



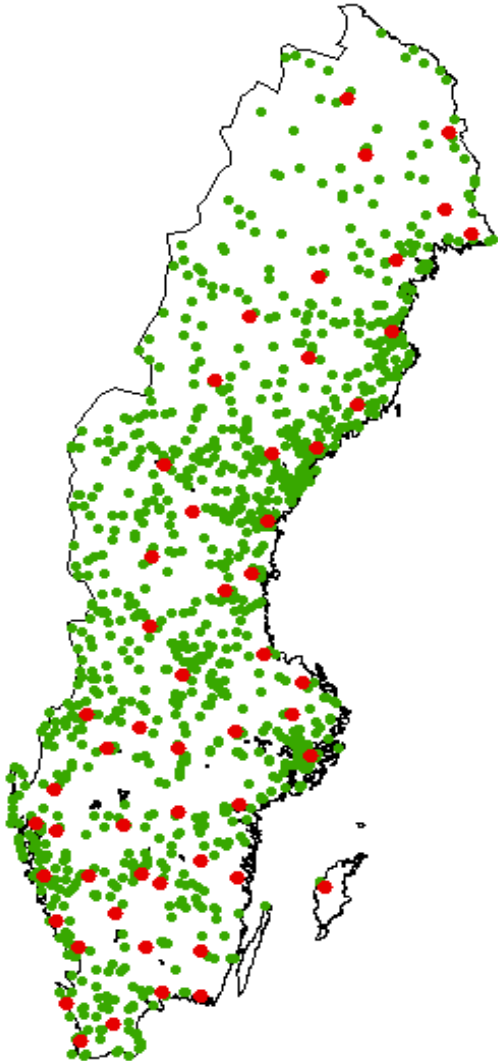
Digital Terrestrial Television The Swedish Experience

Vienna, February 15, 2011

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Public and Regulatory Affairs
Teracom Group

Vice Chairman,
Broadcast Networks Europe

Network operator for Radio, TV and Telecom



TERACOM[®]

- First broadcasts in 1921
- Incorporated in 1992
- Owns the Swedish and Danish Terrestrial Networks
- Owns Boxer Sweden, Boxer Denmark and a majority of PlusTV in Finland
- Revenue, approximately 400 million €
- Employees, approximately 600



TERACOM[®]

Broadcast Networks Europe (BNE) represents the Terrestrial Broadcast Network Operators in Europe

13 MEMBERS

- Abertis
- Arqiva
- Digea
- Elettronica Industriale
- Norkring
- OIV
- ORS
- Swisscom Broadcast
- Radiocom
- RaiWay
- RTENL
- TDF
- Teracom

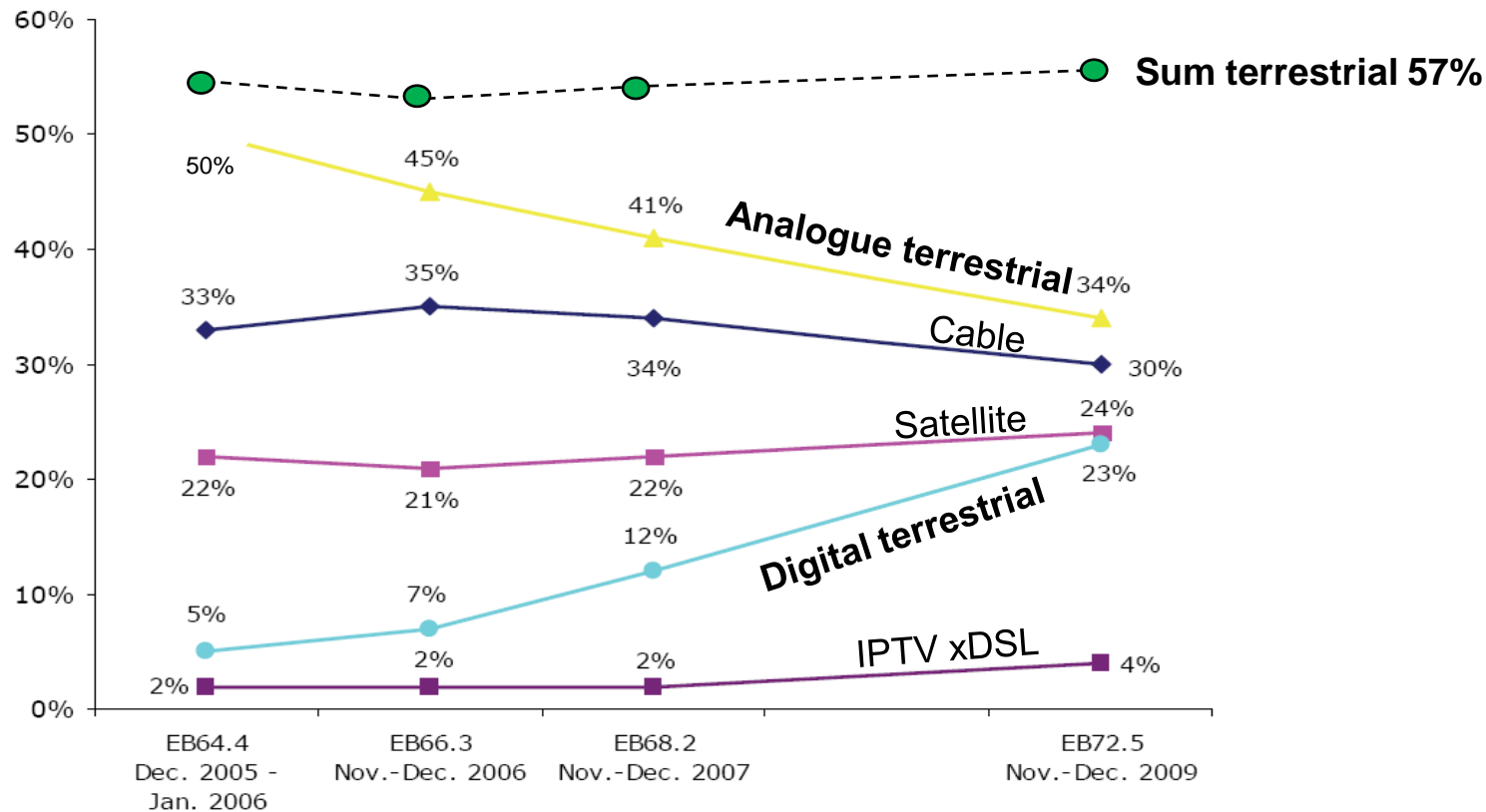
25 COUNTRIES

- Spain
- UK
- Greece
- Italy
- Norway , Belgium, Slovenia
- Croatia
- Austria
- Switzerland
- Romania
- Italy
- Ireland
- France , Germany, Finland, Hungary, Estonia
- Sweden, Denmark, Finland



Terrestrial has a strong position

Data from Eurobarometer show that in winter 2009 TV was received by 57% of EU households using the analogue and digital terrestrial networks. Digital terrestrial was the fastest growing means of reception.



Terrestrial is consumers' preferred choice

Ofcom Digital TV Q2 2010 report indicates that Digital Terrestrial Reception is used by 73% of UK households (18,7 million) on either a primary or secondary TV-set



The Communications Market: Digital Progress Report

DTT households and sets

Figure 15: DTT households and sets estimates

DTT sets and households (millions)	Q2 2009	Q3 2009	Q4 2009	Q1 2010	Q2 2010
Total number of DTT enabled sets	29.7m	28.8m	28.5m	28.8m	28.6m
Percentage of all TV sets (%)	49.4%	47.7%	47.3%	47.8%	47.5%
Total number of homes using DTT equipment	18.2m	18.2m	18.6m	18.7m	18.7m
Homes percentage (%)	71.2%	71.1%	72.6%	73.1%	73.2%
Number of homes where DTT is the only digital platform	9.9m	9.7m	10.1m	10.2m	10.1m
Homes percentage (%)	38.8%	38.0%	39.6%	39.8%	39.3%

The Swedish Terrestrial Network – from the start



- Sweden (and Great Britain) started Digital Terrestrial Television (DTT) in the late 1990's.
- The available transmission technology was DVB-T and compression standard MPEG2
- It took considerable time to develop digital multi-channel pay-TV into a product for the ordinary household.
- Terrestrial, Cable, Satellite and IP-TV platforms compete intensively
- After ten years, Sweden is a mature TV market. More than 60 percent of households subscribe to digital multi-channel pay-TV
- There is a constant demand for more channels in the terrestrial network and there is a lack of capacity due to the limitations in DVB-T/MPEG2-technology and limited availability of frequencies

Milestones



- 1997 Parliament approves DVB-T legislation
- 2003 Parliament sets switch-off date to February 1, 2008
- 2004 99,8% coverage dictated by law
- 2004 Appointment of DVB-T switch-over commission
- 2005 Government sets DVB-T switch-over timetable
- 2005 DVB-T switch-over starts
- 2007 Switch-Over Completed ahead of schedule

DVB-T switch-over, schedule and municipalities

PHASE 1 Sep-Nov 2005

- 1 Visby, 19 sep 2005 Gotland
- 2 Gävle, 10 okt 2005 Hofors, Sandviken, Ockelbo, Älvkarleby
- 3 Motala, 21 nov 2005 Askersund, Finspång, Karlsborg, Mjölby, Vadstena

PHASE 2 Feb-May 2005

- 4 Kisa, 27 feb 2006 Boxholm, Kinda, Linköping, Ydre, Åtvidaberg
- 5 Norrköping, 27 feb 2006 Flen, Katrineholm, Nyköping, Oxelösund, Söderköping, Valdemarsvik, Vingåker
- 6 Uppsala, 3 apr 2006 Knivsta
- 7 Västerås, 3 apr 2006 Arboga, Avesta, Enköping, Eskilstuna, Fagersta, Hallstahammar, Heby, Kungsör, Köping, Norberg, Sala, Skinnskatteberg, Surahammar
- 8 Örebro, 3 apr 2006 Degerfors, Hallsberg, Karlskoga, Kumla, Laxå, Lindesberg, Ljusnarsberg, Nora, Lekeberg
- 9 Östhammar, 3 apr 2006 Norrtälje, Tierp
- 10 Bollnäs, 2 maj 2006 Ljusdal, Ovanåker, Söderhamn
- 11 Borlänge, 2 maj 2006 Falun, Gagnef, Hedemora, Leksand, Ludvika, Smedjebacken, Säter, Vansbro
- 12 Hudiksvall, 2 maj 2006 Nordanstig
- 13 Mora, 2 maj 2006 Malung, Orsa, Rättvik, Älvdalen

PHASE 3 Nov 2006

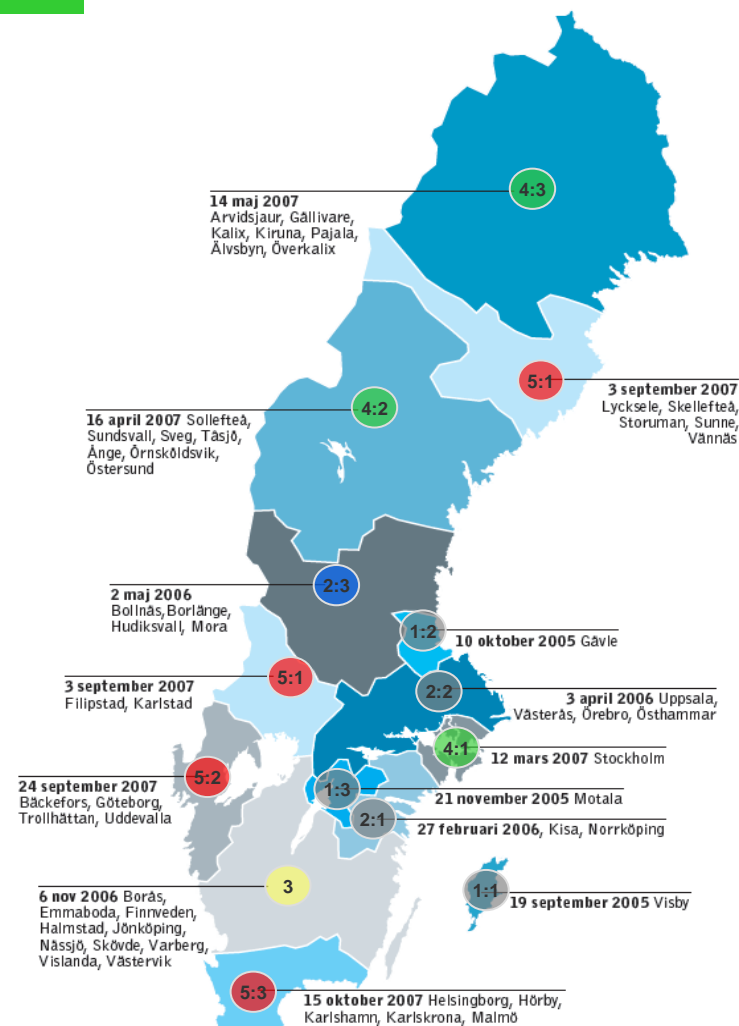
- 14 Borås, 6 nov 2006 Herrevad, Mark, Svenljunga, Tranemo, Ulricehamn, Vargårda, Bollebygd
- 15 Emmaboda, 6 nov 2006 Borgholm, Högsby, Kalmar, Lessebo, Mönsterås, Mörydånger, Nybro, Torsås, Uppvidinge
- 16 Finnveden, 6 nov 2006 Gislaved, Gnosjö
- 17 Halmstad, 6 nov 2006 Båstad, Hylte, Laholm, Markaryd
- 18 Jönköping, 6 nov 2006 Habo
- 19 Nässjö, 6 nov 2006 Aneby, Eksjö, Sävsjö, Tranås, Vaggeryd, Vetlanda
- 20 Skövde, 6 nov 2006 Falköping, Gullspång, Götene, Hjo, Mariestad, Mullsjö, Skara, Tibro, Tidaholm, Töreboda, Vara, Ödesjö
- 21 Varberg, 6 nov 2006 Falkenberg
- 22 Vislanda, 6 nov 2006 Alvesta, Ljungby, Värnamo, Växjö, Älmhult
- 23 Västervik, 6 nov 2006 Hultsfred, Oskarshamn, Vimmerby

PHASE 4 Mar-May 2007

- 24 Stockholm, 12 mar 2007 Botkyrka, Danderyd, Ekerö, Huddinge, Håbo, Järfälla, Lidingö, Nacka, Nynäshamn, Sigtuna, Sollentuna, Solna, Stockholm, Strängnäs, Sundby, Södertälje, Tyresö, Täby, Upplands Bro, Upplands-Väsby, Vaxholm, Värmdö, Österåker, Nykvarn, Gnesta, Trosa
- 25 Sollefteå, 16 apr 2007 Kramfors
- 26 Sundsvall, 16 apr 2007 Härnösand, Timrå
- 27 Svea, 16 apr 2007 Härjedalen
- 28 Tåsja, 16 apr 2007 Dorotea, Strömsund, Vilhelmina
- 29 Ånge, 16 apr 2007 Bräcke
- 30 Örnsköldsvik, 16 apr 2007
- 31 Östersund, 16 apr 2007 Berg, Krokom, Ragunda, Åre
- 32 Arvidsjaur, 14 maj 2007 Arjeplog, Malå, Norsjö, Sorsele
- 33 Gällivare, 14 maj 2007 Jokkmokk
- 34 Kalix, 14 maj 2007 Haparanda
- 35 Kiruna, 14 maj 2007
- 36 Pajala, 14 maj 2007
- 37 Älvsbyn, 14 maj 2007 Boden, Luleå, Piteå
- 38 Övertorneå, 14 maj 2007 Övertorneå

PHASE 5 Sept-Oct 2007

- 39 Filipstad, 3 sep 2007 Hällefors, Kristinehamn och Storfors
- 40 Karlstad, 3 sep 2007 Forshaga, Grums, Hammarö, Kil
- 41 Lycksele, 3 sep 2007 Bjurholm, Åsele
- 42 Skellefteå, 3 sep 2007
- 43 Storuman, 3 sep 2007
- 44 Sunne, 3 sep 2007 Arvika, Eda, Hagfors, Munkfors, Torsby
- 45 Vännäs, 3 sep 2007 Nordmaling, Robertfors, Umeå, Vindel
- 46 Bäckebo, 24 sep 2007 Bengtfors, Dals Ed, Lidköping, Meå, Säffle, Ämål, Årjäng
- 47 Göteborg, 24 sep 2007 Ale, Alingsås, Härryda, Kungsbacka, Lerum, Mölndal, Partille, Stenungsund, Tjörn, Öckerö
- 48 Trollhättan, 24 sep 2007 Essunga, Grästorp, Vänersborg
- 49 Uddevalla, 24 sep 2007 Färgelanda, Lilla Edet, Lysekil, Mörå, Orust, Sotenäs, Strömstad, Tanum
- 50 Helsingborg, 15 okt 2007 Höganäs, Åstorp, Ängelholm
- 51 Hörby, 15 okt 2007 Bjuv, Hässleholm, Höör, Klippan, Kristianstad, Simrishamn, Sjöbo, Skurup, Tomelilla, Ystad, Örke
- 52 Karlshamn, 15 okt 2007 Bromölla, Olofström, Osby, Ronneby, Sölvesborg, Tingsryd, Östra Göinge
- 53 Karlskrona, 15 okt 2007
- 54 Malmö, 15 okt 2007 Bjurö, Eslöv, Kävlinge, Landskrona, Lomma, Lund, Svalöv, Staffanörp, Svedala, Trelleborg, Vellinge





Digital Terrestrial TV, The Sw

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Advertising on the Stockholm Underground



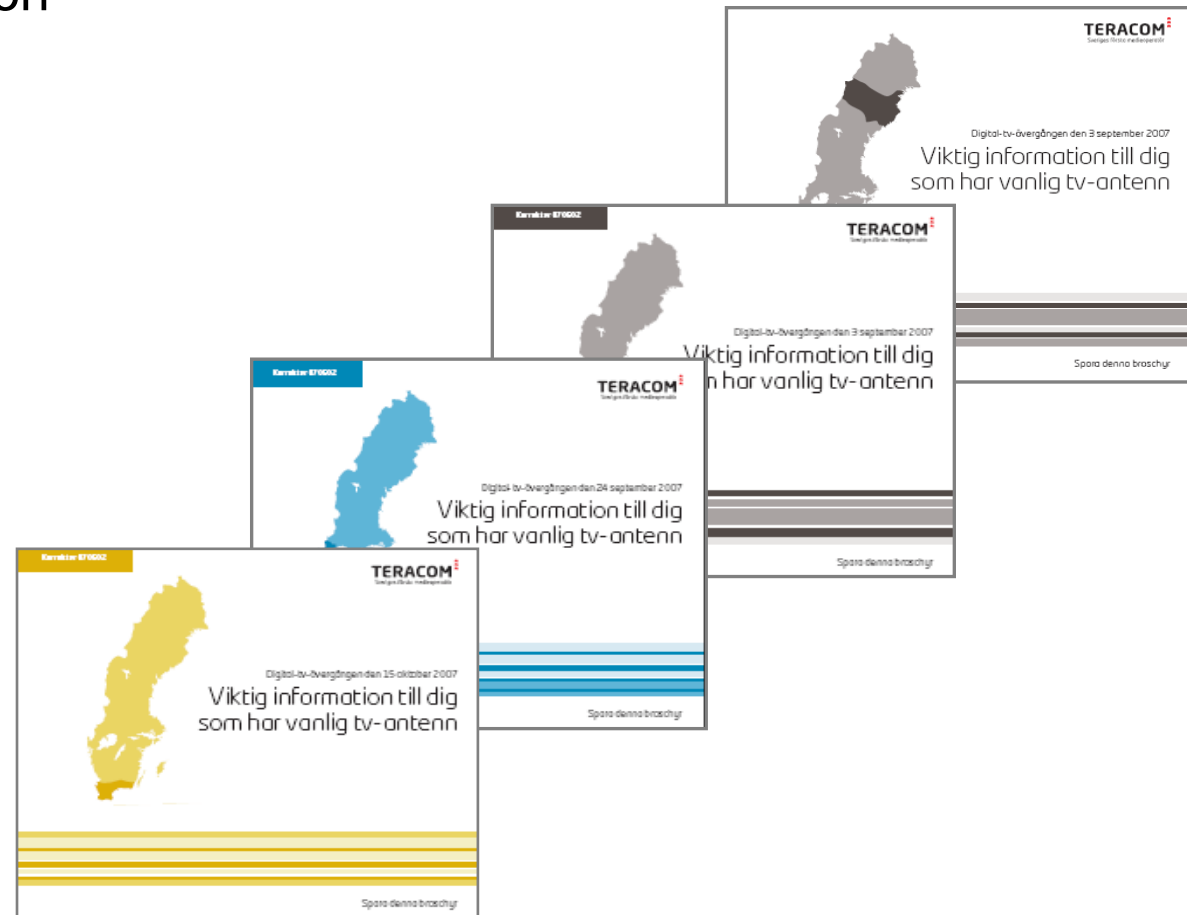
Communication activities



- Direct mail to households, landlords and retail shops
- Crawl text on major TV-channels
- Meetings with retailers and local government reps
- Media activities – chat rooms, interviews
- Transmitter sites open for media at switch-off
- Info-centre on day of switch over
- Advertising
- Website
- Call centres
- SMS/mail distribution on day of switch off

Direct mail to households

- A total of 4.2 million households



Budgets for information campaigns

- Digital TV Commission for 4 years (to the general public) 6,5 M€
- Teracom info (to professional stakeholders) 0,7 M€
- Airtime on several channels (at no cost for the DVB-T project) 15,0 M€¹

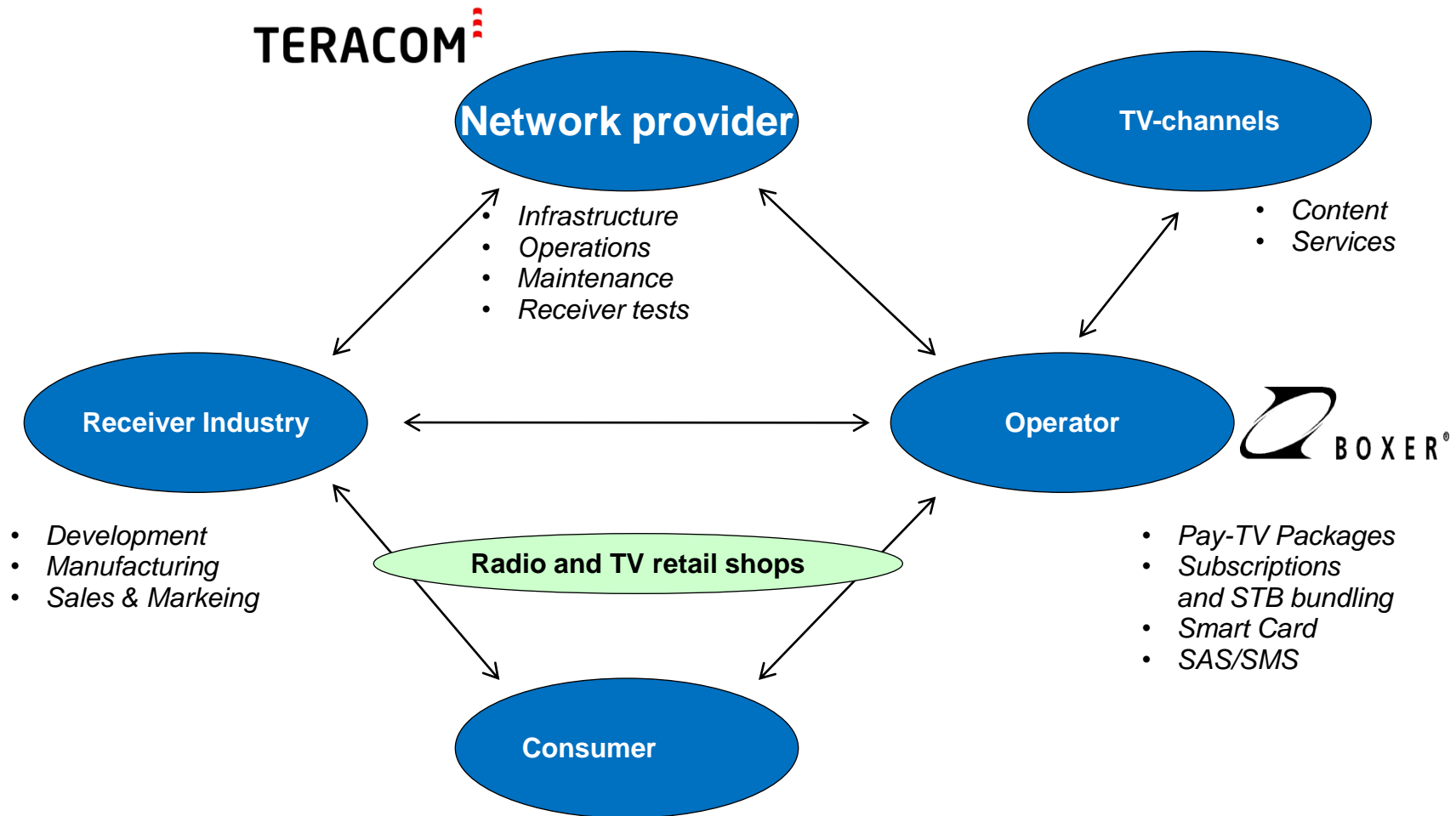


¹ Estimated value

More than 150 approved DVB-T receivers on the market



Who does what

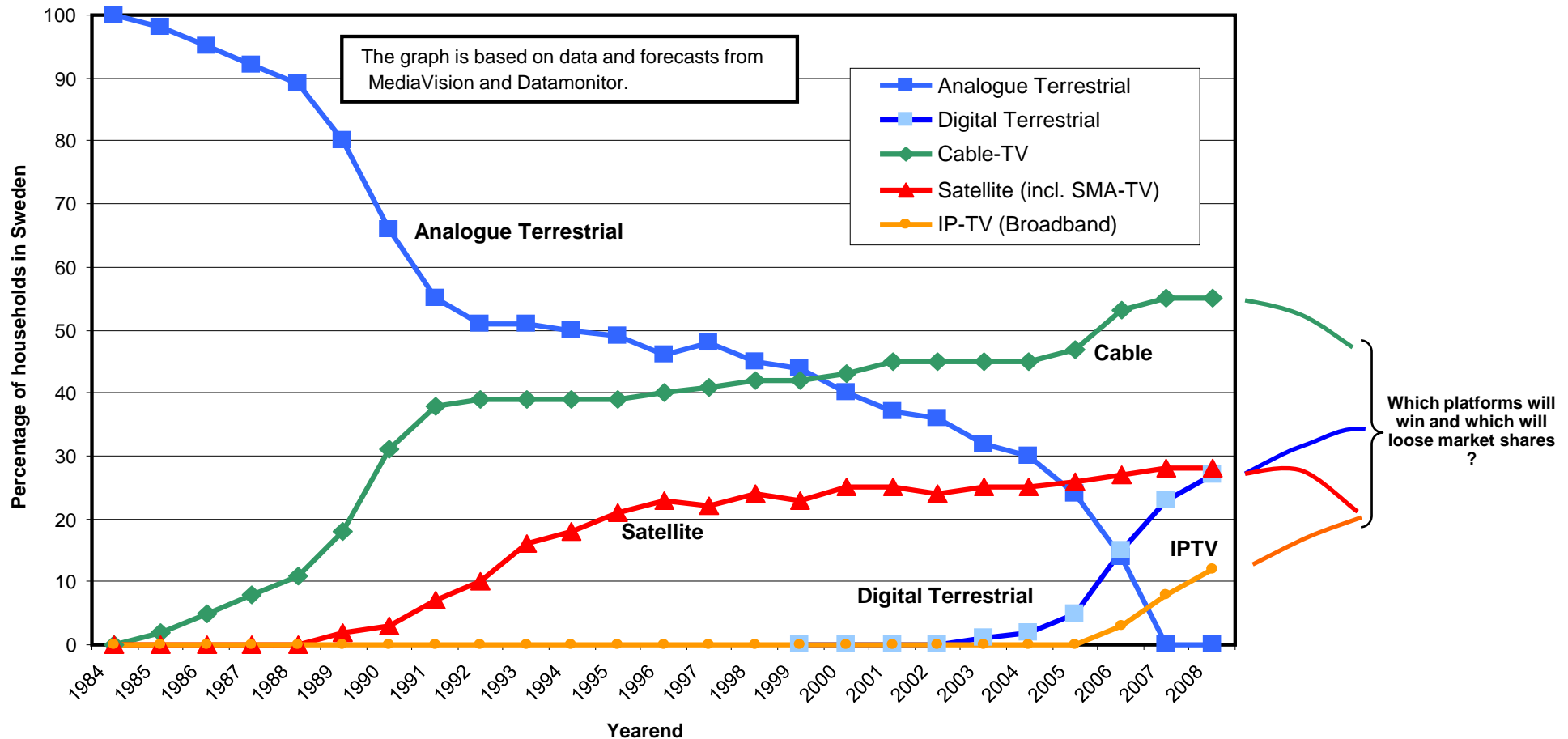


Final results

- Extremely successful switch-over
- Consumers have accepted digital TV
- Relatively small changes between platforms
- About 20 - 25% of households use the terrestrial platform for their primary TV-set
- An estimated ~40% of households use the terrestrial platform for their second or third TV-set (kitchen, bedroom, caravan, summer house, etc)



Viewers – Choice of platforms



The diagram exhibits real competition between distribution platforms and that viewers in real life do move among platforms.

The Terrestrial Digital TV Network Today




















































HD TV

The Swedish Terrestrial Network - today



- ~ 50 Standard Definition TV (SDTV) Channels and 9 High Definition TV Channels (HDTV)
- Five multiplexers continue to use DVB-T
DVB-T.MPEG2 is retained and still improving, allowing additional channels
DVB-T.MPEG4 is introduced for certain channels
- DVB-T will be retained and all subscribers will be able to receive “old” channels without new receivers
- Two multiplexers have started using DVB-T2 for HDTV
- All new set-top-boxes are and TV-sets are at least MPEG4 capable. A graceful transition from MPEG2 to MPEG4 will come naturally
- DVB-T2 receivers, both boxes and IDTV:s, are available on the market and now bundled with subscriptions for HDTV

The Swedish DTT Network, Channel plan

Multiplex 1	Multiplex 2	Multiplex 3	Multiplex 4	Multiplex 5	Multiplex 6	Multiplex 7
 SVT1  SVT2  SVTB/SVT24  The knowledge channel  statmux/dynamic	 TV4  TV4 Plus  TV11  TV4 Film  TV4 Fakta  CNN  TV6	 C+ Hits  C+ First  C+ Sport 1 / SF Kanalen  Kanal 5  TV3  TV8  Disney Ch VH-1	 Eurosport  MTV  Nickelodeon Comedy Central  Kanal 9  Discovery  Discovery TLC  TV10  Eurosport2  Cartoon Network Regional services  24.UNT.	 SPORT TV4 Sport  Silver  TURNER CLASSIC MOVIES TCM  C+ Series  Axess TV  Canal7  BBC World  Disney XD Showtime  Star! 7  Animal Planet Science Regional services  24 Corren 24 nt	 SVT1 HD  MTVN HD  TV3HD  TV4 HD  Kanal5 HD	 SVT2 HD  National Geographic HD  SPORT - FILM - SERIER C+ HD  VIASAT SPORT HD



pay-tv



timeshared services



MPEG2 based service



MPEG4 based service



DVB-T2 and MPEG4 based service

Fierce competition – several platforms



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Development Challenges

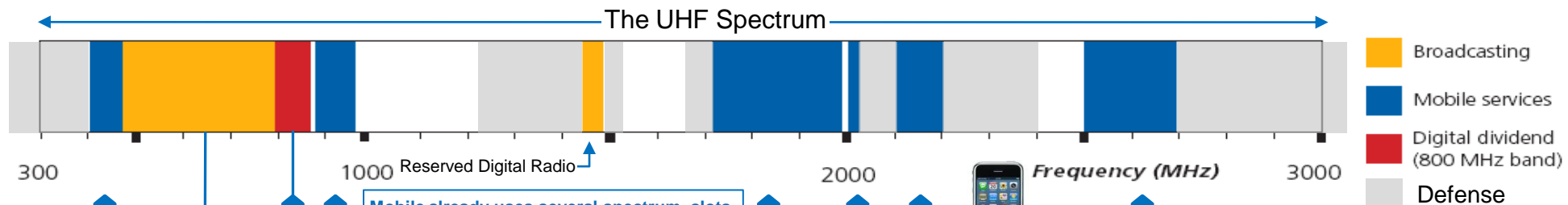
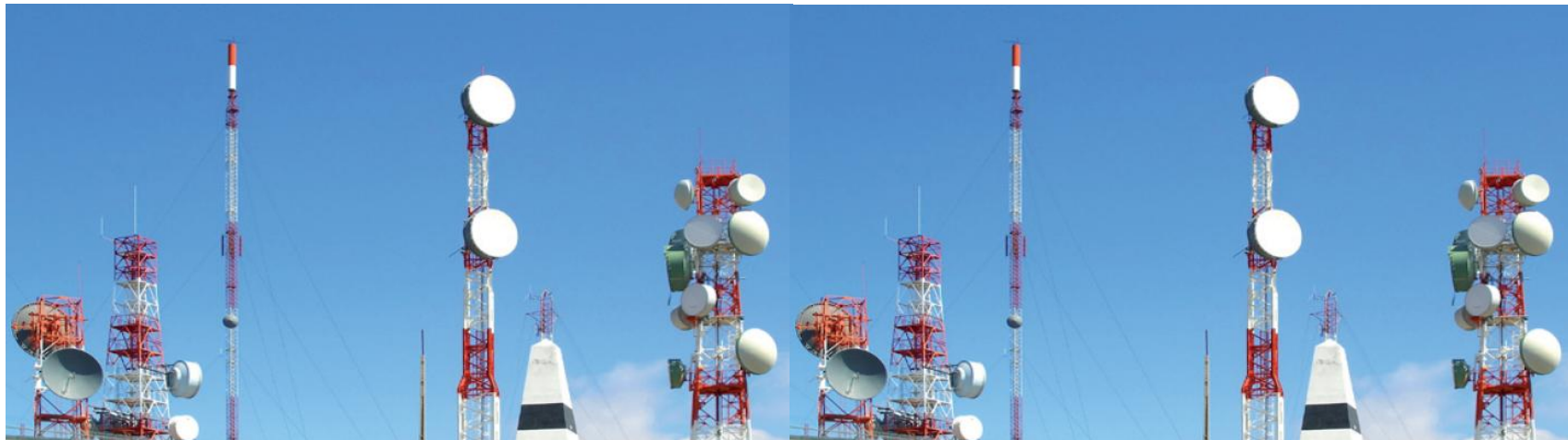


The Multi-Capable Terrestrial Network

- Universal coverage – primary TV:s, kitchen TV:s, bedroom TV:s, second homes, caravans, boats, mobiles
- MPEG2 => MPEG 4
- DVB-T => DVB-T2
- Adequate HDTV capacity
- 3D when screens and content become available
- Set-top-boxes with recording capabilities
- Hybrid solutions
- Push-TV and On-Demand Service
- New things – H265, TFS, MIMO



Spectrum use



≈60 % of households use this spectrum for their TV reception

Mobile already uses several spectrum slots

The 800 MHz band will be cleared from broadcast services in favour of Mobile Broadband by 2013-2015.

How efficiently is available mobile spectrum used ?

UHF Terrestrial Broadcasting:
One layer can be used for:

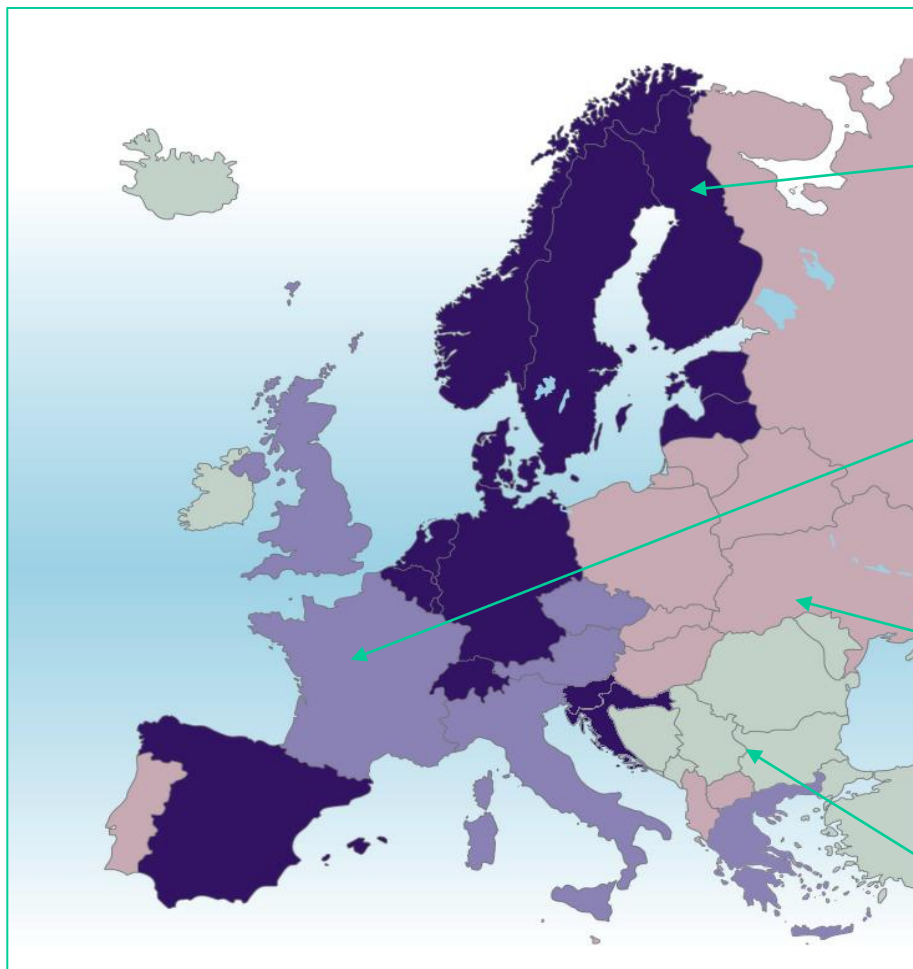
- 6-10 digital layers depending on population coverage
- 4-16 standard definition TV channels (today)
- 3-6 high definition or 3D TV channels (today)
- capacity depends on transmission and coding standard



Key messages in connection with the Commission's proposed Radio Spectrum Policy Program (RSPP)

- Terrestrial Broadcasting is efficient, drives competition and is the consumer's choice – approaching 60% of European households for primary TV reception
- Consumers and the Broadcasting Industry are now making substantial efforts and investment in clearing the 800 MHz band. No additional change of use should therefore be considered for the remaining broadcast spectrum
- Broadcasting services should be afforded appropriate protection from interference
- Financial compensation to cover the migration costs to clear the 800 MHz band should be addressed

The analogue to digital switch-over. Ready by 2013?



Analogue switch-off completed; terrestrial platform converted to DVB-T :

Andorra, Belgium (Flemish), Croatia, Denmark, Finland, Germany, Luxembourg the Netherlands, Norway, Slovenia, Sweden, Switzerland, Spain, Latvia, Estonia. Some still use 800 MHz band for DTT.

Analogue switch-off underway; both analogue and DVB-T services available:

Austria, Czech Republic, France, Greece, Italy, United Kingdom

Both analogue and DVB-T services available; analogue switch-off has not begun. In some cases, the full DVB-T platform not yet launched:

Albania, Belgium (Frenchspeaking), Hungary, Lithuania, Macedonia, Malta, Poland, Portugal, Slovakia

Only analogue services available. DVB-T services may be available on a trial/pilot basis

Plans to launch DVB-T services in 2011:

BiH, Bulgaria, Cyprus, Ireland, Romania, Serbia

Further contract and information

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 www.plustv.fi

Thank You

