



STRATEGIC BUSINESS PLAN (SBP)

IEC/TC or SC	Secretariat	Date
100	Japan	2014-11-09

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Title of TC

Audio, video and multimedia systems and equipment

- TA 1 Terminals for audio, video & data services and content
- TA 2 Colour measurement and management
- TA 4 Digital system interfaces and protocols
- TA 5 Cable networks for television signals, sound signals and interactive services
- TA 6 Storage media, storage data structures, storage systems and equipment
- TA 8 Multimedia home server systems
- TA 9 Audio, video and multimedia applications for end-user networks
- TA 10 Multimedia e-publishing and e-book technologies
- TA 11 Quality for audio, video and multimedia systems
- TA 12 AV energy efficiency and smart grid applications
- TA 13: Environmental aspects in the field of audio, video and ICT equipment
- TA 14: Interfaces and methods of measurement for personal computing equipment
- TA 15: Wireless power transfer (WPT)
- TA 16: AAL, accessibility and user interfaces

**A Background**

TC 100 was established in 1995 comprising of the following IEC Technical Committees:

- TC 12 /SC 12A Receiving equipment
  - /SC 12G Cabled distribution system
- TC 60 /SC 60A Audio recording
  - /SC 60B Video recording (including audio relating to video)
- TC 84 Equipment and systems in the field of audio, video and audio-visual engineering

TC 100 has been standardizing specifications for audio, video and multimedia systems and equipment and initially started with four subcommittees:

- SC 100A Multimedia end-user equipment
- SC 100B Audio, video and multimedia information storage systems
- SC 100C Audio, video and multimedia subsystems and equipment
- SC 100D Cabled distribution systems

Gradually, TC 100 moved to a unique and flexible organisation structure based on Technical Areas, replacing Sub Committees, to achieve standardization in an efficient manner for addressing fast moving multimedia technology.

The technical work in TC 100 is exclusively done in Project Teams. Project Teams, related to each other by addressing a common topic e.g. technology or application, are clustered in a Technical Area (TA) with a Technical Area Manager (TAM) and a Technical Secretary (TS) for efficient project management.

A TA is active as long as the projects that are being addressed are ongoing, and is disbanded when all the projects has been finished.

In addition, TC 100 has two advisory groups and a GMT:

AGS (Advisory Group on Strategy)

AGM (Advisory Group on Management)

GMT (General Maintenance Team)

TC 100 has established an Editing Committee to improve document quality and to advise editorial issues in TC 100.

Please see Section F for a link to the TC 100 web page for the most recent version of the scope of TC and TAs.

## **B Business Environment**

### **B.1 General**

The convergence of digital technology from diverse industries demands interoperability in the consumer and the professional marketplace. Within this marketplace, entertainment, communication and information technology equipment and systems are continuing to evolve.

Due to world-wide economic slow down, some of the electronic industry markets have been facing negative growth. However some markets show recovery and even rapid growth.

The worldwide market sizes of products relating to TC 100 in 2013 are:

- Flat panel TV: 216 418 k unit (+6,3 % year-to-year comparison)
- DVD/Blu-ray Disc recorder/player: 83 323k unit (-1,9 %)
- Video camera: 9 732k unit (-5,2 %)
- Audio set: 20 341k unit (-4,5 %)
- Home theater system: 13 252k unit (-8,4 %)
- PC: 376 519k unit (+3,8 %)
- Tablet terminal: 183 681k unit (+55,6 %)
- Smart Phone: 910 000k unit (+26,2 %)

(Data provided by JEITA)

It is now a common practice that audio and video content is played by a PC (Personal Computer). In that regard, the PC market is included in TC 100 business environment. Recently, so-called smart phones are supplementing portable PCs in the mobile computing field and audio visual content can be played on smart phones.

The TV market shows steady growth by the transition from analogue to digital, especially in developing countries. The video recorder and player have been equipped with high definition function by Blu-ray Disc. While, 3D technology has driven up both the TV and Blu-ray video market, Ultra High Definition TV (UHD TV) such as 4k is evolving in the market. In addition, e-book and e-publishing products were also rapidly penetrating the market but the eBook player function is being replaced by smart phone or tablet terminal.

TC 100 standardizes specifications related to these industries and associated multimedia products indicated above.

Major world-wide companies marketing products related to TC 100 are AMD, Dolby, Fujitsu, Fuji-Xerox, Haier, Hitachi, HP, Intel, JVC Kenwood, LGE, Lenovo, Mitsubishi Electric, NEC, Nokia, Panasonic, Philips, Pioneer, Qualcomm, Samsung, Sharp, Sony, Toshiba, to name but a few.

## B.2 Market demand

### General

For equipment and systems, in particular, interoperability and connectivity are essential. The user cannot easily resolve incompatibility problems and, as a consumer, will not tolerate those products or systems that do not have these essential functions. Specifications that ensure these functions benefit both the manufacturer and the user. Therefore, standards are essential that address both consumer and professional equipment and systems. TC 100 addresses these standards as related to systems, performance of equipment connected to the system, and the protocol of system control and interfaces.

Some of the specifications covered in TC 100 are previously standardized in consortia or fora and proposed to TC 100 for international endorsement. Such a process will become a trend in ICT fast moving technology standardization. Therefore TC 100 has liaisons with consortia and fora such as SMPTE, AES, 1394TA, DLNA and USB-IF, to name but a few.

### Worldwide and regional usage

TC 100 standards are respected and used worldwide. However, some standards are dedicated to regional use, for example, digital broadcasting receiver specifications are based on regional broadcasting specifications.

### IEC CA systems

Currently there are no TC 100 standards used in IEC CA systems. Almost all of the standards developed in TC 100 are not used for regulatory purposes. However, recent energy-efficiency-related standards, for example as IEC 62087 “Methods of measurement for the power consumption of audio, video and related equipment” are referred to by Energy Star Programmes and ErP. Such types of standards will increase.

### Competing standards

TC 100 is continuing our efforts not to compete with existing standards developed by other organizations through effective liaison. Special consideration and cooperation was needed with ISO/IEC JTC 1/SC 25 in home network area. However, it becomes more serious, in view of the conflict with ITU-T SG 5 in energy efficiency related technology.

### Customers of publications

The table below indicates customers of TC 100 publication by each Technical Area (TA).

	Examples of IS	Customers
TA 1	Digital broadcasting receiver specifications	TV, Set Top Box (STB) Manufacturers
	Battery charging interface for mobile devices	Mobile device manufacturers

TA 2	IEC 61966 series (Colour management)	Various kinds of Manufacturer (TV, Printer, Digital Camera, Scanner, Projector, etc.)
TA 4	Digital A/V interface Interconnection of A/V and multimedia equipment Transporting of A/V streams	CE, PC, and IT manufacturers
TA 5	IEC 60728 Series (Cable system)	TV, STB Manufacturers, cable operators, cable- and cable system equipment manufacturers and cable system installers
TA 6	Professional tape-less camera recorder specifications for professional use	Broadcasters, Professional equipment manufacturers
	Portable CE products specifications	Manufacturers, Consumers
	Measuring methods for various recorders/players	Manufacturers, Consumers
	Time-code specification	Broadcasting stations, Professional equipment manufacturers
TA 8	Multimedia home server related specifications	Manufacturers
TA 9	Audio, video and multimedia interoperability specifications for end-user networks; Home multimedia gateway specifications	CE, IT device and other consumer product manufacturers and content providers
TA 10	e-Book specifications	CE, IT Manufacturers, Authoring tool manufacturers, Publishers
TA 11	AV lip-sync specifications	Manufacturers Consumers
	Loudness	Broadcasting studios Manufactures Consumers
TA 12	IEC 62087 (Methods of measurement for power consumption)	Manufacturers, Regulators, NGOs, Consumers

<b>TA 13</b>	<b>IEC 62075 Environmental conscious design</b>	<b>CE, IT Manufacturers Regulators</b>
<b>TA 14</b>	<b>DC power supply for PC</b>	<b>PC manufacturers, DC power supply manufacturers</b>
	<b>USB interface</b>	<b>Various manufacturers (PC, peripherals, AV equipment, mobile phones, etc.)</b>
<b>TA 15</b>	<b>Wireless Power Transfer for audio, video and multimedia systems and equipments</b>	<b>Manufacturers, Consumers</b>
<b>TA 16</b>	<b>AAL, accessibility and usability for audio, video and multimedia systems and equipment</b>	<b>CE, IT and mobile device Manufacturers, Consumers, Life support service providers, Health Care Providers, Regulators</b>
<b>TC 100</b>	<b>Audio, video and multimedia systems – General channel assignment of multi-channel audio</b>	<b>Manufacturers</b>
	<b>Multimedia home network configuration</b>	<b>Manufacturers</b>

### **B.3 Trends in technology**

As currently recognized, general electronics technology is rapidly moving from analogue to digital. Digital broadcasting systems are now widely used and an analogue-to-digital transition can be seen everywhere in the world. Digital TV sets and Set Top Boxes (STBs) have penetrated the marketplace very rapidly with a large amount of products sold worldwide. Digital broadcast receiver specifications have been standardized in TC 100 and new specifications or revisions of the specifications are expected.

As well as digitalization, in display technology, with the decline of the cathode ray tube, flat panel displays such as LCD are expanding worldwide. Organic Light Emitting Diode (OLED) displays are rapidly being developed and will be significant in the foreseeable future. With highly advanced digital and display technology, 3DTV has been developed. Already several 3DTV and Blu-ray recorders are launched in the market. 3DTV related specifications are wide ranging including CODEC, interfaces, 3D glasses, evaluation methods, etc. Display and TV technology is moving toward Ultra High Definition (UHD) such as so-called 4k or 8k technology.

The broadband environment now enables transmission of audio visual content through the Internet or telecommunication network to the TV in the home. Furthermore various applications can be downloaded and applied to the TV set through the Internet or network, that is, so-called connected TV or smart television.

In addition to the transition from analogue to digital, specifications are changing in scope from hardware-based to software-based with logic and software related specification on the increase.

Networking technology now allows connectivity in current stand-alone home electronics equipment and systems that provide compatibility and usability in the home and other locations. AV and multimedia application protocols for these end-user networks are key technologies in the field of standardization within TC 100.

With the advance of display technology, an evolution is occurring in the publishing industry. e-Books and e-publishing are becoming increasing popular; various types of e-reader devices and formats are being developed and launched in the marketplace.

Energy efficiency has been a key theme in the global society and IEC is encouraging every TC/SC to contribute in the effort. TC 100 has standardized methods of measurement for the power consumption for audio, video and multimedia equipment as specified in IEC 62087 series and will continue to meet the needs of the global society as it develops. In addition, Smart Grid is a hot topic world-wide. Smart Grid is considered mainly as an intelligent power distribution system. However, home electronics is one important component of Smart Grid on both the energy demand and energy consumption side. Home networking technology enables energy management in the home by comprising Home Energy Management System (HEMS) which is one of essential elements of Smart Grid. TC 100 will need to address such technologies.

TC 100 also addresses the needs of people with disabilities or age related limitations. TVs have a low barrier to entry amongst older people and people with disabilities, so the combination of connected TVs with accessible interfaces has a huge potential. TC 100 has worked on a Text to Speech standard for digital television. Active Assisted Living (AAL) has been introduced in IEC and addressed by TC 100 from home electronics point of view. In this trend, a new TA 16 was established to address new technologies for the development of accessible user interfaces and interoperable AAL systems which lead to the improvement of the quality of lives of elderly and disabled users.

Seventeen AAL use cases have been identified which show that AV and multimedia devices are very important for applications such as remote monitoring and independent living of elderly persons. Existing accessibility barriers have been analysed and proposals for new technologies to overcome these barriers were developed. To ensure direct input from user groups, a category D liaison was set up with the European Blind Union. The TR 62907 of AAL use cases was published in 2014-10. The stage 0 project on AAL has been transferred in the new Technical Area 16 AAL (active assisted living), accessibility and user interfaces.

Note: The change from 'Ambient' to 'Active' Assisted Living reflects the new name of the IEC System Committee AAL which also changed from SEG AAL (Ambient Assisted Living) to now SyC AAL (Active Assisted Living).

In order to use AV and multimedia equipment more easily, wireless power transmission technologies are being developed and implemented in some products. Keeping compatibility between wireless power transmitter and receiving equipment will be an important issue.

Smart phones and tablet terminals are replacing PC as mobile computing devices. Some audio visual and multimedia functions will be covered by TC 100. In addition, wearable devices are being introduced in the market and TC 100 is looking at the technology. Wearable devices are being developed in conjunction with health care related activities for example, and will be addressed in relation to AAL.

Audio and video content files have been stored in local storage devices, optical discs and hard disc drives (HDD) but those functions are very rapidly being taken over to a large extent by cloud storage. The related technology will be addressed in future work.

#### **B.4 Market trends**

Standardization of audio, video and multimedia applications will be continuously refined. The demands for social standardization regarding issues such as the environment, energy efficiency, and accessibility will be on the increase and some standards will therefore be referred by regulatory agencies. Technical experts involved in standards development will become more diverse, not only as engineers from the manufacturer and user communities but also from regulatory agencies. As the audio, video and multimedia market continues to expand, the customers for these standards will also become more diverse as market trends evolve.

##### **- Digital Television receivers**

With the continuation of the analogue-to-digital transition, digital television receivers and set top boxes (STBs) will increase in the market. Digital broadcasting receiver specifications will be standardized and updated.

##### **- 3DTVs**

High-end TV and video products have the capability to provide 3D pictures. At this moment, content is limited to disc media and a few channels in digital satellite broadcasting. However, source content would expand to

personal video by camera recorders and additional broadcasting channels in the future. Unfortunately, the market acceptance of 3DTV seems to slow down and it is unknown how to address 3DTV related issues.

#### - IPTV, Internet TV and connected TV

Some IPTV related specifications have been standardized in TC 100 and other organizations such as ITU-T. As the future style of television, connected TV or smart television are expected.

The research of current and planned connected TV services and products will be necessary. Standardization of the conceptual model and related specifications will come after additional research.

#### - UHDTV

Recently ultra high definition television formats beyond HDTV have been discussed and some of them, so-called 4k or 8k video format, were specified in ITU-R. Accordingly, standardization of related specifications and measuring methods for the products capable of 4k and 8k signal reproduction will be considered.

#### - HD recordings and cloud services

By diffusion of digital broadcasting and broadband network, High Definition (HD) television content will become more readily available. Additionally, audiovisual recording is increasingly processed by software and stored in HDD or memories rather than with hardware and packaged recording media. Furthermore, audiovisual content will be stored and accessed by using cloud service system. The standardization of recording file format, encoding rules for compression systems and cloud service related specifications will be necessary.

#### - Personal Computers

AV and multimedia presentation capability in PC is common in the market and PC related standardizations are required. Measuring methods of power consumption for PC, and interfaces such as USB are expected to be standardized.

#### - Smart phones and wearable devices

Smart phones have capability to enjoy audio visual content and are penetrating very rapidly. Some wearable devices have been introduced in the market. They usually communicate via a smart phone and transmit data for health monitoring. These devices are thus components of a health care system or AAL.

#### - Wireless power transfer products

Wireless power transfer between CE devices are emerging technical trends and some products have been introduced in the market, such as commercial products (smart phone, Wireless Pad and Cover, TV accessory, Wireless charger for 3D glasses, Electric vehicle, On-line electric vehicle) and developed prototypes (Mobile device, Desktop, LED sign board, TV and OLED lighting device).

#### - Networked AV products

Products, which have capability to connect to the home network through Ethernet, will increase in the market, which will enable users to playback content in various situations. Home network protocols and content protection related standards are expected.

#### - Ecological products

Energy efficient products will continue to gather attention in the market. Some report that users will tend to buy low power consumption products even in AV and multimedia. Therefore a measurement method standard of power consumption for AV products will become increasing important.

From an environmental point of view, the disposal of old battery chargers for mobile phones and AC power adaptors for PC's are viewed as social problems. In that regard, specifications for universal battery charger interface and an AC-DC power supply are expected.

## B.5 Ecological environment

Ecological environment considerations are common interests. The focus within the electronics industry, as TC 100 continues to develop standards, is to comply with ongoing IEC standardization strategies. The ecological aspects relating to audio, video and multimedia equipment will evolve with increasing awareness on the disposal of product and efficient energy consumption usage.

In 2005, TC 100 started to develop a standard for methods of measurement for average TV power consumption aiming to highlight energy savings and completed the standardization as IEC 62087 in 2008-10. Subsequently a method of measurement for power consumption for Set-Top Boxes (STB) was revised in 2011 and audio and video parts are under development. Also expected is the standardization of methods of measurement for standby power consumption. To develop such measurement methods and energy efficiency related standards effectively, TC 100 established TA 12 in 2009.

As the analogue-to-digital transition progresses, analogue CRT receiver disposal will increase. With a relatively short life cycle of PC and IT products, recycle and reuse of materials is an important factor. As addressed in B.4, disposal of old battery chargers for mobile phones and AC power adaptors for PC are highlighted as social problems. In that regard, in addition to specifications for a universal battery charger interface, AC-DC power supply is expected.

In addition, one component of Smart Grid which enables reduction of CO<sub>2</sub>, home energy networking will be highlighted. TC 100 has specified a conceptual model for Energy Saving System (ESS) in TA 12. Measuring methods of power consumption in network standby mode will be considered.

## C System approach aspects

TC 100 is a both product committee and a system committee. TC 100 attempts to focus on the customer role as a user of components while also on a supplier role as a developer of common platform, for example, colour gamut standards. TC 100 also takes a supplier role of sub-system to another system.

<b>Component committee (TC 100 role of a customer)</b>	<b>IEC SC 3C</b>	<b>Graphical symbols for use on equipment</b>
	<b>IEC TC 46</b>	<b>Cables, wires, waveguides, R.F. connectors, R.F. and microwave passive components and accessories</b>
	<b>IEC SC 48B</b>	<b>Connectors</b>
	<b>IEC TC 86</b>	<b>Fibre Optics</b>
	<b>IEC TC 110</b>	<b>Flat panel display devices</b>
	<b>ISO/IEC JTC 1/SC 23</b>	<b>Removable Digital Storage Media Utilizing Optical and/or Magnetic Recording</b>
	<b>ISO/IEC JTC 1/SC 25</b>	<b>Interconnection of IT equipment</b>
	<b>ISO/IEC JTC 1/SC 29</b>	<b>Coded Audio, Picture and Multimedia/Hypermedia information</b>
<b>System committee (TC 100 role of supplier)</b>	<b>ISO TC 42/WG 18</b>	<b>Photography/Digital imaging</b>
	<b>ISO TC 130</b>	<b>Graphic technology</b>
<b>Others (System to System)</b>	<b>ISO/IEC JTC 1/SC 25</b>	<b>Interconnection of IT equipment</b>
	<b>TC 9</b>	<b>Railway systems</b>



TC 100 will investigate the role of TC 100 in the system such as Electric Vehicle, Smart Grid, Smart Community and AAL. TC 100 actively contributed to the establishment of the new IEC System Committee SyC AAL.

#### **D Objectives and strategies (3 to 5 years)**

Two major objectives of TC 100 standardization are:

- to enrich human life with entertainment provided by audio, video and multimedia in home and networked environment; and
- to contribute to society by pursuing energy efficiency and by addressing the options for accessibility and usability in the use of audio, video and multimedia equipment.

In the field of home network application for the next three to five years, IP networking technology will be adopted broadly and the standardization utilizing IP technology will increase in areas such as DLNA and IPTV. The term "home" will be extended to include an automobile environment that will rely on IP networking and wireless technologies. Issues such as the protection of private information will become an important area. TC 100 will address issues related to multimedia security standardization. TC 100 will also address high quality content such as HDTV, home theatre and digital cinema which will become increasingly popular as will be the need to develop multimedia quality evaluation standards.

To respond to the expectation for the enrichment of human life, each TA is setting the following strategies:

- TA 1: Digital TV receiver specifications for corresponding regions have been revised according to the progress of technology. IEC standards should be reviewed in accordance with the revision. Countries with newly introduced digital broadcasting will reference these standards and existing standardization may affect the selection of respective broadcasting systems. This standardization will be beneficial for the manufacturers and finally for end-users.
- TA 2: The increasing popularity of large gamut and high dynamic range content and displays will continue to increase the importance of multimedia colour management standards. While TA 2 believes it is well positioned to meet market needs, it should be recognized that TA 2 is addressing a market with rapid technology change. The strategy of TA 2 is to develop and maintain standards related to large gamut and high dynamic range contents and displays to meet the objectives to enrich human life with entertainment provided by video and multimedia in home and networked environments.
- TA 4: TA4 recognizes continued requirements in the market for interface and protocol standards for the interconnection of Audio / Video (A/V) and multimedia equipment and therefore will
  - continue to evolve the 60958, 61937, 61883 and 62379 standards to accommodate new developments in the market for the transport of new A/V streams that are developed by industry. These standards can expect to add additional parts over several years and will require ongoing maintenance during that time.
  - recognize and understand the transition to networked solutions that change the physical layer to technologies such as wireless and adapt the work of TA4 to these new technologies. While many of these new technologies are developed outside of the IEC structure, TA4 will advocate for adopting them as appropriate in the TC100 body of work. The Project Experts have considerable visibility into new work within the relevant industries and can be expected to bring this new work into TC100 in a couple of years.
  - understand the evolution and impact of IP based networking and user-oriented communication protocol within the scope of TA 4 over the next several years and accommodate TA4 related interface and protocol standards to this technology and establish new liaisons as appropriate to facilitate this work.
- TA 5: TA 5 is continuously following the technical development in the area of cable telecommunicating systems and keeping the TA 5 standards up-to-date.
- TA 6: TA6 will continue to develop international publications on storage media, data structures, systems and equipment related to multimedia applications for professional and consumer electronics. These include

standards or guidelines on file format, metadata, and applications related to storage systems and equipment.

- TA 8: The multimedia home server and cloud server market is expected to expand with digital content distribution and management worldwide. There are needs for standardization of new functions and services for home and cloud server systems. TA8 will develop strategies with international publications relating to multimedia home server systems, software specifications addressing the total system connected in the network and interface specifications to cloud server.
- TA 9: TA 9 has recognized the continued requirements in the market for AV and multimedia applications for end-users more commonly thought of as the multimedia devices connected in a home networks and other personal networks. While personal networking is ubiquitous it is not well understood and must deal with a large number of potential applications. TA9 strategically focuses on the multimedia aspects of the network and has strong support from the consumer electronics industry in promoting standardization to allow consumers to find value in their equipment. Multimedia applications have specific usage constraints for the delivery and rendering of content that requires specific knowledge and expertise. Concentration in this area gives TA9 the opportunity to attract high-profile project leaders and experts from industry.

Additionally, TA9 will continue to attract new work items and several proposals have already been identified. The industry recognizes this growing area of technology will require cooperation and TA9 has been active in meeting with contemporaries in JTC 1 including SC25 and in ITU-T. Liaisons with external organizations such as DLNA, ECHONET Consortium and CESI are important to the work of TA9 and new liaisons are actively maintained while additionally pursuing other related liaisons. TA9 continues to encourage active discussions relating to the interoperability of devices within its domain.

- TA 10: As the transition to multimedia e-publishing and e-book from a paper-based culture has begun on a worldwide basis, it is strongly expected to standardize specifications for interoperable multimedia e-publishing and e-book equipment for users and manufactures. In order to meet those requirements, TA 10 will develop International Standards for multimedia e-books, multimedia e-publishing, and the related technologies, including;
  - formats of multimedia e-book content;
  - minimum requirements for multimedia e-book players;
  - user interfaces for multimedia e-book players;
  - e-publishing services; and
  - guidelines for e-book distribution by interchangeable storage media.

TA 10 is expecting international standardization of major e-book format such as EPUB and continues communication with IDPF and related consortium, forum and TCs.

- TA 11: It is expected that the quality of the human life with entertainment provided by audio, video and multimedia will be higher with new standards and technologies provided by each respective TA. Of utmost importance is that standards and technologies of each TA work well together to form an integrated system, therefore a horizontal viewpoint is needed to ensure a high-quality experience for users. TA11 will study quality issues from that viewpoint and develop standards related to quality accordingly. The following issues will be studied: loudness, audio accessibility quality, 3D/high resolution audio quality and high resolution and high dynamic range video quality.
- TA 12: TA12 is dividing 62087 into multiple parts, which will allow continuous and simultaneous improvement of existing energy measurement methods. The new structure will also allow the introduction of new energy efficiency measurement methods in parallel with other efforts. In addition, we foresee the development of new application-level networking standards related to energy efficiency and savings. Publication of the initial parts of a multi-part 62087 standard is expected in early 2015 with development of additional parts continuing until 2017 or later. As HDR video is introduced to the marketplace in 2015 or 2016, new test materials will be required for proper energy measurement.

- TA 13: TA 13 will support the enrichment of human life by our focus on ecological and environmental considerations of audio, video and multimedia applications. Standardization support will be provided for developing ecological products in the worldwide market. Product carbon footprint will be taken as one main work of TA13 to decrease GHG emission. Maintenance will be initiated for the IEC 62075, Edition 2.0 standard, Audio/video, information and communication technology equipment - Environmentally conscious design. TA13 will also communicate with other leading organizations involved in standardization of environmental aspects.
- TA 14: Personal computers as typical multimedia equipment and systems are now essential common tool for various purposes in office, home and other environments. Specifications and requirements are needed for 1) power and control interfaces, 2) methods of measurement for power consumption and energy efficiency, and 3) interoperability with other systems and equipment.
- TA 15: Wireless Power Transfer (WPT) is a technology that enables the transfer of energy from a power source to an electrical load without a physical interconnection such as a wire. Wireless power transmission is useful especially where connecting devices with wires are inconvenient or dangerous. TA15 strategically and continuously follows the technical development of international publications related to WPT for multimedia systems and equipment, and interoperability between the WPT transmitting and the WPT receiving functions
- TA 16: Demographic studies indicate that over the next twenty years the population will age considerably with implications for consumer electronics, information and communication technology. Therefore, TC 100 will ensure that audio, video and multimedia equipment and systems become more accessible by recognizing the needs of an older population and also of individuals with other disabilities not directly attributed to age. The need for AAL, accessibility and user interface developments result not only from demographic changes but also from an increasing desire for convenience and comfort. Accessibility features improve the usability of audio, video and multimedia equipment and systems for "all" people including those with age-related changing abilities or with other temporary or permanent disabilities.

Contributing to society awareness, TC 100 has developed methods of measurement for TV power consumption by using moving video clips as the test material. TC 100 is revising standards not only for TV but also for recorders, audio equipment and others. As home networking connects various pieces of equipment, energy consumption should be considered from the system point of view. Measuring methods in the home network environment will be investigated.

In addition, TC 100 should contribute to Smart Grid related standardization, considering the 'home' as part of the demand side.

Demand for accessibility is increasing in IT and communication equipment and TC 100 will need to consider the options and opportunities for accessibility for audio, video and multimedia equipment. Furthermore Active Assisted Living (AAL) for multimedia system will be investigated.

Considering the demographic shift towards an older society and the increasing needs of people with permanent or temporary disabilities, TC 100 established a new TA on Active Assisted Living (AAL), accessibility and user interfaces for AV and multimedia systems and equipment. The Technical Report IEC TR 62907 collected AAL use cases to evaluate the existing accessibility barriers and develop proposals for new technologies to overcome these barriers. To ensure direct input from user groups, a category D liaison was set up with the European Blind Union. TA 16 will also contribute to the work of SyC AAL.

To respond to the expectation for this contribution to society, each TA is setting the following strategies:

- TC 100: AGS formed Study Sessions (SS) to discuss specific standardization theme in TC 100 deeply. AGS formed Study Session on AAL and user interface which resulted to establish TA 16. AGS will continuously seek for standardization themes for society. AGS is watching the movement of smart cities especially focusing on smart home and smart education.
- TA 1: Television receivers connected to the external network are expected to offer new options for accessibility.
- TA 2: Issues related to energy efficiency and multimedia security are out of scope of TA 2 at this moment.

- TA 4: Develops more flexible and faster interconnectivity among digital A/V equipment and systems. Reflects additional functions on existing audio/video codec protocols.
- TA 6: To develop documents on file-based systems and equipment for its efficient operation and the improvement of interoperability.
- TA 8: Improving the usability of digital content in homes and in communication with cloud servers is very important. TA8 will develop well-balanced solutions between content management and user convenience. It facilitates online content distribution business under the proper control. Also TA 8 will develop application standards for the ease of user operation.
- TA 9: TA 9 will research the applications to save energy in home-networks.
- TA 10: The method of measurement of power consumption for e-book players is expected.
- TA 11: Energy efficiency and accessibility are important aspects of quality. TA11 will develop quality standards for systems and equipment taking into account the need for energy efficiency and the potential for accessibility in equipment and system designs.
- TA 12: TA12's core mission is to develop energy related standards for audio, video and multimedia systems and equipment. TA12's standards are currently used by manufacturers to develop and test products, and by policy makers to reward energy efficiency and to remove inefficient products from the market.
- TA 13: TA13 will develop strategies for standardization of environmental considerations, based on an ongoing evaluation of industry need.
- TA 14: Though there are many de facto standards in Personal Computer products, TA14 believes that IEC standards help the worldwide recognition and advance the application of standards which TA14 develops. TA14 also tries to reduce electronic waste by pursuing energy efficiency and addressing power and control interfaces, methods of measurement for power consumption.
- TA 15: TA 15 will consider the framework, management, measurement and methodologies for assessing energy efficiency for WPT applications
- TA 16: TC 100's obligation includes caring about the planet and humanity. Worldwide demographic studies show an increasing elderly population which will drive the market for AAL and support for long term health care. Given the challenge of the ageing population, the usability and accessibility requirements of elderly and disabled people must be taken into account in the standardisation work. This aspect is taken into consideration in the newly established TA 16 AAL, accessibility and user interfaces. The development of accessible and human friendly solutions for the elderly and disabled also considers the context of active assisted living (AAL) allowing elderly people to stay independent, safe and healthy in their own homes. These elderly people may need some assistance for e.g. communication, e-health services and tele-monitoring. Audio, video and multimedia equipment and systems combined with e.g. service robots and smart homes can support elderly people and people with permanent or temporary disabilities independent of their age.

## **E Action plan**

To achieve the objectives above, TC 100 and individual TAs will proceed with the following actions:

- Reorganize TA structure, merge, disband and establish TAs. TC 100 AGS and AGM will discuss the new TA structure in every meeting and recommend to TC 100..
- Join and contribute to discussion in IEC SMB SEG 1 Smart Cities, SyC Smart Energy, SEG Low Voltage DC distribution, SyC AAL and SG 6 (Automobile electronics) with, in some cases, the relevant Task Groups established under AGS.
- Continue strengthening liaison with ITU-T and JTC 1 possibly for IP home networking application and other general issues. A high level meeting among ITU-T, JTC 1 and TC 100 was held in 2008-11. TC 100 will continue the communication with those organizations through ITU-T, JTC 1 and TC 100 high level adhoc meetings.

In each TA, the following action plans are drawn up:

<p><b>TA 1</b></p>	<p>Digital TV receiver specifications will be created and revised according to the progress of technology.</p> <p>The progress of technology will be reviewed in TA 1 meeting which will be held in conjunction with plenary every year.</p>
<p><b>TA 2</b></p>	<p>The following action plans are drawn up:</p> <ul style="list-style-type: none"> <li>• In the light of wider applications of IEC 61966 series on colour measurement and management, to develop a part on metadata specification including colour gamut identification as IEC 61966-12;</li> <li>• To develop digital test chart files for evaluation of colour gamut of displays and colour encodings; and</li> <li>• To meet demand and requirement of industry, to maintain IEC 61966 series standards as appropriate;</li> </ul> <p>to meet the objectives to enrich the human life with entertainment provided by video and multimedia in home and networked environment.</p>
<p><b>TA 4</b></p>	<p>TA4 will implement its strategy by reflecting requirements and trends in relevant market and new technologies, the continued use of electronic tools including IEC collaboration tools, timely project reporting with noted milestones, continually recruiting motivated project leaders and experts and identifying new work areas. TA4 will also continue the successful model by holding yearly project meetings jointly with liaison organizations when appropriate for specific projects.</p> <p>Specifically</p> <ul style="list-style-type: none"> <li>• all projects to use the IEC collaboration tools.</li> <li>• all projects to provide bi-annually updates for the AGM, TA4 meeting and TC100 plenary.</li> <li>• maintain contacts within industry to identify and encourage new project works into TC 100</li> <li>• will review the scope and title yearly to insure continued relevance</li> </ul>
<p><b>TA 5</b></p>	<p>TA 5 publishes the IEC 60728 series of standards covering the requirements for technical performance, safety and EMC of cable networks for audio, video and multimedia services. The main task of TA 5 is to keep this series up-to-date by reviewing the multi-part document continuously and publishing amendments and revisions when necessary. Also new parts are developed and published when necessary.</p> <p>To support the standards users TA 5 also publishes Technical Reports.</p>
<p><b>TA 6</b></p>	<p>TA6 will continue the ongoing activities and work on potential future projects based on the strategies stated in section D.</p> <ul style="list-style-type: none"> <li>• Study on future time labeling for digital environment The intention is to develop potential IEC documents based on the ongoing standardization work in SMPTE regarding synchronization and time labelling.</li> <li>• Encoding guidelines for professional tape-less camera recorder: Following the publication of the technical report, continue to develop technical specifications of MXF file format in use by professional tapeless camera recorders to</li> </ul>

	<p>ensure interoperability.</p> <ul style="list-style-type: none"> <li>• Audio Archive for longevity for multi-media use The development of audio archive system standards using DVD as storage format, and an appropriate guideline for storage and reliability of archived contents is underway. The intended development target is 2015-06. In addition, using the other archive medium such as BD will be considered.</li> <li>• Audio file format Standardization of audio file format (BWF) based on the revised AES-3 standard</li> <li>• The other possible standards may also include the following topics: <ul style="list-style-type: none"> <li>- More high resolution video and audio recording/play back equipment</li> <li>- Any new storage medium for video camera recorders on product basis</li> </ul> </li> <li>• Liaison Continue close liaisons with SMPTE, JTC 1/SC 23, SC29, and AES</li> </ul>
<b>TA 8</b>	<p>TA8 will develop application standards for the expansion of content distribution market and the ease of user operation.</p> <ul style="list-style-type: none"> <li>• File allocation system with minimized reallocation: The standards would help to increase free space of storage capacity and system performance by providing the data structure and the section management on file allocation system for multimedia home server. The target for IS is 2015-04.</li> <li>• Stress free content management: Users have multiple devices and utilize the various digital content such as photos, music, movies and e-books on their devices. The standards enable the visualization on all their digital content which is separately stored on the various devices and the easy way to find the desired content. The target for IS is 2015-05.</li> </ul>
<b>TA 9</b>	<p>TA 9 will continue to develop and implement its strategy by frequent use of electronic tools including the IEC collaboration tools, timely project reporting with included milestones, continually recruiting motivated project leaders and experts and identifying new work.</p> <p>Specifically</p> <ul style="list-style-type: none"> <li>• all projects to use the IEC collaboration tools within the next year.</li> <li>• all projects to provide bi-annually updates for the AGM, TA 9 meeting and TC100 plenary.</li> <li>• maintain contacts within industry to identify and encourage bringing new work into TC100</li> <li>• will review the scope and title yearly to insure continued relevance</li> <li>• maintain continued communications with JTC 1, ITU-T and other liaisons.</li> </ul>
<b>TA 10</b>	<p>Transition to multimedia e-publishing and e-book from paper based culture has begun on a worldwide basis. Needs for interoperable multimedia e-publishing and e-book formats and equipments are increasing.</p> <ul style="list-style-type: none"> <li>• Ongoing project Printing specification of texture map for auditory presentation of printed texts (PT</li> </ul>

	<p>62875) will ensure the correct printing of texture maps (IEC 62665).</p> <ul style="list-style-type: none"> <li>• Maintenance projects Two publications, e-dictionaries (IEC 62605) and Texture map (IEC 62665) will be revised.</li> <li>• EPUB format EPUB is a major e-book format in the world and has been approved at JTC 1 as a Technical Specification. TA 10 will send expert to JWG meeting planned by JTC 1 SC 34 in May 2015, Beijing, China..</li> <li>• Future projects The development of following items will be progressed: <ul style="list-style-type: none"> <li>- Digital sheet music (TR)</li> <li>- Raster-graphics image-based E-books (IS)</li> </ul> </li> </ul>
<b>TA 11</b>	<p>TA11 will develop standards of quality for systems and equipment. This requires a study of both consumer and professional electronics products and systems, and study of technologies that content providers employ. TA11 will maintain liaisons with related organizations and expects the following works to be standardized;</p> <ul style="list-style-type: none"> <li>• Loudness and audio accessibility quality</li> <li>• AV synchronization and lip-sync</li> <li>• Sound field quality of multi-channel environment and high resolution audio</li> <li>• Quality of high resolution and dynamic range video</li> </ul>
<b>TA 12</b>	<ul style="list-style-type: none"> <li>• TA12 is splitting 62087 into a multi-part document, allowing parallel development of power consumption measurement standards for AV products. Initial publication is expected in early 2015.</li> <li>• TA12 is also open to standards for additional product types in new parts of 62087. This work is expected to continue through 2017 and beyond, potentially including video content updates to support HDR video.</li> </ul>
<b>TA 13</b>	<p>TA13 will develop standards for environmental conscious design for audio, Video, and multimedia systems and equipment.</p> <ul style="list-style-type: none"> <li>• TA13 will assess maintenance needs for 62075 Ed.3. This standard is environmentally conscious design for Audio/Video, information and communication technology equipment. Assessment process to start in 2014.</li> <li>• TA13 plans to enhance TR62921 "Quantification methodology for greenhouse gas emissions for computers and monitors" first CD 2015 and TR 2016.</li> <li>• TA13 plans to participate in a JWG with ISO TC130 to develop an IS for quantification and communication to calculate the carbon footprint of e-media. Timing is to be determined by ISO TC130.</li> <li>• TA13 plans to develop NWIP for determination of no load power and average efficiencies of active mode for external power supplies. Start in 2015.</li> </ul>
<b>TA 14</b>	<p>TA14 will develop standards to meet the requirements in computing products by collaborating with the related organizations.</p> <ul style="list-style-type: none"> <li>• DC power supply for notebook computer TA14 will try to specify interoperability on notebook common charging to address electric waste and technical challenges described in IEC/TS 62700 Ed.1. Project team will revise the Technical Specification in 2016-02.</li> <li>• Universal Serial Bus interfaces for data and power TA14 will facilitate worldwide recognition on USB interface in collaboration with USB Implementers Forum. IEC 62680 will be reorganized in 2015-01 and updated</li> </ul>

	<p>on the basis of the USB original specifications. Its activity helps the reduction of electric waste.</p> <ul style="list-style-type: none"> <li>Measuring energy consumption of personal computing products</li> </ul> <p>TA14 contributes to the advancement and adoption of the standards through its relationship with Ecma International. IEC 62623 will be revised to follow global regulatory activities by 2016-02.</p>
<b>TA 15</b>	<p>TA15 will develop international publications related to wireless power transfer (WPT) for multimedia systems and equipment, and interoperability between the WPT transmitting and the WPT receiving functions.</p> <ul style="list-style-type: none"> <li>a Framework of Standards whereby WPT common elements and WPT technology-specific elements are coordinated;</li> <li>WPT system specifications, requirements, functional architectures, interfaces and the corresponding services, management and power control protocols for device-level and system-level operations;</li> <li>methods of measurement of power consumption and energy efficiency for WPT devices, equipment and systems.</li> </ul>
<b>TA 16</b>	<p>TA 16 will develop international publications addressing aspects of active assisted living (AAL), accessibility, usability and specific user interfaces related to audio, video and multimedia systems and equipment within the scope of TC 100 including:</p> <ul style="list-style-type: none"> <li>Requirements for accessibility and usability related to audio, video and multimedia systems</li> <li>Requirements for systems and equipment for Active Assisted Living</li> <li>Interfaces, protocols and control mechanisms for systems and equipment for Active Assisted Living</li> <li>User interfaces for audio, video and multimedia systems and equipment</li> <li>Maintaining current publications including IEC 62731, IEC TR 62678 and ISO/IEC PAS 62883</li> </ul> <p>Continue to work on TV Accessibility in PT 62944 to define a set of principles and provisions for user interface and content accessibility. Any further work resulting from the newly established IEC SyC AAL will be handled by TA 16 as well as for IEC SG 7 robotic technologies for the particular use case of service robots.</p>

## F Useful links to IEC web site

[TC 100 dashboard](#) giving access to Membership, TC/SC Officers, Scope, Liaisons, WG/MT/PT structure, Publications issued along with their Stability Dates, Work Programme and similar information for SCs, if any.

Name or signature of the secretary

*Tadashi Ezaki*