ITU and Study Group 9 work

Connecting the world, together.

Stefano POLIDORI
stefano.polidori@itu.int

ITU - Who we are - Who are our Members

Unique in the standards ecosystem – only body including governments and private sector

Unique in the United Nations system – only body responsible for ICT

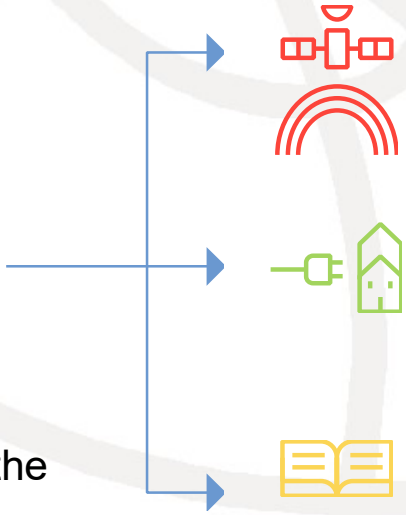
193
MEMBER STATES

700+
PRIVATE-SECTOR ENTITIES

150
+
ACADEMIA

ITU - What we do

‘Committed to Connecting the World’, together



Allocation of radiofrequency spectrum and satellite orbits

Bridging the digital divide

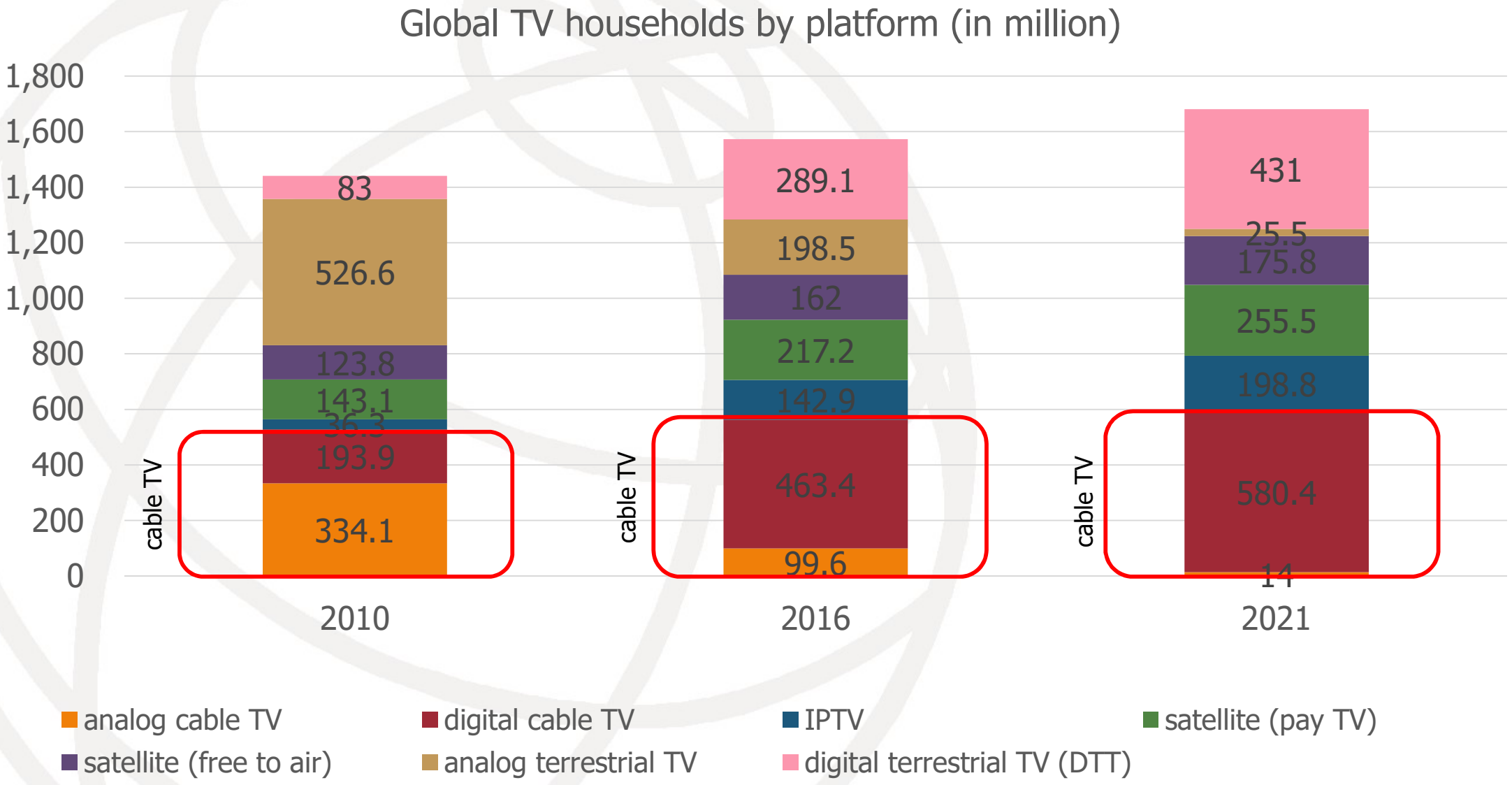
Establishing international standards

STUDY GROUP 9 DEALS WITH BROADBAND AND CABLE TV

LET'S SEE THE FORECAST FOR THE CABLE TV MARKET

TV households in the world - forecast

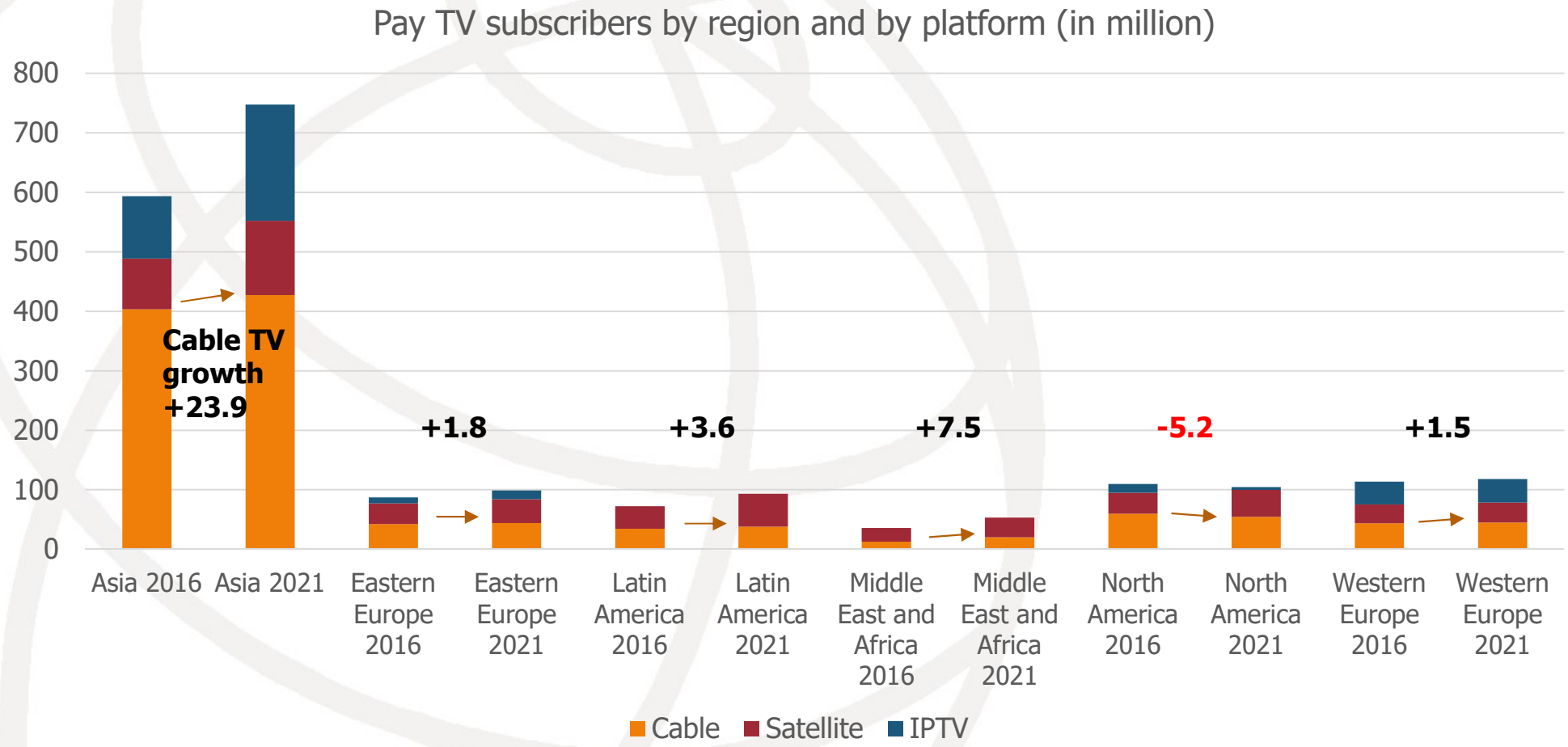
Cable television is still growing and dominant as 35% share in 2021 (forecast).
Digital terrestrial TV (DTT) is rapidly growing toward 2021 mainly in developing country.



Source: Digital TV Research

Pay TV subscribers by region - forecast

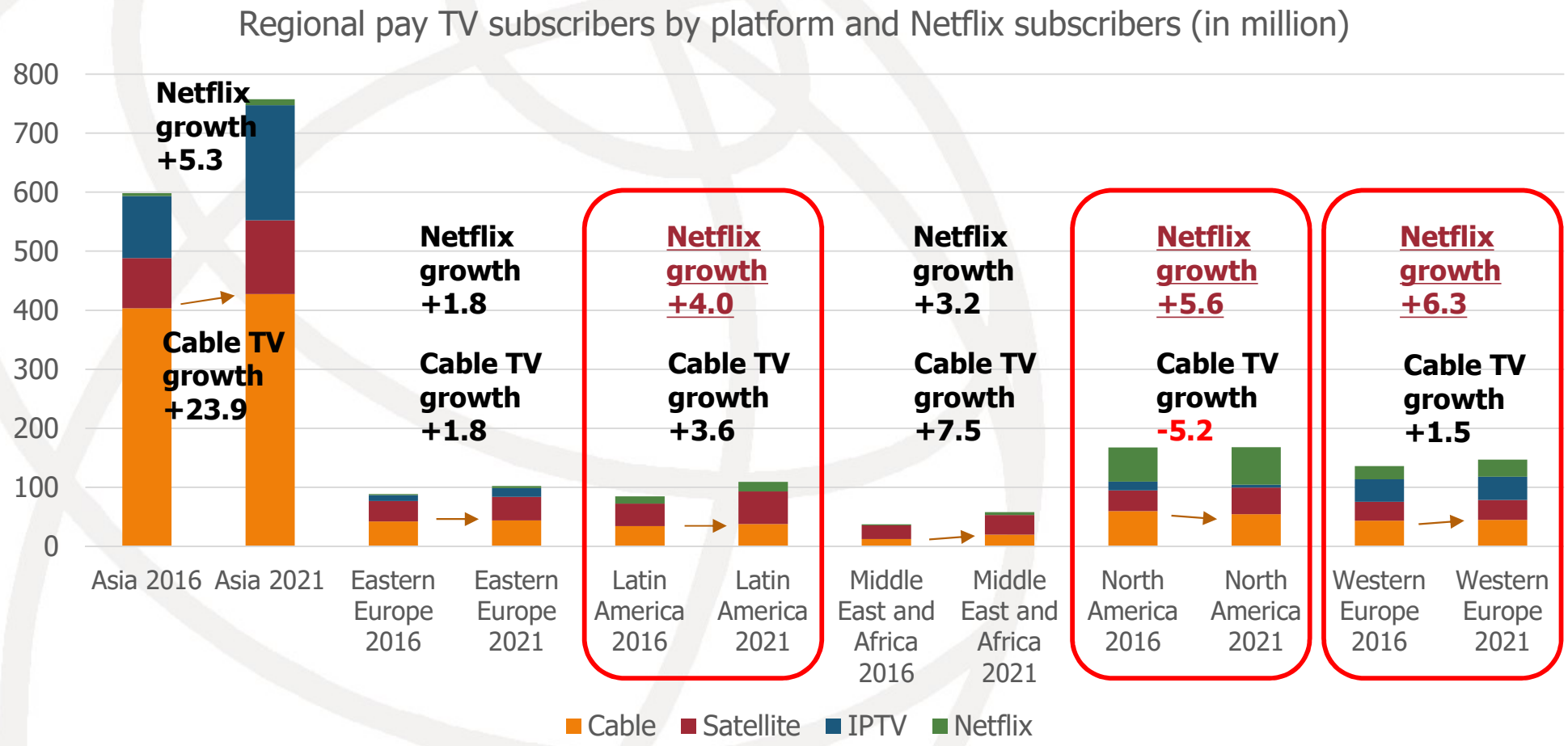
Cable television is still growing in all the regions except for North America. Asia and Middle East and Africa are leading the growth.



Source: SNL Kagan

Impact by OTT

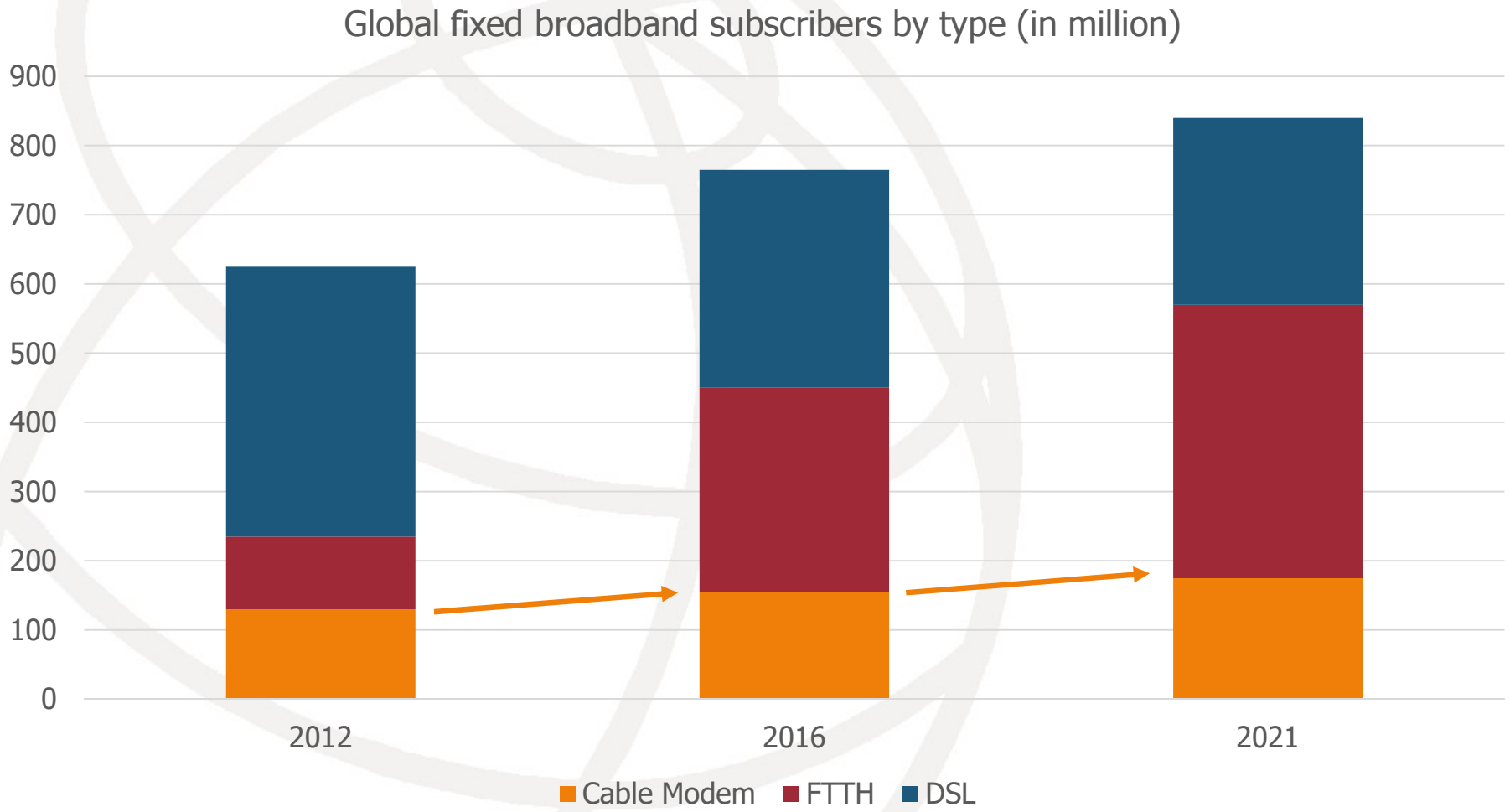
OTT like Netflix is a threat to cable TV operators in general, particularly in Americas and West Europe. Netflix growth (26 M for 5 yrs) is smaller than cable TV growth (33 M for 5 yrs). So cable TV business is very alive and cable TV will have long life and will create business opportunites.



Source: SNL Kagan and Digital TV Research

Broadband access comparison & forecast

Cable television broadband access is still growing.
Cable modem can provide gigabit per second broadband Internet by DOCSIS 3.0, DOCSIS 3.1 and DOCSIS 3.1 full duplex.



Source: Broadbandtrends

Conclusion of cable TV market analysis

1	**Global cable television market is still growing as television delivery networks.**
2	**Cable television is also very important network infrastructure for broadband Internet access. OTT needs such high-speed networks to efficiently provide services to customers.**

Cable TV and related broadband services are still relevant now and in the future so it is important to progress their standardization

STUDY GROUP 9 STRUCTURE AND MISSION

SG9 Management Team

Role	Name
Chairman:	Mr Satoshi MIYAJI (KDDI, Japan)
Vice-chairman:	Mr Zhifan SHENG (ABS, China)
Vice-chairman:	Mr TaeKyoon KIM (ETRI, Korea Rep. of)
Vice-chairman:	Mr Blaise Corsaire MAMADOU (Central African Rep.)

Role	Name
Advisor	Mr Stefano POLIDORI (SGD, TSB)
Administrative Assistant	Ms Rosa ANGELES-LEON DE VIVERO (SGD, TSB)

Current structure of SG9 (1/2)

ITU-T SG9

WP1/9 Video Transport

Q3/9 has been merged to Q1/9.

- **Q1/9** Television and sound transmission
- **Q2/9** Conditional access and content protection
- **Q3/9** Digital programme switching and insertion
- **Q4/9** Guidelines for implementations and deployment

WP2/9 Terminals and Applications

- **Q5/9** APIs for advanced content distribution services
- **Q6/9** Set-Top Box and terminals
- **Q7/9** Cable television delivery of IP packet-based data (cable modems)
- **Q8/9** Voice and video IP applications over cable television networks
- **Q9/9** Advanced service platforms

Q10/9 Work Programme, Coordination and Planning

Current structure of SG9 (2/2)

Intersector Rapporteur Groups (IRG)

- **ITU-R SG6** (Radio - Broadcasting)
- **ITU-T SG16** (Multimedia - IPTV)
- **ITU-T SG9** (Cable - Broadband)

IRG-AVA: IRG on ***"Audiovisual Media Accessibility".***
aim at developing draft Recommendations for "Access Systems" that can be used for all media delivery systems, including broadcast, cable, Internet, and IPTV.

IRG-IBB: IRG on ***"integrated broadcast-broadband* systems"**
aim to form a framework for collaboration on this topic

SG9 Key Missions in 2017 – 2020

- **Evolution of cable TV networks**
  - ultra-high speed cable modems
  - robust and flexible security
  - high-efficiency transport technology, etc.
  - artificial Intelligence (AI)

- **Innovative services**
  - advanced & immersive video experiences (4K/8K/HDR etc.)
  - high realistic experiences (VR/AR etc.)
  - integrated broadcast and broadband services, etc.
  - Enhance service accessibility

- **Bridging the Standardization Gap (BSG)**
  - considering requirements from various regions
  - implementation and deployment guidelines (Q4/9)

ITU-T BRIDGING THE STANDARDIZATION GAP

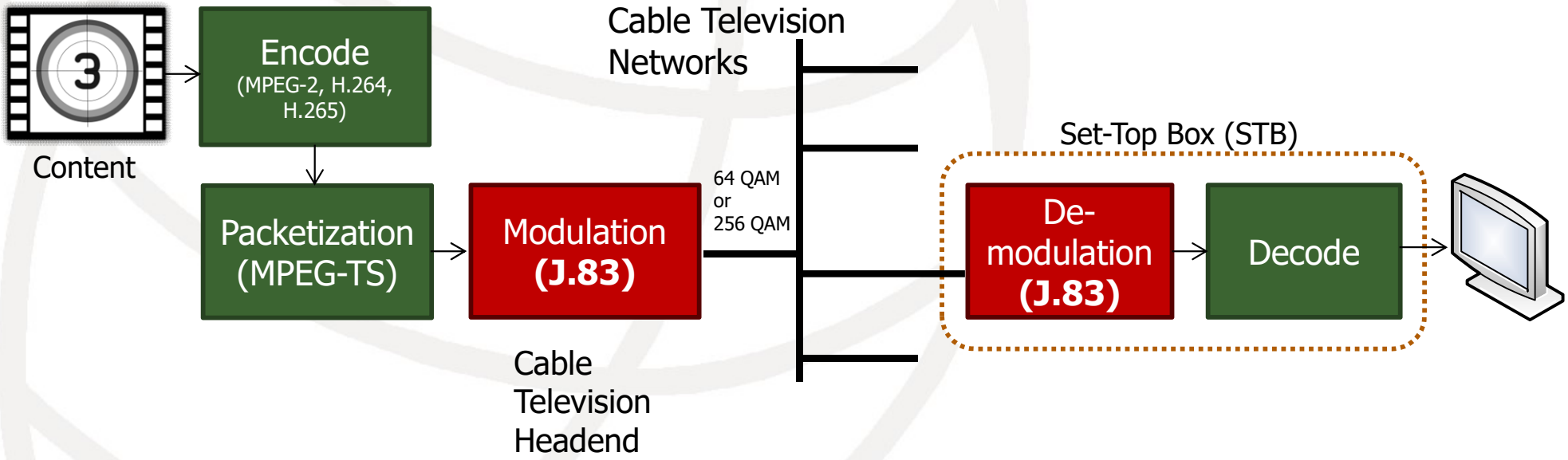
STUDY GROUP 9 (SG9)
STANDARDIZATION WORK

SG9 Highlights in the past 20 years

… 2000	**Digital Cable Television and Emerging IP Technology**	
	J.83 (1995): Digital cable TV modulation-QAM J.90 (1998): Electronic program guide	**J.112** (1998): Cable modem – DOCSIS1.0 J.132 (1998): MPEG-TS transport over SDH
2001 2004	**DOCSIS2.0, Cable Telephony (VoIP), Optcal Transport**	
	J.122 (2002): Cable modem – DOCSIS 2.0 **J.160~J.179**: Cable telephony (MGCP)	**J.185, J.186**: Cable TV over FTTH (RF-based) J.190 (2002): Home Network Architecture J.200～J.202: Interactive TV applications
2005 2008	**DOCSIS3.0, Advanced Television Experience, IPTV**	
	J.83rev (2007): 256QAM addition to Annex C **J.210～J.214, J.222.0~J.222.3**: DOCSIS3.0 J.360～J.370: Cable telephony Ver.2 (SIP)	J.601 (2005): Large screen digital imagery J.700 (2007): IPTV framework for cable TV J.901 (2008): Free viewpoint television (FTV)
2009 2012	**Integrated Broadcast and Broadband, Hybrid Terminal**	
	J.205, J.206 (2012, 2013): IBB framework **J.295, J.296** (2012): Hybrid set-top box	J.380.1～8, J.706, J.707: Target ads **J.381** (2012): Advanced cable transport J.603 (2011): 4K/8K real-time transmission
2013 2016	**Evolution of Transport Technologies**	
	J.183rev, J.288 (2016): 4K/8K QAM transport J.195, J.196 (2014 – 2016): HiNoC v1 and v2 J.223 (2016): Cabinet DOCSIS (C-DOCSIS)	J.301, J.302 (2014 – 2016): AR TV **J.382** (2014): DVB-C2 J.1010, J.1011 (2016): Exchangeable CA/DRM

The most popular Recommendation

- **J.83 (1995, 2007) – Digital multi-programme systems for television, sound and data services for cable distribution**
- **Fundamental technology for digital cable TV transport**
  - J.83 is widely deployed to all over the world regardless of the regional digital TV technology standards.
  - One TV bandwidth unit (6MHz/8MHz) can carry two or more HDTV programs. Typical frequency range is, for example, 54 MHz – 860 MHz (depending on regions).

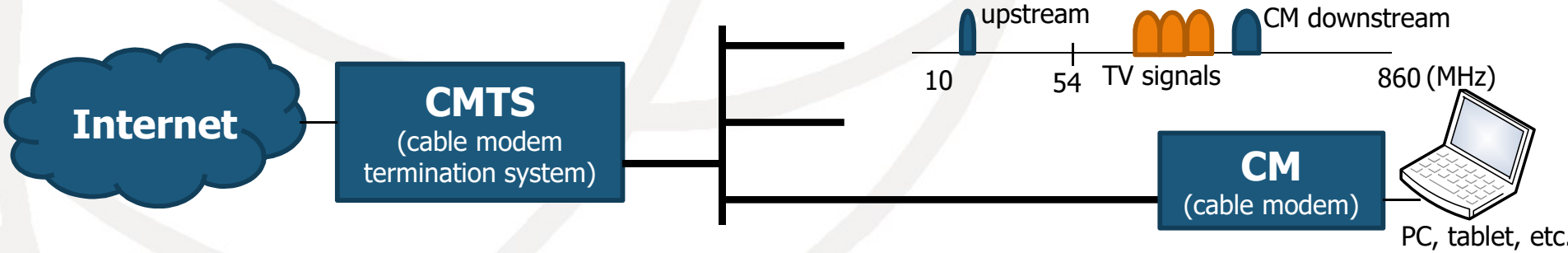


Cable modem Recommendations

- **Cable modem system provides bi-directional IP communication over one-to-N split networks.**
  - Downstream technology is based on ITU-T J.83 with TDM multiplexing.
  - Upstream technology is based on TDMA access control.
  - Two different frequency spectrums are used for downstream and upstream.

- **Cable modem Recommendations**

SG9 Recs	DOCSIS Version	DS Phy Rate (6MHz TV system)	US Phy Rate
J.112 (1998)	DOCSIS 1.1	42 Mbps	10 Mbps
J.122 (2002)	DOCSIS 2.0	42 Mbps	30 Mbps
J.222 series (2007)	DOCSIS 3.0	42 x *n* Mbps	30 x *n* Mbps
J.223 series (2016)	C-DOCSIS	42 x *n* Mbps	30 x *n* Mbps
J.5GDOCSIS	DOCSIS 3.1 (full duplex)	up to 10 Gbps	up to 1 Gbps



Some work in progress in ITU-T SG9

Bridging the Standardization Gap

J.dtt-dist-req
Open platform for TV program delivery over cable TV networks

J.stb-cts (approved)
Set-top box compatible with cable, terrestrial and satellite broadcasting

Sup-digTV
Guidelines for implementing and installing of digital cable television

J.tda
Up-to-date collection of terms and definitions of ITU-T SG9

Evolution of cable TV networks

J.5GDOCSIS & J.MHAv2
Gigabit/sec-capable cable modem system specifications (DOCSIS 3.1 full duplex)

J.dmcd-series & J.oneway-dcas-
Exchangeable CA and DRM solutions (ECI)

J.fdx-series
In-band full-duplex cable modem system

J.ipvb-series
IP Video Broadcast (IPVB) for CATV Networks

J.dcas-oneway
Downloadable CAS for one-way cable television networks

Innovative services

J.pcnp-smgw
Smart Home Gateway

J.acf-hrm & J.207rev
Harmonization for compatibility of IBB applications

J.stvos-series
Specifications of smart TV operating system (smart TVOS)

J.pcnp-fmw
Premium Cable network platform with intelligent analyzer

J.acs-stb
Auto Configuration of STB

J.cable-ott
interfaces between a CAT operator and an OTT service provider

Collaboration with other SDOs

ITU-T SG16
ITU-R SG6
ITU-D SG1 and SG2
and other Study Groups

TC Cable
ISG ECI

TC100

and others

Co-location of workshops at SG9 meetings

In the new Study Period (since WTSA-16), SG9 has been very proactive in organizing co-located events to promote its work and involve more stakeholders in its activities

New members

- **Shenzhen Skyworth Digital Technology, China (Associate SG9)**
- **JiShi HuiTong Technology, China (Associate SG9)**
- **CableLabs, USA (Associate SG9)**
- **Indian Institute of Science, India (Academia)**

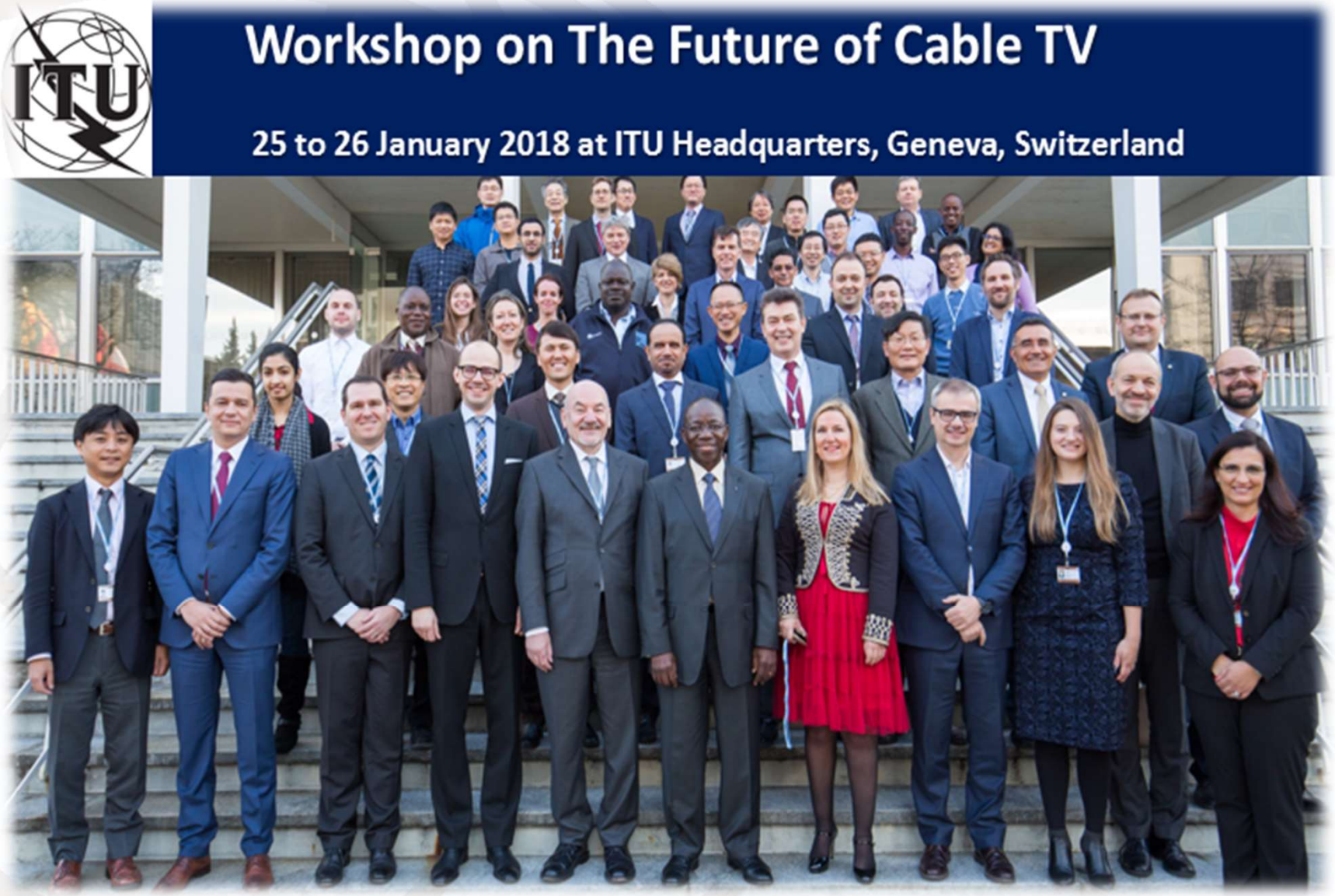
1st SG9 meeting:
24-31 May 2017, Hangzhou, China

Workshop: TV and content delivery on Integrated Broadband Cable Networks

Exhibition

SG9 photo during closing Plenary

2nd SG9 meeting
22-30 January 2018, Geneva
Workshop on the future of cable TV



3rd SG9 meeting
21-28 Nov 2018, Bogotá, Colombia
Workshop on the Future of TV for the Americas

Next meetings of SG9

Rapporteur meetings:

Wuhan China, hosted by Huawei (15-17 April 2019)

http://handle.itu.int/11.1002/db/rgm-sg9

→ workshop on **Future Integrated Broadband Cable Networks** co-organized with Huawei, China (14 April 2019)

Next SG9 meeting:

Geneva, Switzerland, hosted by ITU (6-13 June 2019)

https://itu.int/en/ITU-T/studygroups/2017-2020/09

→ workshop on **the future of cable TV for Europe** co-organized by ITU-R, ITU-T and ITU-D (7 June 2019)

Contact: tsbsg9@itu.int

Stefano POLIDORI is Advisor at the International Telecommunication Union and responsible for the technical secretariat of ITU-T Study Group 9 "Broadband cable and TV".

He is also responsible for the Intelligent Transport Systems (ITS) activities, including the Symposium on the Future Networked Car at the Geneva Motor Show.

Stefano is the ITU representative to the European Multi Stakeholder Platform on ICT Standardization at the European Commission.

stefano.polidori@itu.int

Thank you very much for your attention!!