



annual report

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World Class Standards

World Class Standards

ETSI is a producer of globally applicable standards for Information and Communications Technologies (ICT), including fixed, mobile, radio, converged, broadcast and Internet technologies. The high quality of its work and its open approach to standardisation has seen its reach extend from European roots to circle the world.

ETSI is officially recognised by the European Union as a European Standards Organisation. Its activities are driven by time to market and its standards help ensure the free movement of goods within the single European market, allowing enterprises in the EU to be more competitive.

ETSI is a not-for-profit organisation with more than 700 member organisations worldwide, drawn from 62 countries and five continents. Members include the world's leading companies and innovative R&D organisations.

ETSI is at the forefront of emerging technologies. It is building close relationships with research bodies and addressing the technical issues that will drive the economy of the future and improve life for the next generation.

ETSI is a world-renowned organisation with a solid reputation for technical excellence. It makes its expertise in interoperability available to its Members and customers through a range of services for growing ideas and enabling technology.



ETSI has always been quick to respond to market demand and is today at the forefront of some of the latest technologies. We are emerging as a leading player in the Future Internet, standardising various technologies which integrate 'smart objects' into the communicating network of the Internet of Things – including RFID (Radio Frequency Identification), Machine-to-Machine communications (M2M) and wireless sensor networks.

For example, with its need to support diversified services with a vastly expanded use of wireless access, the Future Internet will increase the strain on already overstretched network resources. So we have instigated new work on Reconfigurable Radio Systems to make the most of scarce spectrum availability.

In 2010, we saw major achievements in our traditional areas of expertise such as mobile telecommunications, Next Generation Networks, human factors and security. But our reputation is now expanding into new territories including Intelligent Transport Systems, M2M and Media Content Delivery.

ETSI has been working actively with the European Commission on a moderate reform of the European Standardisation System (ESS), keeping the fundamental structure but adapting to the changing needs of the Information and Communications Technologies (ICT) industry. These changes are fully in line with ETSI's structure as a membership-driven organisation combined with the strengths of the ESS.

Dirk Weiler
Chairman of the General Assembly



In one way or another, ETSI's standards touch everyone. We are working, for example, to ensure the benefits of ICT are accessible to all, on improving the quality of telecommunications services for users, protecting individuals and making the digital world secure.

We are also concerned for the environment. Technological progress has had an enormous positive impact through new products, applications and services; it has also impacted negatively in the shape of the increased energy consumed.

However, while ICT create a demand for energy, they can also offer the means to reduce consumption. ETSI is actively committed to identifying energy efficiency solutions, including reducing the energy consumption

of individual items of equipment, improving delivery architectures and further developing the services provided.

We are working in support of various European Commission Mandates, addressing 'smart metering', enhancing energy efficiency in ICT equipment and networks, and providing standards to measure environmental impact. Our work on Intelligent Transport Systems includes efforts to reduce CO₂ emissions and fuel consumption, and we are employing our world-renowned expertise in human factors and transmission quality to improve videoconferencing services as part of the 'Green Agenda for Business'. ETSI's standards make the world a better place to live.

Mike Walker
Chairman of the Board



During 2010, I have become increasingly aware of a phenomenon that I call a 'new merger'. It seems to me that traditional ICT industry players are coming into the web arena – such as hardware suppliers moving into web applications – and the web industry is going into the ICT business with, for example, Internet companies offering mobile phones or IP telephony. The strategies for standardisation in these two fields are quite different – formal versus informal – and we have to position ETSI effectively in this emerging market.

In addition, we are seeing research results impacting the Internet of the Future, as is becoming evident in M2M applications.

A parallel trend exists in many vertical industries, where ICT is a key enabler to ensure future competitiveness. Intelligent Transport Systems, aeronautical and railway technology, Smart Grid applications and eHealth are just some examples. Equally, the whole broadcasting industry is in a process of change, with IPTV in particular developing rapidly.

We are embracing this potential, and the range of our work has widened to accommodate it. 2010 has seen ETSI successfully address these new trends, with an approach which supports the whole ICT industry, as well as end-users, by providing the standards necessary to create competitive products and services for global use.

Walter Weigel
Director-General

Adapting to a Changing World – An Overview of 2010

In today's ever-changing world, ETSI is responding to the challenges and taking up the opportunities offered by new technological developments. We have intensified our links with academia and research bodies, to widen our horizons and bring research and standardisation together. In the last four years we have established 15 new activities, and we have introduced the Industry Specification Group as a fast track mechanism for the creation of standards; the first 'Group Specifications' were published in May 2010.

Future Technologies

To enable Machine-to-Machine communications (M2M), we are developing an end-to-end architecture to support multiple applications, we are addressing the European Commission's Mandate 441 on 'smart metering', and we are developing SIM cards specifically for M2M applications.

In Intelligent Transport Systems (ITS), we focussed in 2010 on the standardisation to enable co-operative ITS. We reached a milestone in our work on Cloud and Grid computing with the publication of an ETSI Technical Report on the standardisation requirements for interoperable Cloud services, and we have begun new work on Reconfigurable Radio Systems to maximise spectrum usage.

We are addressing Media Content Delivery, and we made a breakthrough in 2010 in the convergence between broadcast and broadband delivery of entertainment with the completion of the specifications for 'hybrid broadcasting'.

In April 2010, we completed the standardisation related to CAT-iq 2.0 (Cordless Advanced Technology – Internet and quality) for Digital Enhanced Cordless Telecommunications (DECT™). CAT-iq brings together broadband Internet and telephony, allowing standard DECT phones to be used for Voice over Internet Protocol (VoIP) and other Internet-based services such as streaming audio and video.

Achievements in mobile telecommunications

Whilst we have been recognised as a key player in future technologies, our traditional areas of expertise continued to progress smoothly in 2010. More than 4 billion end-users are using products based on our mobile telecommunications standards, and we are one of the founding partners of the Third Generation Partnership Project (3GPP™). In 2010, 3GPP's LTE™-Advanced specifications were accepted for IMT Advanced (generally regarded as the definition of 4th generation mobile telecoms) and will be submitted formally to the International Telecommunication Union in 2011. LTE-Advanced is expected to become the IMT Advanced technology of choice for the vast majority of the world's operators.

Improving the quality of life

Much of our work is aimed directly at making the world a better place to live. In 2010 we made significant progress towards ensuring that Information and Communications Technologies (ICT) are accessible to all, in improving the quality of telecommunications services for users, and in energy efficiency. Our security work is crucial to all aspects of the Information Society, and we have taken a leading role in the specification of the European Public Warning System (PWS).

The central role of testing and interoperability

Ensuring interoperability is an integral part of the ETSI standardisation process, and we have pioneered the use of validation and testing for this purpose. For example, we developed Testing and Test Control Notation version 3 (TTCN-3) which, in 2010, celebrated its tenth successful year in use all over the world. We organised various interoperability events throughout the year, including our very popular Plugtests™ events, which allow companies to validate their prototypes with regard to harmonisation and interoperability, at the same time providing valuable feedback to the ETSI standardisation process.



ETSI's global influence

Despite the continuing world-wide economic crisis, ETSI Membership remained constant in 2010 (indeed it rose marginally). The world's leading telecom companies are all members of ETSI and they come from 62 countries on five continents. The upward trend in the number of universities and research bodies in Membership continued, and we have taken steps to further increase participation from Small and Medium-sized Enterprises (SMEs).

Collaboration with other organisations, including fora and consortia, is crucial to reduce fragmentation in standardisation and to address the convergence of technologies. We now have about 80 strategically important co-operation agreements, including partnerships with the main players in the developing markets of China and India.

Record standards production

In 2010 we surpassed all our previous publication records; we produced over 3 000 standards, specifications, reports and guides – a total of almost 27 000 standards since our establishment in 1988.

... and very much more

These highlights of 2010 only scratch the surface of what has been achieved during the year. Our continuing success is even more significant, given that industry nowadays can choose quite freely where it wants to standardise a technology. The fact that ETSI remains the standardiser of choice for both traditional and emerging ICT is testament to our experience, our expertise and our ability to adapt to a changing world.

In at the Beginning

ETSI is committed to pre-standardisation activities. This enables us to identify areas for standardisation at an early stage in a technology's development. We thus seek to attract new standardisation groups, we maintain links with R&D projects and we organise workshops on innovative topics.

New technologies and applications are emerging from the convergence of Information and Communications Technologies (ICT) and the Internet. ETSI is harnessing this potential, and the range of our work has widened in recent years. Links with academia and research results from, for instance, projects funded under European Commission (EC) Framework Programme 7, have fuelled this development, as we seek to ensure that standardisation and research advance hand in hand.

In 2008, we introduced a new standardisation mechanism – the Industry Specification Group (ISG) – to accelerate the production of standards in key new technological areas. Rapid progress has indeed been made. The first 'Group Specifications' were published in May 2010; a total of 11 were published during the year. We currently have six active ISGs.

The Open Radio Equipment Interface

The newest ISG – on Open Radio Equipment Interface (ISG ORI) – was launched in May 2010 to create an interface specification that will enable interoperability between the different elements of mobile radio base stations. The use of distributed Radio Equipment can lead to significant cost savings for a mobile operator, and offers more flexibility in network design and deployment. ISG ORI is strongly supported by the NGMN Alliance, and leading mobile network operators and telecom equipment vendors from all over the world have become founding members.

ETSI Standards Kick-start the Football World Cup

ETSI's ISG QKD is developing Quantum Key Distribution (QKD) as a new method of communication security. QKD provides a theoretically secure solution for Internet Protocol (IP) traffic, using keys made up of quantum particles. This means that anyone trying to tap into the information feed would have to break the established laws of quantum mechanics to intercept the information without being noticed.

The Group published five specifications in 2010. One of the first applications of QKD in the field was as an integrated part of the metropolitan optical fibre network in Durban, South Africa, where it was used to support communications for the 2010 FIFA World Cup. The quantum stadium project was the first public global event to use a quantum-based encryption solution – and provided excellent proof that it really is possible to move a completely new technology out of the laboratory and into the business environment.

The Internet of the Future

ETSI's other ISGs are all concerned with standardising parts of the Internet of the Future:

- **ISG on Autonomic Network Engineering for the Self-managing Future Internet (AFI)** – establishing a common

understanding of autonomic behaviour and how an autonomic/self-managing network should be engineered, and developing specifications and engineering frameworks that guarantee interoperability.

- **ISG on Measurement Ontology for IP traffic (MOI)** – developing information models and requirements and ontologies architecture for IP traffic measurement.
- **ISG on Mobile Thin Client (MTC)** – addressing the concept where applications are executed on remote server farms and input and output from and to the applications are delivered through the network to the mobile thin client, developing ETSI pre-standards and specifications for mobile computing environments and platforms based on the thin client computing paradigm.
- **ISG on Identity and Access Management for Networks and Services (INS)** – producing specifications for the application of identity and access management to networks and services.

The ISGs draw upon the strengths of ETSI's established processes and tools, and the Institute's industry-leading Intellectual Property Rights regime. They have already demonstrated their effectiveness in getting R&D interests involved in standardisation.



ETSI Business Innovation Summit

The second ETSI Business Innovation Summit, entitled 'ICT Revolutionising the World of Transportation', was held in October 2010 in London. These annual events provide a platform to discuss how, with the help of standardisation, new technologies can be transformed from innovative ideas into compelling market solutions. Preparations are already under way for the third summit, on 'Wireless Network of the Future', which will be held in October 2011.

Hell's Kitchen

Following a 'Hell's Kitchen' session in March 2010, we began several initiatives to analyse the standardisation landscape and identify future activities to meet the requirements of industry, policy and regulatory authorities. As a result, we have adopted Smart Grids as one of our 'strategic topics' and we organised a Smart Grids scoping workshop in June 2010 to discuss our role, strategy and tactics for Smart Grids standardisation.

The Internet of Things

The Internet is an enormous success in terms of connecting people and communities and increasingly supports the functioning of both the economy and society. However, today's Internet was designed in the 1970s to support communication between computing systems for communities of technically expert users. The paradigm shift in society and the opportunities enabled by new technological advances in devices make new demands on the Internet. The Future Internet will enable a multitude of new applications and open up new markets.

In the not too distant future, objects will have a unique way of identification, the capacity to address each other and verify their identities. Billions of machines and objects will be able to exchange and, if necessary, actively process information. This is the Internet of Things – “a world-wide network of uniquely addressable and interconnected objects, based on standard communication protocols”.

ETSI is standardising various technologies which integrate these 'smart objects' into a communicating network. These include RFID (Radio Frequency identification), Machine-to-Machine communications (M2M) and wireless sensor networks. Co-ordinated international standards will be essential to guarantee the interoperability and openness of the Internet of Things.

ETSI is emerging as a leading player in the growth of the Future Internet. We continue to provide advice and assistance at the Future Internet Assembly and Future Networks Cluster meetings, and a member of our Secretariat co-edited the European Commission's book, 'Vision and Challenges for realising the Internet of Things', which was published in April 2010.

Machine-to-Machine Communications

Our Machine-to-Machine Communications Technical Committee (TC M2M) is developing an end-to-end architecture to support multiple M2M-type applications. Potentially there could be many millions of connected devices, varying from highly-mobile vehicles communicating in real-time to immobile meter-reading appliances sending small amounts of data sporadically.

Many disjointed component-level standards have already been created in past standardisation, addressing various radio interfaces, different meshed or routed networking options, or offering a choice of identity schemes. Each is optimised for a particular application scenario. TC M2M aims to bring all these pieces together, and to fill the standardisation gaps, providing an end-to-end view of Machine-to-Machine standardisation needs. In response to pressing market needs, we produced the first M2M Technical Specification (TS), dealing with service and architecture requirements, in August 2010. The first full release of M2M specifications is expected to be completed by the end of 2011.

We are preparing a Technical Specification of M2M functional architecture, covering all the new functionality (service capabilities) required to support M2M services, identification of the new interfaces required and the overall data model. In particular the specification also includes a security solution appropriate to M2M service needs. Work also progressed well in 2010 on the first detailed specification of the necessary interfaces, in the form of a formal definition of the Application Programming Interface (API) and of the required parameters.

The main gap currently being addressed is the development of a 'horizontal' platform which is application-agnostic but which, with its evolved functionality, is capable of supporting a very wide range of services, including smart metering, eHealth, city automation, consumer applications and car automation. We are preparing 'use cases' for each of these five areas, which will eventually be used to verify the specification. The first report, on smart metering, was published in May 2010; work continues on the other four.

Our work on smart metering supports the European Commission (EC) Mandate (M/441) for the creation of European standards to enable the interoperability of utility meters (for water, gas, electricity, heat). The aim is to improve customers' awareness of actual consumption and thus lead to a reduction in energy usage.

In parallel with developments in TC M2M, we are addressing spectrum needs for the smart metering of utilities for the home, and the Third Generation Partnership Project (3GPP™) is reworking its specifications so that its technology can be used in smart meters.

The first ETSI M2M workshop was held in October 2010 in Sophia Antipolis, France. With over 220 participants from all over the world, this proved to be the most popular ETSI workshop to date. This high level of interest reflects both the enormous potential that is foreseen for M2M applications and technologies and also ETSI's leading role in the standardisation of M2M. A second workshop is being planned for October 2011.

ETSI in China

ETSI was a key sponsor of the Global Internet of Things Technology Conference (GIOTC), held in Beijing in November 2010. Organised jointly by ETSI and the Beijing Internet Institute, the event attracted over 250 participants and speakers from around the world – from both industry and administrations, including policy-makers, ministries and the European Commission. Several Chinese companies requested further information about our work on M2M, Smart Grids and the Internet of Things, and expressed a desire to work with ETSI.

ETSI has also joined the new Internet of Things Joint Expert Group, and is involved in the EU-China regulatory dialogue.



Exploiting Powerline Telecommunications

Powerline Telecommunication also has implications for smart metering. In response to Mandate 441, our Powerline Telecommunications Technical Committee (TC PLT) is working on a specification for powerline networks using low voltage and possibly medium voltage communications between the electricity companies and meters in the home to increase consumer awareness of their electricity consumption in real-time. The benefits of smart electricity meters could be considerable; studies suggest that 10% of power might be saved if consumers were aware of how much they were using.

Activities are also ongoing on a specification for wideband low rate Command and Control PLT for in-home networks, which will address applications such as in-home energy efficiency and saving and load control in home applications.

New work is now being considered on the feasibility of Multiple Input Multiple Output (MIMO) PLT to improve performance. This is an innovative area not currently being addressed by any other standards body. The future digital home will share rich content such as HD and HD 3D video everywhere. Current wireless and wireline technologies do not provide the required reliability and coverage. An ETSI Specialist Task Force began work in September 2010, studying how to improve the performance and coverage of the current PLT systems utilising Single Input Single Output (SISO) technology by using MIMO.

RFID

The sheer ubiquity of connected devices will create a whole set of novel applications where sensors and Radio Frequency Identification (RFID) will play a central role. Sensor networks using technologies such as RFID and M2M communications have entered the wireless factory too. These bring a potential for extensive rationalisation and cost savings but also pose a variety of integration, synchronisation and interworking/ interoperability issues. The use of RFID in retail is also growing fast, and it is a contributing technology in the Internet of Things, impacting on banking, identity, authorisation etc. Our aim is to ensure that, as this interconnected world evolves, standards will be there to secure it. Among other things, we are addressing privacy and protection issues.

Our Electromagnetic Compatibility and Radio Spectrum Matters Technical Committee (TC ERM) is addressing spectrum issues related to RFID, specifically co-existence between UHF RFID

and Extended GSM-R (ER-GSM, GSM™ on the railways). A specification on appropriate Detect-And-Avoid (DAA) (or equivalent) mitigation techniques for RFID-implemented technologies at UHF, which will facilitate the operation of RFID with other technologies, was almost completed by the end of 2010. A specification outlining compliance tests for the DAA (or equivalent) mitigation mechanism is being drafted.

In parallel, we are examining the need for additional spectrum for RFID, Short Range Devices (SRDs) and Smart Metering, with the aim of improving the efficiency of the delivery of utilities, including electricity, to consumers.

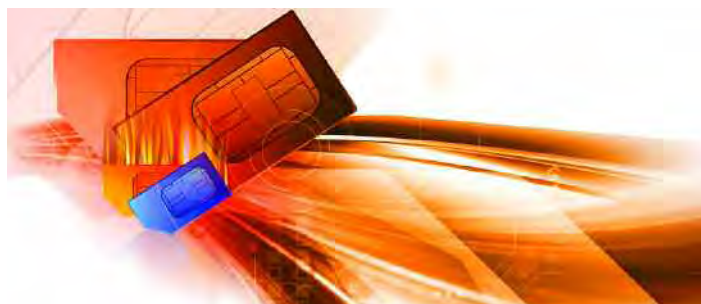
Cloud Communications

ETSI is addressing issues associated with the convergence between IT and telecommunications in scenarios where connectivity goes beyond the local network. This includes not only Cloud computing but also the emerging commercial trend for ubiquitous network access to scalable computing and storage resources. The target is to evolve towards a coherent and consistent general purpose infrastructure which will support networked IT applications in business, the public sector and academic and consumer environments.

2010 marked a milestone in our work on Cloud and Grid computing with the publication of an ETSI Technical Report on the standardisation requirements for interoperable Cloud services.

Smart Cards

ETSI is also looking at the implications of M2M for smart cards. 'Standard' SIMs have been used for specific M2M applications such as metering and device tracking for some time. Other applications may, however, require special functionality and different hardware properties as well as a new form factor. In 2010 we developed specifications to deal with specific constraints such as data retention, temperature, memory update cycles, vibration resistance and humidity, as well as two new form factors for M2M use, and a specification for the physical and logical characteristics of the M2M UICC was published.



The use of confidential applications was further developed during 2010 to allow third-party applications to be loaded on a SIM and executed within a secure and private environment. This will be of particular interest to mobile Near Field Communications (NFC) and M2M application providers who might often not own (or control) the platform onto which their application is loaded.

ICT – Enabling Business Growth

Information and Communications Technologies (ICT) are an extremely important enabler with a significant influence on future competitiveness in areas such as Intelligent Transport Systems (ITS), Smart Grid applications, aeronautical technology and eHealth. In addition, the whole broadcasting industry is changing, particularly with the rapid development of IPTV.

ETSI is one of the key players in standardising the new convergence of ICT and web technologies on a global scale, enabling the use of ICT in vertical businesses and ensuring quality, interoperability and time to market.

Reconfigurable Radio Systems

The diversified services of the Future Internet will require much greater wireless access, intensifying demand on already overstretched network resources. Reconfigurable Radio Systems (RRS) are intelligent radio devices which can sense – and act upon – their environment. For example, they can adjust for location, time, frequency and other users, and they can scan for unused frequency. They thus open up the opportunity for the sharing of unused spectrum frequencies amongst multiple services and radio networks.

With the forthcoming revision of the Radio and Telecommunications Terminal Equipment (R&TTE) Directive, the use of RRS which affect device certification will be allowed in Europe for the first time. In 2010 ETSI published Technical Reports (TRs) on the concept of Cognitive Radio, spectrum aspects of Cognitive Radio and Software Defined Radio (SDR) systems, and system aspects for public safety usage. A Technical Report is well advanced on television band White Spaces (the areas of spectrum between allocated frequency bands unused by the spectrum owner over a given time in a given location). Work is also progressing well on operator requirements in IMT and GSM™ bands, an SDR approach to RRS handsets, and the costs involved in using RRS in public safety. Specification of the system requirements for appropriate radio technologies can now begin.

Digital Enhanced Cordless Telecommunications (DECT™)

ETSI's DECT specification is the leading standard worldwide for digital cordless telecommunications for both cordless voice and broadband home communication. In April 2010, our DECT Technical Committee completed the standardisation related to CAT-iq 2.0 (Cordless Advanced Technology – Internet and quality). CAT-iq has been developed by the DECT Forum to bring together broadband Internet and telephony and allow standard cordless DECT phones to be used for Voice over Internet Protocol (VoIP) and other Internet-based services such as streaming audio and video. With New Generation DECT successfully integrated into broadband IP networks, CAT-iq certified products can take advantage of IP connectivity for wideband telephony and data-driven applications in the digital cordless phone market. Within six weeks of the work having been completed, before the end of 2010, the first handsets had passed the tests and obtained the CAT-iq 2.0 certificate.

New work initiated in 2010 includes the Ultra Low Energy (ULE) profile, which allows for a battery lifetime of more than five years. Typical applications are sensors used in the home, for example for different types of alarm systems or for meter reading applications. With New Generation DECT, the connectivity to the Internet is already available and the combination with ULE makes DECT an ideal technology for such applications. In addition, combinations of data with speech/audio/video services are possible.

IMS Network Testing

The Internet Protocol (IP) Multimedia Subsystem (IMS) comprises a set of specifications designed to enable network operators to implement IP-based networks to carry services for both fixed and mobile customers simultaneously. IMS thus represents a major step in the evolution of telecommunication networks and their convergence with the Internet.

However this promise of advanced communications over the Next Generation Network (NGN) will only be delivered if those same networks can interconnect. Interoperability is a key issue for boosting the roll-out of IMS and, more specifically, of network interconnection between operators. Thorough testing in practical scenarios is required to ensure operational excellence in a multi-vendor and multi-provider environment. Advanced testing techniques, such as the use of Testing and Test Control Notation version 3 (TTCN-3), which was originally developed by ETSI, can save up to 50% of testing costs and time. We are developing test specifications for the automated testing of IMS core networks, and work aimed at standardising a new methodology and framework for the automated interoperability testing of distributed systems was completed in 2010. The result is a powerful test environment enabling efficient testing without the need for constant de-bugging of the TTCN code.



Content Delivery

Historically, the standardisation of broadcast and telecommunications has followed different paths, to meet differing commercial requirements. Recent developments in the Internet, mobile communications and broadcasting have led to a convergence, in which content delivery has become common ground. Commercial solutions developed by different market players do not currently interoperate across platforms. As a result, content providers face the costly challenge of providing different content formats to the various distribution pipes, whilst customers' buy-in remains below expectations.

ETSI is producing standards and interoperability tools to enable content delivery across various distribution platforms, covering all the major elements of media delivery: the networked home, the content/service provider network, the content delivery network (CDN) and the media content distribution (MCD) flow. The goal is the successful overall development of multimedia systems – television and communication, managed and unmanaged networks – to meet present and future market needs.

Media Content Distribution

Our Media Content Distribution Technical Committee (TC MCD) supports IPTV, web, mobile and broadcast TV. In March 2010, we published a framework for Media Content Delivery, which lays a foundation for the standardisation of MCD solutions to enhance the deployment and profitability of multimedia offerings and improve the consumer experience.

A Technical Report (TR) on 3D gaming graphics delivery was also published, which will assist in the definition of further work.

We are developing the internal architecture of CDNs, which offer the end-user fast access to media content while optimising network resources, and work has begun on their interconnection.

Good progress was made in 2010 on the drafting of two TRs describing current distribution methods.

Broadcasting

ETSI works with the European Broadcasting Union (EBU) and the European Committee for Electrotechnical Standardisation (CENELEC) in a Joint Technical Committee, JTC Broadcast, which defines DVB IPTV standards for technologies on the interface between a managed IP network and retail receivers. In 2010, JTC Broadcast completed the specifications for what some see as the creation of a new form of media, 'Hybrid Broadcast/Broadband' or, more simply, 'hybrid broadcasting'. Hybrid broadcasting combines the broadcast and broadband delivery of entertainment to the end-user through connected televisions and set-top boxes, offering the advantages and features of both delivery technologies.

The JTC also made important revisions of the Multimedia Home Platform (MHP) specifications to facilitate their use by IPTV (managed IP networks) both in Europe and throughout the rest of the world.

JTC Broadcast sets the standards for satellite, cable and terrestrial systems too. The Committee has been working on digital cable networks, facilitating the advance of digital radio broadcasting, the provision of in-home networks, and terrestrial and satellite-terrestrial hybrid systems for broadcasting to handheld devices.

In 2010, specifications were agreed for additional features of the DVB-T2 system, which is the world's most efficient digital terrestrial broadcasting system, and agreement was reached on the specification and implementation guidelines for the most advanced system of digital cable-casting, DVB-C2.

Other important specifications were published for Digital Audio Broadcasting (DAB), which will allow a wider choice of radio stations.

We also provide standards for broadcast and ancillary communication equipment and are currently creating a TR which will define how broadcasters can add digital signals to their existing analogue broadcasts, providing the capability for an eventual transition to digital only transmission. By the end of 2010, work was nearing completion on a European Standard which will allow terrestrial mobile television to provide multimedia multi-cast services, and we had approved a TR to improve the reception of DVB-H services, especially in urban areas, in the lower floors of buildings and when using receivers with integrated antenna. We have also been analysing co-existence issues stemming from the current Digital Dividend Decisions.



IPTV for Next Generation Networks

Our Telecommunication and Internet converged Services and Protocols for Advanced Networking Technical Committee (TC TISPAN) defines the internal architecture of CDNs. TC TISPAN is responsible for the integration of multimedia services in the Next Generation Network (NGN) and is defining two solutions (IMS-based and Integrated) for the integration of IPTV in the NGN architecture. In 2010, the IPTV Release 3 protocol specifications were completed. They include numerous new services such as user-generated content, user recommendations, personalised channel, personal service composition, content personalisation, shared service control, targeted advertising, messaging, push Content on Demand (CoD), advanced Personal Video Recorders (PVRs), IPTV roaming/mobility and media synchronisation. Development of the services and architecture for a CDN for IPTV began in 2010, and security for IPTV is being addressed.

We are also working on speech and multimedia transmission quality in mobile TV and IPTV.

The Road to the Future – Intelligent Transport Systems

Intelligent Transport Systems (ITS) embrace a wide variety of communications-related applications aimed at increasing travel safety, minimising environmental impact (in terms of CO₂ emissions and fuel consumption) and improving traffic management.

Road Transportation

The development of 'co-operative' ITS offers enormous potential through vehicle-to-vehicle and vehicle-to-roadside communication, which could provide driver assistance and hazard warning, emergency services, traffic control, fleet and freight management and location-based services. In 2010, our Intelligent Transport Systems Technical Committee (TC ITS) focussed therefore on the standardisation to enable this.

Key issues addressed in 2010 included local dynamic maps, the classification and management of applications, conformance testing of Co-operative Awareness Messages (CAM) and Decentralised Environmental Notification Messages (DNM), GeoNetworking and mitigation techniques to avoid interference in the 5 GHz band.

The first full set of ETSI standards for co-operative ITS is scheduled for completion by mid-2012, but major milestones were achieved en route in 2010. In particular, an important European Standard (EN) was published which defines the communication architecture for ITS and will form the basis for future standardisation. Three parts of an ETSI Technical Specification (TS) describing various agreed priority facility layers were produced, including specifications for the CAM and DNM services, and a framework for conformance and interoperability testing was published.

Additional application standards are now being developed for vehicle-to-vehicle safety communication, including driver assistance and collision avoidance and intersection collision risk warning. Safety and traffic efficiency application standards are also being drafted.

ETSI is taking a prominent role in the global harmonisation of ITS standards and, in February 2010, held a highly successful workshop on ITS, which attracted over 120 experts from throughout Europe, plus Japan, South Korea and the USA.

We are also working on Ultra Wide Band (UWB) for automotive use, notably in short range radar applications, surveillance radar and vehicle radar, to prevent potential interference with police speed measurements. We are addressing location tracking in automotive and transportation environments.

Aviation

The majority of the work in ETSI's Aeronautical Technical Committee (TC AERO) is undertaken in response to European Commission (EC) Mandates related to the Single European Sky (SES) initiative. This initiative aims to enhance current safety standards and overall efficiency for air traffic in Europe, to optimise capacity and to minimise delays by replacing Europe's traditional, highly fragmented air traffic control structures using greater harmonisation and interoperability.

Compliance with the Interoperability Regulation, one of four primary regulations that comprise the SES initiative, is indicated by conformance with Community Specifications (CSs). TC AERO develops ENs which acquire the status of CSs when published in the Official Journal of the European Union. In 2010 we published the first of these standards, on Airport Collaborative Decision Making (A-CDM). The first standard from a European Standardisation Organisation to be listed as a CS, it will enable improvements to airport operations by ensuring airports, airlines, air traffic control and air traffic flow management (ATFM) exchange relevant and accurate information on time.



The final four parts of a new EN on the Advanced Surface Movement Guidance and Control System (A-SMGCS) were also published in 2010. This standard will ensure the safe movement of vehicles and aircraft on the ground at airports through enhanced surveillance and control functionalities.

In addition, we continue to produce ENs for the design and production of components for the ground-based air traffic management system (communication, navigation, surveillance, airport installations), and we support the European Air Traffic Management Master Plan.

We are also specifying new applications such as air traffic control systems and services for passengers, for example on-board telephony and Internet access. Among recent developments in this area, a new specification is being prepared to limit the power outside an aircraft radiated from the base station system equipment.

Railways

GSM-R (Global System for Mobile Communication – Railway) now reaches 75% of the railway lines in Europe and extends to five continents, including countries such as China, India, Algeria, Turkey and Saudi Arabia. GSM-R became available on both passenger and freight border-crossing trains in 2010. In addition, with the recent extension of the available frequencies in the 1 800 MHz band, countries that cannot access the 900 MHz band are also now implementing GSM-R, including, notably, Australia, which intends to use GSM-R mainly for suburban transport.

ETSI is constantly adding new features to GSM-R to meet growing user demand. In particular in 2010, specifications were produced to improve co-existence between GSM-R and public mobile services, representing an important step towards enhancing interference resilience.

Where Man – or Woman – Meets Machine

Developments in Information and Communications Technologies (ICT) have produced major changes which have worked to the benefit of many – though not all! Most of these innovations were technology-led; many have required costly adaptation after deployment to take account of the social and cultural contexts of the end-users, particularly of those with disabilities. ETSI is working to make products and services simpler to use, safer and more efficient.

In 2010, the emphasis in our Human Factors Technical Committee (TC HF) was on ensuring that developments in technology are accessible to everyone, including the elderly, the young and those with disabilities – ‘Inclusive eServices for all’. Much of this work anticipated the European Commission (EC) Mandate on Design for All (M/473), which was issued in September 2010. Including the Design for All approach – targeting usage for as many people as possible without the need for adaptation – will ensure that industry both meets the needs of many more users and also widens its market potential.

In 2010 we produced an Interaction Technologies Roadmap for the next ten years, identifying those technologies that could present obstacles to elderly people or those with impairments – and we have identified the measures that need to be addressed prior to deployment, to ensure their widespread usability. Our results are presented in an ETSI Guide.

Personalisation is now becoming increasingly significant in the commercial context. We completed work on integrating configurability into products and services in February 2010 with the publication of an ETSI Standard (ES) on user profile content. This work has been applied in various areas including eHealth and Intelligent Transport Systems. An ES, developed in collaboration with our eHealth Project (EP eHealth), was completed in 2010, which will enable users to personalise eHealth systems to meet their individual needs in different situations. It has a particular focus on the sharing of information and privacy issues. We also published a Technical Report on the introduction of ICT products, especially users’ own products such as mobile phones, into a vehicle, and the steps that can be taken to prevent distraction and minimise risk on the road.

Other projects include the use of mobile text telephony over Internet Protocol (IP), with the aim of enabling users who are deaf or hard of hearing to use a standard mobile terminal as a text communication device to communicate with other people.

The User Experience

It is widely recognised that most deterioration in telecommunications Quality of Service (QoS) occurs at the network borders due to insufficient standardisation of the interfaces. In 2010 our User Group completed a Technical Report on end-to-end QoS management at the network interfaces which identifies standardisation gaps.

The Group has also produced a Technical Report on standardisation and regulation to help ensure the accuracy and reliability of ICT metering and billing systems.

ETSI supports EC initiatives on consumer protection which aim to help users of electronic communications services take advantage of competition in the market. To gain maximum benefit in terms of choice, price and quality, users need reliable information on the QoS they can expect from the various offers, not just in the actual utilisation of the service, but at any stage of the service life cycle. Clear information, in particular regarding tariffs and conditions, is also needed. Two Technical Specifications were published in 2010 aimed at obtaining meaningful comparisons of service offers. We also produced an ETSI Guide on the definition of and methods for assessing QoS parameters at the different stages of the customer relationship other than utilisation.

Speech and Multimedia Transmission Quality

Our Speech and Multimedia Transmission Quality Technical Committee (TC STQ) is now recognised worldwide as a centre of excellence for QoS/Quality of Experience (QoE) and media quality. It tackles issues from a user’s perspective.

Among many aspects of transmission performance addressed in 2010, TC STQ is looking into the effects of IP impairment on fax quality. With the migration of telephone networks towards Next Generation Networks (NGNs), it is crucial to provide the same services, including modem and fax services, without any degradation in quality. This is particularly important for those countries where fax is the only legally accepted method of ‘electronic’ document transfer.

With Health & Safety issues in mind and in response to EC Mandate 452, TC STQ drafted a Harmonised European Standard (EN) on measuring the maximum acoustic outputs for communication equipment with multimedia functions. This will allow the levels of speech signals (conversational situations) and audio signals (music/audio-visual) produced in human ears by terminals, such as mobile phones, to be tested with similar equipment.



ICT and Energy Efficiency – Both Problem and Solution

While technological progress has undoubtedly had a significant impact on society for the good, it has also had a negative impact on the environment in the shape of the increased energy consumed by the growing number and complexity of Information and Communications Technologies (ICT) products and services.

ETSI is actively committed to identifying energy efficiency solutions, seeking to reduce the energy consumed by non-ICT products and services, and to limit the consumption of ICT equipment itself. Much of our work is in support of EU Mandates. We also work closely with EU research projects on energy efficiency such as EARTH (Energy Aware Radio and Network Technologies) and STRONGEST (Scalable, Tunable and Resilient Optical Networks Guaranteeing Extremely-high Speed Transport).

Enhancing Energy Efficiency in ICT

In support of Mandate 462 on the efficient use of energy in ICT networks, our Environmental Engineering Technical Committee (TC EE) produced a number of important specifications and standards in 2010 to define the methodology and the key indicators to determine the energy efficiency of network access equipment, wireless access equipment, transmission equipment, router and switching equipment, core network equipment and customer premises equipment. In addition, we began new work on a European Standard (EN) on methods for measuring the power consumption of customer premises equipment. This standard is being produced in response to the Energy Using Products (EuP) Directive (2005/32/EC) and Mandate 439 on the standby and off-mode power consumption of telecommunication office equipment. In 2010 we also addressed the control and monitoring of power and cooling systems used in telecommunication infrastructures, with the aim of reducing power consumption, and published a Technical Report on reverse power feeding.

Our Access, Terminals, Transmission and Multiplexing Technical Committee (TC ATTM) deals with energy efficiency for broadband equipment, in close collaboration with TC EE. The Committee is finding technical solutions to improve energy efficiency in networks and devices, such as reverse power feeding and Digital Subscriber Line (DSL) power optimisation. We are also producing a Technical Report to help manufacturers apply the EuP Directive to cable network apparatus and customer premises equipment.

Investigations into energy-saving in the mobile network (GERAN, UTRAN and LTE™) were conducted by the Third Generation Partnership Project (3GPP™).

Assessing Environmental Impact

TC EE made good progress with a Technical Specification on Life Cycle Analysis (LCA) for telecommunication products, which will help manufacturers determine environmental impact from the raw material/components until the end of the product's life. When finalised in 2011, it will give the telecommunications industry the first ever LCA tool designed specifically for use in its field.

TC EE updated its standards on acoustic noise emissions from telecommunication equipment in 2010, and is comparing alternative energy sources such as wind, solar and fuel-cells.

In response to Mandate 462, TC ATTM is helping to develop a set of global Key Performance Indicators (KPIs) to monitor energy efficiency consumption in the field.

Our Telecommunication and Internet converged Services and Protocols for Advanced Networking Technical Committee (TC TISPAN) is defining the means of monitoring power levels in Next Generation Networks (NGNs) and the control of power modes of devices in Customer Premises Networks.

The Green Agenda for Business

Teleconferencing offers a 'green' alternative to physical meetings. However,

the quality of the services currently available is of major concern and this may hinder take-up of the technology. Our Speech and Multimedia Transmission Quality Technical Committee (TC STQ) has made considerable progress during recent years in defining the Quality of Service (QoS) and Quality of Experience (QoE) requirements for a variety of systems from the user's point of view. These definitions can be used as a basis for the development of speech and multimedia conference tools. A new ETSI Guide was also published in 2010, offering guidelines related to a range of real-time services including videoconferencing.

In September 2010 we organised a major workshop on QoS, QoE and the User Experience, with a special focus on speech and multimedia conference tools. The event, which was attended by 60 participants, introduced the results of our work and provided an opportunity to discuss ways of reducing the gap between network measured quality and user perceived quality.

Mobile Phone Chargers

Until now, users who changed their mobile phones have usually had to buy a new charger and dispose of the old one, even if it is in perfect condition. In 2010, our Electromagnetic Compatibility and Radio Spectrum Matters Technical Committee (TC ERM) began work to help end this situation with standardisation to achieve compatibility, and in October published an addition to the appropriate standard. The first universal chargers and mobile phones compliant with the new standard are expected to reach the market early in 2011.



4G Mobile Telecommunications – the Final Countdown

The parameters of IMT Advanced, stipulated by the Radio Standardisation sector of the International Telecommunication Union (ITU-R), are generally accepted as being the essential definition of true 4th generation mobile telecoms. In 2010, 3GPP's LTE™-Advanced specifications were reviewed and accepted as meeting the requirements of IMT Advanced. LTE-Advanced will be submitted formally to the ITU-R in 2011; it is expected to become the IMT Advanced technology of choice for the vast majority of the world's operators. Preparation for this momentous event dominated 3GPP's work during 2010.

LTE-Advanced steps up the already remarkable data rates provided by the original LTE, whilst continuing to reduce latency and increasing spectral efficiency by ever more intelligent modulation and use of multiple antennas for both uplink and downlink.

During 2010, the first half-dozen or so (Release-8-based) commercial LTE networks opened for business. Independent studies reveal that more than 150 network operators have committed to opening up LTE networks.

Release 10 as a whole is to be frozen early in 2011 and, by the end of 2010, it comprised around 130 top-level features and studies. Release 10 focuses mainly on LTE-Advanced although additional improvements were dedicated to updating functionality of the low chip-rate Time-Division Duplex (TDD) offering of the Universal Mobile Telecommunications System (UMTS™). In addition, as usual, a number of new frequency bands became available for cellular use, and the 3GPP specifications were updated to cater for these.

The blurring of the distinction between mobile phones and entertainment/gaming devices has led to studies on haptics (tactile feedback) in the terminal, and also codecs for surround-sound and improved video codec support.

Meanwhile, conscious of the Green Agenda, investigations into energy-saving in the network (GERAN, UTRAN and LTE) were conducted.

3GPP technology also has implications for Machine-to-Machine communications (M2M). It has long been proposed for remote telemetry of water and gas networks, and will certainly soon be coming into the home as smart meters use cellular radio for data backhaul. 3GPP is addressing issues arising from the potentially enormous increase in traffic to be handled by the networks, and the need to ensure that, for example, emergency telecommunications are not blocked by routine gas meter readings.

By the end of 2010, work on Release 11 was already under way, with over 40 new features and studies launched.



ETSI and 3GPP

ETSI is one of the founding partners of the Third Generation Partnership Project (3GPP™) in which we come together with five other regional standardisation organisations in Asia and North America, plus market associations and several hundred individual companies. ETSI is the preferred partner through which European companies can participate in this collaborative activity.

Established to develop globally applicable specifications for third generation mobile telecommunications (the ITU's IMT-2000 family), 3GPP is also responsible for the maintenance and evolution of the specifications for the enormously successful Global System for Mobile communication (GSM™), which was defined by ETSI, and for transitional technologies, including the General Packet Radio Service (GPRS), Enhanced Data for GSM Evolution (EDGE) and High Speed Packet Access (HSPA). 3GPP's scope was later extended to develop radio access solutions beyond 3G, and thus encompasses LTE and its evolution towards true 4G technology, LTE-Advanced.

Since it was established in 1998, 3GPP has completed eight Releases of 3GPP system specifications for cellular telecommunications, with each Release providing mobile operators and equipment manufacturers with a stable reference platform to build networks and terminal equipment.

Today there are nearly 5 billion mobile devices in the world, of which 3GPP technology has about an 85% market share.

3GPP is supported by ETSI's Mobile Competence Centre (MCC).

Further information at: www.3gpp.org

Prevention and Protection

The increasing complexity and rapid development of new systems, combined with the growing sophistication of threats and the presence of intrinsic vulnerabilities, present a real challenge for securing Information and Communications Technology (ICT) systems and networks. Standards are essential to ensure both compliance with legislation and adequate levels of security.

Our work covers a broad range of security issues, from lawful interception (LI) to algorithms, from electronic signatures to smart cards, relating to every aspect of ICT. For example, in 2010 security and privacy work in our TISPAN Technical Committee focused on IPTV, service and content protection, Customer Premises Networks (CPNs), the Network to Network Interface (NNI), prevention of unsolicited communications, threat analysis for customer networks and application layer security. New innovations being developed in our Industry Specification Groups (ISGs) include Quantum Key Distribution (QKD) and Identity and access management for Networks and Services (ISG INS). In addition, we are working towards the establishment of effective telecommunications systems to protect citizens in an emergency.

Electronic Signatures

Standards to support the use of electronic signatures and public key certificates are a primary driver in enabling the successful evolution of eCommerce. In 2010, our Electronic Signatures and Infrastructures Technical Committee (TC ESI) began working in response to the European Commission (EC) Mandate 460, which aims to achieve the interoperability of electronic signatures throughout Europe, by providing a rationalised European standardisation framework to allow mutual recognition and the cross-border interoperability of electronic signatures.

In 2010, TC ESI created a profile for Visible Signatures which will enable untrained users to understand an electronic signature in its visible forms. The Committee has also created a website and a Technical Report to offer help with the implementation of PDF Advanced Electronic Signatures (PADES).

We are addressing concerns over the co-existence of Registered Email (REM) mailing systems using different protocols and, by the end of 2010, work was well advanced on a new interoperability specification. We also initiated new work in 2010 on information preservation systems security.

Lawful Interception and Data Retention

Lawful interception is crucial to preserve national security, to combat terrorism and in the investigation of serious criminal activities. LI is also an essential part of the infrastructure supporting electronic transactions and a key factor in the growth and development of the Information Society. Our LI standards are being adopted around the world. Current activities include the Dynamic Triggering of Interception. New work has been started on system architecture and internal interfaces for Data Retention, and on requests for handover and the delivery of real-time or stored information (known as the 'eWarrant Interface').

RFID

Radio Frequency Identification (RFID) is a method of storing and remotely retrieving data, which can be used as a technology to achieve authentication and access. The technology can be used in company access badges and passports, for toll payments and other systems, and is potentially vulnerable to fraudulent attack. We are addressing the privacy and security of RFID in response to EC Mandate 436 on ICT and RFID. In 2010, practical tests were conducted with a number of manufacturers in The Netherlands to examine the use of RFID in the field, and a Technical Report is being produced.

Security Algorithms

ETSI is a global leader in the provision and maintenance of cryptographic algorithms and protocols for fraud prevention, to prevent unauthorised access to public and private telecommunications networks and to protect user data privacy. Our Security Algorithms Group of Experts (SAGE) produces authentication and encryption mechanisms for various technologies. Most of SAGE's efforts in 2010 focussed on the development of a third set of crypto-algorithms for LTE™, which has been requested by the Chinese partners in the Third Generation Partnership Project (3GPP™) to meet the requirements of their country's regulatory authorities.



Emergency Telecommunications and Public Safety

EMTEL

In a major new initiative, in 2010, our Special Committee EMTEL (SC EMTEL) made a significant contribution to the specification of the European Public Warning System (PWS) for broadcasting national emergencies using the Cell Broadcast Service – EU Alert. The Committee had completed a draft Technical Specification defining the requirements of EU Alert by the end of the year and trials were scheduled to start in January 2011. The specification has been input to 3GPP for inclusion in its PWS specification which, until now, has only contained PWS requirements from outside Europe. It is expected to be included in 3GPP Release 11, alongside the Earthquake and Tsunami Warning System (ETWS).

A Technical Report was also published on the functionality of mobile devices for a PWS and the requirements for configuring the service to provide citizens with a device capable of displaying PWS messages and with consistent and easy access to the PWS itself.

SC EMTEL also updated its Technical Report on the communication of individuals with authorities and organisations in case of distress (emergency call handling) to address the transition to Internet Protocol (IP) networks and the use of the Short Message Service (SMS). It is recognised that voice must, of necessity, remain the primary means of communication in an emergency, but SMS offers an important alternative method of communicating with citizens with impairments and an option to reach the mass population when powerlines are down. The Technical Specification which covers the requirements for communications from authorities and organisations to individuals, groups or the general public during emergencies now includes the use of the Cell Broadcast Service as a means of alerting the population. These documents, along with previous publications on communications between authorities and between individuals, together represent a European co-ordinated position for the development of a common methodology for the core aspects of communications in an emergency.

TETRA

First deployed in 1997, Terrestrial Trunked Radio (TETRA) is now used in over 117 countries worldwide, of which the majority (more than 65%) are outside Europe. The 'Future Vision' for the industry is to evolve TETRA towards a fully integrated and seamless ICT solution, providing narrowband/wideband/broadband wireless communications for 'mission critical' and traditional Professional Mobile Radio (PMR)/Public Access Mobile Radio (PAMR) applications. We are working closely with the European regulators in an attempt to find the additional spectrum which would be required to deal with major emergencies, especially for TETRA wideband and broadband services.

Revision of the existing standards to meet new developments continues on an ongoing basis. Features currently being addressed include an improved Inter-System Interface (ISI). TC TETRA also began a study into the evolution of the circuit switched ISI to include the Internet Protocol (IP) packet data switching concept and new work was initiated on RF compliance for cognitive access to make better use of spectrum shared with Public Safety and Disaster Relief services.

Reconfigurable Radio Systems

The application of Software Defined Radio (SDR) and Cognitive Radio (CR) can maximise the use of the limited radio spectrum usually assigned to public safety communications. In 2010, our Reconfigurable Radio Systems Technical Committee (TC RRS) published a Technical Report on the system aspects of Cognitive Radio for public safety usage and is now starting to define the costs involved.

Satellite emergency communication

Standardisation in this area is the responsibility of our Satellite Earth Stations and Systems Technical Committee (TC SES). By the end of 2010, the Committee had almost completed a new Technical Report on the use of Emergency Communication Cells via Satellite (ECCS). TC SES also contributed in response to the EC's Space Mandate (M/415) on disaster monitoring, prevention and relief management.



At the request of public safety agencies, in March 2010 we published a new standard for global navigation satellite system repeaters. These devices will enable the emergency services to gather information about an incident by satellite access, even before leaving their base, thus improving response times.

Ultra Wide Band sensors (UWB)

Standards are being developed for location tracking using UWB sensors for important applications including to enable the 'blue light' services to pinpoint people trapped in burning or collapsed buildings, for high-precision local positioning (with a resolution to within a few centimetres) to ensure safety on the railways, and in object discrimination, for the safe use of DIY tools.

Safety in transportation

We are working on various mechanisms for road safety through the use of Intelligent Transport Systems.

In addition, our Mobile Standards Group Technical Committee (TC MSG) has been co-operating with 3GPP in support of the European Commission's eSafety initiative, eCall. This in-vehicle emergency call service will automatically relay data about an accident (such as the exact location of the crash site, the model of the car etc.) from the vehicle involved to the emergency services, enabling faster and more effective responses. Two Technical Specifications and a Technical Report were prepared in 2010 which will enable eCall Network Access Devices to be tested and certified for operation on Global System for Mobile communication (GSM™) and Universal Mobile Telecommunications System (UMTS™) networks. Equipment manufacturers can now bring products to market.

We are also developing the standards for the new universal system for maritime distress messages, Digital Selective Calling (DSC).

ETSI Security Workshop

The fifth ETSI Security Workshop took place in January 2010. The workshop, which has become a major annual event, attracted a large number of experts from all over the world.

Testing and Interoperability

One of the main aims of global standardisation in a multi-vendor, multi-network, multi-service environment is interoperability. Interoperability enables today's converging but diverse technologies and complex ICT systems to communicate and work together. It ensures that users have a greater choice of product or service and that manufacturers benefit from economies of scale in a wider market.

ETSI has pioneered the use of validation and testing to deliver interoperability. Testing is now a multi-billion dollar business and is a key phase in any serious development process. Without testing, there can be no compliance with standards, no harmonisation and no way of checking interoperability.

With over 20 years' experience, our Centre for Testing and Interoperability (CTI) supports our technical committees and the Third Generation Partnership Project (3GPP™) in all aspects of protocol specification, standards validation, interoperability and the development of test specifications.

The CTI organises interoperability, or Plugtests™, events, a well-proven and cost-effective approach to the validation of standards for interoperability, and ultimately interoperable products and services. Manufacturers meet at these events to validate their products and resolve issues, and the feedback directly improves our standards development.

In 2010, the CTI offered a varied programme of ten Plugtests plus a workshop on interoperability in the Internet Protocol (IP) Multimedia Subsystem (IMS). In addition, for the last eight years we have co-organised the international TTCN-3 User Conference, which took place in 2010 in Beijing, China.

In response to industry demand, Plugtests are becoming ever more complex and, where possible, ETSI works with various technical partners to provide specialised resources anywhere in the world, as illustrated by the highly successful SIPit 27 held in Taipei, Taiwan.

Plugtests events cover a wide range of technologies including telecommunications, Internet, broadcasting, multimedia, security, services and applications. As well as staple topics such as electronic signatures, Voice over IP for Air Traffic Management and Gigabit-capable Passive Optical Networks (GPON), Plugtests were organised in new areas for the first time in 2010. ETSI co-organised the world's first femtocell interoperability event as the initial step in a comprehensive programme of testing to validate the new 3GPP Release 8 femtocell standard. The CTI ran interoperability events for Cordless Advanced Technology-Internet and Quality (CAT-iq) for DECT™. Other highlights included participation in the IHE Connectathon in April 2010, where a Testing and Test Control Notation version 3 (TTCN-3) test tool was used for testing eHealth applications.

The CTI continues to play a major role in 3GPP testing; 2010 was another key year for LTE™ TTCN test development as the industry pushed to complete LTE user equipment (UE) certification by the end of the year.

ETSI has become the testing reference for electronic signatures. Working together, the CTI and our Electronic Signatures and Infrastructures Technical Committee (TC ESI) have developed a dedicated portal for remote participation in Electronic Signature and eIdentity interoperability events. This was used to good effect at an Extended Mark-up Language Advanced Electronic Signatures (XAeS)/PDF Advanced Electronic Signatures (PAeS) event in October/November; with 27 companies taking part, from 18 different countries, the event had to be extended from two to four weeks to meet demand.

New support was given in 2010 to test specifications and frameworks for Public Mobile Radio (PMR), Digital Mobile Radio (DMR) and Intelligent Transport Systems (ITS) GeoNetworking (the protocol which allows the routing of data packets in ad hoc vehicle networks without the co-ordination of a communications infrastructure). The CTI is also investigating the use of interoperability activities to assist the validation of radio co-existence standards.

ETSI is also starting to develop the expertise and methodologies to improve energy efficiency in standards. In particular, we are participating in the EARTH (Energy-Aware Radio and Network Technologies) project, which aims to enhance the energy efficiency of mobile systems by at least 50%. The project is focussing primarily on mobile cellular systems, LTE and its evolution, LTE-Advanced.

In partnership with the European Commission's Joint Research Centre in Italy, in 2010 the CTI completed a fully functional implementation of its prototype ePassport test platform based on TTCN-3. This will enable the faster processing of passengers at airports and improvements to global border security.

The CTI Hub for Interoperability and Validation at ETSI (HIVE) was put in place and used for the first time in February 2010. This Virtual Private Network (VPN) facility enables remote connection to Plugtests events and remote validation of TTCN-3 test suites. This should increase participation in CTI events and reduce travel costs for ETSI Specialist Task Forces (STFs) developing conformance test specifications.



10th Anniversary of World-leading Test Language

In 2010, TTCN-3, the only standardised test specification language, celebrated its tenth anniversary. Developed by ETSI and adopted by the International Telecommunication Union (ITU), TTCN-3 is now deployed throughout the world in telecommunications, transportation, the Internet, in medicine, web-based services and distributed systems. Its versatility ensures it an effective role in functional conformance testing, load testing, performance and interoperability testing.

While traditionally the use of TTCN-3 has centred largely on Europe, other parts of the world have adopted it and are developing considerable expertise in its use. The first, free workshop organised by the Indian Chapter of the TTCN-3 community took place in September 2010 in Bangalore, India. The event paid special attention to TTCN-3 activities related to LTE and WiMax, and to the role of testing in standardisation.

The international ETSI TTCN-3 User Conference 2010 was held in June in Beijing, China. Organised jointly by ETSI and the Beijing Internet Institute Group, the event drew record numbers of delegates. In recent years, TTCN-3 has experienced a rapid uptake in China, which currently contains the language's largest user community.

We are still developing TTCN-3. In 2010, in addition to updates of the core standard, extension packages were developed to cover real-time and performance as well as configuration deployment support for TTCN-3. Further extensions are expected to be developed in 2011. A significant number of

TTCN-3 compilers are now available on the market and, in response to market demand, our Methods for Testing and Specification Technical Committee (TC MTS) has begun work on the first TTCN-3 conformance test suite, with the aim of ensuring that TTCN-3 tools comply with ETSI's TTCN-3 standards.

Also to meet the needs of the industry, an ETSI Technical Report is being prepared which will establish TTCN-3 programmer competence levels.

New Testing Methods

In a major new initiative, we are developing our work on model-based testing (MBT), a technique that has already proved itself in industry as a mature testing technology that leads to significant increases in productivity. Drafting of the first ETSI Standard on MBT was completed at the end of 2010 and entered its approval phase.

As part of its efforts for the continuous improvement of testing methodologies, TC MTS and experts from the CTI have developed a methodology for automated end-to-end interoperability testing combined with the conformance checking of traffic over internal interfaces. This methodology allows Plugtests to test complex distributed systems in an efficient and thorough manner, and has already proved extremely beneficial in IMS testing. Two Technical Reports, an ETSI Guide and a training package on Automated Interoperability Testing were also published in 2010, and a White Paper was produced, which demonstrates how the automation of interoperability testing can save time and reduce costs.

Sharing our Expertise with Industry

In addition to its core standardisation work, ETSI has an important role to play as a service-providing organisation. We continue to offer our expertise to other organisations, providing support in diverse technical areas through Forapolis™ and Interopolis™. These industry services include a full range of 'idea to product' solutions: Forapolis offers management services and is 'technology-enabling'; Interopolis provides experienced support with testing and is essentially 'product-enabling'.

In 2010, we changed the conditions under which Forapolis and Interopolis operate. As a result, in future services will be provided, on a cost-recovery basis, for the benefit of ETSI Members by delivering high quality support to third party organisations where ETSI Members are involved.



During 2010, Forapolis services to existing customers, including the Open Mobile Alliance (OMA), remained stable. A new partner was enrolled in 2010 and another agreed to start in 2011, bringing the number of partners receiving services to seven.

The Forapolis Portal Platform (FPP) has been developed over the last five years and has become a valuable tool in the management of membership, working groups, meetings and documentation, as well as for internal information and news.



There are few other organisations that can match ETSI's expertise in testing and interoperability and, as a result, Interopolis has developed a worldwide reputation; for example, in 2010, Interopolis completed an IMS TTCN-3 test platform for the China Academy of Telecoms Research (CATR).

In 2010 Interopolis was awarded a second contract by the European Commission for services to allow Member States to check the conformance of their Trusted service Status List (TSL) signatures. The project will run for at least two years.

Working in Partnership

Collaboration with R&D

As a service-providing organisation, ETSI participates in and supports European Commission (EC) Seventh Framework Programme (FP7) projects, which in turn brings new ideas into our work. We joined several new initiatives which were launched in 2010 including: the SUGAST and TESTCASE projects, related to Galileo standardisation and testing; the MyFire project, co-ordinating test beds for the future Internet in collaboration with international partners; and the MOSQUITO project, which is addressing the fragmentation of applications which prevent the development and deployment of services for the future mobile Internet. Our Centre for Testing and Interoperability (CTI) is also heavily involved in the HITCH project on the interoperability of health systems.

Through participation or presentations, we have a regular presence among research teams in different fields of Information and Communications Technologies (ICT). These contacts have been responsible for the establishment of a number of our Industry Specification Groups (ISGs).

In March 2010, we hosted an interactive workshop on Future Network Technologies. Nearly 150 people came to learn about the progress of current research projects allied to our standardisation activities and to identify potential needs for the standardisation or pre-standardisation of Future Network Technologies.

Partnership Agreements

We believe that the future is built around international partnerships and have therefore put together a portfolio of agreements with partners ranging from fora and consortia to international and regional Standards Development Organisations (SDOs). Co-operation is crucial to reduce fragmentation in standardisation and to address the convergence of technologies. ETSI's investment in partnerships is an important means to adapt its activities to new technological trends and to facilitate the development of better, wide-reaching standards.

We currently have over 80 such Partnership Agreements. During 2010, we entered into new Memoranda of Understanding (MoUs) with the European Aviation Safety Agency (EASA), the DLMS User Association, the European Organisation for Civil Aviation Equipment (EUROCAE), the Universal Postal Union (UPU), the Global e-Sustainability Initiative (GeSI), the Traveller Information Services Association (TISA), the ZigBee Alliance, the SIMalliance and the Alliance for Telecommunications Industry Solutions (ATIS). In addition, a Memorandum of Co-operation was signed with the Research and Innovative Technology Administration (RITA) of the United States Department of Transportation. Letters of Intent (LoI) were signed with the Digital Mobile Radio (DMR) Association, the European Defence Agency (EDA) and the Global ICT Standardisation Forum for India (GISFI). We participated in the first GISFI workshop in February 2010 and expect increased co-operation with the Forum, particularly in areas of common interest such as the 'Internet of Things', convergent technologies, future radio access technologies and 'green' issues.

Partnerships were renewed with the Home Gateway Initiative (HGI), the DECT Forum, the Telecommunications Technology Association of Korea (TTA), the Telecommunications Industry Association (TIA) and the European Network and Information Security Agency (ENISA). Letters of Intent with the Next Generation Mobile Networks (NGMN) Alliance and the SDR Forum (SDRF) were upgraded to Memoranda of Understanding.

Most of the new agreements are the direct result of our increasingly diversified technical activities which are attracting interest in different quarters. In particular, new partnerships were established in sectors now impacted by ICT such as the postal market (MoU with the UPU) or traffic management (MoU with TISA).

Partnerships by region in 2010



Global	49%
EU	26%
South America	8%
Asia Pacific	7%
North America	6%
Rest of The World	4%

Dialogue with Developing Markets

Major economic, political and social changes in Asia, Latin America and other regions of the world in recent years have opened new markets and have created new opportunities for trade and investment. Recognising the potential for the European economy, the European Standardisation Organisations (ESOs – ETSI, the European Committee for Standardisation (CEN) and the European Committee for Electrotechnical Standardisation (CENELEC)), decided to appoint 'standards attachés' to intensify their dialogue with key partners in the different regions. The first country with such a post established was China, in July 2006, through the 'Seconded European Standardisation Expert in China (SESEC) project'. The seconded expert is funded by the ESOs, the EC and the European Free Trade Association (EFTA).

ETSI has supported the EU-Russia Information Society Dialogue since 2007, with the aim of promoting the liberalisation of the electronics communications sector. As a result, more than a third of all ETSI Harmonised Standards (especially in the field of electromagnetic compatibility and radio spectrum use) now serve as a basis for Russian Technical Regulations in ICT. In 2010, ETSI joined the Dialogue on Conformity Assessment.

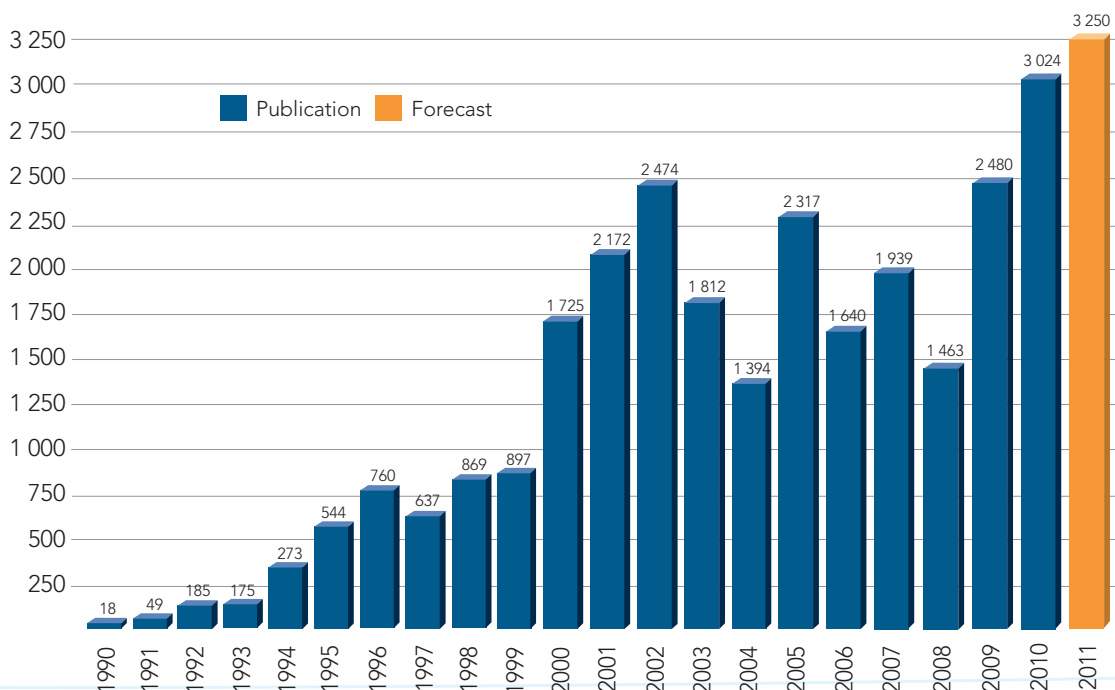
Standards Production

ETSI surpassed all its previous records in 2010 with the publication of 3 024 standards and reports. By the end of the year, the Institute had produced a total of almost 27 000 standards, specifications, reports and guides since its establishment in 1988.

At the same time, production performance improved: the average percentage of deliverables produced before the target date rose to 77% in 2010, compared with 76% in 2009 and 68% in 2008.

ETSI published the first eleven ETSI Group Specifications (GSs) in 2010. This new type of deliverable was created for the output of ETSI's Industry Specification Groups (ISGs). Six ISGs have been established to date, in response to needs expressed by ETSI members, as a mechanism for the speedy preparation of technical requirements or specifications in specific areas of innovation.

The number of deliverables published, for each of the years 1990 - 2010 and the prediction for 2011



Distribution by type of published document

	In 2010	Total since 1988
Technical Specification (TS) ¹	2 662	19 134
Technical Report (TR) ²	203	2 403
ETSI Standard (ES)	32	642
European Standard (telecommunications series) (EN) ³	103	4 369
ETSI Guide (EG)	9	224
Special Report (SR)	4	64
Group Specification (GS)	11	11
TOTAL	3 024	26 847

¹ Includes GSM™ Technical Specification (GTS)

² Includes old deliverable types: Technical Committee Reference Technical Report (TCR-TR), Technical Committee Technical Report (TC-TR) and ETSI Technical Report (ETR)

³ Includes amendments and old deliverable types: European Telecommunication Standards (ETSS), Interim ETSS (I-ETSS) and Technical Bases for Regulation (TBRs)

Specialist Task Forces and other Funded Projects

Specialist Task Forces (STFs) are groups of highly skilled experts sent by ETSI Members to work together for limited periods to perform specific technical work under the direction of an ETSI committee. A similar mechanism has been adopted to support 'funded projects' for the Third Generation Partnership Project (3GPP™) partners and for the FP7 projects funded by the European Commission (EC) and the European Free Trade Association (EFTA).

Altogether, 53 STFs and other funded projects were active during 2010, involving about 200 experts of 24 different nationalities and representing a financial investment of 3,8 M€.

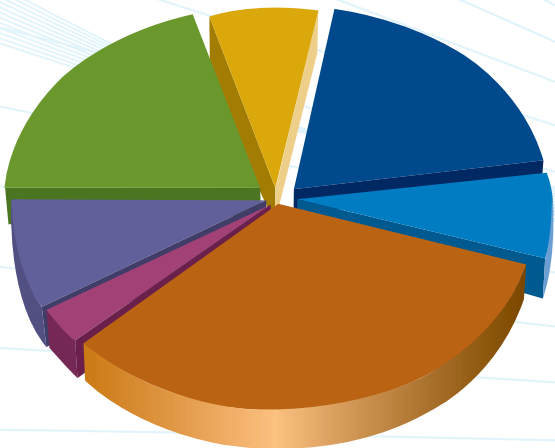
In addition, a voluntary contribution equivalent to 1,2 M€ has been provided from experts working free of charge in the STFs, in the R&D projects and in 3GPP Task Force 160.

Technical areas in which funded resources were invested in 2010

Technical area	k€
3GPP TTCN test specifications – 3G Partners funding	1 002
Intelligent Transport Systems (ITS)	441
Human Factors (HF)	298
Next Generation Networks (TISPAN)	298
Electronic Signatures & Infrastructures (ESI)	207
IMS Network Testing (INT)	188
Methods for Testing & Specification (MTS)	169
EC/EFTA study on SMEs	147
R&D projects – EC/EFTA funding	133
Mobile Standards Group (MSG)	131
User Group	123
Digital Enhanced Cordless Telecommunications (DECT™)	109
Smart Card Platform (SCP)	107
Quantum Key Distribution (QKD)	91
Others	325
TOTAL FUNDED	3 768

Figures are rounded to the nearest k€.

Funding sources in 2010



EC/EFTA Funding

The EC and EFTA contribution to the ETSI standardisation infrastructure for 2010 was set at up to 2 984 k€ via the Operating Grant. The actual sum will depend upon the outturn of the audited accounts for 2010.

The EC/EFTA contribution for specific standardisation contracts under their 2010 budget line provided funding of more than 2 045 k€ to support the EC's ICT 2010-2013 Standardisation Work Programme: the different actions will be performed from 2011 through into 2013. Ten successful proposals were made and the related action grants were signed in November and December 2010. A further action grant is due to be signed during the first quarter of 2011.

ETSI funding	20%
ETSI voluntary contribution	7%
EC/EFTA ICT WP	33%
EC/EFTA FP7	3%
EC/EFTA voluntary contribution	9%
3GPP Partners funding	21%
3GPP voluntary contribution	7%

Membership

ETSI Membership remained fairly constant in 2010. There were about 50 resignations, mostly probably as a result of the global economic crisis, but these losses were more than compensated for by new members joining ETSI. By the end of 2010, the Institute had a total of 721 Members.

The 721 total is made of 579 Full Members, drawn from 40 European countries, 116 Associate Members and 26 Observers. Overall Membership (all categories) is drawn from 62 different countries and provinces, from across five continents.

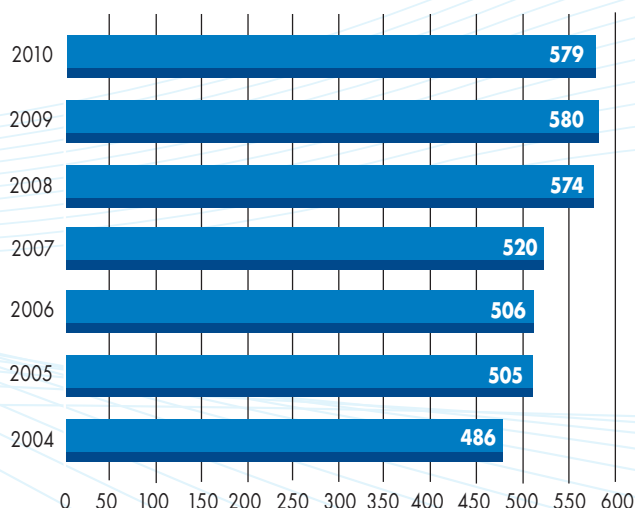
The European Commission and the European Free Trade Association Secretariat, which hold special roles as Counsellors, attend the General Assembly and the ETSI Board and continue to play an active part in ETSI's work.

Widening Membership

The number of universities and research bodies in Membership rose from 64 to 70 in 2010, continuing the upward trend observed in 2009. Academic and research organisations now represent 11% of our Membership.

ETSI already has strong representation of Small and Medium-sized Enterprises (SMEs) – they account for almost 30% of our Members – but in 2010 we adopted a new strategic aim to further encourage their involvement in our work. SMEs represent a significant force in European industry. 99% of companies are SMEs and they account for 70% of industrial employment. There is growing evidence that an integrated approach to the standardisation of Information and Communications Technologies (ICT) by SMEs which develop high technology can achieve significant benefits. An ETSI Specialist Task Force funded by the European Union and EFTA surveyed almost 9 000 European SMEs in the ICT industry and produced a Special Report containing recommendations and guidelines to promote the participation of SMEs in our standardisation activities. A workshop was subsequently held and a White Paper produced.

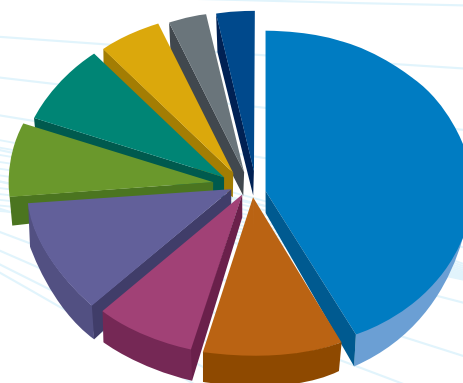
Evolution of ETSI Full Membership



Membership by type

	01-01-2010	31-12-2010
Full Members	580	579
Associate Members	115	116
Observers	22	26
Total	717	721

Full and Associate Membership by category



Manufacturers	288	(41%)
Network operators	75	(11%)
Administrations	59	(8%)
Research bodies	83	(12%)
Service providers	54	(8%)
Consultancies	55	(8%)
Users	32	(5%)
Others	29	(4%)
Other Government bodies	20	(3%)

Overall Membership by country/province

Albania	1	Japan	5
Andorra	1	Jordan	1
Australia	4	Korea	4
Austria	11	Latvia	1
Belgium	26	Lesotho	1
Bosnia Herzegovina	2	Lithuania	1
Brazil	2	Luxembourg	6
Bulgaria	4	Malaysia	2
Canada	9	Malta	2
China	10	Netherlands	30
– Taiwan (Province of China)	13	Norway	10
Croatia	3	Poland	6
Cyprus	2	Portugal	2
Czech Republic	4	Qatar	2
Denmark	16	Romania	6
Egypt	1	Russian Federation	11
Estonia	2	Serbia	1
Finland	11	Singapore	1
France	74	Slovakia	4
Former Yugoslav Republic of Macedonia	1	Slovenia	4
Georgia	1	South Africa	3
Germany	107	Spain	24
Greece	8	Sweden	21
Hungary	5	Switzerland	22
Iceland	1	Turkey	9
India	4	Ukraine	2
Indonesia	1	United Arab Emirates	3
Iran	1	United Kingdom	112
Ireland	10	United States of America	51
Israel	5	Uzbekistan	1
Italy	32	Yemen	1

62 countries or provinces in total

721

Financial Situation

The management of the finances of ETSI is described by

- the budget report
- the financial statements (balance sheet and income and expenditure statement) which are established according to French laws and regulations.

Mr Philippe Aumeras, whose auditor's mandate has been renewed by the 55th General Assembly, has audited the 2010 ETSI accounts and certified that the annual financial statements are true, sincere and give a fair view of the activities carried out during the past financial year.



Budget Maintenance

In total, compared with 2009, income and expenditure decreased by nearly 5% or 1,2 M€. The result of the year is a deficit of 47 k€ compared with a surplus of 10 k€ in 2009.

The key points of the budget management, compared with 2009, are the following:

Expenditure – Secretariat costs decreased by 4,8% and were 1% less than budgeted, mainly due to the ongoing savings policy (travel, telecommunication, promotion...) in order to limit the consequences of reduced Members' contributions and commercial activities converted into partners' services on a cost recovery basis. 4,6 M€ were spent on experts' costs for Specialist Task Forces and other standardisation related technical experts.

Income – Members' contributions decreased by 4,5%. 57% of the budget was funded by Members' contributions (13 M€). EC/EFTA payments amounted to 4,5 M€ to cover expenses related to the operation of the European standardisation platform and standardisation projects. Income generated by support services supplied to fora and consortia (Forapolis™ and Interopolis™) amounted to 1,5 M€ (a 31% decrease).

2010 Budget Statements

Income	k€
Members' contributions and Observer fees	13 023
EC/EFTA contracts	4 533
3GPP™ Partners	1 589
Voluntary contributions	502
Forapolis/Interopolis	1 533
European Friends of 3GPP	582
Sales	220
Plugtests™	221
Financial income	31
Other income	657
TOTAL INCOME	22 892
Expenditure	k€
Secretariat staff costs	12 031
Other Secretariat costs	5 426
Special Projects	164
European Friends of 3GPP	459
Provision and losses	266
Experts costs	4 593
TOTAL EXPENDITURE	22 939

In 2010, there was a deficit of 47 k€.

Financial Statements for the Year 2010

The final accounts and the balance sheet are summarised below.
The fiscal accounting period is 1 January 2010 – 31 December 2010.

Statement of Income and Expenditure Year 2010

	Income (€)	Expenditure (€)
Income	22 842 140	
Purchases		10 206 104
Expenses		12 720 732
Investment management	41 377	10 997
Extraordinary income & expenses	8 537	1 312
TOTAL	22 892 054	22 939 145

There was a deficit of 47 091 € in 2010.

Summary of the Balance Sheet

Assets

Net amounts at:	31 Dec 2009 (€)	31 Dec 2010 (€)
Fixed Assets	6 306 930	6 199 196
Debtors	14 225 680	15 317 665
Securities/cash	7 130 159	9 389 105
Adjustment accounts	157 012	211 666
TOTAL ASSETS	27 819 781	31 117 631

Liabilities

Net amounts at:	31 Dec 2009 (€)	31 Dec 2010 (€)
Equity	8 278 661	8 278 661
Provisions	234 000	78 000
Balance carried forward	-96 616	-86 890
Result of the year	9 726	-47 091
Creditors	6 710 928	9 858 877
Adjustments	12 683 082	13 036 073
TOTAL LIABILITIES	27 819 781	31 117 631

Figures are rounded to the nearest €.

ETSI's Vision of a Connected World



- Air Traffic Management
- Broadband Wireless Access
- Broadcast
- DECT™
- Digital Mobile Radio
- eHealth
- Electromagnetic Compatibility
- Emergency
- Environmental Aspects
- Fixed-line Access
- Grid and Cloud
- Human Factors
- Identity
- IMS Network Testing
- Intelligent Transport
- Internet
- Interoperability
- Machine-to-Machine Communications
- Maritime Communications
- Media Content Distribution
- Medical
- Mobile
- Next Generation Networks
- Powerline Communications
- Protocols
- Quality of Service
- Quantum Key Distribution
- Radio
- Reconfigurable Radio Systems
- Regulation & Legislation
- Safety
- Satellite
- Security
- Smart Cards
- Smart Metering
- Testing
- Terrestrial Trunked Radio (TETRA)

We have introduced the 'cluster' concept to provide a simplified, yet comprehensive, introduction to our activities in the standardisation of Information and Communications Technologies (ICT). This new approach has been introduced to facilitate access to our diverse work, enabling the identification of areas of interest based on business relevance or application domain rather than purely on technical work areas.

Each cluster represents a major component of a global ICT architecture and encapsulates the work of a number of our Technical Committees (TCs) and Working Groups (WGs) that share a common technological scope and vision. It is this joint scope and vision that gives each cluster its own identity; collectively the clusters represent the totality of ETSI's work, creating a connected world.

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World Class Standards

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