



Ministry of Transport
and Communications

Terrestrial television: the next technology transition

Working Group Interim Report

Ministry of Transport and Communications

Vision

Well-being and competitiveness through high-quality transport and communications networks

Mission

The Finnish Ministry of Transport and Communications seeks to promote the well-being of our people and the competitiveness of our businesses. Our mission is to ensure that people have access to well-functioning, safe and reasonably priced transport and communications networks.

Values

Courage, equity, cooperation



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Abstract

This Interim Report discusses some of the recent changes in the Finnish media landscape that need to be taken into account in the next technological transition in terrestrial television broadcasting. The Working Group has drawn up a detailed plan for the transition to more advanced broadcasting technology. The report also outlines an information and communications plan that is designed to facilitate the transition.

To the Ministry of Transport and Communications

The Ministry of Transport and Communications appointed on 5 December 2012 a Working Group to draft a detailed transition plan to facilitate and expedite the transition to more advanced terrestrial television distribution technology. The Working Group's mandate expires on 31 December 2016.

This Interim Report by the Working Group presents a multiplex-specific plan for the transition to more advanced television transmission technology as well as an information and communications plan designed to ensure that consumers and other stakeholders receive timely and appropriate information about what this transition implies.

The Working Group hereby submits its Interim Report to the Minister of Housing and Communications.

Helsinki, 22 November 2013

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1. BACKGROUND

In September 2012 the Finnish Government submitted to Parliament its Communications Policy Programme for Electronic Media in the form of a Government Report (VNS 4/2012 vp). The report describes the Government's vision of the future of terrestrial television with special reference to the current operating licence system and future spectrum use. The measures detailed in the report are scheduled for implementation from the beginning of 2017. In order to achieve the objectives set out in the Communications Policy Programme it is imperative that these measures are put in place as early as possible since they have great significance in terms of both impact and coverage.

This Working Group Interim Report presents a detailed plan designed to facilitate and expedite the next technology transition in terrestrial television. It is intended, first and foremost, to ensure that viewers and other stakeholders have all the relevant information well ahead of time so that they can prepare for the changes taking place from the beginning of 2017.

These changes will affect no more than around half of all households in Finland. Cable households and those using other than antenna reception technologies will remain unaffected.

Since discussions on frequency allocations are still ongoing with neighbouring countries and since no decisions have as yet been reached on multiplex frequencies, the Finnish Communications Regulatory Authority FICORA will in 2014 prepare a more detailed plan on the necessary frequency changes.

Furthermore, during the remainder of its mandate, the Working Group may prepare annual reviews of recent developments and measures introduced each year. This Interim Report is not intended to provide an exhaustive reply to all questions that will need to be resolved before 2017. Some of the issues that remain to be addressed in the next stage include the necessary frequency changes, practical implementation of the information and communications plan, and the possibilities for the adoption of more advanced pay-tv transmission technology with advancing DVB-T2 penetration. In addition separate analyses will be conducted of the costs of parallel broadcasting and the impacts of future changes.

1.1 Key recommendations of the Report and Parliament's position

The recommendations of the Communications Policy Programme for Electronic Media that are most relevant to this Interim Report are reproduced below as published in the 2012 programme document. They do not yet reflect the changes recommended by the Working Group in this Interim Report.

1. Taking care of the interests of viewers and listeners

- Finland has long been a leader in electronic communications. This success is attributable in part to our forward-looking communications policy. In switching over to a new transmission technology in terrestrial television, attention should be paid to implementing the process in a timely, efficient and coordinated way as soon as the necessary preparations 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 switchover 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 from an administrative point of view– this is when nearly all existing television operating licences expire. The measures proposed in the 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.
- The timetable of a larger-scale switchover 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.

2. Ensuring the high quality of content provision

- Requirements that contribute to the 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, programming 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 the drafting of 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 will continue to be used in the granting of network licences.
 - A moderately raised spectrum fee is applied to all multiplexes except for 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 will remain in place, but in a stripped-down format. 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 programming licence decisions will become the responsibility of the Finnish Communications Regulatory Authority (FICORA).
 - If there is scarcity of frequency capacity, programme licences will 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 will be allocated to wireless broadband. The allocation of lower frequencies to mobile communications will enhance 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 customers. They can promote the adoption of new-technology receivers by making their acquisition reasonably-priced, easy and content-wise attractive.

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

In its communication on the Communications Policy Programme for Electronic Media (Eduskunnan kirjelmä 32/2012 vp), Parliament stresses the importance of ensuring that viewer and listener equity is maintained and that viewers' and listeners' needs are given first priority when considering the future and the prospects of the media industry, or for instance when deciding on deadlines for the switchover to new transmission technologies. Furthermore the communication points out that electronic media distribution channels must be developed in a

balanced and technology-neutral manner, with a specific view to promoting new and efficient distribution channels, but at the same time preserving and securing the use of traditional networks that will long remain necessary. Viewers and listeners must have access to choices that meet their needs not only with respect to varied and diverse contents, but also distribution channels. These questions must be given due attention in connection with the interim reviews referred to in the communication.

The Transport and Communications Committee's report (LiVM 18/2012 vp) makes the observation that, given the speed at which technology is moving and the operating environment changing, the parliamentary communication takes a very long-term view on the future. The Committee emphasises the importance of constantly monitoring ongoing developments, progress towards the targets sets and adherence to timetables. Likewise the Committee observes that since the use of Internet media content may increase more rapidly than believed and since it may further accelerate during the current decade, it may be necessary at some point to revisit and revise at least some of the existing targets, measures and timetables.

1.2 Working Group's mandate and work

In order to ensure a smooth and efficient switchover to more advanced distribution technology, the Ministry of Transport and Communications appointed on 5 December 2012 a Working Group charged with preparing the next technology transition in terrestrial television. The initial deadline for the Working Group's detailed transition plan, submitted in the form of an Interim Report, was 30 August 2013. On 14 August 2013 the deadline was pushed back to 29 November 2013. The Working Group's mandate expires on 31 December 2016.

In November 2013 the Working Group's members are as follows:

Juhapekka Ristola, Chair, Ministry of Transport and Communications
Olli-Pekka Rantala, Vice Chair, Ministry of Transport and Communications
Maaret Suomi, secretary, Ministry of Transport and Communications
Asta Sihvonon-Punkka, Director General, FICORA
Heidi Himmanen, Head of Radio Inspection Group, FICORA
Anja Peltonen, Director, Finnish Competition and Consumer Authority
Ossi Ilveskoski, Head of Marketing and PR, Fox International Channels Oy
Jorma Härkönen, Senior Vice President, MTV Media Oy
Marcus Wiklund, Senior Vice President, Sanoma Entertainment Finland Oy
Toni Flykt, CEO, SBS TV Oy
Markku Korhonen, Operations Manager, UrhoTV Oy
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Elina Leino, Director for Communications, DigiTV Plus Oy
Sirpa Ojala, CEO, Digita Oy
Marianne Hynninen, CEO, Anvia TV Oy
Markku Lamminluoto, Senior Adviser, DNA Oy
Jyrki Ojala, Head of TV Content, Elisa Oyj

Olli-Pekka Takanen, Director, Product Management, Media, TeliaSonera Finland Oyj
Reijo Svento, Managing Director, Ficom ry
Markus Nummisalo, Sales Manager AV, Association of Electronics Wholesalers
Kari Karipuu, Managing Director, Kotek
Timo Niemi, lawyer, Consumers' Association of Finland and
Martti Kemppe, Chairman, Satellite and Antenna Association

The Working Group aims to work closely with industry stakeholders to promote the switchover to more advanced transmission technology in terrestrial television. In addition to preparing an Interim Report, the Working Group will give its assessment by 2016 of the right timing for a larger-scale switchover to HD broadcasts, initially scheduled for 2026.

The Working Group's transition plan is to describe the steps needed to increase the number of new transmission technology receivers and to monitor trends in these numbers. Furthermore the plan is to propose ways in which to increase the number of new technology broadcasts before 2017 and to review the antenna solutions required by the switchover. The report is to give special consideration to consumer behaviour and to the provision of appropriate consumer information.

The Communications Policy Programme for Electronic Media was drawn up with a view to providing enough flexibility for effective implementation of the principles and guidelines set out in the interim reviews. As the Transport and Communications Committee observes in its above-mentioned report, it is particularly important to constantly monitor the market situation and the take-up of the new technology receivers.

To date the Working Group has convened on six occasions. During the course of its work it has consulted Finnpanel as well as FICORA experts. It has also decided to commission a television services search tool. In addition the Ministry of Transport and Communications MINTC has commissioned GfK to research and produce a statistical report that monitors T2 receiver sales trends.

To avoid unnecessary overlap, the Working Group decided to make the fullest possible use of work done by earlier and existing working groups in the television field. The most important among these have been the joint industry HDTV Forum and its T2 transition planning group (TPG) and information working party (IWP).

2. OBJECTIVES

The Working Group's mission is to prepare a clear and detailed plan for the needs of both television operators and television viewers regarding the use of the spectrum capacity allocated to terrestrial television from the beginning of 2017. Effective implementation of the plan requires that the parties represented in the Working Group commit themselves to the plan and put in place the required measures in a timely manner.

Ultimately the aim is that the switchover to more advanced transmission technology be based as far as possible on the needs of viewers, television companies and the audiovisual industry.

Consumers will be affected by the changes taking place from the beginning of 2017 in two different ways. On the one hand the 700 MHz spectrum band will be converted to a new use, which will bring changes to the frequencies currently used for television broadcasting and therefore require changes to television reception systems, although households will not need to invest in new television receivers. On the other hand the gradual changeover to new DVB-T2 transmission technology that carries HD services will begin by 2017 latest, which will require consumers to buy new equipment that supports the new technology and HD reception.

As from the beginning of 2017, the so-called 700 MHz UHF spectrum band (694-790 MHz, carrying television channels 49-60) will be converted from television to wireless broadband use. This requires that television channels 49-60 are moved to the 470-694 MHz spectrum band (television channels 21-48) by the end of the current operating licence period, i.e. year-end 2016. With the conversion of the 700 MHz spectrum band, the UHF frequency range allocated to television use will decrease by around 30%. Therefore, to ensure there is sufficient spectrum capacity in the UHF range, it will be necessary to reallocate frequencies and agree on the use of frequencies with our neighbouring countries. In television broadcasting the rollout of new DVB-T2 technology will enable increased capacity and more efficient frequency use, allowing for the continued distribution of both current and new television channels within a narrower frequency band. Some consumers will have to replace their existing receivers in order to accommodate the new transmission technology. In the VHF range the spectrum resources will remain unchanged during the next operating licence period, and therefore no changes will be necessary. All TV broadcasts in the VHF range are already based on the new transmission technology. To receive these broadcasts consumers need to have DVB-T2 receivers as well as a properly tuned VHF range antenna.

The first step in the orderly transition to a new frequency band is to reach agreement on a clear transition plan that protects the interests of all the various stakeholders. This Working Group has been charged with developing a detailed plan for implementing the objectives set out in the Communications Policy Programme for Electronic Media.

In April 2013 MTV Media, Sanoma Entertainment Finland Oy and the Finnish Broadcasting Company YLE submitted to Minister of Housing and Communications Krista Kiuru their proposal aimed at securing a viable future for domestic television broadcasting. The companies reaffirmed their commitment to promote a smooth and rapid transition to new transmission technology and to ensuring consumer satisfaction.

In their letter the television companies also suggested that a specific deadline be set for the use of the 700 MHz spectrum band for television broadcasts in 2017, bearing in mind the difficulties and additional burden and costs incurred to consumers from the installation of reception antennas during the winter months. Furthermore the operators proposed

that to secure the continued availability of pay-tv services and to prevent any unnecessary interruptions to television services, a total of four T1 multiplexes still be screened in the 470–694 MHz spectrum band from the beginning of 2017.

In addition the television companies were keen to stress that the transition to the exclusive use of DVB-T2 transmission technology should take place as described in the Communications Policy Programme for Electronic Media, closely monitoring consumer purchases of new receivers.

YLE furthermore made the point that it was averse to any delay in the switchover to new DVB T2 technology as outlined in the Communications Policy Programme for Electronic Media, as that would force the company to continue to use different transmission technologies for parallel broadcasts.

One of the Working Group's major objectives has been to reconcile the submissions made in this letter and the objectives set out in the Communications Policy Programme for Electronic Media.

3. PRECONDITIONS FOR THE NEXT TECHNOLOGY TRANSITION

3.1 Completion of frequency coordinations

FICORA has entered into negotiations with the relevant authorities in Finland's neighbouring countries to agree on the frequency coordinations required by the Communications Policy Programme for Electronic Media. The outcome of these negotiations will determine the spectrum resources available to terrestrial television.

Discussions on the coordination of television frequencies with Russia were completed during 2013. Agreement on the allocation of virtually all frequencies in the 470–694 MHz band has now been reached between the two countries; final confirmation was received at the beginning of October 2013. Some of the outcomes of these discussions also affect the coordinations with Estonia and Norway, so approval must still be received from these countries.

Finland submitted its proposal on the coordination of new frequencies to Estonia and Norway in spring 2012. Based on the discussions with Russia, the preliminary allocations made with Estonia are currently being updated.

Norway has commented on the Finnish proposal of spring 2012, and this proposal must also be updated based on the agreement reached with Russia. Discussions on frequency allocations with Sweden in particular have been slowed by the fact that the Swedish authorities have as yet made no decisions on the future use of the 700 MHz spectrum band.

In its report to the Swedish Government, the national radio and television authority (Myndigheten för radio och tv) has recommended that the whole 470–790 MHz UHF frequency band be allocated to television broadcasting for the next licensing period, without excluding the possibility of changes

mid-term. The Swedish Government is currently in the process of drafting its decision on the future use of UHF frequencies in the next licensing period and beyond.

Sweden has decided that the switchover to DVB-T2 technology will be made by 2020. Finland has pointed out that if an agreement is in place on frequency allocations, that would support Sweden's needs for additional resources. The Swedish radio and television authority has officially authorised the Swedish Post and Telecom Authority (PTS) to conduct negotiations with Finland on the use of frequency bands. PTS has in October 2013 appointed a working group to investigate the proposed frequency coordinations. Official discussions with Sweden will be resumed in 2013.

Based on these discussions on frequency coordinations, FICORA has proposed an allocation model that would allow for two nationwide multiplexes using existing DVB-T technology and additionally one semi-national DVB-T multiplex beyond the beginning of 2017. Depending on the outcome of the frequency coordinations with Sweden, it might be possible to have a second semi-national DVB-T multiplex. Depending on the final spectrum resources the coverage of these semi-national networks would not necessarily coincide, or they might have gaps in their coverage, particularly if the existing transmission technology is used in more than one semi-national network.

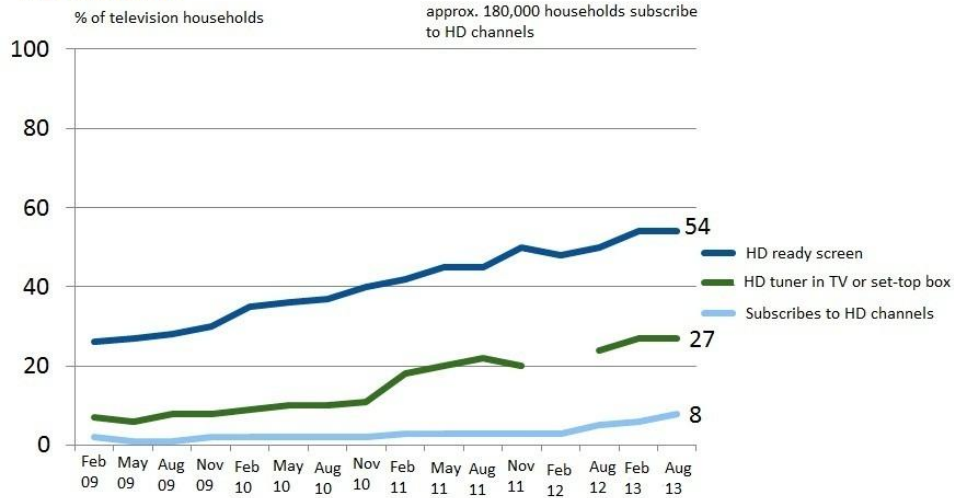
3.2 Diffusion of DVB-T2 equipment

A recent Finnpanel survey of Finnish television households shows that there are 4.4 million television receivers in use in the country. This figure does not include PCs. Cable television households account for some 1.9 million of these television sets, antenna households for the same number. In addition consumers have an estimated 0.5 million antenna receivers in their holiday homes. Cable television households will not be affected by the changes put in place from the beginning of 2017.

According to figures from February 2013, 16% of Finnish television households have purchased at least one new television receiver during the past year. Figures from August 2013 show that 14% of households have a receiver that is less than one year old.

Just over half (54%) of all households have only one television set and some 40% have two or more. Almost 1,310,000 households (54% of all television households) have at least one HD-ready or Full HD receiver. Finnpanel reports that many respondents have some difficulty answering the question concerning HD. Almost one in ten television households said they did not know whether their receivers are HD or not, which means that in reality the number of these households may be greater.

HD diffusion



NB. Question concerning HD tuner slightly revised in 2011
 Source: Finnpanel: Television households in Finland

Figure 2. Diffusion of HD television according to Finnpanel

The Working Group has monitored the progress of DVB-T2 technology penetration based on GfK reports. Furthermore the Working Group has prepared its own assessments of penetration levels. The Figure below is drawn from GfK's most recent report.

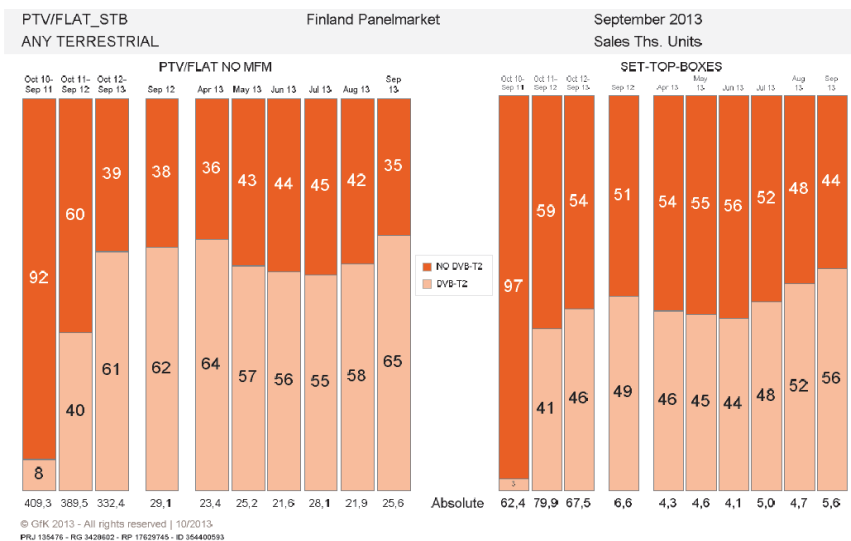


Figure 3. GfK 2013: number of terminal services sold in September 2013

The Figure below gives a forecast for the diffusion of DVB-T2 terminals in relation to the current number of around 2.4 million television receivers.

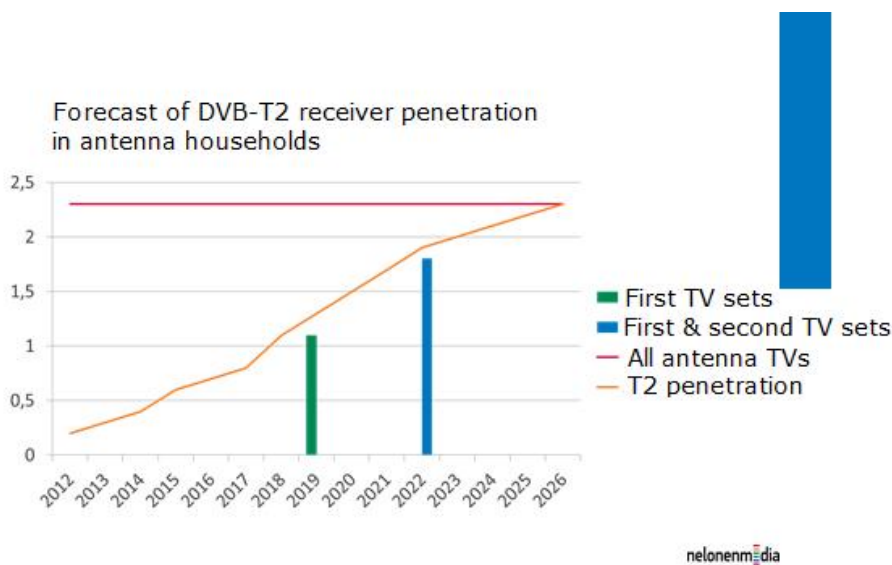


Figure 4. The future of antenna distribution and the DVB-T2 switchover

Future trends in DVB-T2 penetration can also be forecast based on the number of television households, which currently stands at 2,038,000. Roughly half of these are antenna households. The number of DVB-T2 televisions sold to date is 390,000, and at the current rate a further 690,000 will be sold by the end of 2016. The forecast presented below assumes that the number of DVB-T2 receivers is unchanged from its current level, even though it is likely that their share will increase over the years ahead. The calculation is based on the current annual sales volume of 336,000 units, which is 15% less than the figure a couple of years ago and more than 100,000 less than the annual figures recorded in the latter half of the last decade.

To date, sales of DVB-T2 set-top boxes have reached 62,000 units, and at the current rate a further 108,000 units will be sold by the end of 2016. This would bring the total to 170,000 units. The calculation below assumes that set-top boxes account for 70% of the total, since their number may partly overlap with the DVB-T2 television receivers.

Based on the foregoing it is estimated that by the end of 2016, there will be 660,000 terminal devices per one million households, giving a penetration level of 66%.

Since the diffusion of receivers in antenna households is one of the most important preconditions for a successful DVB-T2 switchover, it is crucial that this development is closely monitored. Based on the accumulating evidence, the timetable for the market-driven changeover to DVB-T2 transmissions should be updated in 2014–2016.

Traditional television distribution is complemented by IP-based television distribution. Terminal devices that use both traditional television distribution networks and Internet networks are called hybrid receivers (or

hybrid television). The growing role of hybrid television is closely tied up with the ongoing switchover to DVB-T2. These so-called Smart TVs and more generally all connected TV devices bring new value added to viewers and so contribute to the natural turnover of the existing stock of receivers.

Value added services can be produced with the HbbTV standard, for instance, which is supported by major terminal manufacturers. HbbTV technology can be used among other things to produce interactive value added services related to television programmes. HbbTV can be used in antenna, cable, satellite and Internet television households.

By winter 2013 an estimated 200,000 HbbTV functional or HbbTV ready terminal devices have been delivered to Finland. By the end of 2013, given the favourable market conditions, the number of HbbTV compatible units might climb to almost 500,000. Almost all these HbbTV units incorporate a DVB-T2 tuner.

3.3 Other viewpoints

In order to facilitate the next technology transition and to maintain the vitality of domestic television, the April 2013 letter from MTV Media, Sanoma Entertainment Finland and the Finnish Broadcasting Company YLE also suggests changes to existing legislation. The proposal of these stakeholders is that the Code for Information Society and Communications Services should include the requirement that network operators provide a multicasting service and that the principle of network neutrality be upheld so that consumer interests and freedom of choice are safeguarded.

The stakeholders behind this proposal believe these changes are important because moving television broadcasts to fixed data networks would promote the development of information society in general and the diffusion of high speed broadband in particular. Furthermore they would also facilitate a future reassessment of the uses of limited spectrum resources.

The ongoing process of drafting the Code for Information Society and Communications Services has brought some changes to the regulation of network neutrality, specifically to the conditions for contractual traffic limitations and the implementation of these limitations. Various additions have been made to the relevant regulations, particularly concerning non-discriminatory regulation – including the prohibition of discriminatory pricing practices – and FICORA's market analyses.

Telecommunications operators have been keen to stress that multicasting services are not a practical solution to the needs highlighted by programme companies. They have also proposed other solutions, such as audiovisual content delivery techniques based on CDN servers. As regards the obligation to deliver multicasting services, the ministerial working group on transport and communications policy decided at its May 2013 meeting to issue a statement in connection with the submission of the Code for Information Society and Communications Services to

Government session. This statement will say that the Ministry of Transport and Communications will appoint a working group to promote the development towards information society so that users of wireless and fixed Internet connections can receive audio and audiovisual contents as cost-effectively, widely and simultaneously as possible. The working group is due to submit its proposal by the end of 2014. The proposed solution was considered appropriate because the legislative obligation to provide multicasting services in a situation where work is still ongoing to develop technical solutions and business models was not considered justified.

Furthermore the signatories of the above letter considered it important that to prevent pricing distortions in terrestrial television, the Code for Information Society and Communications Services affords FICORA the authority where necessary to impose a price ceiling on television and radio network transmission services as part of the agency's extensive authority to review and assess pricing and network costs.

The aim of the changes proposed to the Code for Information Society and Communications Services is to step up the regulation of significant market power and to enable true ex ante regulation, as described in EU directives, in certain wholesale products. The Finnish Communications Regulatory Authority FICORA will accordingly have the right to set a ceiling price for wholesale products regulated under its decision and to choose the method used in setting that price.

Legislation would strictly and unambiguously define the aims of pricing regulation and assert the right of telecommunications companies to a reasonable return on invested capital, but at the same time give greater discretion to FICORA on the tools to be applied in the supervision of pricing. The agency would have greater authority to impose upon telecoms companies appropriate pricing obligations if its market analyses reveal significant competition problems. Legislation would also be amended for greater technology neutrality, allowing the same tools of pricing supervision to be applied regardless of the technology used in the communications network.

4. CHANGES IN THE MEDIA SECTOR

4.1 General

The Finnish media sector has seen a number of changes since the parliamentary discussion of the Communications Policy Programme for Electronic Media, including business restructurings involving some of the most significant industry players, including Digita Oy, DNA Oy and Digi TV Plus Oy.

In recent years the effects of economic recession have been plain to be seen in all sectors of society. In 2012–2013 the value of the media market has been in decline. In 2011 its value stood at EUR 1,167,325,000, in 2012 the figure was down by EUR 48.8 million to EUR 1,118,525,000, and projections for 2013 are that the value of the media market has dropped by a further 11%, i.e. EUR 123 million. In other words the decline in the

media market value over 2011–2013 is expected to reach EUR 171.8 million.

Meanwhile Netflix, which started up its service in Finland just over a year ago, has reported that in the past year the number of users outside the United States has risen by almost five million. Currently the number of Netflix users worldwide is over 40 million. Netflix and HBO Nordic, another new entrant in the market, are continuing to change the competitive situation between different transmission modes.

4.2 Development of marketing communication

In autumn 2013 the Ministry of Transport and Communications commissioned a survey on the development of the advertising market in Finland. The findings show that in 2012, the volume of marketing communications reached EUR 3,380 million. Investment was down by 0.6% from the previous year.

Media advertising fell by 2.9% from 2011 and totalled EUR 1,353 million. This figures includes advertising in newspapers and magazines, on television and radio, in printed and electronic listings as well as open air advertising.

These figures on media advertising reflect the general development of the economy as well as the structural changes taking place in the media sector. Online advertising for its part has continued to grow, while in other media categories advertising declined.

The volume of mobile marketing was EUR 17 million, 69% up on the figure one year earlier. This growth is explained by the sharp increase in the use of mobile devices and the ongoing development of mobile advertising solutions. The volume of e-mail marketing was EUR 13.7 million, showing an increase of 16%.

The value of marketing communication design increased last year to around EUR 516 million, up 4.2%. Media agencies saw their gross margin grow by 4.9%, advertising agencies by 2.8%, digital media agencies by 11%, communications agencies by 5.2% and events organisers by 4.3%. Other marketing communication output fell by 1.7%. Production of advertising films fell by 9% as a result of dwindling investment in television advertising and a sharp decline in film advertising.

Advertising revenue remains the main source of financing for domestic commercial television production. Advertiser investment in contacts is monitored using the so-called small media cake. The total value of the media cake in 2012 was around EUR 1.35 billion. Television remains the second biggest media group, but it is expected that in the next few years online advertising will overtake television advertising. In 2012 television accounted for 20.7% of the small media cake.

Development of advertising markets

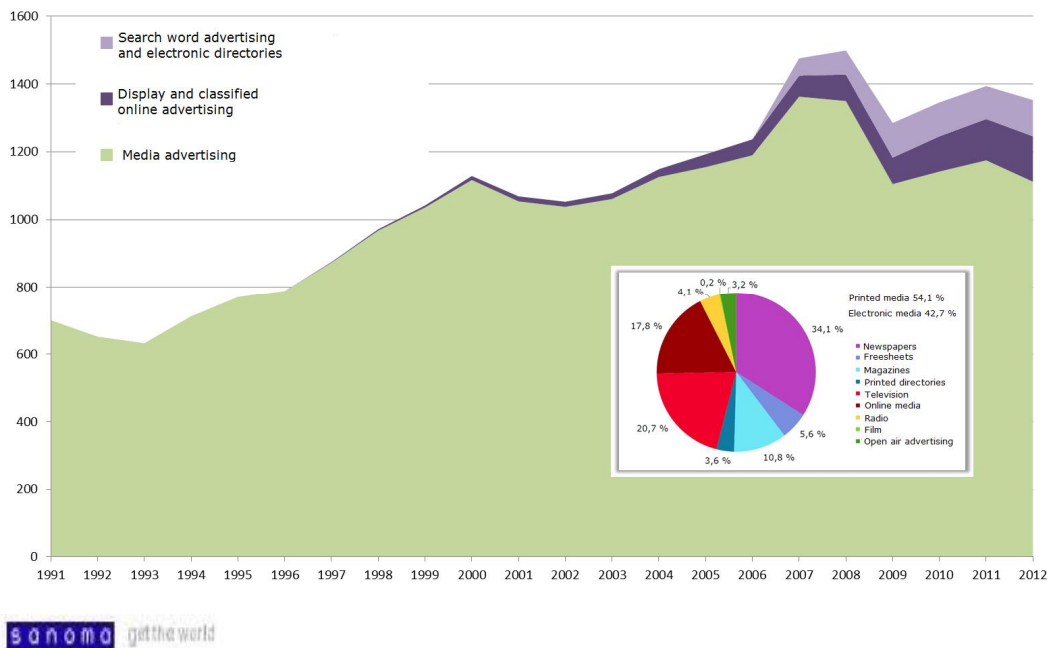


Figure 5. Development of advertising markets

4.3 Fees for frequency use

Changes to the fees collected for frequency use will also affect the television industry. In December 2010 the frequency fee system was revised so that the frequencies accessible to radio licence holders were given greater weight in determining the frequency fee in the case of almost all frequency user groups. This increased the frequency fees payable by television operators and lowered those charged to mobile media operators and created a more equitable balance in the frequency fee distribution. In 2011 television operators paid in some EUR 1.5 million, or 20% of the total amount of fees collected, while the fees charged to mobile media operators came to EUR 2.4 million, or 30% of the total. The changes will be rolled out over a five-year transition period so that the changes will take full effect from the beginning of 2016.

The draft Code for Information Society and Communications Services furthermore proposes the introduction of a new frequency fee that reflects the market value of frequencies used for telecoms and television as well as military defence purposes.

This new fee would be collected on a directly comparable basis for the use of frequencies allocated to telecoms and television broadcasting. However the proposed section includes the option of charging a fee at lower than market value if there cultural reasons to do so or others reasons connected with the general market situation, spectrum band use, or other comparable public-interest reasons. In order to secure the viability of terrestrial television the fee determined for television operations should reflect of the scale of the business operation using the frequencies

allocated, the extent of competition with alternative distribution channels and the conversion of the 700 MHz spectrum band from television to mobile communications.

5. SECURING THE FUTURE OF DOMESTIC CONTENT PRODUCTION

In 2012 the Finnish Broadcasting Company YLE, MTV and Nelonen Media invested a total of some EUR 80 million in programmes made by independent producers. Together, these independent producers accounted for some 2,250 hours of television programming. In addition YLE has programme production of its own. MTV produces news and some current affairs programmes. Nelonen Media outsources all its programme production.

In its cultural policy programme (2012) the Ministry of Education and Culture has compiled information on the role of television companies in audiovisual content consumption, employment and investment. Domestic television companies account for around two-thirds of the funding, employment and consumption of domestic audiovisual content. The figure for domestic films is even higher.

TV's share of audiovisual culture

MoCe cultural policy programme

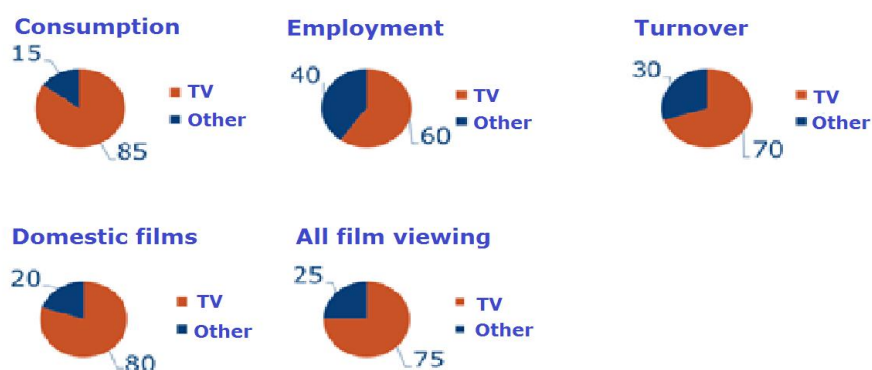


Figure 6. Television's share of audiovisual culture

6. DETAILED TRANSITION PLAN

6.1 Government measures

The Working Group proposes that once the Government has submitted its draft Code for Information Society and Communications Services to Parliament, all Government decision-making on operating licences reflect the new recommendations for greater flexibility in licensing regulation insofar as this is possible under the Communications Market Act and the provisions governing the licensing procedure under the Act on Television and Radio Operations.

The proposed procedure would facilitate a smoother transition to more advanced transmission technology and for instance allow programme licence holders to migrate between different multiplexes. It would also make possible a less rigorous and absolute content-based interpretation of programme licences even before the entry into force of the Code for Information Society and Communications Services when this is deemed appropriate from a market development point of view.

Every effort will be made to minimise the impacts of the frequency changes on consumers by way of careful and long-term spectrum planning. Network licences shall be granted well ahead of time before the beginning of the next licensing period: this is crucial so that future changes can be properly anticipated and any necessary changes to antenna systems made at one and the same time.

The network licences valid from the beginning of 2017 will be granted during 2014.

It is at this stage too early to express any views on the application process for programme licences that are effective from the beginning of 2017. The effective date proposed in the Code for Information Society and Communications Services is 1 January 2015, i.e. the new programme licences would be granted in keeping with the process provided for in the Code. The validity of the programme licences will also be considered in connection with the process of granting the licences.

The network licence conditions, such as minimum population coverage rules, will be published in connection with the consultations ahead of the application process. However like the existing network licences, the new licences will also include the obligation to provide adequate guidance and advice to consumers in matters concerning reception antennas. Furthermore licence holders would be obliged to inform consumers about regional network development and about the required antenna solutions.

6.2 FICORA's measures

FICORA will prepare a detailed plan for frequency changes separately for each main transmitter area in 2014 once agreement has been reached with neighbouring countries on frequency allocations and when decisions have been taken on multiplex frequencies.

This plan will cover all the frequencies of national and semi-national multiplexes during the next licensing period as well as the required frequency changes by region. FICORA will work closely with network operator Digita to implement the frequency change plan so that spectrum planning ahead of the transition can take account of the transmission antenna changes and parallel broadcasts in each area.

For the time being the only existing multiplexes that cover the whole of continental Finland are multiplexes A and B. In connection with the changes that need to be put in place before 2017 it is necessary to plan ahead for four national networks during the following licensing period, i.e.

the channels for these networks must be pre-installed in all regions. Likewise the frequencies for semi-national networks must be pre-installed in master antenna systems in regions where the necessary multiplex spectrum resources are available. At the same time it will be possible to make the necessary changes in buildings that have master antenna systems, modifying them so that they can receive VHF programming.

In order to achieve high quality and interference-free in-building antenna transmission, it is important to take note of FICORA's order 65/2103 M that takes effect from the beginning of 2014. This order says that to receive all antenna television programming, buildings must have separate antennas for UHF and VHF signals and where necessary an amplifier capable of separately processing these signals. The order applies to detached single family houses as well. According to Section 134 of the Communications Market Act programmes and services subject to the operator's transmission obligations must, in all buildings with a community or master antenna system and indoor network, must be available to users unmodified and simultaneously with the original broadcast.

As for DVB-T multiplexes, the plan also includes possible advance measures to amplify the multiplex frequencies after the DVB-T2 transition. These changes include the extension of any single-frequency networks, allowing for the regional release of spectrum resources as necessary for other uses.

In its talks with other countries FICORA's aim is to maximise the spectrum resources and thereby the number of multiplexes available. FICORA's view is that the simultaneous switchover of B and E multiplexes to DVB-T2 technology in 2017 would be the most spectrum efficient solution and give the highest possible number of multiplexes.

FICORA has drafted a preliminary plan for the regulation of significant market forces (SMF) over the years ahead. In this roadmap plan the agency has identified the key focal areas for regulation in Finland through to 2017. In autumn 2013 FICORA has launched a survey aimed at developing a cost-oriented pricing method for the Finnish television broadcasting market. The purpose is to assess the applicability of different pricing estimation methods in the television broadcasting market and to overview the corresponding methods used in other countries.

The next SMF analysis of television and radio broadcasting services market will be started by the end of 2013. FICORA is hoping to announce all SMF decisions by the beginning of 2015. The changes planned to the pricing regulations included in the Code for Information Society and Communications Services would allow for the advance determination of a ceiling price in television broadcasting services, too. During 2014 FICORA will be assessing the need to set a ceiling price for television broadcasting services in view of the current market and competitive situation.

6.3 Other measures

The stakeholders represented in the Working Group have commissioned a search tool that will help consumers make more informed choices of television services. It is increasingly difficult for consumers today to know what services are available, who provides them and what equipment is needed to receive them. An online information tool will help resolve these problems. Consumers can find out what kind of television services they can view with their current equipment, or what equipment and connections they need in order to view specific television services.

In order to promote the adoption of HD technology, YLE has announced that it will be expediting its HD switchover. The company aims to have all four of its channels broadcasting in HD by early 2014. It will be offering HD content to antenna distributors, cable distributors and IPTV on the same terms and conditions, allowing operators to freely carry YLE HD content on their respective networks.

YLE has already made the necessary studio technology updates that allow it to step up its offering. In Tampere the update was completed in early 2013, and the company is now working to upgrade its studios in Helsinki. The company has announced that outsourced programmes will also be purchased in as high quality format as possible. In 2015 YLE will be producing virtually all its own television programming in HD quality.

The promotion of DVB-T2 technology and receivers is now in full swing in DNA's VHF network, which covers 85% of the population. DNA is using DVB-T2 technology to broadcast over both HD and standard quality programmes via its network. Among its HD channels are free-to-air YLE HD and MTV3 HD, which is included on DNA's pay-tv card. In addition there are four other HD channels and 18 standard television channels. In autumn 2013 DNA joined forces with Channel 4 to launch on its antenna network the 4ProExtra service that shows all games from the Finnish ice hockey league. DNA also has plans in place to extend its channel offering, and in summer 2103 three new VHF licences were granted to MTV3 (MTV MAX HD and 2 standard quality channels) In addition DNA has extensive cooperation with Finnish antenna contractors to promote household antenna installations.

During their involvement in the Working Group the television operators had the suggestion that in the initial stages of transition, there should be a larger number of DVB-T multiplexes than proposed in the Communications Policy Programme for Electronic Media. This suggestion triggered a discussion within the Working Group as to whether the transition plan should serve as a general frame for the transition process, although it should at once offer some flexibility for practical implementation of the final plan. This would make it possible to take closer account of the commercial factors relevant to the transition, such as the situation in the marketplace and especially the level of DVB-T2 penetration, which is crucial to sufficient consumer interest and therefore to successful transition.

It was on this basis that the Working Group drafted its so-called compromise proposal for the transition. It also commissioned the HDTV Forum's T2 Transition Planning Group (TPG) to assess the viability of

drafting a transition plan based on the framework concept described above.

The TPG working group led to the idea that for purposes of a smooth and efficient transition, both network and programme licences should allow for a degree flexibility so that operators can put together the most appropriate service package that best serves the needs of transition at each point in time based on commercial discussions between the parties concerned. Partly for this reason it make sense to consider a stage-by-stage approach to transition so that at each stage, similar channels with similar target groups are transferred from DVB-T technology to DVB T2 technology one multiplex at a time.

6.4 Multiplex-specific plan

Multiplexes with national coverage

In line with the Communications Policy Programme, sufficient spectrum resources will be made available for four multiplexes with national coverage. YLE as well as public interest channels will be broadcast with national coverage in a DVB-T multiplex and additionally in another DVB-T2 multiplex. One multiplex using existing transmission technology will be allocated to currently free-to-air commercial channels. All these multiplexes will be designed as multi-frequency networks to support regional broadcasting and the use of DVB-T technology. The fourth national multiplex will be allocated to pay-tv operations, and it will be granted for DVB-T2 technology on single-frequency network.

In the VHF band there are two DVB-T2 multiplexes with frequency resources that enable national coverage plus one DVB-T2 multiplex with semi-national coverage. One VHF multiplex can support regional broadcasts if necessary.

Semi-national multiplexes

In addition to national multiplexes, the Communications Policy Programme provides for one to three semi-national DVB-T2 multiplexes. These semi-national multiplexes are allocated to pay-tv operations. To ensure the continuity of pay-tv operations, a compromise solution has been reached during 2013 based on the successful frequency coordinations with Russia. Under this compromise the licence for one semi-national pay-tv network will be granted on a technology neutral basis, i.e. if necessary using current DVB-T technology. Depending on the final outcome of all the frequency coordinations it might still be possible to have another semi-national DVB-T multiplex with possibly a smaller coverage area.

The technology neutral approach allows for readjustments to be made according to the take-up of DVB-T2 receivers: depending on the market situation, the choice of distribution technology can be made nearer to the new licensing period. However this approach to granting licences requires that the spectrum resources allocated to the multiplex allow for a multi-frequency network.

Premises and objectives for subsequent coordination

In order to secure the conditions for continued successful television operations, discussions with neighbouring countries on the reallocation of UHF frequencies have been aimed at maximising the spectrum resources and therefore the number of multiplexes available in continental Finland. Maximising the availability of spectrum resources is the best way to ensure that multiple frequency multiplexes can be created that use existing distribution technology.

The planning of television frequencies is based on the principle of equity, i.e. neighbouring countries must be given access to the same amount of spectrum resources. This obviously limits the number of networks available. Coordinations based on the maximisation of spectrum resources are thus based on an equal allocation of all available frequencies between Finland and our neighbouring countries. In practice this equal distribution of frequencies supports the creation of large single-frequency regions that take advantage of the new distribution technology, since each channel allocated to Finland can now be used in a large area.

Assuming the frequency coordinations achieve the optimal outcome, it will be possible to grant technology neutral licences to a maximum of two semi-national multiplexes. Two semi-national multiple-frequency networks with corresponding coverage areas and with sufficient commercial interest in addition to four national networks requires a substantial amount of new frequencies in continental Finland. However given the spectrum needs in Finland's neighbouring countries it is unlikely this can be achieved.

In practice the coverage areas of semi-national networks and the distribution technologies they use will depend upon the frequency coordination outcomes. Depending on the resources made available, the coverage areas of the semi-national networks will not necessarily coincide, or there may be gaps in them, especially if more than semi-national network is to use current transmission technology. If the semi-national networks are based on new DVB-T2 technology, multiplexes may use single-frequency regions. This will directly contribute to maximising the number of multiplexes and to broader coverage.

Multiplex-specific plan

Following the guidelines it has been given by the Working Group preparing the next technology transition, the HDTV Forum's T2 transition planning group (TGP) has produced a multiplex-specific transition plan illustrated in the following figures.

The TGP working group's plan starts out from the existing channels currently in terrestrial television distribution and from the number of multiplexes given in the Communications Policy Programme for Electronic Media. The proposed transition model requires that the network licences are granted on a technology neutral basis. Likewise it is important that the terms and conditions for programme licences can be flexibly interpreted as proposed by the Working Group preparing the next technology transition.

The transition plan is based on the premise of moving towards T2 technology with pay-tv programming in the vanguard. This will provide a basis for positive marketing of the transition as a range of new services offered in the antenna television network. For this reason six channels will have to be transferred from multiplexes B, C and E to T2 multiplexes before 2017. This will leave adequate transmission capacity both for current pay-tv channels and free-to-air channels using DVB-T technology, but at the same time an adequate DVB-T2 pay-tv offering and therefore strong enough demand for new television receivers even before 2017. The TGP working group has also noted that new T2 services do not necessarily have to offer HD quality, because in many cases the decisive factor for the consumer may be gaining access to some other new services possibly available through DVB-T2 terminal devices, such as catch up services. This also lends support to the idea of technology neutrality in connection with granting future licences.

Successful pay-tv switchover to T2 technology will in turn pave the way to subsequent technology transitions.

The TPG working group also observes that it might be worthwhile considering an expedited switchover to DVB-T2 technology in the case of YLE's and public interest channels. Furthermore the TPG working group says it is important to bear in mind future technology changes (HEVC, ultra HD, DVB-T3 and other possible new distribution technology standards) and the associated needs for spectrum capacity. In addition it is apparent that, given the long time frame of this analysis, these will not remain the only changes and transitions in distribution technology.

Although the TPG working group's mandate dictates that its plan is mainly concerned with changes in the UHF band, the working group is adamant that in the longer term it is necessary to consider antenna distribution capacity more generally, i.e. in both UHF and VHF multiplexes. A flexible approach to programme licensing can help to optimise spectrum use in both bands and for instance allow programme companies to invite competing tenders from network operators. This will also contribute to enhance the competitiveness of antenna distribution as compared to other service platforms.

DVB-T2 technology is already being used on the VHF band, allowing consumers to receive HD standard services. This will create a strong foundation of positive experiences, which is bound to make it easier for consumers to make the changeover to newer technology.

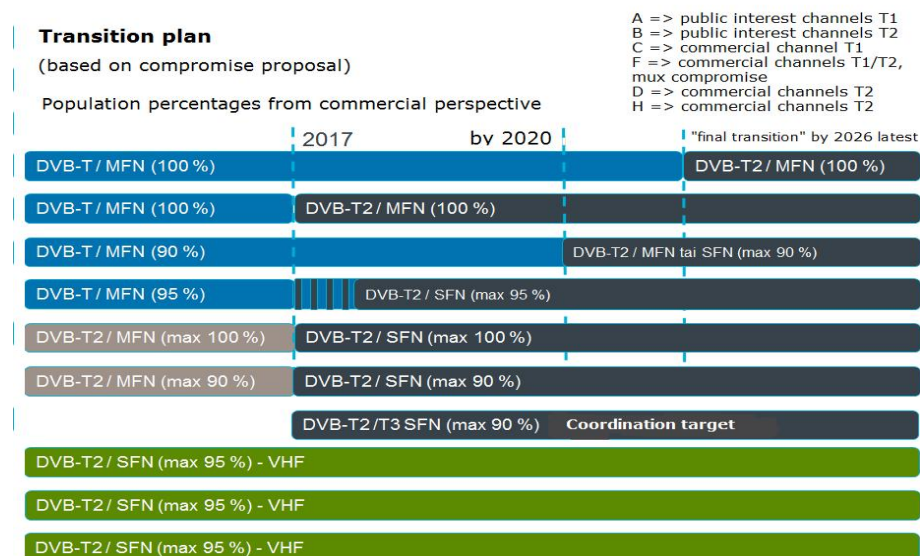


Figure 7. Transition plan

The TPG working group has created a framework structure to accommodate all the changes that need to be put in place. This framework is illustrated in the series of figures below. It is noteworthy that, with the exception of the representation of the current situation, the boxes describing multiplexes are included for illustration purposes only. The final contents and number of channels will be determined in the commercial negotiations and programme licensing rounds during the transition process. The most critical boundary conditions for successful implementation of the plan, as illustrated in the figures below, are the number of multiplexes needed and the multiplex-specific distribution standards presented for each situation. By contrast the dates given for the timing of the changes are indicative only: as the licensing procedure is technology neutral, changes can be introduced in multiplexes on a market-driven basis, depending on industry and consumer interests.

Stage one

The first figure below (Figure 8) describes the current situation. Note the explanations given at the bottom of the figure for the different box colours.

There are currently six multiplexes in the UHF band in Finland, two of which require the use of DVB-T2 technology. As stated in the licensing terms and conditions, multiplex D uses transmission parameters that also allow for signal reception on laptop and mobile devices. For this reason multiplex D has a smaller maximum capacity (e.g. four HD channels and 1–2 SD channels). It is also noteworthy that multiplex H currently has a much smaller coverage area (around 60% at the beginning of 2014) than multiplex D. The figure also illustrates the three VHF multiplexes that use DVB-T2 technology. The description of the transition in the VHF band

multiplex covers frequency resources only, i.e. programming is not considered.

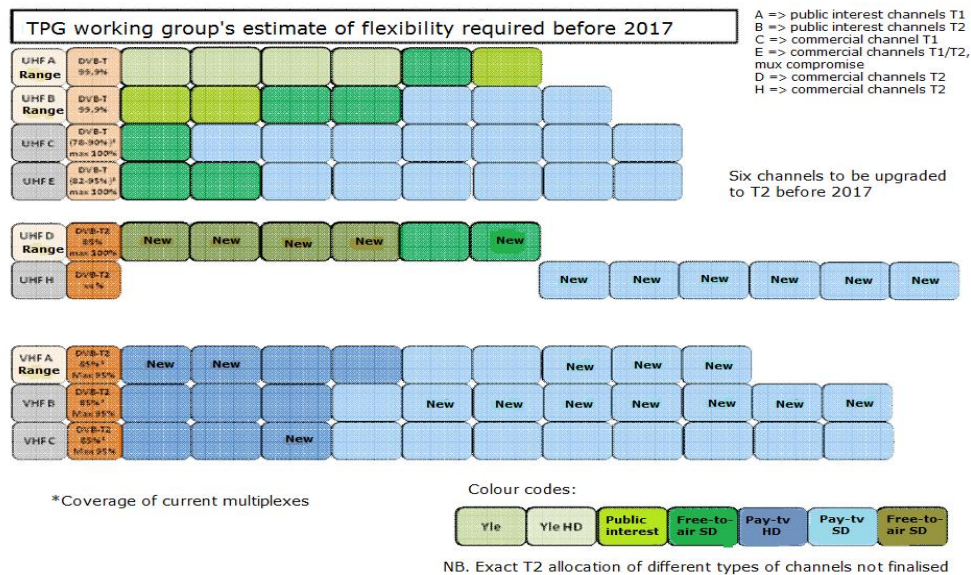


Figure 8. Figure based on current situation of UHF multiplexes and programming; description of VHF multiplexes covers spectrum resources only.

Stage two

At stage two (Figure 9) it will be possible before 2017 to transfer six pay-tv channels from DVB-T multiplexes to DVB-T2 distribution. The purpose of this is to channel consumer demand towards T2-HD contents by selectively reallocating certain pay-tv contents to a new distribution platform. Figure 9 illustrates the transfer of six pay-tv channels to the H multiplex.

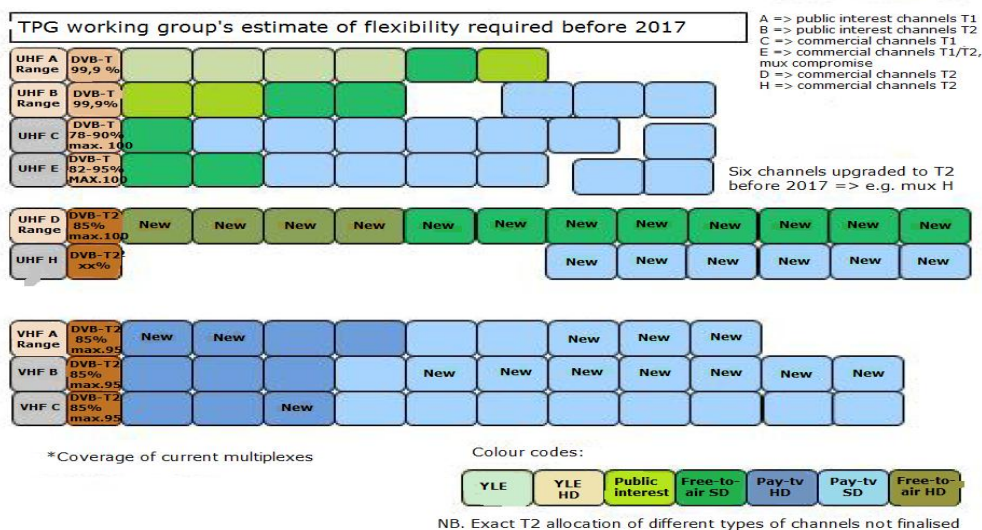


Figure 9. Stage two of transition

Stage three

At the next stage in 2017, multiplex B will be upgraded to accommodate DVB-T2 technology and allocated to HD broadcasts on YLE and public interest channels that are transferred in the same connection to multiplex A. In other words multiplexes A and B will now have identical channel offerings (simulcast). This stage of the transition process is illustrated in Figure 10 below. Following these changes antenna distribution in the UHF band would have access to three DVB-T and three DVB-T2 multiplexes.

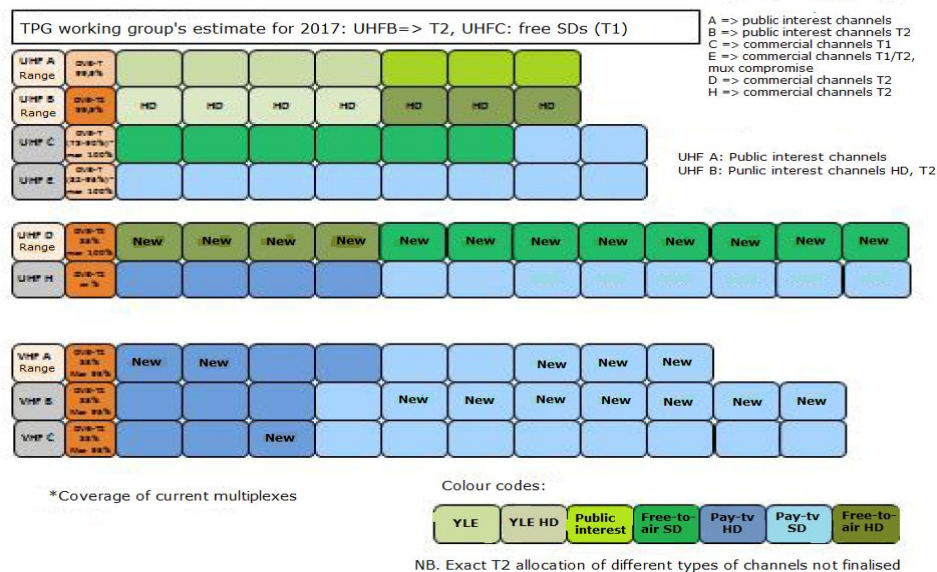


Figure 10. Stage three of transition

Stage four

At the next stage, when sufficient T2 terminal device penetration has been reached, the first pay-tv multiplex (multiplex E) can be upgraded to DVB-T2 technology. Sufficient in this context means a level of terminal device penetration that will allow for an overnight transition to a new distribution standard without significant business interruptions.

The situation following this stage is described in Figure 11 below. It shows that at this stage, the only channels relying on current DVB-T technology are YLE's and public interest channels (multiplex A) and the 6–8 channels on multiplex C (the exact number depending on commercial demand).

Since the distribution capacity available in connection with the transition varies, the change will also have an impact on the number of programme licences granted, especially if SD transmissions are still in extensive use. In practice this means that it will possible to carry a larger number of channels on a single multiplex.

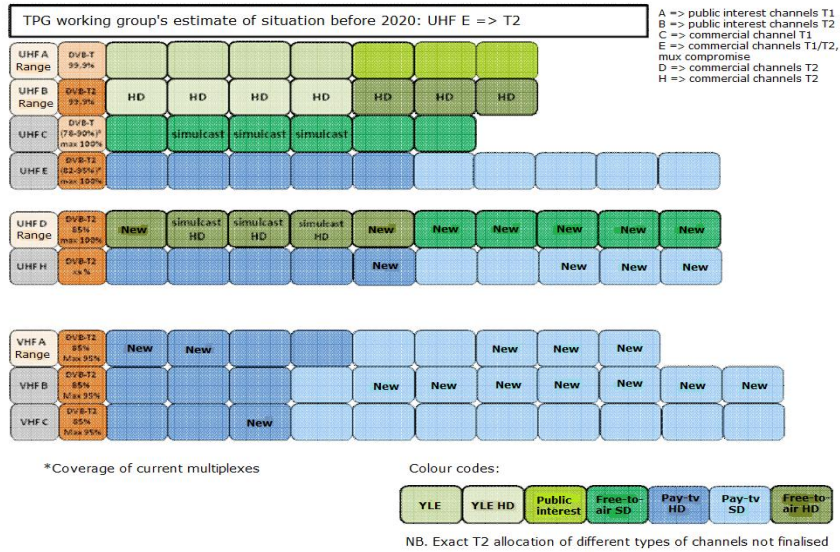


Figure 11. Stage four of transition

Stage five

Current estimates are that the next stage of the transition will take place around 2020. At this stage multiplex C will be upgraded to DVB-T2 technology. Again this will be an overnight switchover, and as in the previous stage the number of channels may at once increase if viewers continue to be willing to use SD image quality.

Furthermore the TPG working group expects that by 2020 it will be necessary to prepare for the next technology transition, which might involve the launch of the seventh multiplex in the UHF band (multiplex X in Figure 12 below). The working group believes that over the next seven years, consumer demands and expectations of image quality and experiences will continue to grow, placing ever greater demands (UltraHD, 3D) on video coding and packaging techniques (HEVC, He-AAC) as well as on distribution technology ("DVB-T3", DVB-NGH). This will also require ongoing advances in antenna television distribution and the development of terminal devices. For this reason these trends are already taken into account during the current period under review.

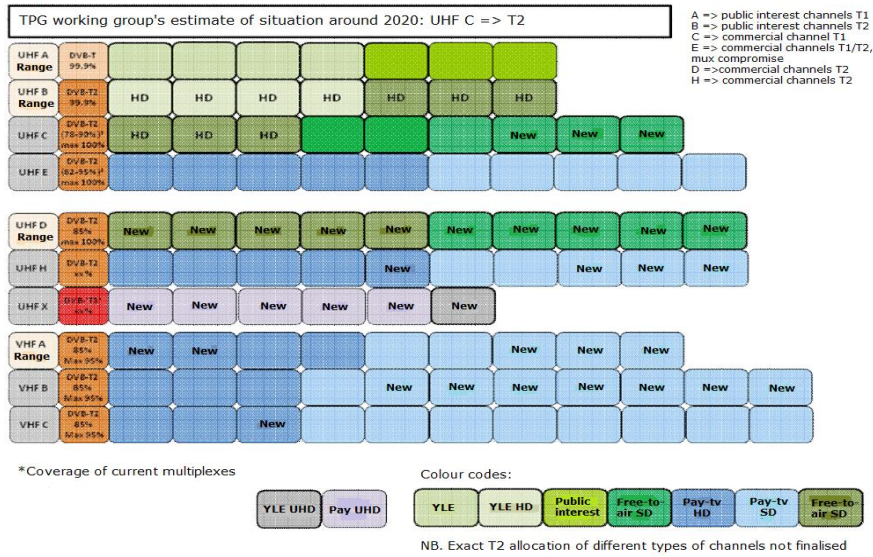


Figure 12. Stage five of transition

Stage six

At the sixth and final stage of the transition DVB-T parallel broadcasts on multiplex A will be discontinued. At the same time it is reasonable to assume that over the six-year period from 2020 through to the current stage, sufficient consumer demand has been created to start the next period of parallel broadcasts with the more advanced distribution and packaging techniques introduced at the previous stage. At this stage five of the UHF multiplexes will be used for DVB-T2 distribution and two for next-generation antenna distribution.

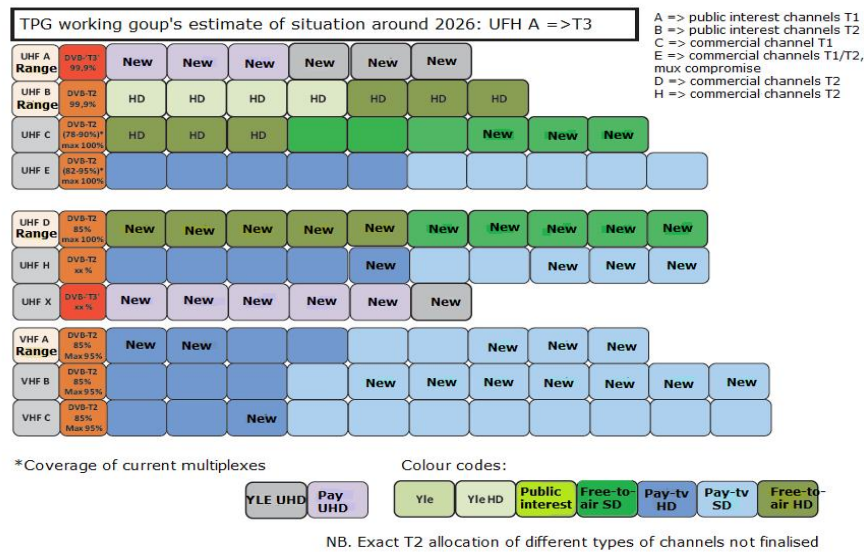


Figure 13. Stage six of transition

In conclusion

The TPG working group's plan has ultimately been geared to ensuring the competitiveness of the antenna network as compared to other distribution technologies. At the final stage of the plan the number of channels on offer is several times greater than currently. Overall the network capacity is around 100 television channels, which in the working group's view is sufficient to ensure that Finnish antenna households will have access to a diverse and high quality offering. Once in place the plan will also guarantee sufficient technology neutrality for industry stakeholders, allowing them to provide an offering that satisfies consumer demand and guaranteeing maximum efficiency of spectrum use.

7. PRACTICAL IMPLEMENTATION OF 2017 FREQUENCY CHANGES

In order to ensure that consumers have uninterrupted access to television programming, the frequency changes in the UHF spectrum band must be completed one main transmitter area at a time. For this reason work must be started at least 18 months before the new licensing period, i.e. in summer 2015. The use of the VHF band for DVB-T2 broadcasts makes it easier for viewers to make their decision as to when to they want to make the switchover. These broadcasts are already available to most people in Finland, and the switchover is possible as soon as the necessary equipment is installed.

Before completing the above mentioned detailed spectrum change plan, however, it is useful to make the following points regarding the practical implementation of these frequency changes.

7.1 Parallel broadcasts

Parallel broadcasting, in the context of broadcast frequency changes, refers to the simulcasting of programming both on the current, outgoing frequency and on the new replacement frequency. The purpose is to ensure that consumers can continue to receive programming without interruption during installation of the new frequencies. Parallel broadcasts are necessary in connection with the replacement of 700 MHz spectrum band frequencies, or if the amplification of frequencies involves changing the multiplex spectrum band for a new one. In addition the logical channel numbers of parallel broadcasts must be defined well ahead of time.

In detached houses, consumers can receive parallel broadcasts via multiplexes transmitted on both the old and new frequencies. For these consumers the best time to conduct a channel scan is once the parallel broadcasts have ended; this will avoid creating duplicate channels (old and new channel). In buildings with community or master antenna systems, residents will only receive the multiplex transmitted on the old frequency until the antenna system has been upgraded by the antenna

contractor. As soon as these changes have been made the contractor will inform the real estate manager, who in turn will inform the residents. The channel scan must be done immediately after installation to ensure reception of all the programmes on the new multiplex frequency.

During parallel broadcasting network licence holders are required to broadcast multiplex programming on two frequencies at the same time, i.e. they need to have two transmitters in service.

Frequency changes therefore entails significant costs. These costs are incurred from modifications needed to transmission antennas, some of which behave differently on different frequencies. International protection of analogue frequencies expires in 2015, and many countries are still in the process of digitalising their networks. This in turn will cause delivery problems to antenna manufacturers because of large order volumes. Therefore, from a planning and delivery security point of view, it is important to make sure the frequencies are available to licence holders as early as possible. Parallel broadcasting is another source of costs.

7.2 Implementation by region

It is proposed that implementation of the transition be started from the north of the country, moving southwards one main transmitter region at a time. This regional approach would contribute to a more controlled process of transition both for operators, antenna contractors and consumers.

This regional implementation strategy requires that information is also staggered and scheduled so that housing companies can plan ahead and get in the contractors and that consumers get the necessary information of forthcoming changes. It will also make it easier to respond to any emerging problems as the process advances. Furthermore the strategy will allow sufficient time for licence-holders, television operators, real estate managers and antenna contractors to prepare for the transition.

7.3 Number of frequency changes

The amount of frequency changes required will vary widely in different parts of continental Finland. Nonetheless frequency changes will be necessary in virtually all main transmitter areas, if not only because of the conversion of the 700 MHz spectrum band from television use. Furthermore some changes might be necessary in channels below the 700 MHz spectrum band in order to improve the efficiency of spectrum and so to achieve the maximum number of multiplexes, for instance.

7.3.1. Number of frequency changes in the 700 MHz spectrum band

Figure 14 shows the number of frequency changes that will be necessary in each main transmitter area following the conversion of the 700 MHz spectrum band from television use.

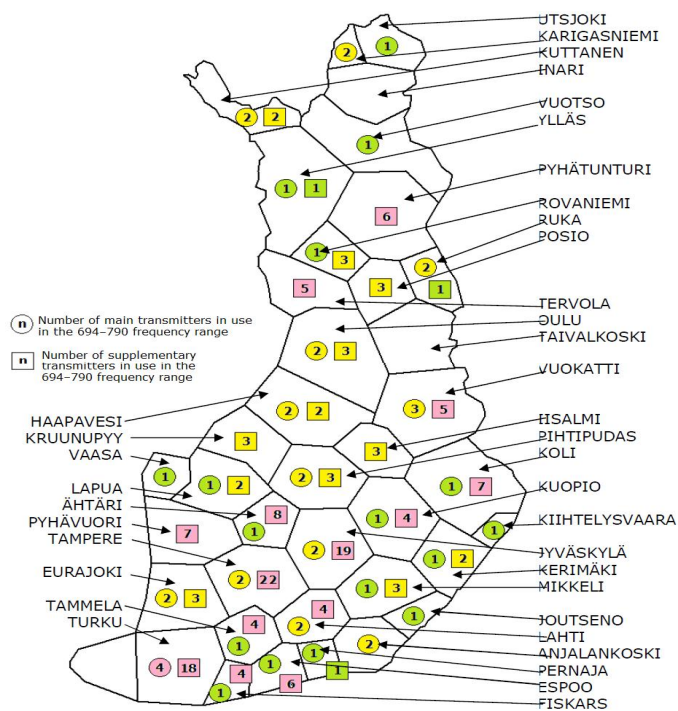


Figure 14. Number of main and supplementary transmitters in the 694–790 MHz frequency range by main transmitter area in continental Finland

The Figure indicates in green the areas that will require only one change. Areas indicated in yellow will need 2–3 changes, and those in red four changes or more. As can be seen, some areas will need changes to all main transmitter frequencies because of the conversion of the 700 MHz spectrum band, while there are few where this conversion will require no changes at all. There are marked regional differences especially in the number of frequency changes required to supplementary transmitters. In particular, the Turku, Tampere and Jyväskylä regions have large numbers of supplementary transmitters, and therefore careful advance planning will be needed to prevent any interference during frequency changes and parallel broadcasts.

The frequency resources required by supplementary transmitters in each region are described separately in the detailed frequency change plan. Where possible the aim is to allocate the supplementary transmitters to the same frequencies as the main transmitters. However depending on the relative location of the supplementary and main transmitters, this is not always possible. The assessment must therefore be made on a case by case basis, always allowing for the possibility that the supplementary transmitter will have to be allocated to a different frequency than the main transmitter.

There is less need for modifications to antenna systems when the supplementary transmitter uses the same frequency as the main transmitter. In this case there is no need for any additional changes in the supplementary transmitter's service area; otherwise the new frequency of the supplementary transmitter must be pre-installed on community antenna systems in its service area.

7.3.2 Number of frequency changes in the 470-694 MHz range

In addition to the changes described above, it might be necessary to make changes below the 700 MHz spectrum band in order to increase the efficiency of frequency use for purposes of building multiplexes and maximising their number and reach.

Since there is as yet no final agreement in place on frequency allocations with all neighbouring countries, the exact number of these frequency changes cannot yet be confirmed. These changes will be described in detail in FICORA's plan on the necessary frequency changes in 2014.

7.4 Changes to receiver systems

At the receiving end, changes will be needed to master antenna system amplifiers and to individual receivers, on which a repeat channel scan needs to be performed. As a rule it will not be necessary to modify or realign antennas in the UHF band, provided that the UHF transmitter locations remain unchanged.

FICORA's order no. 65 specifies the antenna and amplifier requirements for reception systems as well as antenna installation requirements. The order is effective from the beginning of 2014. Its purpose is to ensure interference-free and high quality reception in a changing environment, for both UHF and VHF spectrum bands. The order specifies the UHF frequency range as extending from 470 to 790 MHz. As the 700 MHz spectrum band is converted to wireless broadband use, the upper limit of the television UHF range will be 694 MHz (highest channel 48).

Generally speaking the only situations requiring the attention of an antenna contractor are where master antenna systems needs reconfiguring in housing corporations and public buildings. According to estimates by the Satellite and Antenna Association SANT, Digita and DNA, there are some 60,000 community or master antenna systems in Finland. The amplifiers of these systems will need to be reconfigured for parallel broadcasts, if that is technically possible. If the main amplifiers cannot be reprogrammed (most of the units refurbished in 2000–2007), then it will be necessary for housing corporations to invest in new amplifiers, at once bearing in mind the needs for VHF reception and distribution. In this case new frequencies will be installed in master antenna systems in the 470–694 MHz frequency range (channels 21–48), and at the same time frequencies in the 700 MHz band will be dampened if necessary. It is recommended that the antenna contractor at once installs a filter in the

antenna system for the frequency range over 700 MHz, i.e. into the UHF antenna input.

At the same time, if this has not been done previously, the master antenna system should be upgraded for reception and distribution in the VHF band.

If residents in detached houses are currently viewing terrestrial television broadcasts on the UHF band, the frequency changes will not require any changes to the antenna system itself, but a channel scan on the receiver will be enough to install the update. Any interference caused by mobile communications in the 700 MHz band will be eliminated by filter.

Viewers living in an area where frequency changes are made and wishing to receive all programmes will need to perform a rescan on the receiver once these changes have been completed.

Channel scans work differently on different receivers, depending on their make and age. In some cases an automatic scan may produce a perfect result, but in some makes and models there have been reports of problems. If an automatic scan produces a less than perfect result it is usually necessary to perform a manual search and then store the channels. If possible it is recommended to delete the receiver's channel memory, i.e. to restore factory settings before performing an automatic or manual channel scan. In detached houses it is generally advisable to perform the scan once all parallel broadcasts have ended.

8. INFORMATION AND COMMUNICATIONS

The start of a new licensing period will bring significant changes to the television offering in that the switchover to new distribution technology on the UHF band will enable HD broadcasts on UHF channels throughout the country.

The antenna reception of HD programming will require a new DVB-T2 standard receiver. It is paramount therefore that consumers are kept up-to-date about forthcoming changes so that they can make well-informed decisions as to what receiver to buy.

A major factor facilitating the technology transition in terrestrial television is that there are already three active VHF multiplexes in Finland that use the new technology and that carry additional channels and HD quality programming. The reason these VHF multiplexes will help to smooth the transition is that the features provided by the new technology are accessible to antenna households so that viewers can concretely see the benefits. Consumer awareness and interest in HD quality is bound to grow as increasing numbers of viewers gain access to the new technology and can view HD programming. An integrated HD information and communications strategy covering all distribution platforms will ensure that all people in Finland are on an equal footing as media service users.

From an information point of view the transition to new technology transition involves two separate areas, i.e.

- 1) technical frequency changes following the conversion of the 700 MHz spectrum band from television use, and
- 2) the upgrading of consumers' receivers with the gradual switchover to DVB-T2 technology.

It is crucial that information about the equipment required by the new transmission technology reaches all consumers because the frequency changes from 2015 onwards, ahead of the next licensing period, will concern the whole of Finland and the majority of the population. Given the sheer scale of the project it is necessary to have a separate information plan that takes account of the changes related both to the frequency transition and to the introduction of the new transmission technology. Furthermore it is important to identify who is responsible for which aspects of information.

8.1. Preparing an information plan

It is paramount that consumers are made clear that the forthcoming changes affect terrestrial antenna television distribution only, and that cable television, IPTV and satellite television reception are not affected.

HDTV Forum's Information Working Party¹ has drawn up an information plan for the DVB-T2 switchover that is based on the detailed transition plan drawn up by the TPG working group as described above.

The information plan is based on the idea of two separate transitions and two different but related information objectives:

The first aim is to inform consumers about the conversion of the 700 MHz spectrum band from television use, which will require changes to master antenna systems and bring the need for all antenna households to perform a channel scan.

The second aim is to inform consumers about the switchover from DVB to DVB-T2 broadcasting. This requires that consumer update their receivers, but at the same time it gives them access to a wider selection of programming and to HD quality broadcasts.

The information will be provided on the one hand by the relevant authorities (MINTC, FICORA, Finnish Competition and Consumer Authority, Consumers' Association) and on the other hand by the

¹ The working party has involved representatives from the Finnish Broadcasting Company YLE, MTV, Nelonen Media, Digita, DNA, Anvia, Ficom, the Satellite and Antenna Association SANT, the Association of Electronics Wholesalers, the Home Electronics Association, the Ministry of Transport and Communications, the Finnish Competition and Consumer Authority, and the Association of Independent Producers in Finland.

television industry, i.e. the pay-tv and network operator DNA, the network operator Digita, the television companies YLE, MTV and Nelonen Media, the Association of Satellite and Antenna Association SANT, Ficora and the retail trade sector.

8.1.1 Roles of information providers

The information and communications strategy has a clear allocation of responsibilities. Information on antenna changes and receiver reconfigurations in housing corporations will be provided by the Ministry of Transport and Communications insofar as these concern the conversion of the 700 MHz spectrum band from the beginning of 2017. FICORA for its part will be responsible for overall coordination of the information and communications strategy, for drafting a frequency change plan that will serve as a basis for information on regional changes, and for providing guidance and advice on antenna changes.

Digita is charged with providing background material to the party responsible for information and communications on frequency and channel numbering changes, as well as for providing consumer services as per separate agreement. The Satellite and Antenna Association SANT will be responsible for work needed on antenna networks in housing corporations, and DNA will provide consumer services and background material to antenna contractors relating to the installation and alignment of VHF antennas.

In cases where viewers and housing corporations are experiencing problems with television reception and antenna alignment, for example, the primary point of guidance and advice will be the network operator, who is best placed and who indeed is obliged under the terms and conditions of its operating licence to provide such guidance.

Responsibility for the building, inspection and maintenance of antenna systems rests with local antenna contractors. Digita will be responsible for information about frequency and channel numbering changes and the timetables of these changes, making sure antenna contractors are properly informed well ahead of time.

FICORA is charged with addressing consumer problems when antenna contractors are unable to resolve disturbances in television reception and when it is suspected that the source of the problem is other than radio interference.

As for information concerning receiver upgrades, the Competition and Consumer Authority will provide advice and guidance on the rights and obligations of television operators and consumers in different types of services from a consumer rights point of view. The authority will also advise consumers on where to find various tools for help. DNA for its part will market its HD contents and provide technical advice on receiving different types of contents. Following its purchase of PlusTV, DNA is continuing to streamline its antenna television programming and from December 2013 will give PlusTV pay-tv customers access to its HD

channels. At the same time the equipment needed for the reception of HD channels will become more integrated and Antenna Ready HD equipment will also support Plus TV cards. Given the substantial number of customers, it will be possible to deliver well targeted information to customers about HD contents and the equipment needed to receive them. Digita will provide hybrid services and other new value added services to antenna network customers, and the retail trade branch will encourage consumers to invest in devices that meet the new technology standards (DVB-T2). Ficom will maintain tools such as websites (testatutlaitteet.fi; HDTVopas.fi; Kodindigiopas.fi) and a television service search tool that already provide extensive information on television services.

8.1.2 Information about new HD content

A further channel of information will be through HD content marketing by television companies. YLE, for instance, has indicated it will provide information about progress with its targets of HD diffusion. Among the areas covered during the current year will be information on new contracts and interesting HD contents.

The most significant HD content event of the near future are the Sochi Winter Olympics. Opening on 7 Feb 2014, the Games will be broadcast in HD by the Finnish Broadcasting Company YLE. YLE will be aiming to meet and inform journalists in advance and to inform the public about HD in advance and in connection with its news coverage of the games. Furthermore YLE's website and customer services will provide information on the company's HD programming and on how consumers can receive HD broadcasts. This information will be given as soon as it is known how each operator will be transmitting YLE contents in HD format. This information will be posted among others on YLE's Facebook wall and via the company's Twitter account. YLE will also post an HD information package on its intranet.

YLE also has plans in place to market HD contents via its national TV channels in early 2014, for instance in connection with marketing the Sochi Olympics. The timing of this information will depend on contracts signed with different parties. The information drive to the media will be started during 2013.

This information and communications effort is motivated by the desire to promote the introduction of HD technology in Finland, which is why the company has also taken the decision to expedite the switchover to HD. YLE is aiming to broadcast all four of its channels in HD by early 2014.

YLE is keen to ensure that antenna distributors, cable distributors and IPTV all have access to its HD content on the same terms and conditions, allowing operators to carry HD content on their networks. The primary objective is that at least cable networks can provide an extensive YLE HD offering from the beginning of 2014.

The volume of YLE's HD content is continuing to grow. This is made possible by continuing upgrades in studio technology. In Tampere the

upgrade was completed in early 2013, and currently work is underway at YLE's Helsinki studios. All outsourced programmes are also purchased in as high quality versions as possible.

In 2015 YLE will be producing almost all its TV programming in HD quality.

8.1.3 Timing of information and communications

The information and communications drive will be timed to coincide with the Christmas and sales season, the issue of network and programme licences, and the start of antenna installations. Furthermore HD channels and additional television offerings will be marketed. Television companies will provide information on HD opportunities in connection with various major events. In addition an annual calendar will be created that provides all the dates and timetables for major HD content events.

8.1.4 Specific comments about information and communications

The information and communications effort will be geared to supporting the technology transition in 2017, rather than stressing the possibility to continue to use current DVB-T technology until 2026. Consumer information will especially focus on the aspects of HD quality and the growing range of channels available. The T2 concept brings no added value to consumers. It is also important to stress the existing availability of HD quality programming via the VHF antenna network.

All the parties involved in the information and communications effort will contribute to marketing the shared tools available, such as the online HDTV.fi guide. In addition television operators and the Competition and Consumer Authority will provide information most particularly on purchasing HD and pay-tv receivers and on HD contents. The Ministry of Transport and Communications, FICORA, Digita and the Satellite and Antenna Association for their part will concentrate on general information about the frequency changes, and the latter two will furthermore concentrate on consumer information and on informing housing corporations about antenna and channel numbering changes. It is also noteworthy that in questions concerning television reception and coverage areas, viewers can turn to their network operators.

It is also important that sufficient investment is made in the training of consumer electronics sales staff. The Association of Electronics Wholesalers provides information to consumers and retail sales staff.

Ultimately the aim is that consumers can find the answers to their questions online. However it is important that there is also a telephone service that consumers can contact if they are experiencing problems. Each operator has a customer service desk to deal with inquiries by their respective customers and to provide guidance and advice on their services. The need for a larger, coordinated telephone service will be

discussed separately. It is also important to monitor the number of contacts received by different partners and in the event of obvious clusters of issues work in close collaboration to resolve problems.

One option is to compile all relevant information about the technology transition, receiver units, frequency and channel numbering changes, either directly or via links, into one single website. This website would also provide contact information (telephone and e-mail addresses) for cases where consumers are unable to find the information they need on the website. However the relevant roles and responsibilities must be discussed separately before they can be incorporated in the information and communications plan.

8.1.5 Coordinated information and communications

The information and communications effort will begin on the date that the Interim Report is published (28 Nov 2013). The authorities involved from the outset are the Ministry of Transport and Communications, FICORA and the Competition and Consumer Authority.

All parties will work together to produce shared communications material, such as television spots. In addition all shall use the Antenna Ready logo in their information and communications.



The practical measures taken and the roles and responsibilities of different parties are described in more detail in the Information Working Party's information and communications plan.

8.2 FICORA's role as coordinator of information and communications

The role of coordinator in the information and communications effort surrounding the technology transfer rests with FICORA. FICORA will appoint a project manager to take charge of coordination between the different parties involved. Likewise the project manager will be responsible for monitoring implementation of information and communications and ensuring that the objectives and timetables are met. For purposes of targeted consumer information FOCRA will use the

services of a consultant who will work closely with the project manager and with the various parties responsible for information about the technology transition. Separate discussions will be held to agree on details and resources.

Based on the division of labour agreed by the HDTV Forum's Information Working Party FICORA has broken down the information and communications effort into three stages.

First stage 2014 (ASAP) ->

- Consumer information is spearheaded by two campaigns on "HD offering in 2017 and other new services enabled by DVB-T2 equipment" and "Antenna READY HD receivers can access all programmes available".
- The retail trade sector is responsible for increasing sales of DVB-T2 receivers and for general information to consumers. Ideally, sales of DVB-T receivers will end altogether.
- Antenna contractors are charged with providing advance information regarding the changes and reconfigurations needed in receiver units. Information and communications on frequency changes should be started as soon as more detailed information becomes available.
- Housing corporations with master antenna systems shall ensure that residents are aware of the changes to the antenna system and the timetables well ahead of time. Real estate managers and the boards of housing corporations should know about the changes required well ahead of time so that they can discuss the necessary changes early enough and contact antenna contractors to order the necessary work.

Second stage 2015–2016

- Consumer information and communications will continue to focus on the same campaigns as in the first stage. In addition consumers will receive more detailed regional information as the frequency changes in the respective areas draw closer.
- Antenna contractors will provide information about the reconfigurations required by the frequency changes in each region. The message to housing corporations is the same, i.e. it makes sense to get in touch with antenna contractors well ahead of time. From the point of view of antenna contractors network operators also have a key role to play in sending out the right message: operators must give early advice and guidance to antenna contractors about the timetable of the changes.
- The aim of the retail trade sector is to continue to increase sales of DVB-T2 receivers (Antenna READY HD).

Third stage 2017 ->

- Post-change maintenance and consumer advice. In the new licensing period the focus is turned to consumer advice. Consumers may have inquiries concerning both the content of multiplexes and technical changes.

Based on the division of labour agreed by the HDTV Forum Information Working Part, FICORA has broken down the public information and communications work into three stages. Given the large number of people that need to be reached and the range of issues that need to be covered, it is crucial to have a separate information plan that details the roles and responsibilities of the various parties involved. Well managed and effective communications requires that all the parties involved are fully committed to executing this plan.

9. IN CONCLUSION

The Working Group's mandate extends to the end of 2016. As discussed earlier, the Working Group may compile annual reviews of past developments and measures taken.

