Trends in new broadcasting technologies, services and applications
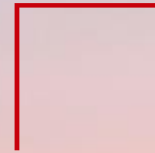
Gang Wu
2019/3

Screen Everywhere

Public Screen

Home Screen

Vehicular Screen

Video

Personal Screen

Industrial Screen

4K Becomes a Main Driver for New Video Services
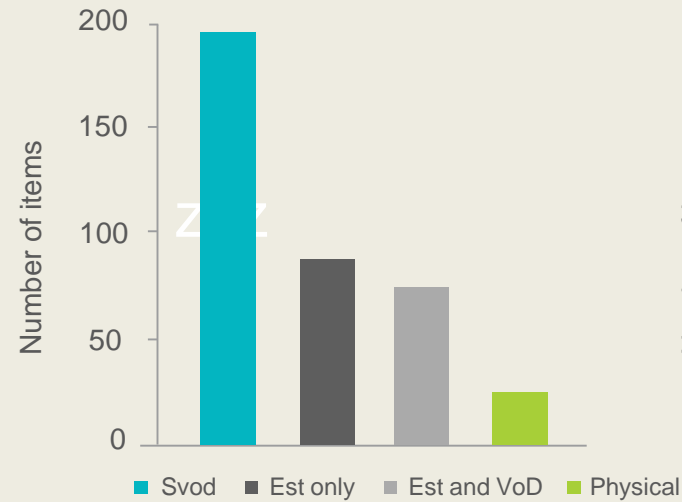
NETFLIX
>750 hours
>1,000 programs
$13.99 / month
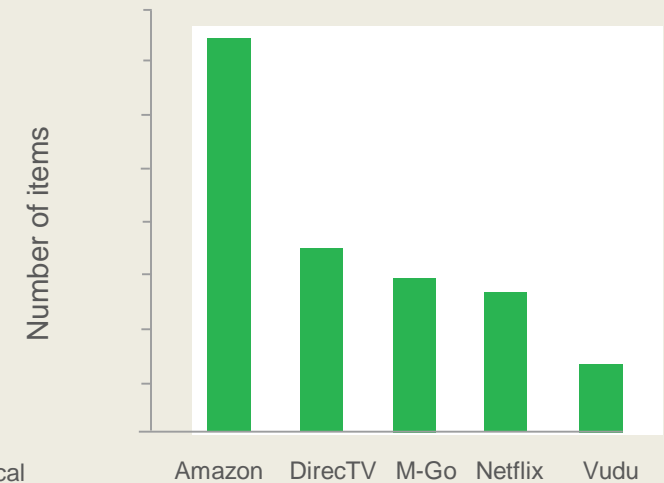
YouTube
>700 hours
>2,000 programs
$11.99 / month

iQIYI
>800 hours
>1,000 programs
¥178 ($26) / year

Delivery method

Number of items

- Svod
- Est only
- Est and VoD
- Physical

Service

Number of items
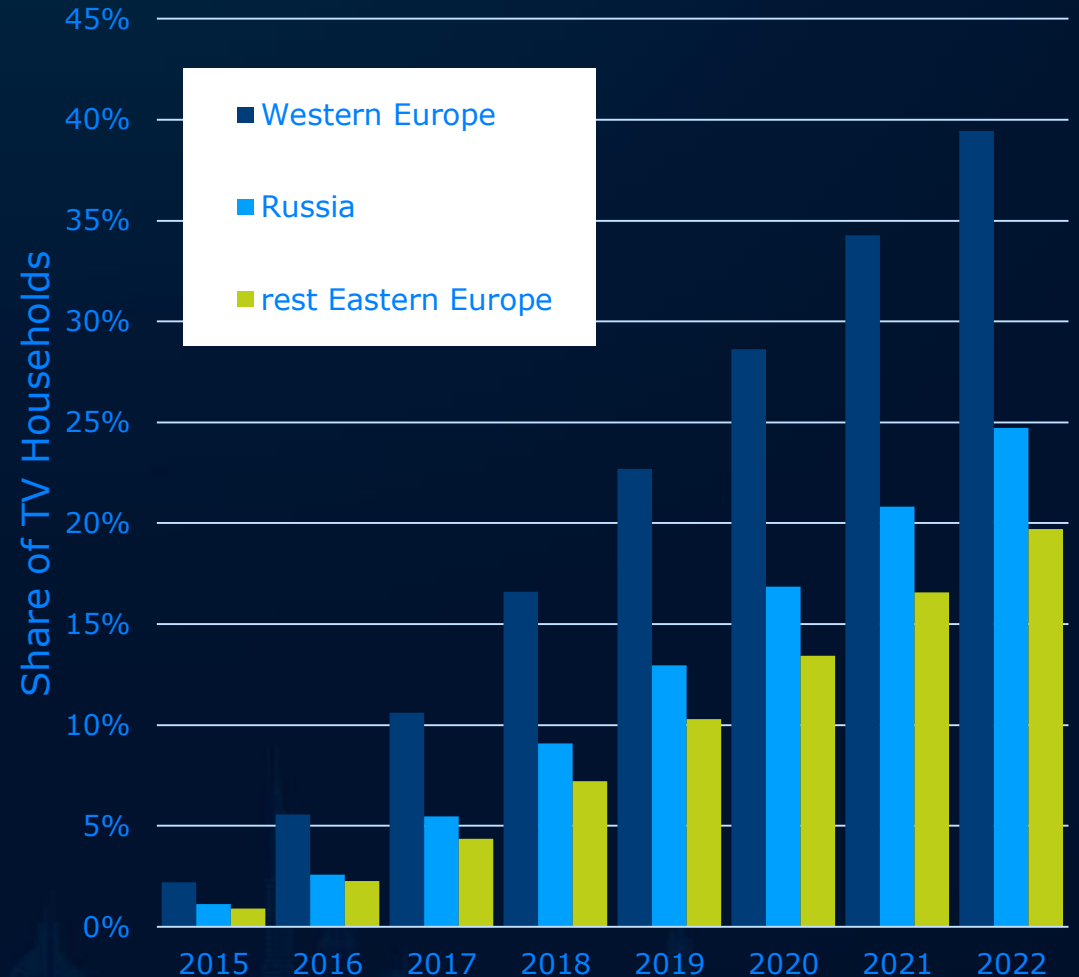
Amazon   DirecTV   M-Go   Netflix   Vudu

Data Source: Digital TV research; IHS Markit 4k TV and UHD the whole picture

Consumer Side: Household equipemnt

UHD HOUSEHOLD PENETRATION

- **Screen size growth largely driving UHD penetration**
- **We expect steady growth:**
  - → **all screen sizes over 55" now ship with 4K resolution**
  - → **Screen size purchased growing by 1" per year (long-term trend)**

- **Lower prices will underpin size growth, with severe price erosion expected as a result of overcapacity in LCD display manufacturing in China**

UHD TV household penetration forecast

Share of TV Households

Legend:
- Western Europe
- Russia
- rest Eastern Europe

Y-axis: 0%, 5%, 10%, 15%, 20%, 25%, 30%, 35%, 40%, 45%

X-axis: 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022

Europe UHD Channels/Services as of August 2018

•**29** or **35**
channels feeds

41
services

0
DTT channels
(with local or
temporary channels)

Ultra HD Associations or Initiatives in Europe

▰ Germany: **Deutsche TV Plattform (DTVP)***

▰ UK: **DTG UK UHD Forum***

▰ Italy: **Ultra HD Forum Italia***

▰ France: **Forum AudioVisuel Numérique** (FAVN)*

▰ Russia: No association, but 4k & HDR conference (Moscow – Oct. – Telesputnik)

▰ Spain: No association, but 4K HDR Summit in November (Sevilla, Malaga - Organised by Medina Media)

▰ 4K Sessions at MIPTV (April) and MIPCOM (Oct.) in Cannes (France), where Production meets Distribution

▰ Non exhaustive list …

To be noted:

▰ 8 Plugfests (interoperability) organised so far by DTG and DTVP

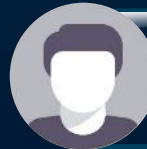▰ * = Associate members of the Ultra HD Forum

2018 DT is the Only video Operator with Growing in Germany

Fixed
Entertain TV

Fixed TV revenue : **1003M€** , **9%** increase

IPTV User : 3400K (incl 4K:900k) , 7% increase

Bundle : 18% , 4Pct increase , Churn 6-7%

Mobile
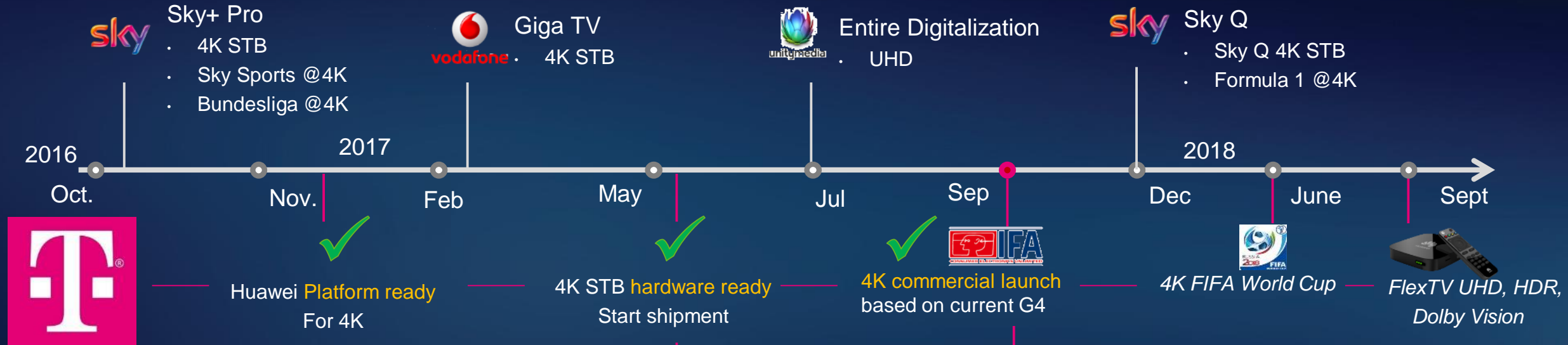StreamOn

Mobile revenue : **5.8B€** , **1.6%** increase

StreamOn User : 1600K , DOU 7GB

Average **DOU 2GB** , **55%** increase

The Milestone of DT UHD-4K Channel

Sky+ Pro
- 4K STB
- Sky Sports @4K
- Bundesliga @4K

Giga TV
4K STB

Entire Digitalization
UHD

Sky Q
- Sky Q 4K STB
- Formula 1 @4K

2016

Oct.　　　Nov.　　　Feb.　　　May　　　Jul　　　Sep　　　Dec　　　June　　　Sept

2017

2018

✓ Huawei Platform ready For 4K

✓ 4K STB hardware ready Start shipment

✓ 4K commercial launch based on current G4

4K FIFA World Cup

FlexTV UHD, HDR, Dolby Vision
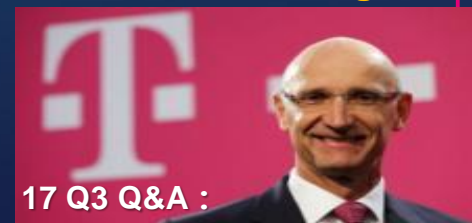
Service enabling

4K Box Promoting:

MR 400 STB: 300 → 49.99 €

MR 401/201 STB: 4.95 €|rent

(350 € for purchasing)

Broadband enabling

17 Q3 Q&A :

Bandwidth Speedup :

7 Million Vectoring

250 Mbps from next summer

4K Bandwidth resolved before 2018 World Cup.

High Speed Package promotion :

Speed XL、Speed XXL、Magenta home Giga available for high bandwidth.

The Establishment of China UHD Video Alliance

China First Ultra High Definition Industry Development and Alliance Inaugural Meeting
March 2018, Guangzhou

CUVA was established on 29th March in Guangzhou. It aims to formulate an UHD action plan, and promotes the development of UHD video industry in China. More than 40 enterprises from the industry chain had joined in CUVA, including content collection and production, network transmission, terminal manufacturing, and application service providers. Since its birth, CUVA has received great attention at the national level.

CUVA Positioning and Overall Goal

Binder for innovative resources

4K goes first taking into account 8K

Main force of ecological construction

4 trillion market

Propeller for industry applications

100 demonstrations

Practitioner of Industry self-discipline

Group standards and certification

Cloud VR is the future trend of VR

- Cloud VR is an online Streaming VR content distribution method that distributes arbitrary VR. Users can directly experience VR services without downloading and installing, and do not need to purchase expensive terminal devices, which will become the future VR service distribution.
- The cloud VR solution requires guaranteed high-speed network bandwidth and edge cloud rendering platform, which fit telecom operators capabilities.

Local VR

1, with HDMI / USB cable
2, Expensive, more than 20,000 RMB
3, the content is discrete, the copyright is difficult to protect
4, independent SDK between helmet manufacturers, can not communicate, the technical threshold is high

Cloud VR

1, Standalone terminal, no cables, more comfortable
2, cloud rendering, no PC, cheaper
3, content on the cloud, cloud aggregation, richer contents
4, unified standards, open ecology, simpler

Home network

5G

Bearer network

storage | rendering
Virtualization | connection

① **Huge user base**

② **Ultra-wide, low-latency high-quality network**

③ **Cloud platform**

5G+VR is a major application scenario of 5G @MWC19

Ooredoo showcased the first 5G "fly" and provided VR simulated flight experience (Huawei's mirror).

HTC released the new-generation VR appliance VIVE FOCUS PLUS.

The STC VR capsule has been chased and pulled up long dragons.

The KT displays the 5G+360 video.

Turkcell Cloud VR Game Experience Cloud Set

5G+AI create infinite possibilities for the VR/AR industry

Experience and ecosystem is the main challenge

- Expensive terminals are difficult for users to bear.
- Video quality, delay, and comfort

The VR/AR ecosystem is active. New products, such as Microsoft and HTC, are released continuously. The 2C business model of carriers is still unclear.

The VR/AR industry approaches the inflection point and begins to recover.
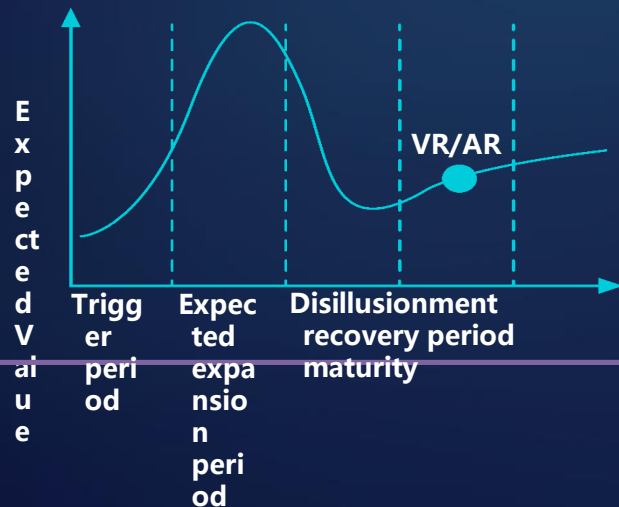
AR market scale $114 Bn

VR market scale $65 Bn