PUBLICATIONS OF
THE MINISTRY OF TRANSPORT AND COMMUNICATIONS 20/2008

Switchover to All-Digital Television
Final Report of Monitoring Group

MINISTRY OF TRANSPORT
AND COMMUNICATIONS FINLAND

Helsinki, 2008

MINISTRY OF TRANSPORT AND COMMUNICATIONS FINLAND

DESCRIPTION

Date of publication
27 February 2008

Authors (from body; name, chairman and secretary of the body)	Type of publication
Working group on monitoring and promoting	Working group
digital television broadcasting,	Assigned by Ministry of Transport and Communications
chair: Liisa Ero, secretary: Maaret Suomi	Date when body appointed 4 April 2005

Name of the publication
Switch-over to all-digital television

Abstract

In accordance with Government resolution of 4 March 2004 Finland switched over to digital television broadcasting in terrestrial television networks when analogue transmissions were switched off on 1 September 2007 at 4.00 a.m. In cable television networks analogue transmissions continued until 29 February 2008.

The task of the working group was to monitor and promote digital television broadcasting until 31 August 2007 and to make any necessary proposals concerning the matter to the Ministry. At the request of the working group its term was continued until 29 February 2008.

An interim report of the working group was published in a series of the Ministry of Transport and Communications, 51/2006. This final report monitors the digitalisation process from October 2006 onwards.

The report describes, for example, the supply, coverage and availability of digital television services in 2008. It also includes a review of the switch-over process to digital television in some countries. Furthermore, it examines the measures the public sector and the players in the sector have taken to promote digital television.

A very important role in creating and implementing the practical measures of the digitalisation process was played by Mr Tauno Äijälä, Project Manager, and the TV2007 group under his leadership. The report includes the TV2007 group's summary of the lessons learnt from the practical work in the process.

Keywords
digital television broadcasting

Miscellaneous
Contact person at the Ministry: Ms Maaret Suomi
This report is also published in Finnish *(Liikenne- ja viestintäministeriön julkaisuja 12/2008)*

Serial name and number	ISSN	ISBN
Publications of the Ministry of Transport and Communications 20/2008	1457-7488 (printed version) 1795-4045 (electronic version)	978-952-201-735-2 (printed version) 978-952-201-736-9 (electronic version)

Pages	Language	Price	Confidence status
74	English		Public

Distributed and published by
Ministry of Transport and Communications

TABLE OF CONTENTS

1. INITIAL STAGES IN SWITCHOVER TO ALL-DIGITAL TELEVISION AND GOVERNMENT RESOLUTION OF 4 MARCH 2004

1.1. Cabinet evening session 1996

The Government resolution on commencing digital television operations was taken on 8 May 1996 in an evening session of the Cabinet. Underlying the decision was a memorandum by the Ministry of Transport and Communications on developing public service broadcasting, which in essence stated that the digitisation of television was an imperative that would enable wider and more diverse service to the viewers, enhance the efficiency of limited resource of frequencies, improve both picture and sound quality in television, and allow new additional services to be transmitted to the public.

The guidelines included in the Government resolution recommended the following steps: the new commercial licences to broadcast national analogue radio and television should be declared open for application, at which time the relationship between these licences and the licence fee for commercial channels should be determined; the funds accruing from licences should be placed in a separate Radio Fund instead of being directed to Yleisradio Oy (Finnish Broadcasting Company, YLE); the transmission equipment of YLE should be incorporated into a separate entity; and the standing of Swedish-language programming in the various channels should be defined. The same decision also confirmed that Finnish television broadcasting also in future would be based on terrestrial television networks. Nearly half of all Finns receive television broadcasts over the terrestrial network, and there was not desire to change this status quo. Terrestrial transmissions are well suited for Finland's geographical location and also enable mobile reception.

1.2. First licences

The first eight licences for digital television operations were granted on 23 June 1999 for a ten-year period (1 September 2000 – 31 August 2000). The recipients were MTV Oy, City-TV Oy Helsinki Oy, City-TV Oy Pirkanmaa, City-Tv Oy Suomi Oy and City-TV Oy Turku for regional programming, Suomen Urheilutelevisio Oy, Wellnet Oy, Oy Ruutunelonen Ab, Helsinki Media Company Oy, Werner Söderström and Deuterium Oy.

In the context of the decision, the Cabinet issued two statements. In respect of pay-TV, it was required that "if pay-TV services are provided, the operators shall in collaboration strive to commit to a single-card service solution and to consistent customer and subscriber administration

that best serves consumers". In addition, the Cabinet set the target of being able to discontinue analogue television services at the end of 2006.

Licence holders commenced digital broadcasts in three multiplexes on 27 August 2001. The number of set-top boxes at this time was still fairly low, which in part contributed to the decision on the part of certain licence holders not to commence the licensed operations or to the cancellation of the licence. New licences including local ones were granted on 13 March 2003 to replace the aforementioned.

1.3. Parliamentary working group of 2001

The working group sitting in spring 2001 and chaired by Member of Parliament Jouni Backman submitted on 18 May 2001 its proposal, according to which:

- no licence fee would be charged for digital broadcasts during the first licence period ending on 31 August 2010;
- the licence fee for analogue broadcasting would be halved effective upon entry into force of the new Communications Market Act (393/2003) on 1 July 2007;
- commercials would no longer be shown in sports broadcasts on the channels of YLE;
- the television fee system would be revised so that effective from 2004, the fee is to be revised annually to increase by the rate of inflation plus one percent; and
- domestic programme production would be supported by increasing the share of programming acquired from independent production companies to fifteen percent instead of the ten percent required under the Television without Frontiers Directive.

The working group held that the funds becoming available from the removal of the licence fee should mainly be used on the development of digital broadcasting and content provision.

1.4. Petitionary motion in Parliament

Upon adopting on 7 February 2003 the second-stage reform of the Communications Markets Act with the amendments proposed by the working group chaired by MP Jouni Backman, Parliament attached the following petitionary motion to the Bill: Parliament requires that in order to promote the provision of new services made possible by the development of the information society, the Government shall without delay determine the necessary further measures to expedite the switchover to digital television broadcasting.

1.5. Government resolution in 2004

In response to the motion of Parliament, the Ministry of Transport and Communications appointed in 2003 a parliamentary working group to draft a proposal for organising the funding, duties and administration of YLE, expediting the switchover to digital television broadcasting and its timetable, and for developing the must-carry obligation in cable television. Secretary General Seppo Niemelä was asked to chair the working group.

On 4 March 2004, the Government issued a resolution on the switchover to all-digital television broadcasting and related measures (Appendix 1). According to the decision, Finland was to switch over to all-digital television broadcasting on 31 August 2007. Pursuant to the decision, the licence terms of existing commercial and other analogue broadcasting licence holders were modified to expire on 31 August 2007. In addition, the Administrative Council of Yleisradio on 16 March 2004 resolved that the company would switch over to all-digital television broadcasting on that date.

The Government resolution was based on the unanimous proposal submitted by the aforementioned parliamentary working group chaired by Seppo Niemelä. In its proposal, the working group started out from the premise that all Finns, regardless of residence and income status, must well in advance of the switch-off of analogue television broadcasting have access to digital television services at a reasonable cost and little effort. Moreover, the digital network needed to cover the entire country well before analogue broadcasts were switched off. The working group underscored the importance of the country-wide transmission network being completed by autumn 2005.

On the basis of the working group's proposal and the comments received thereon, the Government deemed it reasonable to assume that all Finns, regardless of residence or income status, will well in advance of the switch-off of analogue television broadcasting have access to digital television services at a reasonable cost. People were deemed to have sufficient time to prepare, as the date of switching off analogue broadcasts was announced more than three years in advance of the event.

Analogue terrestrial television broadcasts in antenna networks ended on 1 September 2007 at 04:00 in the manner agreed among the television companies. The timing was decided on the grounds that 4am is the time of the "change of the day" in television and also the time of the lowest possible viewing audience.

The following table summarises the most important milestones on the path to digital television:

18.5.1996	Government resolution on the digitisation of television networks
23.6.1999	Licences granted for national digital television broadcasting in two multiplexes
27.8.2001	Digital broadcasting commences
1.7.2002	Licence fee in analogue broadcasting halved and digital broadcasting exempted from licence fee until 31 August 2010 (Act on the Television and Radio Fund 745/1998), programming and network licences differentiated (Communications Market Act 393/2003)
14.11.2002	Network licence granted to Digita for provision of telecommunications network services in digital terrestrial television and radio networks
8.12.2003	Interim report of parliamentary working group chaired by Niemelä, premised on digital television for all at reasonable cost and little effort
18.12.2003	New local digital television licences and licences for radio broadcasting in the digital television network granted
4.3.2004	According to Government resolution, all television broadcasts in Finland shall be digital as of 31 August 2007
16.3.2004	Administrative Council of YLE takes decision on transition to all-digital television broadcasting
23.3.2006	Network licence for mobile television granted to Digita
15.6.2006	Network licence for fifth multiplex in terrestrial digital mass communications network granted to Digita for television broadcasting
14.12.2006	New digital licences operating on the principle of pay-TV
3.4.2007	Announcement from YLE stating that housing companies may convert digital signal into analogue if they also provide full digital television services. The conversion shall take place with a central set-top box. Digital signal conversion cuts back on programme supply and i.a. prevents access to services designed for special interest groups. However, the Ministry of Transport and Communications hopes that the transition to viewing digital broadcasts in the home would primarily take place with digital receivers acquired for the home, in line with the original design.
20.6.2007	If in August fewer than 85% of cable households own set-top boxes, cable companies may convert the digital signal to analogue until the end of February 2008. The Ministry of Transport and Communications hopes that the television companies will grant the cable companies permission for such signal conversion.
1.9.2007 klo 4.00	Analogue broadcasts end in the terrestrial transmission network in accordance with the Government resolution of 4 March 2004. The switch-off of analogue broadcasts is also stated in the Government programme (April 2007).
1.9.2007	Multiplex E comes online. The service area initially covers southern and central Finland (60% of population) and later expands to other parts of the country (80% of population as of 1 October 2007).

2. ÅLAND ISLANDS

Digitisation in the Åland Islands progressed by degrees since 2003, when SVT commenced digital broadcasts. The complete switchover to digital broadcasts took place in spring 2006 when Ålands Radio och TV became the first Nordic public service broadcasting company to switch off analogue broadcasts. The Swedish digitisation timetable has been observed in the Åland Islands. The closest stations on the Swedish side of the border, Östhammar and Väddö, switched off analogue broadcasts in March 2006. No problems were experienced by the audience viewing broadcasts via the terrestrial transmission network, as most households had obtained the necessary set-top box well in advance due to the lengthy transition period.

Analogue Finnish broadcasts (YLE TV1 and TV2, MTV's MTV3) also ended in the Åland Islands cable network in March 2006. The fully digitised cable network comprises some 6,500 households, of which only one quarter owned set-top boxes at the time of switch-off.

3. INTERIM REPORT OF DIGITAL TV MONITORING GROUP

The working group submitted in October 2006 to the Minister of Transport and Communications its interim report[1] containing proposals for action to safeguard the period of transition to digital television. The supply, penetration and availability of digital television in 2006 were described in the report, which also presented a compendium of action taken by the public sector and operators to promote digital television. The working group stated that a particular challenge to the successful transition to digital television arose from digital television reception, the functioning of receivers, the success of information dissemination, and the slow rate of set-top box acquisition among cable households. In addition, the working group underscored the importance of supporting the switchover among persons over the age of 65 with measures clearly targeting the said demographic.

The working group stated that the preconditions to the switchover to all-digital television broadcasting, which included a transmission network covering the entire country, the availability, easy use and affordability of receivers, and digital television content beneficial to consumers, had largely been achieved. On the basis of its submission, the working group found it possible to come to the conclusion that the transition to digital television was progressing on schedule in respect of antenna reception, while additional action might be necessary in respect of cable reception.

[1] Digital television, Intermediate Working Group report 2006, Publications of the Ministry of Transport and Communications 52/2006

This final report continues to monitor the digitisation process from the situation at October 2006 presented in the interim report.

4. REPORT OF TV2007 GROUP ON ACTIVITIES TO PROMOTE TV DIGITISATION

The key television broadcasters appealed to the Ministry of Transport and Communications in 2005 for the public sector to assume a more forceful role and responsibility for the switchover to digital broadcasting. They stated that this could be accomplished through the appointment of a special committee, as in Sweden (digital-tv-komissionen), to coordinate e.g. information campaigns and actions by the various operators and to address bottlenecks in digitisation.

In order to further bolster the role of government and to brainstorm and execute the practical measures needed in the implementation of digitisation, the Ministry appointed Mr Tauno Äijälä, MA (Pol. Sci.), project manager in digital television in February 2006. In addition to the above, his duties also comprised communication with the target demographics and stakeholders of the switchover, the organisation of any advisory and installation services to be provided, and the promotion of digital readiness in the public sector. The project manager was also tasked with attending to follow-up studies and surveys pertaining to digital television operations.

The project manager was assisted by the ”TV2007 Group” on which served Jessi Frey (SWelcom, until September 2007), Riitta Kontula (Digita, until September 2007), Mika Ojamies (YLE, from September 2006 lähtien), Pirkko Rajala (MTV) and Mauri Vakkilainen (YLE, February–August 2006). Birgitta Selonen (Digita) and Outi Vitie (SWelcom/Welho) joined the Group in October 2007.

The working group’s duties concerned the promotion of digitisation, which comprised i.a. the conceptualisation and execution of the necessary practical arrangements, the coordination of all operators’ actions relating to digital television, communication with the target demographics and stakeholders of the switchover, the organisation of any advisory and installation services to be provided, and the coordination and generation of follow-up studies and surveys pertaining to digital television. Among other things, the working group organised a centralised instructor training programme, launched cooperation with various interested parties and participated in numerous advisory and training events.

The TV2007 Group drafted an interim report on its activities between 20 February 2006 and 19 October 2007. The Group remained active until 29 February 2008. The following is a summary of the Group’s activities.

4.1. Measures to facilitate the digital switchover

The TV2007 Group launched its activities with a study of the status and action potential of digitisation in meetings with the authorities, the industry, volunteer organisations and the communications group. Some sixty different parties were consulted during this extensive round of meetings, which quite rapidly established the most significant target demographic for activities: persons over the age of 60 living alone in cities judged to require the most support in switching over to digital television.

Over a period of 18 months, the Group attended nearly two hundred events. Major civic events such as the DigiTV tours (2006) and Digipysäkki (2007) gave Group members access to thousands of people at once all over Finland.

Individual events worth mentioning include the Antenna Day of 30 May 2007 organised by Digita and Satellite and Antenna Association SANT together with the TV2007 Group. The aim of the day was to provide consumers with information on receiving antenna alignment and the importance of proper antenna systems in the reception of digital broadcasts. The topic was addressed in several stories in both print and electronic media.

In addition, the Digipysäkki event organised by the TV2007 Group together with the cable television companies during the Digital Week in August 2007 attracted thousands of people in seven towns to consult experts in the field. In addition to antenna reception, questions mainly concerned connecting other home appliances (VCR, DVD player) in the digital age.

The highest-visibility element of the Group's work was project manager Tauno Äijälä's media presence. Numerous radio and TV interviews as well as newspaper and magazine articles served to promote digitisation. The digitisation process needed someone to personify the entire undertaking. This helped the Group's message reach the wider public also on occasions when digitisation was subjected to criticism. Other Group members also spoke in the media on matters pertaining to digitisation.

Digital Weeks

During its initial study, TV2007 observed that promotional events would be necessary to encourage the switchover to digital television. The active participation of television companies in the switchover created the opportunity for effectively reaching wide audiences. Television companies supported the Group's idea of organising a "Digital Week", of which two were ultimately arranged under the coordination of the TV2007 Group, the weeks of 12 February and 13 August in 2007.

During both Digital Weeks, digitalisation was addressed on TV in a very concrete manner, on the basis of questions coming in from the public. Critical voices were also given a hearing. Pay-TV operators were intensely involved, offering free viewing of their programming during the Digital Weeks for those who had already switched over to digital.

Eläköön yhteys!

Mostly executed through volunteer forces, the *Eläköön yhteys!* [Links for Life] project involved Lions Club members offering their services in installing set-top boxes nationwide. The social work services of the Tampere Evangelical Lutheran parishes attended to a national hotline while Helsinki Mission assumed responsibility for the hotline in the Helsinki Metropolitan Area and for a large number of installation projects.

A total of 34 training events nationwide were organised within the project in October 2006 and between January and March 2007, providing training to well over 1,500 Lions Club members and Helsinki Mission volunteers as well as over one hundred other volunteers in the installation of set-top boxes for the elderly. At the same time, 77 volunteer employees at service centres for the elderly were trained to schedule installations over the phone. Key partners in these training events in the provinces were the local cable TV operators, on whose premises and with whose assistance the majority of the events were held.

Television companies provided massive visibility for the campaign's TV spot with a cumulative audience of some 35 million. The campaign also had a significant indirect effect, as children were roused to attend to the set-top box needs of their parents and grandparents.

The campaign ran from 12 February to 9 March 2007 and resulted in well over 6,700 senior citizens having a set-top box installed and provided training in its use. A key factor to the project was the achievement of the security guaranteed to its beneficiaries. The indirect impact of the campaign in activating the middle-aged in particular to take better care of their ageing family and friends was also substantial.

The *Eläköön yhteys* project was followed by one implemented by the Association for Educational Activity, in which well over 300 assistants based in a total of 105 locations were trained during February and March 2007 in fifteen events organised by the TV2007 Group. Their work continued until 30 September 2007 and in all, they assisted some 500 persons on the basis of roughly one thousand requests.

In August/September 2007, Helsinki Mission and the Lions Clubs organised their own assistance projects in the Helsinki Metropolitan Area that helped hundreds of senior citizens switch over to digital.

Before the end of analogue broadcasts in the cable network as well, the

TV2007 Group together with volunteers from the Association of Finnish Lions Clubs implemented an *Eläköön yhteys 2008* campaign between 18 February and 7 March 2008 to help the elderly population of the campaign locations in the installation of set-top boxes and to provide instruction in their use. Senior citizens living alone in the Helsinki Metropolitan Area were also provided similar assistance in cooperation with Helsinki Mission.

4.2. Other joint projects

Libraries also undertook a significant project to promote the switchover to digital television. Together with the TV2007 Group and with funding from the Ministry of Education, a library project team organised a series of events across the country at 24 provincial and other larger libraries to disseminate information about the switchover and digital devices. Libraries in the Helsinki Metropolitan Area undertook further distinct projects in spring 2007 (libraries in Vantaa) and in August together with Lions Club volunteers. During the Digital Week of 13–19 August 2007, instruction in the use of digital devices was available in the libraries of Helsinki, Espoo and Vantaa. Advisory services were also provided in some libraries in December 2007. Libraries in the Helsinki Metropolitan Area furthermore loaned out set-top boxes so that people might learn about them in their homes. Cable company Welho partnered with the libraries in this undertaking. Advisory service provision was continued in collaboration with Helsinki City Library in the week of 25 February in 2008.

Another example of joint projects is the three-language digital television vocabulary compiled by the Finnish Terminology Centre TSK. The vocabulary is available on the internet at http://www.tsk.fi/fi/info/digi-tv-sanasto.pdf. In Tampere, the eTupa online information service widely distributed advice, while the social services of the Tampere Evangelical Lutheran parishes had been providing assistance in the digital switchover already long before the *Eläköön yhteys* project.

5. MONITORING AND FOLLOW-UP

The digital television monitoring group has monitored the progress of the switchover to digital television through the parties represented on the working group, distinct studies and extensive cooperation with the various stakeholders. The working group has also had at its disposal the reports of the TV2007 Group on progress in digital television in other European countries. The international review in this report is based on the information provided by the TV2007 Group.

5.1. Follow-up studies and surveys

Finnpanel survey "TV Households in Finland"

The Ministry of Transport and Communications together with the Finnish Communications Regulatory Authority (FICORA) commissioned from market survey company Finnpanel a set-top box penetration report published quarterly in connection with the *TV Households in Finland* survey. The most recent results can be viewed (in Finnish only) at www.finnpanel.fi and are also summarised in this report. The reporting method was modified upon publication of the report on the period of February–March 2006 to present the take-up of set-top boxes proportionate to the number of households with television. In 2007, in addition to the basic reports Finnpanel also conducted "intermediate surveys" on which only the penetration rate of set-top boxes was reported. Six intermediate survey reports were published in 2007 while the wider results for November–December 2007 and the results for January 2008 were published in January 2008.

FICORA surveys

In addition to the surveys it conducted in 2005 and 2006, FICORA commissioned in 2007 two consumer surveys on the usability of digital television from TNS Gallup.[2] Both surveys comprised interviews of 1,000 persons who were the best versed in television matters in their household (excluding matters relating to content only).

The surveys indicated that households overall were satisfied with the usability of digital television: in January 2007, digital television was given an overall rating of 3.62 (on a scale of 1–5) while in October, the rating was 3.54. According to the survey, households had mostly encountered no problems with the introduction of digital receivers.

Despite high usability ratings, most digital households at the time of the survey experienced problems with viewing and using digital television. The most common problems mentioned had to do with subtitling and

[2] Further information on the survey (in Finnish only) on the FICORA website: http://www.ficora.fi/index/tutkimukset/tvjaradiotoiminta/digitv.html

picture quality as well as the receiver “seizing up”. Loss of channels and problems with sound or teletext were also mentioned among issues hampering viewing or use.

Attitudes towards digital television / Audience survey by YLE

The attitudes of Finns towards digital television were studied in YLE’s Audience Survey initially commissioned by the digital television communications group, which was later replaced by the TV2007 Group as partner in the survey. The first telephone survey (1,001 interviewees) was conducted in March 2005, followed by a survey in summer 2005 with 1,624 responses. According to the survey in spring 2006 (1,000 respondents), 58% of Finns could pinpoint the digital switchover date. Awareness of the exact date was higher among the older than the younger respondents. The switchover itself and better sound quality were considered the most important reasons for purchasing a digital television. Non-digital households were in no rush to buy set-top boxes but were rather content to continue waiting for special offers and improvements in the functioning of the devices. The highest interest in additional channels was found among those who had already purchased a digital television.

The next attitude surveys were conducted in November 2006, March 2007 and September/October 2007, by which time 64% of households who had already switched over to digital television were at least quite satisfied with the entire switchover. The causes of the most dissatisfaction were the time of the switchover and the functioning of receivers.

According to the last survey conducted in 2007, satisfaction with the switchover to digital television is linked to better picture and sound quality, an interesting selection of channels and the option of recording, while dissatisfaction had to do with the switchover schedule and the functioning of the devices. The survey indicated that supply and the functioning of devices also partly divided digital households into those whose devices functioned or did not function well, and also into those quite interested in new supply, e.g. pay-TV channels, and those with little interest. Personal contacts were valued the highest as sources of information and advice. The most advice in the digital switchover was found from family and friends, stores and sales clerks, and also newspapers and magazines. Respondents felt more information should be forthcoming especially from home appliance stores, newspapers and magazines, and operators in the television sector.

5.2. Major final-stage monitoring targets

Switchover to digital television in hospitals and facilities

A working group of the Association of Finnish Local and Regional Authorities in December 2005 proposed to the Ministry of Transport and

Communications and YLE that it be possible for a period of no more than five years starting in autumn 2007 to convert the digital signal to analogue in the common antenna network of municipal facilities (mostly hospitals) in cases where a fully digital environment cannot be accomplished by the deadline.

The matter was discussed among the Association, YLE and the Ministry on several occasions during 2006 and the following solution was arrived at on 30 November 2006:

1. The antenna systems of hospitals and other facilities will be upgraded to receive digital signal.
2. Effective 1 September 2007, the patients and other persons treated at hospitals and facilities shall have access to television sets on public premises transmitting the digital signal inclusive of all additional services.
3. The digitisation of all television sets will be accomplished in hospitals and facilities by 31 August 2010 at the latest.
4. In respect of those television sets hat are not digital-ready on 31 August 2007, remodulation can be performed, meaning the centralised conversion of digital service to analogue (PAL system). Remodulation shall be a temporary and supplementary remedy to be implemented as part of the digital upgrade. Remodulation allows the viewing of certain channels selected by the relevant facility and permitted by the television companies with the existing analogue television sets in hospitals. The upgraded digital antenna system also allows the introduction of new digital receivers as the hospitals replace their old analogue television sets with these.
5. The procedure described above shall be restricted only to hospitals, wards of a hospital nature and facilities providing round-the-clock care where the facility is responsible for television sets.

The Administrative Council of YLE approved the above solution on 12 December 2006. It was also agreed that the Association of Finnish Local and Regional Authorities provide to YLE and the Ministry of Transport and Communications a report on the development of digital readiness in hospitals and facilities on 31 August 2008, 31 August 2009 and 31 August 2010.

MTV, SW Television, Suomen Urheilutelevisio, SubTV, TV5 Finland and C More Entertainment also signed on to the above.

Conversion of digital television signal to analogue: YLE's decision

The premise for the switchover to all-digital television broadcasts was to secure equal opportunity for all to view the full-service television programming of YLE inclusive of related auxiliary and additional services.

On 3 April 2007, YLE announced that it would not intervene in the efforts of housing companies to convert digital television signal to ana-

logue provided that the digital signal is simultaneously guaranteed and transmitted to all households in the housing company. The announcement impacted on the sales of set-top boxes in April and May, but ultimately only few "central set-top boxes" of this kind were obtained by housing companies.

Continuation of analogue broadcasts in the cable television networks

In a meeting organised under the leadership of Ms Suvi Lindén, Minister of Communications, on 20 June 2007, the operators in the television sector and the cable television companies agreed that cable television companies would continue until 29 February 2008 the analogue broadcasts of the basic channels and, in Swedish-speaking locales also FST5, broadcast in analogue at the time. Underlying this decision was the low rate of set-top box penetration among cable households, which at the time stood at 56 percent. In this context, however, the television companies stressed that 29 February 2008 was the absolute deadline.

Shadow areas in the terrestrial digital television transmission network and satellite reception

The actual service area of the terrestrial digital distribution network usually includes certain areas where reception is difficult due to terrain. In order to cover these shadow areas, the transmission network was supplemented in 2006 and 2007 with gapfillers in several dozen locations.

Even after the completion of the gapfillers, certain shadow areas and blind spots remained within the service areas, mostly due to terrain. Shadow areas have been discovered all over Finland and the areas have usually been very small in size.

In a decision issued on 29 May 2007, FICORA held that the reception quality of the digital television broadcasts of MTV, Subtv and SW Television did not meet the terms of the companies' licences and issued the companies a reprimand in accordance with the Act on Television and Radio Operations.

In order to eliminate shadow areas in digital television, the commercial television broadcasters and YLE announced in spring 2007 the construction of an additional 48 gapfillers in 26 locations. Two additional gapfillers were also agreed on. Subsequent to the installation of all gapfillers, the population coverage of the multiplexes A and B would stand at 99.96 percent.

The last decisions concerning population coverage were taken at a fairly late stage and the majority of the gapfillers could not be installed until 2007. This forced the stop-gap measure of the television companies subsidising viewers in temporary shadow areas in acquiring satellite receivers.

MTV, Subtv and SW Television submitted on 1 June 2007 to the Government an application for licence modification to supplement the terrestrial transmission network with satellite transmission. After the licence holders had committed to the coverage of shadow areas as required by FICORA in its decision of 28 May 2007, the Government by virtue of its decision of 28 June 2007 added to the licences of the aforementioned licence holders a provision to the effect that the licence holders, in exceptional shadow areas in difficult reception conditions, could replace terrestrial television broadcast transmission with alternative means of transmission in order to fulfil the must-carry obligation covering the entire country.

At present, YLE, MTV and SW Television have agreed on an arrangement that allows households outside the service areas of digital television to view television channels through satellite reception, which requires the households to purchase a viewing package costing €50. The equipment and satellite card required for reception are provided by the customer services of Canal Digital, to whom the customer shall supply a certificate issued by a TV antenna company or Digita stating that the customer's residence is located in an area where terrestrial digital television reception is impossible. The card is free of charge for those residing in permanent shadow areas. The package comprises the following channels: YLE TV1, YLE TV2, YLE Teema; YLE FST5, YLE Extra, (Extra replaced by YLE TV1+ on 1 January 2008), MTV3, Sub, Nelonen and JIM.

All reception quality questions are directed to DigiTV Info, which forwards any questions it is unable to answer to Digita. Digita uses coverage maps to determine whether the shadow area in which the reception locale is situated is permanent or temporary. Notification from Digita or a TV antenna company to Canal Digital entitles a household to receive the subsidised reception package, a satellite dish and combo box and a conditional access card.

As part of its shadow area survey, Digita conducted visits to and took measurements in locations with problematic reception and provided recommendations on how best to address the coverage issue. Over the course of twelve months, more than 600 residences were called upon.

6. INTERNATIONAL REVIEW

Now that analogue broadcasts have been switched off in both the terrestrial and cable networks, Finland is the first country in Europe to switch over to all-digital television broadcasts. Terrestrial analogue broadcasts were switched off before Finland in the Netherlands and Luxembourg, closely followed by Sweden on 15 October 2007. However, the cable networks in these countries continue to transmit both analogue and digital broadcasts.

Sweden

Sweden switched over to all-digital terrestrial broadcasting on 15 October 2007 when the last analogue broadcasts were switched off in the Skåne and Blekinge regions. Now some 65 percent of Swedes only receive digital television broadcasts. Analogue broadcasting continues in the cable network, where the digital penetration rate is slightly over 30 percent at present. Roughly 20 percent of Swedes have satellite reception, which is all-digital. IPTV has also grown in popularity; in late summer 2007, TeliaSonera reported it had 200,000 subscribers, double the number from May of the same year.

After Finland, the Netherlands and Luxembourg, Sweden is the fourth State to completely switch off analogue terrestrial broadcasts. Much useful research data on consumer behaviour has been obtained from Sweden.

An interesting phenomenon in Sweden is the clear increase in television fees, which increased in 2007 by 30,000 from the previous year. According to Radiotjänst CEO Anna Pettersson, the increase is due to both digitisation and the immense popularity of flat-screen televisions.

The final report of the Swedish Digitalkommissionen (Digital Commission) will be released in March 2008.

Norway

Digitisation in Norway has progressed slowly despite the first test broadcasts starting already in 2000, since which 25–30 percent of Norwegians have had access to digital broadcasts.

Norway will kick off terrestrial digital broadcasts with the MPEG-4 standard straight away. Test transmissions of both standard and HDTV broadcasts started in January 2007. Commercial service commenced in September 2007 in the Rogaland region, soon followed by Oslo. By mid-November 2007, seventy percent of households in Norway had access to digital broadcasts, and the coverage will be expanded to all of Norway by the end of 2008.

Analogue signals will be switched off in each region within six months of the commencement of digital broadcasts. The Rogaland region comes first here as well: analogue broadcasts will switch off there on 4 March 2008 at 11:30, at which time it is estimated that 98% of the region's 30,000 residents will own a digital receiver. The last analogue broadcasts to switch off will be in the Finnmark region in November 2009.

Digital television offers both free channels and pay-TV services. The number of free channels is five, and pay-TV operator RiksTV offers access to fifteen channels. A second pay-TV operator will be licensed to start operations no later than upon switch-off of analogue broadcasts in 2010.

Of the 1.8 million households in Norway, 650,000 or 36% depend on terrestrial transmissions. Satellite penetration also stands at 36% and satellite transmissions are all-digital. Roughly one third of cable viewers receive their broadcasts digitally.

United Kingdom

The United Kingdom has the highest number of households with digital television in Europe. Of the slightly under 25 million households in the UK, 85 percent receive digital broadcasts. Not only digital penetration but also the number of digital receivers is high, as second and third televisions in homes have been digitised at a rapid pace. Communications authority Ofcom reported in August 2007 that 50 percent of households had acquired a set-top box for every television in the home.

Digital terrestrial broadcasts commenced in 1998 as a pay-TV service operated by OnDigital. However, the pay service failed to capture a sufficient audience against competition from aggressively expanding satellite TV company BskyB, and OnDigital folded in May 2002.

The free Freeview launched in October 2002 has enjoyed excellent success. Freeview boxes are acquired for second and third television sets in cable and satellite households as well due to their affordable price. Ofcom estimates one third of these – i.e. some 12 million out of 35 million – have been digitised. In September 2007, supermarket giant Tesco started marketing Freeview boxes at a price of only £10 (roughly €15).

Freeview's popularity exceeded that of satellite operator BskyB in April 2007. The news is momentous, as the UK is traditionally a satellite-viewing stronghold. Freeview is the primary choice for second and third television sets in particular. Since their launch in May 2002, more than 20 million Freeview boxes have been sold. Terrestrial broadcasts are the primary mode of reception in 9.3 million households while the number of satellite households is 9.1 million.

Digitisation is also forging ahead among cable households. At present, 93 percent of the 3.3 million cable subscriptions in the UK are digital. In summer 2007, the figure stood at 80 percent.

Analogue broadcast switch-off is being carried out one region at a time in the UK between 2008 and 2012. The strategy is to start with smaller towns and have the London area be the last to switch off analogue broadcasts. The first transmitter to switch off, on 17 October 2007, served Copeland and Whitehaven. Areas in southern Scotland will come next in November 2008 and summer 2009.

The switch-off of analogue broadcasts has generated little opposition in the UK, and 91 percent of the population state they will purchase a digital receiver well before the switch-over. Opponents were only a small minority in Whitehaven, the first district to switch over. Surveys indicate only 0.2 percent of the population threatened to stop watching television because of the switchover to digital. Residents were surprised at the affordability of set-top boxes and digital receivers.

Germany

Germany intends to switch over to digital terrestrial broadcasting on a rapid schedule and one region at a time. This is made possible by less than 10 percent of German households being served only by terrestrial transmissions. In Germany, the strategy is to start with the larger cities. Digital broadcasts were started in October 2002 in Berlin, which was the first in Europe to switch off analogue broadcasts, only nine months later.

In Germany, 51% of households are served by cable and 40% by satellite. Ten percent of cable households and 50% of satellite households are digital. When the analogue terrestrial broadcasts were switched off in Berlin, only 160,000 households out of 1.8 million did not receive cable or satellite transmissions. The State subsidised set-top boxes for low-income families, yet only 6,000 households took advantage of the subsidy.

The switchover to digital broadcasts has already taken place in several regions including Cologne, Hamburg, Munich, Frankfurt and Hannover. The transition period in Germany is short, in most cases only 2–3 months. During 2007, a total of 78 gapfillers were constructed in 26 areas. The coverage of digital broadcasts currently stands at 85 percent in Germany, and it will be increased to 90% during 2008. The last analogue terrestrial broadcasts will be switched off in 2010.

Surprisingly, digitisation has heightened interest in terrestrial digital reception. Over the past year, the share of households served by terrestrial reception has increased from 9.2 percent to 11.5 percent. The rise has been the greatest in areas where both commercial and national services are available in the terrestrial network. Sales of receivers suited for ter-

restrial broadcasts have been brisk, and it was estimated that 86% of terrestrial households had gone digital by September 2007.

In December 2007, German electronics retailers announced that households already owned a total of 18 million digital receivers, of which 11 million were suited for satellite reception, 5.5 million for terrestrial reception and 1.5 million for cable reception.

The Netherlands

Digital terrestrial broadcasts commenced in the Netherlands in 2003 and analogue broadcasts were switched off completely on 11 December 2006, a world first. The switchover went without a hitch. Prior to the switch-off of analogue broadcasts, the number of digital terrestrial households was estimated at 160,000. Only 77,000 household were wholly dependent on analogue terrestrial broadcasts, and these mostly consisted of holiday homes.

There are 6.7 million television households in the Netherlands and 6.2 million of these are connected to the cable network. Among these, some 14 percent view television digitally.

The number of satellite households in the Netherlands is roughly 500,000, all of which are digital. IPTV services are also growing in popularity. Tele2 stated the number of its subscribers at year-end 2007 to stand at 225,000. Rival KPN announced its subscriber base was increasing by 1,000 new subscribers each week but has yet to make public its overall subscriber figures.

Spain

Spain was also initially faced with a challenging situation. Of the 12.9 million households in Spain, 9.3 million are served by terrestrial transmission only. Nonetheless, the switchover to digital broadcasts has been encouraged by bringing forward the switch-off date for analogue broadcasts by two years from the original date. Analogue broadcasts will be switched off region by region during the years 2008–2010.

Spain's Quiero TV commenced digital terrestrial broadcasts in 2000 as a pay-TV service. This was soon overrun by the powerful satellite pay-TV channels, however, and discontinued in 2002. Digital terrestrial broadcasts were started again in November 2005 with an offering of 20 free channels.

The re-launch was successful and the rate of digital penetration is rising rapidly. In 2006, the rate increased from 7.7% to 16.3% between June and December. Some eight million terrestrial digital television devices were sold in 2007 and the rate of penetration has climbed to 26 percent.

Nine percent of the receivers suited for terrestrial reception in Spain support the MHP standard.

The pick-up in device sales has heightened interest in the development of digital television services as well. Test broadcasts on the first HD-standard terrestrial digital channel started in Madrid. The State has allocated nearly €20 million to promoting digital television in 2008.

Cable television distribution was not deregulated until 1998. The rate of cable penetration in Spain stands at 13 percent, yet the network is 89-percent digital. The network is rapidly expanding and the cable penetration rate is constantly rising.

Satellite penetration in Spain is some 20 percent and the service is all-digital.

Spain is also perceived as a forerunner in IPTV distribution. The broadband network has triple the coverage of the cable network.

.

Italy

Fourteen million of the 25 million households in Italy are served by terrestrial transmission only. The cable penetration rate in Italy is just one percent. Satellite penetration is at 26 percent and the service is all-digital. Italy launched digital terrestrial broadcasts in January 2004.

The State has intensively supported set-top box sales and subsidised MHP converters to ensure hardware advanced beyond mere basic boxes. Sales of set-top boxes have indeed been brisk: in November 2007, 6.67 million Italian households were already estimated to own one. At present, 82.3 percent of digital television devices in Italy are set-top boxes and the remainder is made up of integrated television sets.

MHP is supported by 95% of all digital devices in Italy, as the State subsidised MHP converters for quite some time before the intervention of the European Commission requiring that State support be technology-independent. Funds are now being recovered from companies which received subsidies. At present, 57.8 percent of all devices are non-subsidised.

The switch-off of analogue broadcasts was originally planned for 2006 but the transition period was extended to 2008. At present, the end of the last analogue broadcasts is envisaged for 2012. As of 2008, all television sets on the market shall have an integral digital tuner. The switchover to digital will begin on 1 March 2008 when Cagliari, the capital of Sardinia, becomes the first location in Italy for analogue broadcasts to go dark.

IPTV broadcasts were started in 2001 by Fastweb, which gained a good market standing due to the weak cable network. At the end of September 2007, Fastweb had 1.25 million household subscribers. The market has been entered in the past year by several new IPTV providers such as Telecom Italia and Wind Italy.

7. SUPPLY, PENETRATION AND AVAILABILITY OF DIGITAL TELEVISION IN 2008

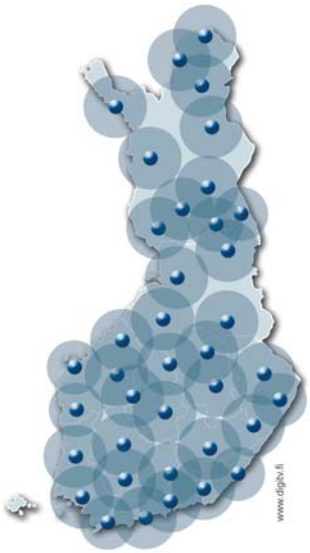
7.1. Coverage of digital terrestrial television network

The following maps describe the coverage of digital television in 2003 and 2004. The presentation is not broken down by multiplex. More specific map details are available as necessary from Digita.

Digital TV coverage in 2003

Digital TV coverage in 2004

At year-end 2005, the digital terrestrial television network covered a calculated 99.9% of the population in mainland Finland. The digital broadcasts of YLE supplied in multiplex A have been available for viewing across Finland as of 1 August 2005. Multiplex B, i.e. MTV3, MTV3+, the then SubTV, Nelonen and Nelonen Plus started broadcasting from stations in northern Finland on 1 September 2005. The broadcasts in multiplex B were of the nature of technical test transmissions until the end of 2005.

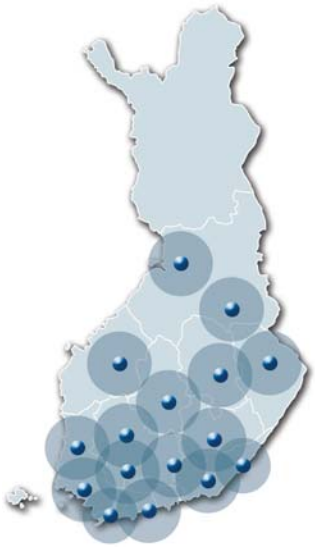


Digital TV coverage in 2006 multiplexes A and B

During 2005 and 2006, Digita installed 51 gapfillers for multiplex A and five for multiplex B. The remaining 46 gapfillers for multiplex B were installed during autumn 2006 so that technical test transmissions from the gapfillers could commence in mid-December. Actual broadcasts were started on 1 January 2007.

In addition, during 2006 Digita negotiated with the television broadcasters belonging to multiplex C on starting broadcasts from ten gapfiller stations in early 2007.

Multiplex C now has a population coverage of 78–90.4 percent depending on channel. Multiplex C expanded well beyond the service area of the original network during 2006 and now its highest-coverage channel, sports channel Urheilukanava, has a population coverage of ca. 90.4 percent.

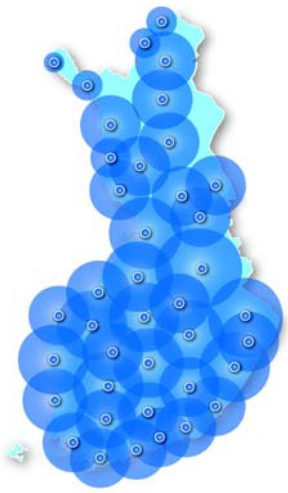


Digital TV coverage in 2006 multiplex C

Digital TV coverage, multiplex C at 1 Feb 2008. Main stations included, gapfillers excluded.

During 2006, Digita continued to survey the shadow areas in the digital television network on the basis of calculatory projections, field measurements and consumer feedback. The information thus obtained formed the basis for negotiations between Digita and the television companies on supplementing the service areas with gapfiller stations. Multiplexes A and B were supplemented with 36 gapfillers in 32 locations at the beginning of May 2007.

As stated above, the commercial television broadcasters and YLE announced in spring 2007 the construction of another 48 gapfillers in 26 locations and two additional gapfillers, bringing the number of gapfillers added to fifty. This procedure allowed the coverage of the terrestrial transmission network for multiplexes A and B to reach 99.96 percent.



Digital TV coverage multiplexes A and B at 1 Feb 2008. Besides main stations, the map also shows four gapfillers in Lapland to clarify coverage in Lapland.

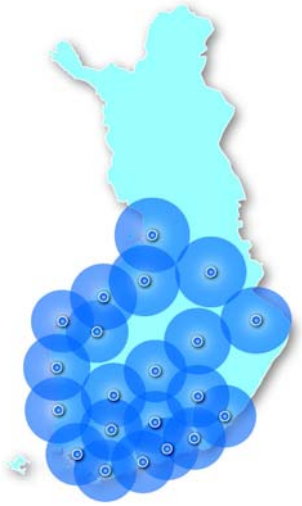
Seven gapfillers still awaited installation at mid-February 2008. Frequency coordination with Sweden and Russia remained pending in respect of six gapfillers while the installation of one was delayed due to challenging conditions.

Digita's survey of shadow areas to improve the coverage of digital television has been an ongoing effort. Homeowners have been able to report possible shadow areas e.g. via the company's website.

The fourth multiplex (D) is reserved for mobile television programming and services implemented with the DVB-H standard. Digita was granted the network licence by the Government on 23 March 2006 and is responsible for the transmission network and the administration of the channels in the network in its capacity as network operator. At the first stage, the network covered the cities in the Helsinki Metropolitan Area

inside the Kehä III ring road and the cities of Turku, Tampere and Oulu. Subsequent to the construction of DVB-T gapfillers prioritised for late 2007, Digita will bring the network's coverage to 40 percent.

On 15 June 2006, the Government granted Digita the network licence for a fifth digital mass communications network (E), which came online on 1 September 2007. The network will initially cover southern and central Finland and gradually expand to the rest of Finland as well. Multiplex E has a population coverage of 80 percent at present and in spring 2008 will cover 95 percent of the population.



Digital TV coverage, multiplex E at 1 Feb 2008.
Main stations included, gapfillers excluded.

On 18 January 2007, the Government granted Vaasan Läänin Puhelin a network licence for a regional multiplex in terrestrial broadcasting. Under the terms of the licence, the holder shall ensure subsequent to the switch-off of analogue broadcasts the uninterrupted transmission of the programming on two channels of the Swedish public service broadcasting company SVT (SVT1 and SVT2) as well as local television programming broadcast in analogue in a manner that as efficiently as possible serves the Swedish-speaking and bilingual population of Finland in the licence area. The terms furthermore stipulate that the licence holder is obliged to build a network spanning the geographical licence area so that the broadcasting of the two SVT channels could commence in the network as of 1 September 2007 in the service area of SVT's analogue transmissions. The terms of the licence required that SVT Europa be made available for digital viewing as of 1 September 2007 in a region with a population of at least 59% of all Finnish residents. The service area was to expand to 80% by the beginning of December 2007. A conditional access card is needed to receive these broadcasts.

On 11 May 2005, VTT Technical Research Centre of Finland was granted a regional licence (Tampere and the Otaniemi district of Espoo)

for network service provision in the digital mass communications network, DVB-T and DVB-H broadcasts in accordance with the standard EN 300 744. The licence remains in force until 2010 and it was granted for the purpose of experimental and educational use of the digital mass communications network. The licence holder is also entitled to engage in commercial general broadcasting of a trial nature to the extent required for research.

7.2. Supply of services

Free-to-air channels

Prior to digitisation, Finland had four national analogue television channels, i.e. TV1 and TV2 broadcast by YLE and MTV3 and Nelonen broadcast by commercial operators. In addition, YLE broadcast programs from Sweden's television in Finland, making SVT Europa available for viewing in southern Finland and SVT1 and SVT2 in Ostrobothnia, in the area served by the Kruunupyy and Pyhävuori stations.

There has been little local television broadcasting in Finland. The most important operators are the cable-transmitted Turku TV in Turku, which later also commenced terrestrial transmission, and the terrestrial and cable-transmitted TTV Tampere (Tampere TV) in Tampere, which closed down in 2006.

The Government granted the licences for national digital television broadcasting in June 1999. When digital television broadcasts started in August 2001, the supply consisted of YLE's TV1 and TV2 plus new digital channels YLE Teema, Yle 24 (subsequently Yle Extra, which was closed down at the beginning of 2008) and FST (FST5) in multiplex A. Multiplex B carried the channels MTV3 and Subtv, created on the foundation of City-TV and TVTV, plus sports channel Urheilukanava programming and the channel logo of Wellnet, which never broadcast any actual programming. Nelonen took over multiplex C, which had also been allocated to two channels that never got operations off the ground: SWelcom's movie channel and WSOY's educational channel. Four new licences (Janton, Canal+ Finland, Turun Kaapelitelevisio, Vizor) were issued by the Government on 13 March 2003.

The multiplexes were reorganised on 1 April 2004, at which time Nelonen transferred to multiplex B, which was to be built to cover the entire nation.

The supply carried in multiplex C is the responsibility of Canal+ and Urheilukanava along with The Voice, initially named Viisi until acquired by SBS, and Digiviihde, broadcasting under a short-term licence. The channels IskelmäTV Harju & Pöntinen and the regional TurkuTV are also transmitted in this multiplex. In summer 2007, the pay-TV

channel Urheilu+Kanava was added to the multiplex, where it shares a frequency with the Disney Channel.

Nelonen introduced a new channel entitled JIM in multiplex B in winter 2007.

Multiplex E carries the channels SVT Europa, Discovery Channel, Eurosport, KinoTV, MTV3 Fakta, Music Television MTV and Nickelodeon. However, the channel offering will continue to vary by region also in future.

In addition to these channels, FICORA may grant a licence for television or radio broadcasting operations in a digital terrestrial mass communications network if the operations do not last more than three months, or weekly operations do not last more than four hours. The licence may also be granted if the operations are carried out in a digital terrestrial mass communications network that has been set aside for television or radio broadcasting operations or the provision of other services with the DVB-H standard or a comparable standard.

Channel supply subject to licence

Licence holder	**Channel(s)** **(p) = pay-TV**
Yleisradio (YLE)	YLE TV1, YLE TV2, FST5, TV1+ YLE Teema, SVT Europa
MTV Oy	MTV3, MTV MAX (p) and MTV Fakta (p)
SW Television Oy	Nelonen, JIM
SubTv Oy	Sub, Sub Juniori (p), Sub Leffa (p)
Suomen Urheilutelevisio Oy	Urheilukanava Urheilukanava +
C More Entertainment Finland Oy	Canal+ channel package / four channels (p)
TV5 Finland Oy	The Voice TV
Turun Kaapelitelevisio Oy	Turku-TV
Discovery Communications Europe	Discovery Channel (p)
Eurosport SA	Eurosport (p)
Swelcom Oy	KinoTV (p)
MTV Networks Europe	MTV Nordic (p)
Nickelodeon International Ltd	Nickelodeon (p)
Walt Disney Company Ltd	Disney Channel (p)

Vaasan Läänin Puhelin Oy	SVT1, SVT2, local channel, etc.
KRS-TV rf	KRS-TV
När-TV rf	När-TV

The following radio stations are also available in the digital television network: five YLE stations, i.e. Ylen Klassinen, YLE Radio Peili, YLE Mondo, YLE Radio Extrem and YLE FSR+, and three commercially operated stations, i.e. Uusi Kiss, Iskelmä, and Harju & Pöntinen.

Digital television supply in Ostrobothnia

On 18 January 2007, the Government granted programming licences for broadcasting operations in the Vaasa regional digital broadcasting network to När-TV and KRS-TV, for continuing the operations of local channels as digital broadcasts in the regions of Närpiö and Kristiinankaupunki, and to Vaasan Läänin Puhelin. As one of the reasons underlying the decision to build the multiplex for the Vaasa region was to safeguard reception of the Swedish televisions SVT1 and SVT2 channels in Ostrobothnia after the switch-off of analogue broadcasts, a stipulation on the continued transmission of the channels SVT1 and SVT2 was attached to the licence of Vaasan Läänin Puhelin.

Pay-TV channels

During the era of analogue transmissions, pay-TV channels could only be viewed with cable or satellite reception. Important parts of the most popular sports among Finns – Formula 1 racing and the national hockey championships – have transferred to pay-TV channels in recent years. Channel package marketing has substantially advanced digital penetration. The 220,000 subscribers won by PlusTV over a very short period of time, for example, are a clear indication of the importance of interesting programming content.

Television fees in Finland generate revenues of some €400 million annually compared to television commercial revenues of some €260 million. No significant growth in either is projected for the near future. Pay-TV revenue, on the other hand, may well rise to €300 million in the next few years, meaning that the number of pay-TV subscribers will rise to 40–50% of all television households.

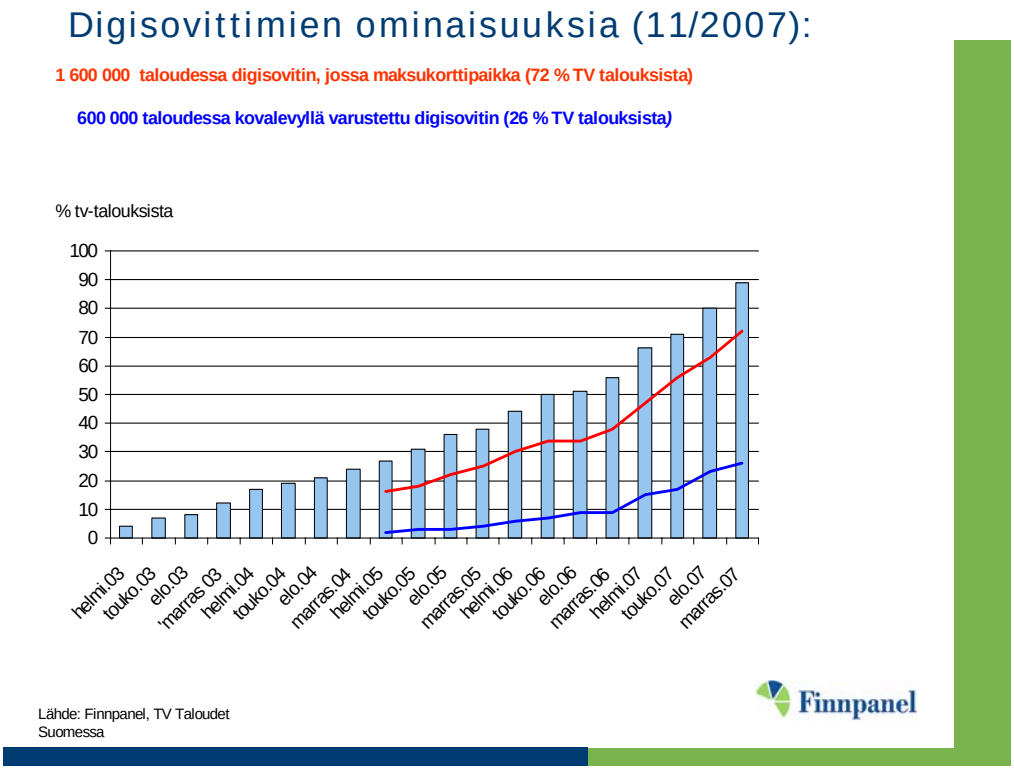
MTV3+ launched its pay-TV operations with programme packages regionally in autumn 2003 and nationally in spring 2004. The pay-TV service of Canal+ commenced in November 2004 and the sales of the company's four channels to antenna households were operated by Canal Digital. The package has since been expanded with the launch of the Disney Channel.

Having secured the broadcasting rights for Formula 1 races, MTV launched two pay-TV channels for antenna households in November 2006 in partnership with pay-TV operator PlusTV.

The programming licences for multiplex E were granted in December 2006. The switch-off of analogue broadcasts on 1 September 2007 brought to the screens the channels Discovery Channel, Eurosport, KinoTV, MTV (Music Television), MTV3 Fakta, Nickelodeon and SVT Europa, all of which are available as pay-TV only.

According to the Finnpanel survey describing the situation in November/December 2007, eighty percent of households with set-top box have acquired at least one box with conditional access (card slot). This translates into 67 percent of television households having the potential for subscribing to pay-TV channels via their set-top box. Pay-TV services are subscribed to by 26 percent of television households. The take-up of pay-TV has been very rapid since digitisation.

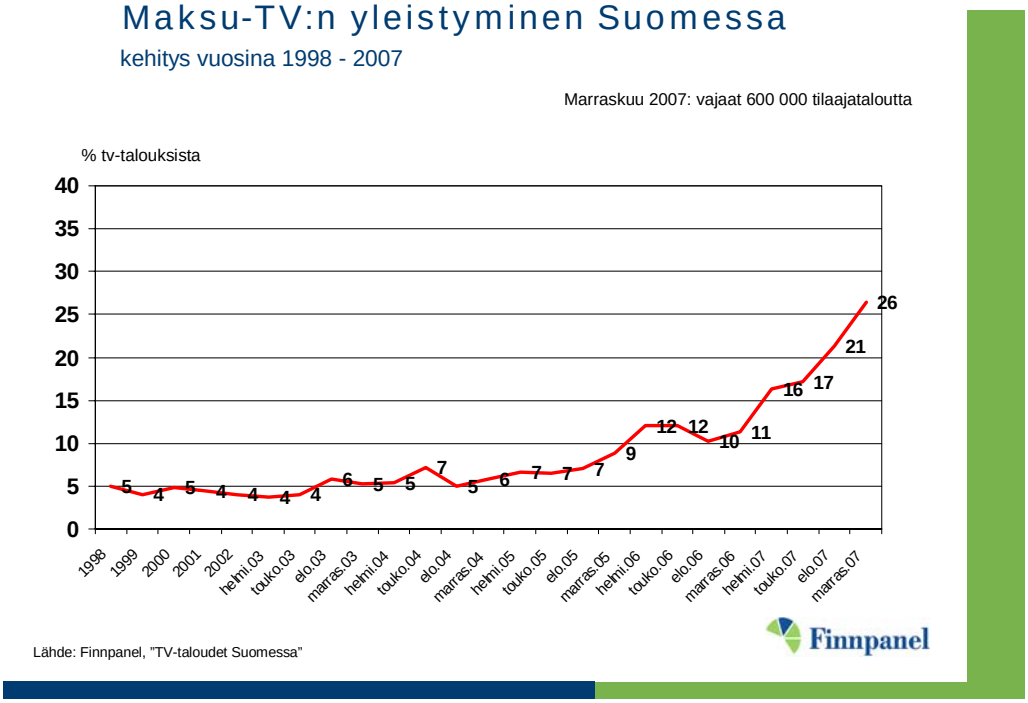
The following is a presentation of the take-up of set-top boxes with card slot and hard drive between February 2003 and November 2007.



Set-top box properties (11/2007):
1,600,000 households have set-top box with card slot (72% of TV households)
600,000 households have set-top box with hard drive (26% of TV households)
% of TV households

Feb ´03 May ´03 Aug ´03 Nov ´03 Feb ´04 May ´04 Aug ´04 Nov ´04
Feb ´05 May ´05 Aug ´05 Nov ´05 Feb ´06 May ´06 Aug ´06 Nov ´06
Feb ´07 May ´07 Aug ´07 Nov ´07

Pay-TV is more common among families with children (parents aged 25–44). Pay-TV channels account for 22 percent of the television viewing of children (aged 4–9).



Take-up of pay-TV in Finland
Development between 1998 and 2007
November 2007: slightly under 600,000 subscriber households
% of TV households
Feb ´03 May ´03 Aug ´03 Nov ´03 Feb ´04 May ´04 Aug ´04 Nov ´04
Feb ´05 May ´05 Aug ´05 Nov ´05 Feb ´06 May ´06 Aug ´06 Nov ´06
Feb ´07 May ´07 Aug ´07 Nov ´07

"Single card system"

In the context of granting the first licences for digital television in 1999, the Government issued a statement in which in respect of pay-TV is was stated that if pay-TV services are provided, the operators shall in collaboration strive to commit to a single-card service solution and to consistent customer and subscriber administration that best serves consumers.

A stipulation to promote this "single-card system" was added to the programming licences. As of 1 September 2007, a single-card system has been in place in terrestrial networks that has allowed consumers to code the services of two different pay-TV operators on the same card. Section

136 of the Communications Market Act concerning the duties of a company using decryption systems was amended effective 1 January 2008 to now clearly apply to pay-TV operators as well.

Additional services in digital television

YLE and the pay-TV channels of MTV use so-called DVB subtitling which allows viewers to be offered a choice of languages. YLE also uses DVB to broadcast subtitling and audio subtitling to the hearing and visually impaired. The broadcasting and reception of this subtitling compliant with the DVB standard has been more challenging than anticipated, which has had a negative impact on capitalising on the advantages of subtitling.

The additional services in digital television are Super Teletext, the programme guide (EPG), games, community services and various kinds of programme-specific services. The additional services provided are MHP-based (Multimedia Home Platform) and have thus had little significance to viewers.

The most important provider of MHP services for long was YLE, whose EPG, Super Teletext, news ticker and Taru-TV were all MHP-based. As set-top boxes compliant with the MHP standard failed to catch on, YLE cut back on its MHP services and freed up the transmission capacity used for these for updates instead. The company discontinued MHP services entirely at the end of 2007.

National commercial television companies have had no interest in MHP services for quite some time.

Among cable television operators, Suomen 3KTV and Vaasan Läänin Puhelin have pioneered the re-marketing of MHP services. The service is entitled Aktiivi-TV and comprises email, newspaper Kaleva’s news service and Lippu-TV, among others.

The standard posed challenges to the development of set-top box penetration: a focus on MHP additional services at the early stage also made MHP services a key factor in the marketing of digital television. Television companies also expected interactive devices to be launched on the market. The first to arrive in stores, however, were the basic set-top boxes, which came to define the market. Nonetheless, even years later the campaign touting the digitisation of television as the “public service bus to the information society” continued to haunt minds: that bus was overtaken by broadband internet services making the information society more efficiently available to all Finns.

Effects of digitisation

Obvious positive effects of digitisation include e.g. a wider supply of programmes, advances in pay-TV operations, the increased supply of services for the disabled, a five-fold increase in television broadcast transmission capacity and i.a. the release of limited frequencies.

Subsequent to the switchover to all-digital television, homes in Finland have the potential for viewing via antenna twelve national public service channels and a total of seventeen pay-TV channels in the packages of two operators. Multiplexes A and C also carry radio stations. Short-term licences further boost the supply. Once the last of the gapfillers have been completed, multiplexes A and B will cover 99.96 of the Finnish population. Multiplex C was available to 78–90.4 percent of the population and multiplex E to 80% of the population in October 2007.

At the end of the year 2007, nearly 90% of the population had already switched over to viewing digital television. The breakthrough of pay-TV also took place in 2007 with a doubling in the number of subscribers.

In other words, the higher number of channels and greater options with the advent of pay-TV channels have made good on the promise of wider supply. According to the Finnpanel survey on the situation in September–December 2007, television viewing after the switch-off of analogue transmission had increased by three percent from the same period a year earlier.

The same Finnpanel survey indicated that time-shifting (recording) had increased television programme viewing by three percent (entire population). The highest increase of eight percent was seen in the group aged 25–34. Looking only at households with personal video recorder, time-shifting had increased viewing by 12 percent.[3]

The Finnpanel survey in 2007 further indicated that the major channels had retained their popularity. The four largest channels combined continued to account for 77% of all viewing (95% in 2002). Smaller channels had also made headway, however, rising to a 19 percent share of all viewing compared to 12 percent a year earlier.

7.3. Receivers

The globally used specifications DVB-T and DVB-C of the Digital Video Broadcasting organisation (www.dvb.org) are used in digital television broadcasting in Finland. The practical implementation of the specifications differs slightly between countries and operators, resulting in possible incompatibility between receivers sold in different countries.

Device testing

[3] Personal video recorders are owned by 632,000 households, i.e. 28 percent of all television households and 31 percent of households with set-top box. Finnpanel, *TV Households in Finland* survey, November/December 2007.

There have been no harmonised policies or obligations in place in Finland concerning specification compliance in digital receivers. Many manufacturers have carried out in-house testing. The Nordic cooperation body for companies in the sector of digital television Nordig has also specified test norms, but no such set-top boxes have been placed on the market.

The Finnish Cable Television Association launched a testing service in 2006 allowing the manufacturers of set-top boxes to ensure that their devices function properly in the Finnish cable television network. Tested devices can be identified from the Cable Ready sticker. The primary goal of testing is to assist consumers in their purchases when buying from a supplier other than their cable operator. The testing system initiated by the Association has resulted in dozens of set-top boxes bearing the Cable Ready sticker of approval being placed on the market.

Cable Ready sticker

Digita also offers digital television terminal device testing services and a testing environment for device manufacturers.

Improper devices in which all features did not necessarily function were available on the market at the early stages of television digitisation. On the basis of experiences obtained, the TV2007 Group ended up recommending in its interim report the creation of a testing system for antenna network receivers as well.

The features of set-top boxes can be enhanced with software updates. FICORA has published a report on software updates (Publications of the Finnish Communications Regulatory Authority 7/2006, in Finnish only), which is available at www.ficora.fi and www.digitv.fi. The report is mainly intended for users and sellers of receivers. According to the report, no updates need to be sought for a digital receiver as long as the receiver functions normally. However, any updates received through the digital television transmission network should always be accepted.

Device manufacturers may update the software in their devices e.g. to add new features, to service the device or to otherwise improve its functioning. Updates may be made through the digital television transmission network (antenna or cable network), in a service shop or over the internet. Most receiver models can be updated via the transmission network, which is also the simplest alternative from the consumer's point of view.

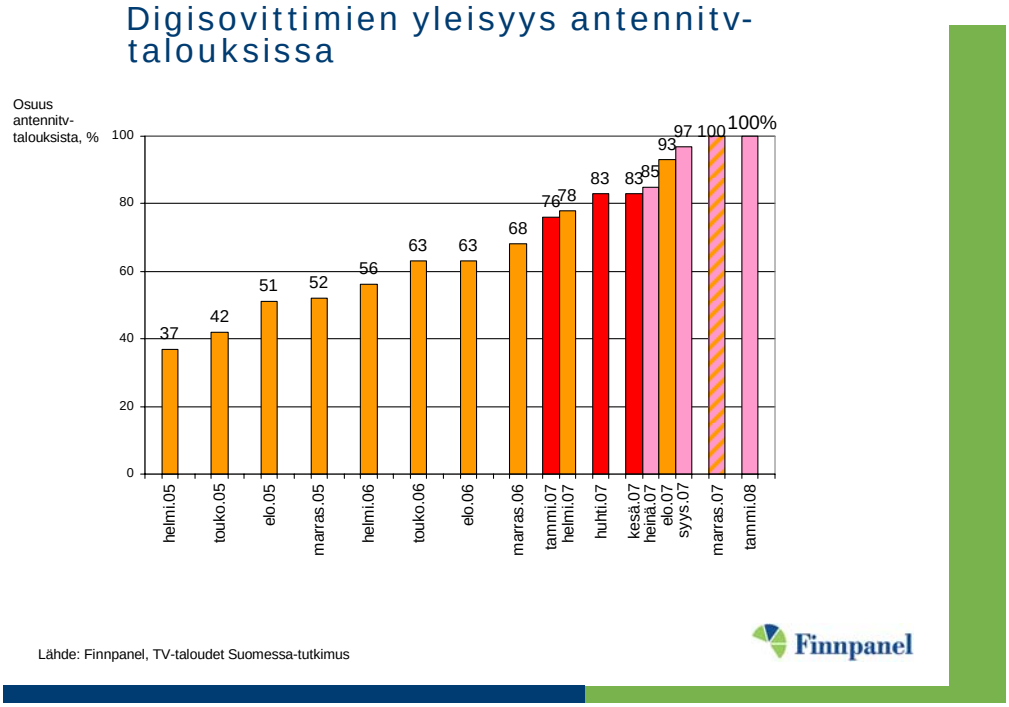
Digita, which is responsible for the terrestrial transmission network, and local cable operators transmit software updates in their networks according to schedules agreed with the device manufacturers. Most digital television receivers automatically notify the viewer of the updated software, which may be downloaded immediately. The software update is transmitted in the network for a specific period of time, after which the update is removed from the transmission. Updates may be subsequently obtained from the device manufacturer or importer.

New channels in the digital television transmission network require retuning of the receiver. However, this is not the same as updating its software.

Number of receivers

According to Finnpanel, in 2005 households owned some 3.7 million television sets, i.e. an average 1.6 sets per household.

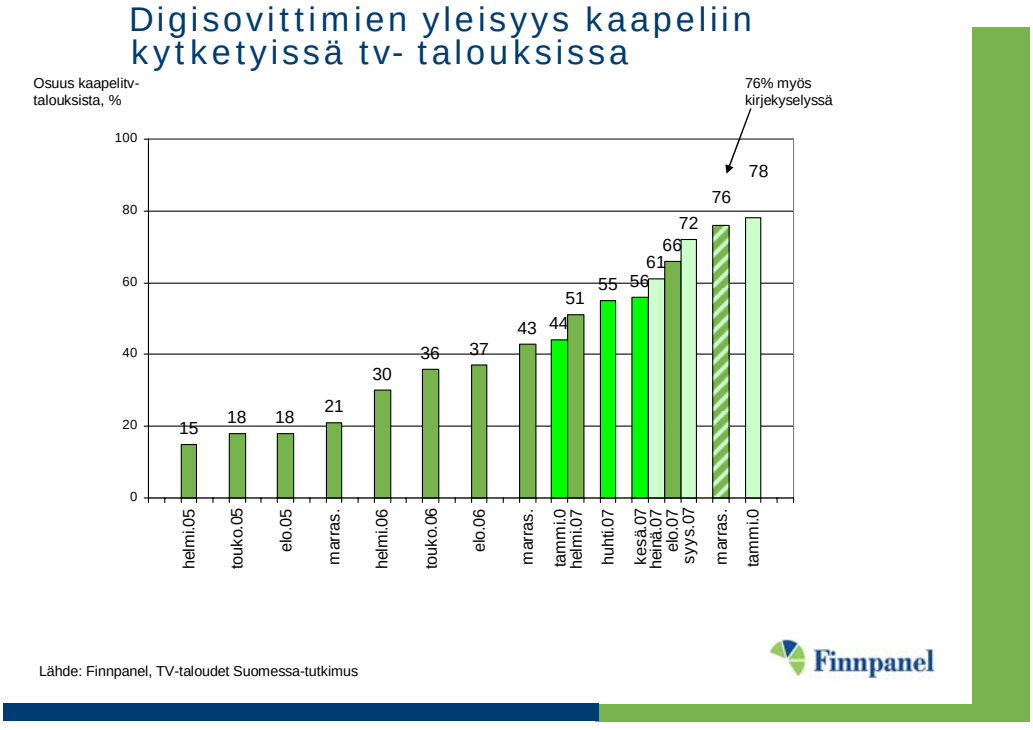
In February 2003, fewer than 50,000 households owned set-top boxes suitable for terrestrial digital viewing. In February 2005, the number had increased to 435,000 and by February 2006 to 679,000.



Prevalence of set-top boxes in TV households with antenna reception
Share of households with antenna reception
Feb ´05 May ´05 Aug ´05 Nov ´05 Feb ´06 May ´06 Aug ´06 Nov ´06 Jan ´07 Feb ´07 Apr ´07 Jun ´07 Jul ´07 Aug ´07 Sep ´7 Nov ´07 Jan ´08

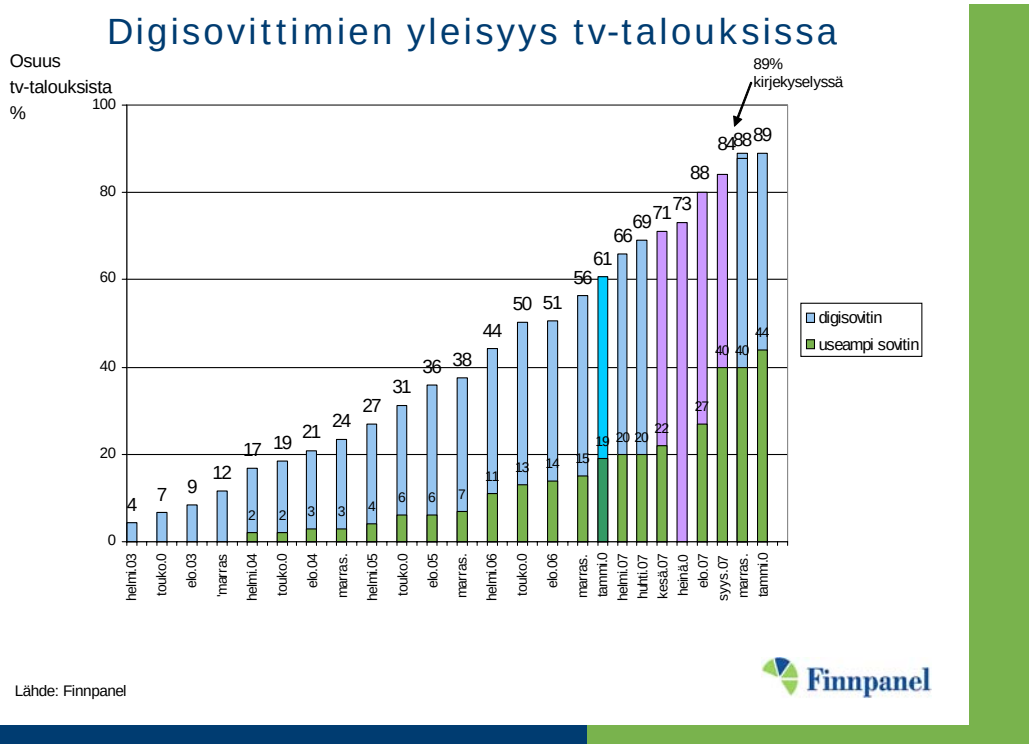
According to Finnpanel's survey *TV Households in Finland* on the situation in November/December 2007, various kinds of devices for digital reception were owned by 2,004,000 households or 88.9 percent of all TV households. Over the past year, between November 2006 and November 2007, the number of households with set-top boxes had risen from 1,255,000 households to 2,004,000 (up by 60%). Among antenna households, the rate of digital penetration was 100 percent and among cable households 76 percent, meaning that some 250,000 cable households had yet to purchase set-top boxes. Among satellite households (private or shared dish) the rate of penetration was 99 percent. The number of households with set-top boxes had risen by some 200,000 from August 2007, i.e. from 1,795,000 to 2,004,000. The percentage change from August 2007 to November/December 2007 was twelve percent. Set-top box penetration among TV households increased from the 80 percent in August to 89 percent.

The following diagram illustrates the prevalence of set-top boxes in TV households with cable reception between February 2005 and January 2008.



Prevalence of set-top boxes in TV households with cable reception
Share of households with cable reception
76% in mail questionnaire as well
Feb ´05 May ´05 Aug ´05 Nov ´05 Feb ´06 May ´06 Aug ´06 Nov ´06 Jan ´07 Feb ´07 Apr ´07 Jun ´07 Jul ´07 Aug ´07 Sep ´7 Nov ´07 Jan ´08

The following diagram illustrates the prevalence of set-top boxes in all TV households between February 2003 and January 2008.



Prevalence of set-top boxes in TV households
Share of TV households
89% in mail questionnaire
One set-top box
More than one set-top box
Feb ´05 May ´05 Aug ´05 Nov ´05 Feb ´06 May ´06 Aug ´06 Nov ´06 Jan ´07 Feb ´07 Apr ´07 Jun ´07 Jul ´07 Aug ´07 Sep ´7 Nov ´07 Jan ´08

No significant numbers of central set-top boxes have been installed. Finnpanel's results show that only 37,000 households had the opportunity of viewing digital transmissions converted to analogue. Of these, 23,000 households also owned a set-top box of their own. Due to the low number of observations, the figures are indicative only. Households with reception via a central set-top box do not count as households with set-top box. According to the same study, 240,000 households own at least one set-top box purchased only for use in a second home or holiday home.

The survey conducted by Finnpanel in the second week of 2008 provided the following penetration figures:

- The prevalence of set-top boxes in all TV households was 89 percent;

- the prevalence of set-top boxes in TV household with cable reception was 78 percent; and
- the prevalence of set-top boxes in TV households with antenna reception was 100 percent.

According to respondents' estimates, 95% of all TV households would have purchased a set-top box by the end of February 2008. The Finnpanel survey conducted in February/March 2008 indicated that 22,000 households had access to digital broadcasts converted to analogue by a central set-top box, and 14,000 of these also owned set-top boxes of their own.

Supply and prices of receivers

The Consumer Agency together with the State Provincial Offices has conducted market reviews and price comparisons on set-top boxes on three occasions during the transition period, in spring and autumn 2006 and in spring 2007. A corresponding study was also made in April 2004.

The Consumer Agency's study of May 2007[4] concerned 154 different set-top box models, on which data was collected from 127 stores in 20 towns in mainland Finland. Online sales of set-top boxes, integrated personal video recorders and set-top boxes for travel use were excluded from the study.

The prices of the set-top boxes included in the previous comparison study made in October 2006 had fallen by 11 percent. The prices of 200 GB-PVRs had fallen by an average of ten percent and those of 160 GB-boxes by fifteen percent. Basic set-top boxes with no recorder function or card slot were thirteen percent cheaper. Over the year, the prices of set-top boxes all in all had fallen by 22 percent.

New and more advanced models had been introduced alongside long-selling set-top boxes. The prices of the new models, such as the 250 GB PVRs with hard drive and HDMI had contributed to the rise of 1.7 percent in average device price. The average price of all set-top boxes on the market in May stood at €277 compared to €273 in October 2006.

The price spread in set-top boxes is wide: the lower price in May 2007 was €39 and the highest €699. A personal video recorder with two tuners and 80–120 GB of memory cost between €250 and €470 and a 160 GB PVR cost between €300 and €600. PVR models with 200–250 GB of memory were selling at €530–€700. A basic set-top box with no card slot and no recording feature was available for between €29 and €200.

The rate of hardware replacement is rapid. Of the set-top boxes for sale in spring 2004, only five models remained in May 2007, accounting for

[4] Consumer agency price comparisons of digital set-top boxes and digital televisions, 1/2007 May 2007 (in Finnish only)

only three percent of the supply. Among set-top boxes for sale in spring 2006, 53 models remained on the market (34%) while 89 of the models (58%) had also been available in October 2006. Well over 40 percent of the current set-top boxes were placed on the market after October 2006.

Set-top boxes are becoming more and more versatile in terms of features. According to the Consumer Agency's study, 73% of all set-top boxes for sale had a card reader needed for viewing pay-TV channels. One third of the devices were personal video recorders. A quarter of the devices were equipped with two tuners, permitting the viewing of one channel and the recording of another. The RS-232 serial port needed to connect the box with a computer and used in file transfers and software updates, among other things, featured in 60 percent of the set-top boxes while 19 percent had a USB port.

According to data obtained from the Association of Electronics Wholesalers, only 50,493 set-top boxes were sold in December 2007, a decline of 63 percent from sales in December 2006. Total sales of set-top boxes in 2007 came to 1,341,283, an increase of 97% from the previous year. Sales continued to climb in January 2008, in which sales came to 90,883 set-top boxes. The highest increase was seen in set-top boxes for cable reception, sales of which rose by 120% from January in the previous year.

The number of television sets sold in December 2007 was 34,436, showing a decrease of 5% compared to sales in December 2006. Total television set sales in 2007 came to 432,990 sets, an increase of 33 percent from the previous year.

Integrated digital television sets first became available in autumn 2006 with dozens of different models on the market for use in antenna networks, while the number of models for use in cable networks in autumn 2006 stood at exactly two. Supply has picked up during 2007 and now comprises several models.

In addition, it should be noted that a substantial number of computers sold to households can also receive terrestrial digital television broadcasts without any separate set-top box.

7.4. Cable television

HTV (subsequently Welho) was the first cable operator to start test transmissions of digital television broadcasts in March 2001. Digital television services in the cable network were launched simultaneously on the national digital television commencement date of 27 August 2001.

Cable households were passive in their interest towards digital television services. The penetration rate developed slowly, as cable households al-

ready enjoyed a substantially wider supply of programming than antenna households. Sound and picture quality in the cable transmission network were also good. Set-top boxes were mainly purchased in order to view pay-TV channels.

Nonetheless, progress in the digitisation of the cable network was made alongside the digitisation of the antenna network. The Finnish Cable Television Association issued on 19 January 2004 to the Ministry of Transport and Communications a statement in support of the switch-off of analogue broadcasts in the manner proposed by the Niemelä group. The cable sector was thus also committed to all-digital television.

All cable television operators updated their networks so that digital television broadcasts could be transmitted already well before the assigned date of 31 August 2007. In addition, the cable sector switched over to all-digital television and audio channel supply in respect of pay-TV operations before the national switchover to digital. By the end of 2006, most cable operators had already discontinued in full their analogue pay-TV service.

The largest cable television companies offered at best as many as 100 pay-TV channels. In addition to the basic channels, the companies also offered several public service channels broadcast only in digital.

There were initially only few set-top boxes suitable for the cable network available on the market due to scant supply on the part of device manufacturers. In Finland, consumers can purchase the set-top box of their choice at any appliance store, while elsewhere in Europe set-top boxes are a part of the cable subscription. Integrated television sets for the cable network first became available in 2005. To ensure the proper functioning of set-top boxes, cable operators commenced testing in 2006. Approved models were granted the right to use the Cable Ready sticker of the Finnish Cable Television Association. The personal video recorders that had become available on the market proved especially attractive to cable households.

Preparation for card pairing in HDTV set-top boxes

High-definition (HD) broadcasts have already been started in the cable television networks. In order to prevent the unlawful distribution of programmes, international production companies insisted on the pairing of the equipment and cards used to view HD content. This means that a HD channel opened for the customer's CA card can only be viewed with the HDTV set-top box or integrated HD television set for which the card is specified. The pairing of card and HD set-top box is already widely in use throughout the world.

In order to ensure Finnish broadcasters' access to HD content of high standard from international production companies, the Finnish Federation for Communications and Teleinformatics, FiCom, initiated a joint

project in February 2008 for the introduction of the required card pairing. The goal is for a single technological profile to be introducd in Finland for all HD set-top boxes in cable networks and to keep the box market open to all manufacturers and importers. HD set-top boxes permitting card pairing are expected on the market in autumn 2008. Some HD content will be available for viewing without card pairing.

Switch-off of analogue television broadcasts

As stated above, the operators in the television sector and the cable television companies agreed in June 2007 that the cable companies would continue the analogue broadcasts of certain basic channels and the FST5 channel in Swedish-speaking locales during the continued transition period extending until the end of February 2008.

At the end of January 2008, MTV, SW Television and YLE provided the cable operators with confirmation that in accordance with the decision taken earlier in summer 2007, analogue parallel broadcasts in the cable network would end on 1 March 2008 at 08:00. The termination of broadcasts concerned the following channels operated by the said television companies: TV1, TV2, MTV3, Nelonen, FST5, Sub and Urheilukanava.

In order to boost device sales, the television companies had decided in the same context on substantial public service announcements to consumers in February 2008, on these channels broadcasting commercial spots about the switch-off in a coordinated manner, and on other dissemination of information to be selected individually by each company and channel.

The campaigns were executed in February 2008, when the following text ran as a ticker in the broadcasts of analogue channels in several cable networks:

"The analogue broadcast of this channel will end in the cable network on Saturday, 1 March 2008 at 08:00."

7.5. Supply via satellite

The number of satellite subscriptions in Finland is fairly low compared to terrestrial or cable reception. The supply transmitted via satellite has been digital for quite some time and comprises a vast number of channels.

In 2006, roughly nine percent of all television households received their television signal via satellite (private dish or shared network). The corresponding figure was 8.5% in February 2007 and 5% in August. According to the Finnpanel survey on the situation in November/December 2007, the figure had again risen close to that in the early part of the year, to 7.7 percent.

7.6. Antenna upgrades

Antenna reception of television broadcasts in the digital era as well requires an antenna system that is in good repair and has been properly installed and aligned. No special digital antenna is needed; however, the reception antenna must cover the entire UHF spectrum, i.e. channels 21–69.

In practice, more antennas than expected needed to be replaced due to the switchover to digital television, as viewers had been using antennas suited for VHF frequencies.

8. COSTS OF DIGITISATION

Consumers

In the examination of the total cost of digitisation, it must be borne in mind that technological advances are an ongoing process in which digitisation is only one element. Replacements and new investment in the broadcasting networks and equipment would have been necessary over the past decade regardless. The following evaluations of cost examine the switchover to digital mainly from the viewpoint of TV households, involving evaluation of costs relating to the purchase of set-top boxes, antenna upgrades and household electricity consumption.

Household purchases of set-top boxes amounted to €420 million by the end of August 2007 (€520 million by the end of February 2008). Consumer outlays include value-added tax. The lowest outlay needed for a household to enter the digital era was the €50 charged for a basic set-top box, putting the total cost at €150 million. However, nearly a third of the set-top boxes actually acquired were higher-end personal video recorders, putting the median price of the box at €160.

Digitisation involved an upgrade of the antenna network especially in older properties built before 1980 and with antenna reception. Housing companies hooked up to cable networks as well as individual houses had little need for antenna network upgrades. The total outlay for antenna network upgrades comes to €130 million.

The cost of digitisation to households thus incurred by the end of August 2007 comes to €550 million as itemised above (€650 million by the end of February 2008). If the population had settled for basic set-top boxes, the total cost inclusive of antenna network outlays would only have been €280 million. During the same time, purchases of flat-screen television sets amounted to €800 million and the revenues of the pay-TV business grew from some €20 million to €100 million, with no end in sight. For

the sake of perspective, we might note that purchases of mobile phones between 1 January 2004 and 31 August 2007 totalled €1,300 million.

Effects on consumption of electricity

Digital set-top boxes require 60 MW of power. In the cold season, the power consumed by the boxes is put to use in heating. The net increase in a household's electric bill per set-top box is €4 per year, taking into account the heating benefit. The switch-off of analogue parallel broadcasts reduced the power requirement of the broadcasting network by 6–7 MW.

Operators

The investments in terrestrial transmission networks, cable television networks and the systems of television companies necessitated by the switchover to digital came to €55–€65 million. The majority of these investments concerned the terrestrial transmission network. Cable networks and the production platforms of television companies had largely already been digitised at an earlier stage. The termination of analogue parallel broadcasts reduced the distribution costs of television companies by €30 million per year.

Digital technology makes approximately five times more efficient use of frequencies than analogue technology, which opens up new business potential within the framework of the existing frequency spectrum. Growth sectors include mobile television.

9. ACTION BY THE PUBLIC SECTOR TO PROMOTE DIGITAL TELEVISION

9.1. Ministry of Transport and Communications

Interim evaluation seminar for stage 1

The Ministry of Transport and Communications organised on 19 October 2007 a seminar upon the conclusion of the first stage of the digital switchover attended by representatives of all parties participating in the project. The aim of the seminar was to compile views on the various stages of the project now that the first stage of the switchover was complete and to prepare for the finalisation of the switchover on 29 February 2008. In addition, it became apparent during the seminar that operators in the television sector would also in future need a common forum in which to address concerns shared by the sector. This matter was also highlighted in the work of the monitoring group.

Communication with citizens and media communications

An extensive civic communications campaign was used to disseminate information about the switchover. The digital television communications group appointed by the Ministry of Transport and Communications delivered much information at all stages of the process and the news of the switchover reached the population well.

The topic was taken up actively in the media, with criticism given attention alongside informative materials. Criticism was directed at i.a. shadow areas, troubles with devices and the timetable of the switchover. Much material with a fundamentally critical premise was published, and important players in the sector dubbed “the digital angries” received much media attention. Public debate since spring 2007 started to question the necessity of digitising the cable networks.

Besides a critical atmosphere, changes in the concept of the switchover also added to the challenges faced in communicating digital television. The switchover date was changed mid-project. YLE also changed its position on central set-top boxes to allow them for housing companies. The changes in policy resulted in the communications team having to modify messages and do over communications materials.

Communications focused on the dissemination of factual information and on reminders. Responsiveness and interactivity were two other main goals. A diverse suite of media and communications tools were employed.

The communications targeted the entire population, in addition to which some communications efforts were also tailored to certain demographics by region, age group, language, etc.

The digital television communications group's budget for 2004–2007 was slightly over €900,000, peaking in 2006 at €420,000. The funds for the campaigns were mainly allocated from the State's Television and Radio Fund.

Media communications

The communications group was in charge of media communications as well as planning and monitoring publicity for digital television. The group also coordinated responses to letters to the editor.

Dozens of joint communiqués on the topic of digital television were issued. National press conferences were held on a roughly quarterly basis. Regional briefings and background briefings were also organised.

The media also did much on their own to keep the topic in the public eye. Many newspapers and magazines printed digital television checklists and instructions. A digital television column was set up on the websites of both tabloid newspapers. Tekniikan Maailma magazine published a Digital Guide in spring 2007 with a print run of 460,000 copies. Background information and other materials were also supplied to the media and access was given to the media for interviews.

In addition, an article service was offered to newspapers and local papers as well as magazines. The highest number of articles was supplied to the publications of retiree organisations. Ready-to-print stories were supplied to local papers in summer and in the run-up to Christmas.

Radio and television campaigns

The communications group produced nine public service announcements for TV built around a character played by actor Sulevi Peltola.

YLE, MTV3, Nelonen, Urheilukanava and Voice broadcast the public service announcements free of charge on their channels. The announcements were also shown on local cable television channels, and the spots were supplied on DVD for use by cable television companies and home appliance stores.

TNS Gallup conducted a survey on the reach of the television campaign in November 2006. The results were encouraging; as many as 93 percent of television viewers remembered seeing the TV spots in the campaign. The spots were described as amusing, informative and standing out from other TV commercials. Only six percent found the digital television spots annoying.

The communications group also produced radio commercials in spring 2007 played on the Classic Radio station and on YLE Radio 1. The target demographic for these spots was mainly urban middle-aged women.

Radio spots for the *Eläköön yhteys* campaign ran on YLE stations. An expert interview was produced for the switchover date in antenna networks and made available for the free use of radio stations.

Other media advertising

Advertising ran in newspapers, magazines and freesheets. The digital television public service announcement produced for the project was shown in cinemas in January 2007 and reached a total audience of 400,000.

Outdoor advertising was put in 43 towns in spring 2007.

The communications group executed several MiniMoi postcard campaigns around Christmas, Father's Day and the Digital Weeks. The postcards were available in i.a. restaurants and the target demographic was young adults.

Information materials

The first basic brochure on digital television was produced in 2004 and it went through several print runs with only slight modifications. The total print run was some 165,000 copies in Finnish and 16,000 in Swedish.

The brochure was supplied to local social services agencies, social workers in parishes, pharmacies, libraries, retiree organisations and service centres for the elderly, cable television companies, home appliance stores and the media. The brochure was also made available to the various operators to meet their individual needs.

The thousands of information sheets (installation instructions, digital television receivers, recording digital broadcasts and software updates) were much in demand and soon ran out. The communications team reassembled the loose information sheets into a new A4-sized additional brochure, of which 11,000 copies were printed in Finnish and 1,100 in Swedish. A separate information sheet was also produced on central set-top boxes.

The digital television communications group also commissioned two posters which were supplied to home appliance stores and cable TV companies, among others.

Online communications

The key details of the switchover to digital were centralised on the campaign's website www.digitelkkari.fi. The news section of the website was regularly updated. A Digital Path service that allowed visitors to easily establish their individual options for switching over to digital was also created.

The website attracted a growing number of visitors as the switchover project progressed. During the weeks around the turn of the year 2007 there were roughly 15,000 hits on the site per month, and visitor figures clearly spiked around the time of the Digital Weeks.

Events, event marketing

The communications group's first events were organised in 2005 with digital television get-togethers in the towns of Seinäjoki, Kuusamo and Ivalo, among others.

As stated above, the national digital television bus tour organised by the communications group took place between 2 and 16 June 2006, with stops in Helsinki, Rovaniemi, Oulu, Kuopio, Joensuu, Jyväskylä, Turku, Töysä, Vaasa and Tampere.

Precisely one year before the first digital switchover to the day, on 31 August 2006, a citizens' forum was held in the Itäkeskus district of Helsinki.

Members of Parliament and Parliament staff were provided with information and materials about the digital switchover at Parliament in November 2006. A similar session for reporters was held at the Helsinki International Press Club in December.

The communications group ran a stand at the DigiExpo fair held at Helsinki Fair Centre in autumn 2006.

The digital television communications group organised a civic event in downtown Helsinki in August/September 2007. The three-day event focused on providing last-minute advice on digital television in the run-up to the switch-off of analogue broadcasts in the antenna network.

The switchover in the antenna network was also recognised with a digital television reception held on 31 August 2007 at the Old Student House in Helsinki. Project participants, media representatives and other stakeholders made up the audience at this event.

The digital television communications group managed the communications for the Digital Week, the *Digipysäkki* bus tour and the *Eläköön Yhteys* installation assistance campaign, the latter of which involved TV spots and a radio commercial as well as information sheet and instructions on using the television set and set-top box for distribution to those assisted.

Communications tailored to special interest groups

The communications group sought to cater for special interest groups as much as possible in all communications. The information needs of senior citizens were a high priority from the very outset. All essential mate-

rials were also made available in Swedish, and communications were targeted to i.a. people with different kinds of disabilities and to foreigners.

A video-format digital television information kit in sign language was produced for the hearing impaired. A spoken presentation on digital television was produced for the visually impaired. Both files could be downloaded from the www.digitelkkari.fi website. An easy-to-comprehend article on digital television was produced for plain-language publications.

Brochures were translated into Sámi, English, Russian and Somali.

English-language papers (articles, advertisements), among others, were used to reach foreigners. Stories and advertisements also ran in Russian-language papers. Two digital television get-togethers for immigrants were held in Helsinki.

Several foreign-language radio spots were produced. The Russian spot ran on Radio Sputnik and Lähiradio. The latter also ran Somali, Kurd and Arabic versions of the same spot.

Financial support for communications to foreigners was received from the Ministry of Labour in spring 2007.

9.2. Finnish Communications Regulatory Authority (FICORA)

The duties of FICORA in respect of the switchover to digital television concerned frequency administration, supervision of the terms of commercial television operations licences, and practical measures having to do with collection of television fees and more widely with the promotion of digital television, studies and surveys of the penetration of digital television and the usability of digital television services, and responding to questions relating to digital television technology.

Supervision of licences

In respect of the transmission coverage of digital television broadcasts, FICORA is tasked with supervising the terms of commercial television company licences and with allocating the necessary frequencies for digital television broadcasts. YLE is excluded from FICORA's supervision mandate in this respect.

The licences granted to television companies required that digital television broadcasts be receivable through the terrestrial network throughout the country by the end of 2006. In May 2007, FICORA obligated the television companies to take immediate action to improve reception. The companies committed in summer 2007 to fill in the broadcast network to licence standard in the shadow areas identified as soon as possible and by the end of 2007 at the latest.

FICORA launched an investigation into the coverage of the digital broadcasts transmission network without delay in summer 2006 after reports of poor reception started arriving at the agency. Since then, FICORA has closely monitored the construction of the transmission network and also drawn the attention of television companies to improving digital television reception. FICORA also drew the attention of television companies to the fact that replacing their must-carry obligation with satellite broadcasts was subject to the approval of the licensing authority. The licences were modified by decision of the Government in June 2007 to permit satellite broadcasts in place of the must-carry obligation in special cases.

In autumn 2007, FICORA called the attention of television companies to substantial shadow areas in the regions of Kalajoki – Piehinki not anticipated in calculations. Negotiations resulted in Digita building gap-fillers in these regions.

The single card principle has been incorporated into the licences, requiring that television operators shall accomplish programme encryption in a manner that allows the use of a single card to decrypt all terrestrial digital television broadcasts. Together with the operators, FICORA has studied the technological solutions for the single-card principle and supervised compliance with the licence terms in this respect.

Radio frequencies

Digita designs the structure of its television broadcast network and submits an application for the requisite frequencies to FICORA.

FICORA grants on application the radio licences required for the use of radio transmitters. The licences contain i.a. information on the frequencies to be used.

In accordance with international conventions, FICORA consults neighbouring countries on the usage of frequencies if Finnish usage may give rise to interference in the neighbouring countries' frequency usage.

Some of the frequencies applied for by Digita have already been agreed with neighbouring countries, or an agreement is pending. Digita has been granted radio licences for all frequencies not requiring international consultation or in respect of which agreement has been reached.

FICORA has sought to provide the conditions to allow Digita to commence broadcasts immediately in all locations it desires. With regard to the transmitters requiring international consultation, in nearly all cases FICORA has been able to specify a provisional transmit power below the neighbouring country consultation threshold.

Safeguarding consumer interests together with operators

Together with the various operators, FICORA prepared in spring 2007 a manual for antenna households on how to proceed in the event of problems with digital television reception. The manual defines the fundamental prerequisites to digital reception in properties with antenna reception and provide instructions on how to proceed in the event of unsuccessful reception despite a proper antenna system.

FICORA has conducted surveys to determine the usability and penetration of digital television. Together with the various operators, FICORA has sought to discover technological solutions to problems with digital television use and picture quality. A digital television technology working group with sub-groups and consisting of experts from the various stakeholders was established at FICORA for this purpose.

Steps relating to the switch-off of analogue broadcast

The parties in the sector under the leadership of FICORA agreed in early 2007 on the steps and timetables relating to the switch-off of analogue terrestrial broadcasts.

Television fees

With regard to television fees, FICORA made a wide range of preparations to meet the changes wrought by digital broadcasts and the challenges of the transition period. The agency investigated the relationship between the new television services and the obligation to pay the television fee. Several information and training events were held for employees to brief them on the kinds of devices/combination on which a television fee was payable. Legislative provisions were rewritten in plainer language. Updated information on the payment obligation subsequent to 31 August 2007 was posted on the agency's website, which also provided examples of the kinds of equipment on which the television fee was payable.

FICORA attended a digital sponsor training event organised by Helsinki Mission. A brief summary was distributed to customer service staff. Employees were also provided with much other information and contact details on the subject (e.g. www.digitv.fi website, Digita, Helsinki Mission, etc.)

The number of telephone calls taken in 2006 was 258,000, climibing to nearly 322,000 in 2007, an increase of 25 percent. The telephone system was expanded in preparation for the rising number of calls. In August and September 2007, 35,000 more calls were received than a year earlier during the same time. Preparatory measures in response to the possible rise in call volume included the hiring of two new employees in the early part of the year, a "holiday freeze" imposed on staff and the full-

time recruitment for August and September of all hourly customer service employees. The customer service lines were also manned by employees in other units with access to the customer service number series.

E-contacts increased by some seven percent between 2006 and 2007. Part of the increase is attributable to contacts having to do with the switchover to digital, part to a normal shift to online communications. Two fixed-term employees were hired in anticipation of this development.

Most of the calls to FICORA concerning digital television were directed to the television fees department. However, the entire agency was prepared for the switchover to digital television with the issuance of clear-cut instructions on the persons/offices to which transfer any calls having to do with the switchover.

9.3. Consumer Agency

The Consumer Agency generated information for both sellers and consumers on issues having to do with the standing of the consumer as a buyer of set-top boxes and television sets. In addition to its own distribution channels, the Agency also offered its materials for use and distribution in other operators' channels, for example via the advisory services made available by the TV2007 Group and on the bus tour.

Information for businesses and sales clerks

The Agency prepared a pocket-sized checklist (Seller's checklist) for sales clerks to review the basic considerations having to do with choice of set-top box together with customers. Customers are not always aware of all the facts that need to be taken into account, nor of the questions that need to be asked. The checklist helps reduce the number of disputes arising from set-top box sales. The Association of Electronics Wholesalers and the Home Electronics Association as well as the major non-affiliated retail chains distributed the checklist to their stores in May and June 2006.

The Consumer Agency also prepared in June 2006 a summary on the division of responsibility and the management of defect situations in set-top box sales. The identification and rectification of defect situations of various kinds has established itself as one of the central problems experienced by consumers throughout the transition period, which has been reflected more widely in the perceived success or failure of the switchover to digital television. The management of defect situations demands the cooperation of all operators, which the Consumer Agency has sought to promote through a variety of means. In spring 2007, the Agency urged operators to establish a communications ring and agree on the ways in which to communicate disturbances of various kinds in broadcasting or software updates to viewers. In December 2007, the Consumer Agency convened the operators to discuss problems with sub-

titling and issues of division of responsibility. This meeting served as the basis for the Agency to prepare guidelines which were communicated in early 2008. The Agency also requested information from importers on the rectification of subtitling issues observed by YLE in set-top boxes.

The Agency published several articles on digital television in issue 5/2006 of its news bulletin. Topics included the seller's liability for the usability of set-top boxes, an examination of warranties and liability for defects, the pricing of set-top box update services and problems with defective broadcast signals.

In order to ensure a high degree of knowledgeability among sales staff, the Consumer Agency and the TV2007 Group organised an in-store training tour in February/March 2007. Over a course of two weeks, instructors from the Face Time company briefed in the matter toured 100 stores in eight towns to familiarise employees with the materials and online services provided by the Consumer Agency, the TV2007 Group and the communications working group of the Ministry of Transport and Communications. The availability of installation services was also examined on this occasion and found to be good.

Information for consumers

The Consumer Agency conducted market reviews and price comparisons of set-top boxes on four occasions together with State Provincial Offices: in spring 2004, spring and autumn 2006 and spring 2007. The most recent of these concerned 154 models of set-top box (ranging in price from €30 to €700 , with the median price being €277), as well as 134 models of integrated television set (price range €600–€4,300, median price €1,347). The data was collected from 127 stores in 20 towns. Alongside model data and prices, the studies also examined i.a. the availability of installation services, audio subtitling features and the knowledge of sales staff about set-top box software updates.

The studies showed a rapid rate of hardware replacement. Of the set-top boxes on the market in spring 2004, only five models, i.e. 3% of the available supply, remained on the market in May 2007. Well over forty percent of the set-top boxes on the market in May 2007 had been placed on the market since October 2006.

The Agency also prepared a checklist for buyers of set-top boxes, a consumer manual on how to proceed in the event of defective set-top box and a general set-top box purchase manual. Bulletins were published on the following topics having to do with selection and use of set-top box and digital television set: subtitling issues (6 February 2008), checklist for set-top box buyers with an emphasis on HD-readiness (13 July 2007), single and dual tuner set-top boxes (11 May 2007), electricity consumption (11 April 2007), the marketing of pay-TV channel pack-

ages (15 February 2007) and the guidelines of the Consumer Agency concerning seller's liability in the event of defects (15 June 2006).

The Kuluttaja magazine also featured articles on digital television on a regular basis since 2005. Articles published in 2006–2007 examined digital television from a wide variety of viewpoints and addressed topics such as 15 key questions about digital television (5/2007), test of digital television sets for antenna households (3/2007), pricing of pay-TV channels (2/2007), choice of devices (1/2007), test of television sets (7/2006), editorial on choice of set-top box (6/2006), comparison of set-top boxes in test use (6/2006), defects in set-top boxes (5/2006), set-top box pricing (4/2006), editorial on switchover to digital (2/2006), Nordig (2/2006) and the causes of defects in set-top boxes (2/2006).

Other projects

As part of the ArviD programme of the Ministry of Transport and Communications, the Consumer Agency prepared a guide to help pay-service designers identify consumer protection viewpoints already at the design stage. The guide reviews principles of consumer sales and distance selling relating to i.a. the provision of information on prices and other facts to support the purchase decision, subscription terms and conditions, payments, management of defect situations and the status of minors.

An issue brought up by the working group on accessible communications prompted the Consumer Agency to include in its market review a section on the set-top box models supporting audio subtitling. The matter was also addressed in the media and among sales staff. The study permits the Finnish Federation of the Visually Impaired to select the proper set-top boxes for test use and to plan its own communications.

The Consumer Agency was also involved in the preparation and funding of the digital television vocabulary designed for all basic users of digital television from viewers to reporters and translators. The vocabulary explains nearly one hundred digital television concepts with clear definitions and supplementary commentary. The vocabulary was published on the website of the Finnish Terminology Centre TSK on 31 August 2006.

9.4. Association of Finnish Local and Regional Authorities

A working group of the Association of Finnish Local and Regional Authorities proposed in December 2005 to the Ministry of Transport and Communications and YLE an extension to the transition period to all-digital television in respect of hospitals and care facilities. The Administrative Council of YLE resolved on 12 December 2006 to allow the use of existing receivers in patient premises and the centralised conversion from analogue to digital of broadcasts until 31 August 2010 if necessary.

The Association communicated the decision to municipalities and municipal federations in a letter dated 8 January 2007, in which it also stated it would be monitoring the accomplishment of switchover to digital among hospitals and facilities in surveys, the results of which would be reported annually to the Ministry of Transport and Communications and YLE. The first such report is due on 30 August 2008. Hospitals are gradually preparing for all-digital television as their resources permit.

The decision was grounded in a survey on the digital television readiness of hospitals and care facilities conducted by the Association in autumn 2006.

10. ACTION BY OPERATORS IN THE SECTOR

10.1. Yleisradio Oy (YLE)

The activities of the digital television project set up in YLE in November 2005 have been steered and supervised by the coordination group appointed by the company's managing director and chaired throughout by Director of TV Operations Olli-Pekka Heinonen. The group held 32 meetings. The measures in 2006 and 2007 to facilitate the switchover to digital focused on YLE's programming and service supply, marketing communications, campaigns and company-level events.

YLE was an active contributor to the national cooperation among digital operators and had an influential voice in the working groups' decision-making. In addition, YLE took the initiative i.a. in the establishment of the DigiTV Info hotline, produced numerous digital advisory programmes and hundreds of public service announcements about digital television for its TV channels and radio stations, trained some fifty in-house digital sponsors and several dozen Swedish-speaking digital television instructors at adult education centres, took part in digital television tours and events across the country and on two occasions set up its own YLE Neuvontapalvelu advisory service to address customers' questions about digital television. YLE furthermore lent support to the Ministry of Transport and Communications by making available its research expertise relating to the digital switchover.

In March 2007, a digital switchover quality project was also initiated at YLE. The aim of the project was to secure appropriateness of the company's technological environment, programming content and broadcasts. Investments were also made in advising customers and ensuring the coverage of the network. The reception of digital television channels was made doubly sure by commissioning from Digita advisory services, shadow area measurements and gapfillers to complement the coverage of the terrestrial network. Transmission services commissioned by YLE allowed the achievement of the 99.96% population coverage rate in terrestrial reception by the end of 2007.

YLE had started addressing the issue of shadow areas independently back in 2005, at which time YLE agreed with Canal Digital and Viasat on the satellite transmission in Finland of YLE's entire digital multiplex. Satellite transmission accomplished nearly 100-percent coverage for YLE's digital television services. The satellite transmission of YLE channels started on 1 August 2005. Viewers in terrestrial digital broadcast shadow areas or outside the service area could obtain the CA card needed for viewing YLE channels via satellite free of charge from the customer services of either Canal Digital or Viasat.

On 24 August 2007, the television operators agreed on offering to households together with pay-TV operator Canal Digital the possibility of acquiring a digital set-up comprising combination set-top box suited for antenna and satellite reception, satellite dish and satellite card.

Despite the coordination input of government, YLE was left to assume wider than anticipated responsibility for the marketing, advisory services and device testing relating to the practical implementation of the digital switchover.

YLE's programming and service supply in 2006–2007

The Olympic Games in Torino in January 2006 accelerated the switchover to digital to a substantial degree. Further boosts were received from the football World Championships and Eurovision Song Contest content on YLE Extra in spring 2007. In August 2007, the World Championships in athletics in Osaka also added momentum to the digital switchover. YLE encouraged Finns to watch native son Tero Pitkämäki compete in the javelin finals on 2 September 2007.

YLE also devised for the transition period a programming strategy and revamped both its channel offering and channel profile for YLE TV1, YLE TV2 and YLE FST. The YLE24 channel was replaced by the new, digital YLE Extra channel in spring 2007. FST programming started transferring by degrees from the channels TV1 and TV2 to its dedicated YLE FST5 channel in September 2006.

The autumn saw extensive changes in YLE's programme line-up in accordance with the company's strategy. A shift in the early evening line-up moved the six-o'clock news from YLE TV2 to YLE TV1. A new section on culture was also added to the news show. The mid-evening news offering was in turn bolstered on YLE TV2, with national news offered at 18:50 and local news at 19:00. The fiction offering on YLE TV2 was also increased with a family quiz show produced in Finland in the 18:00 slot Mondays through Fridays, followed by an top international drama series on Tuesdays and Fridays. All Swedish-language programming was transferred to YLE FST5, allowing the early evening on YLE TV1 to be dedicated to Finnish-language programming while the shows

on Monday evenings on YLE TV2 are either Finnish or subtitled in Finnish. YLE FST5 was profiled as the leading channel for Nordic content.

The YLE Extra channel was discontinued on the last day of December in 2007 and replaced with YLE TV1+, otherwise broadcasting the same content as YLE TV1 but with "open subtitles" in all foreign content. This arrangement was put in place to ensure that subtitles functioned properly with all set-top boxes. In September 2008, TV1+ will be replaced by SVT Europa, which will require a pay-TV card also in its new channel location.

Digital television awareness was widely covered in YLE shows both nationally and locally, in the news as well as in other factual and current affairs programming. Consumer education in keeping with the public service obligation has also been provided within the programmes. Information on the digital switchover remains available on Teletext, YLE's website and various kinds of customer feedback systems.

Internal communications

The company's in-house magazines Linkki and Nettilinkki published nearly 150 news items and articles on topic of digital television.

Marketing of digital switchover on YLE's TV channels

The programme offering on YLE's digital channels was actively promoted in campaigns on all YLE channels. The caption *Enemmän sisältöä* [More content] was used in spring 2007 to bring together the pick-ups from programme offerings on the various channels. YLE continued to promote its diverse programming in summer 2007. The image spots in the *Näkökulmia* campaign [Viewpoints] took to the screen in August to boost the switchover to digital. The six brand commercials consisted of well-known Finnish faces approaching YLE programming from rather surprising perspectives.

Switchover to digital on screens

A week before the switchover in August 2008, viewers were reminded on YLE channels of the switch-off of analogue broadcasting. For a week after the switchover date, a separate text remained on the analogue TV1 channel to inform viewers that broadcasts had ended.

Campaigns

Since January 2006, YLE regularly informed home appliance stores and cable operators of its digital content offering and services. Digital information was provided i.a. in twelve news bulletins, programme roundups and campaign spots.

Digital television specials were broadcast live on YLE TV1 and YLE Radio Suomi during the first national Digital Week of 2007, 12–18 Feb-

ruary. A substantial amount of programming on the regional radio stations as well as on the Swedish-language YLE Radio Vega and youth station YLE YleX also focused on the digital switchover.

The morning show on YLE TV1 and the programming on YLE's Finnish and Swedish-language regional radio stations made particular contributions to National Antenna Day on 30 May 2007.

The second Digital Week of 12–18 August 2007 again saw digital television specials broadcast live on YLE TV1 and YLE Radio Suomi. The online Digichat was opened for viewers. YLE Radio Vega broadcast a live call-in show on the topic of digital television. YLE Radio 1 and Yle YleX also had special programming in place to contribute to the digital effort.

YLE's marketing measures were also visible on-screeen during the national Digital Weeks and national Antenna Day. The practically oriented Digi ABC public service announcements ran more than one hundred times on YLE TV1 and YLE TV2.

In the cable networks, the switchover was boosted by a live special broadcast on YLE Radio Suomi on 5 February 2008. YLE Radio Vega also broadcast its own Swedish-language call-in special in early February.

Service supply

In summer 2007, YLE conducted testing of set-top boxes to ensure the reception of DVB subtitling. The technical test during television broadcasts allowed operators in the field to verify the functioning of basic features, e.g. subtitling, in various set-top box models. The test was implemented twice on YLE Extra and geared to appliance retailers and cable operators.

The subtitles in YLE broadcasts were modified in November 2007 to eliminate the delay experienced in the start-up of the subtitles. Another goal was to ensure that subtitles also transferred to recordings on personal video recorders.

Set-top box list

In autumn 2007, YLE published its own list of set-top boxes in which it was certain that the DVB subtitling it used functioned properly. The list has been updated periodically. Observations on the functioning of subtitling in receivers have been made in cooperation with two testing companies and an importer. The list now contains set-top boxes and integrated television sets of both the T and C variety. The list (in Finnish only) is available on YLE's website at
www.yle.fi/tekniikka/docs/Digiboksitestit_07.pdf

The company also agreed with retail and importers on the provision of a comparable list of cable set-top boxes. The list of Cable Ready-tested set-top boxes was published in early 2008. A combined list was also prepared in 2008 together with importers and published on YLE's web-site.

Subtitling for the visually and hearing impaired

During 2008, YLE will continue to substantially boost its additional information services in text format. The audio subtitling services for the visually impaired will expand from TV1 to other channels as well. The amount of domestic programming subtitled for the hearing impaired will be increased to some 30 percent of all programming.

YLE advisory hotline

The Digirinki advisory hotline operated by YLE answered calls between 15 August and 14 September 2007. Another advisory hotline focusing on technical issues continued the work of Digirinki between 5 November 2007 and 4 April 2008. The core staff in YLE's advisory services consisted of YLE Teknikka employees. Other company employees and e.g. engineering students were also trained to take calls. The hotline was open daily from 9am to 9pm and it answered roughly 400 calls each week.

Digital sponsor activities

The company remained active in digital sponsor actitivities until the end of 2007. Digital sponsors have helped thousands of people with the digital switchover at i.a. YLE's own events and at national joint events with all operators. All in all, well over one hundred of these events have been held.

YLE and Pihtipudas[*]

The municipality of Pihtipudas embarked on a joint project with YLE in spring 2006 to promote the digital switchover. By August 2007, the big moment could arrive, as far as the town was concerned: all public properties used by the municipality, such as the town hall, health centre, home for the elderly and schools were ready to receive digital television broadcasts. The remarkable advisory and instructive contributions of the digital sponsors from Pihtipudas upper secondary school between May 2006 and November 2007 further served to promote Pihtipudas' switchover to digital television on 31 August 2007. The advisory services targeted the elderly in Pihtipudas in particular, to whom the digital sponsors gave assistance through personal house calls.

[*] Translator's note: The Finnish placeholder name *Pihtiputaan mummo*, the granny from Pihtipudas, refers to the senior citizen not conversant with modern technology and to whom things have to be explained very clearly.

YLE commissioned two digital television surveys of town residents, one in January and the second in May/June 2007. In early June, nearly 600 Pihtipudas residents, or nearly one third of all households, responded to YLE's survey concerning the acquisition of set-top boxes, the most viewed digital television channels and technical viewing issues. At 84 percent, households which had already switched over to digital television were well represented among respondents. Reception problems were reported in Pihtipudas, mostly due to faulty antenna systems. The survey provided both YLE and Digita with detailed information about reception problems in all areas of Pihtipudas. Digita addressed these issues together with residents at the request of YLE in July 2007. According to the survey, the biggest problems experienced by residents had to do with low signal strength. Digita studied the situation over four days using a measurement truck built for this purpose, visual inspection of reception antennas and, in some cases, an examination of the condition of the interior network and measurement of outlet level. In all locales where measurements were taken, the problem could be traced to deficient or defective antenna systems. The most common cause was insufficient amplification of the reception antenna. Antennas were also misaligned, while others were simply old and worn out.

After the survey, YLE provided town residents with advice on antenna issues during two days, 10–11 August 2007.

The morning show report from Pihtipudas was shown at Digital Week (13–19 August). Reports and newscasts from Pihtipudas were also broadcast on YLE Radio Keski-Suomi and the local news for central Finland.
Pihtipudas has had high visibility on YLE channels throughout the term of the contract.

Events

YLE was on lavish display as the Five-Star Channel Family at the Helsinki Media Conference in March 2007. The company sought to showcase its programming and boost the digital switchover. Audience members could also take part in the taping of three shows on YLE's stand: Uutisvuoto, Pressiklubi and MusiikkiTV. For informational purposes, the YLE stand featured an interactive touch screen, the Digital Kiosk, from which attendees could access a wealth of information about digital television.

In summer 2007, YLE took part in Operation Digipysäkki, the weeklong bus tour of eight towns organised by the Ministry of Transport and Communications's TV2007 Group. YLE was represented at each stop on the tour but focused its efforts on the last stop in Hämeenlinna, which was also covered on YLE Radio Häme.

Reduction in television fee revenue

The switchover to digital television caused a reduction in television fee revenue in early September 2007. Some 50,000 television fees were left unpaid. A feedback survey suggested that the said households failed to pay the television fee either because they had given up televion viewing altogether, as a form of criticism directed at digitisation, or simply because they were unwilling to pay television fees in the first place.

Audience share subsequent to switchover

Despite the reduction in television fee revenue, YLE's share of television viewing has only increased since the switchover on 31 August 2007. YLE channels are attracting increased viewing despite a rise in the supply of rival channels. In the holiday season from Christmas to Epiphany in 2007, YLE's popularity put its total share of the television audience at 47.5 percent. The figure for the corresponding season in 2006 was 45.9 percent. The audiences of YLE Teema and YLE FST5 have grown substantially from the previous year. YLE Uutiset is clearly perceived at the most trustworthy news organisation in Finland. YLE also outranks its competition in the popularity of its sports programming.

10.2. Inputs of other television broadcasters

MTV Oy / MTV3

MTV Media has offered new channels to promote the digital switchover. In order to support the switchover to digital reception, the company entered the pay-TV business in November 2006 with a package consisting of four pay-TV channels: MTV3 MAX, Subtv Juniori, Subtv Leffa and MTV3 Fakta. The channels target different demographics: MTV3 Max is packaged as a men's channel that i.a. shows live broadcasts of Formula 1 races, MTV3 Fakta shows documentaries, Subtv Juniori is a children's channel and Subtv Leffa a movie channel.

The channel Subtv only being available for terrestrial reception in digital has been an important factor in the development of the digital penetration rate in the antenna network.

All channels were broadcast in the cable network, with MTV3 MAX and Subtv Juniori also broadcast in the terrestrial digital network. The broadcasting window of Subtv's parallel channel was subsequently split between the children's channel (Subtv Juniori) broadcasting during children's viewing hours from 06:00 to 20:00 and the movie channel (Subtv Leffa) taking over from 20:00 to 06:00. MTV3 Fakta has been broadcast in the terrestrial digital network as well since 1 September 2007.

The sales and marketing of the pay-TV channels were contracted to Digi TV Plus and local cable television companies. The channel package was

well received among the public and its subscribers at year-end 2007 numbered 320,000.

In early 2007, MTV announced it was expanding its pay-TV service by adding three new pay-TV channels in cable networks at the beginning of March 2008. The three new channels have also been tailored to distinct audiences: MTV3 AVA is a women's channel, MTV3 Sarja shows the most popular TV series and MTV3 Scifi broadcasts science fiction.

In order to reduce shadow areas, the company joined other television companies in June 2007 in commissioning 48 more gapfillers from Digita. Due to the late date, it wasn't until late 2007 that installation of the gapfillers could be started, and the installation of six remained pending until 2008 due to reasons of frequency coordination.

The arrangement gave rise to temporary shadow areas and the television companies subsidised a satellite reception package for residents in these areas. The receiver in the package can later be used to receive terrestrial broadcasts as well. The package deal was agreed with Canal Digital.

MTV supported the switchover to digital television by broadcasting on its channels six digital television commercials shared with other television companies as well as the *Eläköön yhteys* campaign. The spots featuring actor Sulevi Peltola were entitled [approximate English translation]:

- Sulevi Peltola gets a set-top box
- Tuula next door
- Daughter
- Misconceptions ballerina
- Misconceptions Football League
- Out in the yard

The spots ran for more than two years, and MTV3's teletext was also used for campaign purposes since late 2005. MTV3 Internet furthermore engaged in extensive marketing during the months running up to the switch-off of the terrestrial analogue broadcasting network. The following text was also displayed on analogue television channels at an accelerating rate towards the end of August:

"The analogue broadcast of this channel will end in antenna households on Saturday, 1 September 2007 at 04:00."

The success of the campaign for digital television was surveyed in late 2006. With a reach of 93 percent, it was one of the best recollected and liked television commercial campaigns of the year.

SW Television / Nelonen

Nelonen employed i.a. the following means to promote a smooth switchover to all-digital television among consumers. The company's new channel JIM launched in winter 2007 is transmitted only digitally and in all its communications, the company has held firm with the policy that analogue broadcasts shall not be continued in the cable networks after February 2008.

In order to communicate the switchover, Nelonen broadcast on its channels the *Sulevi – digi-digi* public service announcements produced by the communications group of the Ministry of Transport and Communications and offered digital television information in its channel's teletext service TekstiNelonen as well as on its website nelonen.fi The company also contributed to the administration of the digital television consumer information service (*0306 344 488*) and prepared for a higher number of consumer enquiries as the September 2007 switchover approached. Very few enquiries were ultimately made to the company, however.

In addition, Nelonen has taken part in the work of both the TV2007 Group and the communications group of the Ministry of Transport and Communications and in the tours of the provinces spearheaded by Digi-tv-info.

The company has for its part contributed to the subsidies for purchases of satellite reception equipment by households in shadow areas and together with YLE and MTV3 was involved in the implementation of Digita's measurement and antenna service geared to households.

Cable television companies

The cable television sector on the whole underscored the imporatance of the digital switchover already in the context of its three joint national Cable Open! pay-TV campaigns in November 2006 and in February and November 2007. The fourth Cable Open! weekend will be held in March 2008, after the switchover date in cable networks.

The Cable Ready device testing system initiated by the Finnish Cable Television Association has resulted in the market introduction of several set-top boxes and integrated digital television sets tested for proper function in the cable television network. The number of test laboratories rose from one to two in 2007, and the number of Cable Ready devices is already counted in the dozens. The testing continues under the auspices of Ficom.

Welho, which serves more than 318,000 households in the Helsinki Metropolitan Area through its fixed network, invested in the marketing of set-top boxes in January and February 2008 to promote the switchover to all-digital television and to this end also placed a major advertisement in Helsingin Sanomat newspaper in January 2008. Welho's

customer magazine focusing on the digital switchover was distributed in the Helsinki Metropolitan Area in the week of 11 February 2008. The magazine had a distribution of 315,000 copies. Efforts were also made to provide information on the company's website and information channel, in enclosures to invoices, email messages and the on-hold messages in telephone services.

As of 1 February 2008, Welho ran tickers on the ending of analogue transmission in the broadcasts of analogue channels (TV1, TV2, MTV3, Nelonen and also in part Sub) The ticker in the broadcasts of YLE channels was in both Finnish and Swedish. Welho also allocated additional staff to telephone services and the Welho store for February 2008.

Tampereen Tietoverkko (TTV) organised a hotline for the provision of practical advice. The Kaapeli-TV-digi-info hotline was launched on 1 July 2006 and took questions daily between 9am and 9pm on 010 3095 350.

TTV prepared a series of public service announcements on digital televisin in summer 2007 dealing with topics such as acquisition of set-top box, installation and features, and trouble-shooting the most common problems in a concise and hands-on manner. The announcements starring actor Esko Roine were broadcast regularly on TTV's Infokanava channel since August 2007 and are also available for viewing on TTV's website at www.ttv.fi.

TTV's digital switchover bulletin was distributed to households in the Tampere region in June 2007. The 140,000-copy strong distribution was further bolstered by newspaper advertisements.

TTV provided training to the largest house managing agencies in the region during spring 2007. Digital issues were also emphasised in training provided to retailers (ElisaShopit, Gigantti, Markantalo, etc.) Digital television campaigns of various kinds were also organised in pay-TV marketing.

TTV took part in the Tampere event on the Digipysäkki tour in August 2007.

The company will continue to operate the Kaapeli-TV-digi-info hotline until further notice. Likewise, the public service announcements continue to run on the Infokanava channel and also remain available for viewing on TTV's website. A separate bulletin and instructions on switching over to digital viewing were broadcast on the channels released upon the expiry of the analogue extension period.

TTV took part in the digital television advisory event organised by Lions Club Tampere Ruotu at the main library building Metso and targeted to the elderly in particular. Metso was also the venue for an event organised by Pirkanmaan Kiinteistöyhdistys ry for house managers and

the chairmen of housing companies' boards of directors under the title "Nine days until the end of analogue". TTV was on hand at this event as well.

Pay-TV operator Digi TV Plus Oy

PlusTV made substantial contributions to the digitisation of antenna households. During its first full year of operations (2007), the company gained 220,000 new pay-TV customers in antenna households.

PlusTV is also an important operator in distribution channels. The company has nearly 2,000 sales outlets while the total number of sales outlets for all cable television operators is between 2,000 and 2,500.

PlusTV's pay-TV services can be invoiced as per contract but PlusTV also sells pre-paid pay-TV cards available at kiosks. Kiosk sales bring the CA card closer to consumers and their everyday lives, which indeed was the aim of PlusTV in launching the pre-paid pay-TV card.

Pay-TV subscribers account for some 270,000–300,000 of all terrestrial digital televison households. The majority are PlusTV subscribers. PlusTV's long-term target is to reach a penetration rate of close to fifty percent.

PlusTV has helped bring the entire concept of pay-TV to the Finnish consciousness. The company is expending significant effort and investment on marketing to increase the take-up of pay-TV, which shows in the almost 100% name recognition achieved by the company in just over a year.

Together with Canal Digital, PlusTV has been actively involved in the transition to the single card system and making the system possible for consumers.

The company has also commoditised the PlusTV Pluscard for households with more than one television set. The Pluscards allow antenna households to view the channels of PlusTV on more than one television set either in the home or at a holiday home. The Pluscard system was launched in spring 2007.

PlusTV has also dedicated three separate weekends each year as PlusTV Open weekends, allowing households free access to channels in PlusTV's pay-TV package for a given period of time.

The company is actively investigating possibilities to expand pay-TV to different terminal devices and technologies. One of the areas of interest is mobile television.

Digi TV Plus is a company specialising in the transmission of digital televison channels. Its services are marketed to customers under the name

PlusTV. The target demographic for PlusTV is all Finnish antenna households.

The PlusTV package comprises eleven channels and channel location 23, on which films and series are provided by MTV3 AVA, SF Anytime and PlusTV. PlusTV is the only operator to broadcast to antenna households the full 24-hour programming of MTV – Music Television as well as the entire programming of Nickelodeon, broadcast daily between 7am and 7pm. The domestic channels exclusively available in the PlusTV package are URHEILU+KANAVA, MTV3 MAX, MTV3 Fakta, Sub Leffa, Sub Juniori and DIGIVIIHDE. The Swedish-language SVT Europa is also offered to antenna households. The PlusTV package is rounded out by the Discovery Channel and Eurosport.

10.3. Digita Oy

Switch-off of analogue broadcasts

Digita prepared carefully for the switch-off of analogue broadcasts. A media tour across Finland was implemented in the last week of August to ensure the publication of appropriate information in local media. The tour touched down in Rovaniemi, Joensuu, Jyväskylä, Tampere and Helsinki.

Additional resources were allocated to DigiTV Info. The company's full advisory resources were in use over the weekend to assist DigiTV Info in managing the influx of phone calls. The company also held its marketing, communications and business resources in readiness to respond to any questions from the media.

Enhancement of service area

Digita continued its efforts in autumn 2007 to improve the service area of the digital television network in accordance with the agreement arrived at with television companies in summer 2007. The first installations and deployments under the order for additional gapfillers placed in June 2007 were implemented on an exceptionally quick schedule. Thanks to extraordinary effort on the part of Digita personnel, the first nine gapfillers were deployed with either temporary or permanent solutions by mid-September. This significantly reduced the population affected by shadow areas.

Autumn 2007 and winter 2008 saw the construction of a total of fifty gapfiller stations, 43 of which were in operation by the end of January 2008.

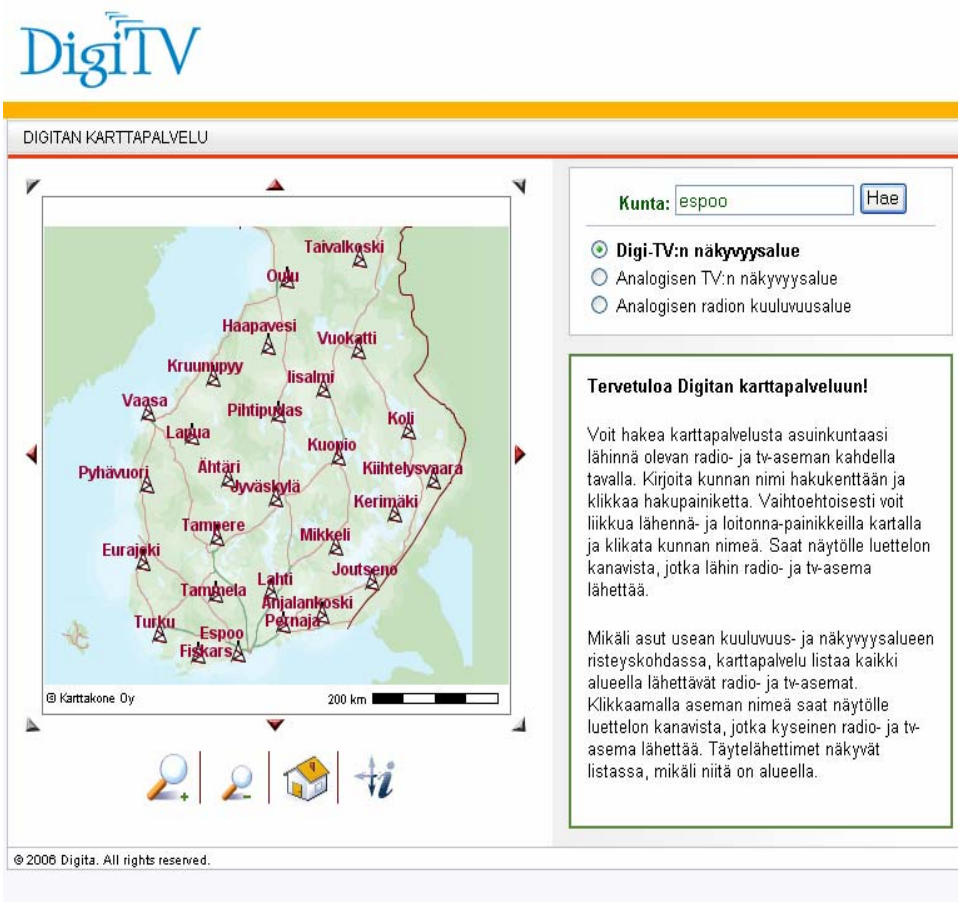
Modifications made in Lahti and Tampere (transmission shifted to main transmission antenna) resulted in markedly improved service especially at the fringes of the service area of these transmission stations. The

modifications thus facilitated reception for thousands of television viewers.

Advisory services and measurements

DigiTV Info has continued to operate actively even after the switchover to digital television. In early September 2007, the number of calls per week stood at 9,000, dwindling to some 4,000 per week later on in the month. By the end of the year, the weekly call volume had settled at roughly 3,000. The online service www.digitv.fi also remains in active use and had a total of 1.1 million visitors in 2007. Visitor figures are monitored on the basis of unique visits per week. The online map service at digitv.fi continues to attract over 200,000 visitors annually.

The map search is based on name of municipality. For locations at the junction of several service areas, the map service lists all radio and television stations transmitting in the area.



DIGITA MAP SERVICE
Municipality: espoo Search
Digital television service area
Analogue television service area
Analogue radio service area

Welcome to the Digita map service!

There are two ways to search for the radio and TV stations closest to your place of residence. You can enter the name of the municipality in the search field and click Search, or use the Zoom in / Zoom out buttons on the map and click on the municipality. Both ways will give you a list of the channels transmitted by the closest radio and TV station.

If you live at the junction of several service areas, the map service lists all radio and TV stations transmitting in the area. Click on the name of the station to get a list of the channels transmitted by that station. Any gapfillers in the area are also listed.

The company's advisory and measurement service project was continued and some 650 house calls have been made to consumers since summer 2007. In addition, some 2,000 shadow area reports have been received from consumers.

The aim of Digita's advisory service was to respond to all consumer enquiries directed to it. The most difficult cases required lengthy and challenging investigation, although more than 90 percent of enquiries could be satisfied with advice on antennas.

DigiTV Info ceased to operate on 14 March 2008. Since then, Digita has offered advisory services to antenna households via its new Digita Info.

New channels in new regions

Broadcasts in the new multiplex E started in September 2007 from eleven broadcasting stations. These were joined by four new stations in early October and another six by the end of 2007. Broadcasts are now provided in 21 service areas and the multiplex has a population coverage of some 90 percent. Three more broadcasting stations will come online in the first quarter of 2008, bringing the total population coverage to 95 percent.

In multiplex C, Canal+ expanded in November 2007 to four new broadcasting stations. Digita engages in active discussions on additional stattions and gapfillers.

10.4. Importers and retailers of home electronics

Eläköön yhteys 2007

The Association of Home Appliance Importers (KOTEK) and retailers took part in the *Eläköön yhteys* project by providing training on set-top box installation and use to volunteers from all districts of the Association of Finnish Lions Clubs.

Information and promotion

KOTEK was responsible for the preparation of four press releases on digital television in 2007 focusing on providing consumers with information about new technologies and alleviating the uncertainty associated with the acquisition and use of set-top boxes. A release published in July/August 2007 as in January 2008 sought to activate consumers to acquire their set-top boxes well in advance of the switchover date to avoid stock sell-outs and the many problems arising from busy hotlines at the actual switchover date.

Representatives of KOTEK appeared on YLE radio and television shows in August 2007 to provide advice to consumers.

Other cooperation

Retailers were actively involved in the cooperation organised by the Consumer Agency to draw up checklists for set-top box sellers and guides for set-top box buyers. In addition, instructions on how to proceed in the event of various defect situations were also prepared on the initiative of the Consumer Agency.

11. SUMMARY

11.1. Particular challenges noted in the interim report and responses thereto

The interim report of the working group in autumn 2006 stated that despite positive development, the switchover to all-digital television also entailed challenges that needed to be resolved in a manner satisfactory to all viewers prior to the switchover. The particular challenges enumerated by the working group were the service area of digital television, the proper function of receivers, information and communications, an increase in interesting content, regard for special interest groups, and means to increase penetration rate among cable households.

As described above, the efforts of the authorities, operators in the sector and volunteers have been especially directed at responding to the aforementioned challenges.

11.2. Lessons garnered from the digital switchover: a list compiled by the TV2007 Group

The TV2007 Group has compiled the following summary on issues and experiences from the various stages of the switchover to all-digital television. The digital television monitoring group concurs with the views of the TV2007 Group and deems it important that these be included in this its final report as well.

1. A sufficient number of set-top boxes and integrated television sets must be available on the market from the very launch of the digitisation project. Local measurements directed at the population to determine actual service area and the advisory services put in place on the basis thereof must be started as soon as the digital broadcasting network has been completed.

2. Once the digital broadcasting network has been completed, the prerequisites to good antenna reception must be intensively communicated to the population. Had we succeeded in getting this message across in Finland in 2005–2006, the population would have had 18 months to make the necessary antenna upgrades. The duty falls on the authorities: to define good and also adequate antenna reception, and to communicate this to the population.

3. An independent testing and approval procedure for set-top boxes should be put in place. Prime examples include the Cable Ready scheme in Finland and the testing organised by Teracom in Sweden.

4. Once the network has been completed and measurements and advisory services are in progress, the necessary additional decisons can be taken to provide service in shadow areas in accordance with legislation and the terms of licences. Service issues in particularly difficult terrain and in fringe areas must be resolved as quickly as possible.

5. A maximal concatenated advisory organisation shall be set up for the switchover to digital television. A combination design as in Finland with representatives of broadcasters, television companies and device importers is recommended. As diverse as possible expertise on the part of advisory service staff and a high number of resources are key to successful citizen advisory services.

6. The roadmap to the digital switchover must hold. Decisions taken must also be kept: dates, technological solutions and permitted exceptions are the key factors that may not waver. In Finland, however, the decision of YLE in April 2007 to allow central set-top boxes helped the switch-off of analogue broadcasts, as public debate on the issue dried up. Nonetheless, decisions should be taken at a sufficiently early stage – the media treat wishy-washiness in a deservedly brutal fashion. All changes undermine consumer confidence in the process, the long-term plans of television companies need to be altered and the financial risk in the changes is borne by retailers and importers.

7. Decisions on subsidies from society, if any, to the population as well as on taxation policies concerning devices and the requisite installation and deployment work must be taken already at the launch stage.

8. Seamless cooperation between all operators is vital to success. The standard of cooperation seen in Finland proved excellent.

9. Every effort should be made to enlist volunteer organisations in the advisory services to senior citizens. The cooperation with volunteer organisations in Finland was excellent, allowing us to put in place a social safety net for the elderly.

10. A knowledgeable and convincing person to give a face to the undertaking must be located. Our solution of this person having a professional background in television and being a senior citizen added credibility to the project.

11. The switchover to digital must be branded. The reasoned decision of the digital television communications group in Finland to enlist actor Sulevi Peltola to front the civic communications effort proved successful.

12. Civic communications should be based on only a few fundamental promises that are sure to hold. Instead of technology, communications should be spearheaded by content and the benefits of digitisation to the population. Digitisation must offer only carrots – no sticks!

13. In addition to the development of the penetration rate of digital reception, survey data must also be obtained at regular intervals on attitudes, device development and challenges pertaining to use. In Finland, this was accomplished superbly, not only through the cooperation between the Ministry of Transport and Communications and operators but also through the surveys conducted by the Consumer Agency and FICORA.

14. Angries are unavoidable. Critical voices must be allowed to speak, but media visibility and communication skills must be used to ensure that the voice of “the defence” is always heard as well.

15. The mood of the public at large must be established. The only way to accomplish this is for the operators to be in direct contact with the public to hear first-hand their opinions and concerns.

16. No contact from the public at large may go unanswered.

17. Special interest groups must be taken into account: the lone and the elderly, the disabled, persons on subsistence allowance, im-

migrants. Each group presents an individual set of challenges which must be met.

18. A “task force” needs to be established. A matrix organisation consting of operators’ representatives, instead of a distinct office, guarantees the support of the operators. In the Finnish model, weekly meetings and clear-cut project responsibilities imparted efficiency to the group’s activities.

19. Regular contact must be kept with all stakeholders. TV2007 achieved this through meetings and a widely distributed monthly bulletin recounting both recent events having to do with digitisation and the Group’s future plans of action.

20. Every question that comes up must be answered – an information bank to support the working group/office is well worth its while.

21. Companies involved in the switchover to digital must also commit to internal measures. The extensive activities of YLE to promote digitisation are a prime example of this in Finland.

22. The geographical coverage of the multiplexes must be equal at the very outset. This means that gapfillers must also transmit the programs in all the multiplexes in the main transmitter.

23. Antenna fitters and housing company managers require the details of the frequency solutions in new multiplexes well in advance so that any antenna solutions in housing companies can be coordinated and implemented in an economically sensible manner. The introduction of multiplex E showed that there were hundreds of housing companies where the antenna installations were not in order.

24. When the fundamentals are in order, the switchover to digital television can take place on a rapid schedule.

25. Project responsibility does not end with the switch-off of analogue broadcasts. People need advice and instruction also after the switchover.

26. Information shall be provided on a regular basis on the services for the disabled provided by the television companies and of the single-card system of pay-TV companies in the terrestrial network.

27. Although the first stage of the switchover to digital television is now over, the fast pace of technological advances requires all television operators also in future to have access to a shared forum which addresses the details of future solutions.

Appendix 1

GOVERNMENT RESOLUTION OF THE CABINET ON SWITCHOVER TO ALL-DIGITAL TELEVISION BROADCASTING AND RELATED MEASURES

1. BACKGROUND AND AIMS OF GOVERNMENT RESOLUTION

The Ministry of Transport and Communications appointed on 22 May 2003 a parliamentary working group whose task, at the first stage, was to determine potential means of accelerating the switchover to digital television as well as the timetable and principles to be observed in the switchover to all-digital television. The working group submitted its unanimous report to the Ministry of Transport and Communications on 8 December 2003, proposing 31 August 2007 as the date for the switch-off of terrestrial analogue television. However, the proposal of the working group was premised on all Finns, regardless of residence and income status, being able well in advance of the switch-off of analogue television broadcasting to have access to digital television services at a reasonable cost and little effort.

Comments on the matter were requested by more than one hundred parties, all of which bar one were in favour of the proposed switch-off date.

In its communication to the Ministry of Transport and Communications in February 2004, Yleisradio proposed that the Government resolve to issue a resolution on the switchover to all-digital television on 31 August 2007 and on related measures. In addition, Yleisradio states that its Board of Directors will put before the company's Administrative Council a proposal to the effect that the Council resolve during 2004 on the switch-off of analogue broadcasts and the switchover to digital television broadcasting on 31 August 2007.

The switch-off of analogue television broadcasts also entails considerations of constitutional law. The switch-off touches upon freedom of speech, public service, equality and protection of property at least.

The aim of the issue of this Government resolution is to set a clear date, 31 August 2007, on which the switchover to all-digital television broadcasts will be accomplished, and to make public the programme according to which that goal will be achieved.

2. GOVERNMENT RESOLUTION

Finland intends to switch over to all-digital television broadcasts on 31 August 2007, on which date terrestrial analogue television networks are to be closed down. The premise is for the digital distribution network to cover the entire country by the end of 2005.

Besides decisions by the Government, preparation also calls for action on the part of other operators. The Government resolution therefore includes a list of measures con-

cerning also parties other then the Government. The views of the operators have been taken into consideration in the drafting of this list. The list of measures below indicates the substance of each measure, its legal foundation, the party or parties responsible and the timetable for implementation.

Compliance on the part of Yleisradio and the television licence holders with the Government resolution is a precondition to the Government undertaking the measures for which responsibility has been allocated to it.

3. MEASURES

Substance of measure	**Legal foundation**	**Party responsible**	**Timetable**
Supervisory Board of Yleisradio takes decision on company's transition to all-digital television broadcasts on 31 August 2007	Act on YLE, section 6	YLE	By 31 March 2004
New licences for analogue broadcasting no longer made available for application	Act on Television and Radio Operations, section 9	Government	As of 1 May 2004
Licence terms of existing commercial and other analogue licence holders modified for analogue licences to expire on 31 August 2007	Act on Television and Radio Operations, section 11a	Government/ MINTC, holders of analogue television operations licences	By 31 May 2004
Government decree on the allocation scheme for frequencies assigned to television and radio operations and telecommunications subject to licence (1159/2002) and corresponding decree concerning the province of Åland modified to state that the frequencies can no longer be used for analogue television broadcasting subsequent to 31 August 2007	Regard to section 3 on the Act on YLE and section 7a of the Act on Television and Radio Operations	Government/MINTC	By 31 May 2004
Terrestrial digital transmission network built to cover the entire country by the end of 2005	(Section 11a, Act on Television and Radio Operations)	MTV, Ruutunelonen, YLE, certain other holders of digital television operations licences in the manner required in their licences	Communication of 24 October 2003 from YLE and certain television operations licence holders to the parliamentary working group
Switchover to all-digital television broadcasting	Aforementioned action taken in accordance with law	Government, YLE, television operations licence holders	31 August 2007