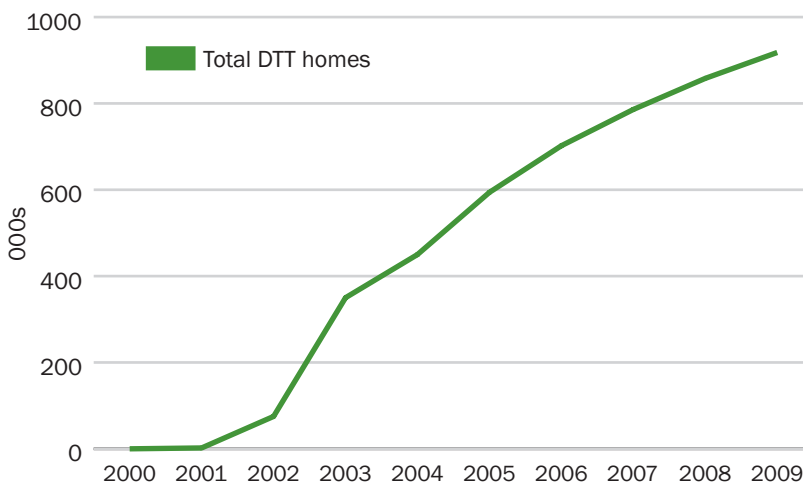


3 Finland

Key data

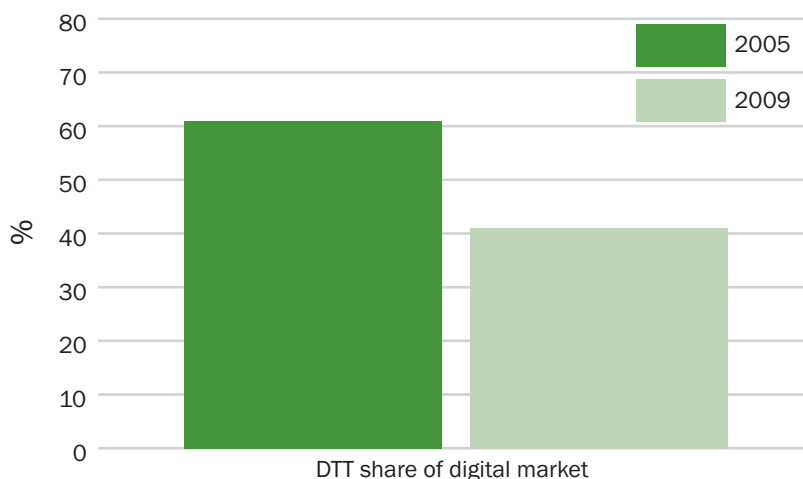
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Population (000s)	5,176	5,188	5,201	5,213	5,228	5,238	5,249	5,260	5,271	5,282
TV HH (000s)	2,355	2,353	2,371	2,376	2,381	2,386	2,391	2,396	2,401	2,406
DTT free-to-view homes	0	2	75	350	450	594	702	786	858	918
DTT pay TV subscribers	0	0	0	0	0	0	0	0	0	0
DTT pay top-up homes	0	0	0	0	12	17	21	24	26	28
Total DTT homes	0	2	75	350	450	594	702	786	858	918
Cable penetration (%)	39.70	42.49	43.24	44.18	50.03	52.92	54.92	56.47	57.48	58.22
DTH penetration (pay) (%)	1.43	2.25	2.36	2.52	2.46	2.80	3.05	3.27	3.44	3.59
DTH penetration (total) (%)	9.43	11.26	9.58	9.89	10.29	10.48	10.87	11.02	11.08	11.47
DTT penetration (%)	0.00	0.08	3.16	14.73	18.90	24.90	29.36	32.81	35.74	38.16
IPTV (%)	0.00	0.00	0.00	0.00	0.02	0.22	0.53	1.57	2.52	3.60
Total digital penetration (%)	1.61	3.45	6.92	19.35	28.45	40.83	53.41	66.09	78.49	92.98
DTT share of digital market (%)	0.00	2.46	45.74	76.15	66.43	60.98	54.97	49.64	45.53	41.04

Total DTT homes



Source: Screen Digest

DTT share of digital market (%) 2005 vs 2009



Source: Screen Digest

Introduction

Finland was one of the first countries in Europe to introduce DTT, starting test transmissions to coincide with the Sydney Olympics in 2000 and launching a full service a year later. Making its debut at the same time as digital cable, digi-TV initially offered simulcasts of the four main analogue channels – two operated by publicly owned YLE and the commercial networks MTV3 and Nelonen (Channel Four) – along with eight new digital channels spread over three multiplexes known as A, B and C. It has since been expanded to provide a much wider selection of programming including paid-for content from Canal Plus, with YLE employing Multiplex A and commercial networks Multiplexes B and C.

- Although digi-TV was at first operated by the programmers, control passed into the hands of the transmission company Digita following a change in the licensing procedure in 2002.
- Digita's service has been rolled out across the country in three stages and by the end of 2005 it is expected that up to 99.9 per cent of the population – effectively the whole of Finland with the exception of the Aland Islands – will be able to receive Multiplexes A and B. Those areas where reception of the two multiplexes is poor are due to be served by 51 small relay transmitters, the installation of which will be completed in 2006.

- Multiplex C was meanwhile available to 74 per cent of the population in August 2005 and likely to be extended to Koli and Joutseno later in the year.
- Digita currently offers a number of Multimedia Home Platform (MHP) applications including an Electronic Programme Guide (EPG), digital text TV and channel-specific additional services. It also allows parties other than broadcasters to offer their content on the DTT platform with the help of its 'Presence Mini Licence' service. One of the first to employ the service, which does not require an actual operating licence, was the Central Organisation of Finnish Trade Unions (SAK) for its nationwide training programme.
- Finland has chosen the Nordic NorDig II specification for DTT set-top boxes and employs the MPEG-2 compression system, though MPEG-4 is under discussion and may be introduced following analogue switch off. It has, in addition, selected Conax

Conditional Access (CA) for its DTT platform, which is a Multiple Frequencies Network (MFN).

- Finland is also a strong proponent of digital services delivered using the MHP protocol. As of Q1 2005 there were already 30,000 MHP boxes in use, almost all of which were for DTT due to the limited availability of cable and satellite-delivered MHP services.

- Digitisation of the main TV stations in Finland was due to begin in August 2005 with YLE and Channel Four Finland and Channel Four Plus leading the way and MTV3, MTV3+ and Subtv following at the end of the year. The analogue switch off date has been set for August 2007.

Legislative/Regulatory Framework

Finland took its first steps to introducing DTT in accordance with the Telecommunications Market Act (1997), starting limited trials in the same year and allocating spectrum space in 1999 ahead of test transmissions in 2000. The Telecommunications Market Act was amended in 2000/2001 and a new piece of legislation known as the Communications Market Act passed in July 2002.

- One of the most important amendments of the Telecommunications Market Act was to divide the licences for the DTT network and programming. They also resulted in licence fees for analogue TV channels being halved and those for DTT channels waived for their 10-year duration.
- The new Communications Market Act meanwhile granted the Finnish Communications Regulatory Authority

Media regulator data

Media regulator	MINTC
Licence issuing body	FICORA
Target analogue switch off date	August 31, 2007

Source: Screen Digest

Transmitter technical details

Polarisation	Horizontal
Power (ERP)	25W to 5KW
Longitude	:
Latitude	:
Altitude	:
Height	:

Source: Screen Digest

Transmitters

	2001	2002	2003	2004	2005
# of transmitters	31	31	31	57	111
Geographic coverage	74% (pop)	74% (pop)	74% (pop)	94% (pop)	99.9% (pop)

Source: Screen Digest

Operators

DTT operator	launch date	pay/free	duration of licence	ownership
Digita	2001 operator licenced 2002	Mixed	8 years	TDF (100%)

Source: Screen Digest

(FICORA) the right to issue licences for TV and radio operations in the DTT network. FICORA also has several other responsibilities including granting radio licences for transmitters and participating in international standardisation work related to digital TV.

- Operating licences are not required for one-off broadcasts or interactive services. Short-term licences are required and can be obtained from FICORA when:

1. The weekly duration of broadcasts is no more than four hours.
2. The overall duration of the broadcasts is a maximum of three months.

Only when their broadcasts are regular and content is agreed with Digita for at least a year are channels granted a fixed location on a multiplex.

- Digita holds the licence to operate the three multiplexes and has the right to sell capacity on them for radio and TV networks.
- The Ministry of Transport and Communications (MINTC) is responsible for mass media administration in Finland. This includes overseeing the technical infrastructure of electronic services, law and licence drafting, granting short-term licences and international co-operation.
- MINTC appointed a working group to look into a fourth multiplex covering around 70 per cent of the population. It proposed that the network should be reserved for new services (IP Datacasting) conforming to the DVB-H standard for mobile receivers. A three-month Mobile TV trial subsequently got underway in March 2005.

DTT technical standards and settings

Spectrum range	470-790MHz	Channels 21-60
bandwidth per channel	8MHz	
Transmission standard	8K	
guard interval	1/8	
Code rate	2/3	
Constellation (carrier modulation)	64QAM	
Hierarchy	Non-Hierarchical	
Total bitrate	22.12Mbps	
Compression	MPEG-2	MPEG-4 expected after 2007

Source: Screen Digest

Multiplexes

Name	Name	Name
Multiplex A	Multiplex B	Multiplex C
Licencee/operator	Licencee/operator	Licencee/operator
Digita	Digita	Digita
Channels	Channels	Channels
YLE TV1-D (free)	MTV3 (free)	Canal Plus Finland (pay)
YLE TV2-D (free)	Subtv (free)	Canal Plus Film 1 (pay)
FST (free)	MTV3+ (part pay)	Canal Plus Film 2 (pay)
YLE 24 (free)	C4 Finland - Nelonen(free)	Canal Plus Sport (pay)
YLE Teema (free)	Nelonen Plus (free)	Sports Channel (free)
Ylen Klassinen (radio, free)		The Voice (free)
YLE Radio Peili (radio, free)		Estradi (free)
YLEQ (radio, free)		SEXTV.fi (free)
YLE Radio Vega+(radio, free)		Kanavalle nimi (free)
		TurkuTV (free)
		Alue-tv (free)
		Kiss FM (radio, free)
		Iskelmä (radio, free)

Source: Screen Digest

Key Players

Digita

Digita is Finland's principal radio and TV transmission company and operates a network consisting of 38 main, 167 sub-broadcasting and 40 transmitter link stations. Created as a subsidiary of the national public broadcaster YLE in 1999, it was taken over by France's TDF group in March 2005. Digita had a turnover of €89m in 2004 and currently employs 370 people.

- Aside from operating the three DTT multiplexes, Digita was involved in the 2005 mobile TV trial with the Finnish broadcasters YLE, MTV and Nelonen, telcos Elisa and TeliaSonera and mobile company Nokia. The project allowed 500 consumers in the Helsinki area to access real-time TV and radio programmes on specially equipped Nokia 7710 smartphones.

- Digita was awarded the licence for the 450MHz frequency by the Finnish government in June 2005. It now intends to construct a broadband network in areas poorly shared by 3G and existing wireless and wireline broadband services. Like its DTT platform, the network will be operated on an open shared basis, with other parties being offered capacity on equal terms.

FICORA

FICORA continues the work of the Telecommunications Administration Centre (TAC), a body that changed its name in September 2001 to reflect growing responsibilities in the electronic communications sector. Regarded as an expert authority and opinion leader, its activities are overseen by the Ministry of Transport and Communications. FICORA is funded by radio transmitter,

Set-top box models and specifications

Set-top supplier	model	memory	chipset	hard-disc size	CI/Card-slot	embedded CA	middleware	cost
Canal Digital	CDC-7000 ST "Combo"	:	:	-	1	Conax	:	:
Finlux/Salora	410T/C	:	:	-	-	Conax	:	:
Finlux/Salora	420T/C	:	:	-	:	:	:	€ 169
Finlux/Salora	DVB-T 510 (MHP)	:	STi55XX	-	:	:	:	:
Handan	DVB-T 4000	:	:	-	:	:	:	:
Handan	DVB-T/C 5000	:	:	-	:	:	:	:
Handan	DVB-T/C 6000	:	:	-	-	:	:	:
Humax	CI-5100T	:	:	-	2	:	:	:
Humax	CX-1201T	:	:	-	-	:	:	:
Humax	F1-4000T	:	:	-	-	:	:	:
Humax	F2-1001T	:	:	-	-	:	:	:
Humax	PVR-8000T (MHP)	24MB	:	40GB	-	:	:	€ 279
I-can	MHP-digiboxi	32MB	STi55XX	-	:	Conax	:	:
Jacobson's	T4/C4	:	:	-	-	Conax	:	:
Medion	9010CF	:	:	-	-	Conax	:	:
Medion	9110CF	:	:	-	-	Conax	:	:
Mobidig	STB 1000T	:	:	-	-	Conax	:	:
Nokia	Mediamaster 110T	:	:	-	:	:	:	:
Nokia	Mediamaster 120T	:	:	-	:	Conax	:	€ 149
Nokia	Mediamaster 150T	:	:	-	-	:	:	:
Nokia	Mediamaster 210T	:	:	-	1	option	:	:
Nokia	Mediamaster 230T	:	:	-	1	option	:	:
Nokia	Mediamaster 260T/C	16MB	STi5518	80GB	1	Conax	:	€ 399
Nokia	Mediamaster 310T (MHP)	:	:	:	:	Conax	:	:
Tevebox	Basic T/C	:	:	-	:	Conax	:	€ 129
Thomson	DTI1001	:	:	-	-	Conax	:	:
Thomson	DTI551	:	:	-	:	:	:	€ 69
Thomson	DTI2400	:	:	-	:	:	:	€ 129
Triax	DVB 250T	:	:	-	:	Conax	:	:

Notes: Selection available via mail order for reception of VRT service

Typical end user cost (except car TV) is around €100

Source: Screen Digest

spectrum, telecom network, postal operation and Internet domain name fees. Its net expenditure in 2004 was €3.941m.

YLE

The Finnish public broadcaster YLE has played a key role in the DTT sector from the onset, having begun the first trials with MTV and Nelonen in 1997 and subsequently formed Digita, now the platform operator. YLE supplies all the radio and TV programming located on the free-to-air Multiplex A. It is also actively engaged in efforts to introduce DVB-H services into the country. YLE is 99.9 per cent state owned, funded mainly by receiver licence fees and overseen by an administrative council appointed by parliament.

Almanova

Almanova, into which all the assets of Alma Nova were dissolved in 2005, is a leading Finnish multimedia company. Its broadcasting division includes the country's most watched commercial station MTV3, SubTV, the national radio channel Radio Nova, digital interactive services provider MTV Interactive and a minority stake in the Swedish commercial channel TV4. Like YLE, Almanova (previously Alma Nova) has played a key role in Finnish DTT from the beginning, and three of its TV channels – MTV3, Subtv and MTV3+ – are now offered on Multiplex B.

SanomaWSOY

SanomaWSOY is the largest media company in both Finland and the Nordic region and posted net sales of €2.5bn in 2004. Its TV operations arm SWelcom includes the national commercial station Nelonen (Channel Four) and Nelonen Plus, a service that currently shows mostly sport. Both are offered on Multiplex B as free-to-air services alongside channels from MTV (Almanova). SWelcome also owns Helsinki Television (HTV), Finland's leading cable operator.

Canal Plus Television

Canal Plus Television produces Nordic versions of Canal Plus premium channels and was acquired from Vivendi Universal by Nordic Capital and the US private equity firm Baker Capital in 2003. Following an agreement with the Nordic TV distribution

company Canal Digital and Digita, it introduced four of its channels – Canal Plus Finland, Canal Plus Film 1, Canal Plus Film 2 and Canal Plus Sport onto Multiplex C in 2004. In 2005, the Nordic Canal Plus channels were sold to SBS Broadcasting and re-branded C More.

Market Analysis

Finland has set itself a highly ambitious switch-off date for the transition from analogue to digital broadcasting, its August 2007 deadline being five years before a EU-wide recommendation of 2012. While the country has already made significant progress in the introduction of digital services, the target is likely to prove difficult if not impossible to meet.

- The driving force for digital broadcasting in Finland has been and remains Digita's DTT platform. Despite a shaky start, it has gone from strength to strength thanks largely to the rapid expansion of the digital transmitter network and introduction of additional services. The latter effectively transformed the platform's business model from free-to-air to mixed, with four channels from Canal Plus and one from the commercial station MTV (MTV3+) in the pay TV tier.
- A good measure of DTT's success, certainly compared to cable and DTH, is the number of set-top boxes present in the marketplace. As of May 2005 there were already a total of 677,000, of which the vast majority – 516,000, or 76.2 per cent – were used to receive the Digita service. By contrast, the number of boxes used to receive digital cable TV services stood at 129,000, and only 48,000 were employed to watch digital satellite programming offered by Viasat and Canal Digital.
- On the other hand, receiving Digita's service is anything but cheap. While low-end receivers now retail for less than €70, standard boxes cost between €100-€150 and top end MHP models up to €400. Canal Plus also charges €27 a month for receiving its four channels, and there are also paid elements in MTV3+'s programming such as coverage of Formula 1. Given such prices, a recent upsurge in subscribers is likely to have been a temporary phenomenon.

- This will prove to be a problem, as total digital penetration in Finland currently stands at under 40 per cent and it remains unclear what plans, if any, the government has for increasing the figure ahead of the August 2007 switch-over. Indeed, the greatest emphasis to date appears to have been placed on expanding the digital transmitter network and in terms of coverage it is now almost national, especially for Multiplexes A and B.
- The analogue switch off will certainly have its plus points, not least of which will be the freeing up of frequencies for the launch of more multiplexes. A move from MPEG-2 to MPEG-4 is now under discussion, and if – as seems likely – HDTV services are launched soon after the transition to digital, MPEG-4 will become the favoured compression standard. However, even then standard definition and HDTV channels are likely to co-exist in MPEG-4 for some time to come. Following the 2005 trial, MPEG-4 will also most certainly be used in a future commercial DVB-H operation.
- Finland's broadcasters are clearly playing their part to ensure the August 2007 deadline is met, with YLE, MTV and Channel Four all scheduled to begin digital transmissions in the second half of 2005. YLE is currently working to a financial plan that saw its losses reduced by €9m to €50.8m in 2003-4 and should see it break even in 2008. The commercial-free public network is financed mainly by receiver licence fees, an increase in which added €29m to its turnover of €359m going some way towards helping fund digital services.

DTT Chronology: Finland

February 1997

- Working group on DTT appointed by the Ministry of Transport and Communications.

October 1997

- YLE, MTV and Nelonen begin DTT trials in Helsinki employing a 5KW SFN transmitter.

November 1997

- Nordic public broadcasters meet to establish common DTT standard named NorDig.

May 1998

- Working group on digital TV proposes DTT launch in 2000 at the earliest.

September 1998

Incumbent telco Sonera and YLE agree to supply interactive services such as on-line banking, e-mail and Internet access to digital TV in Finland.

October 1998

- Digital DTH platform Canal Digital launches across Nordic region following several delays. Decides to use set-top boxes supplied by Grundig, Nokia and Philips.

January 1999

- DTT tendering process gets underway, only for it to be delayed by a scandal surrounding the privatisation of Sonera. At the same time Digita is set up as a division of YLE responsible for operating the future DTT and DAB network. Also the new Act on Television and Radio Broadcasting comes into force, outlining plans for introduction of DTT.

April 1999

- Steering group of Digital TV Forum Finland recommends that the Application Programme Interface (API) be used to meet Multimedia Home Platform (MHP) specifications.

June 1999

DTT licences awarded for three multiplexes. YLE gets exclusive use of Multiplex A, while Multiplexes B and C to be shared by several commercial broadcasters including MTV, Channel Four Finland and Canal Plus.

September 2000

After several delays, DTT tests finally get

underway from TV stations in Espoo, Tampere and Turku. Coinciding with the Sydney Olympics, they reach 39 per cent of the population. By the end of the year the figure rises to over 50 per cent, helped by digitalisation of TV stations in Eurajoki and Lahti.

December 2000

YLE sells 49 per cent of Digita to France's TDF for €141m.

August 2001

A national DTT service makes its debut. Initially free-to-air (FTA), it fails to make an impact due to a shortage of set-top boxes and limited programming. One of the commercial broadcasters (Swelco) eventually loses its licence for delaying the launch of three channels.

July 2002

Following a radical overhaul of the licensing procedure, Digita secures the right to operate the DTT platform. The broadcasters already offering services retain the right to capacity on the platform but no longer have operational powers. The new Communications Market Act reaches the statute book.

June 2003

Digita and broadcasters agree on a major expansion of the DTT network, with 12 new stations to be added by the end of 2004. Work gets under way in October 2003.

July 2003

YLE sells a further 41 per cent of Digita to TDF for €133m. At the same time, amendments to the new Communications Market Act come into force.

March 2004

Digita's DTT platform undergoes a fundamental change with the introduction of paid-for channels operated by Canal Plus (three) and Viisi (one). This is followed at the beginning of April by a renumbering of several channels, as well as some being moved to different multiplexes.

June 2004

Digita, YLE, MTV and Channel Four Finland agree on a further extension of the DTT

network, reaching 99.9 per cent of the population by the following year. Plans are also announced for new channels and the start of digital transmissions for existing services. YLE, Channel Four Finland and Channel Four Plus will be the first to start broadcasting digitally in August 2005.

March 2005

Digita, YLE, MTV and Channel Four team up with Elisa, Nokia and Sonera to launch Finland's first mobile TV trial. Using IP Datacasting, it runs until June 2005.

April 2005

Number of DTT receivers in use reaches 500,000.

June 2005

Digita is awarded the 450MHz licence. It plans to build a wireless broadband network and then act as a service provider, offering capacity to all interested parties on equal terms.

August 2007

Target date fixed for analogue switch-off in Finland.

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81	Total DTT homes	111	Total DTT homes

112	Media regulator data	143	20	Slovakia
112	Transmitters	143		Key data
112	Operators	144		Media regulator data
112	DTT technical standards and settings	144		Transmitters
112	Transmitter technical details	144		Operators
113	Set-top box models and specifications	144		DTT technical standards and settings
113	Multiplexes	144		Transmitter technical details
		145		Set-top box models and specifications
		145		Multiplexes
117	16			Ireland
117	Key data			
118	Media regulator data			
118	Transmitters			
118	Operators			
118	DTT technical standards and settings			
118	Transmitter technical details			
119	Set-top box models and specifications			
119	Multiplexes			
123	17			Norway
123	Key data			
123	DTT share of digital market (%)			
	2005 vs 2009			
123	Total DTT homes			
124	Media regulator data			
124	Transmitters			
124	Operators			
124	DTT technical standards and settings			
124	Transmitter technical details			
125	Set-top box models and specifications			
125	Multiplexes			
129	18			Poland
129	Key data			
129	DTT share of digital market (%)			
	2005 vs 2009			
129	Total DTT homes			
130	Media regulator data			
130	Transmitters			
130	Operators			
130	DTT technical standards and settings			
130	Transmitter technical details			
131	Set-top box models and specifications			
131	Multiplexes			
137	19			Portugal
137	Key data			
137	DTT share of digital market (%)			
	2005 vs 2009			
137	Total DTT homes			
138	Media regulator data			
138	Transmitters			
138	Operators			
138	DTT technical standards and settings			
138	Transmitter technical details			
139	Set-top box models and specifications			
139	Multiplexes			
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