

**EBU**

OPERATING EUROVISION AND EURORADIO

# Technology & Innovation

**Workplan 2015 - 2017**  
**TA-SPG 19816**

June 2015

## **Executive summary**

In the media world, the only constant is change. Content formats, technologies and platforms constantly evolve and users increasingly expect access to entertainment in any place, at any time and on any device. Public Service Media can thrive in this landscape, through innovations based on advanced technologies and new programmes.

As we look to the future of technologies for audio-visual media services in the next two years, the major themes we see are:

- Network IP production architectures,
- Immersive user experiences,
- Security of systems,
- Cloud-based services,
- Quality control,
- Metadata, and
- Personalization.

We view these various elements as being part of the future network and software centric “broadcast media factory”: producing content for new user experiences delivered to a multi-format, multi-screen audience. We will use big data techniques to get to know our audiences better so we can deliver better services, accessibility and recommendations.

Interoperability, industry standards and open source software will play a critical role in future developments. Using our EBU Digital Living Room, we will showcase the latest in consumer media technology and share Member services like HbbTV, UHD TV, hybrid radio and future formats.

Business models of media companies are also changing dramatically. Broadcasters need to be aware of both the commercial and technology factors driving decisions. We continue to advocate for key issues related to public service broadcasting: spectrum, net neutrality, digital radio, hybrid platforms and more.

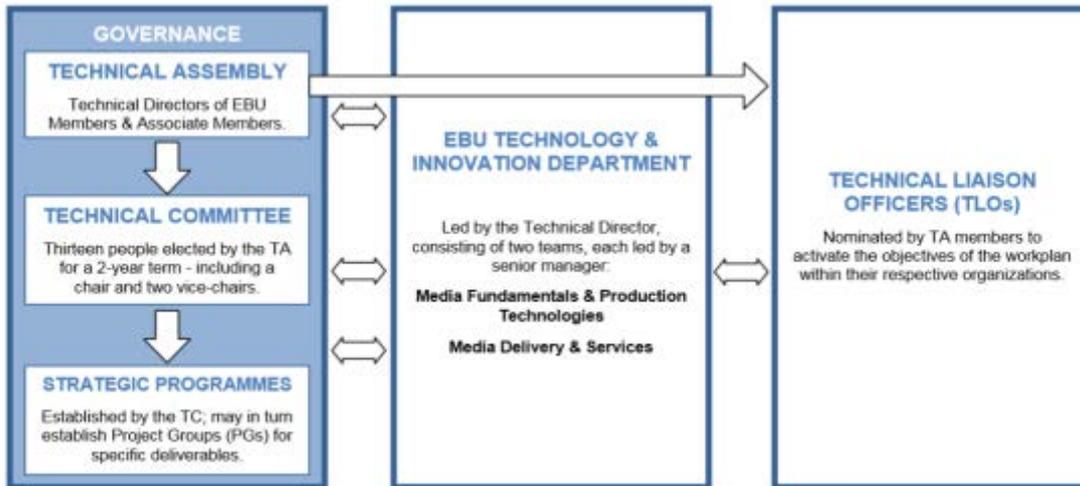
Finally, it is important for public service media to remain at the forefront of these media technology developments. Our two year workplan leverages the collective expertise of our community and encourages further collaboration, inspiration and advancement in audio-visual media technologies and associated innovations. It also lays out detailed objectives for the coming year, and the trends to be further investigated thereafter. The EBU’s Technical Committee continues to monitor the implementation of the workplan, revising it as necessary over its lifetime. If public service media providers collaborate and share knowledge, they will thrive and prosper in this ever-changing environment.

We wish you all the best for the next cycle of our joint activities!

*The EBU Technical Committee*

## Our work

As the largest association of national broadcasters in the world, we leverage the expertise of the pioneers in the field of public service media technology and innovation. EBU's Technical Assembly, Technical Liaison Officers, elected Technical Committee, and Strategic Programmes consisting of Members and industry experts in coordination with the Technology & Innovation team put this workplan into practice.



The thirteen elected Members of the EBU Technical Committee are responsible for managing the EBU's technical activities that are split into both Strategic Programmes and research and coordination groups. For more detailed plans, please refer to the Terms of Reference of each Strategic Programme at <https://tech.ebu.ch/groups>

## Strategic programmes

### Integrated Media Production Strategies (IMPS)

**Chair:** Robert Amlung (ZDF)

The tremendous changes in the media landscape require broadcasters to create content for linear and on-demand delivery, and for use on multiple platforms or devices, such as web, television, OTT and mobile phones. This will call for changes for broadcasters in technology, organisational and editorial matters. IMPS was initially focused on the integrated newsroom and now is moving to



enterprise wide content management areas. IMPS shares best practice and experience to help remote working and allow journalists and other editorial staff to use advanced technologies on software centric, highly agile and integrated platforms. IMPS connects Members in a trusted environment to facilitate the development of improved processes with Members notably through on site themed visits at Members premises.

#### Strategic goals

- Facilitate discussions between Members at different stages of integration and provide a trusted communication platform and to share experience and best practice.
- Understand the Members' evolving integration needs and share different solutions.
- Develop a mutual understanding of our Members television, radio and online operations and the opportunities for possible editorial and technical integration.
- Understand the technical functions and modules necessary for delivering integrated services and how they fit or interface in a general broadcast infrastructure.
- Highlight best editorial practices and new functions in three key areas: what follows the integrated Newsrooms, newsgathering and live sports, and enterprise-wide content management.
- Document best practices and new functions in the three key areas identified above newsrooms (4Q2015); newsgathering in live sports (2Q2016) , enterprise-wide content management 4Q16)
- Collect Members' requirements on the future of media production and facilitate discussion with the broader industry.
- Twice a year, on site themed visits at the broadcasters' premises (with EUROVISION ACADEMY).

#### Building partnerships

IMPS partners with the EUROVISION ACADEMY, in particular, for the organization and delivery of the themed visits as well as for related publications. In addition, the News Technology Committee, the TV Committee and the media online unit are regularly consulted on IMPS matters.

## Future Distribution Strategies (FDS)



**Chair:** Roland Beutler (ARD/SWR)

While linear viewing remains the dominant way of watching TV content, time shifted and on-demand services are increasingly popular. Non-traditional service providers have entered the market and new platforms (e.g. Netflix, YouTube, and Chromecast) seek to drive viewers away from the traditional TV broadcasting.

FDS studies the relevance of different broadcasting, fixed and mobile TV distribution options for Public Service Media, in particular in terms of reach, quality, free-to-air, and market position. It also models the viewing profile of users from a technical point of view (e.g. linear/nonlinear, in-house produced content/user-generated content, TV set/other devices, in the home/on the move, and individualized/personalized services). This needs to link to the future technical and regulatory requirements for connectivity /quality for relevant use cases. FDS also studies the impact of new delivery models/hybrid approaches, and acts as a focal point for EBU activities related to 5G.

### Strategic goals

- Generic distribution models for Public Service Media content and services (4Q2015)
- EBU discussion paper on 5G (2Q2015)
- Publish a study on viewing profiles (1Q2016)
- Publish a study on the impact of new delivery models on the market position of Public Service Broadcasters (3Q2016)
- Guidelines for strategic positioning of broadcasting services to assist Members in their strategic planning (4Q2016)

### Building partnerships

FDS partners with: ITU, CEPT, the European Commission, DVB Project, 3GPP, NGMN and research projects such as 5G-PPP and EU-funded METIS.

## Quality Control (QC)

**Chair:** Andy Quested (BBC), **Vice-chairs:** Friedrich Gierlinger (IRT), Roman Meszmer (ORF)

Lack of quality control in file-based workflows may lead to content quality impairments and require expensive human intervention for correction, especially to prevent programmes failing to transmit. As the amount of file-based content produced continues to increase, broadcasters are finding it difficult to keep up with manual quality control checks.



### How can we help?

QC helps Members optimise the use of automated Quality Control systems by continuing to develop the EBU.IO/QC tools, which defines (but does not carry out) over 200 Quality Test Items: each including a detailed description of a check that can be performed on audio/visual material. In addition, and subject to some restrictions, a set of test material contributed by participants will be made available via this tool. Active collaboration with the FIMS QA group ensures the EBU.IO QC Items can be easily deployed in FIMS compliant devices. We also focus on providing additional details for each of the Test Items and work to establish a common reporting structure to improve equipment interoperability and the implementation of Quality Control in broadcasters' workflows including contribution, production and programme exchange.

### Strategic goals

- Develop a common Quality Control reporting strategy (2Q2015-3Q2016)
- Demonstrate the latest updates at the IBC (3Q2015)
- Complete the final EBU.IO QC platform with new public facing features (4Q2015)
- Update (detailed) parameters for all EBU.IO/QC Test items (2Q2016)
- Recommend interface parameters, workflow and guidance for automated Quality Control processes (with MM/FIMS) (3Q2016)

### Building partnerships

QC partners with: equipment manufacturers, advertising agencies, service providers (e.g. archive, play-out providers), research organisations, industry and standardisation bodies such as FIMS, DPP and the German national Quality Management Workgroup, ITU, MPEG.

# Spectrum Management and Regulation (SMR)

**Chair:** David Hemingway (BBC), **Vice Chair:** Lis-Grete Møller (DR)

Ensuring adequate spectrum for current and future terrestrial and satellite distribution needs is a vital business objective of EBU Members. Any further reallocation of broadcast spectrum in the UHF band to other services will require broadcasters to re-plan their Digital Terrestrial Television services and this will have a significant impact both in terms of coverage, disruption to viewers, network changes and costs for broadcasters. Future 5G spectrum requirements above 6 GHz will threaten the broadcasting satellite bands for direct to home reception and the fixed satellite bands used for contribution links. There will be a need to ensure protection of broadcasting satellite services and any other band above 6 GHz used for wireless cameras.

## How can we help?

SMR sets out to identify, formulate and represent EBU Members' interest in relevant regulatory bodies and at influential events related to spectrum, by building alliances and bringing together the wider broadcasting community to draw in expertise and shared resources from across the broadest selection of members to do technical work and to lobby national and international bodies.

## Strategic goals

- Contribute to work on WRC-15 agenda items, particularly in CEPT and ITU-R, updating Members as required (3Q-4Q2015)
- Analyse the outcome of WRC-15 and start preparing for WRC-19, potentially re-organising the work to address new work items (1Q2016)
- Organize annual Forecast Conferences (4Q2015, 4Q2016) and a workshop in 1Q2016 to inform Members on, and analyse, the outcomes of WRC-15
- Monitor developments in DVB on broadcast distribution technologies. Report on new network planning methods (e.g. TFS, layered division multiplexing etc.) and on any required studies regarding the use of the bands allocated to broadcasting (e.g. the flexible use of the UHF band for supplemental downlink only) (1Q-2Q2016 )
- Continue working relationships with other broadcast distribution stakeholders (e.g. sister broadcasting unions, BNE) to maintain the relevance of broadcast distribution platforms and with European and International bodies (EC, ETSI, Cenelec).

## Building partnerships

SMR partners with: CEPT, ITU, EU, DigiTAG, DVB, BNE, WBU, ASBU, ABU, NABA, Satellite operators, ESOA, ESA.EBU Spectrum Steering group

## **Spectrum Steering Group (SSG)**

**Chair: Peter MacAvock (EBU)**

Combatting the mobile industries insatiable appetite for more spectrum requires a coordinated approach across the EBU. To achieve success, EBU needs to gather expertise from the technical expertise, lobbying and communications areas across the EBU Members.

### **How can we help?**

SSG reports to both the Technical Committee and the Legal and Policy Committee and involves those lobbyists and technical experts that follow closely the spectrum debate in their respective countries. SSG doesn't do any technical work, but focuses on building the case for broadcast spectrum and bringing that – through EBU Members – to Administrations around the world to positively influence the debates leading up to and including WRC-15.

### **Strategic goals**

SSG is responsible for the following areas:

- Through dialogue with appropriate EBU experts, develop narrative in support of EBU's spectrum position and how this may apply to European, Arab and African countries (4Q15)
- Develop Tech.ebu.ch webpages on spectrum (on-going)
- Coordinating EBU Member representations to administrations in the run up to WRC-15 (4Q15)
- Coordinating the EBU presence at key events such as ITU's CPM (2Q15) and WRC (4Q15)
- It is expected that this group's activities will be reviewed post WRC-15



## Future Networked Systems (FNS)

**Chair:** Markus Berg (IRT), **Vice-chair:** Phil Tudor (BBC)

Internet based technologies are increasingly used in the production chain and in the transformation of tape to file-based workflows. Full adoption of IT-based infrastructures for live production workflows will be the next step to allow broadcasters to meet rising public demand for new services by offering more content, more flexibility and reducing costs.



### How can we help?

FNS helps Members transition to IT/network-based infrastructures in their production studios and remote locations, by sharing knowledge, experience and test results with a view to capturing broadcaster requirements and providing new technologies updates. FNS also examines the impact of new IP technologies on production practices and workflows, offering guidance on using IP, cloud technologies and evaluating FIMS in cloud based environments.

### Strategic goals

- Organise two micro-workshops to share best practice for elements of Networked Media Production (4Q2015-4Q2016)
- Complete the first iteration of test and measurement methods and tools on Networked Media Production systems (2Q2017)
- Provide strategic advice and a roadmap for infrastructure use in Networked Media Production (3Q2015 and 2Q2016)
- Plan the annual Network Technology Seminar (2Q2015 & 2Q2016)
- Provide Audio and Video Contribution over IP interoperability testing and implementation guidelines, e.g. ACIP plug fest (3Q2016)

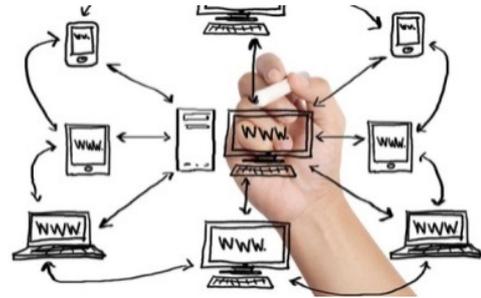
### Building partnerships

FNS partners with: the Joint Task-Force on Networked Media, VSF (SVIP group, etc.), SMPTE 32NF, AES, Media Networking Alliance (AES67), and AVNue Alliance (AVB/TSN).

# Broadcaster Internet Services (BIS)

**Chair:** Ignacio Gomez (RTVE)

Audiences are increasingly using different devices to access and consume media, with the “app” being the central user interface to access all broadcaster services. This multiscreen ecosystem impacts broadcaster’s distribution strategies, ‘back-end’ (delivery) infrastructures and ‘front-end’ (interface) developments.



## How can we help?

BIS is the home for Internet-based distribution technologies, investigating their short, mid- and long-term impact for public service broadcasters (i.e. universal reach, prominence or service provisioning), identifying types of (technical) services EBU Members may develop in the ‘Over The Top’ domain. BIS also delivers useful software personalization tools for Members.

## Strategic goals

- Organise Big Data Workshop alongside EBU’s DevCon Conference (3Q2015) in collaboration with the SP MIM
- Impact analyses for relevant (Internet) trends (4Q2015)
- Provide guidelines/principles for gatekeepers to lock prominence of Members’ brands in application driven portals (4Q2015)
- As part of the EBU’s OTT Project, define requirements for a multi-CDN and OTT client propositions (incl. Quality control) (3Q2015)
- Propose a framework and prototype an infrastructure for a recommendation engine (4Q2015)
- Generate broadcaster implementation guidelines for DASH (4Q2016)
- Organise BroadThinking ’16 (2Q2016)
- Support the development of a Net Neutrality strategic position where necessary.
- Provide a forum for coordinating EBU positions on HbbTV, and implementation of HbbTV V2 (on-going)

## Building partnerships

BIS partners with HbbTV, DASH-IF, DVB, MPEG and SP MIM

# Media Information Management (MIM)

**Chair:** Alberto Messina (RAI)

To address ever-more complex questions in media information management and interoperability in digital workflows, broadcasters need to use flexible metadata models including web technologies. As volumes of data explode, to retain value, it is crucial to be able to efficiently manage, extract, index and retrieve information through the value chain.

## How can we help?

MIM makes use of semantic modeling and flexible IP and 'Service Oriented Architectures' (FIMS) offering greater interoperability over current, often proprietary, system design practices. MIM identifies and evaluates tools for the generation of multimedia and subtitle information through the analysis of content and efficient automatic metadata extraction, through the sharing of expertise and best practice in a community of specialists from industry, academia and Members' experience. FIMS also cooperates in the definition of standards ensuring interoperability and robustness.

## Strategic goals

- Update EBUCore 1.6 (4Q2015) and 1.7 (2Q2017), FIMS specifications, the Audio Definition Model and egtaMeta 1.1 (2Q016),
- Semantic modelling: EBU RDF (2Q2015 and 4Q2016), CCDM 1.1 (2Q2016), sport ontology (4Q2016)
- Organise MDN workshops (2Q2015 and 2Q2016)
- In collaboration with BIS, to organise a Big Data Workshop alongside EBU's DevCon Conference (3Q2015)□
- Review FIMS 1.2 (2Q2015), contribute to FIMS 1.3 (AME tools and cards published via EBU.IO - 4Q2016),
- Develop EBU-TT subtitling specifications for the creation and distribution of (live) subtitles (4Q2016).

## Building partnerships

MIM partners with: BIS, EBU/AMWA FIMS, EBU-egta, USA WGBH (PBCore), W3C Timed Text Working Group, SMPTE, ITU and AES.



## Digital Radio Platforms (DRP)

**Chair:** Javier Sanchez Perez (RTVE), **Vice-chair:** Paolo Casagrande (RAI)

Radio is the only telecommunication service where the primary distribution mechanism remains predominantly analogue. Transitioning to attractive digital and hybrid services, offering a new radio experience for consumers is a challenge.



### How can we help?

DRP provides the platform for EBU Members to help each other in the move from analogue to digital and hybrid radio platforms, through prototyping, testing and demonstrating new services based on digital and hybrid radio.

### Strategic goals

- Provide guidelines on technical aspects for FM switchover based on experience from members (2Q2016),
- Together with an interdisciplinary group initiated in Germany (and in collaboration with the Media Department), research the concept of hybrid content radio (mixing linear and on demand content). If possible create a prototype for a demo to content makers (3Q2016),
- Help to establish guidelines for deploying hybrid radio and production/distribution of metadata (4Q2015),
- Oversee “RadioDNS Project Logo” where EBU has created a platform on ebu.io and will work with EBU members to add basic information (station logo, service following, description) about radio stations in Europe,
- Organize Digital Radio week, Digital Radio Summit, Radiohack workshops (1Q2016).

### Building partnerships

DRP partners with: WorldDMB, RadioDNS, DRM, IDAG, Universal Smartphone Radio Project, Media Department

## Beyond HD (BHD)

**Chair:** Giorgio Dimino (RAI), **Vice-chair:** Dagmar Driesnack (IRT)

To keep up with the increasing public demand for higher quality and new immersive user experiences broadcasters must study the technical questions on what formulates the next generation immersive TV system and the impact to existing workflows. Today it's HDTV; "what's next?" is the question.



### How can we help?

BHD looks to understand options for television image quality in the future, including the practicality, cost and potential impact on business models. By taking an end-to-end approach (from content creation, production, and distribution to the consumer domain), BHD provides strategic and technical advice, and collaborates with industry and standardisation bodies like SMPTE, DVB and ITU-R, to ensure broadcaster requirements are reflected in future TV applications. BHD also conducts tests in collaboration with key partners in the production chain and also makes innovative TV material available to Members.

### Strategic goals

- Develop the framework and plan for a codec test week (3Q2015),
- Develop a new Technical Report on UHDTV (4Q2015),
- Keep EBU Technical Report 028, UHDTV Policy document up-to-date and influence standardisation towards the DVB UHDTV Phase 2 (over the next two years in in DVB CM/TM, ITU and SMPTE)
- Complete Image Dynamic Range tests when methodology and technology are available in UHDTV, in a close collaboration with the BTF-HDR group produce Practical Guidelines for HDR including recommended practices based on tests of Image Dynamic Range, Wider Colour Gamut, use of archive content in UHDTV production, Peak levels for graphics etc. (2Q2016),
- Find a conformance point for H.264-based production codecs (3Q2016),
- Codec test for mastering, exchange and delivery for HDTV and UHDTV play-out environment (1Q2016).

### Building partnerships

BHD partners with: ITU-R WP6B, C & RG-24, DVB CM-UHDTV/CM-AVC, MPEG, SMPTE, Digital Europe, National European Forums on UHDTV, FAME, BTF (Broadcast Technology Future Group), AMWA, monitor the activities of the UHDTV Alliance and UHD Forum.

## Future Audio Formats and Renderers (FAR)

**Chair:** Matthieu Parmentier (France TV)

Alongside their linear broadcast signals many broadcasters have IP streams and related applications to run on various devices extending from the traditional (but now, connected) TV - to the smallest of screens on smartphones and wearable's. It is important that broadcasters look at new audio file formats to produce and deliver audio in these advanced environments.



### How can we help?

FAR provides guidance to help broadcasters make the move to new (IP based) audio systems, provides inputs to ITU and ETSI standardisation, and organizes seminars and workshops to enable sharing of best practice in new audio production technology. FAR targets the development of the missing ecosystem that links the sound rendering functions within the end-user device to the content creators. These objectives are driven by the object-based audio (OBA) approach developed in the Audio Definition Model (ADM) of EBUcore. The PLOUD group falls within FAR's remit and it will continue with work on audio loudness.

### Strategic goals

- Update of the EBU BWF-related file formats to encompass OBA (aka "ADM files") and maintain the ADM taking ITU, MIM and other UR into account (3Q2015),
- Assess OBA rendering (test files, tests ...) and define a baseline OBA renderer for broadcast purposes (3Q2015),
- Import/export ADM files (XML, RF64 etc.) (4Q2015),
- Develop a communications protocol between an editor (a DAW running object-based sessions and files using ADM) and a renderer (object-based rendering engine in 3D space) (1Q2016),
- Organise a workshop on OBA in a broadcasting context (1Q2016).

### Building partnerships

FAR partners with: BHD, DVB UHDTV, FAME audio group, ITU, ETSI, SMPTE and AES standardization bodies.

# Media Cyber Security (MCS)

**Chair:** Andreas Schneider (SRG)

Bringing more IT technology into the broadcasting domain has created new opportunities for media production and distribution but has also opened broadcast companies to new security threats. Media companies are increasingly targeted in massive security attacks. Each broadcaster, once targetted, will develop counter measures, but the sensitivity of such issues means other broadcasters fail to benefit from each other's experiences.



## How can we help?

Dedicated to security experts from EBU Members, MCS raises awareness of the changes and increasing information security risks to senior management boards, and exchanges information on general media and broadcasting security threats. It also provides a platform for exchange of information on security incidents and information security related experiences among the Members of the group (e.g. phishing campaigns, attacks in newsroom environments, targeted malware attacks, etc.). The group also exchanges details of lessons learned from information security incidents, projects, internal procedures and best practices executed inside EBU members (technical, training, etc.) and defines for the long term, information security best practices for broadcast companies.

## Strategic goals

- Define, on the long term, information security best practices for broadcast companies on a quarterly or bi-annual basis e.g. recommendation on DDOS mitigation (3Q2015).
- Define and establish an alerting and notification process including mechanisms and tools for urgent information security related activities, especially ongoing attacks (4Q2015),

## Building partnerships

The nature of the group's activities mean that it will necessarily operate behind closed doors, but partner with national cybersecurity initiatives including governmental security agencies when applicable.

## Agile Software Collaboration (ASC)

**Chair:** Sébastien Noir (RTS)

In-house software development teams are essential to many of our Members' organisations, but they often work in isolation, duplicating work already being performed elsewhere.



### How can we help?

ASC helps software developers to find peers in similar Public Service Media organisations, sharing best practices in software development, such as agile methodologies and best practices in source control, continuous integration, automation and more.

### Strategic goals

- Through visits to Members' premises establish a dialogue between development teams to exchange knowledge on agile software development (every 6 months),
- Organise the annual DevCon to share best practice, collaborate and learn from other experts (3Q2015, 3Q2016)
- Maintain the list of Open Source code relevant for broadcasters (on-going),
- Continue to develop and provide development tools (EBU.IO) (on-going).

### Building partnerships

ASC partners with: software related groups and industry.

## Coordination and Research

### Sustainable Technology in Broadcasting

**Chair:** Jigna Chandaria (BBC R&D)

Research shows that televisions and associated devices are responsible for about two per cent of global greenhouse gas emissions (similar to the aviation industry). This percentage is growing as the number of devices proliferates and the variety of ways to access content increases. In parallel, the cost of energy and resources is increasing. As public service broadcasters, we have a responsibility to improve the environmental performance of the broadcasting industry to make it more sustainable.



How can we help?

STIB helps Members to understand how to use sustainability measurement and metrics to deliver business transformation thus aiding informed decision-making. We do so by supporting the use of case studies that take advantage of work done in other related industries, such as the ICT sector. We produce guidelines on best practice in sustainable production and develop a common methodology for measuring the carbon footprint of production. We also act as a collective voice when liaising with other groups who seek to engage with the broadcasting industry on sustainability and environmental issues, such as the ITU and other stakeholders.

#### Strategic goals

- Organise a mini workshop to share best practice on Sustainable Production (2Q2015)
- Organise a mini workshop to share analysis of the environmental impact of TV distribution and consumption, comparing DTT with mobile and online and TV with tablets and mobiles (3Q2015)
- Define requirements for a common methodology for production carbon calculators (2Q 2016)
- Develop an understanding of the environmental impacts of cloud computing and supporting metrics (1Q2016)
- Develop an understanding of the environmental impacts of beyond HD television
- Share latest research and best practice on environmental matters relating to broadcast
- Provide advice and information to other EBU groups on sustainability

#### Building partnerships

STiB partners with BAFTA, The Green Film Initiative and non-EBU broadcasters.

## Joint Task Force on Networked Media (JTNM)



Building future live media production environments based solely on IT infrastructures, packet networks (Ethernet, IP) and cloud technologies is a great opportunity for broadcasters to offer new ways to produce content, give flexibility in the deployment and reduce capital expenditures. However, this transformation will deliver its full benefits if the user can build systems made of best of breed components for its needs that may come from different vendors and service providers. A common approach amongst product and standard interfaces are therefore required.

### How can we help?

By joining our forces with the Society of Motion Picture and Television Engineers (SMPTE) and the Video Services Forum (VSF) we want to make it easier to build professional media infrastructures by promoting interoperability between IT-based media components, and helping the industry to develop a common approach and identify the current standards to be adopted and the new ones that will be needed to fill any gaps. The Task Force - in its current Phase 2 - works on defining a reference architecture that will provide generic system models and frameworks for key subsystem components.

### Strategic goals

- Define Reference Architecture v1.0 (3Q2015)
- Provide minimum requirements for “WebFirst” user scenario.

## Task Group on Networked Media Reference Architectures (TG-NMRA)



**Chair:** Thomas Saner (SRG)

This Task Group consists of invited experts and SP chairs provides a structure for coordination and liaison between networked and IT based production architectures in different strategic programmes (IMPS, FNS, FIMS, MIM, QC). The group aims to develop a working proposal for media production architectures that allows agile applications on a solid base (IaaS, PaaS, SaaS). In addition to reporting to the TC, the group interfaces with the Joint Networked Media Task Force (JT-NM) itself operating to an aggressive time schedule.

### **Strategic goals**

- As there is a very tight schedule on JT-NM, EBU has to provide input contributions rapidly, the group will act as liaison between the JT-NM and the EBU TC (3Q2015).
- Aggregate ideas and develop a TC proposal for a new working structure (with SPs, Projects, etc.) to address the technical challenges of emerging networked and cloud based media production architectures (4Q2015).
- The aim is to disband the group (1Q2016).

## Broadcast Technology Futures Group (BTF)

**Chair:** Hans Hoffmann (EBU), **HFR Subgroup:** Adi Kouadio (EBU), **HDR Subgroup:** Andy Qusted (BBC)

The Broadcast Technology Futures Group is an alliance of non-industrial Research and Development laboratories that include broadcast futures in their activities and studies. The Group provides a trusted platform for heads of research from of BBC, IRT, RAI, NHK, VRT, CRC and the wider EBU Membership to meet and discuss strategic R&D activities.

### How can we help?

UHDTV being the next evolution steps for broadcast, the Group has created two subgroups to perform research actions: Higher Dynamic Range (HDR) and Higher Frame Rate (HFR).

### Strategic goals

#### Subgroup BTF-HDR:

- Develop documentation of HDR terminology (3Q2015),
- Produce demonstrations for stakeholders and at IBC and prepare a show reel in collaboration with partners (3Q2015),
- Select/create reference image files (dependent on ITU outcome – June 2015)
- Disseminate test results and findings and link with the Beyond HD Strategic Programme to include results to relevant Standardization Bodies (DVB, SMPTE, ITU).

#### Subgroup BTF-HFR:

- Phase 2 – Compression Efficiency: Identify potential implications on bit-rates required in distribution (e.g. GOP length advantages) and on the human perception using prototype HFR Display (3Q2015).
- Phase 3 – Impact on workflows: HFR will have commercial impact. The group will consider performing initial investigations on workflows.(e.g. standards conversion, Motion compensation and workflows) (3Q2015).

### Building partnerships

BTF partners with ITU, SMPTE, DVB and with other consortium with the same interest such as the French 4EVER Project ( [www.4ever-project.fr](http://www.4ever-project.fr) ), or industry ( MIKROM, LOEWE ) to create prototypes. The group will seek for open communication with R&D activities globally such as in Korea (ETRI and KBS-R&D).

## **Summary**

All of the work above represents the detailed developments on-going and planned for the next two years in the Technology and Innovation department's working groups and strategic programmes. The work of the groups can vary during the programme and we have a continuous review process in place with the Technical Committee. This is intended as a live working document that keeps track of developments in the work. By working together with EBU Members and the support in particular of the working group participants we are able to achieve much more than by working in isolation.