countries, it is used for other services, particularly fixed-line connections. It has been decided in the international arena that the 2500-2690 frequency range shall be used in the future for third-generation mobile phones.[15] This frequency range has been used for television broadcasting in Iceland since 1993. At first the broadcasts were in analogue form, but since 2004 the frequency range has been used primarily for digital transmission. In order to receive transmissions in this frequency range, a so-called microwave antenna is necessary.

34. The satellite frequency range 10.7-12.5 GHz has also been used for terrestrial television transmission. Technology that has been developed for terrestrial digital television broadcasting in this frequency range is based in part on the same technology as satellite transmissions and is transmitted according to the DVD-S (satellite) standard. This technology is not in widespread use. Reception of transmissions from such networks usually employs very small satellite dishes.

35. Various other frequency ranges can be used for television broadcasting. For example, the European Committee on Post and Telecommunications (CEPT) has reserved a very large frequency range – 40.5-43.5 GHz, some seven times larger than

[14] According to the agreement of 1 February 2007 between the Icelandic National Broadcasting Service (RÚV) and the Electronic Communications Fund, on the one hand, and Telenor, on the other, programming from Iceland State Television, Channel 1, and Channel 2 is broadcast in digital form via satellite. This service is intended for sailors and residents of sparsely populated areas.
[15] ECC DEC (02)06

that UHF frequency range – for interactive multimedia service (MWS), which includes television.

36. The frequency ranges 3.5 GHz and 10 GHz are intended for high-speed connections. With the technology that can be used in such systems today – for example, ViMax – the transmission speed is great enough that it is possible to transmit television content on such networks. To PTA's knowledge, no television service is yet available via such networks in Iceland.

37. Third-generation (3G) mobile phone service began in Iceland in 2007. Through 3G services, it is possible to broadcast television content via telephone. However, the supply of content is still limited. At present, such content consists of retransmissions from several foreign stations and selected programming from Icelandic television stations.

2.2.2.2 Fixed-line networks

38. Cable networks intended for television broadcasting were previously laid with so-called coaxial (coax) cables to end users. Some such systems use a combination of coax and fibre optic cables. Systems of this sort were used for analogue broadcasting for a long time, but many of them have been updated and can carry digital transmission. Conventional cable networks were not widely used in Iceland. Local networks were laid in certain municipalities, however. The most widely used of these networks was the Síminn Breidband (broadband) network, which reached a considerable number of users in the greater Reykjavík area and a few other locations. It is a compound system in that a fibre optic cable lies to street cabinets, and coax cables lie from the street cabinets to end users.

39. Today's high-speed connections (ADSL) via copper local loops can carry television broadcasting. Such services are widely used in Iceland. All households in the country are connected to copper local loops, and a large proportion can elect to receive television services via ADSL.

40. Fibre optic cable networks reaching all the way to end users are being built up in Iceland. Such networks are used to provide comprehensive electronic communications services, including television broadcasting.

2.2.2.3 Satellites

41. Satellites have been used to broadcast television content to end users since the 1970s. On the uppermost part of the 12 GHz frequency range – 12.1-12.5 GHz – Iceland has been "allocated" a total of 13 satellite channels from a satellite dish located at 33.5°W and with a transmit beam that takes into account the lie of the land. Icelandic parties have not utilised satellite transmission to any substantial degree heretofore. However, two Icelandic television stations – RÚV and Omega – send broadcast content from satellites, and other television stations have experimented with satellite transmission.

2.2.3 From analogue to digital[16]

2.2.3.1 General

42. Digital television is a service that involves transmitting television signals in digital form to consumers. Computer technology is used to transform sound and images into digital data and compress them so as to minimise the number of bits in the television signal. This technology makes it possible to transmit more than one programme on the same bandwidth that is necessary to transmit a single programme in the analogue system. In its current state, this technology allows for the transmission of 4-6 programmes on one conventional television channel. Digital television transmission is not limited to a given transmission route, however; there are numerous possibilities for transmitting such television signals, both wireless and by wire. Digital television signals do not need a demarcated transmission route; therefore, it is possible, for example, to transmit them on the same network as that used for telephone and data transmission. When the signal has arrived at the user's premises, it is routed through an access box, or set-top box, that changes it to a form that can be received by the television set and steers the user's access to locked programming. Digital television offers better quality than does analogue television, as well as more flexibility and diversity of services offered.

43. The principal standards for digital transmission are DVB-C for cable networks, DVB-S for satellite, and DVB-T for air transmission. The user equipment, which differs for each of the three standards, enables users to choose from among the content offered, as well as enabling them to watch television stations' composite programming.

44. The Icelandic Government's Electronic Communications Strategy for 2005-2010[17] states that it is the intention to discontinue analogue television broadcasting no later than 2010.

2.2.3.2 Simplex and duplex systems

45. Digital broadcasts are sent via simplex or duplex systems. The wireless networks that are used today for television broadcasting are generally simplex systems. This means that the network can transmit content to the user but that the user cannot send data back. Thus the service is not interactive. For example, the user cannot place an order for specified services through the network.

46. Interactive digital television can be divided into two main categories: digital transmission with a return link[18] and a digital private channel[19] with a return link. In

[16] The primary source in the discussion of digital television is the legislative bill amending the Broadcasting Act, no. 53/2000, the Act on Printing Rights, no. 57/1956, and the Competition Act, no. 44/2005, with subsequent amendments. (Presented before Parliament at the 133rd legislative session, 2006–2007.) http://www.althingi.is/altext/133/s/0058.html

[17] See: http://www.samgonguraduneyti.is/media/Skyrsla/Fjarskiptaaetlun.pdf

[18] For example, DVB transmission with return link via telephone system

[19] For example, IPTV via ADSL or fibre optic cable.

order to transmit an order for content, there must be a route from the user to the service provider. This is easy to establish in cable systems but more problematical in air and satellite systems. If service in such systems is to be interactive, it is necessary to use a different route from the user to the service provider; for example, a telephone. Digital transmission offers a large number of television channels where users can choose to watch the available programming. By utilising the return link, service undertakings can dramatically expand their services; for example, they can sell access to films and sporting events that are broadcast at scheduled times, and they can offer access to a variety of services other than television programming.

47. A digital private channel differs from digital transmission in that, with transmission options such as fibre optic cable, xDSL and some digital cable systems, the number of channels with scheduled programming is technically unlimited. By the same token, the distribution systems have so much bandwidth that each user can, within certain limits, select video programming to suit his or her own taste instead of watching scheduled programming. In these systems, the supply of television programming is not limited by the frequency range; however, the number of television sets that can simultaneously view content received by this means is limited by the transmission capacity of the private channel. At present, it is possible to receive up to three descramblers per household. Users of private channels can select television programming such as films, television episodes, games, or music videos, and have them sent from a content broker in real time; therefore, the service is actually a digital video, audio, and game rental medium that can host an enormous selection of content. Such digital rental media give viewers the option of paying only for the content that they wish to see. Television users can select and control what they wish to watch and when. The television content is accessible to users for a specified length of time, and within that time frame they have full control over the content. Users can rewind, fast-forward, pause, and stop the programme.

2.2.3.3 Access box (set-top box) for digital television and conditional access system

48. Conventional analogue television sets cannot directly receive digital television signals; therefore, it is necessary to have a special access box, commonly called a set-top box, which transforms digital signals to a format that the television set can process. The software and hardware in the box is based on computer technology. As long as the box receives strong enough signals that it can distinguish between the values 0 and 1, a satisfactory picture will be seen on the screen; otherwise, no picture will be seen at all. Digital set-top boxes differ from the descramblers used for analogue television services. Descramblers merely open up access to the service the subscriber has paid for. However, decoding the television signals so that the user can view the content is only one of the functions of the digital set-top box. Set-top boxes differ technically, depending on which transmission route and/or frequency range is used to transmit the digital signal to the customer. It is not possible to use the same box for all types of distribution systems because of the various types of technology used; therefore, different boxes are needed for cable systems, satellite, air transmission, and ADSL.

49. In the beginning of digital television, government authorities placed significant emphasis on users' being able to use access boxes for various television providers so that they would not be forced to purchase multiple boxes. One such possibility is equipment that conforms to the multimedia home platform (MHP) standard, which enables users to watch a variety of television programming without having to have a special box for each station. The European Commission has supported the use of this standard but has not made its use obligatory. Disagreements among manufacturers and the high cost of MHP equipment have prevented this solution from becoming more commonly used. The price of an MHP box is roughly four times that of the least expensive box on the market. At first, these boxes cost tens of thousands of Icelandic krónur, but now they only cost a fraction of that amount. Most television providers that sell programming or subscriptions provide a box as part of the subscription package. Newly available on the market are access boxes with hard disks and boxes built into game computers, so ideas of a single standard are hardly viable.

2.2.3.4 Greater diversity of service offerings

50. Digital technology opens the possibility for a wide variety of new service offerings. Among the options that are already available or will likely be available soon are these:

Pay-per-View
With pay-per-view service, the viewer pays only for the programming that he wishes to see. This option can be used to offer films, sporting events, or television episodes.

Video-on-Demand
Video-on-demand can be offered on high-speed private channels, such as via fibre optic cable or ADSL.

Rebroadcast of foreign stations
With digital technology, it is possible to offer a far greater number of channels than before, and with digital private channels, the number of possible channels is technically unlimited.

Advertising and sales channels
It is possible to purchase goods directly via television, just as is done on the Internet today.

Leased channels
Because the number of channels is on the rise and they are becoming proportionally more accessible and less expensive, there is the option of leasing a television channel for a specified period of time.

E-mail, selected Internet pages, and various types of interactive service
It is possible to send e-mail and use chat lines such as MSN, view Internet pages, and use various types of interactive services, including online banking, information services, shopping, and games. Experiments in this area have not been very successful, however, as users generally elect to use a remote control device rather

than a keyboard to control the television set. The adaptation of Internet pages has not been very successful either, as pages generally available on the Internet are constantly becoming more complicated.

Distance learning and public services
With an increased number of channels and enhanced interactivity, it will be easy to offer distance learning and various types of public services via high-speed network connection.

Electronic Program Guide (EPG)
Electronic programme guides (EPG) are a key to users' being able to understand the services offered via digital television. EPG is a graphic user interface that provides information on the programming from all channels.

High-Definition Television (HDTV)
High-definition television can be offered via digital broadcasting networks. At present, however, such programmes require substantial bandwidth, and only a few are broadcast. Special television sets are required to receive high-definition broadcasting. A considerable proportion of households already have television monitors that can receive high-definition television in some form; therefore, the market is ready for the service when service providers, television stations, and distribution networks are able to provide it.

Personal Video Recorder (PVR)
Personal video recorders offer a wide range of possibilities, particularly for air distribution systems that cannot offer private channels. This type of user equipment makes it possible to delay viewing, record television programming for later viewing, skip over advertisements, etc. Technologically, it is also possible to offer popular films, games, and other entertainment via the user equipment.

2.2.3.5 IP television and Internet television

51. In addition to conventional television format (DVB), digital television is increasingly broadcast on the Internet's data transmission standard, Internet Protocol (IP). Broadcasting via ADSL and fibre optic cable uses the IP standard. The IP standard has an advantage over DVB in that the frequency spectrum is not used, and the number of channels is therefore technically unlimited.

52. Video content or television programming in IP format is also available via closed systems such as ADSL and fibre optic cable television, and the Internet is also being used in increasing measure to distribute such material. Icelandic broadcasting stations transmit free-to-air radio channels and portions of free-to-air television programming on the Internet. It is possible to purchase music directly via Internet, and in some locations abroad it is possible to purchase or rent films on the Internet as well.

2.2.3.6 Radio in a digital environment

53. Radio content can be broadcast in digital format. Experiments have begun in Iceland with digital transmittal of radio in the air, using the so-called DAB standard. In order to receive such broadcasts, users must have special digital receivers. These receivers are not yet in common use, as this means of broadcasting is still in the experimental stage and most radio stations still send by air in analogue form. Digital radio from numerous broadcasting stations is accessible in digital form on digital television networks and on the Internet.

2.3 Networks and market participants in Iceland

2.3.1 Content providers

54. It is possible to use the term *content providers* to describe parties that purchase service on the wholesale market for broadcasting transmission services to deliver broadcast content to end users. A characteristic of such undertakings is that they offer video and audio content that they must deliver to end users. Some of these operate their own distribution networks for this purpose, while others use other undertakings' networks and still others rely on a combination of these two options. Currently it is possible to divide content providers into the following broad categories: television stations, radio stations, video rentals, and retransmission of material from foreign stations. The largest content providers in Iceland are the Icelandic National Broadcasting Service (RÚV), 365, and Skjárinn. Smaller television stations include, for example, N4, ÍNN, and Omega. Several radio stations are operated by other parties, most of them with limited geographical broadcast coverage. The following is a discussion of the primary content providers currently operating on the Icelandic market.

2.3.1.1 The Icelandic National Broadcasting Service (RÚV)

55. The Icelandic National Broadcasting Service ohf. (RÚV) operates on the basis of Act no. 61/2007. RÚV is an independent limited company owned by the State. The role of the Icelandic National Broadcasting Service is to operate all sorts of broadcasting services in the public interest, including radio and television. This implies, among other things, that a wide variety of high-quality programming shall reach all Icelanders, that the fundamental principles of democracy and human rights shall be respected, that national values shall be cultivated, that content shall be selected in accordance with the needs of as many segments of the nation as possible, that impartiality shall be observed, that various types of cultural activities shall be supported, and that the necessary level of security-related services shall be provided.

56. The Icelandic National Broadcasting Service was established in 1930 and commenced broadcasting on 21 December of that year. During the first decades of its operation, RÚV broadcasts were transmitted on one radio channel. In the first year, radio broadcasting was only transmitted for a few hours each evening.

57. On 30 September 1966, the Icelandic National Broadcasting Service commenced television broadcasting. At first, televised material was broadcast only twice a week, on Wednesdays and Fridays, but soon the number of broadcast days

was increased to six, with no television broadcasts on Thursdays. Year-round television broadcasts began in 1983, whereas until that time the State television broadcasts were suspended during the month of July for summer vacation. On 1 October 1987, television broadcasting was increased to seven days a week.

58. In 1983 the Icelandic National Broadcasting Service began operating a second radio programme, Channel 2, which was intended to appeal to a younger audience than Channel 1.

59. RÚV had exclusive rights to television and radio broadcasting until 1985. It was operated as a State institution until 1 April 2007, when the company was formally changed to a public limited company wholly owned by the State.

60. The programming that the Icelandic National Broadcasting Service currently broadcasts is as follows:

Table 2-1: Icelandic National Broadcasting Service programming

Television	Radio
State Television	Channel 1
	Channel 2
	North Iceland Regional Radio
	West Fjords Regional Radio
	East Iceland Regional Radio

61. RÚV operates its own distribution network for its broadcasts but also utilises the networks of other companies. RÚV's programmes are also accessible on the Internet. RÚV television programming is offered on all networks that provide service to end users in Iceland.

2.3.1.2 365 Media

62. 365 Media is the largest media company in Iceland. It operates television and radio stations, as well as the Internet medium visir.is. The company is part of the conglomerate 365 hf., which includes companies in the media and entertainment markets. 365 hf.'s core operations are in two companies: media operations are under the aegis of 365 Media, and entertainment operations are in the hands of Sena. Sena is Iceland's largest company specialising in the production and distribution of entertainment materials. Its activities include music publishing and cinema operations, and it acts as an agent for a number of brand names in the fields of music, film, and computer games. Among the companies belonging to the conglomerate are D3 Media ehf., which operates the website tonlist.is, the largest domestic sales avenue for digital music, and SagaFilm, the nation's largest producer of television episodes, films, and advertising. 365 also operated the newspaper *Fréttabladid* and the distribution company Pósthúsid, but in October 2008 these companies merged with Árvakur, publisher of the newspaper *Morgunbladid*. As a result, 365 acquired a 36.5% stake in Árvakur. The agreement merging these companies was concluded subject to the approval of shareholders' meetings and the Competition Authority.

63. 365 was previously part of Dagsbrún, which operated both media and electronic communications activities for a period of time. In 2006, Dagsbrún was divided into two companies: the media company 365 and the electronic communications and information technology company Teymi. These companies constitute two separate conglomerates together with their subsidiaries. However, some ownership links between the companies do remain. Both companies were listed on the OMX Nordic Exchange until very recently. 365 was delisted from the exchange on 8 August 2008, and Teymi was delisted on 3 October 2008.

64. The principal media operated by 365 are the television station Channel 2, which is the largest privately operated subscription-based television station in Iceland, and the radio station Bylgjan. Among other media owned by 365 Media are Channel 2 Sport and Channel 2 Sport 2, which are subscription-based television stations dedicated to sports broadcasting, the television station Channel 2 Extra, and Channel 2 Bíó, which are included with subscriptions to Channel 2, and the radio stations FM 95.7, Létt-Bylgjan, and X-id 97.7. Table 2-2 provides an overview of the programming offered by 365.

Table 2-2: 365 programming

Television	**Radio**
Channel 2	Bylgjan
Channel 2 Sport	Léttbylgjan
Channel 2 Sport 2	Gullbylgjan
Channel 2 Extra	Nýbylgjan (web-based radio only)
Channel 2 Bíó	FM 95.7
Channel 2 Fjölvarp (rebroadcasting of foreign channels)	Xid 97.7
	BBC WC retransmission

65. 365's programming is broadcast on the networks of Og fjarskipti ehf. (Vodafone). In addition, its domestic programmes are broadcast on Síminn's networks. 365's radio stations are accessible on the Internet, as is a portion of Channel 2's television programming.

2.3.1.3 Skjárinn

66. Skjárinn ehf., or Íslenska sjónvarpsfélagid hf. (ÍS), commenced operations with the television station Skjár 1 approximately a decade ago and has broadcast free-to-air programming since its inception. Síminn acquired a majority holding in the company in 2004, at which time Síminn's television services, which consisted of retransmission from foreign stations, were merged with Skjárinn. Since then, Skjárinn has added video-on-demand via ADSL. Skjárinn and Síminn still belong to the same conglomerate, and interactions between the companies were subjected to specified conditions with Competition Council Decision no. 10/2005, which is discussed in

further detail in Section 5.7.2. Skjárinn's television services currently consist of the following:

Table 2-3: Skjárinn's television programming

Television
Skjár 1 (domestic programming)
SkjárHeimur (retransmission from foreign stations)
SkjárBíó (video rental - VoD)

2.3.1.4 Registered broadcasting stations in Iceland

67. Pursuant to Article 6, Paragraph 1 of the Broadcasting Act, no. 53/2000, broadcasts originating in Iceland are subject to a license issued by the Broadcast Licensing Committee, unless otherwise provided in Icelandic legislation, particularly the Icelandic National Broadcasting Service Act.

68. The Broadcast Licensing Committee publishes a list of all long-term licences for radio and television broadcasting on its website.[20] The following information from that list is categorised according to type of service and broadcast area. It is not a given that all broadcasting stations with valid licences are actually engaged in broadcasting activities at this time. Some stations have changed their call signs since the licences were issued.

Table 2-4: Long-term radio licences

Licence holder	Call sign	Valid from	Valid until	Distribution	Area
365 Broadcasting ehf.	Létt 96.7	24.02.2005	24.02.2010	Wireless	Entire country
365 Broadcasting ehf.	FM 95.7	24.02.2005	24.02.2010	Wireless	Entire country
365 Broadcasting ehf.	Gull Bylgjan	01.09.2003	01.09.2008	Wireless	Entire country
365 Broadcasting ehf.	Sirkus	01.01.2006	01.01.2013	Wireless	Entire country
365 Broadcasting ehf.	Bylgjan	01.01.2005	31.12.2009	Wireless	Entire country
Gudmundur Jónsson	KFM	04.11.2004	04.11.2009	Wireless	Entire country
Lindin multimedia	Lindin	09.02.2006	09.02.2009	Wireless	Entire country
XA-Radíó amateur association	XA-Radíó	10.06.2004	10.06.2009	Wireless	Reykjavík & environs and Akureyri & environs
Saga radio	Saga radio	21.10.2004	21.10.2009	Wireless	Reykjavík & environs, South Iceland, West Iceland, and Eyjafjördur area.
Icelandic Broadcasting Corporation Ltd.	KissFM 89.5	18.10.2006	17.10.2011	Wireless	Greater Reykjavík area
Icelandic Broadcasting Corporation Ltd.	XFM 91.9	18.10.2006	17.10.2011	Wireless	Greater Reykjavík area
Flensborg Upper Secondary School in Hafnarfjördur	Radio Hafnarfjördur (at Flensborg)	13.09.2006	12.09.2011	Wireless	Faxaflói Bay area
Hallbjörn Hjartarson	Country Town	24.06.2006	23.06.2011	Wireless	Húnavatnssýsla counties and Strandasýsla county

Source: Broadcast Licensing Committee

[20] www.utvarpsrettarnefnd.is

Table 2-5: Long-term television licences

Licence holder	Call sign	Valid from	Valid until	Distribution	Area
365 Broadcasting ehf.	Sýn	27.07.2003	27.07.2010	Wireless	Entire country
365 Broadcasting ehf.	Channel 2	25.08.2002	25.08.2009	Wireless	Entire country
Fasteignasjónvarpid ehf.	Fasteignasjónvarpid	25.10.2005	25.10.2008	Wireless	Entire country
I-info ehf.	TIC Tourist Information Ch.	01.04.2006	01.04.2009	Wireless	Entire country
Christian Missionary Church Omega	Omega	27.01.2002	27.01.2009	Wireless	Entire country
Skjárinn	Skjár einn	01.01.2004	01.01.2011	Wireless	Entire country
365 Broadcasting ehf.	Digital Iceland	19.04.2005	19.04.2012	Wireless	Greater Reykjavík area
365 Broadcasting ehf.	Children's Channel	19.04.2005	19.04.2012	Wireless	Greater Reykjavík area
365 Broadcasting ehf.	Pop-TV digital	19.04.2005	19.04.2012	Wireless	Greater Reykjavík area
365 Broadcasting ehf.	Pop TV	19.04.2005	19.04.2012	Wireless	Greater Reykjavík area
365 Broadcasting ehf.	Channel 2 Bíó	01.01.2006	01.01.2013	Wireless	Greater Reykjavík area
365 Broadcasting ehf.	Sýn 2	09.10.2003	09.10.2010	Wireless	Greater Reykjavík area
Flensborg Upper Secondary School in Hafnarfjördur	Television Hafnarfjördur	13.09.2006	12.09.2011	Wireless	Faxaflói Bay area
Samver hf.	Action	20.08.2005	20.08.2008	Wireless	Eyjafjördur area

Source: Broadcast Licensing Committee

69. Capacent Gallup publishes weekly statistics on listening and viewing of Icelandic broadcasting stations.[21] Table 2-6 shows the radio stations' market share of total listening among users aged 12-80 during Week 20 in the year 2008, according to measurements carried out by Capacent Gallup.

Table 2-6: Listening during Week 20 of 2008

	Market share %
Channel 2	36.4
Bylgjan	29.5
Channel 1	19.4
FM 95.7	8.6
X-id	2.4
Léttbylgjan	1.9
Gullbylgjan	1.6
Rondo	0.1

[21] www.capacent.is

70. Table 2-7 shows the television stations' market share of total viewing among users aged 12-80 during Week 20 in the year 2008, according to measurements carried out by Capacent Gallup.

Table 2-7: Viewing during Week 20 of 2008

	Market share %
State television	39.4
Channel 2	30.5
Skjár 1	14
Channel 2 Bíó	4.0
Channel 2 +	3.7
Channel 2 Sport	2.4
Skjár 1 +	2.4
Channel 2 Extra	1.6
Sjónvarpid +	1.4
Channel 2 Sport 2	0.2
Channel 2 Sport +	0.2
Channel 2 Extra +	0.1

2.3.2 Broadcast distribution systems in Iceland

2.3.2.1 RÚV distribution system[22]

71. RÚV operates its own nationwide network for one television station, two FM radio stations, and one long-wave radio channel.

72. The State television network consists of 180 television transmitters all over the country, which reach 99.9% of all Icelanders. These are UHF and VHF transmitters that transmit data in analogue form. The Icelandic National Broadcasting Service's transmitted television signal is an analogue signal in accordance with the PAL-B/G standard. Stereo audio broadcasts are in accordance with the Nicam-728 standard. Microwave links are used to transmit the signal to the main transmitter. Rebroadcast transmitters receive the signals from the main transmitter and forward it to the specified user area. In addition, Míla ehf.'s fibre optic cable network is used to transmit the signal to the rebroadcast transmitters in certain locations in Iceland. There are widespread alternate routes between transmitters, and these are used in case of malfunction. Transmission of signals via fibre optic cable takes place using MPEG-2 compression technology and goes in two opposite directions along the nationwide fibre optic cable ring, with automatic switching between transmission routes if it is interrupted. The operation of the network has been carried out in collaboration with Síminn, and now Míla, from the outset.

[22] Sources: www.ruv.is and www.fjarskiptahandbokin.is

73. RÚV owns one television transmitter in the series of transmitters that broadcast Fjölvarpid, etc., from the main broadcast location for microwave transmission in Öskjuhlíd. These broadcasts reach most locations in the greater Reykjavík area. At one time, this was conceived as a way to make it easier for users of microwave broadcasting to receive Icelandic National Broadcasting Service broadcasts.

74. The RÚV network is entirely in analogue form. For this reason, it only has the capacity to transmit its own programming. Therefore, RÚV cannot provide other broadcasting stations with wholesale access to its distribution network. In 2005, RÚV was allocated an authorisation for three UHF channels for digital television broadcasting; however, this network has not undergone any development as yet.

75. On 1 April 2007, the Icelandic National Broadcasting Service began broadcasting via satellite on State Television, State Radio Channel 1, and State Radio Channel 2. According to the Government Electronic Communications Strategy 2005-2010, the intention is to distribute this programming via satellite so as to use digital television and radio to reach seafarers and residents of sparsely populated areas who have not received satisfactory services. Agreements have been concluded with the Norwegian satellite company Telenor concerning distribution via the satellite Thor-2, which is located over the equator, at 0.8°W longitude. Because Thor-2 reaches the entirety of Northern and Central Europe, it offers Icelanders abroad the possibility of receiving RÚV programming. In order to receive such programming, viewers must have a satellite dish and a specific type of descrambler.

2.3.2.2 Vodafone/Digital Iceland

76. Og fjarskipti ehf. (Vodafone) is a broad-based electronic communications undertaking that offers, among other things, conventional telephone, mobile phone, and ADSL services. The company took over all of the distribution networks of 365 Media in 2006 and therefore operates television and radio networks today. The bulk of Vodafone's broadcasting transmission consists of 365's programming. Vodafone also offers subscription sales and delivery of descramblers through its retail stores.

77. Vodafone operates an analogue UHF/VHF network that transmits, among other things, the programming of 365, RÚV, and Skjár 1. This network reaches some 98% of all Icelanders.

78. Vodafone operates a digital television distribution system called Digital Iceland. In the southwest corner of the country, programming is sent out in digital form on the MMDS frequency range. This system was converted to digital form in 2005. Vodafone has a temporary authorisation to use this frequency range, but it is intended as a supplemental frequency range to be used for 3G if necessary. Vodafone controls 17 MMDS channels and can broadcast dozens of programmes.

79. Digital Iceland is also on the UHF frequency range. The authorisation to use two UHF channels was originally granted to 365 in the year 2005. That authorisation is valid for 12 years. The development of the digital UHF system was completed in 2007. The network reaches 98% of Icelanders, but whether one or two multiplexes are

available depends on geographical area. The system broadcasts 8 programmes on each multiplex.

80. Vodafone also offers access to television and radio via the Reykjavík Data Utility (GR) fibre optic cable network. Video-on-demand has been operated as part of Vodafone's interactive television services, via the GR fibre optic cable network, but it is still small in scope.

81. Vodafone owns and operates a nationwide FM radio distribution network for 365 Media. The structure of the system is similar to the television distribution system. Transmission of radio signals is leased from the Míla ehf. fibre optic cable network, from 365 Media's studio in Reykjavík to FM transmitters all over Iceland. All of the FM transmitters are owned by Vodafone.

82. Vodafone has operated ADSL services for several years. As yet, however, the company does not offer ADSL television services.

Figure 2-1: Structure of the Vodafone television network

Source: Vodafone[23]

2.3.2.3 Síminn and Skjárinn

83. For several decades, Síminn has collaborated with the Icelandic National Broadcasting Service (RÚV) on the operation and maintenance of RÚV's distribution systems. Síminn owned a number of the masts that contain television transmitters, as well as the transmission routes between transmitter locations; that is, fibre optic cables. Since the division of Síminn, Míla ehf. owns and leases out facilities in masts and access to the fibre optic cable network.

[23] http://www.vodafone.is/sjonvarp/digital

84. Síminn began offering television transmission via cable in 1998. The company began offering ADSL television in November 2004.

85. In 2003, Síminn began to offer digital television via its cable network. This is a network that consists of fibre optic cables lying into neighbourhoods and coax cables lying into individual users' premises. This network, which is operated under the name Síminn Breidband, has been used to offer dozens of channels via digital television. The Breidband network reaches over 35,000 households.

86. Since 2005, Síminn has emphasised ADSL television services. All households in the country are connected to copper local loops, and it is probably possible to provide roughly 95% of all Icelanders with ADSL services via copper local loops. Síminn's ADSL television transmission network reaches the vast majority of this group, or about 90%. The distribution system is therefore quite extensive, and the company has a considerable number of users of this service. Through this system, it is possible to gain access to most Icelandic television programming, as well as dozens of foreign stations. Because the television system is interactive, it offers access to the SkjáBíó video-on-demand system, selected Internet websites, etc.

2.3.2.4 Reykjavík Data Utility (GR)

87. Reykjavík Data Utility ehf. (GR) is a subsidiary of Reykjavík Energy (OR) and handles the operation of the fibre optic cable network. GR was established as a division within OR on 1 January 2005 and was changed into a limited liability company on 1 January 2007. GR's customers are both residential and non-residential users in OR's territory. GR offers both leased lines and access networks.

88. In 2005, GR concluded a contractual agreement with the City of Reykjavík concerning the installation of fibre optic cable networks reaching all homes in Reykjavík. The agreement stipulates that all households in Reykjavík shall be connected to the OR/GR fibre optic cable network by the year 2011. It was planned that approximately 7-10 thousand households per year would be added to the system until the ultimate goal was reached. There are a total of approximately 45 thousand households in Reykjavík. By year-end 2007, approximately 5,000 households were connected to the GR fibre optic cable network.

89. It is not GR's aim to operate fibre optic cable services but rather to provide an open network to which other parties can purchase access. It is possible to broadcast television programming to end users via fibre optic cable, and today it is possible to purchase access to Vodafone's television distribution system via this network.

2.3.2.5 Íslandsmidill

90. The company Íslandsmidill built up a wireless network for digital television broadcasting. The network is based on satellite technology that is used in terrestrial transmitters. Programming is transmitted on the 12 GHz frequency range according to the satellite standard DVB-S, using small dishes to receive the transmissions.

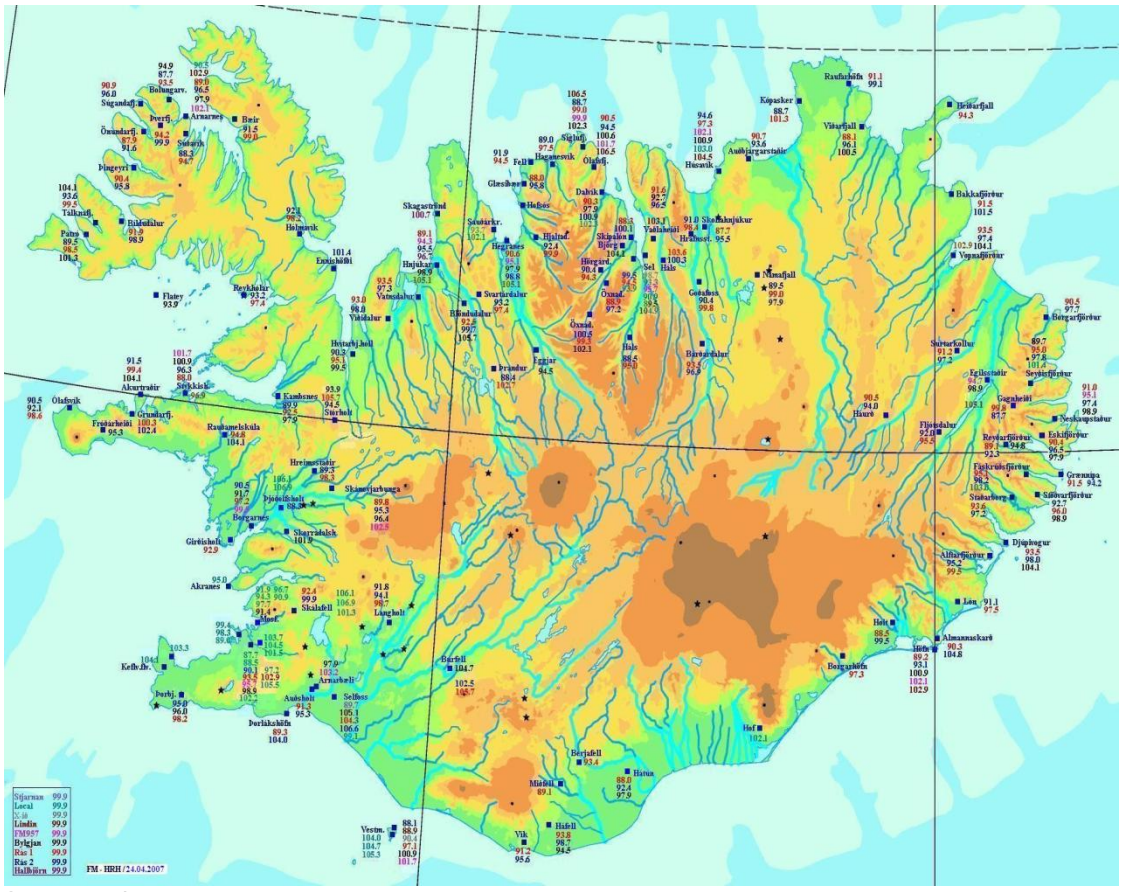
Broadcasts from the network are received in the southwest corner of Iceland and in Eyjafjördur fjord. It appears as though the company has discontinued operations, however, as no information about it can be found on the Internet or in the telephone directory.

2.3.2.6 Other distribution systems

91. Other distribution systems in the country, which are local FM and UHF/VHF networks, are analogue systems that carry only their own programmes.

92. Below is a map that shows the frequencies/channels and locations of all FM radio transmitters. The map shows that most of the transmitters are in the southwest part of Iceland, an and around the greater Reykjavík area. There are also several FM transmitters in North Iceland, near Akureyri.

Figure 2-2: Map showing the location of all FM radio transmitters



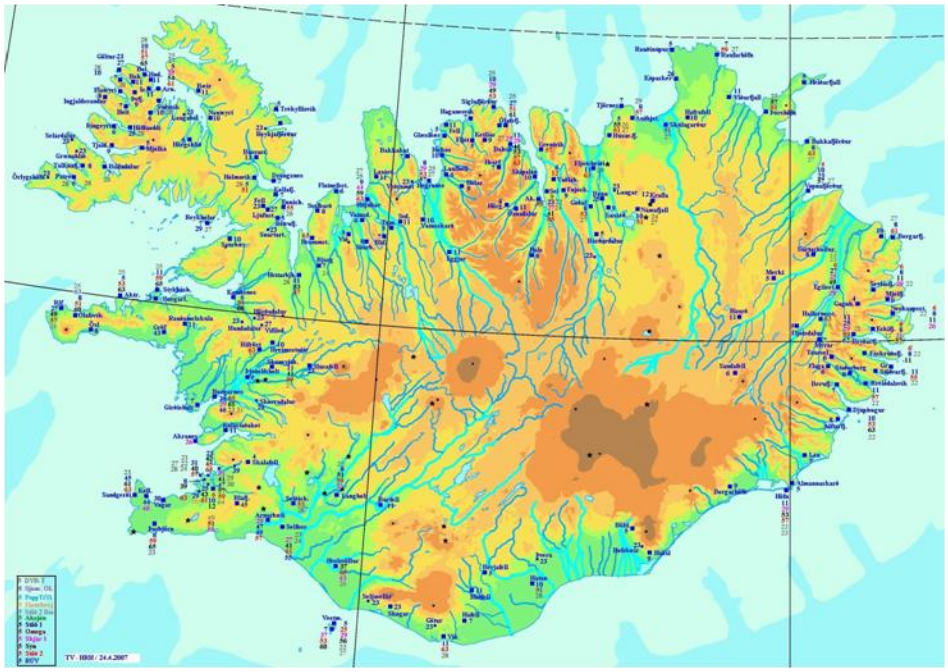
Source: PTA

93. Most radio stations are in the greater Reykjavík area. The following is a list of radio transmitters in the greater Reykjavík area and environs.

Licence holder	Programming	Location of transmitter	Frequency (MHz)
RÚV	Rondó	Vatnsendi	87.7
XA-Radíó áhugamf.	XA Radíó	Vatnsendi	88.5
Hans K. Kristjánsson	Radio France	Borgarspítali	89.0 (foreign rebroadcast)
RÚV	Channel 2	Vatnsendi	90.1
Og fjarskipti ehf.	Talstödin	Vídines	90.9
Og fjarskipti ehf.	Bylgjan	Vídines	91.4
RÚV	Channel 1	Skálafell	92.4
RÚV	Channel 1	Girðisholt	92.9
RÚV	Channel 1	Vatnsendi	93.5
Og fjarskipti ehf.	BBC	Vídines (foreign rebroadcast)	94.3
Akraneskaupstaður	RadioAkranes	Akranes	95.0
Og fjarskipti ehf.	FM 957	Vatnsendi	95.7
Og fjarskipti ehf.	Létt 967	Víðines	96.7
Flensborg	Radio Hafnarfj.	Vatnsendi	97.2
Og fjarskipti ehf.	X-id	Vatnsendi	97.7
Hans K. Kristjánsson	(Political meetings, etc.)	Borgarspítali	98.3
Og fjarskipti ehf.	Bylgjan	Vatnsendi	98.9
Útvarp Saga ehf	Saga	Hús verslunarinnar	99.4
RÚV	Rás 2	Skálafell	99.9
Reykjavík FM ehf	Reykjavík FM	Geithals	101.5
Og fjarskipti ehf.	Barnarásin	Vatnsendi	102.2
Kristileg fjölmiðlun	Lindin	Vatnsendi	102.9
Kristján Friðbergsson	3ABN	Rjúpnahaed (foreign rebroadcast)	103.7
FL Media ehf	Flass 104.5	Geithals	104.5
Bodunarkirkjan	RadioBodun	Vatnsendi	105.5

94. The map below shows frequencies/channels and the location of all UHF and VHF television transmitters.

Figure 2-3: Map showing the location of all UHF/VHF television transmitters



Source: PTA

95. No Icelandic company offers wholesale radio transmission via satellite. Icelandic radio stations can negotiate with foreign satellite companies for distribution in this country. This option is rarely used, however, as it is costly for both radio station and end user. Two broadcasting stations, RÚV and Omega, have their programming distributed by satellite. Both stations broadcast on the Thor II satellite, and Omega also broadcasts on Eurobird.

2.3.3 Coverage and use of television distribution systems

96. PTA has compiled information on television distribution system coverage in Iceland. The Administration has also sought to compile information on the number of users in each distribution system, but data on number of users is difficult to obtain, partly because some sub-groups of users watch only free-to-air programming and therefore do not need to subscribe. However, PTA believes it can estimate with reasonable accuracy the proportion of users of each distribution system. Satellite transmission is not included in the accompanying table. Some users watch foreign television stations that are transmitted by satellite, but it is impossible to compile data on their numbers. Such usage is almost always supplementary to other television services that the households concerned receive from domestic systems. A small fraction of Icelanders – likely less than 1% – use satellite transmission of RÚV's digital broadcasting.

Table 2-8: Coverage and use of distribution systems[(*)]

Television distribution system	Possible connections	Active users
RÚV analogue	99.9%	20-30%
Vodafone analogue	98 %	20-30%
Vodafone digital	98.6%	35-45%
Síminn (broadband/ADSL)	90%	30-40%
Fibre optic cable network	5%	0-5%
Íslandsmidill (KU frequency band)	65%	0%

(*)Figures are estimated from information compiled by PTA in 2007 on the number of possible connections and the number of digital descramblers. For simplification, it is assumed that each household uses only one method of television reception, except for analogue reception.

2.4 Technological developments

97. As has already been stated, the options for distributing digital radio and television programming are constantly increasing in number. Only a few years ago, all broadcasting was in analogue form, and only a specified frequency range could be used.

98. Today at least three means of broadcasting television programming are widely used: analogue UHF/VHF networks, digital wireless UHF/VHF/MMDS networks, and ADSL television. Fibre optic cable connections are still relatively few, but they increase somewhat in number each year. The Síminn Breidband is still in use.

99. New types of networks, such as third-generation mobile networks and wireless access networks like WiMax, can carry television broadcasting. However, they are not used widely for television broadcasting as yet.

100. However, the trend appears to be that most electronic communications networks can carry at least three types of service; that is, telephone, Internet, and television. In the future, this could mean that content providers and end users will have a relatively large number of choices for the transmission and reception of televised material.

2.5 Access to the market

101. It is not necessary to obtain a special licence from the authorities to operate a fixed-line network that can distribute television programming. It is sufficient to report such operations to PTA.

102. In order to operate a wireless network, it is necessary to obtain a frequency allocation from PTA unless such operations use open frequency ranges. The principal frequency ranges that can be used for radio and television distribution are not open; therefore, it is necessary to apply for an authorisation to use them.

103. When television broadcasting was solely in analogue form, there was a shortage of television channels in the greater Reykjavík area. It was only possible to broadcast one programme on each channel, and it was only possible to use every other channel because of the risk of interference.

104. With the advent of digital television, there is no longer a shortage of frequencies under the current circumstances, and it is not foreseeable that there will be a shortage in the near future. It is possible to use channels in between analogue channels, and a greater number of programmes can be accommodated on each channel, so utilisation is more efficient. Analogue broadcasting will probably be discontinued around the year 2010, and this will free up more channels.

105. The UHF frequency range extends from 470-862 MHz (392 MHz bandwidth), for a total of 49 television channels (8 MHz/channel). This is a conventional frequency range for television and is fully utilised in the greater Reykjavík area for analogue broadcasting. In analogue broadcasting, only every other channel is used due to the risk of interference. On the other hand, it is considered possible to transmit in digital form on unused channels between those that are used for analogue broadcasting. At present, there are approximately 15 channels that could be used in this manner. Five of these have been allocated to RÚV and Vodafone.

106. The VHF frequency range for television is in the range of 174-230 MHz (channels 5 – 12). Because of the way the use of this frequency range is currently structured, it is not as easy to use it for simultaneous digital and analogue broadcasting as it is with the UHF frequency range. Also important is the fact that each VHF channel is only 7 MHz, while each UHF channel has a bandwidth of 8 MHz. However, it can be expected that channels in this frequency range will become

available in the next few years, when analogue television broadcasting is discontinued.

107. As regards the UHF/VHF frequency ranges, it should be mentioned that, pursuant to Article 6, Paragraph 4 of the Broadcasting Act, no. 53/2000, it is prohibited to retransmit the entire programming of foreign television stations by other means than by wire and/or microwave. The UHF frequency range for television is not considered microwave,[24] as this provision was set in order to guarantee that the conventional UHF and VHF television channels in the range would not be allocated to the retransmission of foreign programming at the expense of Icelandic programming. It should be assumed that an undertaking that offers digital television services and has the opportunity to access dozens of channels must rely on foreign programming to some extent; therefore, UHF cannot be a comprehensive solution for such an entity if current legislation remains unamended. A legislative bill amending the Broadcasting Act, no. 53/2000, the Act on Printing Rights, no. 57/1956, and the Competition Act, no. 44/2005, with subsequent amendments, was presented to Parliament at the 133rd legislative session in 2006-2007. The bill included a number of provisions, among them the revocation of this particular provision, but it was not passed.

108. On the 12 GHz frequency range, 300 MHz of 1800 are currently allocated. The remaining 1500 MHz could carry 750-1100 television programmes.

109. No one has applied for the authorisation to use the multimedia frequency range (MWS)[25] (40 GHz) to broadcast television programming in Iceland. This frequency range has space for 1,500 to 2,200 television programmes.

110. The MMDS frequency range extends from 2500-2684 MHz (184 MHz bandwidth), for a total of 23 television channels (8MHz/channel). Of these, 21 have been considered useable for broadcasting in Iceland. It has been decided in the international arena that the 2500-2690 frequency range shall be used in the future for third-generation mobile phones.[26] Vodafone has controlled 16 channels 128 MHz), while RÚV, Omega, and Skjárinn have one each. At present, two channels are unallocated.

111. There is no shortage of frequencies for radio broadcasting. In the greater Reykjavík area, there is considerable density, but not enough to cause a shortage of frequencies. There is a much greater number of available channels elsewhere in the country.

112. One fixed-line network is connected to all households in the country – Míla ehf.'s copper local loop network – and the GR fibre optic cable access network is still under development. Given the small size of the market, it is not likely that other undertakings will engage in the large-scale development of a fixed-line network. On the other hand, other electronic communications undertakings can obtain access to the existing networks. Míla is under obligation to offer access to its local loop network,

[24] Microwaves are frequencies above 890MHz. See, for example, Fink & Carroll, Standard handbook for electrical engineers, 10th edition, McGraw-Hill, 1968, Sec 15-101a.
[25] Multimedia Wireless Service
[26] See ECC DEC (02)06, PTA Accompanying Document no. 7.

and it is GR's stated policy to grant other electronic communications undertakings access to its fibre optic cable network. Other undertakings have acquired the equipment necessary to provide Internet service on these networks, but as yet no operator except Síminn has acquired the equipment necessary to broadcast television programming on the copper local loop network.

2.6 Cost to users

113. The costs incurred by users vary in accordance with the broadcast systems to which they are connected. There is a difference in user fees charged, as well as a difference in the cost of the equipment needed to receive broadcast content.

114. In order to receive analogue broadcasting by air, the user needs only a receiver and an antenna. Conventional UHF or VHF antennae can be found in most households in the country. However, there are instances where antennae have been prohibited in certain neighbourhoods, such as the newer neighbourhoods in Hafnarfjördur. This prohibition was subsequently lifted, but few antennae have been set up in locations where antenna use was not originally planned. Households that have antennae and receivers can receive analogue television broadcasting without any other equipment and without paying any special fees for access to the broadcast system concerned. However, all television set owners must pay a user fee of ISK 2,852 per month to RÚV. With Act no. 6/2007, the fee structure was changed effective 1 January 2009, from which time taxable individuals and legal entities will be required to pay the fee. The fee will be ISK 14,580 per year, per individual and legal entity. At present, the fee for radio use alone is ISK 856 per month. In order to receive locked subscription channels from 365 Media via analogue broadcast, users must have a descrambler that is available from Vodafone. Leasing of descramblers is included in the subscription price.

115. In order to receive digital broadcasting by air, users must have, in addition to a receiver and an antenna, a digital access box that receives the television signal and changes it to a form compatible with the receiver. In addition, the box steers access to locked channels. Subscribers to 365's broadcasting programmes receive this equipment at no extra charge. Non-subscribers can lease an access box for ISK 679 per month in order to watch free-to-air programming. Vodafone broadcasts on the UHF and MMDS frequency ranges. In order to receive MMDS broadcasting, a microwave antenna is required. Such antennae did not exist in Iceland until the Icelandic Broadcasting Corporation Ltd (now 365) commenced operation of its MMDS system in 1993, but a considerable number of users in Southwest Iceland have set up these antennae during the time that this system has been in operation. A UHF antenna is necessary for reception of UHF broadcasting. In regional Iceland, most households have such antennae, but most antennae in the greater Reykjavík area are for VHF reception.

116. In order to receive television and radio broadcasting through Síminn's ADSL system, the user must purchase an ADSL connection from Síminn. The least expensive subscription packages for such connections cost approximately ISK 4,000, which includes an ADSL connection and Internet service. Users can purchase such packages from Síminn or from Internet service providers that resell Síminn's ADSL

connections. Customers receive an ADSL descrambler at no extra charge. Users can watch free-to-air programming or purchase programming by subscription from 365 or Skjárinn's video-on-demand service, and they pay the providers directly for such use.

117. Users that receive television via Síminn Breidband pay ISK 600 per month for a descrambler. If the user purchases a subscription to Skjárinn programming, the basic fee is included in the subscription charge.

118. In order to receive television broadcasting via the GR fibre optic cable network, the user must pay a fixed monthly fee of ISK 2,390 for the connection. In addition, the user must pay for a digital descrambler, either separately or as part of a subscription package.

2.7 Costs incurred by content providers

119. The Post and Telecom Administration has not become aware of any disputes concerning the fees that content providers must pay to distribution networks for their services.

3.0 Further definition and demarcation of service markets

3.1 Market 18 as defined in the ESA Recommendation

120. PTA's point of departure in its definition of the wholesale market for broadcasting transmission services to deliver broadcast content to end users is the definition found in the ESA Recommendation. This market corresponds to Market 18 in the ESA Recommendation. However, PTA considers it necessary to examine this definition in terms of circumstances reigning in Iceland and to determine whether it is necessary to depart from the definition in the Recommendation.

121. Because the market under scrutiny is an electronic communications market, it is necessary to distinguish between service that entails transmitting signals (the actual electronic communications service) and the service that entails offering broadcast content and controlling access to it.

122. The Recommendation distinguishes between the retail and wholesale markets. One wholesale market for broadcast distribution is defined as:

> *Broadcasting transmission services to deliver broadcast content to end users.*

123. In the Explanatory Note accompanying the corresponding Commission Recommendation, the market is described as follows:

> *Broadcasting transmission services and distribution networks in so far as they provide the means to deliver broadcast content to end users.*

124. The Recommendation allows for the possibility that it will be necessary to divide the market into a number of sub-markets based on how service is rendered and what sort of networks are used. The following points, among others, could be important in an assessment of whether it is appropriate to distinguish among different service markets:

- Whether there is genuine substitutability between the broadcasting services offered in the various systems, in terms of price and content.
- Geographical coverage and access to different broadcasting systems.
- Whether users in general, or a large proportion of them, can switch between broadcasting systems.
- The existence and coverage of digital broadcasting systems.

125. According to the Recommendation,[27] related services, such as conditional access systems, electronic program guides, and application program interfaces are not part of this market, but according to Articles 5 and 6 and Annex I to the Access Directive, no. 2002/19/EC, it is possible to require that all those operating such systems provide access to them on reasonable and appropriate terms and without discrimination.[28]

126. The definition in the Recommendation is objective with respect to technology and refers to broadcasting via wireless network, fixed-line network, and satellite. Neither is any distinction made between analogue and digital technology. This market covers broadcasting of both radio and television content. The market should be defined in terms of the service, irrespective of the means of transmission used. If the types of service all have the same characteristics vis-à-vis content providers and end users, then they belong to the same market. If not, it is necessary to examine whether there is reason to subdivide the market.

127. The following sections contain PTA's assessment of substitutability among the various broadcasting systems based on the retail and wholesale segments of the market for transmission of broadcast content. The objective of the assessment is to determine whether all of the means of transmission belong to one and the same market or whether it is necessary to distinguish among individual sub-markets.

3.2 The boundaries between broadcast transmission and leased lines

128. In general, it is possible to use leased lines to transmit any type of signal, including broadcast signals. Leased line services can be based on various types of technology and various networks, such as fibre optic cables, copper lines, and wireless connections. Leased line connections can be both analogue and digital. The market for transmission of broadcast content is tangent to the leased line market. As is described in Section 2.2.1, broadcast transmission networks can be divided into four

[27] Explanatory Memorandum, Section 4.4.
[28] Cf. PTA rules on conditional access systems, no. 570/2006, which are discussed in Section 5.4.

segments: contribution networks, feeder networks, trunk networks, and access networks. Contribution, feeder, and trunk networks often take the form of fibre optic cable connections or some other type of fixed connection, either wireless or by wire. Undertakings engaged in broadcast transmission may own such connections themselves or may lease them from electronic communications undertakings. PTA is of the opinion that, in these instances, there is substitutability between connections set up as part of a broadcasting distribution system and general leased line connections. A broadcast transmission company can easily discontinue use of a special broadcast transmission connection and can obtain a leased line instead, and an operator of leased line connections can easily equip leased lines for broadcast transmission. Therefore, PTA is of the opinion that the first three parts of broadcast distribution systems belong to the markets for leased lines – either the retail or the wholesale markets, as appropriate. The access part of a broadcast distribution system that is intended to provide broadcast content to end users, however, is not comparable to leased line service, and it is this part of the network that belongs to the wholesale market for broadcasting transmission services to deliver broadcast content to end users.

3.3 Internal and external business

129. In accordance with the Recommendation and conclusions of the Commission, the relevant market is defined as a wholesale market. Three undertakings are the largest operators in this market: Síminn, Vodafone, and the Icelandic National Broadcasting Service ohf. All of these companies are vertically integrated undertakings; that is, they operate their own networks and provide services at the retail level. Use of these companies' broadcast distribution systems belongs to the relevant market, whether such use involves wholesale sales to unrelated parties, sales to related undertakings, or use that takes place entirely within the company itself.

3.4 Assessment of substitutability

3.4.1 General

130. A market consists of products or services that are sufficiently substitutable for one another. 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).[29]

131. 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. 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 competition is made with the

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

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

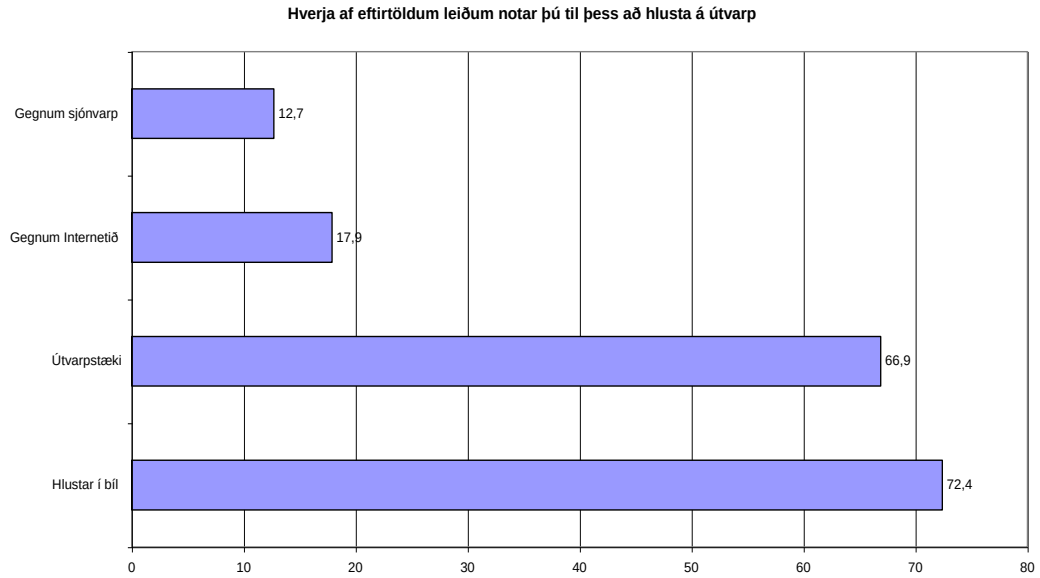
132. In this analysis, the assessment of substitutability takes several factors into consideration. First of these is whether radio and television can be considered to belong to the same market at the retail and/or the wholesale level. Second, it examines whether the various means of distribution – that is, wireless terrestrial systems, fixed-line networks, and satellites – can easily substitute for one another. The third factor under scrutiny is whether analogue and wireless distribution can be considered substitutable services. Fourth, consideration is given to whether there is reason to distinguish between local and nationwide service. These criteria are examined from the point of view of end users, content providers, and transmission network operators.

3.4.2 Radio and television services

133. It is unlikely that end users will consider radio and television to be substitutable products, given the vast difference in the content that is broadcast on these two media. PTA assumes that the end user listens to the radio or watches television to meet distinctly different needs. Listening to the radio involves listening to spoken language or music, while television involves simultaneous listening and viewing. Among the content that viewers watch most often on television are television episodes, films, and athletic events, while music predominates among radio materials.

134. Another factor that distinguishes radio from television is where and how consumers use these services. It is very common that users listen to the radio in automobiles or by means of other mobile devices, while television viewing takes place largely within the home, using equipment that is permanently connected to the network in question.

Figure 3-1: Radio reception options



Source: Survey carried out by Capacent Gallup for PTA in September 2007

135. The costs incurred by users for radio and television services vary as well. The equipment needed for television reception is much more expensive than is radio equipment, and a large portion of television programming is sold by subscription, while radio programming is available at no charge, with the exception of the RÚV user fee, which remains in effect through the current calendar year.

136. For the above reasons, it is virtually impossible that end users will consider radio and television to be substitute services.

137. From the wholesale point of view, television and radio broadcasting are, in general, too different to be considered mutually substitutable. A seller of television content cannot have its materials transmitted by distribution systems that can only broadcast radio content, and a radio station cannot use a television network as its primary distribution channel, in part because the programming in question would not reach the largest audience: those who listen to the radio while driving. For operators of the systems that can only carry one service or the other, it is costly to change the system so as to allow it to carry the other. On the other hand, digital systems are generally conducive to the transmission of both radio and television content.

138. Conditions vary for radio broadcasting via terrestrial wireless systems, on the one hand, and via satellite and fixed-line systems, on the other. In wireless systems, there is a clear distinction between radio and television in analogue systems, and in digital systems, the distinction centres, among other things, on the various options users have for receiving broadcast content. Satellites and fixed-line networks can distribute both radio and television content. In receiving content via satellite and fixed-line network, the user is generally limited to listening or viewing within his own home. This is true of both television and radio. Another factor that must be borne in mind is that the user purchases such connections in a single package and does not have the option of selecting only one type of service.

139. In view of the above discussion of the boundaries between radio and television services, PTA concludes that broadcasting transmission services for radio and television constitute two separate markets in the context of terrestrial wireless systems, but that there is no reason to separate the two services when examining satellite and fixed-line networks.

3.4.3 Further subdivision of radio services

140. Radio broadcasting is transmitted on all three types of networks described here; that is, wireless, fixed-line, and satellite. On wireless networks, broadcasting content is transmitted in analogue or digital form. Some radio broadcast systems are national in scope, while others are local. It is necessary to examine whether these factors make it necessary to distinguish among various service markets for radio broadcasting.

141. Wireless radio broadcasting is distinctly different from fixed-line broadcasting because the former can reach a much larger audience. According to the previously mentioned survey carried out by Capacent Gallup for PTA, only 12.7% of Icelanders

listen to radio content via television system and 17.9% listen on the Internet, while 72.4% listen while driving and 66.9% listen to radio equipment, much of which is mobile. Therefore, PTA is of the opinion that wireless transmission of radio content does not belong to the same market as does radio content transmission via wire.

142. In part, broadcasting via satellite has the same properties as fixed-line broadcasting, in that reception generally takes place through a fixed network termination point. Satellite broadcasting is much more expensive, however, and no Icelandic radio station used such service until RÚV began doing so in 2007, with financial backing from the Electronic Communications Fund (Fjarskiptasjódur). Therefore, broadcasting by satellite is probably a separate market.

143. No permanent licences for digital radio broadcasting (DAB) have been issued in Iceland, and no development of such systems has begun. The only broadcasts have been done on an experimental basis. PTA believes the DAB radio broadcasting system will not have become common during the time horizon for this analysis. Apart from the fact that development of these systems has not yet begun, it is likely to begin very gradually, as receivers for this form of broadcasting are not in common use. An important factor in this context is that, as yet, radio receivers in automobiles sold in Iceland are only equipped for analogue reception. Therefore, PTA does not consider it appropriate at this time to take a position on whether DAB radio broadcasting is a separate market or not.

144. The largest radio stations in Iceland – Bylgjan, Channel 1 and Channel 2 – have nationwide coverage. The vast majority of local radio stations are located in Southwest Iceland and therefore reach about half of all Icelanders. There are very few local radio stations elsewhere in the country. In view of the fact that there are few radio stations with small market areas, PTA sees no reason to subdivide the service market for radio station coverage into local and national service.

3.4.4 Separation of digital and analogue television

145. For users, there are various differences between digital and analogue television broadcasting. There is some difference in broadcast quality, but it is not a given that this will be a decisive factor except where the conditions for analogue reception are not good enough.

146. If a user wishes to use his television only to watch free-to-air programming, the difference in costs is that those wishing to receive digital television broadcasting without subscribing to locked programming must pay a user fee for a set-top box in order to watch the broadcasts. That fee is ISK 679 per month for Vodafone customers and ISK 600 for Síminn Breidband. The set-top box for Síminn's ADSL television service is included in the ADSL subscription, but users can only make use of this option if they purchase an ADSL connection from Síminn.

147. Digital broadcast systems can transmit far more programming than analogue systems can, and if a user wishes to subscribe to a large number of programming offerings, he must connect to a digital system. From the user's point of view, it must

be considered unlikely that there is substitutability between digital and analogue television broadcasting systems, as their characteristics differ in many respects.

148. Television stations that must transmit one programming schedule can do so on either an analogue system or a digital system. In general, either type of system can reach the majority of users in Iceland, and it is possible to achieve acceptable broadcast quality from both. However, it is unlikely that a television needing to choose a broadcast method would opt for analogue transmission. If a television station were to request to use another station's analogue system, it would hardly be possible, as such systems can only carry one programme at a time. All analogue systems in the country are intended for certain television programming; therefore, there is no room to add other programming except during a part of the day not currently used for broadcasting. It should also be borne in mind that licences for broadcasting on analogue channels are issued for specified programming. If a television station wished to build its own transmission network, it is virtually a given that it would choose a digital system because it is not economically feasible to invest in an analogue system that would probably have to discontinue operations in two years' time, according to the Government strategy for electronic communications affairs. A television station that distributes its programming in analogue form today could elect to switch to digital broadcasting, but the reverse is not true. Therefore, PTA considers that, at this time, there is limited substitutability between analogue and digital television broadcasting systems from the standpoint of television stations.

149. From the viewpoint of the network operator, it is clearly possible from a technical point of view to convert analogue systems to digital systems. This has been done with Vodafone's MMDS system. Vodafone also built up a digital system on the UHF frequency range alongside the previously existing analogue system. Síminn converted its Breidband television system from analogue to digital. However, such conversions are costly. For example, RÚV has not yet been able to utilise the frequency allocation it received for digital UHF broadcasting because of the cost involved. Today, no operator would change its network from digital to analogue. Therefore, the conclusion regarding supply-side substitutability is that it exists to some degree but is subject to considerable limitations, including cost restrictions, if the system is large in scope.

150. In view of the above, PTA considers that analogue and digital television broadcasting do not belong to the same service market. This is primarily meaningful with respect to wireless terrestrial systems, as most other transmission is now digital.

3.4.5 Separation of television broadcasting via wireless network, fixed-line network, and satellite

151. Satellite broadcasting is unique in that television stations' transmission costs are high and users' reception equipment is expensive in comparison with other options. Satellite broadcasting can have characteristics similar to those of wireless terrestrial networks. Satellite broadcasts are digital and can carry many programmes. They are limited by the fact that the satellite dish must be within the satellite's line of vision, which means that there are dead spots in the broadcast area where the connection cannot be made. Satellite broadcasting has proven too costly for Icelandic

television stations and are generally not used by them. The only stations that use this option are RÚV's stations, which are subsidised by the Electronic Communications Fund, and Omega, or the Gospel Channel, whose market area extends far beyond Iceland. PTA is of the opinion that television broadcast via satellite does not belong to the same service market as broadcast via wireless terrestrial network or fixed-line network.

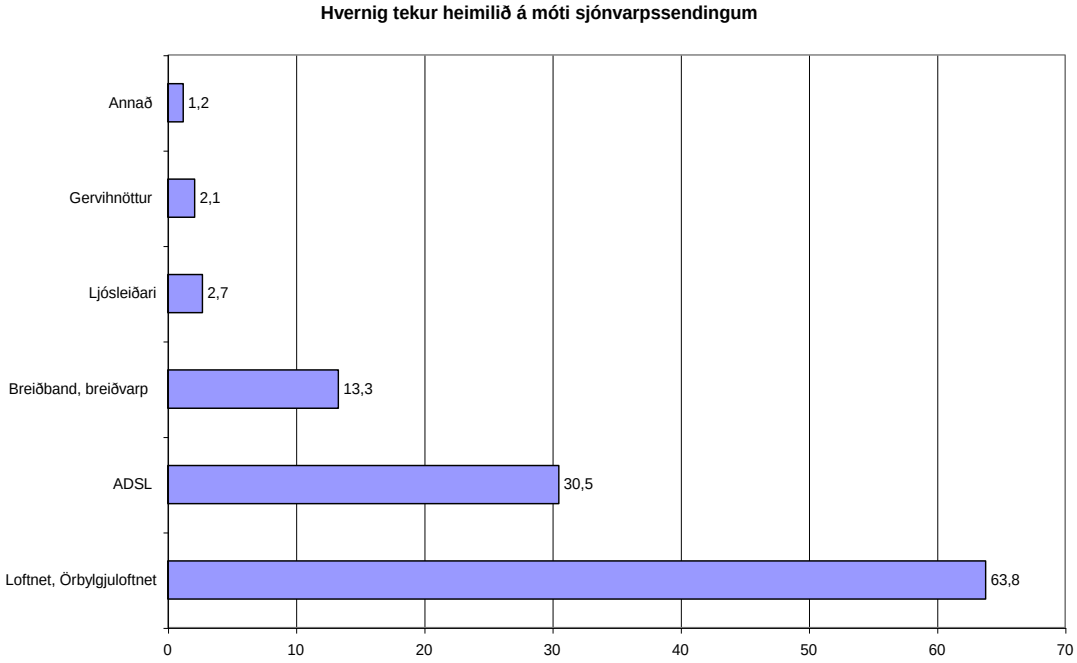
152. The next step is to examine whether there is substitutability between wireless terrestrial networks and fixed-line networks. PTA is of the opinion that analogue transmission via fixed-line network is so rare in Iceland today that there is no need to examine this option specially in this analysis. That being the case, wireless networks such as UHF/VHF are the only analogue broadcast option in use to any extent today. Because PTA concluded in Section 3.4.4 that analogue and digital television broadcasting did not belong to the same market, analogue television broadcasting via wireless terrestrial networks is a separate service market.

153. Digital transmission on wireless networks and fixed-line networks have a number of parallels, but there are also several characteristics that distinguish them from one another. The parallel items from the consumer's viewpoint include similar broadcast quality, the capacity to carry numerous programmes, and the accessibility to the vast majority of Icelanders.

154. What distinguishes digital broadcasting via wireless network from digital fixed-line broadcasting is the interactivity of the fixed-line systems. Fixed-line systems such as Síminn's ADSL network and the GR fibre optic cable network have a return link from the user, which can be used to order the material the viewer wants. The user has a private channel that he uses to access the material, and as a result, the number of channels is theoretically unlimited. On a fixed-line network, it is possible to offer video-on-demand, which is not possible on the wireless networks in operation today. The cost of connecting to these networks varies. Although the cost of connecting to Síminn Breidband is similar to that for Vodafone's UHF/MMDS network – between ISK 600 and 700 per month – viewers wishing to connect to ADSL television must purchase ADSL service, which costs a minimum of ISK 4,000 per month. Connecting to GR's fibre optic cable network costs ISK 2,390 per month.

155. From the standpoint of content providers, these broadcast methods are parallel if the content provider intends only to offer conventional television programming with no interactivity. A television station that wants to broadcast or re-transmit numerous programmes, however, cannot be sure of obtaining space on wireless networks, as there is a limit on the number of channels. Content providers cannot offer video-on-demand via wireless network. Domestic television stations actually need to be broadcast on both of these networks, as large groups of viewers are connected to one or the other, as is shown in Figure 3-2. Whether a television station bases its revenues on subscription sales or advertisement sales, or is obliged to provide public service, it is important that it be accessible on as many systems as possible so that it can reach a maximum number of users.

Figure 3-2: Television reception options



Source: Survey carried out by Capacent Gallup for PTA, September 2007 NOTE: No distinction was made between digital and analogue broadcasting in the survey.

156. An undertaking that operates a wireless network cannot easily adapt its operations for fixed-line network transmission, nor can an undertaking operating a fixed-line network system easily adapt its operations to wireless transmission. Therefore, there is no supply-side substitutability between these types of service.

157. Given how many dissimilarities there are between wireless networks and fixed-line networks, PTA concludes that wireless digital television transmission does not belong to the same service market as digital fixed-line television transmission.

3.5 Conclusions on service market definition

158. The summarised conclusion on the boundaries between service markets, based on the discussion in the above sections, is that PTA considers it appropriate to define the following wholesale markets for broadcasting transmission services to deliver broadcast content to end users:

1) Broadcasting transmission services for analogue radio via wireless networks
2) Broadcasting transmission services for analogue television via wireless networks
3) Broadcasting transmission services for digital radio and television via wireless networks
4) Broadcasting transmission services for digital radio and television via fixed-line networks
5) Broadcasting transmission services for digital radio and television via satellite

4.0 Geographical market

4.1 General

159. 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 it 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 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.[30]

4.2 Wireless systems

160. In Section 3, PTA defined three service markets for broadcasting via wireless terrestrial network. These are the markets for analogue radio, analogue television, and digital television. PTA is of the opinion that the same (or parallel) conditions apply to all of these systems when evaluating the geographical demarcation of the markets.

161. The same regulatory framework applies to the entire country, both for the transmission of broadcast content and for the operation of transmission networks.

162. Licences for broadcasting and for frequency usage for broadcasting purposes are either national or local. It is most common that a broadcasting licence is specified as applying to the entire country or to the southwest corner of the country. Few long-term broadcasting licences specify smaller geographical areas. The authorisation for frequency use is usually determined specially for each individual region in Iceland. It is necessary to find the most suitable frequency in each location with consideration given to possible interference; there fore, the use of channels is determined on a regional basis. This does not restrict the broadcast area of the system in question, as there are generally no limits on the number of transmission locations for which a given undertaking can obtain a licence. Although the frequency authorisation for Vodafone's digital television network specified that the authorisation was nationwide in scope, it was nonetheless necessary to find a separate channel for each transmission location outside the greater Reykjavík area.

163. The largest distribution systems for radio and television – that is, the Icelandic National Broadcasting Service (RÚV) and Vodafone's networks – are virtually national in scope. RÚV reaches 99.9% of all Icelanders, and Vodafone reaches 98.6%. Although local systems exist as well, especially in the southwest corner of the country, PTA does not consider this to change the competitive conditions in the wholesale market in a manner that requires a geographical subdivision of the market.

[30] See Section 2.2.2 in the Guidelines.

164. As far as consumers are concerned, the retail price for the service is the same all over the country, and consumers' taste and purchasing patterns do not appear to differ from region to region.

165. PTA is of the opinion that it is not possible to identify specific areas in the country where the competitive conditions are so unlike those in other areas that the difference justifies a geographical subdivision of the relevant markets. The Administration considers the entire country a single market for broadcasting transmission services via wireless terrestrial network.

4.3 Fixed-line networks

166. In Section 3, PTA defined a single service market for broadcast transmission via fixed-line network: the market for broadcasting transmission services for digital radio and television via fixed-line networks.

167. The same regulatory framework applies to the entire country, both for the transmission of broadcast content and for the operation of transmission networks.

168. No special licence is required for the operation of a fixed-line distribution system. Undertakings wishing to commence operation of such a distribution system need only notify PTA of the operations, whereupon they are authorised to operate throughout Iceland.

169. The largest fixed-line network used for broadcast transmission in Iceland is the copper local loop network owned by Míla. This network reaches all households in the country. It is possible to provide ADSL television services on the local loop network to approximately 90% of all Icelanders. Although local systems exist as well, PTA does not consider this to change the competitive conditions on the wholesale market at this time. The cable systems in some communities outside the greater Reykjavík area do not make a decisive impact on overall conditions. The fibre optic cable network in the greater Reykjavík area could affect competition in the future, however, but at present the network is not widespread enough.

170. Network operators in regional Iceland have commented on the cost of gaining access to television content for their networks because they must pay to have the content sent from Reykjavík to their regional locations. This could affect the operational outlook for local transmission networks, but PTA does not consider it enough reason to divide the transmission market up geographically, partly because the problem belongs to the market for television content, and the cost of conveyance relates to the leased line markets.

171. As far as consumers are concerned, the retail price for the service is the same all over the country, and consumers' taste and purchasing patterns do not appear to differ from region to region.

172. PTA is of the opinion that it is not possible to identify specific areas in the country where the competitive conditions are so unlike those in other areas that the difference justifies a geographical subdivision of the relevant markets. Therefore, the

Administration considers the entire country to consist of one market for broadcasting transmission services for digital radio and television via fixed-line networks.

4.4 Satellite transmission

173. The undertakings that offer transmission via satellite are all foreign, and their market areas are much larger than Iceland. The satellites that distribute Icelandic programming generally cover most of Europe. The markets for satellite transmission are therefore transnational in nature.

174. ESA has not defined a transnational market for satellite transmission of broadcast content. It is outside the scope of PTA's authority to intervene in markets that extend beyond the borders of Iceland. Furthermore, PTA is of the opinion that this service has little or no effect on competition in the domestic broadcast transmission market. Therefore, the Administration does not intend to examine this service market further.

5.0 Current rules on access to broadcasting systems

5.1 Obligations in effect pursuant to the previous Telecommunications Act

175. As was stated previously, broadcasting distribution systems were not considered as part of electronic communications networks according to electronic communications legislation until the Electronic Communications Act , no. 81/2003, was passed. The Telecommunications Act, no. 107/1999, did not allow the imposition of specific obligations on networks for distribution of broadcast content. For this reason, no obligations have yet been imposed on broadcast distribution systems pursuant to electronic communications legislation, which provides for the obligations to grant access to such networks. Obligations concerning certain network elements, such as leased lines, have been in effect in recent years and have proven somewhat useful for television stations in the transmission of content between transmission locations, but there has been no regulatory intervention in access networks.

176. However, Article 17 of Act no. 107/1999 contained a provision intended to guarantee broadcasting stations access to public electronic communications networks such as cable networks. This provision was never applied for that purpose. The wording of the provision indicates that was only intended to address individual requests for access and not to impose *ex ante* obligations on operators networks.

5.2 Obligations in related electronic communications markets

177. PTA has published decisions based on market analyses pursuant to the Electronic Communications Act, no. 81/2003 in several markets that are directly or indirectly related to broadcast distribution. Leased lines are often used to transmit broadcast signals, although this transmission is seldom to the end user. With Decision

no. 20/2007, PTA designated Síminn and Míla as having significant market power in the leased line markets (Markets 7, 13, and 14). The companies were subjected to obligations concerning access, non-discrimination, transparency, accounting separation, price controls, and cost accounting.

178. With Decision no. 26/2007, PTA designated Míla ehf. as having significant market power in the market for copper local loops and imposed obligations concerning access, non-discrimination, transparency, accounting separation, price controls, and cost accounting on the company. This decision guarantees, among other things, access to the local loop network for operators wishing to provide ADSL service and potentially ADSL television.

179. With Decision no. 8/2008, PTA designated Síminn as having significant market power in the market for broadband access and imposed obligations concerning access, non-discrimination, transparency, accounting separation, price controls, and cost accounting on the company. Those obligations open up the possibility for other undertakings to operate television distribution services on Síminn's network.

5.3 The Broadcasting Act and the Act on the Icelandic National Broadcasting Service ohf.

180. The Act on the Icelandic National Broadcasting Service, no. 61/2007, does not contain any provisions concerning the Icelandic National Broadcasting Service's (RÚV) access to electronic communications networks.

181. Article 22 of the Broadcasting Act, no. 53/2000, contains a provision on access to electronic communications networks. That provision makes reference to the Telecommunications Act concerning the handling of such matters. The provision is worded as follows:

> *Where a broadcaster applies for access to a cable network or other public telecommunications network used for broadcasts, including broadband, the application shall be dealt with in accordance with the Telecommunications Act and the Post and Telecom Administration Act, as appropriate in each case.*
>
> *Where necessary a regulation may provide for a limitation of the number of channels in the above telecommunications infrastructures that can be allocated to broadcasters owned by the same or related parties.*

5.4 Provisions on digital television in Chapter XI of the Electronic Communications Act

182. Chapter XI of the Electronic Communications Act, no. 81/2003, contains several special provisions on digital television.

183. Article 55 includes a "must-carry" provision on the obligation to carry television programming. The provision states that must-carry obligations may be

imposed on undertakings providing electronic communications networks for the distribution of radio or television broadcasts to the public, where a significant number of users utilise the networks to receive radio and television broadcasts. Such obligations shall only be imposed where there are especially cogent reasons for so doing.

184. The comments on that provision in the legislative bill for this Act states:

> *The must-carry provision on the obligation to carry broadcast content is based, on the one hand, on Article 12 of the Access Directive, which provides for access to electronic communications networks, and on the other hand, on Article 31 of the Universal Service Directive, which concerns the obligation to carry specified broadcast content. The obligation to carry broadcast content is a new provision in the Electronic Communications Act, but such obligations have been in effect in some other countries, particularly with respect to cable television systems. This provision allows for the possibility of imposing such obligations on operators that offer electronic communications networks for the distribution of broadcast content when a considerable number of users use that network as their primary means of receiving broadcast content. The application of this provision is subject to the restriction that such obligations may only be imposed under unusual circumstances; for example, in order to transmit broadcast content to all residents of Iceland. The application of this provision must take place in consultation with the Ministry of Culture.*

185. This provision has not been applied to date, and the primary reason is probably that the Icelandic National Broadcasting Service's television programming has been carried on all electronic communications networks that distribute digital television services in Iceland without any intervention by the regulatory authorities.

186. In Article 56 is a provision permitting PTA to set rules concerning conditional access systems.

187. Article 57 contains a provision stating that undertakings operating digital interactive television services for distribution to the public or selling enhanced digital television equipment shall be instructed to use an open application program interface (API).

188. Article 58 contains a provision stating that public electronic communications networks that are set up in order to distribute digital television service shall be capable of distributing wide-screen television services and programmes and that electronic communications undertakings the receive and distribute wide-screen television services or programmes shall maintain the wide-screen format.

189. Article 61, Paragraph 4 of the Act, which appears in Chapter XII, contains a provision concerning interoperability of user equipment for digital television.

5.5 Rules on conditional access systems

190. Conditional access systems are not actually a part of the relevant market, but they are so closely related to it that the Administration considers it appropriate to discuss the rules that pertain to them. The Post and Telecom Administration has set rules on conditional access systems and user equipment for digital television. The Rules, no. 570/2006, are based on Article 56 and Article 61, Paragraph 4 of the Electronic Communications Act.

191. The Rules provide for access by broadcasting stations, content providers, and users to conditional access systems in electronic communications networks that can distribute digital radio and television services, and they contain provisions on the technical characteristics of access systems and corresponding user equipment. The Rules contain stipulations on the following points:

- Operators of conditional access systems for digital radio or television services that are needed by broadcasting stations and/or content providers in order to reach a given group of users shall, without discriminating and on fair and reasonable terms, provide all broadcasting stations and content providers requesting access control with technical services that enable users to receive digital service via a set-top box controlled by the operator of the access system.

- A broadcasting station that distributes free-to-air programming is entitled to have that programming and related data streams transmitted unobstructed through the set-top box at no charge.

- Operators of conditional access systems shall not prohibit the use of set-top boxes other than their own, provided that such boxes fulfil the technological requirements necessary to connect to the system. Operators of conditional access systems shall publish information on the technical characteristics of the access system so as to make the use of other set-top boxes possible.

- In their accounting, operators of conditional access systems shall keep the operations of the access system separate from other operations.

- Operators of conditional access systems are obliged to provide access to application program interfaces on terms that are reasonable, fair, and non-discriminatory.

- Operators of conditional access systems are obliged to provide broadcasting stations and content providers with access to electronic program guides on terms that are reasonable, fair, and non-discriminatory.

192. Operators of conditional access systems are subjected to the obligations according to these Rules irrespective of their market power. However, it is permissible, following a market analysis, to withdraw or amend obligations on undertakings that do not have a large market share, to the extent that such decisions do not compromise users' opportunities to receive programming that is obligatory

according to the must-carry provision in Article 55 of the Electronic Communications Act, no. 81/2003, or do not have a negative effect on the competitive outlook in the retail market for broadcasting services or the markets for conditional access and related services.

5.6 General provisions on joint utilisation of infrastructure

193. According to Article 25 of the Electronic Communications Act, PTA may oblige an electronic communications undertaking to negotiate agreements on co-location or other types of joint utilisation, including use of cable ducts or pipes, buildings or masts, under specified conditions. This applies when an electronic communications undertaking is entitled to set up or lay subterranean electronic communications facilities in common pasture land, public or private property, or to expropriate property, or in instances involving special geographical locations or where environmental considerations justify joint utilisation.

194. This provision applies to electronic communications undertakings regardless of their market power. It could be significant for broadcasting stations wishing to set up transmitters in masts owned by other undertakings and utilise the infrastructure jointly at the transmission location concerned.

195. As yet, this provision has not been applied in cases related to broadcast distribution systems.

5.7 Decisions by the competition authorities

5.7.1 Mergers of electronic communications and television providers

196. In late 2004, Síminn acquired a majority holding in the Íslenska sjónvarpsfélagid hf. (ÍS), called Skjárinn. Somewhat later, a transaction involving the merger of Vodafone and 365 Broadcasting was announced. With these acquisitions, the electronic communications undertakings Síminn and Vodafone attempted to guarantee that they would be able to distribute television content on their electronic communications networks.

197. The acquisitions by Síminn and Vodafone represented mergers in the sense of Article 17 of the Competition Act. Both were considered to create or reinforce a dominant market position in the merged entities. The acquisitions in question created two groups of undertakings, each of which comprises electronic communications and television undertakings. In the absence of other changes, these corporate blocs, which own nearly all of the privately operated television and radio stations in Iceland would control the vast majority of all of the most popular foreign television content available to privately operated stations. In addition, the two electronic communications undertakings, Síminn and Vodafone, as leaders of the two corporate blocs in question, essentially divided the Icelandic electronic communications market between themselves. In the estimation of the Competition Council, it was clear that the mergers would lead to substantial concentration in the competitive markets within their sphere of influence. This concentration could exclude competitors from the

relevant markets and prove detrimental to consumer interests, especially for the long term, because it would be conducive to the companies' bundling dissimilar electronic communications and media products and could encourage them to discriminate against other operators in the market.

198. In March 2005 the Competition Council rulings in the two cases were handed down. The Competition Council decided to approve the merger of Síminn and Íslenska sjónvarpsfélagid hf., on the one hand, and the merger of Vodafone with 365 Broadcasting ehf. and 365 Media ehf., on the other, subject to certain conditions. The conditions that were set touch on a number of the factors discussed earlier in this report.

5.7.2 Decisions directed at Síminn and Skjárinn

199. Decision no. 10/2005 on the merger of Síminn (which was named Landssími Íslands, or Iceland Telecom, at that time) and Skjárinn (then named Íslenska sjónvarpsfélagid hf.) sets forth the following conditions for the approval of the merger:

1. *Íslenska sjónvarpsfélagid hf. shall be operated as an independent legal entity effective 1 July 2006. The current television operations of Landssími Íslands hf. (Iceland Telecom) on its Breidband shall be merged with Íslenska sjónvarpsfélagid hf. no later than the same date. Effective 1 July 2006, the accounts of Íslenska sjónvarpsfélagid hf. shall be independent, and the chartered public accountant for Íslenska sjónvarpsfélagid hf. shall not carry out any accounting duties for other operations related to the activities of the parent company, Landssími Íslands hf., and/or other related companies as of that date. Effective 1 July 2006, the accounts of Íslenska sjónvarpsfélagid hf. shall be made public.*

2. *Effective 1 July 2006, the accounts for the operations of Íslenska sjónvarpsfélagid hf. shall be available as is customary in accordance with the Annual Accounts Act, and the accounts for its operations shall be separate from those of Landssími Íslands and its subsidiaries; cf. the Regulation on Accounting Separation and Financial Separation in the Operations of Electronic Communications Undertakings, no. 960/2001. Within six months from the date of this decision, Landssími Íslands' chartered public accountant shall confirm to the Competition Authority that financial separation has been implemented.*

3. *After 1 July 2006, neither the managing director nor Board members nor directors of Landssími Íslands hf. may be members of the Board of Directors of Íslenska sjónvarpsfélagid hf. Neither may other employees of Landssími Íslands hf. be involved in the day-to-day operations of Íslenska sjónvarpsfélagid hf. Furthermore, after 1 July 2006, neither the managing director nor Board members nor directors of Íslenska sjónvarpsfélagid hf. may be members of the Board of Directors of Landssími Íslands hf. Neither may other employees of Íslenska sjónvarpsfélagid hf. be involved in the day-to-day operations of Landssími Íslands hf.*

4. *All business transactions between Landssími Íslands hf. and Íslenska sjónvarpsfélagid hf. shall be carried out in the same manner as transactions between unrelated parties. Therefore, liabilities and guarantees between Landssími Íslands hf. and Íslenska sjónvarpsfélagid hf. shall be on terms and conditions prevailing in the market. The foregoing implies that all transactions between Landssími Íslands hf. and Íslenska sjónvarpsfélagid hf. shall be priced at market rates.*

5. *Landssími Íslands hf. is prohibited from requiring that services from Íslenska sjónvarpsfélagid hf. be included in purchases of the company's own services. Furthermore, Landssími Íslands hf. is prohibited from bundling its own services and those of Íslenska sjónvarpsfélagid hf. at a price or terms that constitute the equivalent of such a requirement.*

6. *Landssími Íslands hf. and Íslenska sjónvarpsfélagid hf. shall engage in business transactions and other communications with their own customers and other consumers – such as invoicing of subscription fees and promotional and marketing campaigns – as separate entities, as though they were unrelated companies. The foregoing does not prevent the companies from purchasing services from one another in accordance with Item 4 of these terms; neither does it prevent them from engaging in joint operations that are useful to both companies; e.g. a joint service desk.*

7. *Landssími Íslands hf. shall grant others than Íslenska sjónvarpsfélagid hf. access to its distribution systems for television and radio broadcasting. To that end, Landssími Íslands hf. shall prepare a price list that includes the price for such access. Landssími Íslands shall publish the price list in a public and accessible manner no later than 1 September 2005. This price list shall be objective and relevant and shall apply both to Landssími Íslands hf.'s business transactions with Íslenska sjónvarpsfélagid hf. and to its transactions with other parties.*

8. *Landssími Íslands hf. shall authorise Internet service providers to resell the company's ADSL connections at the same price and terms as those enjoyed by Landssími Íslands hf.'s Internet service, so that non-discrimination is guaranteed between Landssími Íslands hf.'s Internet service and other Internet service providers.*

9. *Landssími Íslands hf. shall ensure that the ADSL terminating equipment (modem/router) provided by Síminn's ADSL service as a part of its television service is compatible with the Internet service of all Internet service providers that meet the relevant requirements for the provision of service via Landssími Íslands hf.'s ADSL system. This arrangement shall be reviewed when ADSL terminating equipment for television has been standardised, and no later than 31 December 2006.*

10. *Íslenska sjónvarpsfélagid hf. shall comply with all relevant requests from Internet service undertakings for the distribution of Íslenska sjónvarpsfélagid hf.'s television and radio signals on channels for free-to-*

air and locked content, with the exception of channels that carry direct retransmission of foreign television stations. The foregoing is subject to the condition that Íslenska sjónvarpsfélagid hf. have the distribution rights according to the distribution route in question, that such distribution is technically possible, and that the distribution meets the company's relevant requirements concerning image and sound quality.

11. *Íslenska sjónvarpsfélagid hf. shall comply with all relevant requests from undertakings engaged in distribution of digital television for the distribution of Íslenska sjónvarpsfélagid hf.'s television and radio signals on channels for free-to-air and locked content, with the exception of channels that carry direct retransmission of foreign television stations. The foregoing is subject to the condition that Íslenska sjónvarpsfélagid hf. have the distribution rights according to the distribution route in question, that such distribution is technically possible, and that the distribution meets the company's relevant requirements concerning image and sound quality. Íslenska sjónvarpsfélagid hf. and/or Landssími Íslands hf. are authorised to set the condition for distribution of the companies' television and radio channels to parties engaged in digital television distribution and related parties that they offer Landssími Íslands and/or Íslenska sjónvarpsfélagid hf. reciprocal distribution of their own television and radio channels in free-to-air and locked content, including via Landssími Íslands hf.'s fibre optic cable and copper line networks.*

12. *In the instance of Íslenska sjónvarpsfélagid hf.'s subscription channels, the company is authorised to set the condition vis-à-vis undertakings engaged in Internet service and digital television distribution that the television signal shall be transmitted through the descrambler provided by Íslenska sjónvarpsfélagid hf. to subscribers until 1 July 2007.*

13. *Access to a descrambler provided by Landssími Íslands hf. and/or Íslenska sjónvarpsfelagid hf. shall be in accordance with the rules set by the Post and Telecom Administration on conditional access systems and user equipment for digital television.*

14. *In order to ensure non-discrimination between competitors in the television and radio market and the market for distribution of television and radio signals, Landssími Íslands hf. shall provide its competitors and Íslenska sjónvarpsfelagid hf.'s competitors access to information that concerns Landssími Íslands hf.'s basic electronic communications and distribution services in the television and radio market and has business significance; for example, information on proposed changes in pricing, proposed new services, distribution, experimental broadcasting, and technical items. This implies that competitors shall receive this information at the same time as the relevant departments of Landssími Íslands hf. and Íslenska sjónvarpsfelagid hf., and in the same form. Íslenska sjónvarpsfélagid hf. shall also grant other distributors access to the content of the radio and television stations it operates, just as Landssími Íslands does.*

15. *Employees of Landssími Íslands hf. who possess information on business transactions and terms are prohibited from providing employees of Íslenska sjónvarpsfélagid hf. with information on business transactions and/or business terms of individual customers of Landssími Íslands hf. In the same manner, the relevant employees of Íslenska sjónvarpsfélagid hf. are prohibited from providing employees of Landssími Íslands hf. with information on business transactions and/or the business terms that Íslenska sjónvarpsfélagid hf. enjoys with other distributors. The applicable employees of Landssími Íslands and Íslenska sjónvarpsfélagid hf. who possess the information described here shall sign a special declaration of confidentiality with respect to this information. A copy of these declarations shall be sent to the Competition Authority no later than at the time distribution agreements are concluded on the basis of Items 10 and 11.*

200. For purposes of simplification, the conditions can be divided into several categories:

- Network access: Items 7 and 8
- Transparency: Item 7
- Non-discrimination: Items 7 and 14
- Separation (of companies, finances, and management): Items 1, 2, 3, 4, 6, and 15
- Access to content: Items 10 and 11
- Prohibition of bundling: Item 5
- Technical matters: Items 9, 12, and 13.

201. If the conditions are compared with the obligations that PTA can be authorised to impose, it can be said that the Competition Council's conditions correspond to obligations concerning access to broadcast distribution systems, transparency, and non-discrimination. It is required that television operations be financially separated from electronic communications operations, but there is no requirement that accounting related to broadcasting distribution systems be separated from that for other electronic communications activities. It is not required that the price for access to distribution systems be cost-oriented. Price lists, however, must be relevant and objective, and they must apply equally to transactions between Síminn and Skjárinn and transactions between Síminn and other parties.

202. In addition to the conditions that correspond to obligations pursuant to the Electronic Communications Act, there are conditions concerning other electronic communications undertakings' access to television content for distribution and a prohibition of bundling.

203. After this decision took effect, other electronic communications undertakings experienced difficulties in gaining access to television content from Íslenska sjónvarpsfélagid. The Competition Authority published a temporary decision on 12 September 2005, following up on the provision of access to television content. [31]

[31] Temporary Decision no. 1/2005.

204. Competition Authority Decision no. 32/2007 amended Item 3 of Decision no. 10/2005. The conditions related to Board membership are now worded as follows:

> *1. A maximum of one Board member, director, or managing director of Síminn hf. is permitted to sit on the Board of Íslenska sjónvarpsfélagid hf. at any given time. Other employees of Landssími Íslands hf. may not be involved in the day-to-day operations of Íslenska sjónvarpsfélagid hf.*
>
> *2. With the exception in Item 1 above, Board members, the managing directors, and other directors of Íslenska sjónvarpsfélagid hf. shall not sit on the Board of Síminn hf. Neither may other employees of Íslenska sjónvarpsfélagid hf. be involved in the day-to-day operations of Síminn hf.*

5.7.3 Decisions directed at Vodafone and/or 365

205. The above-mentioned Competition Council Decision no. 12/2005, on the merger of Og fjarskipti hf. (Vodafone), 365 Broadcasting ehf., and 365 Media ehf., sets the following conditions:

> 1. *The activities of 365 Broadcasting ehf. shall be operated as a separate legal entity that shall be separate from the operations of Og fjarskipti hf. beginning on 1 January 2006.*
>
> 2. *The chartered public accountant for 365 Broadcasting ehf. shall confirm to the Competition Authority before 1 January 2006 that financial separation has been implemented between 365 Broadcasting ehf. and OG fjarskipti hf.*
>
> 3. *Before 1 January 2006, a separate parent company for 365 Broadcasting ehf. and Og fjarskipti hf. shall be established. A separate board of directors shall be appointed for each of the three companies: the parent company, 365 Broadcasting ehf., and Og fjarskipti hf. A maximum of one board member or managing director of the parent company shall be permitted to sit also on the board of the subsidiaries – 365 Broadcasting ehf. and Og fjarskipti hf. – at any given time. With the exception in the last sentence of Item 3 above, Board members, the managing directors, and other directors of 365 Broadcasting ehf. shall not sit on the Board of the parent company or of Og fjarskipti hf. Employees of 365 Broadcasting ehf. other than the party specified above may not be involved in the day-to-day operations of Og fjarskipti hf. Similarly, and with the same exception as that mentioned above, Board members, the managing director, and other directors of Og fjarskipti hf. shall not sit on the Board of the parent company or of 365 Broadcasting ehf. Employees of Og fjarskipti hf. other than the party specified above may not be involved in the day-to-day operations of 365 Broadcasting ehf.*
>
> 4. *Transactions between 365 Broadcasting ehf. and Og fjarskipti hf. shall be carried out on the same basis as transactions between unrelated parties.*

Therefore, liabilities and guarantees between Og fjarskipti hf. and 365 Broadcasting ehf. shall be on terms and conditions prevailing in the market The foregoing implies that all transactions between Og fjarskipti hf. and 365 Broadcasting ehf. shall be priced at market rates.

5. *365 Broadcasting ehf. is prohibited from requiring that services from Og fjarskipti hf. be included in purchases of the company's own services. Furthermore, 365 Broadcasting ehf. is prohibited from bundling its own services and those of Og fjarskipti hf. at a price or terms that constitute the equivalent of such a requirement.*

6. *365 Broadcasting ehf. and Og fjarskipti hf. shall engage in business transactions and other communications with their own customers and other consumers – such as invoicing of subscription fees and promotional and marketing campaigns – as separate entities, as though they were unrelated companies. The foregoing does not prevent the companies from purchasing services from one another in accordance with Item 4 of these terms; neither does it prevent them from engaging in joint operations that are useful to both companies; e.g. a joint service desk.*

7. *365 Broadcasting ehf. shall comply with all relevant requests from other undertakings for the distribution of the company's television and radio signals on channels for free-to-air and locked content, with the exception of channels that carry direct retransmission of foreign television stations. 365 Broadcasting ehf. is authorised to set the condition for distribution of its television and radio signals that the company have the distribution rights according to the distribution route in question, that such distribution is technically possible, that scrambling and descrambling of locked content is carried out by 365 Broadcasting ehf., and that the distribution meets the company's relevant requirements concerning image and sound quality. 365 Broadcasting ehf. is prohibited from making further requirements of other distributors in the above context than are made of 365 Broadcasting ehf. and Og fjarskipti hf. 365 Broadcasting hf. is authorised to set as a requirement for the distribution of its television and radio channels to parties engaged in digital television distribution that these parties offer 365 Broadcasting ehf. reciprocal distribution of their own television and radio channels with free-to-air and locked content.*

8. *365 Broadcasting ehf. is prohibited to require of distributors according to Item 7 or television subscribers that terminating equipment and/or descrambling equipment from 365 Broadcasting ehf. or Og fjarskipti hf. be used for the reception and descrambling of the company's television and/or radio signals. Access to descrambling equipment sold or delivered by the companies shall be in accordance with the Post and Telecom Administration's rules on conditional access systems and user equipment for digital television. 365 Broadcasting ehf. shall provide distributors with all necessary information on the requirements made of the necessary equipment. Furthermore, 365 Broadcasting ehf. shall provide the necessary information on the configuration of the terminating equipment and/or descrambling equipment so that it is possible to distribute television*

and radio signals using that equipment. This information shall be published in a public and accessible manner.

9. *In order to guarantee non-discrimination among competitors in the market for distribution of television and radio signals, 365 Broadcasting ehf. shall provide distributors according to Item 7 with access to information that pertains to the company's television and radio services and is of business significance; for example, information on proposed changes in pricing, proposed new services, distribution, experimental broadcasting, and technical items. This implies that competitors shall receive this information at the same time as the relevant departments of Og fjarskipti hf. and 365 Broadcasting ehf., and in the same form 365 Broadcasting ehf. shall also grant other parties access to the content of its radio and television stations on a non-discriminatory basis.*

10. *Employees of Og fjarskipti hf. who possess information on business transactions and terms are prohibited from providing employees of 365 Broadcasting ehf. with information on business transactions and/or business terms of individual customers of Og fjarskipti hf. In the same manner, the applicable employees of 365 Broadcasting ehf. are prohibited from providing employees of Og fjarskipti hf. with information on business transactions and/or the business terms that 365 Broadcasting ehf. enjoys with other distributors. The applicable employees of Og fjarskipti hf. and 365 Broadcasting ehf. who possess the information described here shall sign a special declaration of confidentiality with respect to this information. A copy of these declarations shall be sent to the Competition Authority no later than 1 April 2005.*

206. The conditions that were set for the merger of Vodafone and 365 were, in part, parallel to the conditions set for the merger of Síminn and Íslenska sjónvarpsfélagid. The same applies to the terms concerning separation between companies and the obligations concerning content provision. On the other hand, no conditions are set concerning other content providers' access to 365 or Vodafone's distribution systems.

207. Following this decision, changes were made to the operational form of the conglomeration which were more thorough than provided for in the decision. Instead of a single joint parent company for the media and electronic communications companies, two separate parent companies were established: 365 for the media operations and Teymi for the electronic communications and information technology operations. All distribution systems were transferred to the electronic communications company Og fjarskipti ehf. (Vodafone).

208. In 2007 the company Canal Digital Iceland ehf. (CDI) requested that it receive 365's television programming content for distribution via satellite. 365 refused to comply unless it received access to CDI's customer database. The Competition Authority considered this an unjust requirement and deemed it a violation of Competition Council Decision no. 12/2005. With Temporary Decision no. 1/2007, the Authority stipulated as follows:

1. 365 Media ehf. must immediately deliver the television signals of its stations to Canal Digital Iceland ehf. in return for the latter company's fulfilment of the requirements that 365 Media ehf. is permitted to make according to Competition Council Decision no. 12/2005, cf. further information in this Decision.

2. 365 Media ehf. is prohibited from setting as a requirement for the delivery of its television signals that it be granted access to Canal Digital Iceland ehf.'s customer bookkeeping, which pertains, among other things, to subscribers to television stations owned by 365 Media ehf.

3. 365 Media ehf. is authorised to require that an objective party review Canal Digital Iceland ehf.'s information on the number of subscribers to 365 Media ehf.'s programming who purchase subscriptions to that content through Canal Digital Iceland ehf.

209. This Temporary Decision shall remain in effect until 1 April 2008. It has not been confirmed with a final decision, and Canal Digital Iceland has not begun providing services in Iceland.

5.7.4 The effects of the competition authorities' decisions

210. One of the most important conditions to which the companies were subjected in the above decisions is the so-called may-carry provision; that is, the obligation to offer their content on other distribution routes. Such requirements make it easier for consumers to choose an electronic communications undertaking. This should prevent a shortage of popular television content from hindering electronic communications undertakings in competing for customers in the markets for access systems.

211. The must-carry provision, which requires that an operator distribute television content from other parties, applies only to Síminn according to these decisions. The companies have agreed, however, to engage in reciprocal distribution of domestic programming and television content from other Icelandic television stations; for example, content from RÚV is distributed by Síminn and Vodafone.

6.0 The threshold for *ex ante* obligations

6.1 General

212. If domestic regulatory authorities in the electronic communications sector define a service market differently than is done in the ESA Recommendation on relevant markets, it is necessary to assess whether those markets are of a nature that allows for the imposition of *ex ante* obligations on the undertakings operating in them.[32] That assessment shall be based on the same methodology as that used when the markets were defined in the Recommendation; cf. Section 1.4.3 of this report.

213. In the opinion of PTA, conditions in Iceland are such that it is not possible to define a single joint wholesale market for broadcasting transmission services. PTA has come to the conclusion that it is appropriate to divide the wholesale market for broadcast transmission to users into five sub-markets because of a lack of substitutability between the various distribution systems. They are the wholesale markets for broadcasting transmission services for analogue radio broadcasting on wireless networks, analogue television broadcasting on wireless networks, digital radio and television broadcasting on wireless networks, digital radio and television broadcasting on fixed-line networks, and digital radio and television broadcasting via satellite. This represents a deviation from the definition in the Recommendation and, as such, requires a separate examination of whether the nature of these markets is such that they could require the imposition of *ex ante* obligations.

214. In assessing whether *ex ante* obligations may be imposed in the relevant markets, it is necessary to examine three criteria that appear in Item 12 of the Introduction to the ESA Recommendation. All these criteria must be filled in order for the relevant market to be subjected to a market analysis with the aim of imposing *ex ante* obligations. The three criteria that must be met are as follows:

1) That there be substantial and persistent entry barriers, whether their causes be structural, statutory, or administrative. It is necessary to consider whether it is possible to eliminate such barriers during the period used as a reference, considering that electronic communications markets are flexible.

    a. Entry barriers relating to structure or form of the market can involve, for example, the scope of the electronic communications network, sunk costs, and control of infrastructure not easily duplicated.

    b. Statutory or administrative barriers could involve, for example, frequency allocations.

[32] See Articles 6, 7, and 15 of the Framework Directive, Item 22 in the introduction to the ESA Recommendation on relevant markets, and Sections 3.2 and 3.3 in the Explanatory Memorandum accompanying the Commission Recommendation on relevant markets.

2) That effective competition not be expected to exist during the period used as a reference. In this context, it is necessary to examine, among other things, what competitive conditions lie behind the entry barriers.

3) That the application of the existing provisions of competition law in the European Economic Area would not suffice in and of itself to improve conditions in the affected markets.

    a. If broad-based measures are necessary in order to correct malfunctions in the market.

    b. If it proves necessary to intervene relatively often and without delay.

    c. If special measures are required in order to create statutory predictability.

215. Of the above-listed five service markets, the market for satellite distribution is a transnational market; therefore, intervention in this market is beyond the scope of PTA's authority. Thus it is not subjected to further examination in this analysis. In the following sections, the other four service markets are analysed with reference to the three criteria that must be met in order for the imposition of obligations to be permissible.

6.2 The market for broadcasting transmission services for analogue radio via wireless networks

6.2.1 Entry barriers

216. The first criterion that must be met in order for market intervention through *ex ante* obligations can be considered justifiable pursuant to the Electronic Communications Act is that substantial and persistent entry barriers obstruct entry into the relevant market.

217. In PTA' estimation, it is not especially difficult to establish the facilities necessary for radio broadcast distribution. FM transmitters are not very expensive, and an operator does not need a large number of transmitters to reach a large proportion of the population. Moreover, it is possible to reach half of all Icelanders with one transmitter located in the southwest corner of the country.

218. Broadcasting stations generally own their own transmitters; therefore, distribution is seldom offered at the wholesale level. However, 365 and Vodafone changed this when they divided up the companies, as Vodafone took over all of 365's distribution systems, including the FM system. However, Vodafone does not offer FM radio distribution to parties other than 365.

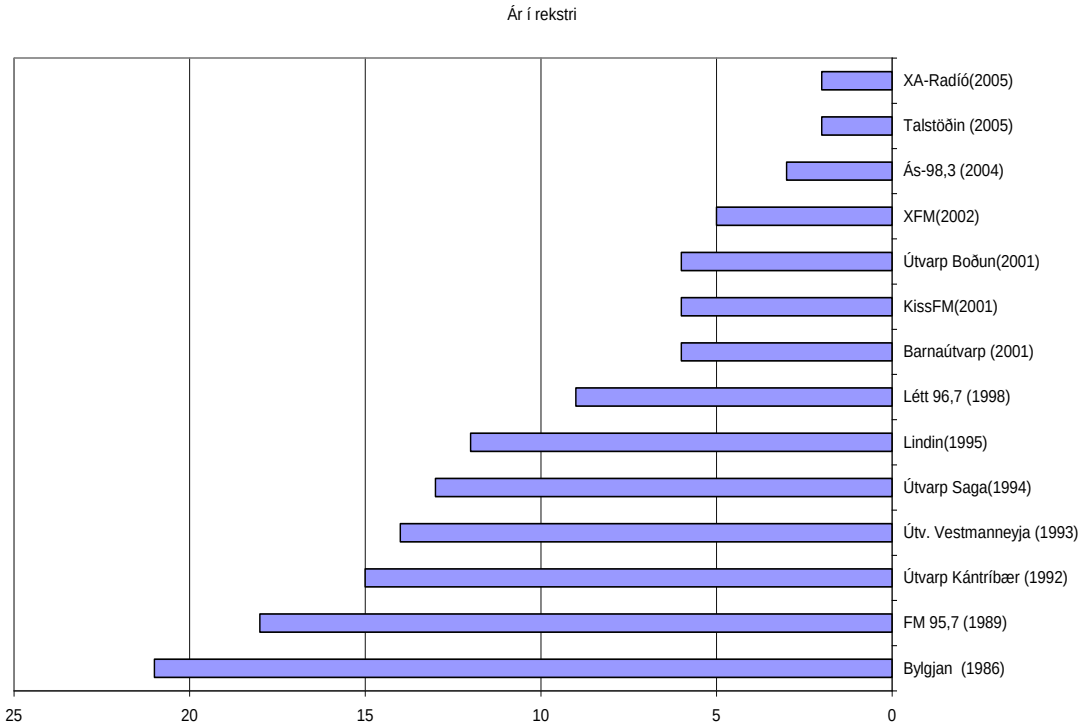
219. It is common that various types of facilities, transmission lines, technical assistance, and maintenance are obtained from another company, such as Míla. Two

companies, Míla and Fjarski, offer access to masts and related infrastructure. In addition, broadcasting stations have obtained facilities in tall buildings. There have been few if any complaints concerning matters related to access to infrastructure for broadcasting transmitters; therefore, PTA concludes that it is relatively easy to obtain such facilities on acceptable terms.

220. In order to commence operation of a broadcast distribution system, it is only necessary to invest in a transmitter. Other infrastructure can be leased from other parties. The cost of a studio is not included here, as it does not belong to the distribution system. As a result, there is little danger of incurring sunk costs in broadcast transmission operations. It is frequently possible to resell used broadcasting transmitters when companies discontinue operations.

221. Since RÚV's exclusive radio broadcasting rights were lifted at year-end 1985, there has been considerable movement in the market. Over 40 privately operated stations have commenced operations. Some are still in operation, while others have disappeared from the market. This indicates that the barriers to entry and exit are not significant in this market. At present, some 20 radio stations send out regular broadcast content. Of that total, 13 stations are privately own according to the Broadcast Licensing Committee registration, and 6 are operated by RÚV if regional programming is included. Radio stations increased steadily in number from 1986 onward, until they peaked at 26 stations in the year 2001.

Figure 6-1: Privately owned radio stations 2007



Source: Media Report 2005[33] and PTA

[33] Report by the Minister of Education, Science and Culture's committee on Icelandic media, April 2005.

222. There are few if any statutory barriers in this market. It is necessary to apply to PTA for permission to use of frequencies for wireless radio distribution systems. Such permission is easily obtained, as there is no shortage of frequencies. If the operator of a distribution system broadcasts its own content, it must also apply to the Broadcast Licensing Committee for a broadcasting licence. PTA is unaware of any difficulties in obtaining such a licence. It should be emphasised that a broadcasting licence does not pertain to operations in the market for distribution systems but to the content that is transmitted.

223. A party intending to set up radio transmitters may need the approval of the planning authorities in order to set up masts and other infrastructure. It is most common, however, that undertakings utilise jointly the facilities already in existence. To PTA's knowledge, companies have not experienced any difficulty in obtaining the planning authorities' permission to set up radio transmitters.

6.2.2 Conclusions

224. As regards the wholesale market for broadcasting transmission services for analogue radio via wireless networks, PTA concludes that no substantial and persistent entry barriers exist in this market. The primary reasons for this conclusion are that the cost of establishing a distribution system is manageable, there is no shortage of frequencies, and there is considerable movement by operators into and out of this market. In order for it to be possible to impose ex ante obligations in this market, all three criteria – those concerning entry barriers, potential competition, and competition law – must be met. PTA has come to the conclusion that the first criterion – substantial and persistent entry barriers – is not met in the wholesale market for broadcasting transmission services for analogue radio via wireless networks; therefore, there is no reason to examine whether the other two criteria are met. Therefore, PTA does not intend to examine this market further.

6.3 Wholesale market for broadcasting transmission services for analogue television via wireless networks

6.3.1 Entry barriers

225. There is clearly a considerable amount of expense involved in commencing the distribution of television content. Even though distribution systems have limited coverage, the equipment for such systems is more expensive than is radio broadcasting equipment. In addition, it appears as though television stations often aim at achieving broader coverage than radio stations do. Television stations carry more expensive programming and must sell it to as many users as possible; furthermore, greater coverage enhances their chance of selling advertising time.

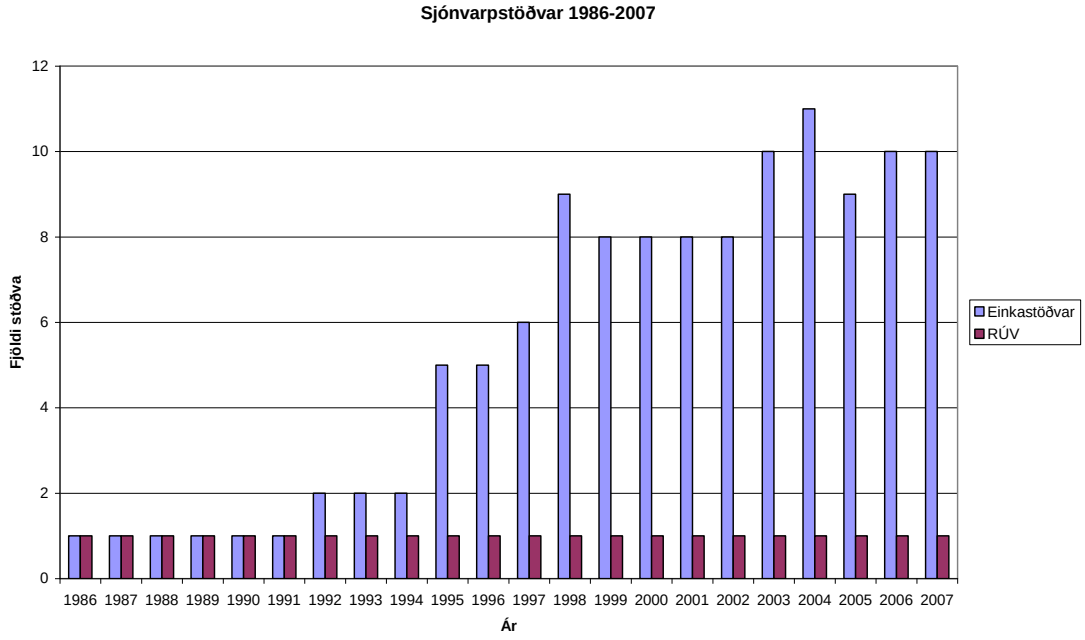
226. Television stations usually own their own transmitters; therefore, analogue television broadcasting is seldom offered at the wholesale level. However, 365 and Vodafone changed this when they divided up the companies, as Vodafone took over all of 365's distribution systems, including the analogue television distribution

system. However, Vodafone does not offer distribution of analogue television to parties other than 365.

227. It is common that various types of facilities, transmission lines, technical assistance, and maintenance are obtained from another company, such as Míla. Two companies, Míla and Fjarski, offer access to masts and related infrastructure. In addition, television stations have gained obtained facilities in tall buildings. There have been few if any complaints concerning matters related to access to infrastructure for television transmitters; therefore, PTA concludes that it is relatively easy to obtain such facilities on acceptable terms.

228. Since the Icelandic National Broadcasting Service's monopoly was lifted at the beginning of 1986, over 10 privately operated television stations have commenced broadcasting. Channel 2, the first privately run television station, began broadcasting in October 1986. Channel 2 was the nation's only privately operated television station until 1992, when the Christian station Omega commenced regular broadcasting. Since that time, television stations have increase in number to the current 10, half of which are owned by 365. A total of six companies are currently engaged in television station operations. These companies all operate their own distribution systems, which vary greatly in scope and coverage.

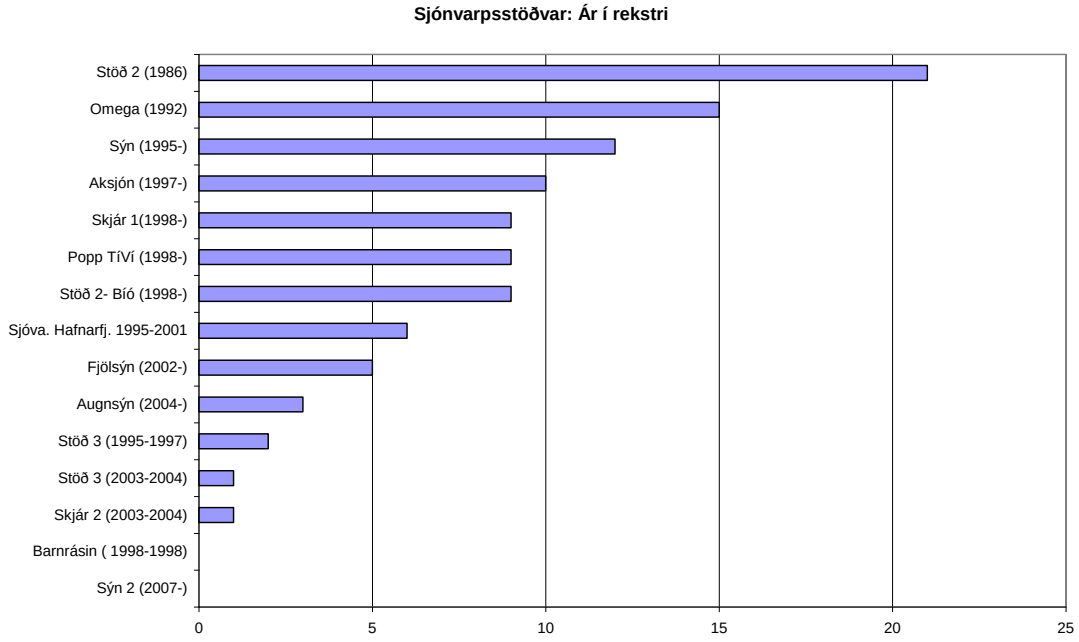
Figure 6-2: Television stations 1986-2007



Source: Media Report 2005 and PTA

229. Television stations' operational lifetime varies, as can be seen on the chart below. Some only last a short time, while others maintain their footing and are still on the market after years of operations.

Figure 6-3: Television stations – years in operation



Source: Media Report 2005 and PTA

230. State Television Channel 1, Skjár 1, Channel 2, Channel 2 Bíó, Channel 2 Sport, and Channel 2 Sport 2 are considered to broadcast nationwide, as their broadcasts reach all parts of the country and most households. The broadcast areas of other channels are largely limited to the southwest corner of the country or to individual municipalities (Akureyri, Reykjanesbaer, and the Westman Islands).

231. This shows that entry into the television market with the operator's own distribution system has been a possibility in recent years. Undertakings engaged in television operations have never been as numerous, however, as undertakings in radio operations. In the past four years, no new undertaking has entered this market. This can be explained in part by the fact that analogue broadcasting is being phased out, and as the time approaches when it will be discontinued entirely, the likelihood of any undertaking's being willing to invest in an analogue system is reduced accordingly. PTA takes the view that entry into this market is virtually inconceivable at present, as there is so little time left until analogue systems become obsolete that investors have no chance of recouping their investment.

232. It is necessary to apply to PTA for authorisation to use the frequencies for analogue wireless television distribution systems. If the operator of a distribution system broadcasts its own content, it must also apply to the Broadcast Licensing Committee for a broadcasting licence. PTA is unaware of any difficulties in obtaining such a licence. It should be emphasised that a broadcasting licence does not pertain to operations in the market for distribution systems but to the content that is transmitted. The channels that are best for analogue television distributions – that is, UHF, VHF, and MMDS - are all in use in the greater Reykjavík area at present, although unused channels can be found in regional Iceland. When the companies that now engage in analogue distribution switch entirely to digital distribution, it is likely that channels will be freed up in the greater Reykjavík area. They will hardly be re-allocated for

analogue broadcasting, however, in view of the fact that the government's aim according to its Electronic Communications Strategy is to discontinue analogue broadcasting no later than 2010.

233. A party intending to set up television transmitters may need the approval of the planning authorities in order to set up masts and other infrastructure. It is most common, however, that undertakings utilise jointly the facilities already in existence. To PTA's knowledge, companies have not experienced any difficulty in obtaining the planning authorities' permission to set up television transmitters.

6.3.2 Potential competition

234. As is stated in Section 6.3.1, further competition is not likely to develop in the market for analogue television operations. On the other hand, competition could come from other distribution systems, such as digital wireless systems, which can offer the same service, better quality, and a greater number of service options without substantial extra cost to users.

6.3.3 Do the principles of competition suffice?

235. Actually, there is little opportunity to grant others access to analogue distribution systems. An analogue distribution system can carry only one programme at a time, and it is usually the case that the same company operates the television station and the distribution system. However, it is possible to grant other parties access to related facilities, such as masts. To PTA's knowledge, there have not been any disputes between companies regarding access to such infrastructure.

236. PTA is of the opinion that because this service option is being phased out, there is little point in imposing obligations concerning access or any other aspect of the market. The service will very likely remain in use to some extent during the estimated time horizon for this forecast, which is 2-3 years, but not for much longer than that. It is not likely that new undertakings will seek out analogue distribution during that period, and the companies already operating in the market seem to have no difficulty in obtaining access to the infrastructure that they need.

237. PTA believes that the provisions of competition law suffice to address any problems that could arise in this market, as disputes are extremely rare.

6.3.4 Conclusions

238. As regards the wholesale market for broadcasting transmission services for analogue television via wireless networks, PTA concludes that entry barriers do exist in this market. The main reasons for this conclusion are the cost in establishing a distribution system, the shortage of frequencies, and the planned discontinuance of analogue distribution systems within a few years. PTA does not consider it likely that further competition will develop in this service market; however, there is potential competition from digital broadcasting systems. PTA is of the opinion that the

provisions of competition law suffice to solve the problems that may emerge in this market, as it is very rare that disputes related to this market are referred to the authorities. Furthermore, PTA considers it inappropriate to impose obligations in a service market that is obsolescent and will hardly be operable in 2-3 years' time.

6.4 Wholesale market for broadcasting transmission services for digital radio and television via wireless networks

6.4.1 Entry barriers

239. One company has established itself in this market. That company is Vodafone, which took over the development and operation of the digital distribution system of 365 when the companies were separated in 2006. Vodafone's distribution system is quite extensive. Its digital UHF broadcasts reach 98.6% of the population of Iceland. On UHF channels, Vodafone can broadcast sixteen programmes at once. The MMDS part of the network reaches the southwest corner of Iceland and a part of South Iceland. It is possible to broadcast over 100 programmes simultaneously on the MMDS channels.

240. Vodafone has incurred significant expense in developing the digital distribution system. It has operated it for several years and now has a large group of customers. It is therefore an entry barrier if a new operator is forced to incur similar expense in order to enter this market and attempt to attract enough customers to make the investment worthwhile.

241. The possibility of building up a less extensive distribution system is limited at present. The entire MMDS frequency range is in use, in accordance with temporary frequency authorisations. Channels in the UHF frequency range were auctioned in 2005, subject to the condition that they would be used for distribution systems that reached at least 98% of Icelanders. No decision has been made about the conditions for future allocations of UHF channels. In PTA's auction of UHF frequencies in 2005, bids were submitted by two companies: 365 and RÚV. RÚV has not yet been able to acquire capital for the development of a digital distribution system. Therefore, it is clear that costs can be a substantial entry barrier in this market.

242. A party intending to enter this market must obtain a frequency authorisation from PTA. If that party intends to broadcast its own programming, it must also apply for a broadcasting licence. In the southwestern corner of Iceland, there are at present approximately 10 unused channels that could be used for digital UHF distribution. Therefore, there is no shortage of channels in this frequency range; however, the conditions attached to allocations have yet to be determined. The fact that UHF channels cannot be used for retransmission of foreign programming – cf. Article 6, Paragraph 4, Subparagraph b of the Broadcasting Act, no. 53/2000 – somewhat reduces their usefulness. There are no unallocated channels in the MMDS frequency range. Other frequency ranges that could carry both domestic and foreign programming are available – for example, the KU frequency range – but attempts to operate a distribution system on this range have proven unsuccessful from a marketing point of view.

243. A party intending to set up television transmitters may need the approval of the planning authorities in order to set up masts and other infrastructure. It is most common, however, that undertakings utilise jointly the facilities already in existence. To PTA's knowledge, companies have not experienced any difficulty in obtaining the planning authorities' permission to set up television transmitters.

6.4.2 Potential competition

244. PTA does not consider it likely that there will be effective competition in this particular service market in the next 2-3 years. Companies have been able to obtain frequency authorisations for the development of further UHF distribution systems, but none except Vodafone have taken advantage of the opportunity. The Icelandic National Broadcasting Service has not yet begun developing its system in accordance with its frequency allocation, and it is uncertain what will happen in that case. One system, that of Íslandsmidill on the KU frequency range, has been in operation for several years but now appears to have discontinued operations.

245. Although distribution via fixed-line network is considered to belong to another service market, it is not unlikely that competition could develop between such networks and wireless systems. The main reason for the distinction between the service markets for fixed-line and air distribution is that wireless distribution systems lack interactivity and have a limited number of channels, while fixed-line distribution requires that the user purchase ADSL service in order to use television services. Fixed-line distribution offers all of the service elements that wireless systems can offer. Because the use of ADSL service has become very common in Iceland, a large proportion of users are undeterred by the need to purchase ADSL service with their television service. Both Vodafone and Síminn have a very large user group for their television distribution service, and these two are the most-used distribution options in the market today. PTA is of the opinion that wireless distribution networks could feel some competitive pressure from fixed-line distribution in the years to come.

6.4.3 Do the principles of competition suffice?

246. According to the Competition Act, no. 44/2005, the Competition Authority has measures that it can use in response to companies whose actions could obstruct competition. Article 10, Paragraph 1 of the Act states that any agreement or resolution between undertakings, whether binding or guiding, and concerted practices which have as their object or effect the prevention, restriction or distortion of competition are prohibited.

247. Article 11 of the same Act prohibits abuse by one or more undertakings of a dominant market position. Such abuse may include the following:

- directly or indirectly imposing unfair purchase or selling prices or other unfair trading conditions;
- limiting production, markets or technical development to the prejudice of consumers;
- applying dissimilar conditions to equivalent transactions with other trading parties, thereby placing them at a competitive disadvantage;

- making the conclusion of contracts subject to acceptance by the other parties of supplementary obligations which, by their nature or according to commercial usage, have no connection with the subject of such contracts.

248. Refusal of access to a television distribution system or unfair terms for such access could fall under these provisions of the Competition Act.

249. According to Article 16, Paragraph 2 of the Competition Act, action taken by the Competition Authority may include any measures needed to bring an end to violations of the provisions of the Act or to respond to actions of public entities which may be detrimental to competition. The Competition Authority may take action both to change behaviour and structure in proportion to the infringement committed and as necessary to bring such infringement effectively to an end.

250. According to Article 17 of the Competition Act, the Competition Authority may intervene in corporate mergers. If the Competition 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 annul a merger that has already taken place. The Competition Authority may also set conditions for such a merger that must be met within a given time. Mergers have taken place between content providers and electronic communications undertakings, as is described in Section 5.7. In accordance with the then-current Competition Act, the Competition Council then set conditions for the merger between 365 and Vodafone in 2005. Those conditions focus more on 365 as a content provider, however, than on Vodafone's distribution system.

251. In assessing whether the provisions of competition law suffice to correct a market malfunction, it is necessary to consider whether broad-based measures are necessary, whether frequent and immediate intervention will be necessary, and whether special measures are necessary to create statutory predictability in the market.

252. Broad-based measures are necessary primarily when an undertaking that controls essential infrastructure refuses to grant other undertakings access and the authorities must establish access through instructions to the undertaking in question and perhaps must involve itself in access arrangements through intervention in prices and other terms and conditions. Vodafone, which controls the only digital wireless distribution system in operation in Iceland, has granted unrelated television stations access to its system, and the authorities have received no complaints on these matters.

253. PTA believes that there is only infrequent need for regulatory intervention due to matters concerning access to digital television distribution systems. Based on the experience of recent years, disputes on such matters are rare or even unknown. Disputes between companies have tended to revolve around access to content rather than access to distribution systems. In view of this, it is likely that the provisions of competition law will suffice to solve possible problems in the market. If it proves necessary to intervene quickly, the Competition Authority is authorised to render temporary decisions upon fulfilling certain conditions; cf. Article 16, Paragraph 3 of the Competition Act. On two occasions, the Competition Authority has rendered temporary decisions in order to follow up on its decisions concerning mergers

between content providers and electronic communications undertakings, but those decisions both related to access to content rather than access to distribution systems.[34]

254. Obligations have not hitherto been imposed on broadcast distribution systems pursuant to the Electronic Communications Act. In spite of this, access to distribution systems has been established. PTA has not been asked to intervene in matters related to access to a wireless television distribution system. Therefore, the Administration does not consider it necessary to impose particular obligations in this market, given the current circumstances and the experience of recent years.

255. One of the reasons access has been granted to distribution systems without special administrative decisions is that content providers and distribution systems are mutually dependent to a degree. Operators of distribution systems seek to broadcast popular television content on their networks in order to increase users' interest in connecting to their system. Content providers that are related to electronic communications undertakings have had a tendency to allow distribution of their own content on the distribution system of that electronic communications undertaking, for the purpose of increasing the popularity of that system. The merger decisions discussed above, no. 10/2005 and 12/2005, are intended in part to prevent such conduct. Given the current situation in coverage and use of various distribution systems, it has probably become desirable for content providers to have their materials broadcast on more than one system so as to reach a sufficiently large group of users. These reciprocal needs of content providers and electronic communications undertakings enhance the likelihood that the companies can come to an agreement on access without the intervention of the authorities.

256. Finally, it is appropriate to bear in mind that it is permissible to require that electronic communications undertakings carry certain broadcasting content if a considerable proportion of users use their network to receive radio and television broadcasting. This provision can be applied, for example, to achieve the objective of broadcast transmission to all Icelanders. The provision is not limited to undertakings that have been designated as having significant market power following a market analysis. No broadcasting station has requested that this provision be applied, which indicates that access to distribution systems is not a significant problem.

6.4.4 Conclusion

257. PTA's conclusion regarding the wholesale market for broadcasting transmission services for digital television via wireless networks is that entry barriers do exist. The main reason for this conclusion is the cost of establishing a distribution system. PTA does not consider it likely that effective competition will be established in this service market in the next few years; however, competition could come from fixed-line systems, although they do not belong to the same service market under current circumstances. PTA is of the opinion that the provisions of competition law suffice to solve any problems that may arise in this market, as disputes related to this market are rarely referred to the authorities.

[34] Temporary decisions no. 1/2005 and 1/2007.

6.5 Wholesale market for broadcasting transmission services for digital radio and television on fixed-line networks

6.5.1 Entry barriers

258. The development of a fixed-line network is extremely costly. Fixed-line networks are more expensive to build than are wireless distribution systems, but the revenue-generating potential of such networks is greater, as they can be used to offer a wider variety of services. Nonetheless, it is very unlikely that it would be considered economical to build up a cable system in those locations where another such system already exists.

259. Conventional cable networks have not gained a large following in Iceland. It was not until the advent of ADSL television that television reception via fixed-line network became widespread. ADSL television has become more popular in Iceland than in most other countries. Síminn seems to have stopped marketing its Breidband as an option for television reception, although the network is still in operation. Developments in interactive television have not extended to Síminn Breidband.

260. Due to the popularity of ADSL television, undertakings wishing to enter the television distribution market need not necessarily lay their own subterranean cables. They can lease access to Míla's copper local loops and set up their own ADSL service and television distribution system. In spite of the fact that this reduces the investment requirement and the risk of sunk costs among new operators in the market, expenses seem to be high enough that new operators have difficulty entering the market. At this writing, three years have passed since Síminn began providing ADSL television services, and no other undertaking has begun to offer it. This indicates that costs remain somewhat of an entry barrier.

261. GR is developing a fibre optic cable network that can be used for television distribution, among other things. Vodafone has begun offering such service on this network. The build-up of the network is proceeding slowly, however, as it represents a very large investment.

262. There are few statutory hindrances on this market. There is no need to apply for a frequency authorisation for the fixed-line network, and operators need only announce their operations to PTA. If the company wishes to broadcast its own programming, it must apply to the Broadcast Licensing Committee for a licence.

263. In some instances, planning and building regulations could cause difficulties related to the laying of cables. However, undertakings need not own their own cables in order to enter this market. If an undertaking wishes to do so, however, it generally has the right to lay cables on land belonging to another party, according to Article 69, Paragraph 1 of the Electronic Communications Act.

6.5.2 Potential competition

264. PTA is of the opinion that competition can be expected in this market in the near future, in spite of the cost accompanying the establishment of an ADSL

distribution system. Companies other than Síminn have obtained the equipment to provide ADSL service. PTA considers it highly likely that they will attempt to expand their service offerings in the near future and will begin to offer television distribution, partly in order to improve the competitive position of their ADSL service.

265. Furthermore, competition can be expected from fibre optic cable networks in the future, although the build-up of these networks has been so slow in recent years that it is not possible to assume that they will have a significant market share during the time horizon for this analysis.

266. When a greater number of options are available in this market, users should have little difficulty in switching service providers. The termination period for new contractual agreements for electronic communications services may not exceed six months, according to Article 37, Paragraph 2 of the Electronic Communications Act, and at the end of six months, the termination period is one month. Users generally do not invest in reception equipment themselves, as the cost of such equipment is included in the price list for the connection.

267. In spite of the fact that PTA considers it extremely likely that competition will increase in this market in the future, it is impossible to say with any certainty when that competition might become effective. For this reason, the Administration considers it appropriate to examine whether the provisions of competition law could suffice to resolve potential problems in the market until effective competition has been established.

6.5.3 Do the principles of competition suffice?

268. As regards the remedies and statutory authority of the competition authorities, reference is made to Section 6.4.3 of this report.

269. In assessing whether the provisions of competition law suffice to correct a market malfunction, it is necessary to consider whether broad-based measures are necessary, whether frequent and immediate intervention will be necessary, and whether special measures are necessary to create statutory predictability in the market.

270. Broad-based measures are necessary primarily when an undertaking that controls essential infrastructure refuses to grant other undertakings access and the authorities must establish access through instructions to the undertaking in question and perhaps must involve itself in access arrangements through intervention in prices and other terms and conditions. Síminn, which controls the largest digital fixed-line distribution system in operation in Iceland, has granted unrelated television stations access to its system, and the authorities have received no complaints on these matters. GR also grants access to its fibre optic cable network so that undertakings can offer television distribution, among other things. However, GR does not operate a television distribution system on the fibre optic cable network. Vodafone is the only company currently offering television distribution via the GR fibre optic cable network, and all of the most popular domestic programming and a number of foreign stations are available on that system. Therefore, there is no indication that content providers' access to fixed-line television distribution systems is limited.

271. There have been few complaints about television stations' access to fixed-line distribution systems. PTA received one complaint concerning Fjölvarp's access to Síminn's Breidband in certain neighbourhoods in Hafnarfjördur, where it was prohibited to set up antennae. That instance involved analogue distribution, and the dispute centred on whether there were sufficient transmission capacity. No decision was rendered in that case because circumstances changed and the prohibition of antennae was lifted, and digital television entered the market. PTA is unaware of any other complaints about television stations' access to fixed-line distribution systems.

272. Obligations have not hitherto been imposed on broadcast distribution systems pursuant to the Electronic Communications Act. In spite of this, access to distribution systems has been established. Only once has PTA been asked to intervene in matters related to access to a fixed-line television distribution system. Therefore, the Administration does not consider it necessary to impose particular obligations in this market, given the current circumstances and the experience of recent years.

273. PTA is of the opinion that the conditions reigning in this market are the same as those in the market for wireless digital distribution, as regards the reciprocal needs of content providers and distribution systems. Distribution systems' need for content and content providers' need for wide coverage mean that both parties have a certain amount of countervailing buying power, which makes it likely that they will be able to negotiate for access and distribution without the imposition of special obligations pursuant to the Electronic Communications Act.

274. In the above-mentioned Competition Council Decision no. 10/2005, which concerned the merger of Síminn and Skjárinn, conditions were set pertaining to access to Síminn's television distribution system. The Competition Council's conditions correspond to obligations concerning access to a distribution system, transparency, and non-discrimination. After this decision was published, most Icelandic television and radio stations have been distributed on Síminn's system. Síminn has published a price list for digital television distribution. The price list specifies the price for the distribution of locked and free-to-air television programming and video-on-demand services.

275. It is permissible to require that electronic communications undertakings carry certain broadcasting content if a considerable proportion of users use their network to receive radio and television broadcasting. This provision can be applied, for example, to achieve the objective of broadcast transmission to all Icelanders. The provision is not limited to undertakings that have been designated as having significant market power following a market analysis. No broadcasting station has requested that this provision be applied, which indicates that access to distribution systems is not a significant problem.

6.5.4 Conclusion

276. PTA's conclusion regarding the wholesale market for broadcasting transmission services for digital television via fixed-line networks is that entry barriers do exist. The main reason for this conclusion is the cost of establishing a distribution system. PTA considers it likely that effective competition could develop in this market in the next several years. The Administration considers the provisions

of competition law sufficient to solve problems that may arise in this market, as it is very seldom that the authorities receive complaints concerning access to fixed-line television distribution systems.

7.0 Summary and conclusions

277. In this analysis, the Post and Telecom Administration (PTA) has discussed the wholesale market for broadcasting transmission services to deliver broadcast content to end users. The analysis examined the definition of the relevant market (Market 18) as set forth in the ESA Recommendation and the applicability of that definition to market conditions in Iceland. PTA came to the conclusion that, given the conditions reigning in Iceland, this market consists of several different service markets. PTA considers it appropriate to define five distinct service markets for broadcasting transmission services:

1) Broadcasting transmission services for analogue radio via wireless networks
2) Broadcasting transmission services for analogue television via wireless networks
3) Broadcasting transmission services for digital radio and television via wireless networks
4) Broadcasting transmission services for digital radio and television via fixed-line networks
5) Broadcasting transmission services for digital radio and television via satellite

278. PTA is of the opinion that all of the service markets except the satellite market extend to the entire country, as it is not possible to distinguish individual areas where competitive conditions differ substantially from those in other areas. The market for broadcasting transmission services via satellite, however, is not limited to Iceland. The marketing area of undertakings engaged in such operations is much larger; therefore, this is a transnational market and is not within PTA's jurisdiction.

279. PTA conducted further examination of the service markets it had defined, with the exception of the satellite market, with the aim of determining whether they fulfilled the conditions for the possible imposition of obligations on undertakings in those markets. Those conditions are as follows:

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 law do not suffice to eliminate barriers or promote competition.

280. The market for broadcasting transmission services for analogue radio on wireless networks was not considered to fulfil the first criterion, as entry barriers to this market are not significant.

281. The market for broadcasting transmission services for analogue television on wireless networks was considered to fulfil the first two criteria but not the last, as the provisions of competition law were considered sufficient to solve any problems that could arise in that market. Furthermore, it was considered of diminishing significance to intervene in this market, as this service is obsolescent.

282. The market for broadcasting transmission services for digital radio and television on wireless networks was considered to fulfil the first criterion, as there are significant entry barriers in this market. As regards competition, it was not considered likely that effective competition would be established in this particular service market in the near future; however, it is conceivable that competition from distribution systems on fixed-line networks could affect this market. PTA was of the opinion that the provisions of competition law would suffice to solve any problems that might arise in this market, as disputes concerning access to distribution systems are rare.

283. The market for broadcasting transmission services for digital radio and television on fixed-line networks was considered to fulfil the first criterion. As regards competition, it was considered highly likely that competition could be established in this market, but it is difficult to say when this might happen. The Administration was of the opinion that the provisions of competition law would suffice in this market. Disputes concerning access to distribution systems are rare, and the competition authorities have already begun to set conditions pertaining to access, transparency, and non-discrimination in the operation of the largest distribution system in the decision on the merger of Síminn and Skjárinn.

284. Pursuant to the Electronic Communications Act, various types of rules are in effect concerning access to distribution systems and related infrastructure. These are explained further in Section 5. Among these are the provisions of Article 55 of the Electronic Communications Act, which states that it is possible to oblige electronic communications undertakings to broadcast television programming. It has not proven necessary to enforce these so-called must-carry provisions with an administrative decision; thus it is not considered necessary to impose further obligations on market participants at the present time.

285. It is a characteristic of the radio distribution markets that data utilities and distribution systems are mutually dependent, and this encourages the parties concerned to come to an agreement on the distribution of material.

286. In the new Commission Recommendation on the relevant markets, no. 2007/879/EC, the market for broadcasting transmission services has been removed from the list of markets that regulatory authorities in the electronic communications sector are required to analyse. This Recommendation has not yet been incorporated into the EEA Agreement. For this reason, PTA is still required to analyse this market, both because it is still part of the applicable ESA Recommendation and because this market has not previously been analysed in Iceland, and it is assumed that all markets specified in the original Recommendation will be analysed before work begins in accordance with the new Recommendation.

287. The Commission's grounds for excluding this market from the list in the Recommendation can be found in Section 4.4 in the Explanatory note accompanying the new Recommendation,[35] which gives consideration, among other things, to the

[35]EXPLANATORY NOTE Accompanying document to the Commission Recommendation on Relevant Product and Service Markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services (Second edition) {(C(2007) 5406)}

fact that the reception options for television are constantly increasing in number with the advent of digital transmission, and that this tends to promote effective competition. Furthermore, it is stated that must-carry provisions can be used to guarantee user access to television programming when such access is in the public interest. It is pointed out that the Electronic Communications Act contains provisions concerning joint utilisation of infrastructure, irrespective of market analysis. Finally, it is emphasised that the competition authorities can actually address the problems that have arisen with respect to radio distribution systems.

288. PTA intends to follow developments on the relevant markets closely and, if circumstances change significantly, it will consider carrying out a new analysis of these markets.

http://ec.europa.eu/information_society/policy/ecomm/doc/library/proposals/sec2007_1483_final.pdf