



Ministry of Transport
and Communications

Communications Policy Programme for Electronic Media

Government report to the Parliament of
Finland 2012

1.	GOVERNMENT POLICIES AND KEY ACTIONS	4
2.	INTRODUCTION	6
3.	OBJECTIVES OF THE COMMUNICATIONS POLICY PROGRAMME.....	9
4.	PREPARATION OF THE COMMUNICATIONS POLICY PROGRAMME	14
5.	FINNISH MEDIA ENVIRONMENT	14
5.1	Television-equipped households	14
5.2	Financial aspects of the television industry	16
5.2.1	Development of marketing-communication volumes	19
5.2.2	Income from television operations.....	20
5.2.3	Development of pay television	21
5.2.4	Television change factors	23
5.3	Radio	24
5.3.1	Radio industry	24
5.3.2	Financial aspects of the radio industry	25
5.4	Domestic programme production.....	25
5.5	Changes in consumer behaviour in the communications market	28
6.	SPECTRUM MANAGEMENT	29
6.1	International spectrum management	29
6.1.1	International Telecommunication Union.....	29
6.1.2	European Union directives on electronic communications	30
6.1.3	Radio-spectrum policy programme of the European Union.....	32
6.2	Current system in Finland.....	33
6.2.1	Frequencies used in general telecommunications operations	34
6.2.2	Television frequencies.....	36
6.2.3	Radio frequencies.....	36
6.2.4	Government Resolution on Spectrum Policy	37
6.3	Tasks of the Government	37
6.4	Tasks of the Finnish Communications Regulatory Authority.....	37
6.5	Frequency fees that promote spectrum efficiency	38
6.6	Reform of frequency management.....	39
7.	CURRENT REGULATION OF TELEVISION AND RADIO OPERATIONS	39
7.1	Audiovisual Media Services Directive of the European Union	39
7.2	Legislation.....	40
7.3	Subordinate statutes.....	42
7.4	Must-carry obligation	44
7.5	One-card principle	45
7.6	Other regulatory details	46
8.	CURRENT LICENCE SYSTEM.....	47
8.1	Valid regulation.....	47
8.2	Television and radio operating licences.....	47
8.3	Regulation and supervision of licences	50
8.4	Transfer of licences and changes in effective control	51
8.5	Programme licence system in relation to the Constitution	52
8.6	Valid network and programme licences	53
8.6.1	Network licences for television operations	53
8.6.2	Television programme licences.....	54
8.6.3	Radio licences.....	54
9.	MARKET DEVELOPMENTS AND COMPETITION IN THE COMMUNICATIONS MARKET	55
9.1	Development of competition in the television broadcast service market.....	55
9.2	Market development for wireless broadband	57
9.3	Development of competition in the radio broadcasting service market.....	60

9.4	Market entry barriers, promotion of competition, and market regulation in the communication-services market	61
9.5	Frequency distribution in relation to market competition in the communication-services market	63
9.6	Investment incentives in the communication-services market	63
10.	FINNISH CONTENT CREATION AND THE PLURALITY AND VERSATILITY OF COMMUNICATIONS	64
10.1	Safeguarding domestic content creation	64
10.2	Plurality and versatility of communications	65
10.3	Promoting freedom of speech	66
11.	DEVELOPMENTS IN TECHNOLOGY	66
11.1	From digitalisation to high definition	66
11.1.1	Distribution technology	67
11.1.2	Compression technology	68
11.2	UHDTV and 3DTV	68
11.3	Mobile television	69
11.4	Other distribution channels and promotion of their use	69
11.4.1	Wireless broadband	70
11.4.2	Hybrid model: Broadband as an enabler of supplementary services in terrestrial television	70
11.4.3	Promoting multicast technology in IP traffic	71
11.5	Vitality of terrestrial television	72
11.6	Cognitive radio networks	72
11.7	Radio	73
12.	FREQUENCIES OF TERRESTRIAL TELEVISION OPERATIONS	74
12.1	Television in the future	74
12.2	Future frequency needs of wireless broadband	75
12.3	Alternative frequency-distribution models for television operations	76
12.4	International frequency plan for television	79
12.5	Re-planning of television frequencies	81
12.5.1	Single-frequency networks	82
12.5.2	Location of television transmitters	82
12.6	Secondary systems using television frequencies	82
12.6.1	Radio microphones	82
12.6.2	Programme production frequencies	83
13.	CONSUMER QUESTIONS	84
13.1	Receivers	84
13.2	Antenna solutions and the internal networks in real property units	84
13.3	Issues related to interference with television reception	86
13.4	Informing consumers	86
13.5	One-card principle	87
14.	RADIO OPERATIONS	88
14.1	Digitalisation of radio	88
14.2	Development of the licence system	88
15.	CONCLUSIONS	89
15.1	Resolutions on spectrum policy and frequency technology	89
15.2	Promotion of financial efficiency in frequency use	94
15.3	Frequency management and licensing system reform	95
15.4	Guaranteed high quality of programme content and domestic content production, and promotion of multifaceted communications	99
15.5	Promotion of new, alternative distribution channels	100
15.6	Radios	101
15.7	Taking care of viewers and listeners	101
15.8	Conclusions on some other details	102
15.8.1	Pay-TV service providers and the one-card principle	102
15.8.2	Must-carry obligation	103

15.8.3	Quality of television broadcasting	103
15.8.4	Channel numbering	104
15.8.5	Multicast technology	105
16.	REQUIRED CHANGES IN LEGISLATION.....	105

Figures:

Figure 1:	Proposal for nationwide multiplexes from 2017 onwards	6
Figure 2:	Television-equipped households in Finland (source: Finnpanel survey on television in households in Finland in late 2011, $n = 3,198$)	16
Figure 3:	The mass communication market in 2000 (source: Statistics Finland).....	16
Figure 4:	The mass communication market in 2010 (source: Statistics Finland).....	17
Figure 5:	Income from television operations in 2000–2010 (source: Statistics Finland's mass-media statistics).	18
Figure 6:	Cash flows in the television industry in 2011.	18
Figure 7:	Development of marketing-communication volumes, in terms of prices in effect at the time.	19
Figure 8:	Development of marketing communication volumes, 2002–2012.	20
Figure 9:	Income from television operations in 2002–2011.	21
Figure 10:	Proliferation of pay television in 1998–2011 (source: Finnpanel, TV Households in Finland).	22
Figure 11:	Pay-television operators.....	23
Figure 12:	Structure of content creation in Finland.....	26
Figure 13:	Television networks and channels, autumn 2012.....	54
Figure 14:	Viewing shares by channel in 2010 (source: Finnpanel).	55
Figure 15:	Viewing shares amongst the three major operators in 2011 (source: Finnpanel Oy, TV Audience Measurement Survey, 10+ age group).	56
Figure 16:	Developments in traffic volume (source: ITU-R M.2243).	59
Figure 17:	Development in volumes of data transferred via mobile-communication networks in Finland in 2008–2011 (source: FICORA, Market Review 3/2011).	60
Figure 18:	HD in television-using households (source: Finnpanel, TV Households).	67
Figure 19:	Auction model (scenario 1).....	76
Figure 20:	Administrative incentive price model (scenario 2).....	78
Figure 21:	Intensified network competition model (scenario 3).....	79

1. GOVERNMENT POLICIES AND KEY ACTIONS

1 Taking care of the interests of viewers and listeners

- Finland has long been a leader in electronic communications. This success has been contributed by our forward-looking communications policy. In switching over to a new transmission technology in terrestrial television broadcasting, attention should be paid to implementing the process in a timely, efficient and coordinated way as soon as the necessary preparations for it have been completed.
- Terrestrial television broadcasting is undergoing major changes, with new services and content distribution channels challenging traditional TV. Viewers themselves can choose when to make the move to the reception of high-definition broadcasts. This is why action must be taken to ensure that free-to-air channels can continue to use current technology until 2026 unless the Government identifies a good reason to switch over to a new transmission standard earlier than this.
- During the step-by-step switch-over process beginning in 2017, transmissions would continue in two multiplexes using current technology until 2026, unless a decision is made at an interim review that one of these multiplexes should begin using new transmission technology earlier than this.
- 2016 is an important year as far as administrative aspects are concerned - it is when nearly all existing television operating licences are due to expire. The measures proposed in this policy programme require changes in the current system of allocating frequencies to television broadcasting. Impacts on viewers prompted by spectrum technology are minimised through diligent and sufficiently long-term frequency planning.
- In an effort to ensure a coordinated and efficient switch-over to new transmission technology, the Ministry of Transport and Communications will set up a broad-based working group to prepare a detailed plan for the switch-over by summer 2013. By 2016 at the latest, the working group will also produce estimates on the timetable for switching to high-definition broadcasts. This will allow future governments the opportunity to review the situation and assess whether the timetable now outlined is feasible.
- The timetable of a larger-scale switch-over to new transmission technology will be examined separately. The situation will be first evaluated in 2020, for example in terms of whether 2026 is an appropriate year for full switchover to newer television transmission technology.
- Digitalisation of radio is not to be initiated at this time.

2 Ensuring the high quality of content provision

- Requirements that promote preservation of the current high standard of content provision are targeted at channels serving the public interest, as specified separately. Channels serving the public interest are, amongst other things, to provide programmes in Finnish and Swedish, news and current-affairs programmes, and domestic drama and documentaries.
- The quota for programmes created by independent producers is raised to 19 per cent of transmission time or programming budget. The purpose of this change is to ensure that the number of first broadcast works produced by independent producers in Finnish or Swedish will remain at least at the 2012 level.

3 Establishing the conditions necessary for the development of terrestrial television

- Sufficiently long licence periods for network operations (i.e., 20 years) and a simplified programme licence procedure facilitate the development of operations.

4 Encouraging competition in the television market and streamlining administration

- In the future, programme licence-holders will be able to select a network operator and a multiplex and also choose between standard transmissions and high definition.
- As part of drafting the Code for Information Society and Communications Services, steps will be taken to examine legislation on market regulation, which may influence the distribution costs of television and radio operations.

5 Increasing spectrum efficiency

- The comparative method continues to be used in the granting of network licences.
- A moderately raised spectrum fee is applied to all multiplexes except the ones used for channels serving the public interest. The spectrum fee for a multiplex would be in the range of EUR 30,000 to 40,000 per year.

6 Simplifying the programme licence system and revamping frequency administration

- The programme licence system continues but in a simplified form. This will promote the opportunities of pay-TV operators, in particular, to develop their operations in a flexible way by offering versatile and high-quality television content.
- As a general rule, both television and radio-programme licence decisions become the responsibility of the Finnish Communications Regulatory Authority (FICORA).
- If there is scarcity of frequency capacity, programme licences continue to be issued by the Government. Other decisions that are significant in terms of communications policy will also remain with the Government.

7 Promoting alternative distribution channels

- In 2017, the 700 MHz spectrum band is to be allocated to wireless broadband. Allocating lower frequencies to mobile communications enhances the distribution of audiovisual content.
- Pay-TV plays a significant part in terms of developing television content and services. For Finnish television supply, it is important that people continue to have a sufficiently wide range of programming to choose from in the terrestrial pay-TV network. This policy programme aims at encouraging pay-TV operators to take steps to strengthen their role in the Finnish media landscape. Pay-TV operators are well-placed to do this, for example through their direct contacts with the customers. They can promote the adoption of new-technology receivers by making their acquisition reasonably-priced, easy and content-wise attractive.
- By the end of 2012, the Ministry of Transport and Communications will draw up an Action Programme for the promotion of market-driven broadband supply and demand.
- A Government Resolution adopted in May 2012 sets out policy lines regarding the development needs of both basic rate and high-speed internet connections. The target set for 2015 by which permanent residences will be no more than two kilometres from a high-speed 100 Mbit/s broadband connection contributes to the uptake of alternative distribution channels.

8 Ensuring the operating conditions for versatile radio services

- The measures proposed in points 4 and 6 above also improve the operating conditions of versatile radio programming.
- Frequency management is simplified such that technical decisions are, as a rule, made by FICORA.
- During the current licence period, an action plan will be drafted to ensure the vitality of Finnish radio operations.
- In conjunction with preparations for the Code for Information Society and

Communications Services, steps will be taken to clarify the use of frequencies allocated to licence-free and short-term radio operations such that commercial communications would not be allowed within these frequencies.

9 Proposals pertaining to some other details

- Pay-TV providers will be included in the scope of communications legislation, and regulation related to the so-called one-card principle will be tightened.
- The must-carry obligation continues for YLE channels and other channels serving the public interest, even after 2016.
- FICORA will be authorised to issue regulations on channel numbering.

Proposal for nationwide multiplexes 2017- ➔

	Standard	Valid until	Content	Granting of network licence	Frequencies
1	T1	2026	YLE and commercial channels of public interest	'Beauty contest'	470-698 MHz multi-frequency
2	T2	2036	YLE and commercial channels of public interest	'Beauty contest'	470-698 MHz multi-frequency
3	T1	2026	Commercial free-to-air channels (7 SD channels)	'Beauty contest' + moderate AIP	470-698 MHz multi-frequency
4*	T2	2026	ca 7 HD or 15-20 SD channels	'Beauty contest' + moderate AIP	470-698 MHz single frequency
Spectrum band for mobile use					698-790 MHz
Spectrum band for mobile use					698-790 MHz
VHF A	T2	2036	ca 7 HD or 15-20 SD channels	'Beauty contest' + moderate AIP	174-230 MHz
VHF B	T2	2036	ca 7 HD or 15-20 SD channels	'Beauty contest' + moderate AIP	174-230 MHz
VHF C	T2	2036	ca 7 HD or 15-20 SD channels	'Beauty contest' + moderate AIP	174-230 MHz
In addition, 1-3 nearly nationwide multiplexes in the UHF band:					
5	T2	2036	ca 7 HD or 15-20 SD channels	'Beauty contest' + moderate AIP	
6	T2	2036	ca 7 HD or 15-20 SD channels	'Beauty contest' + moderate AIP	
Etc.					

* DVB-T1 = standard television SD
 * DVB-T2 = newer standard enabling high-definition quality HD
 * Present multiplex E; licence valid until 2026; after that new licence through beauty contest + AIP

1

Figure 1: Proposal for nationwide multiplexes from 2017 onwards

2. INTRODUCTION

The Finnish Government has submitted this communications policy programme in the form of a Government report Parliament. The target of Prime Minister Jyrki Katainen's Government is a caring and successful Finland. As stated in the Government Programme, the Government will draw up a 'Communications Policy Programme for Electronic Media'. In line with the Government Programme, the availability of electronic content services using mass media is promoted via all distribution channels that are essential for citizens. Moreover, spectrum policy will be formulated so as to account for the needs of Finnish culture and communications policy while, simultaneously, aiming at increased spectrum efficiency on the basis of earlier experience. Legislation, spectrum policy, and network licence terms are used to ensure the versatility and continuous high quality of electronic media content.

For quite some time, Finland has been a frontrunner in electronic communications. Some of this success has been brought about by a forward-looking communications policy that has created opportunities for new kinds of technologies and markets. The target of the

communications policy is to provide high-quality services available for everyone, at an affordable price. One key challenge of the new decade is to ensure, through communication policy decisions, that Finland continues to have the conditions for being an early adopter of new kinds of services and technologies.

With the granting of the first competing network licences, in 2009, a significant step was taken to open competition in, for example, provision of terrestrial television network capacity. Since the 1990s, major technological and commercial disruption has taken place in the field of communications. For terrestrial television, the digital transition completed in 2007 was a major turning point.

Central features of this development in communications include commercialisation, the internet, mobility, and increasingly fast communications via a growing number of channels. In spite of the ubiquity of the internet, easily utilisable frequencies continue to be scarce, leading to the question of how the spectrum is to be distributed.

To allow us to review the future of terrestrial television from a clean slate, so to speak, the licence decisions of the past years have been made in accordance with a policy aimed at granting all licences with the same date of expiry. Nearly all network licences expire at the end of 2016.

On the other hand, increased supply of broadcasting capacity has changed the television market and calls for, among other actions, a review of the current licence system.

This policy programme assesses the future of terrestrial television as a whole, trends in the television market, and the development needs of the current licence system. The policy programme applies to continental Finland. The programme also includes views on the future of radio. Licences granted for analogue radio operations expire in 2019.

The policy programme has links to the Government Resolution on Spectrum Policy, which concerns mobile communication operations. The resolution states that licences for the 800 MHz spectrum band, reserved for mobile-communication networks, will be granted through auction no later than by the end of 2013. As far as the 700 MHz band is concerned, the resolution states that Finland will strive to influence the international preparations and cooperation related to the matter in such a way as to remove, as swiftly as possible, the international restrictions limiting the uptake of this frequency band for mobile communications. In addition, the resolution assesses the development needs of the current licence system on a more general level. The target of the policy programme is to increase spectrum efficiency and present an assessment of whether cost-based spectrum fees should in Finland be replaced with administrative incentive-based pricing, corresponding to the financial value of the frequencies.

In line with the Government Programme, the Ministry of Transport and Communications has initiated the preparation of the Code for Information Society and Communications Services. The new law will collate all statutes pertaining to electronic communications and the provision of services in an information society. The Code for Information Society and Communications Services will include statutes such as the Communications Market Act, Act on the Protection of Privacy in Electronic Communications, Domain Name Act, Act on Radio Frequencies and Telecommunications Equipment, and Act on Television and Radio Operations.

The Communications Policy Programme for Electronic Media is intrinsically linked to the Code for Information Society and Communications Services and its progress. The information society code project preparations have been divided into two phases. After the policy programme for communications is finalised, the first-phase status and the schedule for the information society code will be reviewed. The objective is to present a

government proposal to Parliament in the autumn of 2013. This proposal would include the legislative amendments, if any, required by the policy programme for communications.

The policy programme proceeds from the assumption that the terrestrial television network is a reliable and cost-efficient distribution channel for linear television content, with superior coverage. However, in assessment of the future of television, alternative distribution channels need to be considered, and equality in the preconditions for operation of various operators ensured.

Terrestrial television plays a key role in the nationwide distribution of television content to all citizens. The terrestrial distribution network is the only nationwide television network. Terrestrial television transmission networks also enable mobile reception and reception even in locations where the construction of cable-television or other broadband networks is not financially viable.

Business operations focusing on content are moving towards more personalised and wider-scope service entities that combine content, technologies, and services in new ways. As a result, existing media offerings will increasingly be transformed into services.

As traditional business models are replaced by models adopted by the internet, the ground rules of the communication industry are changing. Internet content and the volume and versatility of its services either have undermined the traditional business models of the communications industry, which are based on scarcity, or are about to do so. This development will have a corresponding impact on our current regulation system. The regulatory models based on scarcity need to be re-examined.

Operators in the communications industry will need to adapt quickly to a continuously changing, rapidly paced business environment in which established business advantages are no guarantee of a strong position in the future. The new regulatory system needs to create a model that treats distribution channels equally but does not set barriers to market entry.

Today's citizens, who as television-viewers and radio-listeners are also continuously faced with new options and challenges introduced by increasing supply, can, at the same time, when they so desire, make their choices more freely from a service supply that is more versatile.

Electronic media now encompass many books, games, magazines, etc. Nationally, questions related to publishing are dealt with by the newspaper and magazine committee, so the scope of the policy programme is limited to television and radio operations while still taking into account new distribution channels and their significance to the industry's future.

Another definition of the scope of the policy programme, with overarching importance in terms of electronic media, involves Finland's national public-service broadcasting company, YLE Ltd. In June 2012, the Finnish Parliament approved a government proposal on amendments to the Act on Yleisradio Oy and to the Act on the State Television and Radio Fund, which will enter into force on 1 January 2013. The amendments are based on the statement approved on 16 December 2011 by parliamentary group chairpersons and Minister of Housing and Communications Krista Kiuru and on the resolution approved by the Government on 21 December 2011, which outline the key principles of the amendments pertaining to public-service financing, steering and monitoring, and the definition of a public service. This policy programme will, however, deal with YLE from a spectrum-policy perspective, taking into account the spectrum needs of public services.

The Government Programme specifies that copyright legislation will remain within the purview of the Ministry of Education and Culture. Accordingly, copyright issues are not dealt with in the present policy programme. According to the Government Programme, the Copyright Act will specify in more detail the reasonable terms and compensation that are conditions of copyright transfer. Various distribution channels are taken into account in the development of the copyright system. For the above-mentioned reasons, the Communications Policy Programme for Electronic Media excludes copyright issues pertaining to Finnish culture and content production. Consequently, the programme does not take a stand on copyright issues related to authors, artists, producers, or television companies. Also, the programme does not express views on matters related to television programme storage services.

Some of the conclusions presented in the programme are such that they allow current practices to be reviewed and assessed from a new perspective. Some conclusions are also likely to influence company operations as well as consumer behaviour. Even if the measures proposed by the policy programme are scheduled for later in the decade, it is very important that viewers, listeners, and stakeholders of the industry receive information on the reasoning behind and targets of future solutions sufficiently early.

3. OBJECTIVES OF THE COMMUNICATIONS POLICY PROGRAMME

Television and radio play a key role in Finns' everyday life. In 2011, Finns spent on average three hours a day watching television and another three listening to the radio.

The objective of the communication policy programme is to formulate a long-term, forecast-based outlook on the regulatory environment through the assessment of future regulation needs from the perspectives of consumer behaviour, market developments in the industry, and technological development.

The objectives and expectations for the programme have been considered in cooperation with industry representatives. The programme has been prepared in collaboration with the licence system reform group, open to all participants and established for the purpose of preparing the Code for Information Society and Communications Services. The group has a total of 47 members representing a wide array of stakeholders from the television, radio, and telecommunications industries, along with authorities and other organisations.

The objective of the programme is to secure the preconditions for operation of Finnish electronic media and to maintain high-quality, versatile, and pluralistic television and radio programming. The objectives have been grouped into the following eight entities.

The communication policy programme aims to look after viewers and listeners.

Comprehensive and versatile television and radio programming must be available to everyone as easily as possible, at reasonable cost, irrespective of place of residence. If they so desire, viewers may also choose from a wide array of pay-television supply, and complement the services of linear television with content available via other distribution channels. The solutions implemented will ensure equality across regions.

Correspondingly, radio-listeners must be able to receive versatile radio content irrespective of their place of residence.

Both the authorities and operators in the industry will focus on timely and easily understood communications. Particular attention must be paid to the changes associated with the years 2016, when terrestrial television licences and programme licences expire, and 2019, when licences granted for analogue radio operations expire. It is important for

both television-viewers and receivers of radio programming to know in good time when and how the changes, if any, are going to affect their receivers and reception systems.

Efficient spectrum planning that accounts for viewer needs helps minimise the impact of changes as experienced by viewers.

The objective of the communications policy programme is to guarantee the high quality and versatility of television and radio programming, and to ensure that the volume of Finnish programmes remains at least at the current level.

High quality and versatility are features of Finnish television and radio programming. Maintaining versatility and high quality is one of the key objectives of the programme.

The tasks and content of the public service provided by YLE are defined in the Act on Yleisradio Oy (1380/1993). In addition to provision of public service, television and radio broadcasting versatility demands that sufficient spectrum capacity be reserved for the so-called public-interest channels, which are separately defined in legislation. Also, sufficient radio-frequency capacity must be reserved for commercial radio operations.

The objective of the programme is to create preconditions for operation and develop the operating environment via communication policy measures such that Finnish content production, in particular, is ensured. There is great demand for content created for Finns, and the continuation of such content must also be ensured in the future. When regulation is renewed, it must be assessed whether requirements related to the original language of programmes, for example, should be used more extensively in the regulation of the audiovisual industry. When used with consideration, the requirement for use of the country's official languages could be enough to guarantee that programme investments are sufficiently targeted at Finnish and other Nordic productions.

The preconditions for television-industry operations can be guaranteed even if some of the frequency capacity currently used by television operations were to be allocated to other use. This is possible because of the continuous development of digital television compression technology, and the subsequent increase in spectrum efficiency. The re-planning of television frequencies will also increase the capacity available to television operations. Irrespective of developments in standards, network operators can also improve the efficiency of currently used compression techniques so that a single multiplex can carry more content than before. When efficiency is improved by such means, consumers do not need to replace their equipment.

The licence system and the model for making decisions on rights of frequency use can be used to contribute to pluralistic content provision.

Ensuring the financial preconditions for electronic media operations is a prerequisite for continuous high quality and versatility. It is a way to guarantee that Finns can also in the future choose from a wide range of versatile programming including, in particular, Finnish programmes created in the country.

The policy programme creates preconditions for the development of terrestrial television.

Television operations must continue to have sufficient frequency capacity at their disposal. Long-term investment is enabled with licences that are valid for sufficiently long time periods. In terrestrial television broadcasting, it is recommended that newer broadcasting technology be adopted in all spectrum bands from 2017 onward.

Equal operations preconditions for television- and radio-industry operators are a

requirement for the development of terrestrial television. Terrestrial television is expected to remain the most significant distribution channel for linear television content far beyond 2017. Terrestrial television covers 99.98 per cent of the Finnish population, and since it enables also mobile viewing and viewing at holiday residences, it plays a key role as an enabler of communications in exceptional circumstances and in times of crisis.

The conditions needed for further development of terrestrial television can be promoted also via simplification of licence-granting procedures. The deployment of new, emerging technologies can on the other hand be promoted with more flexible licence regulation.

The policy programme creates competition in the television industry and simplifies administration.

The model selected for granting of television and radio licences will be significant in terms of both the television and radio markets and the programme supply. For the past two decades Finnish communication policy has focused on establishing the preconditions for competition in communication networks and services. Competition has resulted in significant advantages, such as new and versatile services and more affordable prices. From an international perspective, the Finnish telecommunications market provides consumers with services that are reasonably priced, of high quality, widely available, and the result of competitive selection.

Since the early 2000s, the objective of communications policy has been to foster competition in the terrestrial television networks, too. It is possible to create a competitive environment in the terrestrial transmission network by granting licences to companies other than the company that holds a monopoly in the market. Network and service competition can be promoted also by giving competing network companies who do not have their own high masts access to high masts and mast equipment rooms.

On the other hand, the terrestrial television network competes both in terms of content and in quality with satellite broadcasting and cable-television networks, and the future will see it do so also with optical fibre and other high-speed wireless broadband networks.

Our current licence system, in which the Government first decides on the licence-holders among terrestrial television operators and then grants programme licences – i.e., defines the television content that is to be transmitted via certain terrestrial television multiplexes – prevents content-providers from organising competitive bidding processes for transmission service provision. Programme licences as such can also be considered to be a barrier, preventing content-providers from entering the market.

The current licence system for terrestrial television operations differs from that for cable-television operations, which, from 1998 onwards, have not been subject to a licence. For terrestrial television operations, the licence system is still in force, because of the scarcity of transmission capacity. With digitisation, the situation has changed considerably and the grounds for granting programme licences need to be reconsidered. Abandoning the programme licence system would also simplify administration and decrease the administrative burden of companies.

Sufficiently flexible licence policies can also safeguard the profitability of radio operations. We need to be able to develop operations without being restricted by licence terms that are too strict for today's environment.

The policy programme boosts spectrum efficiency.

Currently, television operations utilise various multiplexes, of which some are underused. Through television frequency re-planning and the adoption of more efficient transmission

and compression technologies, some current television frequencies can be allocated to mobile communications already in 2017, even if some programmes will be sent in both standard digital and new-generation high-definition format. In the future, when programmes of similar content and quality are no longer sent in several multiplexes, the demand for frequencies may continue to diminish.

The efficiency of frequency utilisation can be influenced with fees related to the processes for granting of various user rights, and adjustments to these fees. As the utilisation of wireless communication services continues to grow, operators in the industry have an increasing need for more usable radio frequencies. At the same time, the financial value and societal significance of radio frequencies have grown considerably. Various mechanisms that boost the efficient use of frequencies can be deployed to ensure efficient utilisation of the most sought-after frequencies. These mechanisms include frequency auctions, permanent spectrum fees that encourage efficient use of frequencies, and frequency licences that are resellable and technology- and service-neutral.

The frequency needs of analogue radio are influenced by the growing audiences of internet radio. The issue of digital radio, which would multiply the number of radio channels within a certain frequency band, is also essential to technology development in the area.

The expansion of new, alternative distribution channels is promoted.

In addition to terrestrial distribution channels, television content is distributed via cable and satellite. Currently, terrestrial broadcasting and cable-television broadcasting reach households in equal numbers. Additional, growing methods of distribution of audiovisual content include IPTV transmission¹, with specific quality assurance in full IP, and over-the-top (OTT) television broadcasting in IP format, wherein television programmes or other programmes are distributed over the internet. Developments in the latter areas will have a significant impact on the future of terrestrial television.

On 4 December 2008, the Finnish Government issued a resolution on a nationwide broadband project. By the end of 2015, all permanent residences (almost 99 per cent of the population) and the permanent facilities of companies and public administration are to be no more than two kilometres from an optical fibre or cable network that enables connection speeds of 100 Mbit/s. Consumers will purchase a subscription at their own cost from a telecommunications company of their choice. The Broadband 2015 project promotes the proliferation of high-speed broadband connections both in areas governed by the market and in those where operations are not financially viable.

The act on broadband construction aid in sparsely populated areas (1186/2009) took effect at the start of 2010. Amendments to this act are being prepared, with the proposal being to amend it in light of the interim review of the broadband project. One goal in this is to simplify the financing of supported broadband projects during network construction.

Allocating low frequencies to mobile communications also promotes the distribution of audiovisual content via high-speed mobile-communication networks.

Various objectives of the communications policy programme may seem in mutual conflict. Taken as a whole, however, enabling provision of a wide range of options is most appropriate both for consumers using communication services and for spectrum efficiency. Governance and regulatory authorities have the task of seeing that companies working

¹ IPTV refers generally to linear television services transmitted in an IP network where television channels are broadcast to viewers so as to be able to guarantee the viewer full quality television image in all situations, irrespective of other load experienced by the network and the distribution system.

with different distribution channels have equal foundations for their operation.

New IP distribution channels will be in direct competition with traditional television distribution channels. By combining television services available from the terrestrial network with additional channels and video-on-demand services brought by new distribution channels, viewers can be offered versatile, highly interesting sets of services. The flexible cost structure of new distribution channels also enables financially viable provision of new kinds of television channels and video-on-demand services. Regional or highly specialised television operations, for example, may thus become financially sound.

The development of new distribution channels is boosted by the intensifying construction of fixed and mobile broadband and the internet connections, interactive services, and service platforms (ConnectedTV or Internet TV) integrated into television sets.

We cannot foresee any individual options that would replace FM listening, but, as multi-channel distribution gains ground, the promotion of high-speed broadband connections is also important in terms of the future of radio.

Steps are taken to ensure operating conditions for radio broadcasting.

The term for new analogue radio licences began in January 2012. These are valid until 2019.

To develop the industry, one must review current licence policies and ensure that they guarantee sufficient and efficient competition. Genuine competition and equal operation conditions for competing operators improve the financial performance of the industry.

Developments in radio technology must be monitored, and preparations must be made for national-level decisions. In this phase, there is no apparent need to promote digital radio by communication policy means. The proliferation of internet-based radio is a key factor in the assessment for the licence period that begins in 2020. The most significant factors improving the operations conditions of radio broadcasting will be evaluated in more detail in an action plan to be drafted in cooperation with operators in the field.

By modernising the licence system, we can improve the conditions the radio industry has for focusing on content development. This involves questions of licence period duration and the content of licence terms.

4. PREPARATION OF THE COMMUNICATIONS POLICY PROGRAMME

This policy programme was drafted by public officials of the Ministry of Transport and Communications as part of their normal duties. In drawing up the programme, stakeholders were consulted by providing them with an opportunity to present their views verbally and organising a round for consultation. The programme has been prepared in cooperation and open dialogue with operators in the field and with organisations representing them.

The draft programme was widely circulated for comments between 23 May 2012 and 2 July 2012. The total number of submissions was 44. After the consultation stage, the draft was edited on the basis of the feedback received. The most significant change introduced concerns the timetable and roadmap for switching over to HD-only transmissions.

The ministerial working group on transport and communications policy discussed the programme on 17 September 2012.

5. FINNISH MEDIA ENVIRONMENT

5.1 Television-equipped households

Television continues to be an important medium: on average Finns watch it for nearly three hours each day. Viewing habits are, however, diverging to some extent. In 2011, different age groups viewed television as follows:

10–24-year-olds	1 h 24 min
25–44-year-olds	2 h 23 min
46–64-year-olds	3 h 35 min
over-65-year-olds	4 h 30 min

According to Finnpanel Oy's 2011 survey, 90 per cent of all Finnish households are able to view real-time television transmission at their home by using a digital adapter, digital television, or digital television card for a PC. Still 11,000 households (0.4 per cent) have only a computer with a TV card or a digital adapter. Roughly every other household has a single television set, and just under 40 per cent of households have two or more television sets at their disposal. Approximately 450,000 households (18 per cent of all households) have a television set at a second home or summer cottage, and 67,000 households (roughly three per cent of all households) had television sets used elsewhere – for example, in cars or boats. The total number of television sets in Finland is approximately 4.1 million. Fewer than one in five television-viewing households have purchased at least one television set during the past 12 months.

The majority of households that do not have a television set are single-person households in the 25–44-year-old age group, living in blocks of flats in cities. Ten per cent of households in the 25–44-year-old age group do not have a television set. Households in the below-25 age group are fewer in number, but 30 per cent of them do not have a television set or a digital adapter or TV card in their computer. About 81 per cent of households, both with and without television sets, have a computer that they can use at home. Roughly one in five (20 per cent) households without a television set views Finnish programmes in their entirety via the internet at least once a week. The corresponding number for households with a television set is 13 per cent.

According to the study, around 46 per cent of television-viewing households still own at least one cathode-ray tube television set. The number of households with a tube television set was down from 52 per cent at the beginning of 2011 to 46 per cent at the end of the year. Three quarters of television-viewing households have a flat-screen television set, 2.0 per cent of television-using households have a 3D set, and nine per cent have the option of using internet services directly via the television set (so-called Internet TV). According to Finnpanel, the latter number may be an overestimate, as viewers do not necessarily differentiate between Internet TV and viewing via a computer.

Approximately 71 per cent of television-viewing households have at least one separate digital adapter, and 58 per cent have an integrated television receiver – i.e.

More than one million households (47 per cent of television-using households) have at least one receiver that is prepared for high-definition (HD) use – i.e., HD-ready – or has Full HD capability. In all, roughly one in five television-equipped households (21 per cent) have an HD tuner either in a television set or in a separate digital adapter.

The number of households with an HD tuner either in a television set or in a Digibox unit had grown to 21 per cent of television-using households. The corresponding figure early in 2011 was 19 per cent. However, with 3.3 per cent of television-using households stating that they subscribe to high-definition channels, their subscriber numbers remain low. In comparison to the beginning of the year, this shows an increase of roughly 0.7 percentage points.

Growth in the size of flat-screen television sets generates greater demand for higher picture quality and content in high-definition format. The following figure presents flat-screen television sets' features in 2011.

Percentage of all television-equipped households

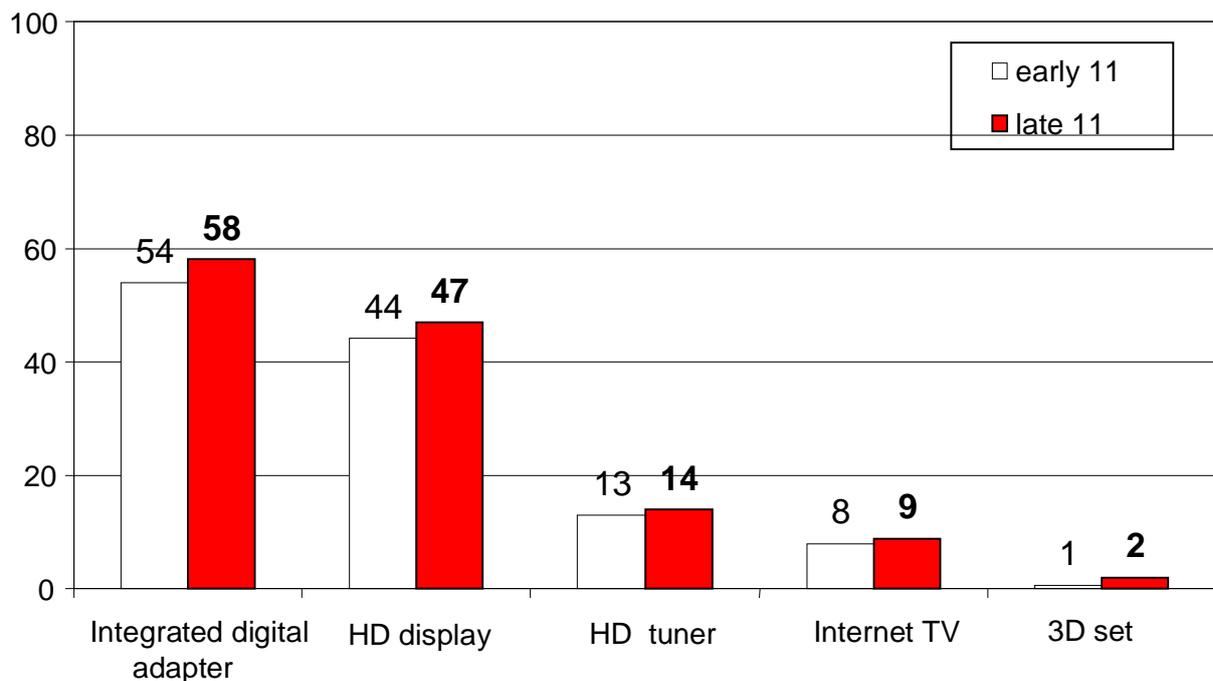


Figure 2: Television-equipped households in Finland (source: Finnpanel survey on television in households in Finland in late 2011, $n = 3,198$).

5.2 Financial aspects of the television industry

According to Statistics Finland, the size of the Finnish mass-media market in 2010 was approximately EUR 4.3 billion. Print media continue to constitute the largest sector of the Finnish mass-media market, but their share was down considerably. While in 2000 the figure was still 75 per cent, it had since fallen by approximately 11 percentage points, predominantly because of a shift in favour of electronic mass communication: the share of electronic mass communication has grown rapidly, boosted by growth in television and online media. In 2010, the size of the electronic-communication market was approximately EUR 1.25 billion.

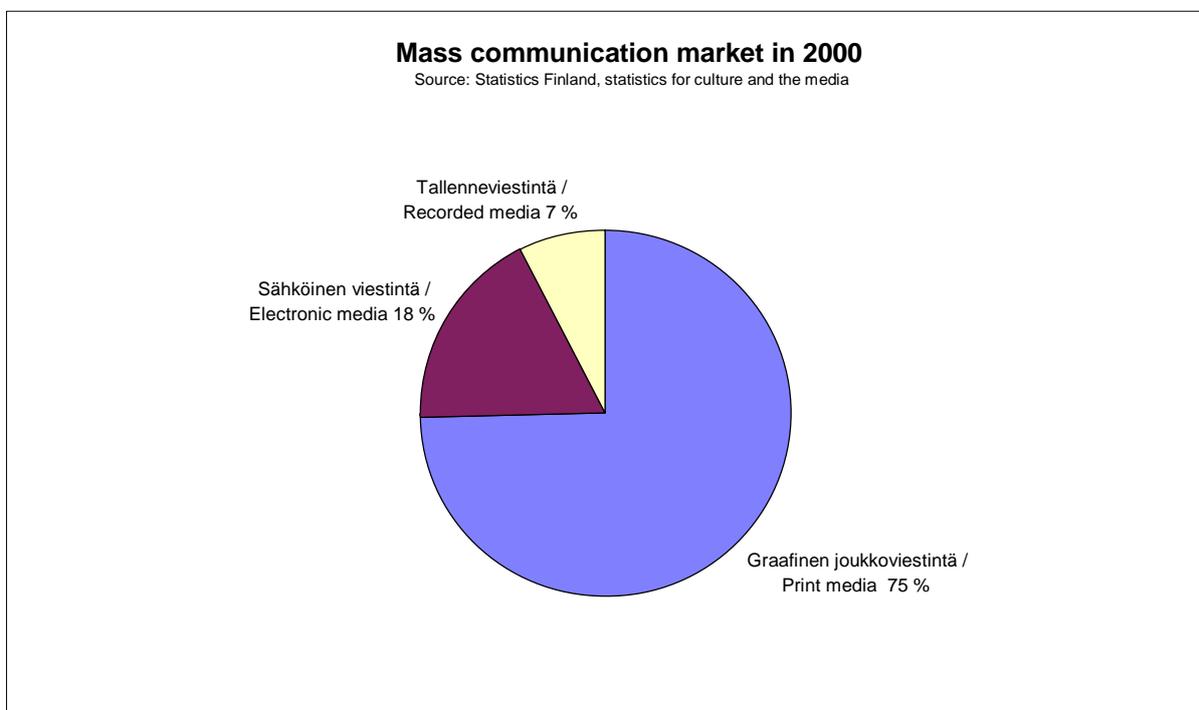


Figure 3: The mass communication market in 2000 (source: Statistics Finland).

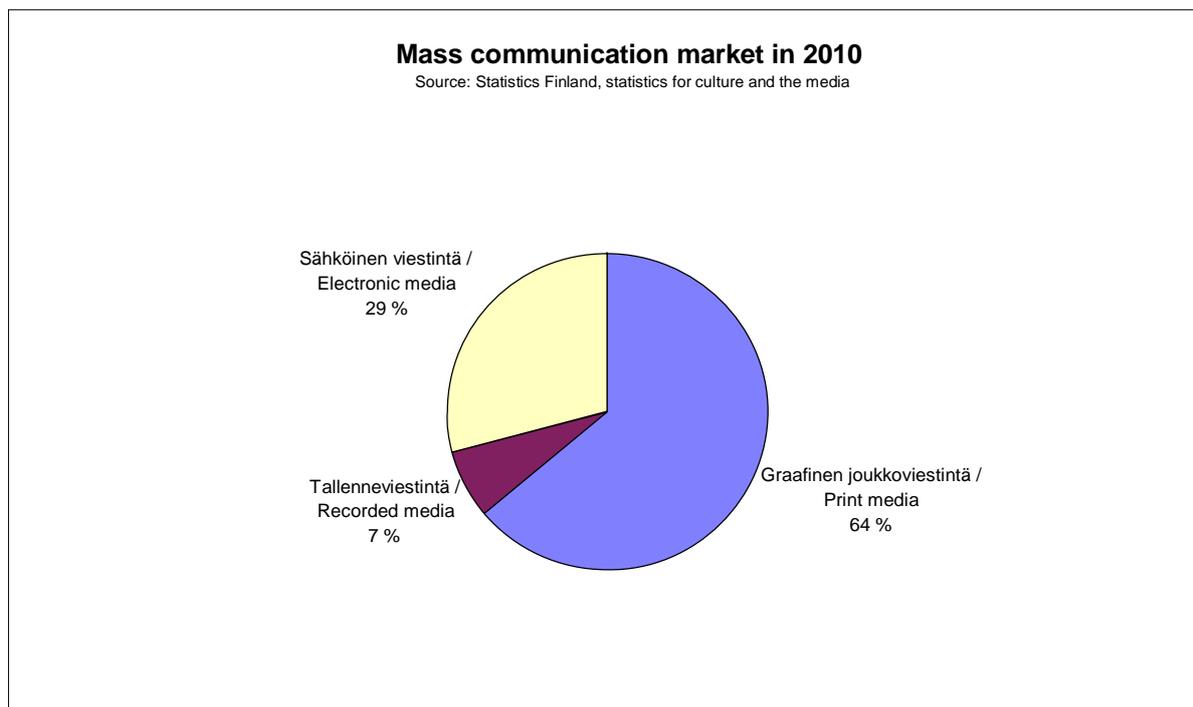


Figure 4: The mass communication market in 2010 (source: Statistics Finland).

The television sector experienced rapid growth particularly during the last years of digitisation, 2007–2008, when, for example, the pay-television market was ripe for growth. Today, television operations constitute approximately 80 per cent of the market for electronic media. For the most part, turnover from television operations is accrued from television fees related to traditional television broadcasting, advertising, and pay television.

According to Statistics Finland, the value of television operations in 2010 was EUR 983 million. This includes the public-service television operations of the Finnish Broadcasting Company YLE. Statistics Finland estimates that the value of television operations is broken down as follows:

Income from television operations (terrestrial + cable + satellite) in, 2000–2010

	TV fees %	Advertising	Subscriptions		Total	Total M EUR
			Pay TV	Basic cable-TV fees		
2000	49	37	3	11	100	581
2001	52	33	4	11	100	591
2002	50	33	4	13	100	611
2003	49	33	4	15	100	636
2004	49	33	4	14	100	692
2005	48	31	9	11	100	739
2006	46	31	12	11	100	776
2007	43	30	16	10	100	865
2008	40	28	22	9	100	948
2009	42	25	24	9	100	944
2010	40	27	23	9	100	983

Numbers are estimates

Figure 5: Income from television operations in 2000–2010 (source: Statistics Finland’s mass-media statistics).

According to Statistics Finland, the combined turnover of television operations in 2010 came to approximately EUR 980 million. Advertising and pay television account for approximately half of this amount. The share of television fees had declined to roughly 40 per cent. The proportion for pay-television channels began growing rapidly in 2005, but in recent years this growth has more or less stalled. In 2010, television-equipped households subscribed to pay-television channels in roughly the amount of EUR 230 million.

The figure below depicts the key cash flows of television.

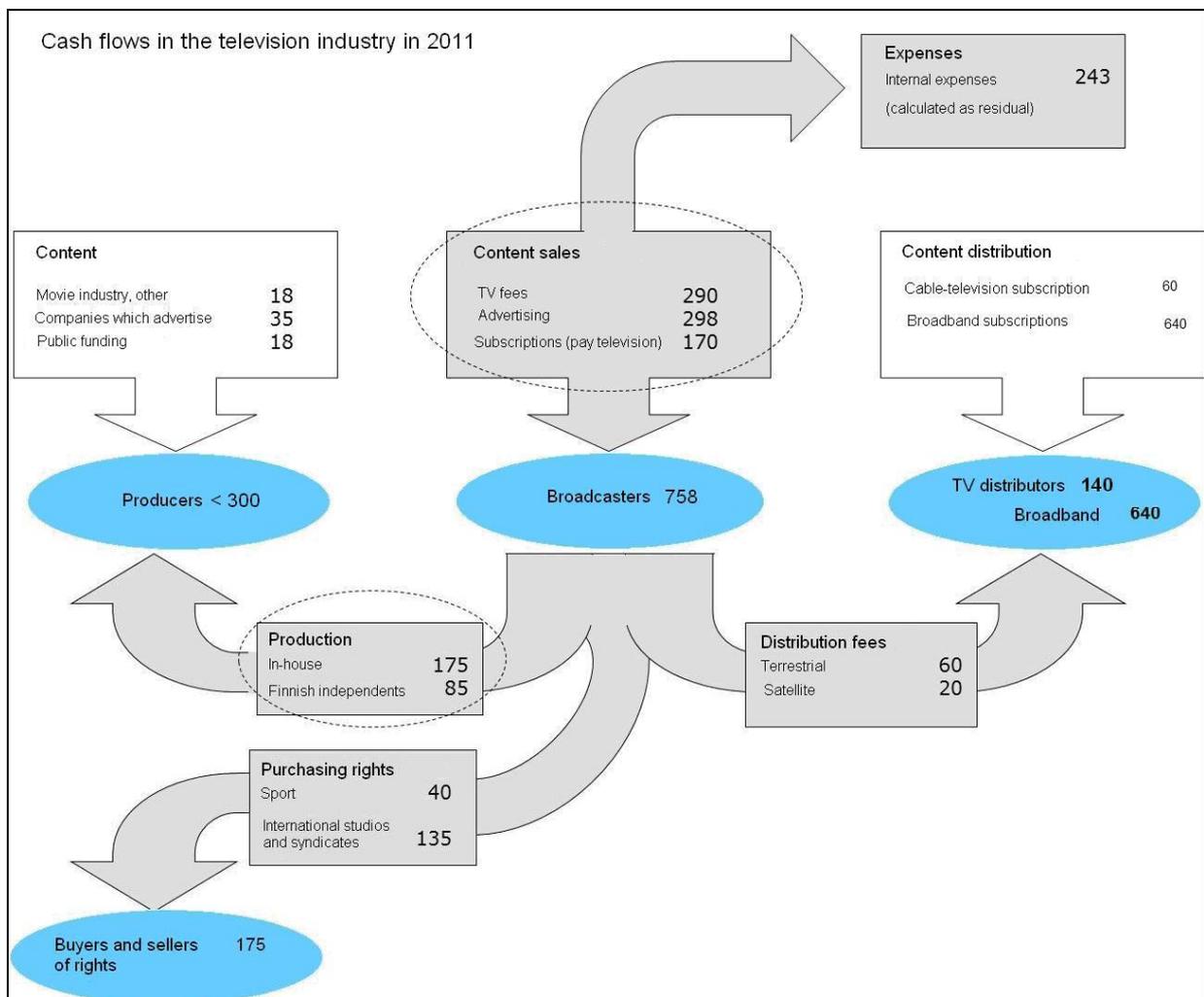


Figure 6: Cash flows in the television industry in 2011.

In the figure, independent content production is depicted as an entity that, in addition to traditional television content, includes films, advertising and the production of marketing content for companies. This is why the value of independent production is higher in this 2012 update when compared to the corresponding figure from 2009. Since various types of content are created by means of the same resources and expertise, independent production is here handled as a single entity. Correspondingly, YLE’s purchases from Finnish content-producers have declined, directly reducing the volume of content production. In the figure, content sales cover television fees, advertising and pay

television.

5.2.1 Development of marketing-communication volumes

The combined value of Finnish advertising media and the power relationships between various media have undergone changes. The long-term trend is influenced by fundamental structural changes in the advertising industry, while economic cycles account for short-term variation. The total value of media advertising grew steadily from the early 2000s up until 2008, after which it declined almost 15 per cent in 2009. The figures for 2010, however, indicate that the industry is recovering from the recession and returning to the long-term trend.

Regardless of the value in euros, the share of television has continued to be one fifth of the total value for the past 10 years. Online advertising, on the other hand, grew rapidly in 2002–2008 and even in 2008–2010. Online advertising has grown both through breaking of new ground for the market and at the expense of print media, whose year-on-year growth percentage in 2008–2010 was negative, at -10.6 per cent. Since the unit prices of online advertising are very low when compared to print media, for example, the growth in the value of online advertising corresponds to volumes that are increasing extremely rapidly. For this reason, it would be interesting to investigate changes in advertising volumes.

In comparison to other media, the benefits of online advertising include targetability, lower price per contact, measurability, and the continuous fine-tuning of the advertising. Mobility is also a significant competitive advantage for online advertising. The increasing use of online advertising may also constitute a threat to the Finnish advertising industry, as its production and design are location-independent.

The figure below shows how television's share of marketing communication has remained steady throughout the 2000s. The share of newspaper advertising is down, and that of online advertising up.

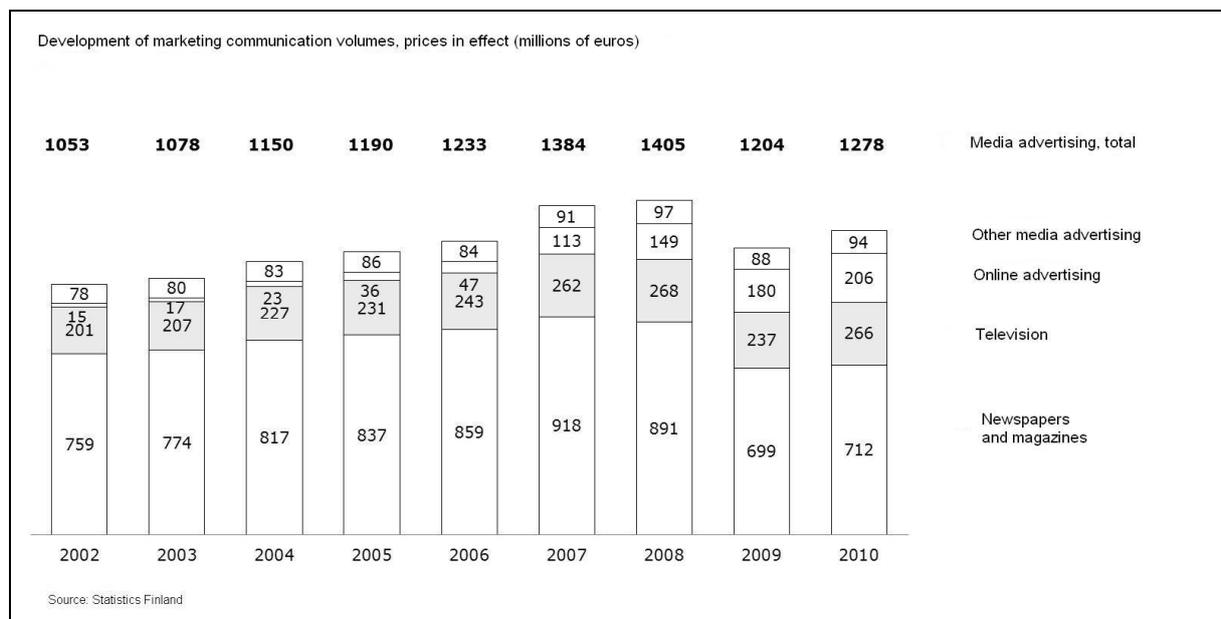


Figure 7: Development of marketing-communication volumes, in terms of prices in effect at the time.

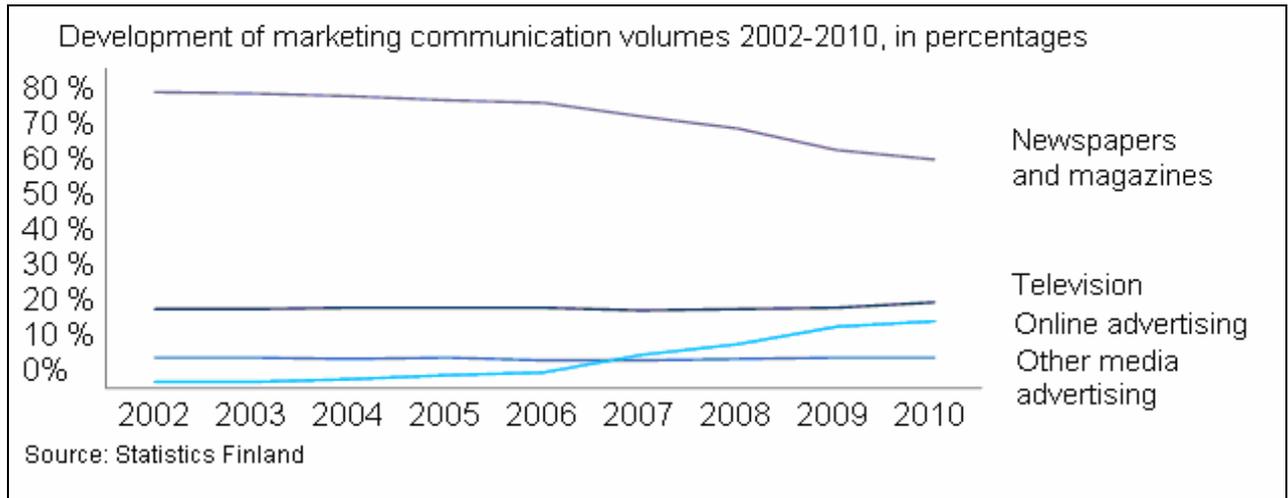


Figure 8: Development of marketing communication volumes, 2002–2012.

5.2.2 Income from television operations

Amidst the structural change of the media industry, the financing structure of television operations has also changed during the first decade of the millennium. In the first half of the decade, total income from television operations grew at a good pace, but the second half saw growth become slower. In relative terms, income from pay television has experienced the strongest growth. Compared to that in Sweden and Denmark, for example, pay television in Finland still has growth potential, particularly in the paid-for broadcasting of certain types of content, such as sports. The moderate growth of advertising, on the other hand, was replaced with a decline in 2008. The gradual growth of IPTV and the consequent benefits of online advertising, such as greater targetability and real-time reachability, may increase advertising income before this decade is out.

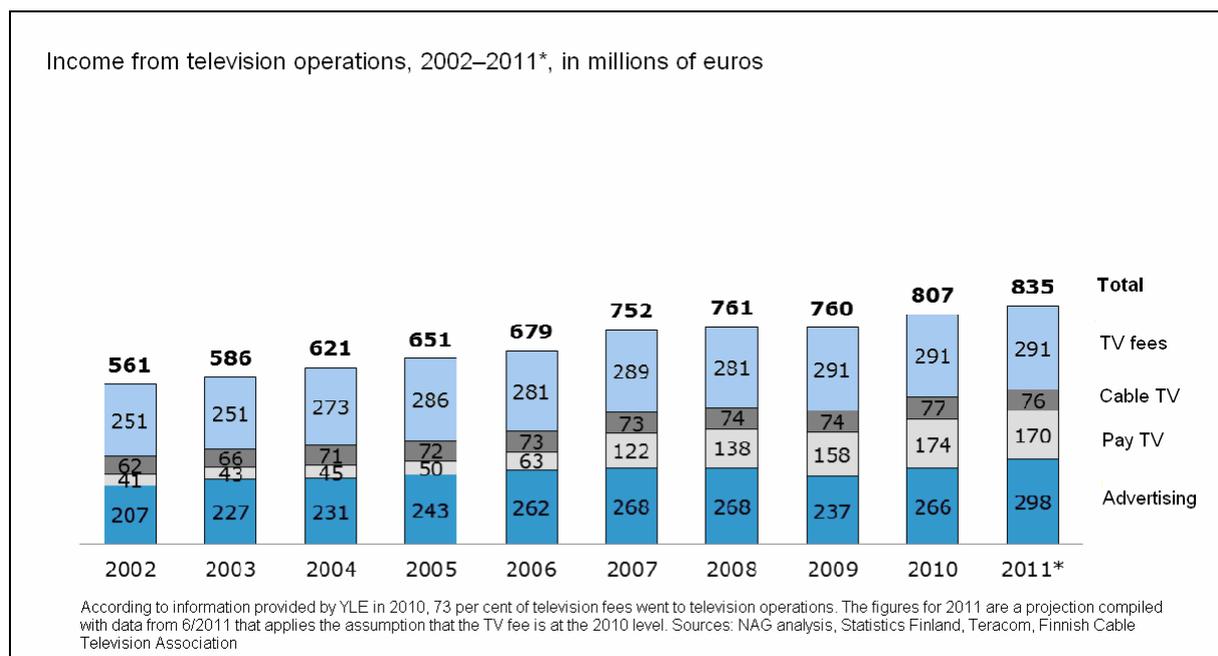


Figure 9: Income from television operations in 2002–2011.

5.2.3 Development of pay television

In the 2000s, pay television has become a significant source of revenue for television operations. The global market for pay-television content is growing in terms of net sales and continues to grow at a slightly faster pace than does income from television advertising. In 2007, income from pay television exceeded that from advertising. Pay-television income in 2010 was estimated to be EUR 150 billion – roughly 54 per cent of the total volume of the television industry.

In Finland, pay-television volumes have grown steadily, while the number of households with pay television stabilised in 2007–2010, reaching just over 25 per cent. In 2011, the number of households subscribing to pay television grew to 32 per cent of all television-equipped households.

The penetration of pay television in Finland remains considerably below the levels of Sweden and Norway, for example, where nearly two thirds of households subscribed to pay television in 2010. Forecasts state that a significant proportion of the content that is interesting to the general public will, in various ways, move to the domain of pay television. For example, some of the 2012 Ice Hockey World Championships games could only be viewed on pay-television channels. The future will see television content become subject to fees also in various other ways than through the growth of pay-television services as we know them. The Government decree (199/2007) addressing the broadcasting of events of major importance to society, which identifies the important sporting events that are to be broadcast via free-to-air television operations, is likely to be of great importance also in the future.

Precise information on the market shares of pay-television service-providers is not available, but according to Finnpanel Oy's 2011 survey, 'TV Households in Finland', MTV3 MAX, for example, is available to 342,000 pay-television-using households, Nelonen Pro 1 to 179,000 households, and Canal+ Sport to 97,000 households.

The graph below illustrates the proliferation of pay television in Finland in 1998–2011. In 2011, roughly 680,000 households subscribed to pay television.

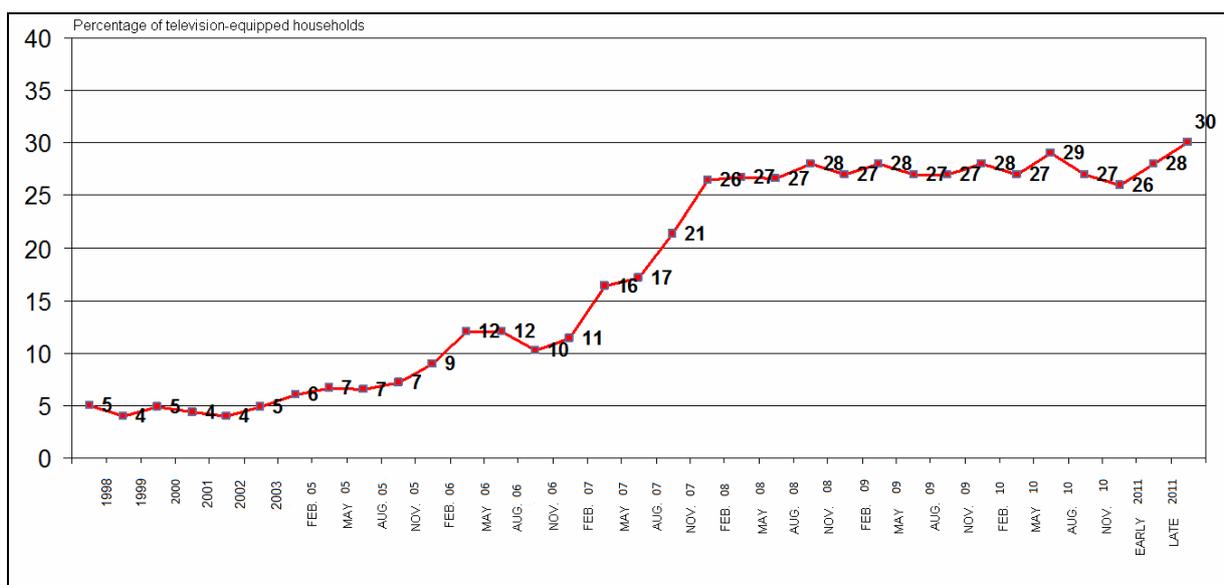


Figure 10: Proliferation of pay television in 1998–2011 (source: Finnpanel, TV Households in Finland).

Growth in internet network capacity has introduced television services provided to the market by telecommunications operators. These services, based on television broadcasting via telecommunications operators' internet networks, are often linked to the recipient having an internet subscription from the same operator. Recently, operator-independent OTT television services provided over the open internet have entered the market. Many of them provide video-on-demand services. Internet-based distribution has enabled on-demand viewing, independent of transmission times. The financial volume of this group is still small.

Activities are described in more detail in the table below.

Group	Pay-television activities	Remarks	Examples
Cable and satellite operators	Provision of paid content as a supplementary service alongside cable or satellite distribution	Mostly regional operations (cable) or international operations (satellite)	Cable operators in cable networks, ViaSat and Canal Digital in satellite distribution
Telecommunications operators	Paid content in connection with their internet connection services	Television service supply usually packaged with an internet connection	Elisa Viihde, Sonera KotiTV
Pay-television card companies	Provision of paid content, typically for terrestrial distribution		PlusTV and DNA
OTT and internet video service providers	Operator-independent provision of content over the internet	International operators' entry to the market, service based on either streaming or download, service use that often requires technical	Maxinetti, TV Kaista, iTunes, BBC Worldwide iPlayer (iPad version), Netflix

		competence	
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Figure 11: Pay-television operators.

Many of the paid-content services available are hybrid services, in which linear channels are received via broadcasting technology and on-demand services over the internet. Pay-television companies may provide several kinds of services: ViaSat, for example, provides the internet-based ViaSat Play service alongside satellite pay-television services. The most commonplace solution for receiving pay-television programmes has been a television set with a digital adapter equipped with a card reader. Scrambled pay-television broadcasts are decoded with the card.

Pay-television operations are expected to continue to grow. Current developments in television operator revenue and expenses drive operators in the industry to seek growth in the various forms of pay television.

5.2.4 Television change factors

Over the last 10 years, television and video content provision in Finland has grown significantly both in traditional television and over the internet. This has been made possible by growth in the number of channels brought about by digitisation, and, in particular, the strong growth of internet content. Irrespective of the growing volumes of content available over the internet, traditional television formats still control cash flows in the market as well as content production, distribution, and consumption. Nevertheless, the content offering that has been built up alongside traditional formats does raise big questions about the future of the television market.

In addition to the growing content offering, major change factors for television include the increasing number of television-industry operators, changes in distribution channels, creation of new services and user interfaces, equipment diversification, and – as a consequence of the above – changes in people’s viewing habits. When these factors are actualised on a large scale, they will have a significant impact on the television user experience and business models. With equipment renewal and developments in user interfaces, television use may evolve into a more personal experience as user interfaces enable tailored content provision. Television viewing may then branch out from the living room as content is viewed from various interactive screens in several places in the household.

Industry operators are more heterogeneous than before, which is a significant change in terms of business activities. Instead of a few operators and channels, today witnesses availability of a wide range of channels and services. Television’s traditional value chain, in which only television channels have a direct customer relationship with viewers, is transforming such that all parties in the value chain work towards being in direct contact with the end customers.

In addition to traditional television distributors, television content and services are provided on the internet by telecommunications operators, equipment-manufacturers, television network operators, and various small companies. Moreover, global internet operators such as Apple and Google have their own content and service supply. Various video services are also, at least to some extent, in competition with the above-mentioned operators and may also develop more in the direction of traditional television content distribution.

With Netflix and HBO Nordic entering the Finnish market (the latter one expanding the HBO online video service not only to Finland but also to other Nordic countries), competition between traditional pay-TV companies will increase. This will benefit the

viewers, in particular, as they will have more choice in terms of watching films and serials.

Even though linear television continues to reach a majority of the population and its daily viewing times have grown, television viewing habits have changed over the past few years. According to Finnpanel, for example, more than one in four households viewed television programmes with a computer in November 2010. At the same time, according to a survey by Statistics Finland, 16 per cent of 16–74-year-old Finns viewed or downloaded films with a computer or other equipment. The information from Finnpanel Oy and Statistics Finland indicates that a significant percentage of Finns use the internet for retrieving and viewing of content.

Television content can be received and viewed with ever more varied equipment and user interfaces. New equipment used for viewing television content or as a television remote control, for example, includes tablet devices, smartphones, and television sets with an internet connection. Game consoles too are used for viewing of television content.

From the perspective of the service-user, options and choices are becoming more versatile. At the same time, there are challenges from the service-developer's point of view. Already, there is a huge selection of equipment and device features on the market, with no foreseeable clarification of the overall situation. Creating separate solutions for each piece of equipment and screen size requires resources and effort, but there is no guarantee the effort will ever pay off. This is why solutions implemented with browsers are a strong option when the goal is to reach users in large numbers.

G-I-D-E (Growth, Innovation, Digital services and Evolution), an intelligent strategy for communications drafted at the Ministry of Transport and Communications, takes into account the changes taking place in the media field. The strategy aims at promoting cooperation between media students and the television business to ensure that the changing needs of market operators are better understood in content production.

5.3 Radio

5.3.1 Radio industry

Finland's radio industry consists of YLE's regional and nationwide public-service channels, alongside commercial regional and national radio stations. Five nationwide radio networks are reserved for YLE. Commercial radio operations use 12 nationwide and 55 regional or local frequency bands. For the licence term that began at the start of 2012, commercial radio licences were granted to four networks with more than 80 per cent coverage of the population, five networks with coverage of 55–80 per cent, one with coverage of 25 per cent, and two so-called urban networks. The licences are valid until the end of 2019. The permanent licence system is complemented by short-term use of radio frequencies with which operations are allowed under a short-term licence granted by the Finnish Communications Regulatory Authority (FICORA).

On average, Finns can listen to 20 analogue radio stations, but the number varies greatly with the listener's place of residence. Local radio stations have the important task of disseminating information on local issues. Operations are typically small-scale.

Finns listen to the radio for, on average, more than three hours a day. With radio too, hours increase with age: over-55-year-olds listen to the radio for over four hours a day, whereas the 9–14-year-olds listen for only one hour. Of the 15–24 age group, up to 40 per cent listen to the radio at least monthly via the internet. Radio is most commonly listened to in the mornings and during the working day.

Radio reaches nearly 80 per cent of Finns daily. In 2010, YLE transmitted almost 150 hours of daily programming on its nationwide stations. YLE's domestic regional programming amounted to 125 hours a day. Most private radio stations operate around the clock. Combined, they transmit 1,350 hours of programming daily.

5.3.2 Financial aspects of the radio industry

As an industry, commercial radio is small. In 2010, its share of the total mass-communication market was 1.3 per cent. However, the value of private radio operations increased from EUR 40 million to EUR 57 million in 2000–2011, with 75 per cent of net sales consisting of nationwide advertising sales, and the remaining 25 per cent of local sales.

Radio's share of media advertising was approximately four per cent. Approximately 95 per cent of the income of commercial radio is generated by advertising. In 2010, the advertising income of radio stations amounted to EUR 52 million.

In the 2000s, growth of the radio industry has mainly involved large nationwide or semi-national radio networks. In recent years, nationwide radio stations have been the engine of the industry, attracting the interest of advertisers and increasing the credibility of the radio industry as a whole.

5.4 Domestic programme production

Television

Finnish content has always been important in the Finnish television programme supply. In 2009, there were 776 film, video, and television-programme production companies, of which nearly 30 focused on full-length films and several dozen on documentaries. The majority of audiovisual companies were independent television production companies, while 61 of the companies were actual television and radio operators.

Measured by net sales, television operations are the largest sector of the audiovisual industry. Television operations are, therefore, also the largest employer in the audiovisual sector.

According to a consultant survey, television companies purchased programmes worth approximately EUR 85 million from independent programme-producers in 2011. Independent companies also created films, commercial advertisements, and other productions.

Since the structural changes of the 1990s, most commercial television programmes have been sourced from independent production companies, with, in essence, only news programmes being produced by the television companies themselves. YLE continues to be a significant producer of programmes. In the current media environment, production companies are highly dependent on purchases by commercial and public-service television companies. The majority of programmes created by production companies are commissioned, and opportunities for autonomous product development appear limited.

Finnish television production is characterised by the key role of a single operator: more than half of the value of all production is created through YLE's own programme production. The other half consists of independently produced television programmes; films; television and film advertising; and communication, promotion, training, and user guide materials created for commercial use. Game production, which in 2011 more or less had the same value as all of the above-mentioned production types combined, is

excluded from the scope of this document. Even though the game industry generates creative content that is to some extent similar to television or cinema, as an industry it is completely separate, with different operators, sources of financing, and business models. The business models of the game industry have more in common with the international software business than with content creation.

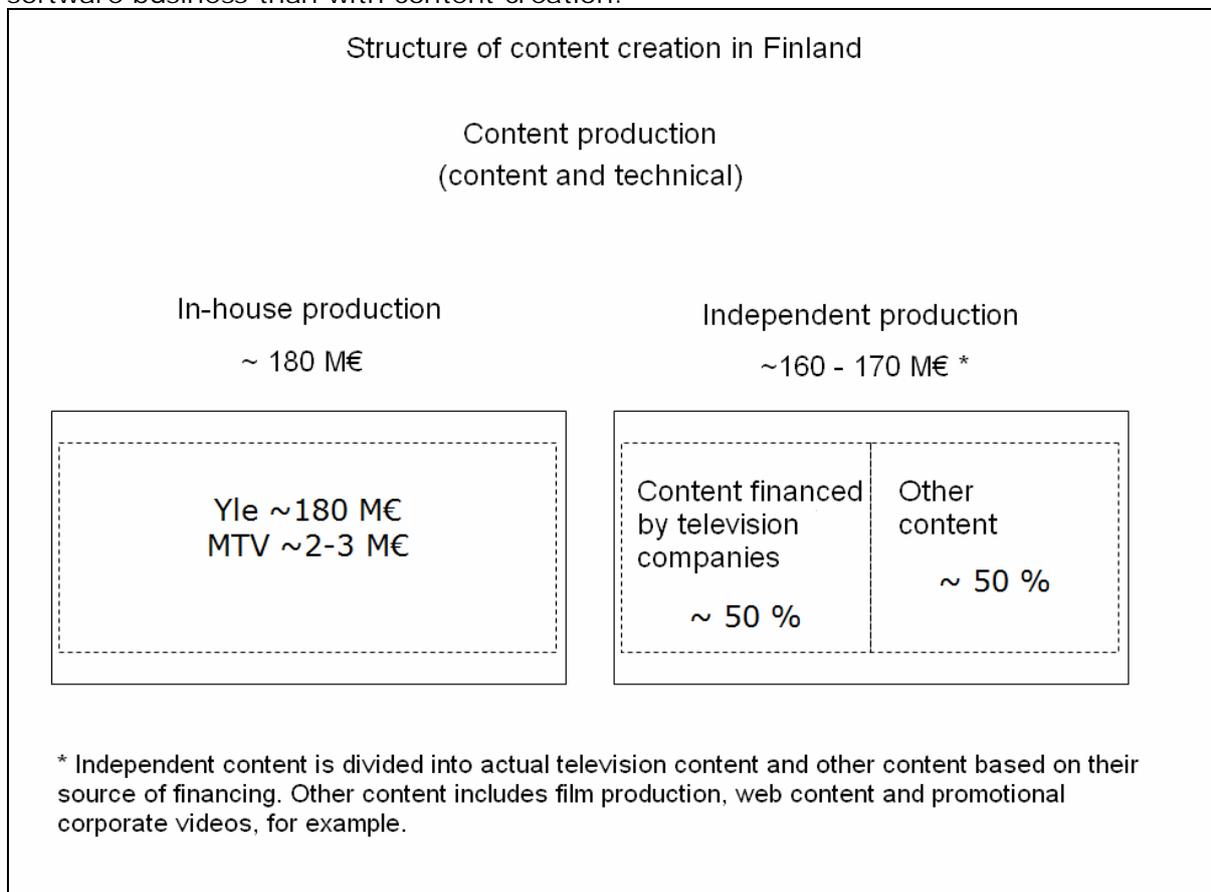


Figure 12: Structure of content creation in Finland.

The value of independent Finnish content production is approximately EUR 160 million a year, of which content creation accounts for approximately EUR 135 million, and technical production for EUR 38 million (including EUR 5–8 million for the use of YLE's production equipment in joint productions of YLE and independent production companies). There is an overlap of approximately EUR 10 million a year in the net sales of companies consisting of content and technical production.

The market for independent Finnish productions relies on the sourcing practices of television companies. The buying market has clear oligopolistic features. Major television companies keep content production alive but on the condition that purchased volumes can be forecast for a reasonable period of time. YLE itself emphasises its role as a major purchaser of Finnish content and a promoter of the nation's mental advancement. The decisions to develop programme content that were made by the YLE Administrative Council in April 2012 are a good example of this.

For independent content-producers, Finnish television companies are major customers with great negotiating power; however, content-producers are increasingly able to offer their products also to customers who do not buy actual television content. This other content includes internet content, such as online games and online advertising, and corporate promotional videos. There is increasing overlap and synergy in the competencies and resources of independent operators who create targeted content for

various needs. For this reason, it is appropriate to view these operators in the market as a single entity.

Company consolidation is a major trend in independent content production. Finnish production companies are consolidating into larger entities in connection with and simultaneously with international consolidation. The Finnish company Broadcasters, for example, became part of the international media group Zodiak in 2005, when it was acquired by the Swedish Zodiak Television. Currently, after acquisition of major national independent production companies, the turnover of the global group Zodiak Media is approximately EUR 600 million a year. The consolidation of national, Nordic, and international production companies will continue.

As a result of consolidation, content that is perceived to be domestic does, in fact, consist largely of imported international formats that have been tailored to local tastes. Compared to national-level competitors who base their operations on their own product and production development, adaptations of international formats create a major competitive advantage and benefits of scale for the production companies that own, import, or export these formats. Buyers too are happy to purchase programme ideas that have been tested elsewhere, reducing the business risks involved in the purchases.

Finnish content production is divided into television companies' own production and independent programme production. In practice, YLE accounts for all of the in-house production. MTV Media accounts for a nominal share of Finland's production, consisting mainly of production technology for the news produced by the company. The value of independent content and technical productions is equal to that of domestic production.

It is possible that, at some point, major telecommunications operators will become direct purchasers of independent content production. Companies search for the content that best fits their subscribers, and this can be done most conveniently and cost-efficiently via purchasing directly from the content-producers rather than with television companies as intermediaries.

Finnish independent content production has traditionally been buyer-driven. Three buyers – YLE, MTV Media, and Nelonen Media – have dominated the market. All of these companies have purchased similar volumes of content from independent producers. In the last couple of years, the purchases of YLE have been cut to roughly half of the previous annual level of EUR 20 million. This change has affected operators unevenly and essentially changed the balance of supply and demand. The stronger position of two of the buyers, MTV Media and Nelonen Media, has increased their purchasing power in relation to independent content-producers, whose position has in turn become weaker. YLE's input to the development and growth of the creative Finnish content industry is particularly significant in the fields of drama, film, documentaries, and other works of this nature that can rarely be profitably purchased by commercial channels but whose value is great from the perspective of public service. Roughly EUR 60 million of the company's annual income is directed to the Finnish creative industry and its domestic makers.

As the financing of this public service becomes tax-based, the obligation of a public service to promote Finnish content production in its various forms grows stronger. The acquisition of SuomiTV by Fox International Channels created a new operator in the television market. Its impact on Finnish content creation remains to be seen.

Other new operators have entered the market. A large share of the new production consists of sports programmes created for pay television. This production consists mostly of technical production. Production of sporting events for pay-television channels has increased investment in outdoor production equipment and created a new production structure.

Traditional Finnish television companies together with new companies entering the industry, regardless of their market position or model of operation, view domestic content as a critical competitive advantage or a factor without which success in the market cannot be attained. This is apparent from growing volumes in the market. The value of the market has grown at a clearly slower pace. This phenomenon can be explained by three factors:

- 1) YLE's purchases have decreased by an amount that corresponds to the purchases of new operators.
- 2) The substantial decrease in YLE's purchasing has altered the ratio of demand and supply such that the negotiating power of other buyers has increased, leading to essentially lower prices.
- 3) The professional competencies and production-related know-how of independent production companies have increased, leading to higher production efficiency, which is reflected in pricing. A greater percentage of purchases are format programmes, which, through economies of scale, enable lower unit prices.

Radio

Programmes by private radio stations consist mostly of in-house production; news may be bought from an external party. Independent production companies are used mainly in advertising. To some extent, the largest radio operators utilise the same programme streams in separate channels. Some radio operators cooperate with each other in programme production, which increases the cost-effectiveness of operations. Radio is also an important medium for students at educational institutions related to the industry.

5.5 Changes in consumer behaviour in the communications market

In Finland, the tradition of free-to-air television broadcasting has been very strong, and consumer viewing needs have to a large extent been met with its versatile programme supply. Pay television began to gain ground when large television companies started moving major sports event broadcasts that interest the public at large to channels viewable with a conditional-access card. According to Finnpanel Oy, pay-television channel subscriptions passed the 30 per cent mark in late 2011, having remained below this percentage of all television-equipped households for several years. However, only seven per cent of total television viewing time is used for watching pay-television channels. Since the pay-television programming focuses on sports and channels directed at children, men and children have higher than average viewing rates. It is likely that pay-television viewing will grow in the future.

Alongside what we traditionally understand as pay television, various types of payable audiovisual content may also change viewer behaviour quite rapidly. With television services provided by telecommunications operators, based, for example, on individual programmes or films that viewers pay for, consumers will get accustomed to paying for the audiovisual content they choose to view. Paid content available via the open internet may also become widespread quickly as viewing habits grow increasingly fragmented and new on-demand services become available. On the other hand, there is a multitude of free content available on the internet, usually in English and without subtitles. For younger generations who are fluent in English, the absence of subtitles is not an issue. For traditional pay television, these changes will present great challenges in the future. In order for people to subscribe to television content that is subject to a fee, content that is particularly interesting must be moved from free channels to channels available via a conditional-access card.

Already, most programmes transmitted via traditional television networks are afterward

available on the internet. Content that is not broadcast via traditional television, or that is broadcast only after being made available first on the internet, will also become more common. Young people, in particular, are a challenging target group with respect to the traditional television programme supply. Even though viewing times have, according to Finnpanel Oy's TV Audience Measurement survey, remained quite high, viewing times amongst 15–24-year-olds in particular are down. This age group also views different channels most equally, indicating that these viewers are not as committed to certain channels and programmes as older age groups. With low channel loyalty, the threshold for moving over to new content services is low to begin with.

According to FICORA's research on audiovisual content services, 15–19-year-olds in particular have strong views regarding changes in viewing habits. Viewing over the internet will grow at the same pace amongst 15–65-year-olds, but traditional television viewing is expected to decrease most significantly in the youngest age group.

Nearly 90 per cent of viewers watch television programmes at the time of broadcast, a fact that has not changed in the last three years, the time in which the audiovisual content research referred to in this paper was conducted. The same period, however, has seen an increase in internet viewing of videos that resemble television content, from 40 to almost 50 per cent. This figure does not include short videos, which are viewed by approximately 65 per cent of 15–65-year-olds.

6. SPECTRUM MANAGEMENT

6.1 International spectrum management

Radio frequencies are a limited natural resource with great societal, cultural, and financial significance.

Radio frequencies are used for various public and business purposes. They are utilised in, for example, mobile communications; wireless broadband communication; industrial, traffic, and other radio networks owned by corporations; municipal infrastructure; civilian and military authorities; satellite communications; radio and television broadcasting; traffic; radio location services; and numerous applications such as alarm systems, radio-controlled and remote-controlled equipment, radio microphones, and wireless programme production and hearing aids. Frequencies are also utilised by public services, such as services related to public safety, and in scientific activities such as meteorology.

Spectrum management and availability has a bearing on, for example, the economy, security, culture, science, and the environment. The efficient and appropriate use of frequencies generates economies of scale, which may lower costs for both companies and consumers, while promoting financial recovery and social integration.

Spectrum management has international and cross-border aspects related to radio signals' propagation in the air, the international nature of services that are based on radio communications, and the need to avoid harmful interference between countries.

6.1.1 International Telecommunication Union

The International Telecommunication Union (ITU) organises a global radiocommunication conference (WRC) every four years. The future use of radio frequencies is agreed upon at global level at this conference. Decisions made at the conference also affect future availability of radio frequencies for the various needs of the Finnish information society.

Appropriate and diligent utilisation and management of radio frequencies also ensures

that interference between radio equipment of various types is as rare as possible. Frequencies do not honour national borders. This is why spectrum planning must involve international cooperation.

Decisions made at the radio conference will be reflected in international radio regulations. This will constitute an agreement on frequency use that prevents the various wireless services of different countries causing interference to one another. The decisions are binding for all countries of the world.

The frequency allocation table of radio regulations covers frequencies between 9 kHz and 400 GHz. The table indicates what frequencies are used by various types of traffic, and the related limitations and exceptions. The corresponding decisions in Finland are addressed in the Finnish frequency allocation table, which is included in FICORA's radio regulations as Appendix 4.

6.1.2 European Union directives on electronic communications

Framework Directive

In the directives on electronic communications, the regulatory framework governing frequencies consists essentially of the European Parliament and Council of the European Union Directive on the authorisation of electronic communications networks and services (2002/20/EC), hereinafter 'the Authorisation Directive', and the European Parliament and Council of the European Union's Directive 2002/21/EC, on a common regulatory framework for electronic-communication networks and services (hereinafter 'the Framework Directive').

Article 8 of the Framework Directive stipulates that regulation must use all means available in order to avoid commitment to any given technology. According to Article 8 a of the Framework Directive, Member States must cooperate with each other and with the Commission in the strategic planning, coordination and harmonisation of the use of radio spectrum in the European Community. By cooperating with each other and with the Commission, Member States must promote the coordination of radio spectrum policy approaches in the European Community. Under the article, the Commission may, taking into account the statement of the radio-frequency policy group, submit legislative proposals to the European Parliament and the Council for establishing multiannual radio spectrum policy programmes. Moreover, the article states that, in order to ensure the effective coordination of the interests of the European Community in international organisations in radio spectrum matters, the Commission may, if necessary, propose common policy objectives to the European Parliament and the Council. Article 9 of the Framework Directive also calls for effective spectrum management and objective, transparent, non-discriminatory, and proportionate criteria for frequency-use decisions and frequency allocations.

According to Article 9(3) of the Framework Directive, Member States must ensure that all types of technology used for electronic communication may be used with frequencies that have been declared available for electronic communications services in national frequency allocation plans, in accordance with Community law. However, Member States may provide for proportionate and non-discriminatory restrictions to technology-independence when this is necessary to avoid harmful interference, to protect public health against electromagnetic fields, to ensure technical quality of service, to safeguard efficient use of spectrum, or to ensure the fulfilment of a general interest objective.

The directive allows Member States to decide on procedures through which companies can transfer frequency-use rights to other companies. If such a transfer procedure is created, transfers must take place in accordance with the procedure confirmed by the

regulatory authority.

Authorisation Directive

The objective of the Authorisation Directive is to establish the conditions necessary for an internal market for communication networks and services by unifying and simplifying authorisation terms and regulations. The purpose of the authorisation system is to account for progress towards convergence in communications technology and to treat various service types in a technology-independent manner.

Article 5 of the same directive states that, whenever possible, making the use of radio frequencies subject to the grant of individual rights of use should be avoided. If frequency use is based on individual rights of use, such a right must be granted upon request to all companies within the scope of general authorisation unless restricting such a right is fundamental for ensuring spectrum efficiency. Radio-frequency use rights must be granted through open, objective, transparent, proportionate, and non-discriminatory procedures. When user rights are granted, the recipient of the right must be informed whether, and on what grounds, it may transfer the right on its own initiative. Decisions on radio-frequency user rights must be made within six weeks. If radio frequencies are granted on the basis of competitive or comparative selection procedures, this period may be extended by eight months. Decisions on user rights must be made public.

Article 6 of the Authorisation Directive identifies the maximum conditions that may be attached to the rights of use for radio frequencies. Such conditions must be objectively justified in relation to the network or service concerned, non-discriminatory, proportionate and transparent.

Article 7 of the directive sets forth a procedure to be applied when limiting the number of rights of radio-frequency use is under consideration. When considering limitations to the number of rights of use, Member States must give due weight to the need to maximise benefits for users, and facilitate the development of competition. All interested parties, including users and consumers, must be given the opportunity to express their views on any limitations. Decisions to limit the granting of rights of use must be published and state the reason therefor. After having determined the procedure, Member States are to invite applications for rights of radio-frequency use.

The need to limit the number of radio-frequency user rights must be reviewed at reasonable intervals or at the reasonable request of affected companies. If further rights of use for radio frequencies may be granted, Member States shall publish that conclusion and invite applications for such new rights of use.

Rights of use of radio frequencies shall be granted on the basis of selection criteria that are objective, transparent, non-discriminatory, and proportionate. The selection criteria must give due weight to the achievement of the objectives of Article 8 of the Framework Directive. Where competitive or comparative selection procedures are used, Member States may extend the maximum period of six weeks to a maximum period of eight months to ensure that such procedures are fair, reasonable, open, and transparent to all interested parties.

Article 8 regulates the granting of rights of radio-frequency use when frequency use has been internationally harmonised and when conditions and procedures for rights of use have been internationally agreed upon. In such cases, Member States must grant rights of use in line with international agreements and Community rules, and no further conditions, additional criteria, or procedures which could restrict, alter, or delay the common assignment of such radio frequencies may be imposed for the selection procedure.

If a national regulatory authority finds that an undertaking does not comply with the obligations imposed on it, it must, in line with Article 10, notify the undertaking and give it a reasonable opportunity to state its views or remedy any breaches within a reasonable time period. If the undertaking concerned does not remedy the breaches within the set time limit, the regulatory authority must take appropriate measures to ensure compliance with conditions and obligations.

Article 10 of the directive stipulates that Member States may empower relevant authorities to impose financial penalties on undertakings where appropriate. The measures and the reasons for them must be communicated to the undertaking concerned without delay, with, at the same time, a reasonable period being specified for complying with the measure.

A regulatory authority may prevent an undertaking from continuing its operations or either suspend or withdraw rights of use if there is a serious and repeated breach of the conditions and specific obligations, and if the authority actions described above have not led to the desired result. If the breach of conditions or specific obligations represents an immediate and serious threat to public safety, public security, or public health, or it will create serious economic or operational problems for other undertakings or users, the regulatory authority may take urgent interim measures to remedy the situation.

Article 11 of the directive states the reasons for which regulatory authorities may require undertakings to provide information. Information can be collected systematically or on a case-by-case basis when compliance with obligations related to fees (administrative fees and fees related to rights of use or universal service fees, if any) and any industry-specific obligations set for companies is being monitored. Member States may require information that confirms spectrum efficiency and cost-efficient frequency management as well as information that is needed in the assessment of such future networks or services as may affect services provided to competitors on a wholesale basis.

All terms related to rights of radio-frequency use may be reviewed on a case-by-case basis if a complaint has been filed against an undertaking or if the regulatory authority has reason to suspect that there has been a breach of a specific term. In connection with the procedure for granting of rights of use, undertakings involved may be required to submit information.

Article 13 of the directive gives Member States the opportunity to grant authorities the right to set fees for rights of radio-frequency use and rights to install facilities. The fees must proceed from the principle of ensuring optimal use of these resources.

6.1.3 Radio-spectrum policy programme of the European Union

According to the Framework Directive, the European Commission may submit legislative proposals to the European Parliament and the Council of the European Union for establishing multiannual radio spectrum policy programmes. In February 2012, the European Parliament and Council approved establishment of the first multiannual radio spectrum policy programme.

The policy programme confirms national guidelines and objectives for the strategic planning and harmonisation of radio frequencies in line with the directives applied to electronic-communication networks and services.

A key objective of the radio-spectrum policy programme is to support the Europe 2020 strategy and digital agenda, which specifies that by 2020 all citizens of the European

Union should have general access to a broadband connection with a speed of at least 30 megabits per second.

The policy programme aims at ensuring efficient use of spectrum. The programme's key principles include maintaining neutrality in terms of technologies and services, increasing the flexibility of spectrum management, and improving the operations of the internal market by ensuring healthy competition. Moreover, the political objective of the proposal is to ensure sufficient availability of frequencies.

According to the policy programme, Member States and the European Commission must cooperate in order to promote, for example, the flexible use of frequencies, harmonisation of radio equipment, and cognitive technologies. Member States are also to promote healthy competition and prevent distortion of competition in the internal market.

The proposal sets specific targets for wireless broadband. In collaboration with the European Commission, Member States are to implement all measures that are necessary to ensure sufficient availability of wireless data traffic frequencies within the Union. According to the resolution, at least 1,200 MHz should be allocated to mobile-telephone traffic by 2015.

The policy programme includes separate stipulations for the 800 MHz spectrum band. By 1 January 2013, Member States are to carry out an authorisation process that allows this band to be allocated to electronic communication services. If exceptional national or local circumstances in the Member States or problems in cross-border frequency coordination prevent this band from being available in the Member State in question, the European Commission may, until the end of 2015, grant specific derogations on the basis of a duly substantiated application submitted by the Member State concerned.

In cooperation with the European Commission, Member States are to monitor the capacity needs of wireless broadband services continuously.

Whenever possible, Member States are to work in cooperation with the Commission for the promotion of broadband services' availability in the 800 MHz spectrum band in sparsely populated and remote areas. Member States must allow the transfer or leasing of rights of use of spectrum in the harmonised bands, such as the 800 MHz band.

In line with the radio spectrum policy programme, the Commission will conduct an inventory that helps identify frequency bands which could be suitable for reallocation and spectrum-sharing opportunities and which could be allocated or reallocated for another purpose in order to improve their efficient use. Upon request, the European Union is to give Member States legal, political, and technical support to resolve spectrum coordination issues with countries neighbouring the Union.

6.2 Current system in Finland

FICORA steers radio-frequency use in Finland. Frequency-use planning is conducted in order to ensure that both current and future radio systems can be assigned sufficient resources of appropriate and interference-free radio frequencies. The Act on Radio Frequencies and Telecommunications Equipment (1015/2001), hereinafter 'the Radio Act', governs possession and use of radio equipment, and the planning and allocation of radio frequencies for various purposes.

According to section 1 of the Radio Act, the purpose of the act is to promote the efficient, appropriate, and sufficiently interference-free use of radio frequencies; safeguard the fair availability of radio frequencies; create conditions for maximising the unrestricted mobility of telecommunications equipment; and promote the efficiency of the

communications market in general telecommunications operations.

Under section 6 of the Radio Act, FICORA makes the decisions on granting spectrum bands for specific uses, as well as decisions on granting available frequencies to users, with due consideration to the international regulations and recommendations on radio frequency use. Section 6(2) of the Radio Act stipulates that the Government shall confirm with a decree the general guidelines for frequency use, a radio-frequency allocation plan for television and radio operations, and the radio frequencies allocated for telecommunications operations subject to licence. Moreover, the radio-frequency utilisation plan will confirm the general principles of frequency use in product development, testing, and education.

When preparing its resolutions, FICORA is to cooperate with the Ministry of Transport and Communications. If a regulation on the use of an individual spectrum band may have a major impact on the development of the communications market in general, the Government shall grant the radio licence.

Provisions on the use of radio frequencies are laid down in section 6 of the Radio Act. FICORA decides how radio frequencies are to be used for various purposes, taking into account international regulations and recommendations. The regulations must include information on the purpose of the spectrum band, along with the most important radio requirements that radio equipment utilising the spectrum band must fulfil. When preparing its regulations, FICORA is to cooperate with the Ministry of Transport and Communications.

The Government shall confirm the frequency plan for spectrum bands allocated to telecommunications and television and radio operations subject to licence. If FICORA's regulations addressing an individual spectrum band have a major impact on the general development of the communications market, the frequency plan for the spectrum band in question shall be confirmed in the frequency plan confirmed by the Government. A decree issued by the Ministry of Transport and Communications confirms the utilisation plan for the radio frequencies referred to in the Government's frequency plan, including detailed provisions on the use of these frequencies.

On 22 December 2009, the Finnish Government issued a decree on radio frequency usage and on the frequency plan (1169/2009), hereinafter referred to as the frequency plan. Usage limitations for spectrum bands reserved for telecommunications operations subject to a licence are included in an annex to the decree.

Television operations subject to a licence and the radio frequencies allocated for the use of YLE's nationwide and regional television networks are defined in a Ministry of Transport and Communications decree, issued under section 6 a of the Radio Act. This decree of the Ministry of Transport and Communications also specifies the frequencies allocated for radio-network use, and the municipalities in which radio transmitters are located. The maximum allowable transmission power and antenna height from ground to tip are stated by FICORA in the radio licence terms issued on the basis of section 8(1) of the Radio Act.

6.2.1 Frequencies used in general telecommunications operations

Public mobile-communication networks that are subject to licence include @450 (the Digiset Oy mobile-communication system operating in the 450 MHz spectrum band), GSM-900 and GSM-1800 (second-generation mobile-communication system), UMTS 900 and UMTS 2100 (third-generation mobile-communication system), and LTE (Long Term Evolution, evolution of the UMTS network). The authorities' telecommunications network VIRVE and the GSM-R railroad GSM network are examples of private or exclusive

mobile-communication networks.

The frequency plan includes more detailed definitions of the spectrum bands available to mobile-communication networks. Usage limitations for spectrum bands reserved for telecommunications operations subject to a licence are also included, in an annex to the frequency plan. The restrictions pertain to frequencies reserved for purposes such as product development, testing and educational use, and to geographic usage limitations.

450 MHz spectrum band

The 453.700–456.925 MHz and 463.700–466.925 MHz spectrum bands are available for digital broadband 450 mobile-communication networks in continental Finland. Additionally, the 452.425–453.700 MHz and 462.425–463.700 MHz spectrum bands are available, with consideration for the restrictions specified for safeguarding PMR use in the annex to the Government decree (1169/2009). Three carrier waves are used.

800 MHz spectrum band

In 2008, the frequencies 791–821 MHz and 832–862 MHz were allocated for terrestrial systems that can be used for the provision of electronic communication services. There are both national and international restrictions on the use of this spectrum band. On 29 March 2012, the Government approved a resolution on spectrum policy according to which licences for the 800 MHz spectrum band would be auctioned in 2013. The resolution stipulates that other use of the band should cease no later than at the end of 2013.

900 MHz spectrum band

For 900 MHz, a 2 x 35 MHz frequency band, corresponding to 174 GSM channels, is available for mobile communications. The frequencies 880.2–914.8 MHz and 925.2–959.8 MHz are allocated to mobile-communications use.

All channels in continental Finland are allocated to three telecommunications companies. In Åland, channels are apportioned to two telecommunications companies. The radio licence also allows UMTS use in this spectrum band.

1800 MHz spectrum band

For 1800 MHz, a 2 x 75 MHz frequency band, corresponding to 374 GSM channels, is available for mobile communications. The 1710.2–1784.8 MHz and 1805.2–1879.8 MHz frequencies are assigned for mobile communications' use.

In continental Finland, frequencies are allocated to three telecommunications companies. In Åland, one telecommunications company holds the right of use for 70 channels. The radio licence also allows the use of LTE technology.

2 GHz spectrum band

For 2 GHz, 2 x 60 MHz FDD pairs (1920–1980 MHz and 2110–2170 MHz) and unpaired 20 MHz TDD frequencies (1900–1920 MHz) are available for mobile communications. Currently, three telecommunications companies have rights of use for the 2 x 20 MHz and 5 MHz spectrum bands in continental Finland.

In Åland, three telecommunications companies have the right of use of the 2 x 15 MHz (FDD) and 5 MHz (TDD) spectrum bands.

2.6 GHz spectrum band

Licences for the 2500–2690 MHz spectrum band were auctioned in 2009. Two telecommunications companies utilise the paired (FDD) 2 x 25 frequencies, and one company uses the 2 x 20 MHz frequency. Additionally, one telecommunications company uses unpaired (TDD) 50 MHz frequencies.

3.5 GHz spectrum band

The 3410–3590 MHz spectrum band is allocated to radio systems of the fixed wireless access network, and to terrestrial systems applicable for provision of electronic-communication services. Use of the spectrum band can be based on current so-called fixed WiMAX technology (FDD) or on mobile WiMAX technology (TDD).

The spectrum band is divided into three segments. Unless rights of use in neighbouring geographic areas limit frequency use, rights of frequency use may be granted to three telecommunications companies in one geographic area. Only radio licences based on WiMAX technology have been applied for and granted in the 3410–3590 MHz spectrum band. The radio licences are valid until the end of 2016.

6.2.2 Television frequencies

The digitalisation of television broadcasting was agreed on at the ITU Regional Radiocommunication Conference of 2006. Seven nationwide networks in the UHF band and two in the VHF band were allocated to Finland. Planning focused on the 174–230 MHz VHF spectrum band and 470–862 MHz UHF band.

Currently, there are six multiplexes used jointly by nationwide and regional television operations in the 470–790 MHz spectrum band allocated to television use; one of them is primarily reserved for YLE's public-service obligations, broadcasting programmes in line with the licence granted to the company (for SVT). Moreover, one multiplex in this spectrum band is reserved for regional television operations. This area covers the Helsinki Metropolitan Area, in Southern Finland. Also, one regional multiplex each is reserved for regional television operations in the Vaasa and the Seinäjoki region.

Two multiplexes in the 174–230 MHz spectrum band are in shared use by nationwide television operations. Additionally, there is one almost-nationwide multiplex in this band.

In August 2007, Finland's terrestrial broadcasting networks became fully digitalised. Since a digital transmission network utilises frequencies far more efficiently than does an analogue network, it has been possible to allocate frequencies utilised by television operations also to other uses while simultaneously increasing the number of channels. Consequently, in 2008, the 790–862 MHz spectrum band, the so-called digital dividend, could be allocated to wireless broadband services.

6.2.3 Radio frequencies

In line with the frequency plan, the 87.5–108 MHz spectrum band is utilised by analogue FM radio operations. On 17 February 2011, the Government granted 10 licences that are virtually nationwide in terms of population coverage, two licences for the largest cities, and 55 regional and local licences. The licences are valid from the beginning of 2012 until the end of 2019. Moreover, YLE has seven networks at its disposal, of which three (Radio 1, YleX and Radio Suomi) cover the whole country; two (Vega and Puhe) cover most of the country; and two (Extrem and Sámi) are, in essence, regional networks.

The frequency plan also stipulates which spectrum bands are to be used in analogue

amplitude-modulated radio operations.

6.2.4 Government Resolution on Spectrum Policy

With the exception of the trial auction of 2009, telecommunications licences in Finland have been granted via the so-called beauty contest method. On 29 March 2012, the Government issued a resolution according to which licences for the digital broadband 800 MHz mobile-communication network are granted by means of a spectrum auction.

In total, 2 x 30 MHz of frequencies will be auctioned in 2 x 5 MHz frequency pairs. The frequencies are to have a starting price that will guarantee income of at least EUR 100 million for the state.

Currently, this band is used by radio microphones; i.e., it is utilised by operators who use wireless microphones in, for example, studios, theatres, and concert venues. Use of this spectrum band for any other purpose than mobile communications will cease by the end of 2013. Substitute frequencies have already been allocated for radio microphones.

The explanatory memorandum of the Resolution on Spectrum Policy states that consumers should be able to receive television broadcasting free of interference even after the 800 MHz frequency has been allocated to wireless broadband systems. A licence-holder for this spectrum band would have the responsibility to remove any interference caused by its operations to other radio communications that abide by regulations, and to compensate for the expenses incurred in removal of the interference.

The Resolution on Spectrum Policy also states that Finland strives to influence the international preparations and cooperation in such a way as to remove, as swiftly as possible, the international restrictions limiting the uptake of the 700 MHz frequency band for mobile communications.

6.3 Tasks of the Government

As has been stated above, frequency use is governed by a Government decree. More detailed provisions addressing radio-frequency use governed by the Government decree are set forth in the ministerial decree issued by the Ministry of Transport and Communications.

When frequencies become available that are technically and in terms of spectrum efficiency appropriate for operations subject to a licence, the Government shall invite applications for such licences. The Government has adhered to a principle under which the available spectrum capacity has, by default, been declared open for applications.

The Government shall make licence decisions within six weeks from the closing of the application period. In special cases, this period may be extended, by no more than eight months.

6.4 Tasks of the Finnish Communications Regulatory Authority

FICORA's plans indicate how radio frequencies in Finland can be used efficiently, appropriately and with sufficient freedom from interference. FICORA steers spectrum use in Finland and issues, pursuant to law, regulations on radio-frequency use as explained in section 4.2 above. FICORA also monitors radio-transmitter use, ensuring that valid decrees as well as regulations and licence terms related to radio-frequency use are adhered to. The authority investigates cases of radio interference in order to remove or

restrict the interference. Moreover, FICORA supervises that the compliance of the radio equipment imported and sold is verified as required by law. International spectrum management cooperation at the European and global level is very active.

In line with section 7 of the Radio Act and to guarantee the efficient, appropriate and sufficiently interference-free use of radio frequencies, the possession and use of a radio transmitter are subject to a licence. Radio licences are granted by FICORA. The majority of radio transmitters currently in use have, however, been made exempt from the obligation of a radio licence through a regulation issued by FICORA on collective frequencies for licence-exempt radio transmitters and their use.

Radio licences granted by FICORA are subject to a frequency fee. In line with the Act on Criteria for Charges Payable to the State, frequency fees are laid out in the decree of the Ministry of Transport and Communications on the fees collected by the Finnish Communications Regulatory Authority for radio administration services (1222/2010).

The amounts of frequency fees are set on the basis of frequency usability and the number of frequencies used, for example. Frequency fees are also used to promote spectrum efficiency. Frequency fees are collected such that the accrued income covers nearly all of FICORA's administrative costs related to radio frequencies. In 2010, income from frequency fees came to approximately EUR 11 million. In 2011, this income was roughly EUR 9.8 million.

In late 2010, the Ministry of Transport and Communications revamped the frequency-fee model and the relevant decree. This was necessary since the model was somewhat difficult to understand and did not treat the various user groups equally. The frequencies used by a holder of a radio licence will have a stronger bearing on the frequency fee for nearly all frequency user groups. Because of the change, television operator fees increased while mobile-communication operator fees declined, making frequency fee distribution more equal.

6.5 Frequency fees that promote spectrum efficiency

As the utilisation of wireless communication services continues to grow, operators in the industry have an increasing need for the most usable radio frequencies. At the same time, the financial value and societal significance of radio frequencies have grown considerably. In consequence, state spectrum management is increasingly responsible for the task of ensuring the efficient use of those frequencies most in demand, irrespective of whether the frequency is used by a private or a public operator. To take care of this task, regulatory authorities have deployed various mechanisms that increase spectrum efficiency. These mechanisms include frequency auctions, permanent spectrum fees that encourage the efficient use of frequencies (a higher frequency fee), and frequency licences that are resellable and technology- and service-neutral.

According to the Authorisation Directive, permanent frequency fees in Europe are to be divided into two parts: administrative charges and fees that encourage the optimal use of frequencies. According to Article 12 of the directive, '[a]ny administrative [frequency] charges [...] shall in total, cover only the administrative costs which will be incurred in the management, control and enforcement of the general authorisation scheme'. In other words, only costs incurred in frequency management can be collected from frequency-licence-holders through frequency fees. On the other hand, Article 13 of the directive stipulates that 'Member States may allow the relevant authority to impose fees for the rights of use for radio frequencies [...] which reflect the need to ensure the optimal use of these resources'. In other words, frequency fees that promote the efficient use of frequencies are to be considered separate from administrative fees. From the users' perspective, a frequency fee therefore, consists of two elements: an administrative

charge, collected for all frequencies, and an optional fee ensuring optimal use of resources.

In Finland, covering the administrative costs of frequency management has been the only criterion in the setting of frequency fees. Frequency fees have, therefore, as defined in the Authorisation Directive, been administrative fees. Some countries, however – most notably Great Britain – have adopted the practice of collecting permanent frequency fees with the aim of promoting efficient frequency use in addition to collecting administrative fees. In such cases, the total amounts collected via frequency fees usually exceed the costs of frequency administration and the surplus has been transferred to the state budget.

With regard to mobile communications, the Government Resolution on Spectrum Policy, issued in March 2012, states that, in connection with the preparation of the Code for Information Society and Communications Services, Finland is considering adoption of a frequency fee that reflects the market value of the frequency and exceeds administrative costs for frequency bands for which the auction procedure is not used.

Incentive fees consist of annual frequency usage fees that reflect the market value of the frequency and are aimed at creating incentives for the frequency-user's utilisation of the frequency in a manner that maximises long-term benefits to society. The purpose of the fee is to provide a tool for ensuring the optimal use of radio frequencies in both the public and private sector. The fee is based on the philosophy that when a frequency is subject to a considerable fee that reflects its market value, the user of the frequency will give up any unused frequencies or aim to increase spectrum efficiency, thereby reducing the relative size of the fee. If the frequency fee exceeds the value the frequency holds for the user, frequency-users may also transfer frequencies to more efficient operators.

6.6 Reform of frequency management

The above-mentioned model, wherein frequency management decisions are made via instruments that have been established in statutes of various levels has not, in practice, turned out to be sufficiently efficient and flexible. The system is in need of reform particularly in the area of radio operations. The new model must be understandable, well argued and sufficiently simple with respect to its objectives.

The new model must be able to ensure and promote efficient and appropriate frequency use, and to guarantee television and radio market functionality.

7. CURRENT REGULATION OF TELEVISION AND RADIO OPERATIONS

7.1 Audiovisual Media Services Directive of the European Union

Television operation regulation in the EU has been harmonised by means of the Audiovisual Media Services Directive (2010/13/EC), known as the Audiovisual Directive. The directive is based on the country-of-origin principle; i.e., television broadcasting is, by default, regulated in line with the regulation in force in the country of establishment of the television operator, and, with the exception of certain specific circumstances, the reception of broadcasting may not be subject to limitations in other Member States.

The directive harmonises the regulation applied to determination of the country of origin of audiovisual services; to the protection of minors; and to the volumes of advertising, product placement, and sponsorship. The directive also regulates the free broadcasting of events that are particularly interesting to the general public and the rights of television operators to use short news reports on matters of great interest to the general public on

an exclusive basis. Moreover, the directive encourages Member States to make television broadcasting gradually more accessible to people with a visual or hearing disability.

The directive divides audiovisual content services into traditional linear, scheduled television operations and on-demand audiovisual media services. Provisions on the promotion of European content; the protection of minors; and the general principles for commercial communications, sponsorship, and product placement apply to on-demand services.

The Audiovisual Directive is a 'minimum directive', which means that Member States may also adopt regulation that is more specific than that of the directive if compatible with community law. In Finland, the regulation has essentially followed the minimum levels laid out in the directive, and, with some exceptions, there has been no apparent need for adoption of more detailed regulation.

7.2 Legislation

The most significant statutes on television and radio operations within the mandate of the Ministry of Transport and Communications are included in the Communications Market Act (393/2003); the Act on Television and Radio Operations (744/1998), hereinafter referred to as the Television and Radio Act; and the above-mentioned Act on Radio Frequencies and Telecommunications Equipment (1015/2001), or Radio Act.

The Communications Market Act includes key provisions concerning telecommunications companies involved in general telecommunications operations. In the act, 'telecommunications operators' refers to network operators and service operators. According to section 1 of the Communications Market Act, the objective of the act is to promote the provision and use of services within communication networks and to ensure that communication networks and communication services are available under reasonable conditions to all telecommunications operators and users, throughout the country. A further objective of the act is to ensure that the opportunities available for telecommunications in Finland are in accord with the reasonable needs of users and that the opportunities are competitive, technologically advanced, of high quality, reliable, safe and inexpensive.

The Television and Radio Act applies to the operations of television companies established in Finland. The act includes rules on granting and revocation of licences, programme content, advertising, tele-shopping programmes and sponsorship, and obligations related to preparing for exceptional circumstances. The Radio Act, on the other hand, governs possession and use of radio equipment, and planning and allocation of radio frequencies for various purposes.

According to section 7 b of the Television and Radio Act, notification in accordance with section 15(1) must be submitted, prior to the commencement of the operations, to the Finnish Communications Regulatory Authority for television and radio broadcasting operations that are not subject to a licence. Section 15 of the act specifies the information to be included in the notification.

If the operations are regional, the terms of the Television and Radio Act apply, with the exception of licence regulation and rules pertaining to the quotas for European content and independent programme-producers, to cable-television operations.

Section 16 of the Television and Radio Act includes rules on the proportion of European works in television broadcasting: pursuant to its 1 subsection, a television broadcaster must reserve for European works a majority proportion of his annual transmission time, excluding the time appointed to news, sports events, games, advertising, teletext

services and teleshopping. According to section 17 of the act, a television broadcaster must reserve 15 per cent of his transmission time for programmes produced by independent producers, excluding the time devoted to news, sports events, games, advertising, teletext services and tele-shopping, or alternatively, 15 per cent of his programming budget. In 2002, the percentage was raised from 10 per cent to promote digital content production. These terms, based on the Audiovisual Directive, apply to all television broadcasters.

The act on prohibition of certain decoding systems (1117/2001) lays down provisions on the protection of decoding systems against hacking. The act applies to, for example, pay television and broadcasting scrambled with specific technologies.

Protection of minors

The new Act on Audiovisual Programmes (710/2011) entered into force at the beginning of 2012. A key objective of the act in its updated form is to create a more secure media environment for children, a goal that is promoted by means of media education and communications. Film classification was discontinued when the act came into force, but the age-limit system was retained. In connection with the new law, the Finnish Board of Film Classification became the Finnish Centre for Media Education & Audiovisual Media.

The Centre for Media Education & Audiovisual Media, operating under to the Ministry of Education and Culture, has the tasks of coordinating and promoting media education; supervising television programme, computer and video-game supply; and maintaining the age-limit system in accordance with the principles of child welfare. The centre may, on its own initiative, classify audiovisual programmes and enforce adherence to obligations by issuing a statement and notice of a conditional fine. At the same time, some supervisory tasks related to television operations and child welfare were transferred from FICORA to the centre.

As a general rule, all programmes are to be classified as suitable for all ages; be classified with an age limit of seven, 12, 16, or 18 years; or be given an age limit of 18. Classified programmes must display a label that describes their content.

The act requires that audiovisual programmes available in Finland be classified in accordance with uniform criteria. Classification applies to all types of programming – i.e., films, television programmes and games – and all methods of provision of audiovisual content: cinemas, distributed recordings, television broadcasting and on-demand services available on the internet, for example.

To cover the costs of audiovisual media's supervision, a tax-like supervision fee is collected from providers of audiovisual programmes. Fees are also collected for programme classification and announcements made through the system of the Finnish Centre for Media Education & Audiovisual Media.

Obligation of contingency preparation

By means of contingency planning and preparations for exceptional circumstances, all telecommunications companies must ensure that their activities will continue with minimum disruption even in the exceptional circumstances referred to in section 90 of the Emergency Powers Act and in disruptive situations under normal circumstances. In line with section 15 a of the Television and Radio Act, a similar contingency preparation obligation applies to programme licence-holders operating in terrestrial mass-communication networks as specified in section 7 of the Television and Radio Act. According to section 7 of the Act on Yleisradio Oy, public-service programming must in particular make provisions for television and radio broadcasting in exceptional circumstances. According to section 43

a of the Act on Radio Frequencies and Telecommunications Equipment, '[t]he principal radio frequency users and user groups [...] all have a duty, in cooperation with the Finnish Communications Regulatory Authority, to ensure, by means of emergency planning and precautionary measures for exceptional circumstances, as well as other measures, that the use of radio frequencies is efficient and sufficiently free of interference even under exceptional circumstances and in disruptive situations in normal circumstances'. This obligation, as specified in the Radio Act, pertains only to users and user groups specified by the Ministry of Transport and Communications on the basis of a proposal by the National Emergency Supply Agency.

In line with section 93 of the Communications Market Act and section 15 a of the Radio Act, further provisions on contingency preparation may be made by Government decree. The issuing of provisions on contingency-preparedness with a decree has been limited to communication networks and television and radio operations that are necessary for saving human lives or for ensuring national security or the functioning of the nation's leadership or economy. Under section 93(3) of the Communications Market Act, the Finnish Communications Regulatory Authority may issue further technical orders pertaining to a telecommunications operator's contingency-preparation obligation. Moreover, section 93 allows the Ministry of Transport and Communications to issue instructions on the contingency-preparation obligation and general contingency planning in addition to binding legal provisions.

Obligation to broadcast official announcements

Under section 7 of the Act on Yleisradio Oy, YLE is obliged to broadcast official announcements for which further provisions shall be issued with a decree. Also, pursuant to section 15 of the Television and Radio Act, a television and radio broadcaster with a licence is obliged to transmit information from authorities to the public at no charge if this is necessary for saving human life, protecting property, or safeguarding the functioning of society. Further provisions on a television and radio broadcaster's obligations as referred to in subsection 1 may be made by Government decree. The provisions may concern the television or radio broadcasting necessary to save human life or ensure the functioning of the nation's leadership or national security of the economy.

7.3 Subordinate statutes

Government decrees

In addition to frequency planning, the Government steers electronic communications with the provisions issued in the following decrees.

Under section 13(2) of the Communications Market Act, the Government in 2003 issued a decree on telecommunications of minor significance (675/2003). In 2009, this decree was amended by means of another Government decree (963/2009). According to the latter decree, public telecommunications is regarded to be of minor significance if the operator's turnover from telecommunications in Finland is less than EUR 300,000 per year.

In 2003, pursuant to section 16(2) of the Television and Radio Act, the Government issued its Decree on Television and Radio Operations (698/2003). The decree includes further provisions addressing what types of work are deemed European as referred to in section 16(1) of the Television and Radio Act.

The Government decree on the broadcasting of events of major importance (199/2007) includes further specifications related to section 20 of the Television and Radio Act on the use of exclusive rights.

The Government decree (292/2011) issued under section 19(3) of the Television and Radio Act includes provisions for audio-subtitling and subtitling services to be implemented in television programmes. According to the decree, the programme licence-holders and programme sets, as defined in section 19a(2) of the Television and Radio Act, are MTV Oy, Sanoma Entertainment Finland Oy, Nelonen programmes, Fox International Channels Finland, and FOX programmes.

The Government decree on the contingency-preparation obligation concerning the communications market and the obligation to broadcast official announcements (838/2003) was issued under section 93 of the Communications Market Act, section 7 of the Act on Yleisradio Oy, and section 15 a of the Act on Television and Radio Operations. The decree includes provisions addressing the obligations of telecommunications companies to broadcast official announcements, the authorities that decide when an official announcement is to be broadcast, the transmission system for emergency announcements, official announcements in exceptional circumstances, and contingency planning.

Decrees of the Ministry of Transport and Communications

The decree of the Ministry of Transport and Communications (695/2003) issued under sections 6 and 14 of the Communications Market Act includes provisions that address the content of operating licence applications and telecommunications notifications.

By virtue of section 8 of the Act on Criteria for Charges Payable to the State (159/1992), frequency fees and other fees related to FICORA's radio administration are laid out in the decree of the Ministry of Transport and Communications on the fees collected by the Finnish Communications Regulatory Authority for radio administrative services (1222/2010).

A decree issued by the Ministry of Transport and Communications (1799/2009) confirms the utilisation plan for radio frequencies, including detailed regulations on the use of radio frequencies confirmed in the Government decree.

Regulations of the Finnish Communications Regulatory Authority

FICORA's Radio Frequency Regulation No. 4 (FICORA 4 O/2012 M) is the authority's most significant regulation on radio frequencies. It includes regulation of radio frequencies' use aimed at ensuring their equal availability and efficient, appropriate and sufficiently interference-free use. The regulation applies to the 9 kHz – 400 GHz frequency range.

Pursuant to section 8 of the Radio Act, FICORA has issued a regulation on inspection of radio transmitters with a great risk of causing interference (2/2001 M). The regulation applies to other radio transmitters than those intended for short-term use. According to the regulation, a transmitter has to be inspected prior to its deployment, for ensuring that it does not cause interference.

Under the Communications Market Act and the Act on the Protection of Privacy in Electronic Communications, FICORA has also issued technical regulations on the quality, verification, compatibility, and information security of communication networks and services that further specify the requirements of the law. The technology-neutral regulations concern, where applicable, mass-communication networks and the communication services provided via such networks.

The Communications Market Act and the Act on the Protection of Privacy in Electronic Communications do not regulate the content of communications. As far as technical

regulation is concerned, this means that communication services provided via mass-communication networks as referred to here do not include programme content, only the technical transmission and conveyance of the programmes and their related additional services, irrespective of the task being the responsibility of the network-owner or a channel company, for example. Additional services related to programmes include but are not limited to teletext services, programme guides (EPG), and transmission and synchronisation of subtitles and audio with the image – also including new services for persons with disabilities.

FICORA's regulation 54 on the protection of communication networks and services defines the priority rating criteria for communication-network components on a scale of 1–5. A priority rating can be given in view of the service type (for example, mass-communication service or a telephony service) and the number of users. The equipment, route, electricity supply, and physical protection must be implemented in the network in keeping with the priority rating.

FICORA's regulation 57 on the maintenance of communication networks and communication services, procedures, and notifications in the event of faults and disturbances and regulation 58 on the quality and universal service of communication networks and services, also stipulate requirements for mass-communication network management. Moreover, regulation 57 includes provisions for a severity classification of faults and disturbances, notification submitted to FICORA, and communications to users. Regulation 58 includes requirements for service quality management. Mass-communication networks must monitor the availability and capacity use of channel-specific transmission flows, for example.

The information security requirements for telecommunications companies specified in Chapter 1 of FICORA's regulation 28 on interoperability apply also for IP traffic between mass-communication networks.

FICORA's regulation 21 on customer-premises community aerial networks and community aerial systems which defines the basic requirements for a housing-company-internal network, is particularly relevant for broadcast reception. The regulation is directed at housing-company-owners and not binding for telecommunications companies.

In the EU regulatory framework, the interoperability of terminal equipment and television networks has essentially remained the responsibility of terminal-equipment manufacturers. Terminal equipment's features are not covered by regulation, with the exception of some isolated features defined in detail in the directives. Equipment for receiving HD broadcasting via cable television and terrestrial television networks is covered by a joint industry testing system, coordinated in Finland by FiCom, and type approval procedures aimed at ensuring that television terminals entering the market function optimally.

7.4 Must-carry obligation

Section 134 of the Communications Market Act includes provisions for the so-called must-carry obligation associated with television programmes in the cable network. The provision was amended most recently in 2010, when the number of programmes falling under the must-carry obligation was reduced. In addition to YLE television and radio programmes, the must-carry obligation covers public-interest programmes broadcast under a nationwide licence. In line with section 19 a of the Television and Radio Act, programmes serving public interest are required to be broadcast with audio-subtitling and subtitling services. The identity of such programmes is confirmed by means of a Government decree. Currently, the commercial programme sets within the scope of the must-carry obligation are those of MTV3, Nelonen, and Fox.

The must-carry obligation is an exceptional intervention in television broadcasting market operations, partly because section 25i of the Copyright Act (404/1961) stipulates restrictions to copyright in relation to the must-carry obligation. Cable broadcasts related to the must-carry obligation have been made exempt from copyright fees.

The must-carry obligation is aimed at ensuring the availability of channels that are important to society also via cable networks. The regulatory measures are intended to ensure the right, related to freedom of expression, to receive messages, thus giving viewers the prerequisites for pluralistic communications and freedom of opinion.

As such, television services provided via the internet and intensified competition between cable networks reduce the need for legislators to intervene in the television broadcast market. However, to ensure that all viewers have equal opportunity to receive broadcasting from YLE and other channels serving the public interest, the must-carry obligation should continue beyond 2016.

7.5 One-card principle

The one-card principle refers to channels being scrambled through cooperation between operators such that they can be decoded with a single conditional-access card. It is a pay-television service usability requirement that television-viewers be able to access all pay-television services with one conditional-access card. This significantly increases viewers' opportunities for using the services of different service providers, which would contribute to increased service demand and advance the pay-television service market in Finland.

Today, the one-card principle is included in the Communications Market Act. According to section 136 of the Communications Market Act, a company using a decoder for scrambled broadcasts is responsible for ensuring that the decoding system does not prevent the distribution or reception of another company's television or radio programmes or related ancillary or supplementary services in a digital television or radio network.

Content services as communication services

According to the statement of reasons (recital 45) for Directive 2002/22/EC on universal service and users' rights relating to electronic communications networks and services (hereinafter 'the Universal Service Directive'), services providing content such as the offer for sale of a package of sound or television broadcasting content are not covered by the common regulatory framework for electronic-communication networks and services. In the same recital, it is mentioned that the Universal Service Directive is without prejudice to measures taken at national level, in compliance with Community law, in respect of such services.

The same point is made in the directive on access to, and interconnection of, electronic-communication networks and associated facilities (2002/19/EC, hereinafter referred to as 'the Access Directive'). According to the statement of reasons for the Access Directive (recital 2), services providing content such as the offer for sale of a package of sound or television broadcasting content are not covered by the common regulatory framework for electronic networks and services. According to the rationale for the Communications Market Act, the purpose of its section 136 is to prevent situations wherein a consumer would need to switch conditional-access cards during viewing in order to use the services of a different service provider and to ensure that the various services are accessible with the same conditional-access card. In this respect, Finnish legislation is beyond the directive's scope of harmonisation.

7.6 Other regulatory details

Channel-slot number assignment

Currently valid legislation does not include provisions for channel-slot number assignment. In November 2010, eight television-industry operators reached mutual agreement on the principles of channel-slot number assignment after operations of new network and service operators had commenced. According to the agreement, channel numbering is, in general, based on ease of use and the interest of the general public. Channel numbering is implemented such that free channels are placed first in the numbering space, followed by pay-television channels. Free channel numbers and channel numbering spaces are granted in the order of reservation.

Role of pay-television operators

The currently valid regulation has its origins in the time when pay television was not yet widespread in Finland. With digitalisation, pay television has grown significantly and established a position as an important stakeholder in the Finnish television landscape. The communications legislation in force does not regulate pay-television operators' activities in any way.

Television broadcasting quality

Key components of broadcasting network and service quality include reliability, backup in case of fault and failure situations, transmission capacity management and the interoperability of the entire transmission chain – which ensures that various programme flow components will be transferred throughout the chain. Such factors are within the scope of technical regulation as specified in section 128 of the Communications Market Act, and, on the basis of section 129 of that act, FICORA has issued technical regulations that specify the requirements in further detail.

As stated in section 5.3 above, FICORA's regulations pertain to, for example, the priority classification of television network and service components, and the related minimum levels of verification, scalable on the basis of classification. Furthermore, the regulations pertain to network management capability in normal quality-control situations, and to monitoring and management in fault and failure situations. On a general level, the requirements for verification and network management apply to all television networks and services, since these requirements are fundamental to the high technical quality of television operations.

The regulations are based on the principle that regulation of communication-service verification and other aspects of technical management should be intensified in proportion to the objective importance the service, in light of regulation, can hold for users and in proportion to the number of service-users. An essential principle is that regulation cannot classify telecommunications companies or users by their importance without the support of the law, and requirements must be based on generically defined activities and types of communication service.

For the sake of comparison, it can be stated that the technical regulations on targeted communications classify communication services and network components by their importance and with regard to universal service rights, for example: telephone, SMS, and internet connection services are considered most important basic services, while instant messaging services over an internet connection cannot be regarded as critical.

It is a feature of mass-communication networks and services that they cannot be classified by importance without account being taken of the broadcast programmes and

whether they are free or not; however, current regulation does not support this in any significant way. Communications services in all mass-communication networks are, as such, fundamentally the same, consisting of message distribution or provision.

The requirements for mass-communication networks have been itemised in the regulations in a fairly rough and technically oriented manner. For example, the verification requirements for cable-television network and terrestrial-network components have been defined separately. For network management, regulations define the factors that need, at minimum, to be monitored and measured for transmission networks and the programme stream, and specific requirements are defined only for established terrestrial networks (DVB-T technology) and cable-television networks (DVB-C technology). Moreover, because these networks carry large numbers of free and pay-television channels, and the cable-television service provider is in a contractual relationship with the end user, increasing the provider's power in influencing quality control, specific measurement and monitoring obligations for cable-television networks are restricted to programmes subject to the must-carry obligation. Regulations set actual performance-level requirements only for the most significant components serving large numbers of users – i.e., DVB-T transmitters and main amplifiers of cable-television networks.

8. CURRENT LICENCE SYSTEM

8.1 Valid regulation

The Television and Radio Act specifies that television and radio operations, when carried out via a terrestrial mass-communication network, are subject to licence. By contrast, a licence is not necessary for cable or satellite broadcasting. Cable broadcasts are viewed by approximately half of all households. FICORA must, however, always be notified when cable-broadcasting operations are established. The notification must include information on the operator and the area of operations, also describing the programmes to be broadcast.

As for other provisions pertaining to cable broadcasting, the licence required for analogue radio broadcasting grants the right to transmit programmes or to make programming available. The licence is linked to the radio frequencies, specified in the licence, that are needed for operations.

With digital television broadcasting, the licence (programme licence) grants the right to transmit or make available programmes but does not grant the right to control or use the radio frequencies required by the operations. For this purpose, a licence separate from the programme licence (i.e., a network licence), as defined by the Communications Market Act, is required. The holder of a network licence can offer network services in digital television and radio networks. The holder of a programme licence, on the other hand, has the right to transmit programmes under either a provision of the network licence or an agreement concluded with the network licence-holder.

Programme licences and network licences were made separate during the first phase of the large-scale reform of communications market legislation in 2002. The provisions covering programme licences are found in the Television and Radio Act. Network licences, on the other hand, fall under the Communications Market Act.

8.2 Television and radio operating licences

Programme licences

Television or radio operations in terrestrial television and radio networks require a

licence, as specified in section 7 of the Television and Radio Act, granting the right to transmit or make available programmes. Licences are granted and declared open for application by the Government.

Section 10 of the Television and Radio Act stipulates the manner of granting of licences and declaring them open for application. When granting licences or declaring them open for application, licensing authorities need to take into account the full television and radio operation environment in the region in question, aim at promoting freedom of expression, and ensure the diversity of the programme sets as well as the meeting of the needs of special groups in the audience. According to the detailed rationale for the government proposal on the act (HE 34/1998) and the statement of the Constitutional Law Committee, communications must also be prevented from becoming centralised in a way that would jeopardise freedom of expression. Licences can also be granted to natural persons, communities, or foundations when these are financially sound and are manifestly able to carry out continuous operations as specified in the licence. In practice, the licence-granting procedure is a 'beauty contest' in which applications are assessed from the perspectives described above.

According to section 11 of the act, the licensing authority has the right to issue licence-related regulations on programme operations that safeguard the diversity of programming and the needs of special groups. The licensing authority also has the right to issue regulations on the regional service area of broadcasts, daily hours of transmission, transmission technology and transfer capacity. During the validity of the licence, its terms may be amended by request of or with the approval of the licence-holder. The licence can be amended also in other circumstances, if this is rendered absolutely necessary by technical developments or specific factors created by fundamental changes in the prerequisites for the operations covered by the licence. Licences can be granted for a maximum period of 10 years.

Operations not subject to licence

YLE may engage in public-service television or radio operations without a licence. The operations of YLE are governed by the Act on Yleisradio Oy (1380/1993).

FICORA must be notified of television and radio operations that do not match the descriptions above. Such operations include, for example, television operations in cable-television networks (for example regional channels that are not re-broadcasting). The notification must include information on the operator and the area of operations, and it must give a description of the programmes that are broadcast.

Section 13 of the Communications Market Act includes provisions for telecommunications operations subject to notification. Before initiating operations, an operator of public telecommunications must submit a written notification (i.e., a telecommunications notification) to FICORA. The notification obligation does not apply to public telecommunications if they are temporary, target a small audience, or otherwise are considered of minor significance. A Government decree may be issued with more detailed provisions addressing the types of telecommunications operations to be considered minor.

Network licences

As specified in section 4 of the Communications Market Act, the provision of network services in a digital terrestrial television and radio network is subject to a licence (i.e., a network licence). The licence grants authorisation to offer network services in terrestrial digital mass-communication networks. Licences are granted and declared to be open for application by the Government. According to section 5 of the Communications Market

Act, a licence is to be announced as available for application when frequencies that are technically appropriate and appropriate for efficient frequency use become available for the purposes of telecommunications subject to a licence.

Section 9 of the Communications Market Act includes provisions addressing the requirements for granting of a network licence. A licence must be granted if the applicant has sufficient economic resources to meet the network operation obligations, and if the licensing authority has no justifiable reason to suspect that the applicant will violate the provisions of the Communications Market Act, the Act on Radio Frequencies and Telecommunications Equipment, the Act on the Protection of Privacy in Electronic Communications, or any other law that governs telecommunications operations. According to legislation, if, because of frequency scarcity, licences cannot be granted to all applicants, they are granted to those applicants whose operations best promote the objectives set out in section 1 of the Communications Market Act.

According to section 1 of the Communications Market Act, the objective of the act is to promote the provision and use of services within communication networks and to ensure that communication networks and communication services are available under reasonable conditions to all telecommunications operators and users throughout the country. A further objective of the act is to ensure that the opportunities for telecommunications in Finland match the reasonable needs of users and that the opportunities are competitive, technologically advanced, of high quality, reliable, safe and inexpensive.

In practice, this licence-granting procedure too is a 'beauty contest' in which applications are assessed from the perspectives described above.

Short-term licences

Licences for short-term television and radio operations are granted by FICORA. FICORA may also grant a licence for radio operations in the analogue broadcasting network if the duration of operations does not exceed three months. The licence must be granted if frequencies are available and there is no reason to suspect that the applicant will violate the provisions of the Television and Radio Act or any other act governing television and radio operations.

FICORA may grant a licence for television or radio operations in a digital broadcasting network if:

- The duration of the operations will not exceed three months
- The weekly duration of the operations does not exceed eight hours
- Operations in the broadcasting network are implemented via DVB-H or a corresponding standard.

FICORA must grant a licence if there is no justified reason to suspect that the applicant will violate laws governing television and radio operations.

Auctioned licences

In 2009, television operation licences in Finland were granted through an auction. According to section 4 of the Act on Auctioning Certain Radio Frequencies (462/2009), the Government shall grant a licence as referred to in the act to the enterprise or other organisation that has made the highest valid bid for the frequency band or frequency pair in the auction unless the licensing authority has especially weighty reasons to suspect that granting the licence to the applicant in question would apparently place national security at risk. Under that section, a licence may be granted for a maximum period of

20 years. The act, as currently formulated, is to be applied only to granting of licences in the 2.6 GHz spectrum band.

8.3 Regulation and supervision of licences

According to section 10 of the Communications Market Act, a network licence defines the geographical operating area of the licence-holder. Quality requirements for the network or service, and/or requirements promoting the objectives of the law, may be incorporated into a network licence. Also, terms supplementary to FICORA's technical regulations on the technical features of communication networks and efficient frequency use, as stated in the law, may be appended to the licence. Moreover, the licence includes a condition to ensure that YLE and programme licence-holders have enough network broadcasting capacity at their disposal. Terms on the capacity reserved for a programme licence-holder, or on cooperation between programme licence-holders for capacity distribution or issues related to electronic programme guides, can be appended to a licence. Terms addressing broadcasting technology too may be incorporated into a licence.

Valid network licences include terms on geographical areas of operation, validity period, construction obligations, the technologies used and the time limits set for the launch of operations.

According to section 11 of the Television and Radio Act, regulations related to the programme service that are necessary to safeguard the diversity of programmes and meeting of the needs of special groups of the public may be incorporated into programme licences. The licensing authority also has the right to issue regulations on the regional service area of broadcasts, daily hours of transmission, transmission technology and transfer capacity.

Programme licences granted for television operations include terms addressing the regional service area of broadcasts, the inclusion of news and factual programmes in the programme supply, programming in Finnish and Swedish and programme subtitling, for example. Programme licences granted for radio operations include regulation of the amount of speech content, news and current-affairs programming, regional programme content and music content, for example.

FICORA supervises the implementation of the Communications Market Act and the statutes and regulations issued under it. Coercive measures are laid out in Chapter 12 of the Communications Market Act, and section 12 includes provisions for the cancellation of a licence.

FICORA also monitors adherence to the Television and Radio Act, and the statutes and regulations issued under it. Coercive measures are laid out in Chapter 6 of the Television and Radio Act.

FICORA monitors broadcasters' adherence to the provisions of the Television and Radio Act on advertising, sponsorship, product placement and tele-shopping programmes. The supervision is based on viewer complaints, self-monitoring and sample-based surveys. Research results are reviewed in light of provisions, and operators may be given either more detailed guidelines or solutions with the right of appeal. Research results are also published on the web site of the authority.

According to the Television and Radio Act, television broadcasters must make sure a certain percentage of their programming is of European origin and produced by independent producers. Each year, FICORA collects information from television companies on the share of European and independently produced broadcasting. This information is reported to the European Commission every other year.

The authority handles 200 cases of issues being raised by viewers and listeners each year; 10–20 of these lead to further investigation.

Moreover, FICORA conducts monitoring to ensure that operators adhere to the terms on programming and operations stated in the programme licences. Supervision is implemented through both commissioned surveys and authority investigations conducted by FICORA. FICORA also monitors the audio-subtitling and subtitling requirements set for YLE and the channels under the must-carry obligation. The supervision is implemented with surveys.

8.4 Transfer of licences and changes in effective control

According to section 11 of the Communications Market Act, a network licence may be altered during its validity period with the consent of the licence-holder, or otherwise if alteration is necessary for special reasons due to technical development or a fundamental change in the operating conditions of an activity subject to licence.

Provisions for cancellation or transfer of a licence are laid out in section 12 of the act. The Government may cancel the licence of a telecommunications operator in part or in full if the operator has repeatedly and seriously violated the provisions of the Communications Market Act or the terms of the licence; if the operator no longer has sufficient economic resources to meet its obligations, in view of the nature and extent of the operation; or if the operator, despite being requested to do so, fails to rectify its conduct and replenish its economic resources to a sufficient level.

According to section 12(3) of the Communications Market Act, a licence is non-transferable. The Government may cancel a licence if the effective control in respect of the licence-holder changes. Any such change in effective control must be reported immediately to the Government, which decides, within two months of the notification, whether to cancel the licence. According to section 12(5), the internal transfer of a licence within a group between the parent company and a wholly owned subsidiary is not considered to be a licence transfer that would require cancellation. Such a transfer still must be reported immediately to the licensing authority.

The non-transferable nature of the licences is also a basic assumption of the network licensing system. According to section 13 of the Television and Radio Act, if a licence granted to one party is transferred to another, it becomes void. Effective control over a licence, however, may change. If the effective control with regard to a licence-holder changes, or if the effective control of the licence-holder with regard to the operations referred to in the licence changes in that the licence-holder can no longer be regarded as a television or radio broadcaster as referred to in the act, the licensing authority may approve the changes or cancel the licence.

The licensing authority may approve a change in effective control if it is evident that the conditions for granting a licence referred to in section 10 of the act are met, and the operations will continue in accordance with the licence terms. In other cases, the licence must be cancelled. In situations involving changes in effective control, the licensing authority bases its decisions on overall consideration. Thus the licensing authority will decide on a case-by-case basis, applying its discretion, whether the change can be approved or instead there are grounds to declare the licence open for applications. When changes in effective control are being considered, the criteria are essentially the same as those used when licences are being granted.

8.5 Programme licence system in relation to the Constitution

In 2008, a working group established by the Ministry of Transport and Communications conducted a survey investigating operators' perceptions of the television and radio licence system. The survey's participants were current and potential licence-holders, other companies in the industry, industry organisations, and representatives of YLE and of research and educational institutions in the field.

First of all, the licence system was perceived to be limiting television and radio operations as compared to other media. Radio operations licence-holders were the only group for which more than half were of the opinion that the current licence system promotes freedom of expression. More than half of both radio and television licence-holders felt that the licence system promotes the versatility of programmes.

All groups of respondents were of the opinion that the types of operations licences granted, including their terms, should be defined beforehand and in more detail than they currently are. Television licence-holders were the only group of respondents for whom more than half felt that frequencies are being used efficiently. The claim that a licence ensures the availability of sufficient transmission capacity for television operations divided the television operators, amongst whom the groups who disagreed and the groups who agreed were larger than amongst other respondents.

As a summary, it was stated that the licence system and the efficiency of its operations divide opinion among the industry operators starkly. Only slightly more than one in four felt the licence system to be up to date. The discretionary nature of the licence-granting procedure was, for the most part, considered to be functional and a proposed move towards more commercial procedures was not greeted with much enthusiasm.

Over the years, there has been extensive discussion of the licence system, both for and against. As a question separate from that of the system's appropriateness, the compatibility of the current system with the Constitution has been assessed in a changing operation environment wherein the use of frequencies is far more efficient than before.

Freedom of expression

Freedom of expression, as safeguarded by section 12 of the Constitution of Finland, includes the right to express, disseminate, and receive information, opinions and other messages without prior prevention by anyone (i.e., there is a ban on preventive barriers). The key objective of the freedom-of-expression provision in section 12 of the Constitution is to guarantee free opinion-formation, which is a prerequisite for the development of a democratic society, open public debate, free development and pluralism of mass communications, and the freedom to criticise the exercise of powers publicly. Freedom of expression has traditionally been considered to be fundamentally and at its core a political basic right, as has been pointed out many times by the Constitutional Law Committee of the Parliament of Finland. Freedom of expression is not, however, limited to political expression, but other types of expression, regardless of their content, fall within its purview. On a general level, freedom of expression safeguards various forms of creative activities and self-expression. Advertising, for example, is an area in which restrictions have been imposed but with weaker criteria than applied to the core area of freedom of expression.

Operations subject to licence, such as those under the programme licence system, are fundamentally problematic where the ban on preventive barriers as laid out in the provision for freedom of expression is concerned. It was, however, considered possible to uphold the licence system in connection with the 1995 Constitution reform (Government

Bill 309/1993) with the condition that its necessity could be argued for in a manner that is acceptable in terms of the realisation of freedom of expression. The licence system was considered to constitute a means for ensuring the practical implementation of freedom of expression on as wide a scale as possible. Moreover, it was stated that the need to distribute available frequencies equally is another premise for keeping operations subject to a licence.

Traditionally, the programme licence system has been defended first and foremost on grounds of frequency scarcity. It has also been defended as a protector of freedom of expression, since, via the system, programming versatility has been guaranteed and the needs of special groups have been taken into account. With the programme licence system, it has also been possible to distribute scarce resources equally. At the same time, if broadcasting operations are subject to a licence, this constitutes a major fundamental and practical restriction to the usage opportunities provided by freedom of expression.

Freedom to engage in commercial activity

According to section 18(1) of the Constitution of Finland, everyone has the right, as provided by an act of law, to earn his or her livelihood through the commercial activity of his or her choice. In its statements (see, for example, PeVL 4/2000 vp, PeVL 35/1998 vp, and PeVL 15/1996), the Constitutional Law Committee has identified the freedom to engage in commercial activity as a general rule in accordance with section 18(1) of the Constitution. However, the committee has acknowledged that a commercial activity may in exceptional cases be made subject to licence. According to the committee, being made subject to licence must always be stipulated by an act that complies with the general requirements for laws that restrict a basic right. In terms of regulation, the committee has emphasised that provisions setting forth the criteria for and duration of a licence should provide a sufficient outlook to authority measures. In this respect, it is important whether the purview of an authority is defined by so-called constrained deliberation or by expediency considerations. In general, the more the provisions for granting a licence are formulated along the lines of expediency considerations, the more problematic they essentially are in terms of the freedom to engage in commercial activity. This is why, for licence decisions based on expediency considerations to be deemed acceptable in view of the Constitution, the grounds for applying expediency considerations to licence decisions need to be very solid. In terms of the Constitution it is, correspondingly, markedly less problematic if the provisions for granting licences are drawn up in line with constrained deliberation in a manner that leaves the authorities no leeway in granting licences: with decisions based on constrained deliberation, the authority must grant a licence if the conditions for granting a licence are fulfilled.

In the area of programme licences, the Constitutional Law Committee has consistently seen the scarcity of radio frequencies as an acceptable reason for limiting the freedom to engage in commercial activity. So far, the statements of the Constitutional Law Committee have taken the stand that licence regulation already fulfils the conditions for limiting basic rights, such as the requirement that the regulation be specific and clearly defined.

8.6 Valid network and programme licences

8.6.1 Network licences for television operations

Since the launch of digitalised television operations in 2001, it has been possible to allocate more multiplexes to television use as additional frequencies have been agreed on in international negotiations. Until the summer of 2009, digital television operations were carried out with four multiplexes of the UHF spectrum band (A, B, C, and E). The fifth multiplex, D, was already then reserved for mobile television broadcasting. Moreover, in

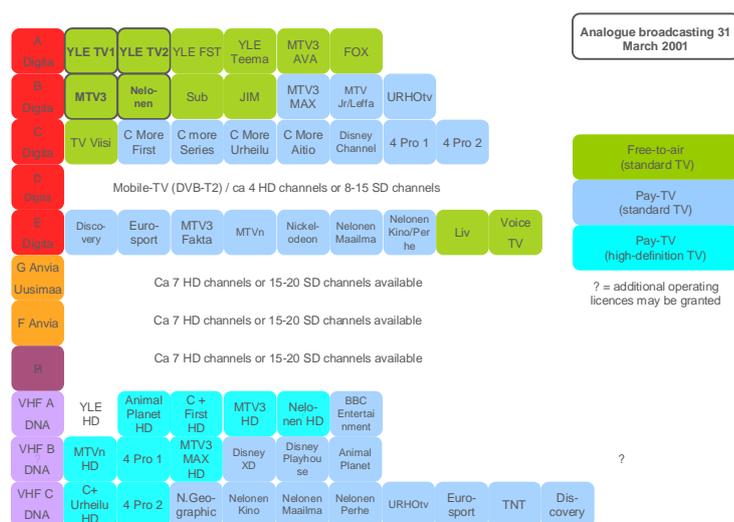
2007, Anvia Plc was granted a licence for a digital regional multiplex in the Närpiö, Pietarsaari, and Vaasa area. A company named Satman was granted a licence for regional terrestrial television operations in the Seinäjoki area.

In the summer of 2009, two nationwide terrestrial television network licences for the VHF spectrum band were granted to DNA Ltd. This meant that Digita Ltd, who had until then commanded the market, now had a competitor. In the spring of 2011, DNA Ltd was granted an additional, third network licence for the VHF band. Currently, Digita Ltd, DNA Ltd, and Anvia Plc (which, in addition to the above-mentioned regional licence, has been granted network licences for multiplexes F and G) provide network services in terrestrial television networks. Anvia's coverage area is somewhat larger than the Uusimaa region.

8.6.2 Television programme licences

The Government has granted a total of 48 licences, with eight multiplexes, for television operations. In 2001, terrestrial television programmes were broadcast on four channels in analogue format. In the image below, different colours represent the situation in spring 2002, when a considerable percentage of the frequency capacity reserved for television operations was unused.

Television networks and channels, autumn 2012



2

Figure 13: Television networks and channels, autumn 2012.

8.6.3 Radio licences

In February 2011, the Government granted operating licences for the licence period 2012–2019. In January 2012, two new radio channels launched operations, covering the largest cities. The Government granted 10 nationwide licences, two licences that cover the largest cities, and 55 regional and local licences. The licences are valid from the beginning of 2012 until the end of 2019.

New nationwide licences covering the largest cities were granted to Basso Media and NRJ

Finland's Radio Nostalgia.

Of the nationwide channels, those with established operations continue with their existing frequency bands. Licences were granted to Nova, The Voice, Radio Energy, Radio Rock, SuomiPOP, Radio Aalto, Groove FM, Rondo FM, Radio Dei, and Sputnik.

9. MARKET DEVELOPMENTS AND COMPETITION IN THE COMMUNICATIONS MARKET

9.1 Development of competition in the television broadcast service market

When observed from the standpoint of providers of programme content, television viewing in Finland is very centralised. According to Finnpanel Oy, the channels of the three largest Finnish television companies together account for 90 per cent of television viewing. The combined share of YLE channels is 45 per cent, the share of MTV Media is 30 per cent, and that of Nelonen Media is 15 per cent.

The results of Finnpanel's TV Audience Measurement survey indicate that the 10 channels of YLE, MTV, and Nelonen account for 90 per cent of viewing in a given 24-hour period. The individual viewing shares of channels other than those mentioned remain, at maximum, at a level corresponding to 0.5 per cent of daily viewing. In all, approximately 50 licence-holding television channels broadcast programme content over the terrestrial television network. As the same content is sent via various multiplexes or separately on several channels in both standard definition (SD) and high definition (HD), there is sometimes overlap between various channels' programme content. The figure below shows viewing shares by channel.

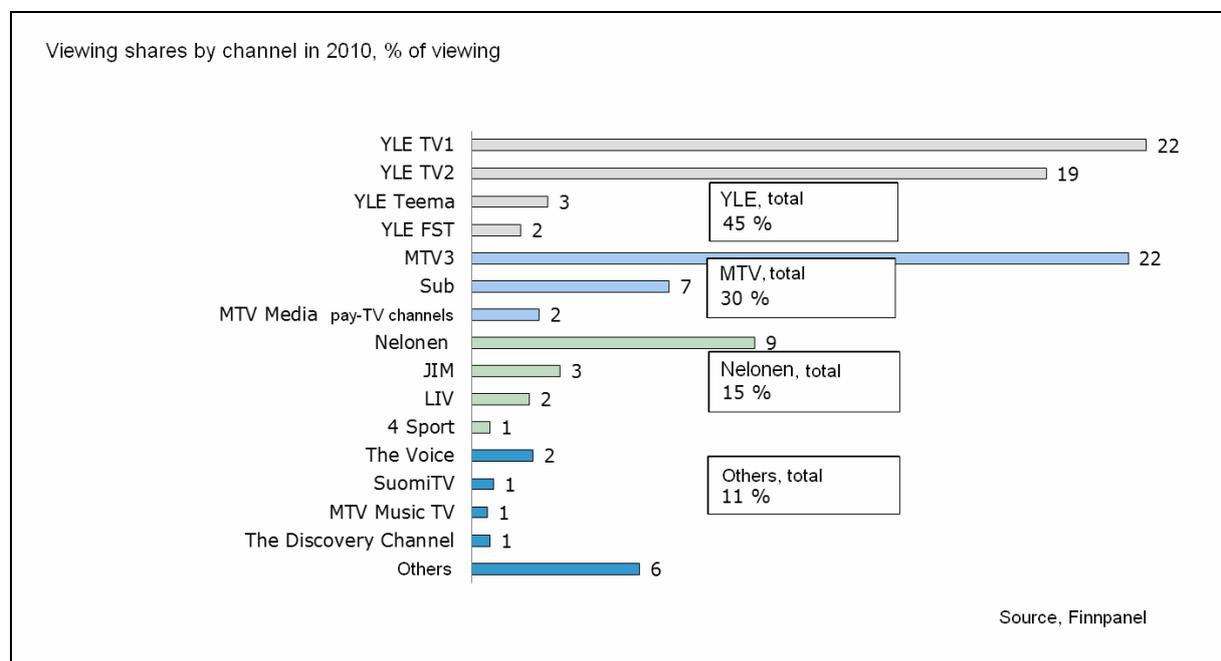


Figure 14: Viewing shares by channel in 2010 (source: Finnpanel).

The next figure groups channel viewing shares by the three major operators in 2011.

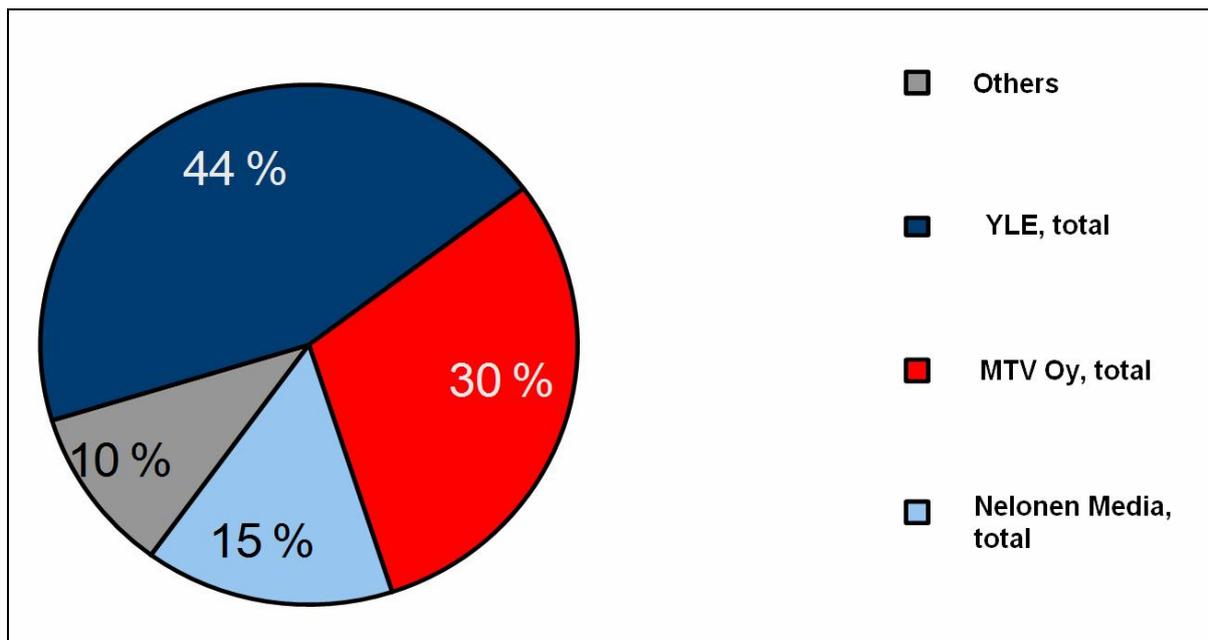


Figure 15: Viewing shares amongst the three major operators in 2011 (source: Finnpanel Oy, TV Audience Measurement Survey, 10+ age group).

For a long time to come, terrestrial television broadcasting will retain its position as the most important route for programme operators to reach the entire population, even if young people are increasingly using the audiovisual services available on the internet as an option replacing traditional television services. Roughly half of the households in Finland have the capability of receiving television broadcasting via cable or broadband networks in their permanent place of residence. For a large share of the population, terrestrial television broadcasting remains the only way to receive comprehensive programme sets. Terrestrial television broadcasting can also be considered the most cost-efficient way of reaching mass audiences. The results from Finnpanel's survey called 'TV Households in Finland' indicate that in late 2011, approximately 1.1 million households received programming content via terrestrial television-broadcasting networks. The figures that describe methods of reception include only permanent places of residence, which means that overall, reception of programme content via terrestrial television networks is even more widespread than indicated above. The cost-efficiency of terrestrial television broadcasting is further highlighted if broadcasters aim at reaching also those households that use leisure homes or recreational vehicles. When considering the figures that describe methods of reception, one must note that various methods are used in a complementary, overlapping fashion. All in all, it is most likely that terrestrial television will long retain its position as the primary method of reaching the entire population.

Cable television will continue to be a replacing alternative to terrestrial television broadcasts mainly in larger population centres. It is still, to some extent, cost-efficient to extend the cable-television network, particularly to new residential areas, by expanding the optical fibre backbone and thereby bringing cable-television network equipment even closer to the end customers. At some point, the traditional cable-television network with metal conductor cables will be fully transformed into a communication network based on optical-fibre cable. For this to occur, prices of optical-fibre network television equipment must fall from their current levels, and communication networks based on optical cable must support so-called multicasts more comprehensively in place of today's singlecasts. According to data FICORA has collected from telecommunications companies, approximately 1.4 million household and corporate customers had a cable-television subscription in late 2011.

IPTV, in addition to cable television, will challenge terrestrial television broadcasting primarily in large residential areas. IPTV will also partially replace cable-television broadcasts. As metal conductor cables are replaced with optical-fibre cables in the cable-television network, IPTV's significance as an alternative to cable-television networks will grow. IPTV is and will be used partially alongside terrestrial television and cable broadcasting so that basic channels are received normally as terrestrial or cable broadcasts, and additional services, such as video on demand, are received with IPTV. In parallel with IPTV, OTT services, which are not restricted to the supply of a customer's own broadband operator, will proliferate as well. OTT services will, however, compete mostly with cable television and IPTV services, also complementing their services. Insufficient broadcasting quality assurance is a problem with OTT services. Consumers may experience this as inconsistency in television image quality or even gaps in broadcasting.

According to data FICORA has collected from telecommunications companies, in late 2011 there were approximately 1.6 million fixed-network broadband subscriptions. The number of fixed-network broadband connections declined from 2008 all the way to June 2010, with numbers again growing since then. It is likely that the number of fixed-network broadband connections will continue to grow, even though their overall growth potential is no longer significant.

In line with increasing numbers of fixed-network broadband subscriptions, as consumers switch to ever faster connections, numbers of IPTV and OTT subscriptions too will grow. According to data FICORA has collected from telecommunications companies, there were nearly 200,000 IPTV and OTT subscriptions in late 2011. Currently, the majority of IPTV subscriptions are so-called hybrid solutions, wherein basic channels are received normally via terrestrial and cable-television networks while additional services such as pay television and on-demand video are received with IPTV.

Satellite-television broadcasts will remain marginal. For satellite broadcasting to become significantly more widespread than it is today, broadcasters would need to be able to offer programme content that differs markedly from the current content of terrestrial and cable-television networks. As a method of reception, satellite television is often complementary to terrestrial and cable-television broadcasts. The results of Finnpanel's survey called 'TV Households in Finland' indicate that in late 2011, approximately 90,000 households received programming content via satellite.

The majority of television and video services received via mobile-communication network data-transfer subscriptions will consist of services that are complementary to terrestrial television, cable television, and IPTV broadcasts. It is not yet possible to broadcast a comprehensive programme set efficiently – i.e., in a manner reaching a large number of viewers simultaneously with several channels – via the data-transfer connections of a mobile-communication network; consequently, they will be used mostly for viewing individual programmes or videos on demand when more efficient reception methods are not available. Provision of television broadcasting via mobile-communication networks has not become significantly more widespread.

9.2 Market development for wireless broadband

Numbers of mobile-communication network data-transfer subscriptions have grown significantly since late 2008. According to data collected by FICORA from telecommunications companies, there were almost 3.6 million mobile-communication network data-transfer subscriptions or contracts active in late 2011. Mobile-communication network data-transfer subscriptions are used mostly to complement fixed-network broadband subscriptions. In all likelihood, the number of mobile-communication network data-transfer subscriptions will continue to grow significantly, as current volumes are not

yet anywhere near the limits of potential growth. Mobile-communication network data-transfer subscriptions are personal subscriptions while fixed-network broadband subscriptions are mostly for the use of businesses or households.

Terminal equipment

Large numbers of pieces of evolved equipment utilising mobile broadband, such as smartphones, USB modems, tablets, e-readers, and game consoles, have entered the market in the past four years. The large displays and high resolution of the devices increase the volumes of data transferred. They also encourage the use of applications such as video calls that require high data-transfer capacity. These devices are the primary cause of the fast increase in mobile broadband traffic.

Smartphones

In 2008, traditional mobile phones accounted for 70 per cent of the world's total traffic. In 2010, smartphones accounted for 13 per cent of all phones globally but already generated over 78 per cent of all traffic. On average, a smartphone generated considerably higher volumes of data traffic (79 MB per month) than did a traditional mobile phone.

Touchscreen smartphones have been a key factor in the growth of wireless data traffic. Growth in data traffic is due both to increasing numbers of users and to increasing use by individual users.

In evolved markets, a smartphone creates roughly 50 times more traffic per month than a traditional mobile phone does. In Western Europe, for example, a smartphone generates 73 MB of traffic per month, while a traditional mobile phone generates, on average, 1.22 MB per month.

In comparison to tablets and laptops, however, the data-traffic volumes generated by smartphones are low in absolute terms.

Other new terminal devices

Tablets, e-readers, and game consoles have proliferated in the past four years, and their impact can already be seen in growing traffic volumes. Compared to a traditional mobile phone, a tablet generates up to 500 times more traffic. In Western Europe, for example, a tablet generates 740 MB of traffic per month, whereas a traditional mobile phone accounts for 1.22 MB monthly.

Growing use of the mobile internet

With mobile devices, consumers expect access to the same services and applications they use with a fixed internet connection. Mobile devices also enable new applications, such as applications utilising location-based services.

Growth in the mobile application supply

Hundreds of thousands of applications, including games, news apps, maps, social networking, and music, are available for the various smartphone platforms. With approximately 11 billion downloads in February 2011, these applications constitute a major new market. It has been estimated that by 2014, the total number of downloads might reach 77 billion globally. Both downloads and application use increase data traffic.

Strong growth in video traffic

Smartphone video traffic generally refers to real-time video streaming. So far, YouTube and Flash-based videos have generated the majority of mobile video traffic. However, video sharing will be a major feature of social networking in the future. According to estimates, video downloading and sharing will account for 66 per cent of global mobile data traffic in 2014.

Other ways of using mobile broadband that increase data traffic include:

- Social networking
- Machine-to-machine communication
- Improved user experience with fast networks
- Reasonable prices (fixed monthly fees)
- Proliferation of cloud services
- Growing numbers of users from different age groups

The figure below compares the ITU's 2006 market forecast with information published by Cisco on actual traffic volumes in 2007–2010 and Cisco's forecast for 2010–2015. The blue line indicates the estimated forecast for 2006, which varies depending on the geographic region and the development of wireless broadband networks. The yellow line depicts traffic volumes realised in 2007–2010 according to Cisco, and the red line indicates Cisco's forecast for traffic volume growth until 2020. The figure clearly illustrates the conclusion that the global traffic growth realised in 2007–2011 has been considerably higher than that forecast in 2006, and that, according to Cisco, traffic growth will continue to be higher than was forecast in the 2006 market research.

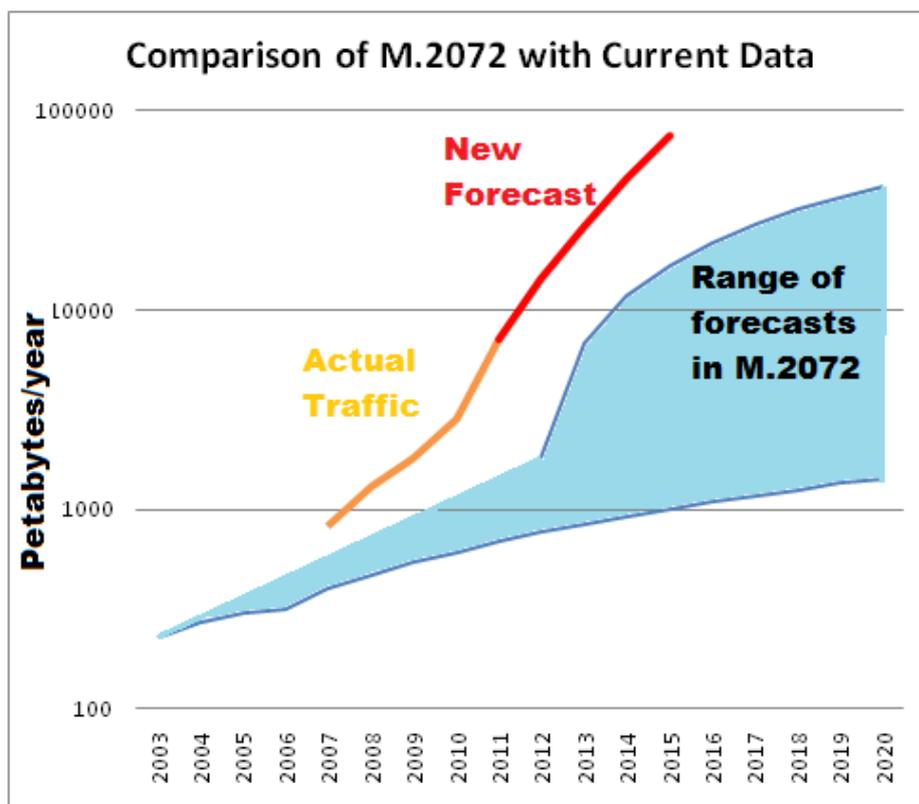


Figure 16: Developments in traffic volume (source: ITU-R M.2243).

The next graph illustrates developments in volumes of data transferred via wireless

broadband networks in Finland in 2008–2011. The European Conference of Postal and Telecommunications Administrations (CEPT) has published a report on the development of the mobile broadband market in Europe. The report forecasts that daily data traffic in a typical Western European country will grow 185 TB (terabytes) a day from the traffic volumes of 2010, reaching 12,540 TB, which represents a nearly 70-fold rise, in 2020. From the traffic volumes depicted in the figure, it can be estimated that Finland's daily data traffic volume was approximately 150 TB in late 2011. According to the forecast, the levels of 2020 would equate to 10,500 TB of daily traffic and 3,800 PB (petabytes) annually. This forecast matches the middle of the old and conservative ITU market prognosis. The forecast indicates that more frequency space needs to be allocated to wireless broadband networks.

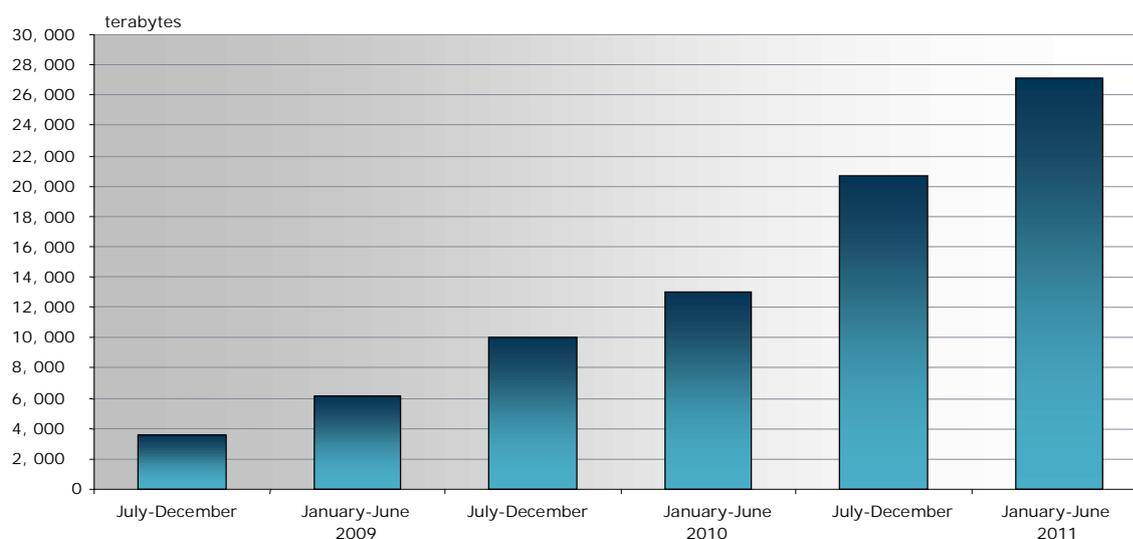


Figure 17: Development in volumes of data transferred via mobile-communication networks in Finland in 2008–2011 (source: FICORA, Market Review 3/2011).

According to FICORA's market review of the status in December 2011, volumes of data transferred via mobile-communication networks in Finland grew markedly in the course of the year. The number of broadband subscriptions grew by 12.5 per cent, reaching 3.6 million in late 2011. Mobile-broadband data transfer via mobile-communication networks grew by 82 per cent.

9.3 Development of competition in the radio broadcasting service market

Terrestrial radio broadcasting services continue to be very significant, particularly to nationwide broadcasters. With terrestrial radio broadcasts, the public at large can be reached cost-efficiently. According to Finnpanel Oy's National Radio Survey, the combined daily reach of nationwide and regional terrestrial radio broadcasts was 78 per cent in 2011, with weekly reach at 95 per cent of the population. The daily reach has not declined significantly since the early 2000s, when it was approximately 81 per cent. On average, listeners listened to the radio for 3 hours, 8 minutes per day. Daily listening times have, in practical terms, not declined at all since the early 2000s. The figures indicate that no significant alternative radio broadcast technologies or methods of reception have emerged to replace terrestrial radio broadcasts.

Internet radio has not replaced the use of terrestrial radio broadcasting services in any

major way. According to Finnpanel Oy's National Radio Survey, internet radio's weekly reach in 2011 was approximately 10 per cent. Broadcasting, receiving and listening to radio programmes broadcast via the internet was mostly based on one-to-one communications; i.e., each individual listener to internet radio was continuously in contact with the radio programme broadcaster via the internet. Thus, broadcasting a radio programme requires great volumes of data-transfer capacity. With currently used technology, internet radio cannot reach the masses cost-efficiently. In the future, growth in listener numbers can be induced with new compression methods and with upgrades to data-transfer networks such that they support technologies such as multicasting. The proliferation of internet radio has to some extent been slowed down by the scarcity of consumer equipment. For example, there is no readily available equipment for internet radio reception in vehicles.

9.4 Market entry barriers, promotion of competition, and market regulation in the communication-services market

The objective of communications policy is to provide high-quality and reasonably priced services that are available inclusively to all. For these objectives to be reached by terrestrial communications services, sufficient competition in the area of communication networks must be secured as a primary measure. Currently, there are three network companies in Finland that have been granted frequencies for the provision of television broadcasting services. Of these companies, only one has a television broadcasting network that covers almost all of the country. Nationwide radio broadcasting services, on the other hand, are provided by two communication-network companies in Finland. The other nationwide radio broadcasting service provider also operates as a network company in the television broadcasting service market.

Network competition in the television broadcasting service market is only now emerging. Currently, only one of the two competing network companies is building its own network, and the other company uses the network of an established network company for the provision of its services. The competing network operators build their networks primarily to cover densely populated residential areas and then, in line with the requirements of their network licences, expand their networks to sparsely populated areas. Network competition in the television and radio broadcasting service market can to some extent be accelerated by ensuring efficient entry to the television and radio broadcasting service market.

Almost without exception, building a comprehensive television and radio broadcasting network requires access to high transmission masts, which acts as a significant barrier to market entry. In practice, the only options for network companies entering the market are to rent parts of high transmission masts from the company owning the masts or to build transmission masts themselves. It is, however, not efficient to build overlapping high transmission masts. Also, permit issues related to land use often prevent the building of a network of several overlapping transmission masts. It is, therefore, most efficient to ensure that all network operators have access to existing high transmission masts. Through guaranteed efficient access to existing high transmission masts, the emergence of network competition can be boosted significantly. Use of the same high masts also advances consumers' opportunities of requesting competing tenders from television and radio broadcasters in particular, since no additional costs will be accrued by consumers aligning their antennas for the reception of programme content from broadcasters who operate in networks provided by other service providers.

There are signs of network competition in the television broadcasting service market, but not yet on a major scale. Competition can be said to be still in its infancy. The established operator in the television broadcasting service market is the price-setter defining the baseline for pricing, and the two other operators determine the prices for

their services in relation to that baseline.

In the radio broadcasting service market, the competition between the two nationwide network operators is polarised such that one network operator is the price-setter and the other the price-taker. With high masts and high-power transmitters at its disposal, the price-setter is able to set price levels for nationwide radio broadcasting services more cost-efficiently. In the television and radio broadcasting service market, the price-taker does not own or have efficient access to high transmission masts, rendering it unable to use high-power transmitters and leaving it in a position of 'underdog', reacting to the actions of the established network operator. Access to high transmission masts is another major barrier to the market entry of new network operators.

In terms of creating competition in the network market, it is also important to take available frequency capacity into account. Network competition is enforced in tandem with the growth in the numbers of frequencies network operators have at their disposal. On the other hand, when network operators have fewer frequencies at their disposal, competition is generated amongst broadcasters, who will compete for a limited number of channel slots. It is important to find the right balance in the number of frequencies allocated to television and radio services. Frequencies are a limited resource, and they must be used efficiently. For this reason, there is a need for estimation of what constitutes an efficient share of frequencies allocated to television and radio broadcasting services in relation to all types of frequency use. Ensuring the creation of network competition is a primary target, followed by competition amongst broadcasters.

Associating programme licences with an individual multiplex constitutes another barrier to efficient competition and the market entry of television broadcasting services. Association with an individual multiplex has prevented broadcasters from requesting competing bids for broadcasting network services from network service providers. Earlier, there were grounds for associating programme licences with individual multiplexes: when there were very few channel slots available to broadcasters, the association could be used to ensure broadcasting service availability. In today's situation, with channels slots available even in overabundance, it might be worthwhile to assess whether programme licences could be discarded, at least if their use is not considered necessary from some other perspective.

When assessing the possibilities for eliminating programme licences or making the current licence system simpler, one should assess also the need for, and ensured reception of, public interest channels, which all of the population should be able to receive. If the need for ensuring the availability of public interest channels to all of the population is still seen to apply, one needs to assess whether it is reasonable to continue to use programme licences for these broadcasters. If programme licences do continue to associate public interest channels with certain multiplexes, steps must be taken to assess how these broadcasters can be efficiently guaranteed reasonable availability of broadcasting services from network operators.

For radio broadcasting services, it is worth noting that radio operators manage the frequencies granted by the Government themselves. If the number of radio broadcasting service providers were sufficiently high, operators could organise competitive bidding processes for radio broadcasting service providers without the limitations brought about by programme licences. Regional radio companies can be said to be in a better position to request tenders from radio broadcasting service providers than are the nationwide radio operators. If the coverage area required is small, regional companies could even take care of the terrestrial distribution of their radio programming themselves.

If the above-mentioned issues can be resolved, it is likely that network competition will be generated and that programme operators can provide programme content to

consumers with increasing efficiency and versatility. Competition amongst both network and programme operators can ensure the availability of high-quality terrestrial television and radio broadcasting services. Intensifying competition and the removal of its barriers also removes the need for *ex ante* regulation of the market.

At present, FICORA has considered it necessary to target financial *ex ante* regulation at the television broadcasting service market and the nationwide analogue radio broadcasting service market in order to guarantee the availability of television broadcasting services with cost-oriented pricing and the availability of radio broadcasting services to broadcasters. If true network competition is generated, allowing broadcasters to organise competitive bidding processes for network operators without limitations, it is likely that financial *ex ante* regulation could be gradually lifted.

9.5 Frequency distribution in relation to market competition in the communication-services market

Frequencies are allocated for communication network use with so-called beauty contests or through an auction. If beauty contests are used to distribute frequencies, it needs to be ensured that the operators who receive frequencies through a beauty contest have sufficient encouragement to use the frequencies under their management as efficiently as possible. To this end, a frequency-fee system encouraging the efficient use of frequencies should be established, taking into account the costs of spectrum management and covering incentives that promote efficient frequency use. Correspondingly, if frequencies are distributed through an auction, a frequency fee that encourages frequencies to be used efficiently is not needed *per se*, as it is sufficient to ensure that the costs of spectrum management are covered. Auctions, as such, steer operations towards efficient use of spectrum.

Through use of either auctions or beauty contests and frequency fees that serve as incentives in frequency distribution, it is possible to minimise the after-effects of the distribution on the market. Auctions have the benefit of market-driven frequency pricing, along with transparent granting of rights of use. With beauty contests, on the other hand, the availability of certain crucial frequencies and their use in special circumstances can be ensured. The problem with frequency fees that include incentives is that frequency fees are defined with an administrative decision wherein the amount of the fee is always based on an estimate of its potential market price.

In the communication-services market, frequency distribution can also be carried out through a combination of beauty contests and auctions: the availability of frequencies to the so-called public interest channels can be ensured with beauty contests, for example, and the availability of market-driven channels through an auction. The frequency licences granted after a beauty contest could include requirements of ensuring the availability of frequencies for public interest channels, and obligations related to broadcasting services' pricing. For frequency licences granted after a beauty contest, it should also be ensured that there are at least two separate network operators in the television broadcasting service market providing television broadcasting services for public interest channel broadcasters. Thereby, in addition to any *ex ante* regulation, public interest channel broadcasters would have the opportunity to request competing tenders from two broadcasting service providers. However, for this to take place, programme licences must be defined in sufficiently open terms to allow operators to choose the broadcasting service provider from at least two network operators.

9.6 Investment incentives in the communication-services market

A company operating in a centralised market does not face competitive pressure in the

wholesale or end-customer markets. In such markets, companies are not motivated to improve quality, as they can charge monopoly prices without pressure to make investments that improve their competitive edge or the quality of their end product.

When compared to centralised markets, competition in the wholesale or end-product markets strengthens investment incentives in a variety of ways as companies providing competing services aim to offer increasingly attractive services to their customers. In technology-driven industries, a key investment incentive is created when the company that is first to invest in technology that enables the provision of newer or better services is also the first that can reap the benefits of the investment as acquisition of customers. Investment incentives created by competition affect all operators in the market.

In the area of telecommunications services, for example, intense price competition in basic services has led to competition in terms of quality and new services. When customers can purchase basic services with roughly the same content for the same price from all operators in the market, companies can differentiate themselves from others by offering new features or supplementary services.

In television and radio operations, key investments and, at the same time, changes in technology influence the technology of the transmission network. Of the technological changes being introduced in the foreseeable future, moving to HD broadcasting in the terrestrial television network will require perhaps the clearest investment. To some extent, networks that support the broadcasting of HD content have already been built. For competing network companies, increasing the coverage of the broadcasting network will also continue to require investment.

10. FINNISH CONTENT CREATION AND THE PLURALITY AND VERSATILITY OF COMMUNICATIONS

10.1 Safeguarding domestic content creation

According to the current Government Programme, cultural policy must focus on content creation and the efficient distribution of content. The Government Programme also includes other objectives that are significant in terms of audiovisual culture. These objectives and the policies affecting audiovisual culture in 2012–2015 are presented in the Ministry of Education and Culture publication 'Audiovisual culture in a digital environment'.

The Finnish independent content creation market is dependent on the purchasing activities of television companies. The purchasing market has clear oligopolistic features. The largest television companies keep content creation alive but with the condition that purchasing volumes can be forecast for a reasonable time period. YLE itself emphasises the company's significant role as a purchaser of Finnish content and a promoter of the nation's mental advancement. The future of Finnish content creators is, however, likely to be weakened by circumstances such as the increasing ease with which consumers will in future be able to choose international content over Finnish content via the internet.

In the spring of 2012, YLE announced that it will develop its programming content. For the Finnish content creation industry, this is encouraging news. The YLE Board of Directors has proposed that, in the next three years, the company purchase programmes and services from domestic production companies in increasing volumes. From the 2012 level, the company intends to increase its new external purchases by 30 per cent in 2013–2015. The purchases would amount to EUR 20–24 million annually and most likely be in the fields of entertainment, drama, films and documentaries. Purchasing news externally, in contrast, is not being considered. YLE has also announced that it wants to

increase its cooperation with external parties in format and product development.

Even though Finnish television companies are major customers of independent content-producers and have great power in negotiations, content-producers are increasingly able to offer their products also to customers who do not purchase actual television content. The other content includes, for example, internet content such as online games and online advertising, along with promotional videos for companies.

Since the internal market for Finnish content production is small, with few opportunities available outside the national borders of Finland, it would seem reasonable for content-producers to coordinate shared technical production resources, and concentrate on the creation of programme formats that would be in demand abroad, too.

10.2 Plurality and versatility of communications

In the 2000s, the television content supply has grown significantly. In 2001, at the time of the switchover to digital television operations, two YLE channels and two commercial channels were available via terrestrial networks. In 2011, television operations use 10 multiplexes, which transmit more than 50 channels.

The assessment of licence granting criteria – i.e., the promotion of versatility and freedom of speech, as defined in the Television and Radio Act – has changed too: in a world with four channels, granting criteria were assessed per channel. With the greater availability of television services, granting criteria are now assessed in view of the entire supply.

The strong position of domestic content in the fields of music and audiovisual culture is largely due to Finns' cultural preferences. The Television and Radio Act has set the quota for independent programme production five percentage points above the figure given in the EU's Audiovisual Directive. With few exceptions, licence terms have, in practice, not included a requirement for broadcasting programmes in Finnish or Swedish.

When regulation is renewed, it needs to be assessed whether the original language of programmes should receive stronger emphasis in the steering of the audiovisual industry. Used with discretion, a requirement to broadcast in the official languages might ensure sufficient investment in Finnish and other Nordic programme production.

Regulation and assessments of programme supply should take into account the change in how versatility is viewed: the versatility of an extensive offering consists of combinations of different channels, not of channels that are versatile individually.

On the European level, many countries regulate the centralisation of communications. In Austria, Germany, Ireland, and Great Britain, for example, competition legislation includes provisions related to various media. Moreover, the competition authorities of many countries cooperate with the authorities that grant television and radio licences. Traditionally, regulation of communications centralisation has aimed at limiting the chances of any operator gaining a dominant position, through regulation of licences, ownership or viewership shares at either national or local level. Cross-ownership amongst television, radio, and newspaper and magazine companies is also restricted in many countries, including the Netherlands, Italy, Sweden and Great Britain. In the Netherlands, however, cross-ownership regulation was recently loosened in order to facilitate cooperation between communications companies.

Countries that regulate the centralisation of media aim at ensuring the versatility of communication services and safeguarding the right to freedom of speech. In Sweden, for example, local radio operators have been divided in the licensing phase into commercial

and public-interest radio stations, of which the latter have the task of broadcasting programmes particularly on topics that touch the local population. The limited number of existing frequencies and the size of the market in small countries are also reasons behind regulation of communications centralisation.

Currently, YLE has four public-service channels in the terrestrial mass-communication network. MTV Media, part of Bonnier Group, has a total of three free-to-air channels and 10 pay-television channels in the terrestrial mass-communication network. Sanoma Media Finland, on the other hand, has three free-to-air channels and eight pay-television channels. Other free-to-air channels include Fox (previously SuomiTV) and TV5/VoiceTV. Moreover, licences for seven pay-television channels have been granted to international operators. UrhoTV, which provides pay-television services, has also been granted a licence to the terrestrial network.

According to a study of Finnish television supply, the three largest classes of programme content in 2010 were factual programmes (34 per cent), entertainment (20 per cent), and foreign fiction (19 per cent). The classification of entertainment and factual programmes has become increasingly difficult. Sports accounted for 11 per cent of the programme supply. The share of children's programmes was down to four per cent. In 2010, 39 per cent of the total programme supply of the 12 channels covered by the study (TV1, TV2, FST5, Teema, MTV3, Subtv, Nelonen, JIM, Liv, Nelonen Sport, The Voice / TV Viisi, and SuomiTV) consisted of domestic productions.

10.3 Promoting freedom of speech

The Constitutional Law Committee has on numerous occasions commented on the need to move, whenever this is technically possible, to a system that limits freedom of speech less than the current programme licence system does. The current system can be said to include too much room for interpretation in terms of issues such as the criteria for granting licences as defined by law. For example, ensuring the versatility of programming is a criterion on the basis of which the licensing authority can still use considerable discretion when deciding what type of broadcaster a licence will be granted to. Assessing licence applications from the overall perspective of applications and programme supply may also be questionable from the viewpoint of an individual applicant, in addition to appearing arbitrary because of its connections to other applications.

Freedom of speech can be promoted through more detailed definition of the prerequisites for terrestrial television broadcasting operations and via the means of more constrained deliberation.

11. DEVELOPMENTS IN TECHNOLOGY

11.1 From digitalisation to high definition

A digital television network is a communication network that consists of three functional elements. In assembly of a multiplex, television channels of programme licence-holders and other content are combined to form one multiplex. Next, the transmission, combined in a multiplex, is sent via the transmission network to regional transmission centres. Finally, television broadcasts and other information are sent aurally with radio transmitters for reception by the general public.

Digital television broadcasts were launched in Finland in the autumn of 2001, and analogue television broadcasting in the terrestrial networks ceased completely on 1 September 2007. As the distribution technology changed from analogue to digital, the volumes of transmittable programme content grew manifold. Thanks to digitalisation, one

transmission network can now transmit a full multiplex instead of a single television channel. The number of television channels grew from four to over 20. This development was made possible by the considerably higher spectrum efficiency and transmission speed of digital distribution technology, as well as the benefits created by digital audio and video compression technology.

Digital television broadcasting distribution and compression technology has continued to evolve, further increasing the volumes of transmittable content. At the same time, viewer demands for image quality have grown in line with television sets' screen sizes.

In 2011, second-generation DVB-T2 distribution technology was introduced, brought in alongside first-generation DVB-T technology. Multiplexes A, B, C and E use DVB-T technology and MPEG2 video compression technology. Multiplexes D, F and G, and VHF A, VHF B and VHF C use DVB-T2 technology with MPEG4 video compression technology.

One multiplex using DVB-T and MPEG2 technologies can transmit 6–9 standard-quality television channels. One multiplex using DVB-T2 and MPEG4 technologies can transmit 10–15 standard-quality television channels or 6–7 high-definition channels. Switching to high definition quality, a process that is now underway, has in fact led to surplus capacity being used, instead of increasing the amount of content, to improve image quality, or to their combination.

The figure below depicts the proliferation of high definition in television operations. Approximately 1,066,000 households have high-definition receivers (Full HD or HD-ready), and roughly 75,000 households subscribe to HD channels.

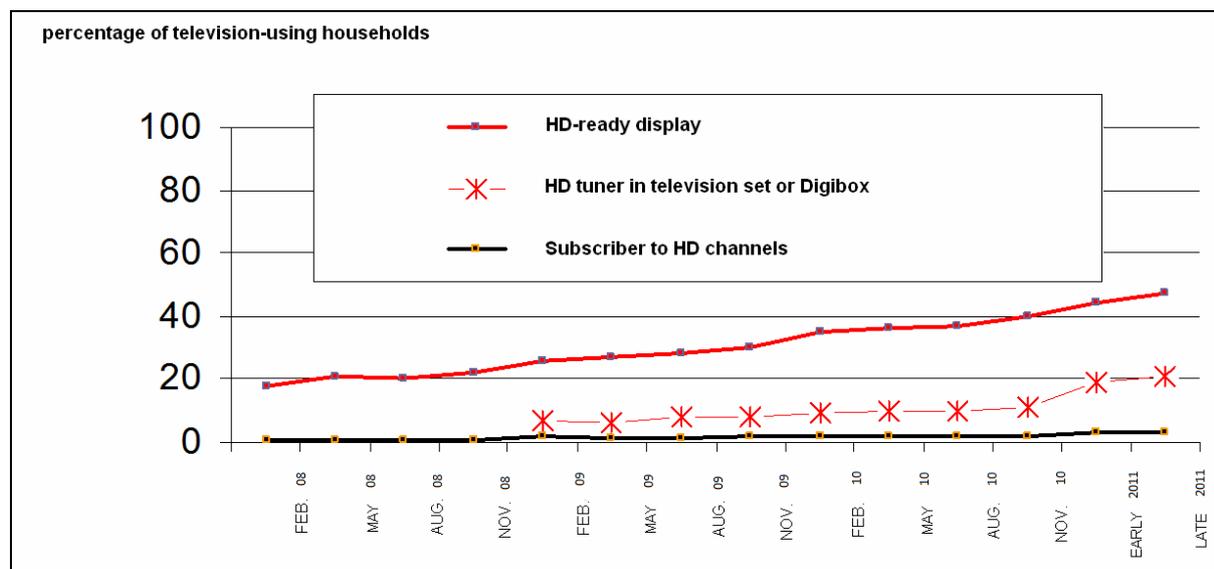


Figure 18: HD in television-using households (source: Finnpanel, TV Households).

11.1.1 Distribution technology

Work on the DVB-T2 standard for terrestrial television was completed in 2009. Many countries are already transmitting with DVB-T2. In Finland, transmissions began in 2011. The DVB-T2 transmission standard enables standard quality, high definition and mobile television services.

In the summer of 2011, a new version of the DVB-T2 standard was published, including the T2-Lite profile, which facilitates mobile and portable reception. The new profile also

introduces support for various services and methods of reception in the same multiplex. The same multiplex can be used for sending high-definition services for fixed reception as well as mobile television or sound-broadcasting services for mobile reception. With T2-Lite, the equipment manufactured for mobile television or sound broadcasting use can be simpler. As tablet computers become widespread, they may become a significant channel of media content distribution.

Increasing deployment of DVB-T2 technology provides television operations with opportunities for expansion thanks to faster transmission, more flexible technology, and improved spectrum efficiency. When DVB-T2 becomes commonplace, it could provide a solid platform for the transmission and reception of all public communication services.

The international DVB community is developing the new DVB-NGH (Next Generation Handheld) mobile-television standard. The purpose of the new standard is to facilitate the improved distribution of rich content over mass-communication networks. The convergence of television distribution, satellite distribution, and wireless broadband is also an objective of the standard. DVB-T2 technology and the T2-Lite profile in particular already fulfil many of the objectives of this development work. At the same time, the future utilisation of all-new technologies, such as multi-antenna or hybrid technologies, is being investigated. The standard is expected to be ready in 2013 or 2014. It is possible that the NGH standard will be utilised commercially during the coming licence term. In terms of frequency use, it does not appear that the NGH standard would differ markedly from DVB-T2 technology. Also, NGH technology can be used in the same multiplex as DVB-T2 technology.

11.1.2 Compression technology

High-definition television is today transmitted with MPEG4 AVC compression technology. A new standard, HEVC (High Efficiency Video Coding), is being developed for video compression, estimated to double the efficiency of the compression technology that follows the current standard. HEVC technology is planned to become the compression technology that will enable, amongst other things, transmission in ultra-high-definition quality (i.e., for UHDTV). The new compression technology standard is expected to be ready in 2013.

Utilisation of HEVC video compression technology would mean that the television sets currently used would need to be replaced. For this reason, it is not likely that HEVC technology will replace the compression technologies now used in television broadcasting. It is fair to assume that the MPEG4 AVC standard, released in 2003, will remain the compression technology used by high-definition channels for a long time to come.

11.2 UHDTV and 3DTV

High-definition image resolution is still being improved and is now leading to the above-mentioned UHD (Ultra High Definition) television. In principle, UHDTV technology is ready for use, but as things stand today, there are problems with the technology's immense need for capacity. Even with the most advanced technology available, one UHDTV channel currently requires a transmission speed of 150 Mbit/s, the same frequency capacity as several of today's television multiplexes. Therefore, UHDTV distribution in any network will require great advancements in technology, and it will not be used for transmissions any time soon.

In recent years, 3D television has been a major point of interest. After early enthusiasm, however, European television operators are now taking a more moderate stance. Early

this year, for example, Canal+ discontinued the 3D broadcasting it had introduced in France in the summer of 2010 because viewer numbers did not reach expectations.

It seems that 3D technology is not yet mature enough to attract the interest of consumers on a large scale.

11.3 Mobile television

The television networks of Finland are designed such that the amplified directional antennas used in reception are placed high up – for example, on a rooftop. An exception to this is the television network intended for mobile television operations, using multiplex D. Mobile reception requires network planning that differs from that of other television broadcasting. Broadcasts should be receivable with a handheld terminal that has a small antenna. Reception can additionally take place indoors or in a rapidly moving vehicle that does not have a separate external antenna.

The mobile-television network that began operations in 2006 utilised DVB-H technology. Mobile television utilising DVB-H technology has not, however, reached large audiences in Finland. One reason for this is the scarcity of terminal equipment. In 2012, with DVB-H technology becoming obsolete, DVB-T2 supporting mobile reception was adopted as the distribution technology used by multiplex D.

The terrestrial television network even enables high-definition television content to be received efficiently with laptops and tablet computers. The reception of television broadcasting irrespective of place and also on the move will become more widespread. This is why it will be increasingly important that television networks be developed such that they support mobile and portable reception without large receiving antennas. DVB-T2 technology will play a key role in the introduction of television services for mobile use even if T2 terminals, which support this transmission technology, are still scarce. Once television broadcast reception with portable terminals becomes more widespread, the use of other mass-media services too, such as radio, may increase via the DVB-T2 network.

11.4 Other distribution channels and promotion of their use

The most common ways of receiving television broadcasting are terrestrially and via cable. Terrestrial reception is used by 49 per cent and cable reception by 51 per cent of households. Satellite reception is used by four per cent and IPTV by five per cent (the shares overlap with those of antenna and cable distribution) of households.

Unlike in many other European countries, television reception via satellite has not become widespread in Finland. One reason for this might be that the terrestrial network in Finland has very high coverage and transmits the most popular channels at no charge.

About 81 per cent of Finnish households have a computer for home use. Of these, 41 per cent have a desktop computer and 64 per cent a laptop. According to Finnpanel Oy's survey on the situation in late 2011, three per cent of households had purchased an iPad or a Galaxy Tab (referred to as a tablet or touchscreen computer). Approximately 80 per cent of all households have a broadband connection.

There are various services and types of equipment in the consumer markets that combine television and internet services. IPTV services distributed over a broadband connection require a speed of at least 2 Mb/s for the distribution of fast, basic-quality video, and of 8 Mb/s for distribution of video in high definition. So-called hybrid technology, which utilises both the television network and the broadband connection, is another way to combine television and internet services.

11.4.1 Wireless broadband

There are three nationwide telecommunications companies in Finland with mobile-communication networks that enable the provision of mobile data-transfer services. These three companies are DNA Ltd, Elisa Corporation, and TeliaSonera Finland Oyj. In addition, Ålands Mobiltelefon Ab operates in the county of Åland.

Third-generation (3G) mobile-communication networks (UMTS/HSPA/HSPA+) provide fast data-transfer connections. In densely populated areas, 3G networks utilise the 2,100 MHz spectrum band, and the best coverage in sparsely populated areas is currently achieved with the 900 MHz band. The first LTE networks operate in the 1,800 MHz and 2,600 spectrum bands, thus enabling transmission speeds of dozens of megabits per second. Already, 3G networks reach more than 95 per cent of Finns. In addition to major urban areas, 3G networks cover most smaller towns and, to a large extent, even sparsely populated areas. Moreover, the Government Resolution on Spectrum Policy outlines that the operator winning the auction for a licence in the 800 MHz spectrum band must build a nearly nationwide (99 per cent) LTE network by 2019.

Wireless broadband services are available also via other radio networks. The most important of these are the 450 MHz spectrum band's wireless broadband network (Digiset) and the 3.5 GHz spectrum band (regional) fixed wireless access networks.

Almost every fourth Finnish household has both fixed broadband and mobile broadband connections, after the percentage of these households nearly doubled in 2011. One explanatory factor for the strong growth of mobile broadband is its lower price when compared to fixed broadband. Outside major cities, in particular, the price difference is very significant, as one can subscribe to mobile broadband for almost half the price of fixed broadband. In Northern and Southern Savo, over 40 per cent of broadband-equipped households used a mobile broadband subscription as their only internet connection, whereas the proportion of such households in Uusimaa was below 20 per cent.

Roughly 80 per cent of households that utilise both fixed broadband and mobile broadband consider fixed broadband to be their primary internet connection. However, the share of those who describe mobile broadband as their primary internet connection nearly doubled during 2011. Almost half of all Finnish households already have mobile broadband subscriptions.

The most common reason for acquiring a mobile broadband subscription in 2011 was the opportunity to use the subscription irrespective of place or on the move. More than 40 per cent indicated that mobility was the primary reason for the acquisition of the subscription, while in the previous year, their share had been five percentage points larger. Correspondingly, various service packages that include mobile broadband subscriptions were an increasingly common reason for acquiring a subscription in 2011. Roughly 60 per cent of those who use mobile broadband with a mobile phone had already acquired a subscription for reasons of mobility. Using a single subscription with several pieces of equipment is continuously becoming more common, and, as a result, even those who use mobile broadband with desktop computers appreciate the possibility of using the connection location-independently.

11.4.2 Hybrid model: Broadband as an enabler of supplementary services in terrestrial television

Combining mass-communication networks with targeted communication networks via hybrid technology is one of the development directions of the future. Television services,

especially high-definition programmes, require high data-transfer speeds. This is why it is cost-efficient, particularly with wireless distribution, to keep television services in a network built specifically for this use. On the other hand, supplementary services or content that is not distributed via a television network can be transferred in a targeted communication network, such as a broadband network.

Supplementary services for terrestrial television broadcasting can be made possible with a broadband connection. A wireless connection could introduce supplementary services wherever terrestrial television services are available. This is why reserving frequencies from the UHF spectrum band, which enables large coverage, also for wireless broadband must be seen as an opportunity also in terms of development of television operations. Terrestrial distribution is a requirement for introducing television services everywhere in Finland. Similarly, reserving UHF frequencies also for wireless broadband promotes the implementation of supplementary television services throughout the country.

With hybrid solutions, it is also possible to introduce new services in locations where a fast broadband connection is not available. IPTV services are generally provided by a broadband operator, whereas hybrid technology is implemented primarily by the terminal equipment, as the television set or Digibox is connected to the internet.

Combinations of television and internet services are considered to be one of the possibilities of the future, changing the way people watch television and creating new services, such as video rentals and interactive services.

11.4.3 Promoting multicast technology in IP traffic

As one of the key questions related to providing television content over the internet, content-producers, in particular, have brought up the need to promote multicasts in IP traffic of telecommunications companies. Technically, multicasts constitute one IP traffic routing model. Most typically, IP traffic is unicast traffic: communication between a single sender and a single receiver. In multicast traffic, IP packets are delivered from one to many, with the target group predefined.

Multicasts are not widely used in the networks of telecommunications companies. As a network feature, they can be compared to IPv6, for example: the question here is about network features that telecommunications companies can deploy once they are feasible both technically and commercially. Multicasts are technically challenging and require careful planning and configuration of the network for optimisation of the transmission capacity used by the broadcasts. This is simpler to execute within the telecommunications company's own network, and in all likelihood operators' own IPTV services will, to some extent, utilise multicasts.

The need for careful planning is emphasised in the IP interconnection of telecommunications-company networks, where it has to be ensured that other networks will not experience disturbances and the company's own network will remain able to transmit the traffic received. Operators in the industry have traditionally been able to resolve such questions of interoperability, and, where doing so is necessary, the questions can be specified further with FICORA's technical regulations on network management and interoperability. So far, telecommunications companies have not deemed it necessary to create solutions for questions of interoperability. It also needs to be noted that the service chain from the content creator to the customer may include several telecommunications companies. Both content providers and customers need to acquire an internet subscription from a telecommunications company, and there may be other telecommunications companies relaying traffic in line with interconnection agreements. The full service chain should support multicasts.

From the telecommunications companies' point of view, there are two key perspectives on the financial feasibility of offering multicasts. The internet ecosystem is undergoing a transformation, and as far as telecommunications companies are concerned, gaining access to income streams derived from other operations than technical transmission is a key challenge. For telecommunications companies, it is not worthwhile to develop technical platforms for services if the related income will go to content providers.

Also, the commercial prerequisites for multicasts are affected by the requirements multicast traffic imposes on IP interconnection agreements. These needs involve both traffic pricing and the technical features of interconnection products. In the EU's regulatory framework, IP interconnection agreements are not covered by regulatory controls on undertakings with significant market power, as they are drawn up purely on commercial grounds. However, the European Commission is investigating whether there are phenomena in the evolving IP interconnection market that jeopardise healthy competition and, indirectly, the development of services provided over the internet.

11.5 Vitality of terrestrial television

The terrestrial television network is the only nationwide television distribution network. Television distribution implemented via cable or optical fibre reaches predominantly the residents of urban areas. Wireless networks, such as the terrestrial television network and satellite network, enable television viewing location-independently. Terrestrial and satellite networks serve all Finnish households, and they reach also summer residences. They enable mobile or portable reception and television viewing even in places where it is not commercially feasible to build a cable-television or other broadband network. The terrestrial television network also enables the distribution of regional content.

Terrestrial television will continue to be vital. It is the only distribution channel that reaches everyone, and it enables the free reception of the content that is most popular. Cable and fibre networks cannot compete with the terrestrial network in terms of coverage. Moreover, households that use IPTV services can additionally utilise the terrestrial television network, for example, with a second television. Mobility and the hybrid model provide new opportunities for developing the terrestrial distribution network and utilising its special characteristics.

The future of terrestrial television is also promoted by the 13 television operators, from around the world, who in the spring of 2012 agreed on the Future of Broadcast Television (FOBTv) initiative. The objective of these operators is to identify shared terrestrial digital television technologies that could be used by all standardisation organisations. Ideally, it could, for example, lead to the same standard being used worldwide, as LTE is in the field of mobile communications. This would have a positive impact on equipment sales, and in the future it could also promote mobile television, as the same receiver could be used on different continents.

If the initiative is a success, the work will support the vitality of terrestrial television and its development towards a global market. Moreover, the initiative strengthens the future opportunities of terrestrial television for providing new services and uses, such as UHDTV, mobility and television+broadband hybrid services.

The terrestrial distribution network also plays a key role in the security of supply amid exceptional circumstances or crisis situations.

11.6 Cognitive radio networks

Cognitive radio refers to intelligent radio that is aware of its environment and detects

other radio networks and frequencies in use. Awareness of the environment enables the radio communication to use the most appropriate radio frequency available at the time. A key benefit of cognitive radio is its ability to use scarce frequency resources more efficiently than traditional radio units do.

There are, however, various technical challenges still unresolved in relation to the deployment of cognitive radio. These challenges involve areas such as the method with which cognitive radio builds an awareness of its radio environment – will it use a location database or detect and identify other radio equipment and transmits? Several research projects, such as the Tekes trial research programme, are ongoing, focusing on these functions. In addition to technical challenges, there is great difficulty in development of revenue generation and business models when frequency use can be very dynamic and there is no 'guaranteed' spectrum band allocated for a particular user.

Currently, the most interesting applications involve long-range wireless local networks and machine-to-machine (M2M) traffic. The problem with these applications is that similar applications and services are already used in other spectrum bands. Use in the spectrum band allocated for television operations does not necessarily increase the usability of these applications in comparison to existing solutions.

The term 'white space', which refers to a spectrum band where a frequency range allocated for a wireless system is unused either geographically or temporally, is also used in connection with cognitive radio. The first spectrum band for which use of white space is being planned is the UHF 470–790 MHz spectrum band, allocated for television operations.

White-space frequencies in the UHF band have already been utilised by television companies in small-scale programme production use. Because of their good propagation characteristics, VHF and UHF frequencies are very suitable for white-space use.

White-space frequencies can be utilised in lower-power use without causing interference to television reception. Such use is secondary in relation to television broadcasting. In 2010, the UHF spectrum band allocated for television was opened up for cognitive radio. So far, cognitive radio's use has consisted mostly of testing operations. In 2011, the VHF and UHF spectrum bands allocated for television were also opened for radio microphone use.

11.7 Radio

Such digital replacement for the analogue FM technology currently used in radio distribution has not yet been identified which would, in terms of overall radio operations, have proved considerably better than the current analogue technology. Consumers have multiple FM receivers, of varying quality, both at home and in vehicles, and replacing them with receivers based on some other technology would be relatively expensive. Replacing the FM distribution network, on the other hand, would require significant investments from network companies. Moreover, the technical quality of FM broadcasts is so high that digital technologies would not bring any essential improvement. This too reduces the attractiveness of switching over to digital technology.

The spectrum band for FM radio in Finland is used very efficiently, and there are no major opportunities to expand it any further. For this reason, it is likely that other popular ways to send and receive radio programming will develop alongside FM distribution.

Digital radio (DAB) was broadcast in Finland as an experiment in 1997–2005, but it did not gain popularity amongst listeners. Many countries in Europe have digital radio

broadcasts alongside FM networks. Currently, DAB and its updated version, DAB+, are the digital radio technologies used most often in Europe. As DAB listening gains ground, Norway plans to shut down its FM networks in 2017 or 2019.

In addition to DAB, there are several other digital radio technologies. From the very beginning, radio content has been distributed via digital television networks. Television's DVB-T2 technology, which enables also mobile reception, is another key contender. If mobile reception of television broadcasting becomes widespread, it can be expected that receiving radio via television networks will also become common. Accordingly, the same mass-communication network could distribute both television and radio programmes. Radio receivers that use DVB-T2 or T2-Lite technologies are not yet available, however.

Radio programmes are also distributed via the internet. The role of internet radio is largely to complement radio transmissions via the FM network. According to Finnpanel Oy's National Radio Survey, the weekly reach of internet radio in 2011 was approximately 10 per cent.

The simultaneous and unaltered transmission of FM broadcasts over the internet is a radio development option worth considering. As wireless broadband networks expand and evolve, mobile and portable radio broadcasting reception via the internet may grow alongside them. As voice transmission requires only a fraction of the transmission capacity of high-definition television broadcasts, mass-communication networks are not necessarily a prerequisite for wireless radio content transmission. Consequently, it is a likely development that listening to the radio wirelessly also via a broadband connection will become more common.

Radio content can be transmitted both via television networks and over the internet, and it can be expected that the utilisation of these new distribution channels will increase. Since radio can be listened to via the internet with other terminal equipment than the traditional radio set, both the freedom to choose the time of listening and the volumes of content available for listening will continue to increase as internet radio gains ground. FM broadcasts will, however, continue in the 2020s. The distribution of regional content in particular will continue to be carried out with FM technology for many years to come.

As operations move to the internet, radio operations too will need to compete for income from advertising with other advertising on the internet. The risk here is that advertising expenditure that earlier remained within the domestic economy will now go to non-Finnish companies.

12. FREQUENCIES OF TERRESTRIAL TELEVISION OPERATIONS

12.1 Television in the future

After the switch to fully digital television operations, the frequency capacity available for television has multiplied in line with evolving technology. This has led to a situation in which several multiplexes are underused. Television frequency re-planning from the beginning of 2017 onward and the deployment of more efficient transmission and compression technologies will continue to increase the frequency capacity available for television operations.

Until the end of 2016, eight nationwide multiplexes will be available to television operations, with six of them in the UHF spectrum band and two in the VHF band. Regional multiplexes are additionally used in the Helsinki Metropolitan Area and the Vaasa and Seinäjoki regions, and one multiplex with nearly nationwide coverage in the VHF band. Moreover, in February 2012 the Government declared the new multiplex H, which covers approximately 60 per cent of the population, open for applications. As the network licences

were opened for applications, the Government also invited applications for programme licences in this multiplex. However, the programme licences did not interest broadcasters and the Government received no applications. Two companies submitted applications for a network licence, but one of the two later withdrew the application.

After 2016, it will in all likelihood be possible to create six nationwide multiplexes, of which two would be in the 700 MHz spectrum band, in the UHF range. Additionally, there would be three nationwide or nearly nationwide multiplexes in the VHF spectrum band. Depending on frequency coordination, television operations could be allocated even more semi-national or regional multiplexes from both spectrum bands.

12.2 Future frequency needs of wireless broadband

In its market research of 2006, the ITU estimated that data volumes transmitted in wireless broadband networks will grow significantly by 2020.

A frequency-need analysis based on the market research indicates that in 2020, frequencies between 1,280 and 1,720 MHz should be available to wireless broadband networks. The frequencies needed depend on the geographical area and the development of wireless broadband networks there.

In 2011, the ITU conducted more in-depth market research on the development of traffic volumes in wireless broadband networks. According to the research, traffic volumes are growing far more rapidly than was estimated in 2006.

This is largely due to the increasing use of smartphones, USB modems, and tablet devices. Consumers want to use the same internet services with these devices as they do with fixed connections.

The ITU's report M.2078, on estimated spectrum bandwidth requirements for wireless broadband, used the traffic forecasts from the 2006 market research. According to the most conservative forecast, 1,280 MHz of frequencies, in all, will be needed in 2020.

In Finland, in total, 1,025 MHz has been allocated to wireless broadband networks. Of these frequencies, 565 MHz, in all, was rendered usable before 2014; 625 MHz, in total, will be usable in 2014 and 2015; and the full 1,025 MHz will be available only after 2016. In practice, GSM operations, referring mainly to voice services, will need frequencies in the 900 MHz and 1,800 MHz spectrum bands even after 2016.

With the expectation of larger urban areas, lower frequencies are more suitable for the wireless broadband supply in Finland, since they can be utilised to build and provide wireless broadband services most cost-efficiently. Currently, 3G services in the 900 MHz spectrum band cover almost all of Finland in geographical terms. More frequencies for wireless broadband are allocated from the 800 MHz spectrum band. The current use of frequencies in Russia, however, hampers the full utilisation of the 800 MHz spectrum band. Together with the 900 MHz band, the 800 MHz spectrum band provides a frequency resource of only 130 MHz for the use of wireless broadband.

If data traffic grows in line with forecasts, wireless broadband networks will need more frequencies from the lower spectrum bands. Currently, the only possible spectrum band would be the 700 MHz band. The World Radiocommunication Conference this year (WRC-12) has allocated this spectrum band, currently used in television operations, to wireless broadband networks. Assignment of the frequencies to wireless broadband is still pending the final decision of WRC-15. Prior to this, the frequency needs of television and wireless broadband have to be investigated, in view of how wireless programme production utilises radio systems. Also, technical compatibility calculations need to be

carried out for current spectrum-band-users – i.e., television operations, aviation radio navigation systems, and wireless broadband networks. Preparing a wireless broadband use plan (frequency raster) for wireless broadband networks is another important part of the preparatory work. These preparations also include making decisions on the lower edge of the allocation both at national and international level.

In addition to the final decision of the radio-communication conference, the allocation of the 700 MHz frequencies to wireless broadband requires decisions at EU level together with bilateral frequency coordination between neighbouring countries. In Finland, the current network licences for this spectrum band are valid until the end of 2016. Finland aims to promote cooperation and international preparations related to the matter so that international barriers to allocating the spectrum band for mobile communications' use would be lifted as soon as possible.

However, it seems that the 700 MHz band will not suffice on its own if one considers the additional frequency needs of wireless broadband identified by the forecast in the ITU's frequency-need report for 2020. The ITU has already initiated investigations into possible additional spectrum bands for wireless broadband from new, higher frequency bands.

12.3 Alternative frequency-distribution models for television operations

In preparation of the Communications Policy Programme, three alternative models for developing the distribution market of terrestrial television were drawn up. The basic idea behind all of the options described below is that the current programme licence procedure should be discarded and terrestrial television should move closer to the regulation model for cable-television operations.

It is proposed that licence terms continue to last 20 years, which enables long-term investment and consequently promotes the vitality of the industry.

Scenario 1, auction model:

Scenario 1: Nationwide multiplexes 2017
Discussion framework – auctioning model (revenue to State) ➔

	Standard	Valid until	Content	Granting of network licence	Frequencies
1	T1 (T2)	2026	YLE and channels of public interest	'Beauty contest'	470-698 MHz
2	T2	2036	YLE and channels of public interest	'Beauty contest'	470-698 MHz
3	T2	2036	No content regulation ca. 7 HD or 15-20 SD channels	Auction	470-698 MHz
4*	T2	2026	No content regulation ca. 7 HD or 15-20 SD channels	-	470-698 MHz
5	T1/T2	2026	No content regulation 7 SD/ ca. 7 HD or 15-20 SD channels	Auction	698-790 MHz
6	T1/T2	2026	No content regulation 7 SD/ca. 7 HD or 15-20 SD channels	Auction	698-790 MHz
VHF A	T2	2036	No content regulation ca. 7 HD or 15-20 SD channels	Auction	174-230 MHz
VHF B	T2	2036	No content regulation ca. 7 HD or 15-20 SD channels	Auction	174-230 MHz
VHF C	T2	2036	No content regulation ca. 7 HD or 15-20 SD channels	Auction	174-230 MHz
Plus possible nearly nationwide or regional multiplexes in the UHF and VHF bands:					
7	T2	2036	No content regulation ca. 7 HD or 15-20 SD channels	Auction	
8	T2	2036	No content regulation ca. 7 HD or 15-20 SD channels	Auction	
Etc.					

* DVB-T1 = standard television SD
 * DVB-T2 = newer standard enabling high definition quality HD
 * Present multiplex E: licence valid until 2026 / after that licence would be auctioned (revenue to State)

Figure 19: Auction model (scenario 1).

The so-called auction model described in scenario 1 proposes six multiplexes from the UHF spectrum band and three from the VHF band to be allocated to television operations from the beginning of 2017 onward. If deemed necessary, in addition to these multiplexes, it would be possible to have, pending international frequency coordination and network-planning decisions, several semi-national or regional multiplexes from each of these spectrum bands. Network licences for the two multiplexes of the UHF band would be granted by means of the current comparative method. Network licences for other multiplexes both in the UHF and in the VHF bands would be granted through an auction, and the revenue received would be entered in the Budget. The two first-mentioned multiplexes of the UHF spectrum band would be reserved for the YLE public-service channels, and for other public-interest channels that fulfil the criteria laid down by law. Nationwide free reception would be a requirement for these channels. The use of different models is also based on the conclusion that in other multiplexes, the content available would essentially consist of pay-television supply.

YLE and channels serving the public interest would have the important task of maintaining and promoting the versatility and plurality of the Finnish television supply. In order to ensure that these objectives are reached, the channels serving the public interest would be required, in addition to providing nationwide coverage of the population and free reception, to broadcast programmes in Finnish or Swedish daily, including Finnish drama; news; and current-affairs programmes, such as domestic documentaries, and to fulfil requirements for audio-subtitling and subtitling services and the quotas set for independent production company programmes.

The goal of separately defining channels serving the public interest is to ensure that the provision of high-quality and versatile content which can be received free-to-air throughout the country will continue in the future.

Multiplexes granted through an auction, on the other hand, would not have similar requirements regarding content. The general provisions of the current Television and Radio Act and the child protection provisions of the Act on Audiovisual Programmes, for example, would still apply to television broadcasters who operate in these multiplexes.

In scenario 1, one to three multiplexes would continue with the current broadcasting standard until 2026. Two of these multiplexes are in the 698–790 MHz spectrum band. With this scenario, the 700 MHz spectrum band would remain in the use of terrestrial television for as long as until 2026. The model does not take into account the additional frequency needs of wireless broadband that were described in section 10.1.2 above. Other areas excluded from the model are the resolution of the radio-frequency conference in the spring of 2012 on the future use of the 700 MHz spectrum band, and the fact that the 700 MHz spectrum band is not, on its own, sufficient to fulfil the growing frequency needs of broadband forecast in the ITU's frequency-need report for 2020.

In the second scenario, a licence term of 20 years is applied for auctioned rights of frequency use, except for those multiplexes that would use current broadcasting technology (DVB-T1). At least one multiplex would continue with current broadcasting technology, and the content would be simultaneously broadcast in high definition, with newer broadcasting technology (DVB-T2) in a multiplex with licences granted under the comparative model. One multiplex using current broadcasting technology can accommodate 7–8 standard-definition channels. A multiplex that uses newer broadcasting technology can accommodate approximately seven high-definition channels or 15–20 standard-definition channels. If standard-definition channels are transmitted with multiplexes that use DVB-T2 technology, considerable transmission capacity is available.

Scenario 2, administrative incentive price model:

Scenario 2: Nationwide multiplexes 2017
 Discussion framework – administrative incentive price (AIP) model (revenue to State or to TV and Radio Fund)

	Standard	Valid until	Content	Granting of network licence	Frequencies
1	T1 (T2)	2026	YLE and channels of public interest	'Beauty contest'	470-698 MHz
2	T2	2036	YLE and channels of public interest	'Beauty contest'	470-698 MHz
3	T2	2036	No content regulation ca. 7 HD or 15-20 SD channels	'Beauty contest' + AIP	470-698 MHz
4*	T2	2026	No content regulation ca. 7 HD or 15-20 SD channels	-	470-698 MHz
Spectrum band for mobile use					698-790 MHz
Spectrum band for mobile use					698-790 MHz
VHF A	T2	2036	No content regulation ca. 7 HD or 15-20 SD channels	'Beauty contest' + AIP	174-230 MHz
VHF B	T2	2036	No content regulation ca. 7 HD or 15-20 SD channels	'Beauty contest' + AIP	174-230 MHz
VHF C	T2	2036	No content regulation ca. 7 HD or 15-20 SD channels	'Beauty contest' + AIP	174-230 MHz
Plus possible semi-national or regional multiplexes in the UHF and VHF bands:					
7	T2	2036	No content regulation ca. 7 HD or 15-20 SD channels	'Beauty contest' + AIP	
8	T2	2036	No content regulation ca. 7 HD or 15-20 SD channels	'Beauty contest' + AIP	
Etc.					

DVB-T1 = standard television SD
 DVB-T2 = newer standard enabling high definition quality HD
 * Present multiplex E; licence valid until 2026 / after that auction + AIP

Figure 20: Administrative incentive price model (scenario 2).

In scenario 2, the administrative incentive price model, four multiplexes of the UHF spectrum band and three of the VHF band would be available to television operations. YLE's public-service channels and the channels serving the public interest would be in the UHF-band multiplex. The operating licences for all multiplexes would be granted with the comparative method, but for multiplexes granted for the use of channels other than YLE's and channels serving public interest, the new, administrative incentive price model (with so-called AIP charges) would be applied, as this model, when compared to auctions of rights of frequency use, creates a lighter financial burden on operators.

In line with the Government Resolution on Spectrum Policy of 29 March 2012 applying to telecommunications operations, the Code for Information Society and Communications Services that is being prepared in accordance with the Government Programme should be drafted in a way allowing auctions to be used in the future, too, particularly when granting licences for new spectrum bands. In preparing the code, the introduction of such a frequency fee – reflecting the market value of frequencies and exceeding administrative costs – is considered for frequencies to which the auction method would not be applied. The administrative incentive price model of scenario 2 would be entered as revenue in the Budget.

After the World Radiocommunication Conference in 2015 has made its decision on use of the 700 MHz band, this band can be assigned for wireless broadband as early as 2017.

As was pointed out above, in addition to the final decision of the radio-communication conference, the allocation of the 700 MHz frequencies to wireless broadband requires EU level decisions and bilateral frequency coordination between neighbouring countries. In Finland, the current network licences for this spectrum band are valid until the end of 2016. Finland aims to promote cooperation and the international preparation related to the matter such that international barriers to allocation of the spectrum band for

mobile-communication use would be lifted as soon as possible.

Scenario 3, intensified network competition model:

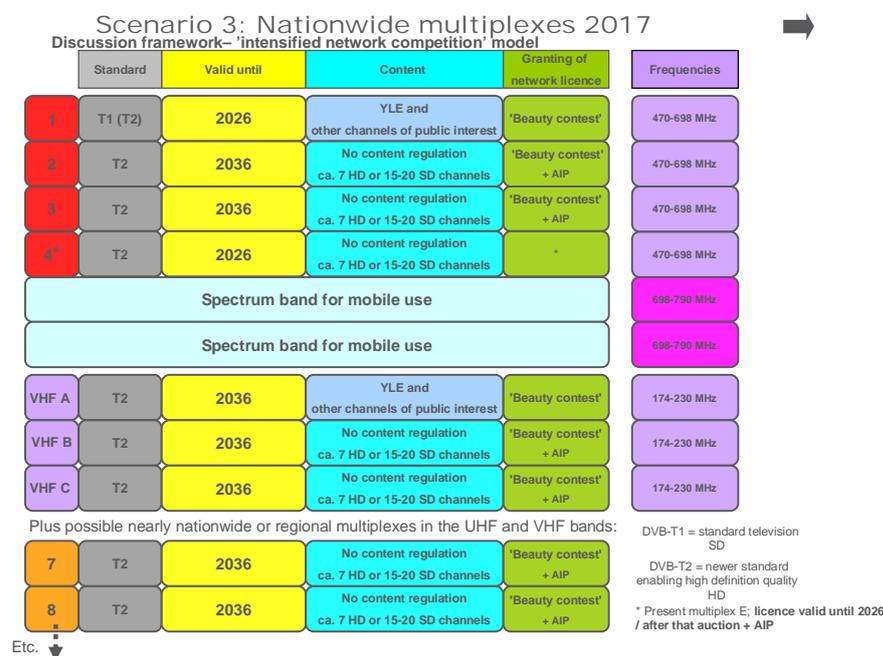


Figure 21: Intensified network competition model (scenario 3).

Scenario 3, which can be described as the intensified network competition model, differs from scenarios 1 and 2 in that the multicast multiplex granted to YLE's public-service channels and other channels serving public interest via the comparative method, utilising the newer DVB-T2 broadcasting technology, would be in the VHF spectrum band. The model could be used to promote competition in the television market and equal conditions for operation of television networks in the VHF and UHF spectrum bands.

12.4 International frequency plan for television

The use of television frequencies is based on the frequency reservations made in accordance with the agreement concluded at the ITU's Regional Radiocommunication Conference of 2006, in Geneva; the basic philosophy of the GE-06 agreement is to provide all countries with equal rights to frequency use. Under the agreement, Finland is divided into 38 geographical areas, each of which has a certain number of frequency reservations. If a change in frequency could cause interference, the procedures for transferring a frequency reservation from one region to another always require an agreement between neighbouring countries.

Current regional frequency reservations allocated to television operations in Finland

As a result of the 2006 radio-communications conference in Geneva, Finland received regional frequency reservations in both VHF and UHF spectrum bands. Originally, two digital television networks that covered continental Finland were assigned for the VHF band and seven for the UHF band. In 2009, after Russia's initiative, frequencies in the VHF band were rearranged between Finland and Russia after the radio-communications conference, laying the ground for Finland's third digital television network in the VHF band. Through coordination with other neighbouring countries, the third network could be

coordinated to cover all of continental Finland with the exception of an area corresponding roughly to the former Province of Lapland.

Plans from the Geneva 2006 conference indicated that the upper end of the UHF band, 790–862 MHz, would be used by television operations. In Finland, it was allocated, via a 2008 Government decree, for mobile-communication use, reducing the number of television networks in the UHF band and with continental coverage by one. Consequently, there are currently three digital television networks in the VHF band (174–230 MHz) with coverage of continental Finland (the third of these does not reach the former Province of Lapland) and six with coverage of continental Finland in the UHF band (470–790 MHz).

Basic philosophy behind regional frequency reservations

Regional frequency reservations create the conditions for using the radio frequencies allocated for the region without prior knowledge of the transmitters' locations and numbers. If the combined interference the transmitters deployed in the area will cause for the world outside is lower than the 'reference level' defined in the frequency reservation, the transmitters may be deployed without further coordination with neighbouring countries. The regional frequency reservation method is well suited to situations wherein a frequency assigned to a region is distributed on the basis of a network licence, and the various applicants are expecting a wide range of network topologies: there is no need for separate coordination of the network to be implemented in the region or its individual transmitters after the operating licence round, as long as the licence-holder's implementation is within set reference values.

Coordination limitations affecting Finland's regional frequency reservations

In many areas, particularly those close to Russia, Finland's regional frequency reservations have limitations involving the need for coordination regardless of whether the interference generated by the network implemented in the region is above the reference level. To be able to accommodate as many television networks as possible within the spectrum band and the framework of the GE-06 agreement, Finland has had to accept the fact that frequency reservations in neighbouring countries within the same frequency cause computational interference to each other. This happens even if the network to be implemented in the region does not exceed the reference interference level specified in the frequency reservation. This is a fact that Finland's other neighbouring countries, almost without exception, accepted without special terms. Russia, in contrast, issued a notification on all Finnish regional frequency reservations that could in theory cause interference, requiring that a network implemented in the region must always be coordinated separately with Russia. At the conference, Finland set the same condition for Russia's corresponding frequency reservations as a countermeasure. In all, 2/3 of Finland's approximately 330 regional frequency reservations need to be coordinated separately with Russia.

Bilateral coordination agreements with Russia

The 2006 Geneva agreement does not set unambiguous limits on acceptable levels of interference from a neighbouring country when that country is coordinating new transmitters. Also, time limits have not been set as to the speed with which a neighbouring country's coordination request should be responded to. For resolution of these issues, a coordination agreement was concluded with Russia in 2008, specifying the criteria on the basis of which a coordinated transmitter is deemed acceptable and the time limits within which a response needs to be given. Finland proposed that the coordination agreement should cover both the VHF and UHF bands, but Russia wished to limit it to the UHF frequencies only. Nevertheless, in its coordination responses pertaining to VHF frequencies, Russia has indicated that its interference analyses are in line with the

2008 coordination agreement also for the VHF band.

12.5 Re-planning of television frequencies

The basic idea behind television frequency re-planning was to allow terrestrial television operations to switch to mostly DVB-T2 broadcasts in early 2017. In Finland, half of the transmission network capacity currently available is already used by DVB-T2 multiplexes. From the television operators' point of view, however, switching over to an all-new technology would require more modern receivers to have become sufficiently common. From the households' point of view, current terminal equipment should remain usable until the end of its service life, without a purchase of new equipment being mandatory.

The estimates now available indicate that households will not be ready to switch over to the reception of broadcasts using newer technology by 2017 in the extent planned. Based on the feedback received during the consultation process, the basic idea in planning is broadened such that two multiplexes continue to transmit with the current standard technology until 2026, unless the interim review to be carried out in 2020 gives a good reason to speed up the process. Since, in the coming years, the situation may change considerably and more rapidly than we are able to forecast today, the development needs to be reviewed at regular intervals.

To ensure the appropriate deployment of new technologies, licence regulation needs to be more flexible than it is today. In cooperation with network operators, television operators could decide whether multiplexes other than those transmitting channels of public interest would transmit in standard or high definition, and the matter would no longer be resolved by a licence decision.

The re-planning of television frequencies will be carried out such that three multiplexes will be implemented as multi-frequency networks. This way, the continuation of regional television operations and regional advertising, which are important to YLE and to commercial television operators, is ensured.

When the future frequency needs of television operations are assessed, it is also important to note that several television channels are already transmitted both in standard definition (SD) as digital television broadcasts and in high definition (HD) in different multiplexes. Therefore, capacity for multicasts in television operations already exists, and this multicast capacity can be utilised also during future technology disruptions. On the other hand, multicast broadcasting is a factor that opens the television transmission market to competition. When the same content is available via competing networks and channels serving public interest, for example, can be viewed via competing networks, viewers can choose the option that provides them also with other content that interests them.

Multicast broadcasting generates overlapping distribution costs for television operations, which is why multicast broadcasting in standard and high definition should not be continued if there are no specific reasons to do so.

The re-planning of television networks and the deployment of more efficient transmission and compression technologies enable, for their part, the allocation of some of the frequencies currently used by television operations to mobile communications within the schedule specified for Finland in international frequency agreements. Depending on the agreements and other technical matters, 2017 is the year during which this will in all likelihood happen.

12.5.1 Single-frequency networks

Single-frequency networks are networks in which the same content is transmitted on the same frequency from transmitters located in various geographical regions. A single-frequency network boosts spectrum efficiency, since it enables one channel to have greater geographical coverage than would be achieved with a single channel in a multi-frequency network. Moreover, using a single-frequency network can improve the possibilities for receiving transmissions in borderline coverage areas.

The use of single-frequency networks is, however, limited by regional content, as there are currently no technologies in use that would enable transmitting different content via a single-frequency network.

The efficiency of frequency use can also be boosted by having optional supplementary transmitters utilising the same frequency as the main transmitter, a solution also made possible by new technology.

12.5.2 Location of television transmitters

In order to avoid unnecessary reception problems, it is recommended that the main transmitters of different networks be placed at the same transmission stations by spectrum band (VHF/UHF). To ensure competition between distribution network operators, it would need to be ensured with statutes that all operators have access to the infrastructure they need (antenna sites in masts, cabling, equipment rooms, etc.) under non-discriminatory terms and with cost-oriented pricing.

Placing the main transmitters for a given spectrum band primarily at the same transmission station should not, however, be a barrier to supplementary transmitters or the construction of a network that supports mobile reception. In such cases, network planning should pay particular attention to reception conditions.

12.6 Secondary systems using television frequencies

12.6.1 Radio microphones

Of the spectrum bands allocated to radio microphones, the frequencies 174–230 MHz, 470–694, and 694–789 MHz are also used by digital television networks. In these bands, television use is primary and radio microphone use secondary, which means that radio microphones are not allowed to cause interference to television reception. The frequency that is applicable for radio microphone use depends on the location. This is why radio licences for radio microphones as a rule do not specify certain frequencies, and radio microphone users can choose the frequencies they use. FICORA's Radio Frequency Regulation No. 4 specifies the technical operation conditions for radio microphones. The frequencies and technical operation conditions of licence-exempt radio microphones are available in FICORA's regulation 15.

Radio microphone use in the UHF spectrum band

Between 10 and 12 radio microphones can operate in the same location of use as one television channel with a width of 8 MHz. Permanent, large-scale productions typically need 50–60 radio microphones; i.e., the frequency need is approximately 50 MHz (corresponding to 5–6 television channels).

800 MHz frequencies

Most radio microphones subject to a licence and still in use operate in the 800 MHz spectrum band. In total, 40 MHz from the 800 MHz band (790–822 MHz / 854–862 MHz) has been allocated to radio microphones subject to a licence. Throughout the country, these frequencies are currently used predominantly by radio microphones. Frequencies in addition to the allocated 40 MHz are also allocated on a per-event basis to some theatres and large touring productions, such as outdoor concerts. Radio microphone use in this spectrum band will end by 2014.

UHF television channels

Frequencies in the television spectrum band 470–789 MHz have been allocated to radio microphone use, with the 694–789 MHz spectrum band allocated for a fixed term until 2020. The frequencies may be used by radio microphones in those geographical areas where they are not used by television operations.

If a certain geographical region has seven television networks in the 470–790 MHz spectrum band, this equals 56 MHz being assigned to television operations for the main transmitter. This means that roughly 260 MHz is regionally available to radio microphones in the television operation UHF band.

If subtransmitters that may be used by regional television operations in different frequency ranges than the main transmitter are taken into account, it can be estimated that sufficient frequency space in the television UHF band will be available for radio microphone use in each geographical area.

During the next television network licence round (starting on 1 January 2017), frequency planning will be based on the objective of having most gap-fillers use the same frequency as the main transmitters. Then 48 MHz (six television networks) could be available for television operations in the 470–790 MHz spectrum band, or 32 MHz (four television networks) in the frequencies below 694 MHz, leaving approximately 270 MHz or 190 MHz of frequencies for the local use of radio microphones.

The 700 MHz spectrum band

In February 2012, the World Radiocommunication Conference of the ITU decided to allocate the 700 MHz spectrum band for the use of wireless broadband systems from 2015 onward. FICORA has recommended that, before national decisions on the future use and schedule for the 700 MHz band are made, out of UHF television frequencies, new radio microphone systems should use the 470–694 MHz spectrum band, in order to minimise equipment alteration costs.

Radio microphone users select the frequencies used in the 174–230 MHz spectrum band themselves.

If, as is proposed, television frequency re-planning ends up recommending that single-frequency networks be implemented on a large scale in the 470–698 MHz spectrum band, for example, or a frequency used by radio microphones at a certain location changes on account of re-planning, radio microphone users must switch to a new UHF frequency in order to be able to avoid television operation frequencies. Currently, radio microphone users can search for free frequencies themselves on the basis of the information available on FICORA's web pages. Accordingly, frequency re-planning may have a regional impact on radio microphone users.

12.6.2 Programme production frequencies

The international frequency plan does not feature a reservation for television broadcasts

in Finland in the 470–478 MHz range. In Finland, private radio networks in the adjacent frequencies limit television use, which is why 470–478 MHz is reserved for programme production. Frequencies in this band have been allocated to narrow-band audio programme production, and it is the only programme production and radio microphone spectrum band used nationwide in the UHF band.

Many countries have assigned frequencies in the 470–790 MHz to broadband programme production. In Finland, frequencies in the UHF band have not been allocated for programme production video image transfer. However, frequencies are in short-term use during large events related to programme production by non-Finnish television companies.

13. CONSUMER QUESTIONS

Regardless of the evolution of technology, consumers must be guaranteed a sufficient amount of television services distributed with current technology for a reasonable transition. The transition period must be long enough to allow for the natural renewal of the receiver base through equipment ageing, so that consumers are not forced to purchase new equipment purely because new technologies are introduced. The fact that some households have several receivers, also at holiday or similar homes, that need to be upgraded when new technologies are adopted must also be taken into account.

In practice, the transition period means that programmes with the same content must be transmitted via two separate networks. As this will generate considerable expenses for operators, the transition period should not be extended in the absence of solid grounds.

The utilisation of new services requires both new equipment and, in some cases, updating of the receiving antenna. To ensure that consumers can benefit from changes as effortlessly as possible – basically by just performing a retuning of the receiver (i.e., a channel search) – the broadcasting network must be implemented such that it does not generate unnecessary problems or costs for consumers. Both consumers and retailers must also be informed with sufficient clarity that, on the one hand, the deployment of new services requires new receiver technology, and, on the other hand, that broadcasts using old technology will at some point cease completely.

13.1 Receivers

Receiving new DVB-T2-technology broadcasts with current DVB-T receivers is not possible. If consumers do not obtain new receivers – a new Digibox is a minimum requirement – the television services available to them will diminish as some broadcasts move to DVB-T2 technology. In contrast, DVB-T2 receivers understand older technology.

Some equipment on sale today is already DVB-T2-ready, but a large percentage comes with only an obsolescent DVB-T tuner. Its average life is estimated at eight years.

For the transition to new technology to be as smooth as possible, consumers and industry retailers need to be informed of future solutions involving the adoption of new technologies as soon as schedule decisions are made. This will safeguard consumer rights by ensuring that equipment is not for sale that may become obsolete during its service life.

13.2 Antenna solutions and the internal networks in real property units

The importance of appropriate antenna systems has grown and will continue to do so as new television broadcasting networks are built. Purchases related to the common antenna system are long-term from the perspective of real property units and require

information on foreseeable changes. For this reason, FICORA is to specify the technical minimum quality requirements for antennas and antenna systems used in television reception.

Requirement specification is also indispensable for the purpose of ensuring that there are reasonable grounds, acceptable to both consumers and broadcasting operators, for resolving any possible occurrences of interference in relation to the adoption of new broadcasting technology.

In detached houses, television reception is often organised via the terrestrial television network such that the signal goes straight from the antenna to the receiver, meaning that there is no internal network in the sense specified by FICORA regulations. In detached houses, interference affecting antenna reception is a more common problem, since high-quality antenna reception is not an issue that is taken into consideration during the construction phase as much as is done with other types of real property.

In addition to requirements concerning internal networks of real property units, it would be necessary to specify the technical minimum quality requirements for antennas and antenna systems used in television and radio reception. The requirements would aid in resolution of interference situations related to new broadcasting technology when one must assess what corrective actions can in all fairness be said to be the responsibility of the party who owns the receiving antenna and its related installations and, at the same time, what is the responsibility of the broadcasting company. It is worth pointing out that in a manner similar to the requirements set for internal networks, defining technical requirements for antenna installations retroactively calls for very solid reasons.

In addition to receivers and antennas, the services that are receivable in real property units are also affected by the quality of the unit's internal communication network and the transmission technologies it supports. Decisions on any network upgrade schedules and technical solutions are the responsibility of the possessor of the real property unit (either the possessor of a leased property or a housing company). From the standpoint of the properties, the impact of the choices made will be felt for a long time to come. To allow ability to build an internal network that can be altered in the future and that provides the freedom to choose services, competencies and expertise in reception methods and their future developments are required.

The evolution of mass-communication networks and of transmission and reception technologies creates additional requirements for properties' internal networks to which the public networks of telecommunications companies are connected to carry the services all the way to the residents. Traditionally, buildings have two separate internal networks: a common antenna network, via which services from cable-television networks (including cable broadband) and other mass-communication networks are distributed, and the building wiring, via which services from copper- or fibre-based fixed telephone or broadband networks are distributed. What internal networks exist and what shape they take have an impact on the types of services residents can subscribe to and use.

The internal networks of a piece of property fall under the authority and decision-making power of the building's possessor, which might be, for example, a housing company. Other relevant parties include the constructor in the construction phase, and the telecommunications or antenna contractor, which refers to the provider of building wiring installation and maintenance work, in both the construction and use phases of the building; the latter is often the same company as the building's electrical contractor.

The possessor of the building has the power of decision over the type(s) of internal networks built, the schedule of their upgrades or repairs, and the choice of telecommunications company to whose network the internal networks are connected.

Statutes do not directly make the building of internal networks an obligation, but, indirectly, securing the availability of basic services does mean that internal networks need to be built at least for properties with more than one flat (for example, Section 134 of the Communications Market Act stipulates that it is the responsibility of the administrator of a joint antenna network to ensure that basic channels are available within the property unaltered and simultaneously with the original broadcast).

The obligations related to technical quality, as laid out in the Communications Market Act, also extend to the internal network of a property that has been connected to the network of a telecommunications company; furthermore, FICORA has issued technical regulations for community aerial networks and customer premises' telephone networks. Requirements as to network structure and documentation, as specified in the regulations, pertain to new construction and situations in which the possessor is upgrading the network. Because of historical developments, the regulations have focused on cabling and related structures and equipment; i.e., no specific requirements have been defined for antenna systems.

Regulation of the internal networks of properties affects the protection of private property to such an extent that the requirements do not, as a rule, target existing internal networks retroactively unless statutes or technical developments also create exceptional mandatory requirements for old networks. The digital switchover was such an exception, as it set certain minimum requirements for the performance of all common antenna networks in order to make the reception of television services at all possible.

Whether a possessor of a property decides to build or upgrade an internal communication network, what types of networks are installed for a building, and which telecommunications-company networks the internal network(s) is connected to are all factors that have a far-reaching impact on the residents' possibilities for using and choosing communication services. Whether several telecommunications companies can provide services to the building simultaneously is also dependent on these decisions. To be able to choose a solution that does not tie the building and its residents to one operator or transmission technology at a time, possessors of real estate must have certain competencies and information.

13.3 Issues related to interference with television reception

In television operations, interference-free reception is a key question for viewers. Prior to launching of operations, the impact of the 700 and 800 MHz mobile-communication operations will be fully disclosed to viewers.

As spectrum efficiency increases, it will no longer be possible to fully avoid situations of a new radio system causing interference to an existing system – for example, television reception. In such cases, it is appropriate for the party causing the interference to be responsible for the measures needed to remedy the situation as well as for related costs, even if the system used is in compliance with technical requirements. It is an obligation of households, on the other hand, to ensure that their reception equipment is compliant with regulations and operates appropriately.

If a building's antenna system is in line with regulations, television network operators are to have the obligation of restoring the network to the status it had prior to the interference caused by changes to the network, without generating costs for the consumer.

13.4 Informing consumers

It is important for television users and receivers of radio broadcasting to know in good

time when such new transmissions technologies are to be deployed as require changes to consumers' receivers or systems. Television and radio operators also need to be prepared for the changes in television and radio operations that will take place in the latter half of this decade.

Changes affecting terrestrial television need to be communicated to consumers over a long time. Information needs to be disseminated on both ongoing and planned changes. The authorities must inform consumers about any relevant decisions made, without delay. Operators, on the other hand, must communicate in good time what transmission network development measures they will undertake, so that consumers will have enough time to purchase the equipment required by the new services, for example.

From the consumers' perspective, the situation is complicated by the growing number of operators. When there are problems with reception, in particular, it is difficult for consumers to know which organisation they should contact or where additional information may be available. The situation can be improved and made easier for consumers by means of communications-related web portals, established jointly by the various operators. An example of this is HD TV Guide available at www.hdtvopas.fi.

13.5 One-card principle

The role of the pay-television operator will become significant in pay-television operations. Typically, pay-television operators are responsible for the marketing of the pay-television channel packages and conditional-access cards, paying network operators for the costs of channel distribution.

In order to get the content they want, viewers often purchase several pay-television packages, from various operators. Exclusive rights to broadcast sports events, in particular, spread content that is interesting to viewers over several channels. So that viewers need not swap conditional-access cards in order to view different content, Finland has sought to implement the one-card principle. The one-card principle involves a model wherein the channels distributed by all pay-television operators can be received with the card of any pay-television operator.

In new-generation digital television, cards are associated with a specific television set or Digibox, which poses a problem for the implementation of the one-card principle in the event that not all pay-television operators adopt it. Moreover, switching to programmatic decoding and operator-specific set-top boxes increases the challenge of implementing the principle.

Currently, Section 136 of the Communications Market Act stipulates that an operator that uses a decoding system has an obligation to ensure that the decoding system does not prevent the distribution or reception of television or radio programmes or related ancillary and supplementary services of another operator in a digital and radio network. An operator using a decoding system, wherever necessary, has an obligation to supply another operator with the technical services required for distribution at a cost-oriented and non-discriminatory price.

For the near future, the consequences of the so-called Premier League case (C403/08 and C429/08), resolved by the Court of Justice of the European Union, on exclusive rights to sports events need to be closely monitored, alongside future developments in the status of viewers as encryption technologies evolve. Regulation needs to be reviewed in order to ensure guaranteed better status of viewers.

Regulation needs to be developed and more detailed provisions introduced so as to ensure the flexible availability of pay-television services provided to consumers by

various service providers in the digital terrestrial television environment.

14. RADIO OPERATIONS

Radio plays an important role in the everyday life of Finns. Judged by financial metrics, however, private radio operations are a small industry. FM radio continues to be, by far, the most popular method of listening to the radio. Nevertheless, the majority of FM radio broadcasts are today transmitted simultaneously via the internet as parallel broadcasts.

Industry estimates indicate that the reason for the relatively slow growth of internet and mobile listening is the lack of broadband connections that are sufficiently fast to enable interference-free internet listening also on the move. Other possible reasons include mobile phones that are not equipped with radio functionality and, at the same time, the well-functioning FM network via which it continues to be effortless to listen to radio broadcasts. Broadband connections that enable interference-free listening are a prerequisite for replacement of FM listening with internet listening.

14.1 Digitalisation of radio

Private Finnish radio stations are happy with the current analogue FM network, which, thanks to its ease of use, reliability and reachability constitutes a clear advantage for radio operations. Many European countries have already begun digitalising radio. Radio digitalisation can be implemented in various ways. The above-mentioned DAB (Digital Audio Broadcasting) was developed in the early 1990s. The newer version, DAB+, has already been developed. DMR (Digital Radio Mondiale) was designed for the digitalisation of short-, medium-, and long-wave broadcasts. A later version, DMR+, which expands the spectrum band used, has already been developed. Radio digitalisation could also be implemented with DVB technology, which can be applied additionally to radio distribution.

In Finland, a new licence term has just begun, to end in 2019. Currently, there are no radio digitalisation options that would obviously be the best choice from the perspective of the Finnish radio-listener. Digital radio technologies evolve continuously, and it is difficult to assess which of the competing options would be the best choice from the angles of listeners and operators in the industry. From the spectrum efficiency standpoint, the digitalisation of radio is also not an issue that would need to be resolved immediately. It is very likely that radio too will be digitalised at some point, but for now Finland can monitor the developments of other countries, particularly in Europe, and make its decisions only when information on the digitalisation experiences of other countries is available.

Switching to digital radio would require that frequency capacity be reserved for such operations. Ongoing European digital radio projects operate in the 174–230 MHz spectrum band. In Finland, this band is used by terrestrial television.

14.2 Development of the licence system

In practice, the current licensing system has turned out to be complicated and time-consuming to administer. As a new option, a model has been considered wherein the Government would set out in a decree the more extensive frequency bands used by YLE, nationwide commercial radio operations, and regional and local radio operations subject to a licence. These frequency bands and individual spectrum bands, if any, would be granted through an auction. The key advantages of the model would include equality and administrative transparency. The auction price would be market-oriented and based on the operators' views on the commercial value of an operating licence.

As was mentioned above, radio is a small industry on financial terms. The financial result

of the industry corresponds to less than 10 per cent of turnover. Introducing new, additional costs to the industry would not be a measure that supports the vitality of Finnish radio operations. Also, unlike those used in television operations, the frequencies currently used for radio broadcasting are not subject to similar pressures requiring a change in their use. At least in the foreseeable future, there do not seem to be any other uses for frequencies utilised in FM broadcasts.

From the perspective of the radio industry, the most efficient scenario for development of the operating licence system that would also ensure the conditions for operation of the industry is the model wherein licence granting criteria are developed further in line with the currently used comparative model. The Government would continue to define in its decrees what kinds of frequency bands would be available to YLE, nationwide commercial radio operations, and regional and local radio operations subject to licence. After this, FICORA would grant the radio licence, for example, through a registration procedure, using constrained deliberation criteria. If, however, there is scarcity in the frequencies available for radio operations, power of decision would be transferred to the Government.

15. CONCLUSIONS

15.1 Resolutions on spectrum policy and frequency technology

Section 12.3 above describes alternative scenarios for utilising the frequency capacity allocated to television as efficiently as possible. Of the scenarios presented, scenario 2 can be considered to be the one that best promotes the competitive edge and vitality of terrestrial television in the rapidly evolving and changing world of media.

In scenario 1, multiplexes reserved for television operations, with the exception of two multiplexes reserved for channels of public interest, should be auctioned. The current, comparative method will continue to be applied in the granting of frequency capacity user rights.

Even though there are three active network operators, competition in the terrestrial television distribution market has not moved forward with the expected intensity. In light of international examples, auctions appear to be a good option for markets wherein genuine competition prevails. We can observe also that auctions are not the best way to grant frequency-user rights in situations in which the spectrum band is already in use, or where there is a need to reserve frequencies for public-interest use. Auctions are best suited to new or released spectrum bands in cases in which the band is expected to be in excessive demand.

According to Statistics Finland, the turnover of radio and television operations in 2010 came to approximately EUR 1.0 billion. A few network operators and several service providers, or broadcasters, operate in the radio and television market. Correspondingly, according to FICORA, the 2010 turnover of the telecommunications market was approximately EUR 3.8 billion, with services provided via mobile networks accounting for close to EUR 2.2 billion of this and fixed-network services for EUR 1.6 billion. The turnover cited for the telecommunications market does not include equipment sales or income from operations not directly involving telecommunications operations. Three network operators and several service providers are active in the mobile-communication market. A number of local network operators and service providers are active in the fixed-network service market.

In total, three network operators are active in television distribution, using two spectrum bands. In telecommunications markets with genuine competition, auctions are an appropriate method of granting user rights to frequencies. In television broadcasting, on the other hand, competition has not evolved to such a level of true competition as would

make auctions a viable method when one is granting frequency-use rights.

Scenario 3 would place the multiplex for simulcast channels in the VHF spectrum band. This multiplex has been granted, under the comparative method, to the public-service channels of the Finnish state broadcasting service, YLE, and to other channels serving public interest, with more modern (DVB-T2) broadcasting technology applied. Choosing this option would mean a need for households to acquire new equipment, which is not feasible, as the transition to new broadcasting and compression technology is based on the assumption that the process can be completed without forced measures of the kind required in 2007. The acquisition and alignment of new antennas would bring significant additional challenges and costs to households in the terrestrial network.

This option would boost competition amongst networks significantly, but, when alternative models are assessed, competition cannot be regarded as the only or most significant criterion. The coverage of the terrestrial television network in the UHF spectrum band is nearly 100 per cent of the population of Finland. Moreover, the majority of terrestrial television reception takes place via the UHF network. In connection with the 2007 digital transition, households have been equipped with updated antenna systems that are suitable for UHF reception. The network licences that are currently valid will expire as early as 2016. This means that there is relatively little time for households to switch to reception in the VHF spectrum band in any significant number. Consequently, allocating the simulcast multiplex with the latest broadcasting technology to YLE's public-service channels and other channels serving the public interest at a time when the VHF-spectrum-band network is only being built would be too demanding a solution for viewers. The above-mentioned channels are precisely the ones whose nationwide availability needs to be ensured through communication policy measures.

In scenario 2, network licences continue to be granted in line with the comparative method – i.e., via so-called beauty contests. This model, however, entails higher spectrum fees being collected for multiplexes that are not used by channels serving the public interest. In terms of public policy, it is no longer acceptable that limited natural resources could be exploited commercially without a related use fee. The introduction of a fee is also supported by the objectives of communication policy, which include ensuring equal conditions for operators engaged in electronic communications, and the requirement for spectrum efficiency.

To ensure reasonably long utilisation of consumers' current reception systems, major channels should be transmitted with current, DVB-T technology even after 2017. This would mean that programme content might be transmitted simultaneously with current DVB-T technology in standard format and in high definition via the new, DVB-T2 technology. Multicast transmission allows consumers to switch over to the new technology voluntarily. The multicast transmission phase does, however, involve inefficient use of both frequencies and network capacity. Instead of transmitting seven programmes in one multiplex in standard quality and in another multiplex in high definition, the DVB-T2 technology would allow for the transmission of seven new high-definition channels.

Multicast transmission is also expensive for the television companies, who pay for transmitting the same content in two multiplexes. For the above-mentioned reasons, it is advisable to aim at keeping the duration of multicast broadcasting as short as possible while, at the same time, guaranteeing that the consumers' equipment does not become obsolete too soon.

The draft programme proposed that one multiplex using DVB-T technology (multiplex UHF-1) and one multiplex using DVB-T2 technology (multiplex UHF-2), enabling regional content, be reserved for television operations. It was further proposed that this multiplex

that uses obsolescent transmission and compression technology (MPEG2) would continue until 2026 unless the Government has well-grounded reasons for full switchover to a new transmission standard before that.

However, viewers need to be allowed a long enough transition period and, taking into consideration the small number of DVB-T2 devices, two multiplexes (UHF 1 and 3) using DVB-T2 technology are to be reserved for television operations until 2026.

For television operators, this means a financially significant change in the scale of tens of millions of euros as compared to the original proposal. The proposal by which two multiplexes continue after the year 2017 is aimed at securing television companies the preconditions for profitable business operations also in the transition stage.

Figure 1 (Proposal for nationwide multiplexes from 2017 onwards) shows the number of frequencies in television operations per multiplex. Three multiplexes would be multi-frequency networks, which makes regional broadcasting with good coverage possible during the transition stage, too, as requested by television operators. The present free-to-air channels can be broadcast in these multiplexes using current technology (DVB-T) – multiplexes 1 and 3 in the figure. Multiplex 1 would include four channels of the Finnish Broadcasting Company Ltd and three channels serving the public interest (currently MTV3, Nelonen and FOX) while multiplex 3 would include the other free-to-air channels (currently SubTV, Ava, Jim, Liv, TV-Viisi and VoiceTV). The programme licences of all channels are, however, due to expire at the end of 2016. In the figure, the current multiplex E has been marked as multiplex 4, with its licence valid until 2026. A licence for a multiplex and a radio licence may each only be amended if it is necessary due to a significant change that occurs in the preconditions for operations subject to a licence, in the manner specified in section 11 of the Communications Market Act and section 8 of the Radio Act.

Transmission capacity would be reserved for pay-TV channels in multiplex 4 (Figure 1) and in the nearly nationwide multiplexes to be coordinated in the UHF band (1-3) or in the three multiplexes in the VHF band. Pay-TV accounts for a large share of television operations in Finland. As far as communications policy is concerned, it can, however, be treated in a different way as compared to channels which can be received free-to-air. In pay-TV broadcasting, television operators have a wider range of opportunities to speed up the uptake of devices using new technology. This can be influenced by measures such as making the acquisition of the devices reasonably-priced, easy and content-wise attractive to viewers. Pay-TV still has five years before the switch-over to the newer T2 transmission technology taking place in 2017. Agreements concerning pay-TV services are normally considerably shorter-term than this. This means that both viewers and businesses providing pay-TV services have enough time to prepare for the upcoming change.

The efficient uptake of new technology (DVB-T2 and MPEG4) from the beginning of 2017 will speed up the process of switching over to HD broadcasting. In terms of the national economy, it is important that the financial advantage to be gained from the 700 MHz band can be fully taken into use as soon as it becomes possible at national and international level. The changes must, however, be implemented so as to secure the interests of the viewers and the operating conditions of television broadcasters.

The goal is that the switch-over to DVB-T2 technology will be implemented on a larger scale in 2020. In order to determine a feasible and, in terms of the operators and viewers, an appropriate time for the switch-over, it is deemed necessary that arrangements be made to agree on a time for an interim review.

To ensure a coordinated and efficient transition to T2 technology, the Ministry of

Transport and Communications will set up a working group to draft a detailed switch-over plan by summer 2013. The working group would include the representation of television operators, network and service operators, equipment retailers, FICORA and the Consumer Agency. The switch-over plan will cover issues such as measures to increase the number of T2 devices and monitor this development, draft a plan on how to increase T2 broadcasts even before 2017, and identify measures required after this so that decisions can be made at the interim review on when DVB-T2 should be adopted on a larger scale. The working group would also evaluate measures needed to disseminate information to consumers and operators in the field in an efficient way.

If more than three multi-frequency multiplexes were reserved for television operations, this would have a particular impact on the long-term technical planning of frequency use, resulting in weaker spectrum efficiency. In terms of efficient use of spectrum, the model proposed enables Finland to work towards a reasonably high number of television networks in international frequency coordination. The model does not, however, allow as extensive reorganisation of frequencies – or increase in efficiency enabled by new technology – as was originally planned.

The option proposed strengthens the position of terrestrial television, because it guarantees nationwide coverage for public-service and public-interest channels also in the future without requiring that households purchase new equipment or realign their antennas in situations wherein the households do not wish to receive programmes by using new technology.

As a general rule, network licences would no longer specify whether programming transmitted via the DVB-T2 multiplexes needs to be in standard or high definition. Network operators could then, in cooperation with television broadcasting companies, decide whether the multiplex shall transmit in high definition, basing the decision on demand. If the DVB-T2 multiplexes are used for standard transmission, a single multiplex could accommodate 15 to 20 channels. Moreover, it is possible to transmit the two broadcasts simultaneously.

The latest DVB-T2 technology standard features mobility. Scenario 2 would, therefore, also enable mobile television broadcasting. If necessary, this issue can be addressed in network licences, for example.

Also, through guaranteed viability of terrestrial television, equality across the regions can be promoted. Scenario 2 provides nationwide coverage for YLE's public-service channels and other channels serving public interest for all viewers. Experience of recent years indicates that there is still enough frequency capacity for television operations even to exceed demand. In terms of equality across regional boundaries, it is also important that the content of broadcasting be as varied in terrestrial as in cable television or, in future, IPTV.

The model does not make estimates as to how many network operators would be active in terrestrial broadcasting. Currently, the number of network operators is three. The target is still to promote competition in the terrestrial television market and improve the operation conditions of network operators. Alternative service providers have a positive impact on price competition. Distribution costs can be influenced also through market regulation, a topic reviewed separately in connection with the preparation of the Code for Information Society and Communications Services.

The 700 megahertz spectrum band, currently used for television broadcasting, will be allocated to mobile communication use from the beginning of 2017. In addition to domestic resolutions, decisions on the global and European levels and coordination agreements with neighbouring countries are needed, to make this possible. Finland

strives to influence the international planning and collaboration work related to the future use of the 700-megahertz spectrum band such that mobile use of the band would be possible within the schedule planned at the World Radiocommunication Conference in spring 2012.

Information and communications technology and high-quality communications networks are important for maintaining and increasing people's well-being. Finland has long been a leader in wireless communications. According to forecasts, the world's mobile data traffic will grow by 26 per cent each year until 2015. The uptake of the 700 MHz band for mobile communications creates early opportunities for the deployment of new services and technologies – predictability together with the preparation of spectrum decisions at national and international level significantly improve our opportunities to respond to future needs. Japan allocated the 700 MHz band to mobile communications (LTE) in June 2012, while Australia is planning to auction it in April 2013. These examples, too, indicate that this frequency band can be transferred to other than television use quite quickly. The decisions made are also in line with the goal written down in the Government Programme according to which Finland will become the leading European country in terms of broadband access.

If 698–790 MHz – referred to as the 700 MHz spectrum band – were to be allocated to mobile broadband use, Finland's current frequency reservations in the 470–694 MHz band should be increased. It is to be expected that Finland's neighbouring countries will want at least as large additions to their television frequencies as those proposed by Finland.

The concept of additional frequency reservations refers to frequencies that have not been allocated to Finland in line with the Geneva 2006 agreement, or on which there has not been separate agreement with neighbouring countries.

With additional frequency reservations, it is possible that a neighbouring country will not approve the addition of the frequency or will set conditions that make building the network more difficult. Moreover, some of the additional frequency reservations proposed by Finland are such that their implementation would obstruct some of the expansion opportunities available to neighbouring countries. To arrive at an estimate of the final number of television networks enabled by frequency reorganisation, we must investigate the needs of Finland's neighbouring countries for expanding their television networks by means of DVB-T2 technology. Neighbouring countries must reach mutual agreement on how frequency reservations will be divided among countries in border and coastal areas.

Compared to DVB-T technology, DVB-T2 enables more extensive single-frequency networks (SFNs). The transition to single-frequency networks would enable construction of more multiplexes than is possible with current network planning. DVB-T2 technology enables the construction of single-frequency networks, of which Finland already has some experience. FICORA has initiated re-planning of the UHF frequencies associated with the television network licences that expire in 2016. Preliminary discussions with Finland's neighbouring countries began in 2011. Frequency planning aims at providing a flexible opportunity for using the 700 MHz band for wireless broadband, creating at least two multi-frequency networks and, optionally, more extensive single-frequency networks in the spectrum band below 700 MHz. The results of frequency planning depend on those of the negotiations with Finland's neighbouring countries.

The transition from standard broadcasting with DVB-T technology to DVB-T2 high-definition broadcasting is currently under way. The new technology will introduce evolved broadcasting and compression technologies that allow a single multiplex to be used for transmitting as many programmes with the old technology as with the new. It is fair to assume that developments will be similar during the transition to UHD TV.

When decisions on the transitions to newer technologies (DVB-T2 and MPEG4) are made, the options for practical implementation and related measures can be planned and prepared for in cooperation with the authorities and operators in the industry.

15.2 Promotion of financial efficiency in frequency use

A spectrum fee, covering only the administrative costs of FICORA, has so far been paid for frequencies used for television operations. Until the most recent amendment to the spectrum-fee decree, this fee was completely disproportionate to the spectrum fees paid by telecommunications operators. The Ministry of Transport and Communications decree on the fees collected by the Finnish Communications Regulatory Authority for radio administration services (1222/2010), which came into force in early 2011, specifies how the basic formula for spectrum fees is to be applied to both mobile-communication networks and mass-communication networks. This change raised the spectrum fees for television operators and made spectrum fees' distribution more equal. The fees paid by television operators rose from EUR 54,000 to approximately EUR 1.5 million. Those paid by mobile-communications operators declined from EUR 5.2 million to about EUR 2.4 million.

As the number of frequencies is now accorded greater weight, causing significant increases in television operation spectrum fees, the decree specifies a transition period. The changes in spectrum fees for television and mobile-communications operations are implemented through a five-year transition, so they do not become fully effective before the beginning of 2016.

The plans to reorganise the frequency use of television operations also introduce a new spectrum fee, reflecting the market value of the frequency and exceeding the administrative expenses of FICORA, that would be collected from the users of terrestrial television frequencies – i.e., network operators. A supplementary spectrum fee is particularly well suited to spectrum bands that are already in use and for cases wherein authorities find it necessary to steer the use of the relevant spectrum band.

In determination of the spectrum fee proposed, the scope of the business operations involving the frequencies allocated for television operations would be taken into account, as would the transition of the 700 MHz spectrum band from television operations to mobile communications, and the competition with alternative distribution channels.

However, the fee to be applied must be realistic also in terms of the scope of related television business operations. In the Government's resolution on the auction of the 800-megahertz spectrum band, for example, the initial price for one 2 x 5 MHz spectrum band pair was proposed to be 16 million euros, making the price of one licence for 2 x 15 MHz frequencies at least 50 million euros, and the price of the entire spectrum band at least around 100 million euros. When adjusted for the length of the licence period, this sum would equal only approximately one per mille of the telecommunications companies' annual turnover.

If one follows a similar principle and takes into account the above-mentioned special characteristics of television operations, the annual adjusted spectrum fee for a multiplex reserved for other than public-service and public-interest channels could be in the range of 30,000–40,000 EUR. The estimate is based on the value of the Finnish television industry in 2010 (roughly a billion euros), of which pay TV accounted for approximately 230 million euros.

This statement pertains to pay-TV operations. Other criteria should be used for determination of which channels serve the public interest alongside the public-service channels of YLE. It would be the responsibility of the holder of the network licence to

grant transmission capacity to these channels from the multiplexes that do not have higher spectrum fees. The proposed model can be justified in terms of specific objectives of communication and public policy, such as the objective of guaranteeing the prerequisites for domestic-content-generation operations, which also serve as grounds for definition of, reciprocally, various obligations to the public-interest channels as set forth by law.

Regulation pertaining to the higher spectrum fee would require that a holder of a network licence who has a licence for both public-interest and other multiplexes separate these multiplexes from each other in its accounting. The holder of a network licence must be able to verify credibly that the cost of a higher spectrum fee is not allowed to permeate the network capacity prices of public-interest multiplexes.

15.3 Frequency management and licensing system reform

The reformed licensing system should be unambiguous, easy to administer for both operators and authorities, and easy to apply and monitor. In order to improve forecasting, which is a key factor for operators, the criteria for granting of licences should be unequivocal and precise.

Frequency management reform

The law would continue to specify which operations that use radio frequencies require a Government-granted licence. As a baseline, a licence granted by the Government would be required for provision of network services via digital terrestrial mass-communication networks. A Government decree would set out the general principles for frequency use. The decree would include provisions pertaining to the number of television, radio, and mobile-communication networks, for example, and the spectrum bands used. Furthermore, the decree would include provisions for how spectrum bands are to be used for mobile communication system product development, testing, and educational purposes.

The detailed provisions addressing radio-frequency use laid down in the Government decree would be enforced with FICORA regulations. For television networks, this would entail provisions addressing what channels and radiation power may be used by the various multiplexes. For public services as well as national, regional and local radio operations, FICORA's regulations would specify the frequencies to be used in various frequency bands.

Television network licences

Terrestrial television network licences determine which companies have the right to use national frequency resources for a maximum term of 20 years. The question of licences involves, therefore, a major communication policy decision that should continue to be resolved by the Government. Section 15.1 above presents in more detail the rationale for preserving the current model for granting of licences. Network licences would be granted in line with the comparative method, and the licence period would be 20 years. However, it needs to be possible to review the licence terms and conditions during the licence period if required for reasons such as technological development. Such an occasion will be, for example, the interim review to be carried out in 2020 with the purpose of estimating the need to continue DVB-T2 transmissions. The principle of technology-neutrality must also be taken into account in the terms and conditions of future licences. The regulatory framework related to network licences will be evaluated as a whole in conjunction with the drafting of the Code for Information Society and Communications Services. In the process, the experience gained from existing regulation will be utilised in order to simplify and clarify the regulatory framework as necessary. For example,

spectrum efficiency can be promoted by stipulating that a licence holder may no longer possess unused frequency capacity.

In order to further the efficient use of spectrum, multiplexes that do not serve the public interest would be subject to a higher but reasonable spectrum fee.

Simplified programme licence procedure

With respect to the fundamental-rights system, it has become evident that scarcity of frequencies has lost its significance as a key criterion in the current television programme licence-granting system. Most recently, the Constitutional Law Committee observed in its statement of 24 February 2010 that even if scarcity of frequencies at the time were still to constitute legitimate justification for the licence system, the situation will in all likelihood, as a consequence of emerging new distribution channels, be different in the future, resulting in the need to re-evaluate the extent to which the licence system is in line with Constitutional law.

The restrictions presented for the programme licence system are still largely related to the scarcity of frequencies, on the one hand, and to the objectives to do with freedom of speech, which the licence system seeks to ensure. In terms of the fundamental-rights system, these are still valid arguments. Examining the system in light of Constitutional law requires assessing whether these arguments alone can, in the future, justify the programme licence system in a manner in line with the Constitution.

Making frequency resources available for television operations and guaranteeing versatile programming that also takes the needs of special groups (such as children) into account is also possible through means that do not compromise freedom of speech. In cable broadcasting, this principle was applied as early as 1999, when licences were no longer required.

In assessment of the licence system for radio operations, it needs to be noted that FM radio is still the most common method of listening to the radio, and there is no single alternative method that would emerge as its replacement. Also, radio distribution channels have not evolved in the manner of digitised television broadcasting. In many cases, demand for radio frequencies outstrips supply and licences can be granted to only some of the applicants.

The proposal to transfer programme licence decisions for both television and radio to FICORA in situations wherein there is no shortage in frequency capacity relative to that required by the operations would simplify the current programme licence system. This would facilitate forecasting and shift procedures in the direction of constrained deliberation.

Licence procedure for television operations

Nationwide reception of YLE's public-service channels and channels serving public interest needs to be ensured also in the future, and the free reception of channels serving the public interest must be promoted. By contrast, the situation of pay-TV channels differs from that of the channels mentioned above. Pay-TV channels should be given the opportunity to respond to customer needs and market changes through flexible adjustments in programme content.

Following digitisation and the proliferation of modern broadcasting and compression technologies, the frequency capacity available for terrestrial television operations no longer suffers from the scarcity that was still common 10 years ago, in the analogue era.

Consequently, there is no corresponding need to bring programme content decisions to the Government in cases wherein available frequency capacity does not meet demand.

After granting network licences, FICORA would initiate a registration procedure, whereby television operators are requested to announce their interest in conducting operations. In the first phase, FICORA would verify that the general prerequisites for operations are met. This assessment would comprise an investigation related to the material requirements for a licence, as specified in Section 9 of the Communications Market Act and Section 10(2) of the Act on Television and Radio Operations. The current EUR 1,000 application fee would become a EUR 5,000 registration fee. The fee increase is aimed at preventing groundless applications that generate superfluous work and expenses. In view of the nature of the operations, the fee can still be considered to be reasonable and quite low. The registration fee would have to be paid prior to the commencement of operations.

When applicants register a channel that serves public interest, FICORA's task in the following phase is to clarify whether the conditions for public interest, as set forth by law, are fulfilled. These conditions include nationwide coverage of the population; daily programming in Finnish or Swedish, including drama in Finnish or Swedish; daily news and current-affairs programming, including documentaries in Finnish or Swedish; audio-description and subtitling services; free reception; and meeting of the requirement ruling out communication clusters, which specifies that companies other than YLE may not obtain more than one channel serving the public interest in the terrestrial television network.

If the conditions are fulfilled, FICORA can state that, given the announcements received from holders of a network licence, there is sufficient capacity for all operators who have expressed an interest and can specify in the licence decision that the content provided by the television operator in question constitutes a channel serving the public interest. After such a decision, the channel has the legal right to receive broadcasting capacity from network licence-holders in a terrestrial television multiplex that is not subject to higher spectrum fees. In the event that the operators fail to reach agreement on channel numbering and FICORA issues a regulation on the matter, a location may be allocated to a channel serving the public interest among the first five channels, for example. In conjunction with the drafting of the Code for Information Society and Communications Services, steps would also be taken to clarify the provisions included in the Television and Radio Act concerning supervision fees such that a licence holder would not be obliged to pay a supervision fee for licences granted to multicast programmes. This change would specifically influence channels serving the public interest since these would be broadcast as multicast transmissions during the transition period.

Television operators who do not fulfil the requirements of the licence decision will lose their right to operate in a public-interest multiplex; i.e., their licence is, in practice, revoked through procedures set forth by law.

The licence period would continue to be 10 years at maximum; otherwise the licence has no special terms or conditions.

For channels other than YLE's public-service channels or channels serving public interest, FICORA would investigate the companies who have expressed their interest only to the extent of whether or not they fulfil general requirements. If sufficient capacity is available for all operators who have expressed their interest, FICORA will make licence decisions wherein it specifies the companies who have the right to conduct television operations in terrestrial television networks without restricting this right to any specific multiplex. Consequently, television operators could in the future select the network

capacity provider who best suits their needs. The licence period would be 10 years, with no other, separate terms and conditions.

If the capacity available exceeds that required by the companies that have registered – i.e., there is unused broadcasting capacity – FICORA may, after issuing its decisions, approve applications in order of arrival. However, the period for one of the licences so granted may not exceed the period of those licences that were granted through the registration procedure.

Licences can be transferred, but FICORA would have to be notified of such transfers so that it can investigate whether the prospective recipient of the licence fulfils the above-mentioned general requirements. This is to ensure that the licence is not transferred to a company that does not, for example, have the financial capability to carry out continuous television operations.

If the total capacity for television operations is insufficient (i.e., more operators have expressed an interest in conducting terrestrial television operations than there is available capacity), the power of decision over licences would be transferred to the Government, with governmental decisions determining only whether the operator has the right to use of terrestrial network capacity. For multiplexes other than those reserved for the public interest, the Government would no longer determine the multiplex used by individual channels. Government decisions would be based on FICORA's groundwork. This does not, however, mean that the Government is bound by FICORA's proposal.

The Government decisions would to a large extent be based on the requirements expressed in the Act on Television and Radio Operations in its current form. However, as regulation is developed further, the need for specifying the criteria in more detail, bringing the process closer to constrained deliberation, must be considered. At the same time, it should be considered whether the means of communication policy and electronic-communications legislation should be used to promote regulation that more forcefully prevents creation of communication clusters.

Licence procedure for radio operations

The procedure described above would also be applied to radio operations whenever relevant. The licence period would be 10 years. For improved forecasting and better meeting of the conditions for operations' development, it is assumed that, in a departure from previous practices, the term of a licence would be the maximum duration set forth by legislation.

The use of spectrum in operations lasting no longer than three months, subject to a licence issued by FICORA, and licence-exempt spectrum use should be more clearly than at present separated from permanent radio operations. The use of frequencies intended for short-term radio broadcasting is to be clarified such that in radio broadcasting based on a short-term licence, it is not allowed to engage in commercial communications.

Telecommunications subject to notification obligations

The legislative development work related to the reform of the licence system also involves reassessment of the notification obligation set forth in Section 13 of the Communications Market Act. The current notification obligation would be extended to cover a wider range of operators who are under the supervision of FICORA. Video-on-demand service providers, for example, should in the future notify FICORA of their operations. As the purpose of the notification obligation is to improve the quality of information available to the authorities, it does not on its own generate any rights or duties. Currently, FICORA is not informed of video-on-demand service providers,

although they operate under the same regulations on sponsorship, product placement, and European programme content as linear-television service providers do.

The notification procedure would be simple and electronic, requesting operators to provide only such basic information as is mandatory for supervision purposes. FICORA would obtain all other information on a case-by-case basis and in line with its right of data acquisition.

15.4 Guaranteed high quality of programme content and domestic content production, and promotion of multifaceted communications

Domestic content production and its guaranteed continuity are essential for ensuring that Finnish audiences will, in addition to multinational content, continue to receive diverse high-quality and versatile programming created for Finnish audiences in Finland.

Communication policy measures ensuring the vitality, high quality, and versatility of Finnish television operations include using legislation and making licence decisions such that first, two multiplexes and later on, one multiplex can be reserved for the free reception of commercial channels serving the public interest alongside the public-service programming of YLE. Through legislation and FICORA's decisions and regulations, it can be ensured that the channels providing public-interest-broadcast programmes in Finnish or Swedish daily, including domestic drama and daily news and current-affairs programming, also feature domestic documentaries and programmes created by independent producers. By default, such programmes are to be available for all Finnish viewers. Moreover, channels serving public interest are required to provide their programming with audio-description and subtitling services.

It is proposed that regulation of the percentage of programming to be created by independent production companies be amended such that television operators are to reserve 19 per cent of broadcasting time or, alternatively, 19 per cent of their programming budget for programmes created by independent producers. In comparison to programmes created abroad, Finnish programme content is very expensive for television operators. The true competitive advantage of Finnish content lies in our languages and culture, and in programmes that speak of Finns and to Finns. This is confirmed by the great popularity of Finnish television content.

The objective of the proposal is to ensure meeting of the prerequisites for Finnish content production. Based on the information released by FICORA concerning the year 2011, it can be assumed that the financial impact of the proposed amendment will be insignificant. Finland's report to the European Commission on the meeting of the quota for European programmes in 2009 and 2010, as specified in articles 16 and 17 of the Audiovisual Media Services Directive, includes further information on this matter. The report is based on information collected from television operators by FICORA.

The criteria that must be met for a channel to be considered one serving public interest have been described earlier in this document. One proposed criterion involves daily broadcasts in either Finnish or Swedish, along with news and current-affairs programmes including, for example, domestic documentaries and drama in Finnish or Swedish. The objective of the proposal is to contribute to the protection of domestic content production.

The equal treatment of special groups is ensured via legislation, which also guarantees that broadcasting operators continue to have obligations related to advertising, sponsorship, product placement, and tele-shopping programmes. Regulation relevant to the protection of children, such as imposition of age limits for specified viewing times, would continue to apply for all broadcasting operators. As it stands, the definition of

freedom of speech in the Constitution prevents all forms of advance censorship or intervention in content.

The provisions of section 20 of the Television and Radio Act concerning the use of exclusive rights and the Government Decree issued by virtue of that section on television broadcasting of events of importance for society (199/2007) ensure, for their part, that the public has the opportunity to follow events of social importance via free television channels.

15.5 Promotion of new, alternative distribution channels

Extending well beyond 2017, terrestrial television is likely to maintain its position as a cost-efficient, national and reliable distribution channel that serves as an alternative to linear television broadcasting. On the other hand, hybrid reception and other distribution channels will take on a bigger role also as distribution channels for traditional television broadcasting. Broadband is seeing increasing use for viewing of films and television series, for example. Changes in viewing habits, such as increasing demand for various time-shifted services, also affect the proliferation of IPTV and OTT television in particular.

When the best features of various broadcasting networks are combined, viewers can be provided with comprehensive, high-quality services that are also reasonably priced. The importance of broadband as a distribution channel will also be accelerated by hybrid terminals, which allow for easy, large-screen content delivery via all distribution channels.

Communication policy measures are used to promote the proliferation of fast broadband connections in areas governed by the market and in those where operations are not financially viable. In its resolution of 3 May 2012, the Government stated that the target of 100 Mbit/s by 2015 will be maintained for the current term of government. By 2015, permanent residences are to be no more than two kilometres from a high-speed 100 Mbit/s broadband connection. The publicly supported broadband project for sparsely populated areas continues, but more flexibility is needed in its financing. In line with this resolution, the cost-efficiency of broadband construction too will be improved. To this end, road, rail and private-road legislation will be amended such that cables' placement in the future is handled in the most cost-efficient manner possible where the transport infrastructure as a whole is concerned.

The universal-service broadband speed will for now remain as it is, but the option of raising it to 10 Mbit/s is being investigated. Currently, the basic speed for a connection provided under the universal service obligation is 1 Mbit/s.

In line with the Government Programme of Jyrki Katainen's Government, the Ministry of Transport and Communications will, by the end of 2012, draw up an Action Programme for boosting the supply and demand related to market-driven broadband connections.

The Government Resolution on Spectrum Policy, as made in March 2012, includes solutions that will expand the availability of mobile broadband, particularly outside urban areas. The 800 MHz spectrum band is of especially great significance for service availability and competition in sparsely populated areas. This spectrum band enables high-speed connections to be constructed cost-efficiently also in less densely populated areas. With LTE technology, mobile services can reach the speed and quality-of-service levels of fixed-network broadband. In line with the resolution, high-speed wireless broadband connections will, in practice, be available to all Finns within five years.

As stated above, the future also includes the possibility of freeing a fourth, 4G-enabling spectrum band for mobile communication use. In February of this year, the World

Radiocommunication Conference (WRC-12) allocated the 700 MHz spectrum band, currently used by television operators, to mobile broadband networks from 2015 onward. Allocating the frequencies to wireless broadband networks requires, however, a final decision by the next Radio Communication Conference (WRC15). Once it is possible to assign this band to mobile communication devices in Finland, the licences for this spectrum band will be granted in the way that best promotes competition in the market.

Allocating lower frequencies to mobile communications enhances the distribution of audiovisual content and promotes high-speed mobile-communication networks.

15.6 Radios

During the current licence period, measures are being initiated to ensure the vitality of Finnish radio operations. Particular attention is being paid to ensuring the future of regional radio operations. These measures include, for example, assessment of the impact of radio advertising, particularly from a financial point of view. Preparations for the coming licence period also include evaluation of how licence and frequency-set planning can better account for the market situation and the competitive environment.

The action plan drawn up in cooperation with the authorities and operators in the industry will address, in addition to the issues mentioned above, frequency questions related to digital radio switchover, matters of community radio and frequency capacity reserved for short-term radio operations, including a clear distinction between short-term and permanent radio operations, and the opportunities for developing innovative cooperation models for radio operators (involving, for example, independent content creation).

15.7 Taking care of viewers and listeners

The changes that viewers and listeners should prepare for have been described above. Informing the public of these changes and related options in good time and with sufficient clarity is a major challenge for the authorities, service providers, and also equipment retailers.

When mobile-communication networks in the 800 MHz spectrum band are built in 2014, reception problems may occur. Also, the reorganisation of network licences in 2017, including the allocation of the 700 MHz band for operations other than television broadcasting, may require actions from consumers, consisting mostly of searching for channels. Consumers might also encounter changes in antennas. In buildings with a master antenna system, for example, measures by professionals related to the antenna and channel amplifiers are required. However, diligent frequency planning is conducted with an aim of minimising any impact these changes might have on consumers.

Wireless broadband use within the 800 MHz band and the allocation of the 700 MHz band to wireless broadband may both cause interference to television reception, particularly if the antennas and antenna systems used in reception are of poor quality or incorrectly installed. FICORA should, therefore, have authorities prescribed in law to issue regulations on the minimum technical requirements for antennas and antenna systems used in television reception. This would also improve the quality of new antenna system instalments and prevent future interference.

It is essential for viewers to know that, regardless of the 2017 frequency reorganisation and the introduction of new technical alternatives, the YLE channels and other channels serving public interest can be received with today's terminal equipment until 2026 – households are not expected to purchase new equipment. Switching to higher-quality

television broadcasting would depend on the decision of each household. Since it is difficult to estimate the number or schedule of households moving over to reception of high-definition broadcasting, it is proposed that an interim review be carried out before switching over to HD broadcasts on a larger scale. The working group responsible for making preparations for the switch-over would evaluate the situation, and the review would take place in 2020, as explained above.

Pay-TV operators play a significant and immediate role in services offered to viewers. The proposed changes to pay-TV operators' regulation advance the viewers' interests.

15.8 Conclusions on some other details

15.8.1 Pay-TV service providers and the one-card principle

Pay-TV operators are a key stakeholder in the Finnish television environment. Consequently, we need to assess whether it will be necessary to extend regulation to pay-TV service providers and their operations in the future. As explained in section 13.3, minimum-level regulation requires that pay-TV service providers notify FICORA of the establishment of their operations.

Extending the regulation of electronic communications more explicitly to cover also pay-TV operators is a measure aimed at giving consumers a more secure position. The service supply of pay-TV service providers is comprehensive and not restricted to video-on-demand services.

In the digital, terrestrial television environment, consumers need to be able to use the pay-TV services of various service providers flexibly. Television-viewers must be provided with the option of using all pay-TV services with a single conditional-access card. In addition to improving the viewers' user experience, this is a way to promote the possibility of using the services of various service providers.

Terrestrial networks' pay-TV channels are currently not available with only one card. If consumers wish to view channels provided by two or more pay-TV operators, they need to change card when watching broadcasting via the terrestrial network. In addition to switching cards, consumers need to call the customer service unit of the pay-TV operator in order to implement the change.

In its decision of 7 May 2012 (1459/9229/2011), FICORA stated that the one-card principle must be implemented in digital terrestrial mass-communication networks. In the resolution, FICORA urged DNA Ltd and DigiTV Plus Oy to ensure, through cooperation if needed, that consumers do not need to change cards while viewing if they use services of more than one pay-TV operator in the terrestrial network. This requirement must be met by 1 October 2012.

Regulation under section 136 of the Communications Market Act needs further clarification. The situation will become only more challenging as pay-TV channel decoding becomes software- instead of card-based and as viewers switch to operator-specific set-top boxes, which limit viewer choice and make it more complicated to switch pay-TV operator.

A clarification is proposed to the regulation in section 136 of the Communications Market Act, which would be amended such that the purpose and objectives of said section are included in a new regulation on the one-card principle. As a presumption, the obligation to implement the one-card principle would be clearly extended to include all operators in the television-industry value chain. Pay-TV service providers could continue to agree amongst themselves as to how the one-card principle would be implemented in technical

terms. If agreement ensuring that viewers can, in practice, receive the pay-TV services of all competing operators via one card cannot be reached with a new operator, FICORA would determine the terms of the agreement among the operators within a time period laid down by law.

15.8.2 Must-carry obligation

The European Commission has initiated an investigation into regulation related to the current must-carry obligation in light of the Copyright Directive. The current solution, wherein the cable network's retransmission of channels within the scope of the must-carry obligation is completely free of copyright royalties through full-copyright restriction, might face pressure in the future.

The must-carry obligation ensures that viewers can receive programming that is essential in terms of freedom of speech. The well-grounded expectations of viewers speak in favour of continuation of the must-carry obligation for not only YLE's public-service programmes but also commercial programming serving the public interest.

In the process of drafting the present policy programme, a variety of different views have been expressed on the necessity and extent of the must-carry obligation. As far as communications policy is concerned, copyright royalty decisions and compensations for the must-carry obligation are considered separate questions. Therefore, irrespective of future copyright royalty decisions, the assumption is that the must-carry obligation would continue to apply, with its current scope, to YLE and the programmes of other channels serving the public interest. This is a communications policy decision that further strengthens the equal opportunity of all viewers to receive channels that serve public interest.

15.8.3 Quality of television broadcasting

The technical quality of a television broadcast, as experienced by the viewer, is influenced by the entire transmission chain and the viewer's reception system and terminals. The transmission chain consists of a technical programme stream generated by broadcasting companies and the television broadcasting network(s) through which the programme stream is transmitted to viewers' reception systems and terminals.

Transmission network

FICORA's regulations apply to, for example, rating of television networks' and service components' importance, and the minimum levels of verification, scaled on the basis of the rating. The regulations apply also to network management capability in situations of normal quality control and to detection and management of faults and other events. Since, on a general level, the requirements involve the basic prerequisites for high-quality television operations, the security and network management requirements apply to all television networks and services.

The scope of regulatory obligations has for quite some time been determined first and foremost by the requirement that basic television services be extremely reliable technically. Because of this premise and the functionality- and quality-related questions that arose with the digital switchover, FICORA's reliability-requirement-related regulations apply to all linear television services. On account of the diversification of television networks and services, future regulations need to determine the classification criteria for programmes and distribution networks whose high quality and reliability are considered to be indispensable to viewers. Currently, regulations specify only YLE's

public-service television programming and other free-to-air television programming serving public interest as constituting a special group of special interest.

Reception and internal networks

Reception quality is influenced by reception systems, such as the antenna systems used in terrestrial television reception, and the quality of a building's internal communication network. The compatibility of terminal equipment, related software and the television network is another essential factor in reception quality.

As stated in section 11.2, the decisions that building-owners make on internal network renovation and the types of networks they install have a long-term impact on the options the building's residents have for communication services' selection and use. Also, whether several telecommunications companies can provide services to the building simultaneously is dependent on these decisions. To be able to choose a solution that does not bind the building and its residents to one operator or transmission technology at any given time, holders of real estate must have certain competencies and information. Furthermore, it has been stated that regulation of a building's internal network involves protection of private property to such an extent that network renovation and renewal requirements should be specified in separate regulations.

The high quality and technical flexibility of internal networks can be ensured by means such as inter-authority communications, more detailed obligations, or even financial support for internal network renovation. Recommendations or requirements can, for example, be used to stipulate that the communication network of a building is, by default, to be renovated in connection with pipe repairs, if not earlier.

Co-regulation

In terms of terminal compatibility, self-regulation within the industry has functioned well. To ensure the overall quality of television services, self-regulation and co-regulation that is to some extent based on statutes are apt mechanisms for application alongside normal requirement regulation. Co-regulation, for example, can be applied when viewers are able to assess the success of co- or self-regulation, or when operators have a shared interest and relatively little room to manoeuvre within the constraints of a standard. Security and preparedness requirements and similar factors for which the interest of society typically surpasses business interests, and for which the impact of investment on the quality of television broadcasting is not immediately visible to the viewers, are by nature not suitable for self-regulation by the industry.

Co-regulation, self-regulation, and greater industry responsibility for quality assurance could be promoted through creation of a regulated framework of predefined subjects to which this regulatory method could be applied. This matter should be considered in more detail during the preparation of the Code for Information Society and Communications Services.

15.8.4 Channel numbering

As is stated above, there are currently no legislative provisions for channel numbering. To facilitate switchover to new transmission standards or the market entry of new operators, channel-numbering regulation must be examined. It is also necessary to consider the viewers' established viewing habits. To accommodate both of these objectives, it would be necessary to give FICORA the authority to issue, when necessary, more specific regulations on channel numbering. As a rule, however, decisions on channel numbering should be made by operators in the field. When preparing the

regulation, FICORA should give priority in channel numbering to YLE channels and the other channels serving public interest that meet the criteria set.

15.8.5 Multicast technology

The creation of network service products based on multicast technology, driven either by commercial initiatives or by regulation, is one expression of the ongoing development in which a combination of unlimited internet connection services and interconnection of IP networks can have an impact on the financial and technical development possibilities of a variety of services, such as the prospects of OTT services over the internet when compared to the telecommunications companies' own IPTV services.

Any decisions to promote regulation in support of OTT services as opposed to broadband services and included IPTV services would, by nature, address and affect aspects of competition and business. Multicast technology has its own challenges, though these are not decisive factors. National regulation decisions that touch on competition would in all likelihood require the approval of the European Commission. The requirement of a multicast product offering, for example, would bring with it questions related to regulation of significant market power over the terms on which the product is offered.

In this phase of market development, we cannot argue for the establishment of national regulatory resolutions. Monitoring international developments and participating in European discussions are, however, important if we are to be able to assess the possible need for national resolutions and regulations in cooperation with the industry. Any legislative measures required can be examined, for example, in conjunction with the drafting of the Code for Information Society and Communications Services.

16. REQUIRED CHANGES IN LEGISLATION

In many instances, the proposals of the Communications Policy Programme for Electronic Media require amendments to existing legislation. Further preparation of the legislative amendments is being conducted in connection with the preparation of the Code for Information Society and Communications Services and in collaboration with the operators and authorities of the industry.