



Efficient Deployment of Ultra HD “4K” TV via Satellite 2nd December 2014

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www.esoa.net



- ◇ Who is ESOA ?
- ◇ What does UltraHD “4K” TV offer ?
- ◇ What is needed to make it happen ?
- ◇ The role of satellite to drive 4KTV
- ◇ Conclusions



ESOA – European Satellite Operators Association

◇ 11 satellite operators in 8 MSs of the EU (plus 14 supporting members)



◇ Flying over 175 satellites

◇ Global coverage of communication services

◇ Covering > 99 % of the world's population

◇ The world's 4 largest satellite operators are European companies

Ultra High Definition TV (UHD TV) will offer:

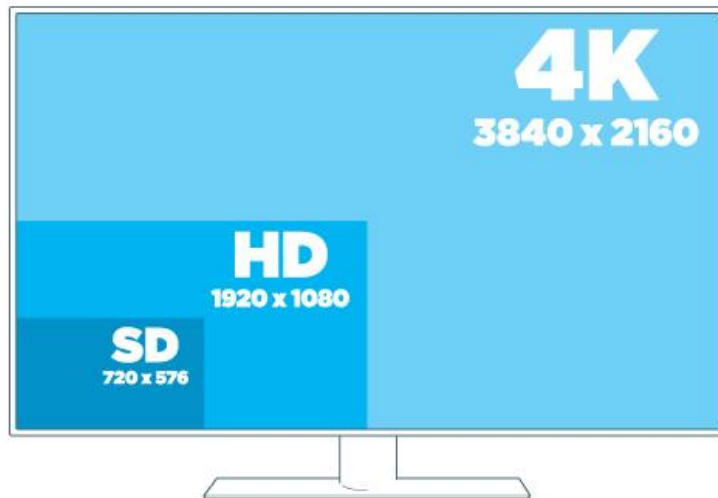
- ◇ Higher resolution
- ◇ Higher frame rate(s)
- ◇ More and deeper colours
- ◇ Higher Dynamic Range (HDR)
- ◇ Immersive video and audio
- ◇ **In summary - an unrivalled new TV viewing experience**



Industry consensus that Ultra HD is going to be the next “big thing”

UltraHD - the better viewing experience

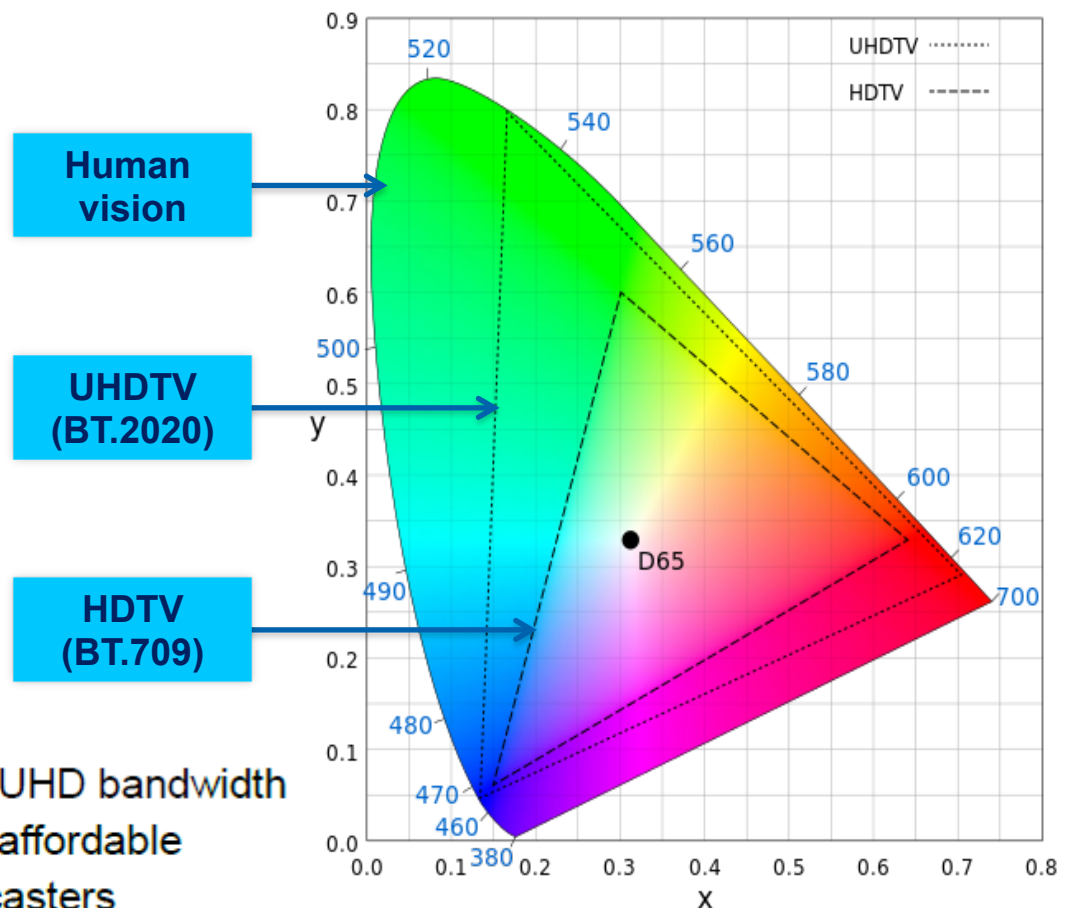
More pixels



Compression		
SD	•MPEG-2:	ca. 4 Mbit/s
	•MPEG-4:	ca. 2 Mbit/s
	•HEVC*:	ca. 1 Mbit/s
HD	•MPEG-2:	ca. 19 Mbit/s
	•MPEG-4:	ca. 10 Mbit/s
	•HEVC:	ca. 5 Mbit/s
UHD	•MPEG-2:	ca. 80 Mbit/s
	•MPEG-4:	ca. 40 Mbit/s
	•HEVC:	ca. 20 Mbit/s

HEVC will bring UHD bandwidth requirements to affordable levels for broadcasters

More colors



Pre-requisites for UltraHD

- ◇ The right content
- ◇ The right standards
- ◇ The right equipment
- ◇ The right demand
- ◇ The right distribution

└─→ *The role of satellite
in driving 4KTV*



The right content

- ◇ *“DirecTV first multi-channel TV provider to deliver 4K to the home”*
 - ◇ *“The Weather Channel’s (TWC) plans “to fully convert to 4K by 2018”.*
 - ◇ *“Sky delivers first 4K TV broadcast in the UK”*
 - ◇ *“Sky Germany launches UHD demo for IFA 2014”*
 - ◇ *“Over-the-air 4K broadcast of (Roland Garos) French Open”*
 - ◇ *“Rai screens First Ultra HD Documentary (Rossini) and “La Boheme””*
 - ◇ *“BBC showcases Wimbledon and Wildlife Documentary in 4K”*
 - ◇ *“Red bull gives wings to 4K” - “Tricolor TV launches 4K channel”*
 - ◇ *Netflix launches 4KTV streaming offer in Europe”*
-
- Major feature films & sports events, e.g. FIFA WC 2104 already captured in 4K
 - 150 feature films and TV shows were available as UHD master copy and almost 800 in UHD source format by 2013
 - UHD expected to serve a growing segment of TV homes (with > 55’ screens)

The right content

Over **800 Ultra HD channels** within the next 10 years predicted with a **CAGR of almost 50%***

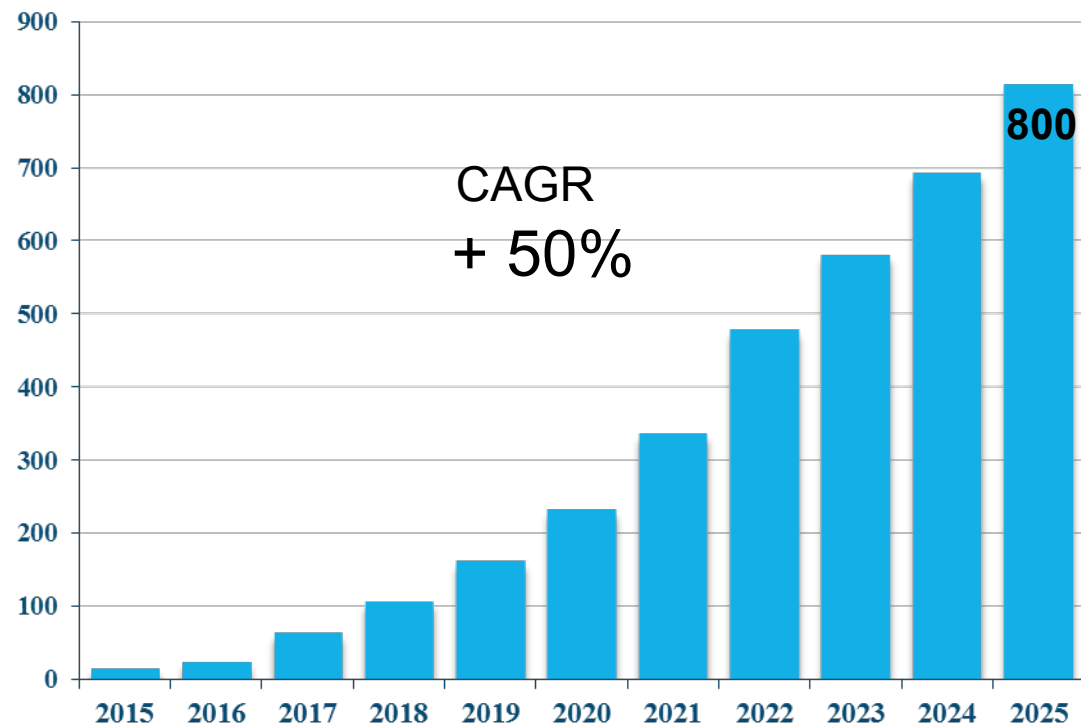
Growth mainly driven by North America (40%), Asia (17%) and **Western Europe (14%)**

HTS will support roll-out in selected regions, notably in North America and Western Europe

Plus UHD user generated content and UHD-VOD

ULTRA HD
Ultra High Definition

► Number of UltraHD Channels*



Predicted Ultra HD Channel Growth

*Northern Sky Research, 2014

What is needed to make it happen?

The right content

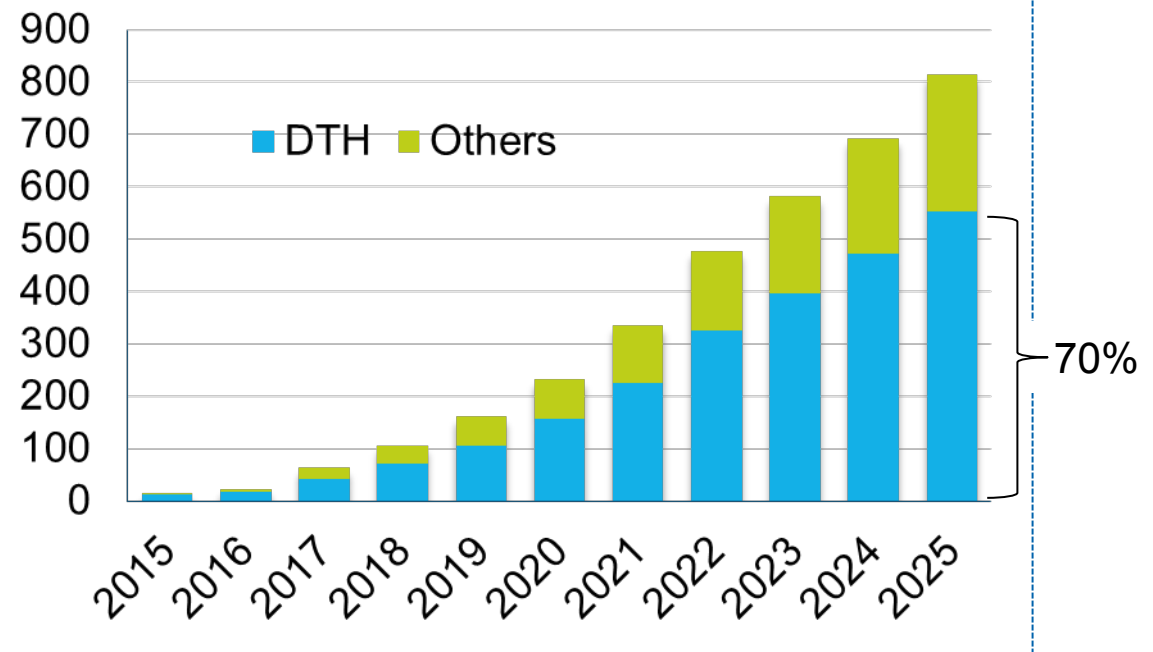
With **almost 70% of channels** distributed via DTH platforms, **satellite will drive Ultra HD roll-out***

For **2015-16**, already **12 UltraHD channels** are expected

About **60% of channels** broadcast via satellite will be from **North America, Europe and Asia**

ULTRAHD
Ultra High Definition

Number of UltraHD Channels by platform*



Satellite to Drive Ultra HD Channel Growth

*Northern Sky Research, 2014

The right standards – UHD Phases

Technology development of Ultra HD is ongoing

UHD-1 – 4K Phase 1

- ◇ more pixels
- ◇ 3840 x 2160 pixels
- ◇ HEVC Main 10
- ◇ at 50/60 fps
- ◇ 10-bit color depth
- ◇ DVB standardized

now

UHD-1 - 4K Phase 2

- ◇ better pixels
- ◇ Higher Dynamic Range (HDR)
- ◇ at 100/120 fps
- ◇ more colors
- ◇ better audio

in EU by 2016-2017

UHD-2 – 8k

- ◇ Super Hi-Vision
- ◇ 7680 x 4320 pixels
- ◇ e.g. by NHK

in EU by 2020

Ultra HD is encoded in HEVC – High Efficiency Video Coding



- Current data rate via satellite is about 25 Mbit/s
- With better encoders the bitrate can go down to 20 Mbit/s in 2015-2016
- With HEVC bandwidth cost become affordable for broadcasters

The right standards - DIGITALEUROPE logo

Logo:



Minimum conditions:

Display:

Resolution:	capable of rendering 3840x2160 through at least one path
Aspect Ratio:	16:9
Colorimetry:	BT.709

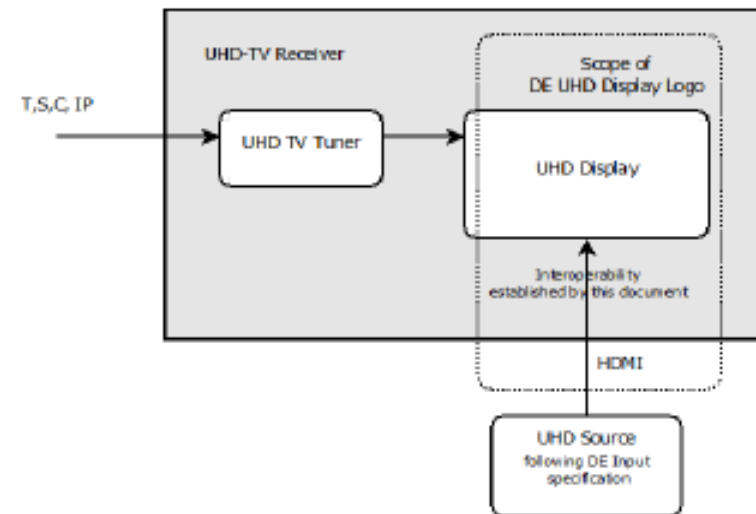
Interfaces:

HDMI 2.0 with HDCP 2.2 accepts 50/60P (4:2:0) and 24P/25P/30P (4:2:2), 8-bit depth

Audio:

2.0 Stereo PCM

Scope:



more details: www.digitaleurope.org

The right equipment

Production

- ◇ UltraHD cameras and encoders available; although still at higher price levels
- ◇ **Over 2000 UHD cameras units** shipped by April 2014
- ◇ Companies like Ateame, dbw, Ericsson, Grass Valley, Hitachi, Panasonic IDC, SMARDTV, Sony etc. are actively supporting the UltraHD

ULTRAHD
Ultra High Definition



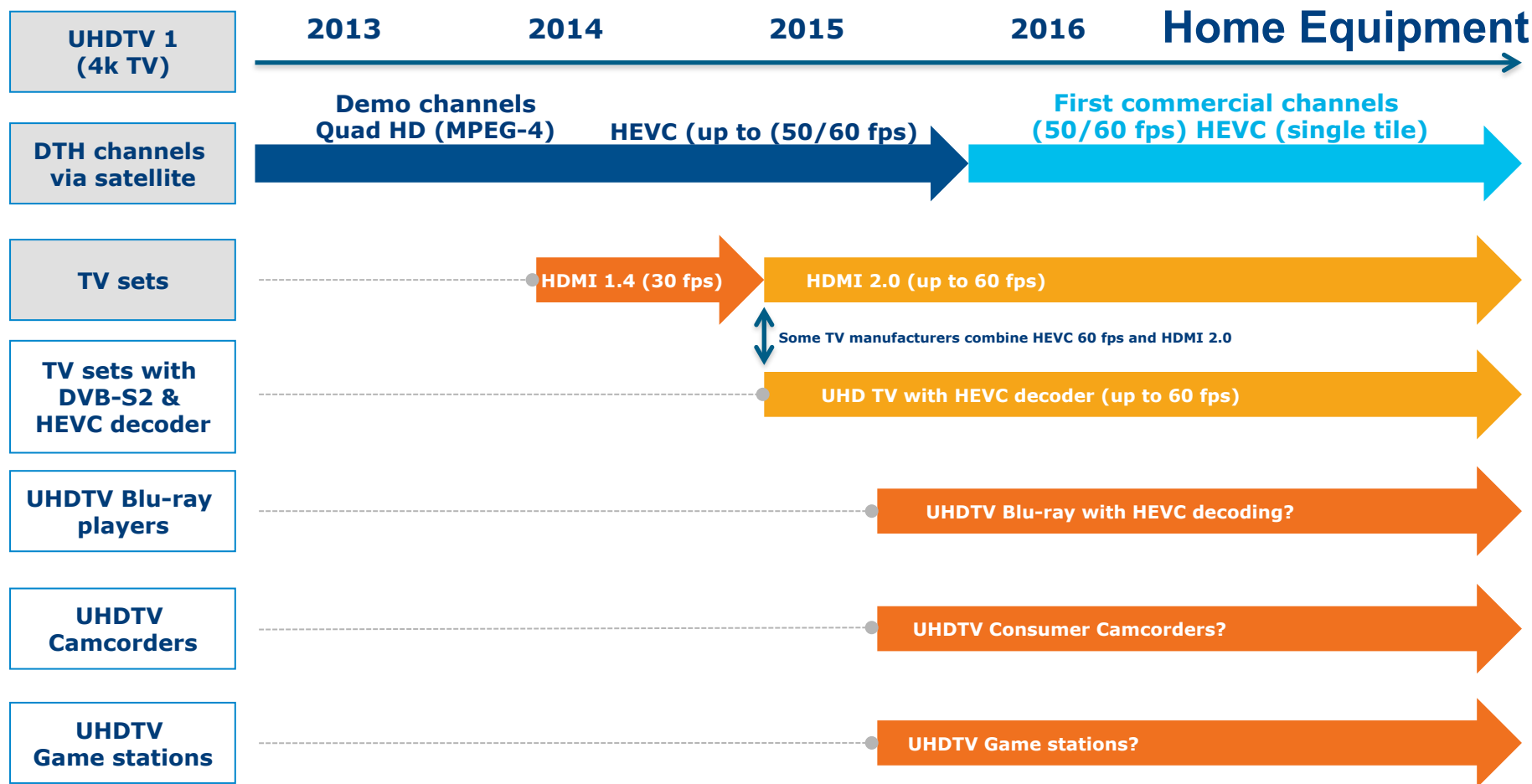
Home Equipment

- ◇ UltraHD–HEVC chipset available from several manufacturers
- ◇ **Over 12 million UHDTV sets already shipped** globally by
 - Grundig, JVC, LG, Panasonic, Samsung, Sharp, Sony etc.
 - Forecasts revised upwards, x 2 this year
- ◇ **First 4KTV STBs are coming to the market** from manufacturers
 - such as Arris, Cisco, Humax, Pace, Technicolor etc.



The right equipment – at home

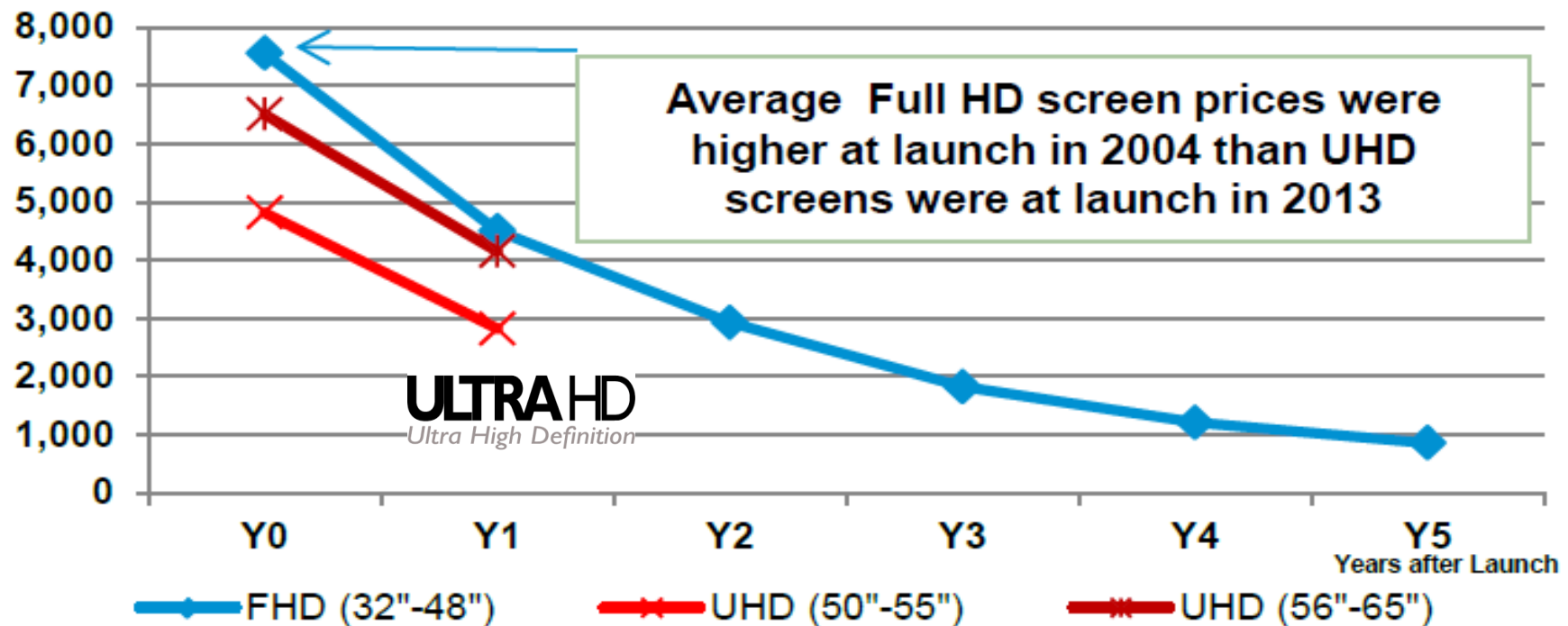
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The right equipment – at home – *price trends*

UHD screens saw a 36 – 41% price decrease between April 2013 and April 2014

FHD & UHD Price Comparison (EUR)



The price comparison shows that UHD screens exhibit a **similar price entry point and price decrease** as Full HD screens did when first introduced.

The right demand

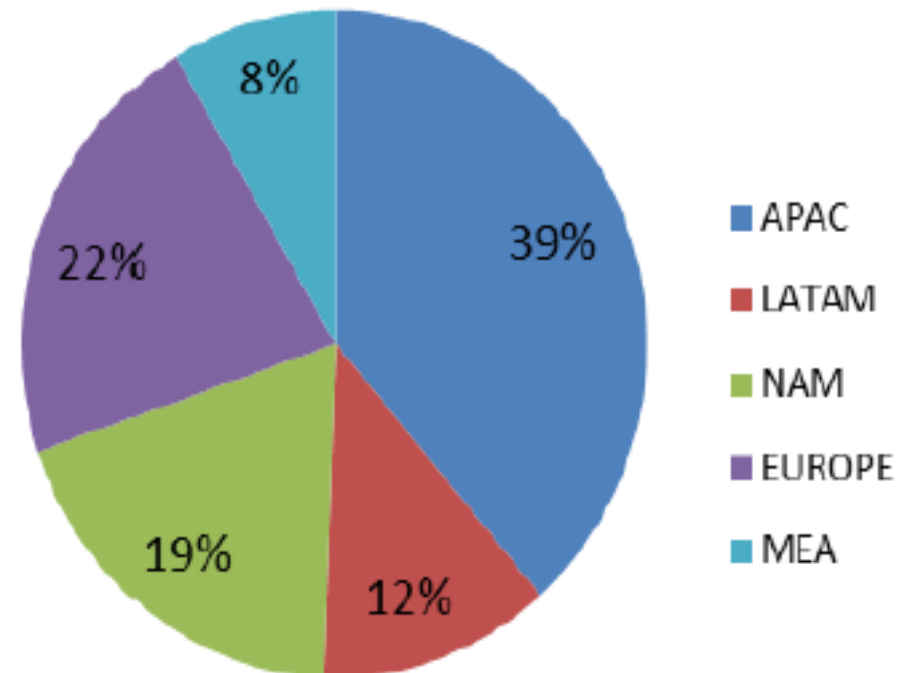
2/3rd of consumers would like to have an UHD screen once they have seen it

Every 4th consumer would be ready to pay more for receiving High or Ultra High quality (Ericsson Consumer Lab 2013)

55% of European consumers would buy U-HDTV (Strategy Analytics Consumer Metrix 2013)

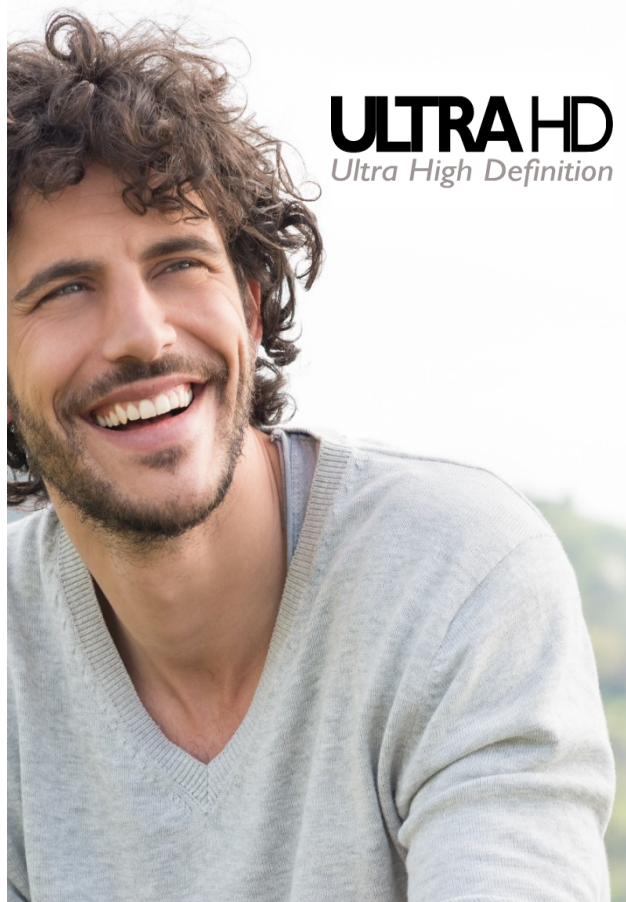
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UHD Screen Sales per Region in 2020



What is needed to make it happen?

The right demand



“An amazing view of a scene that I felt I could touch, almost smell, feel. Really realistic. Made me want one of those TVs.”

Female, NPTV

“It was a top quality picture, unbelievable, new technology.”

Male, PTV

“This must be 4K – already proposed by Sony and Samsung but no broadcasting available for the moment.”

Germany, PTV

“They look like 3D pictures.”

Italy, male, NPTV

“You could see every detail, each drop, even ashes falling off the building, it’s all shown, faces of the firemen. Slow motion is also a plus, it features all the details even better.”

Poland, 41-65yo - PTV

“... I’d buy a 4K TV, but 4K broadcasts will only be available in 3 years!”

Poland, 41-65yo - PTV



The right demand

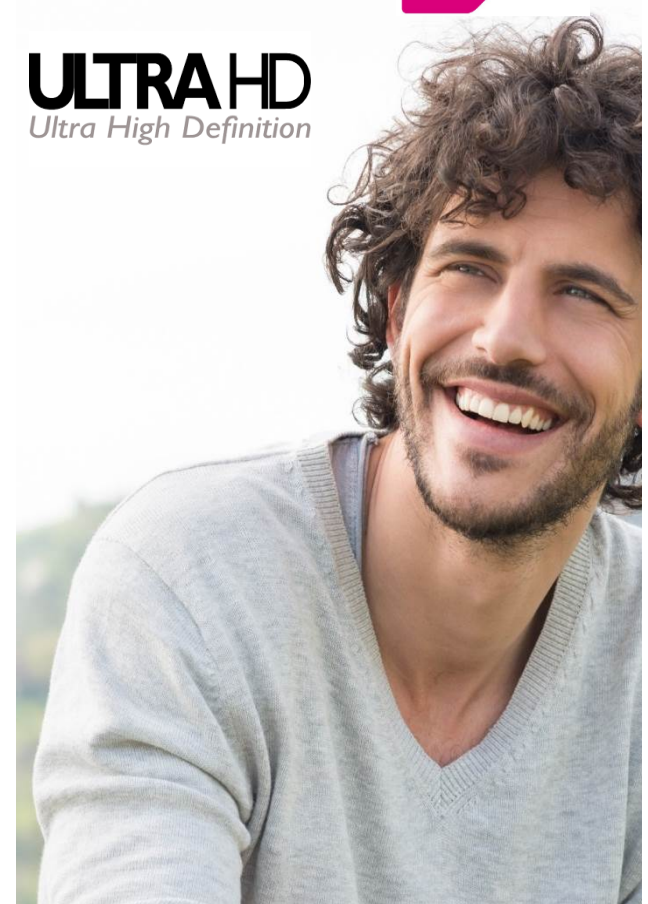
- ◇ unprompted consumer awareness still low
- ◇ prompted awareness in WE at 64 %*
- ◇ Consumers recognize the superior image quality versus SD and HD
- ◇ Consumers are seduced by UHD but expect UHDTV to be a costly, premium product
- ◇ Genre expectations include movies, series, documentaries and sport
- ◇ Significant difference in markets maturity:
 - UK, Germany and Poland are ready to invest
 - France and Italy need more communication



Source: Eutelsat 4kTV Focus Groups – Q4-2014



ULTRA HD
Ultra High Definition



* Source: Eutelsat TV observatory WE 2014

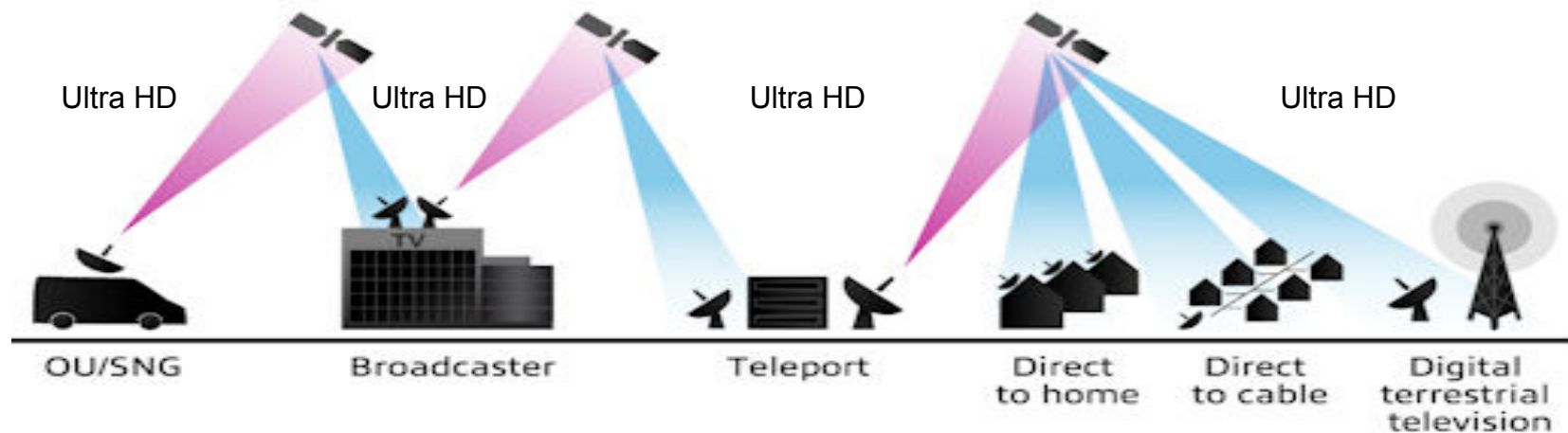
The right distribution – Status of UltraHD per infrastructure

- ◇ First UltraHD distribution - started via fiber and via satellite (2013-2014)
- ◇ Commercialization on non-linear UltraHD - launched by Netflix (2014)
- ◇ Sky, DirecTV, Tricolor etc. preparing for UltraHD services via satellite (2015)
- ◇ Almost all leading satellite operators
 - have launched first UltraHD test cases
 - and UltraHD demo channels
 - mainly in Europe, US and Asia (2013-2014)
- ◇ Not all terrestrial infrastructure are ready to launch linear UltraHD (congestion!)
- ◇ Key players of terrestrial infrastructure Cable/IP (Vodafone, ANGA, PIKE etc) and DTT (TDF) have teamed up with satellite operators to show complementary UltraHD distribution
- ◇ Satellite will be a key driver for UltraHD distribution in cities and rural areas



The right distribution – Status of UltraHD per infrastructure

- ◇ Satellite operators play a crucial role for UltraHD delivery globally



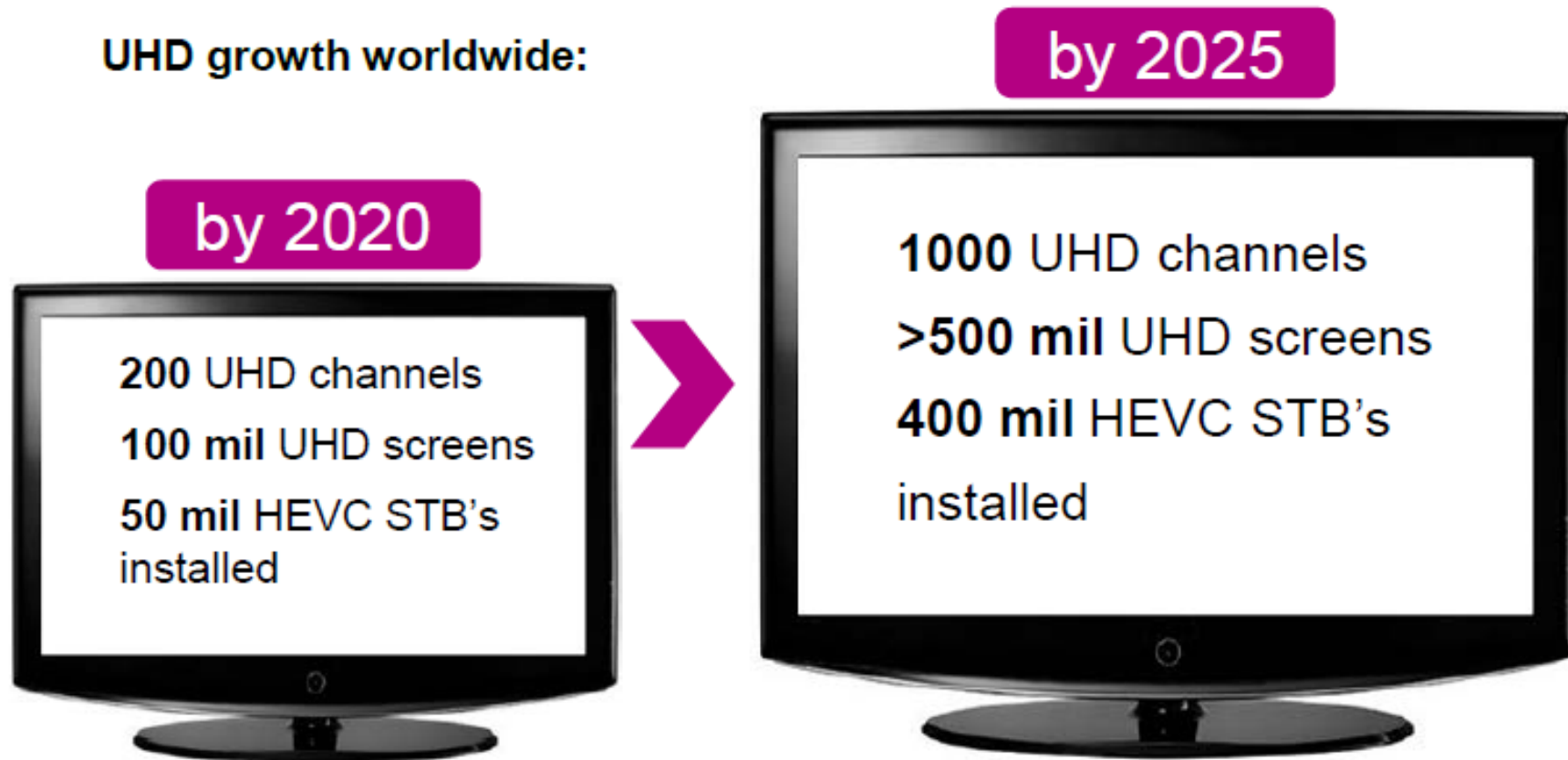
- ◇ **UltraHD via satellite enables**

- ◇ global distribution and local delivery of UltraHD services
- ◇ Immediate and cost efficient role-out of UltraHD Broadcasting and Push-VOD services
- ◇ ubiquitous distribution of UltraHD - anywhere within the footprint - in urban and rural areas
- ◇ direct (DTH) and indirect delivery (DTX – feeding and complementing of terrestrial networks)
- ◇ de-congestion of terrestrial networks from bandwidth heavy applications (UltraHD etc.)

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Ultra High Definition

ULTRAHD
Ultra High Definition

UHD growth worldwide:



UHD will become mass market in the next decade – by 2025 half of all screens and STB's sold will be UHD

- ◇ UltraHD availability already much higher than what immediately comes to mind
- ◇ UltraHD devices are already in the living environment and actively used
- ◇ Chinese manufacturers offer UltraHD TV sets for less than US\$1,000
- ◇ Film studios already produce massively content
- ◇ UltraHD is in a much better position moving forward compared to the initial HD development life-cycle
- ◇ Satellite is UHD *ready* and does already deliver UltraHD direct-to-home and to other infrastructure (feeding and de-congestion)



THANK YOU

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