



building the future



annual report

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# ETSI's Vision of a Connected World



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 facilitates 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.

**ETSI is** a producer of globally applicable standards for 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 influence extend from its European roots to impact 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 available to its members and customers through a range of services for growing ideas and enabling technology.



**Dirk Weiler**  
Chairman of the  
General  
Assembly

In the general overview of standardisation, two issues featured prominently in 2012.

Firstly, the long awaited reform of the European Standardisation System was adopted by the European Council in October. The new system acknowledges the importance of standards in a much wider variety of areas, amends some of the processes and adds new elements, including the need to increase the involvement of Small and Medium-sized Enterprises (SMEs) and other stakeholders. ETSI is already aware of the value of this – almost 200 of our members are SMEs and, in recent years, we have increased our collaboration with CEN/CENELEC and with fora and consortia. We were encouraged that the specific needs

of ICT have been recognised and that the principle of direct participation in the standards-making process – much cherished by ETSI – has been upheld.

Secondly, issues over Intellectual Property Rights (IPRs) grew in frequency and significance. In ETSI, the tension between IPRs (destined for private, exclusive use) and standards (intended for collective use) is minimised by our highly respected IPR Policy. But there is always room for improvement, so we are consulting widely on this subject. This is just one example of the way we continually strive to meet our members' needs and to protect their interests.



**Jonas Sundborg**  
Chairman of the  
Board

The technical highlights of 2012 were numerous. They include the freezing of the Third Generation Partnership Project (3GPP™) Release 11, the largest 3GPP release so far. We were a driving force behind the move to establish a new Partnership Project to ensure the most efficient global deployment of Machine-to-Machine (M2M) communications systems, becoming a founding partner in oneM2M. We produced the specifications for the 4th Form Factor for the UICC. To minimise the environmental impact of Information and Communications Technologies (ICT), we are pioneering the use of Life Cycle Assessment for telecommunication products, networks and services. And, by the end of the year, we were in the process of finalising more than 65 standards, specifications and reports

for the first release of Intelligent Transport Systems (ITS) specifications, which will enable the deployment of Co-operative ITS.

We continue to address the technologies for which we have always been so well regarded – cordless telecommunications, electronic signatures, smart cards, testing and interoperability, speech and media quality and, of course, mobile communications.

But we are also moving in new directions. We are responding to a new challenge in which ICT is both a driving force and a facilitator in other sectors. As this report shows, we are now developing no less a reputation in new areas such as M2M, ITS, Smart Grids and eHealth.



**Luis Jorge Romero**  
Director-General

Despite the continuing economic crisis, our members are still finding the resources to invest in standardisation – because standardisation helps them maintain and renew their businesses. In 2012 we adopted a new approach to our members, opening up much more direct relations, so that we can better ascertain their needs.

Our Industry Specification Groups (ISGs) are proving an effective mechanism to kick-start standardisation in the new technologies our members are bringing to us. For example, at the end of the year we launched a new ISG on Network Functions Virtualisation with the aim of developing a new approach to the technologies and operations within telecoms networks.

Our Cloud activities are also gathering pace. We have been tasked by the European Commission to co-ordinate the development of a detailed map of the necessary standards for Cloud (including security, interoperability, data portability and reversibility), and we have launched the Cloud Standards Co-ordination.

We do not neglect our traditional areas of strength – as is obvious from the following pages – but we also recognise the potential of emerging technologies and their importance to our members' future. We are responding in innovative new ways with our traditional adaptability.

# Building the Future – an Overview of 2012

2012 was an exciting year for ETSI. We signed new partnership agreements, notably with the International Telecommunication Union (ITU). We strengthened our relationships with the European Commission (EC) and with other standardisation organisations, including the European Committee for Standardisation (CEN) and the European Committee for Electrotechnical Standardisation (CENELEC), and we participated in the debate on the reform of the European standardisation system. But our main achievement was the creation of over 2 700 standards and reports on an ever widening range of topics.

## Connecting Things

In January, we published our first Release of Machine-to-Machine (M2M) standards, defining a standardised platform for administrating multiple M2M services. Work has started on Release 2 and, in July, we joined with six other major Standards Development Organisations in launching the oneM2M Partnership Project to bring about the global deployment of M2M communications systems.

The first phase of work under the EC Mandate on Smart Metering (M/441) was finalised and validated in December 2012. Work on the impact of smart grids on the M2M platform progressed well in response to the 'Smart Grid Mandate' (M/490), and we completed the Smart Grid Architecture Model.

## Greener Living

During 2012 we produced numerous standards and specifications to improve the energy efficiency of Information and Communications Technologies (ICT) equipment. And we are well on the way with the specifications necessary to enable the application of Digital Enhanced Cordless Telecommunications (DECT™) for Ultra Low Energy (ULE) technology in home automation, for sensors, alarms, utility meters and M2M applications.



## Cordless Communications

DECT is still the leading standard worldwide for digital cordless telecommunications for both cordless voice and broadband home communication. We are now developing New Generation DECT, with advanced features such as high quality wideband (7 kHz) and super wideband (14 kHz) voice, support of Internet telephony and broadband data connections.

## Intelligent Transport Systems (ITS)

By the end of 2012, we were finalising the first Release of ITS specifications. This Release will enable the deployment of Co-operative ITS, which offers enormous potential through vehicle-to-vehicle and vehicle-to-roadside communication. For example, it could provide driver assistance and hazard warning, emergency services, traffic control, fleet and freight management and location-based services.

## Smart Cards

2012 saw the specification for the technical realisation of a 4th Form Factor for the UICC smart card. The SIM card has come a long way – and shrunk significantly – since we specified the first ID-1 Card in 1988! We also produced a Technical Specification containing use cases and a fairly extensive set of requirements for the management of the embedded UICC (eUICC).

## Mobile Communications

As one of the founding partners of the Third Generation Partnership Project (3GPP™), we are helping to develop specifications for advanced mobile communications technologies. In 2012 3GPP Release 11 was virtually completed, with nearly 100 new top-level 'Features' and a wide variety of new functionality.

## Cloud

We are addressing the rapidly expanding worldwide market for cloud products and services with the launch of the Cloud Standards Co-ordination. At the request of the EC, we will co-ordinate with stakeholders and identify a roadmap of new standards required. We also began new work on Cloud as a mitigating technology to reduce greenhouse gas emissions in other (non-ICT) sectors.

## Ongoing Activities

We continued our pioneering work on testing and organised 12 Plugtests™ interoperability events in 2012. There were notable achievements in maritime radar, we published our first Technical Specification on the radio reconfiguration related requirements for mobile devices, and we are developing the first ever Harmonised Standard outlining the essential requirements for Reconfigurable Radio Systems (RRS) operating in TV White Space spectrum. Working in the Joint Technical Committee on Broadcast, we completed the standards for the second generation of the Digital Video Broadcasting (DVB) interactive satellite system (DVB-RCS2). We continue to address electronic signatures, public safety, medical implants and speech and multimedia transmission quality. We have refocused our fixed network standardisation, creating a new ETSI Project on End-to-End Network Architectures (EP E2NA), and new committees on Network Technologies (TC NTECH) and Integrated Broadband Cable Telecommunication Networks (TC CABLE).

## Introducing New Technologies

But we are always looking for ways to extend our activities to support our members as technology – and their businesses – evolve. In 2012 we strengthened our links with research projects and we organised major workshops to promote developing standardisation activities, including M2M, Cloud, energy efficiency, RRS and Smart Body Area Networks.

The introduction of Industry Specification Groups (ISGs) to accelerate standardisation in key new areas is already yielding fruit. In particular, ISG Open Smart Grid (OSG) delivered an OSG Protocol in 2012 which forms part of our first set of Smart Grid specifications. We created three new ISGs in 2012: Operational energy Efficiency for Users, Low Throughput Networks, and Network Functions Virtualisation, of which we have high expectations for the creation of specifications to support virtualised functions of telecoms networks.

Standards are a key enabler of new technologies. They are the bricks with which we build the future.

# New Beginnings

*We are constantly looking for ways to expand our portfolio of activities to keep up to date with the changing nature of the Information and Communications Technologies (ICT) industry. Responding to emerging needs is crucial to maintain our position as a global leader in ICT standardisation and to provide our members with the standards they need to develop their businesses with innovative services and equipment.*

## Industry Specification Groups

The establishment of standards early in the development of a technology means that products are commercialised faster and reach global markets. Standardisation also contributes to customer confidence and ensures interoperability. We introduced the concept of the Industry Specification Group (ISG) to operate alongside our traditional standards development process to produce specifications in these new areas. ISGs focus on a specific activity and, by their nature, offer a very quick and easy alternative to the creation of industry fora.

By the end of 2012, there were 11 active ISGs:

- AFI – Autonomic network engineering for the self-managing Future Internet
- INS – Identity and access management for Networks and Services
- ISI – Information Security Indicators
- LIS – Localisation Industry Standards
- LTN – Low Throughput Networks
- MOI – Measurement Ontology for IP traffic
- NFV – Network Functions Virtualisation
- OEU – Operational energy Efficiency for Users
- ORI – Open Radio equipment Interface
- QKD – Quantum Key Distribution
- SMT – Surface Mount Technique

By the end of 2012, there were 11 active ISGs. They had produced 25 Group Specifications (GSs) since their establishment in 2008, and were working on more than 30 others.

Highlights of the year included the publication by ISG Open Smart Grid (ISG OSG) of its first Group Specification, on an OSG Protocol. This, together with a companion specification on powerline telecommunications, forms our first set of Smart Grid specifications.

ISG ORI also published its first release of specifications for an interface between remote radio heads and base band units of mobile base stations in 2012. Work has now begun on the second release.

In 2012 we created three new ISGs:

**ISG Operational energy Efficiency for Users (OEU)** – major industrial user groups will develop performance indicators for environmentally efficient ICT, such as infrastructure, equipment and software in data centres and networks, taking into account, for example, power consumption and greenhouse gas emissions.

**ISG Low Throughput Networks (LTN)** – will specify a new ultra narrowband radio technology for very low data rates for ultra long autonomy devices, which will provide the Internet of Things and Machine-to-Machine (M2M) communications with an efficient connection that is both cost effective and low in energy consumption.

**ISG Network Functions Virtualisation (NFV)** – will leverage standard IT virtualisation technology to consolidate different network equipment types onto industry standard high volume servers, switches and storage. It will develop the

specifications for the hardware and software infrastructure to apply virtualisation to any data plane packet processing and control plane function in fixed and mobile network infrastructures.

## Collaborative Research

We maintain close links with R&D projects so that we can identify new technologies with a standardisation need in areas where we can push innovation. During 2012, we were a partner in ten European Commission Framework Programme 7 (FP7) projects and we maintained active contacts with a number of others. These projects span a wide range of technology areas. Many are related to the Future Internet, including the Internet of Services and the Internet of Things; others address sectors in which ICT increasingly drive innovation, such as improving the quality of life through eHealth in the HITCH project, and energy efficiency in EARTH.

Our role in these projects varies. For example, our Centre for Testing and Interoperability is developing test specifications for electric vehicles as part of the PowerUp project. We supported the MOSQUITO project on the Future Mobile Internet with a Plugtests™ interoperability event in May in Paris, France. And we hosted an EARTH project meeting in March. In some cases, participation in collaborative research has triggered new standardisation activities in ETSI, mainly in ISGs. Other projects have contributed to our ongoing standardisation work.

Project SUNRISE began in February 2012, with the aim of ensuring the successful implementation and evolution of the EU's Global Navigation Satellite System (GNSS) Programmes by involving future users. Through our Forapolis™ service, we have set up the Open GNSS User Forum to reach communities of users of Location Based Services and Intelligent Transport Systems (ITS).

## Workshops

We regularly organise workshops to facilitate early consensus-building, to kick-start new standardisation activities, and to fertilise ongoing technical work. For example, we ran a workshop in December in Cannes, France, at which we officially launched the Cloud Standards Co-ordination. Our third M2M Workshop took place in October in Mandelieu, France, attracting a record 200 participants. The fourth ETSI ITS Workshop was held in Doha, Qatar, in February 2012, with over 120 delegates from all over the world.

The seventh annual ETSI Security Workshop took place in January 2012, bringing together over 150 participants. We held our first Energy Efficiency workshop in June in Genoa, Italy, with over 80 delegates. We organised a workshop on Telecommunications Quality Matters in Vienna, Austria, in November. In December we held a workshop on Reconfigurable Radio Systems in Cannes. And our eHealth project organised a workshop on Smart Body Area Networks in September as part of the BodyNets 2012 conference in Oslo, Norway.

# Connecting Things

## Integrating Objects to Create New Networked Services

*An ever increasing number of everyday machines and objects are now embedded with sensors or actuators and have the ability to communicate over the Internet. These 'smart' objects can sense and even influence the real world. Collectively they make up what is known as the 'Internet of Things' (IoT). The IoT draws together various technologies including Radio Frequency Identification (RFID), Machine-to-Machine (M2M) service platforms and Wireless Sensor Networks (WSNs). In ETSI we are addressing the issues raised by connecting potentially billions of these 'smart objects' into a communications network, by developing the standards for data security, data management and data processing. This will ensure interoperable and cost-effective solutions and allow the market to reach its full potential.*

### Machine-to-Machine Communications

We are working to address the fragmentation of existing M2M solutions. Technology is typically dedicated to a single application (e.g. fleet management, meter reading, vending machines), with the result that interoperability is prejudiced and the global M2M market is being impeded. Standardisation is a key enabler to remove technical barriers and ensure interoperable M2M services and networks that can be deployed worldwide. The creation of a standardised platform for M2M services and technologies is expected to ensure that the various industries involved will benefit fully from the economic growth and innovation opportunities that M2M communications offer. It will help multiple industries to lower their operating costs and capital expenses, shorten time-to-market, create mass-market economies of scale, simplify the development of applications and expand and accelerate global business opportunities.

Early in 2012, our M2M Communications committee (TC M2M) published the first Release of the M2M Service Layer standard, defining a standardised platform for multiple M2M services. It provides the first detailed specification of the necessary interfaces with a formal definition of the Application Programming Interface (API) and the required parameters, and includes the functional aspects, the information data model and the transport bindings on HTTP and Constrained Application Protocol (COAP).

The whole system is capable of running on a generic IP (Internet Protocol) network, but is designed to take advantage and reuse the functionality of the underlying telecommunication networks. This includes, for example, security and management aspects which are made easily available to the M2M application, together with a wide set of additional M2M-oriented functionality including the management of discontinuously connected terminals, log management, cloud data storage and privacy management tools.

Following the completion of Release 1, we turned our attention to the application-independent 'horizontal' service platform within the architecture which, with its evolved functionality, is capable of supporting a very wide range of services, including (but not limited to) smart metering, smart grids, eHealth, city automation, consumer applications and car automation.

We are working in response to the European Commission (EC) Mandate on Smart Metering (M/441), which seeks the creation of standards to enable the interoperability of utility meters (for water, gas, electricity, heat) to improve customers' awareness of actual consumption and thus lead to a reduction in their energy usage. The first phase was finalised and validated by the EC in December 2012.

In response to the 'Smart Grid Mandate' (M/490), we made good progress with a Technical Report (TR) on the impact of smart grids on the M2M platform. The Smart Grid

Architecture Model was completed in November 2012, providing guidelines and a stable reference for the creation of Smart Grid solutions.

We organised the third M2M workshop in October 2012 in Mandelieu, France. The event attracted a record 200 participants, making this the best attended regular ETSI workshop ever.

Following extensive discussion in TC M2M, in July 2012, ETSI became a founding partner in a new global organisation launched to ensure the most efficient deployment of M2M communications systems. The oneM2M Partnership Project brings together interested organisations including seven of the world's leading Information and Communications Technologies (ICT) Standards Development Organisations (SDOs).

TC M2M was a leading proponent of the initiative, and in due course most of its work will be transferred to oneM2M, where it will be addressed on a global level. Until then, TC M2M will continue to develop Release 2, expanding the configuration towards inter-operator communications. Release 2 will also include the construction of a common application semantic for the sharing of information in different application and service environments (vertical sectors).



oneM2M's first task will be to develop technical specifications for a common M2M Service Layer that can be readily embedded within various hardware and software, connecting the wide range of devices in the field with M2M application servers worldwide. These specifications will provide a common platform to be used by communications service providers to support applications and services as diverse as the smart grid, the connected car, eHealth and telemedicine, home automation and energy management, enterprise supply chain and public safety.

oneM2M held its first plenary meeting in September 2012 and established two Working Groups to deal with, respectively, requirements and architecture. By the end of 2012, good progress had already been made. In December two additional working groups were established for Security, and Management, Abstraction and Semantics.

## Reducing Energy Consumption

### Open Smart Grid Protocol

As the smart grid evolves, it will become commonplace for utilities to co-operate with grid-aware systems and devices to reduce power usage intelligently, giving commercial, industrial and municipal users reduced rates in exchange for lower consumption, while at the same time increasing grid reliability and the use of renewable energy sources.

In January 2012 we published two specifications for the Smart Grid that will help drive the development and deployment of open, interoperable smart grid technologies internationally. Working in co-operation with the Energy Services Network Association (ENSA), our Open Smart Grid Industry Specification Group (ISG OSG) produced a Group Specification for an application layer protocol which can be used with multiple communication media. Our Powerline Telecommunications committee (TC PLT) published a Technical Specification which defines a high-performance narrowband powerline channel for control networking in the smart grid that can be used with multiple smart grid devices. Together these two form the first set of Smart Grid specifications produced by ETSI.

### Low Throughput Networks

Many of the connecting objects in M2M and IoT need only low throughput connectivity. In 2012 we established an ISG on Low Throughput Networks (ISG LTN) to specify a new ultra narrowband radio technology for very low data rates for ultra long autonomy devices. This will provide an efficient connection that is both cost effective and low in energy consumption.

### RFID

Our Technical Committee for Electromagnetic Compatibility and Radio Spectrum Matters (TC ERM) is working with the European Conference of Postal and Telecommunications Administrations (CEPT) in an attempt to find additional spectrum for RFID, short range devices (SRDs) and smart metering. By the end of 2012, a new two-part Technical Specification (TS) on the smart metering wireless access protocol for SRDs was nearing completion, pending copyright considerations. When finished, it will harmonise protocols for devices supporting M2M applications.

We have also been looking for solutions to achieve co-existence between UHF RFID and Extended GSM-R (ER-GSM, GSM™ on railways). The aim is to enable friendly spectrum sharing between future UHF RFID systems in the 915 - 921 MHz band and ER-GSM systems in the 918 - 921 MHz band. Tests and trials continued in 2012. These produced good results which were used to update the existing TS on the methods, parameters and test procedures for cognitive interference mitigation. A TR on the testing plan itself is also being prepared. The final results of this work, including active mitigation techniques, will be incorporated in a Harmonised Standard for RFID.

## eHealth – Saving Lives, Saving Costs

Improving the quality of health care, reducing medical costs and fostering independent living for those needing care are key objectives of the Digital Agenda for Europe.

Telemedicine, for example, can improve the treatment of patients both at home and away and reduces unnecessary hospitalisation but, according to the World Health Organisation, only 8% of patients today use tele-monitoring.

Medical issues were a key focus of TC ERM in 2012. We began work on an exciting new project – telemedicine solutions for the ‘Internet polyclinic’. In countries such as Russia, with a population scattered over wide areas, health

services are looking to home medicine and telemedicine to help provide a comprehensive health care system and to reduce the growing costs of health care. The aim is to create the standards necessary for the confidential transmission of medical data by wireless signals from individual measuring equipment, via a PC and video-link. One of the current problems is the lack of interoperability between devices. We are preparing a TR, examining use cases and analysing the economic, legal and technical issues for the implementation of a telemedicine solution. We are also working on a related TS, defining the protocol requirements to ensure interoperability, and addressing security and transmission quality.



We are also working on Low Power Active Medical Implants operating in the 2 483,5 - 2 500 MHz band, which use low power implanted wireless devices to provide telemetry and telecontrol to and from an external programmer. Given their crucial usage, we published a specific product standard (a European Standard) to ensure that the radio links are tested to appropriate levels.

We are producing a System Reference Document with a view to adjusting the current regulatory requirements to allow for the emergence of new medical products, to enable the same 2 483,5 - 2 500 MHz band to be used additionally by SRDs for cochlear implants operating as Low Power Active Medical Implants outdoors, within a range of a few metres from the equipment.

In 2012 we began to investigate possible standardisation in the area of Body Area Networks (BAN). We co-organised a workshop on Smart BAN as part of the BodyNets 2012 conference in Oslo, Norway, which highlighted a number of key points. There is a pressing need for harmonisation and standardisation in this area and discussions about how to manage the work are continuing.

# Wireless Systems

## Enabling a Wireless World

*Radio technology is an integral part of our daily lives. We use radio technology for our mobile phones, for broadcast radio and television, in Wireless Local Area Network (WLAN) and cordless technology, Global Navigation Satellite Systems (GNSS), Radio Frequency Identification (RFID) and short range devices. All of these technologies and applications compete for use of limited radio spectrum resources.*

*ETSI creates the standards which define many of these radio technologies and systems. We also provide the standards which the regulatory authorities in Europe – and elsewhere – use to manage the radio spectrum environment and to ensure safe co-existence between all these systems.*

### Supporting the European Regulatory Environment

ETSI plays a key role, co-operating with the European Commission (EC) and the Electronic Communications Committee (ECC) of the European Conference of Postal and Telecommunications Administrations (CEPT) on aspects of the regulatory environment for radio equipment and spectrum, both at the European Union (EU) level and at the wider intergovernmental level across Europe.

The EC harmonises the essential requirements for radio equipment, which include constructing radio equipment so as to avoid harmful interference, via the Radio and Telecommunications Terminal Equipment (R&TTE) Directive. We provide a broad range of Harmonised Standards in response to EC mandates. Applying these standards enables manufacturers to demonstrate that their products comply with the Directive's requirements before being placed on the market or put into service. National governments also use these standards in their important work of enforcement. ETSI standards define the state of the art, and enable Administrations to take action against non-compliant equipment, ensuring that legitimate users can use spectrum without interference. In October, the EC published proposals for replacing the R&TTE Directive with a new Radio Equipment Directive, and we began to analyse the implications of the new proposals for our future radio work, especially in relation to software defined radio, cognitive radio and installations.

While the EU develops new modes of spectrum sharing in Europe (a key element of the Radio Spectrum Policy Programme, adopted in March 2012), we are developing new technologies which take advantage of these approaches. We propose new radio systems via 'System Reference Documents' which provide technical, legal and economic information, to inform the ECC's allocation of spectrum. For example in 2012, we began examining the technical means for systems to operate under a Licensed Shared Access regime, in parallel with this spectrum policy being developed by Europe's regulators.



### Broadband Radio Access Networks

In 2012, our work on Broadband Radio Access Networks included the preparation of Technical Reports (TRs) for Direct Air to Ground Communication (DA2GC) systems and the production of Harmonised Standards for Wireless Access Systems including Radio Local Area Networks (RLANs). We completed two System Reference Documents describing the technical characteristics of DA2GC systems operating in license exempt spectrum, to support additional spectrum, and we continued our work on Ultra-Broadband Wireless Systems.

### Reconfigurable Radio Systems (RRS)

Reconfigurable Radio Systems (RRS) are opening up an opportunity for the sharing of unused spectrum amongst multiple services and radio networks, maximising the use of scarce and expensive frequencies. A new focus is on Licensed Shared Access (LSA), which allows for the co-existence of the original incumbent alongside a new cellular operator in the same band. In November 2012, the EC issued Mandate 512 to regulate RRS, including LSA. We began work immediately, kick-starting activities at a highly successful ETSI workshop on RRS, held in Cannes, France, in December 2012.

We are already developing the standards necessary for the future enforcement of the new Radio Equipment Directive, specifically to enable dynamic certification, which is a crucial factor in the introduction of new features, especially radio applications.

We published our first Technical Specification (TS) in March on the radio reconfiguration related requirements for mobile devices. A TS defining the system architecture was approved in December 2012 and a TS on the system requirements for RRS operating in IMT and GSM™ bands for intra-operator scenarios is well advanced.

### TV White Spaces

We are actively engaged in work on UHF TV White Spaces (TVWS, the areas of spectrum between allocated frequency bands that are unused by the spectrum owner over a given time in a given location). A feasibility study on control channels for Cognitive Radio Systems was published in April. The existing TR outlining use cases for operation in White Space frequency bands was revised to take account of Machine-to-Machine (M2M) devices. Ongoing activities are focused on the co-existence architecture for Cognitive Radio Networks on UHF White Space frequency bands, the system requirements for operation in UHF TVWS, and a feasibility study into Radio Frequency (RF) performances for Cognitive Radio Systems operating in UHF TVWS, which will address concerns about interference. We are also conducting a feasibility study into co-existence between Cognitive Radio Systems and RF cable networks.

In addition, we made good progress in 2012 developing the first ever Harmonised Standard (EN) outlining the essential requirements for RRS operating in TV White Space spectrum.



## Satellite Communications

In 2012, we published two TRs on satellite navigation: one on GNSS based applications and standardisation needs, and the other on GNSS receivers reference performances and interference mitigation capability. We revised the GMR-1 and the G family technical specifications for the satellite component of the Universal Mobile Telecommunications System (UMTS™)/IMT-2000. We also updated the Harmonised Standard on mobile terminals operating in the L band (1,5/1,6 GHz) to include the so-called 'extended L band', a 7 MHz adjacent slice of spectrum newly opened to the Mobile Satellite Service by the International Telecommunication Union (ITU).

We are taking a leading role in three areas in response to the European Commission's 'Space Mandate' (M/496): Navigation and Positioning receivers for road applications and airport services; interoperability and the integration of Mobile Satellite Systems and Fixed Satellite Systems with terrestrial systems, in particular Next Generation Networks, and with GNSS, in particular Galileo; and disaster management.

## Advanced Mobile Communications Technologies – 3GPP

### 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 worldwide, plus market associations and several hundred individual companies, to develop specifications for advanced mobile communications technologies. Based on the evolution of GSM, which was defined by ETSI, 3GPP has developed UMTS, LTE™ and LTE-Advanced technologies. A derivative of GSM, GSM-R, which was developed by ETSI's Railway Telecommunications committee (TC RT), is used in the rail industry.

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

Further information at: [www.3gpp.org](http://www.3gpp.org)



3GPP Release 11 was virtually completed in 2012; stage 2 was frozen in March and stage 3 in September, leaving just final protocol adjustments to be made in 2013.

Release 11 encompasses nearly one hundred new top-level 'Features', resulting in a wide variety of new functionality including quality of service controlled by pre-set subscriber spending limits, novel non-radio access to 3GPP networks (for example, wireline broadband), improvements in interworking with WLANs including hotspots, domestic and corporate networks etc., new EEA3/EIA3 security algorithms (ZUC), and more, together with the usual improvements to and enhancement of existing features.

Release 11 also includes more than 30 top-level studies, most of which will lead to new or revised specifications in Release 12. Topics covered were as diverse as IMS-based peer-to-peer content distribution services, non-voice emergency services, Single Sign-On (SSO) application security, mobile 3D video codecs, management techniques to reduce radio network energy dissipation, improvements to the radio access technology for machine-type communications, and the inevitable addition of extra frequency bands and the feasibility of various types of carrier aggregation.



Channel aggregation was a key focus of 2012. The demands for data transmission have been rising and are projected to continue to rise for years to come. One way to achieve the required level of service is to have wider channels. This can be accomplished efficiently by aggregating individual channels to make wider composite channels, of up to 100 MHz. 3GPP has therefore been working on the aggregation of channels both from the same band (intra-band channel aggregation) and from different bands (inter-band channel aggregation). LTE has been specified for operation in a large (and growing) number of frequency bands, and thus very many combinations of channels can be envisaged. Often, pairs of bands are only available in particular geographical areas or to particular licensed operators. Parameterisation and characterisation of channel aggregation now makes up an increasingly important percentage of the total 3GPP work plan; already Releases 11 and 12 show 200 individual items of channel aggregation work.

### Mobile Standards Group

Our Mobile Standards Group committee (TC MSG) provides the regulatory standards which are needed to support the deployment of GSM, UMTS and LTE networks in Europe. In 2012 work focused primarily on completing the revision of the Harmonised Standards for GSM base stations and GSM repeaters, to introduce the 3GPP Release 9 features of Voice over Adaptive Multiuser on One Slot (VAMOS) and Multi-Standard Multi-RAT Base Station (MSR) in GERAN single RAT mode.

As part of our standardisation of GSM on board aircraft, in March we published a TS to limit the power outside an aircraft radiated from the base station system equipment, which will help prevent interference with mobile networks on the ground.

### New Generation DECT

Digital Enhanced Cordless Telecommunications (DECT™) is still the leading standard worldwide for digital cordless telecommunications for both cordless voice and broadband home communication. We are now working on 'New Generation DECT'.

### New Technologies

In 2012, our Industry Specification Group on the Open Radio Equipment Interface (ISG ORI) published its first release of specifications for an interface between remote radio heads and base band units of mobile base stations. Use of distributed radio equipment can lead to significant cost savings for a mobile operator, as well as offering greater flexibility in network design and deployment. Work has now begun on the second release.

Our ISG on Surface Mount Technique (ISG SMT) began work on three specifications for embedded communications modules using SMT.

# Better Living with ICT

## Technologies for a Better Life

*While technological progress has improved the way we communicate for both social and business purposes and opened up exciting new opportunities, we are careful to minimise any adverse social consequences. Part of our work therefore involves making products and services simpler to use, safer and more efficient. We are also committed to identifying energy efficiency solutions that mitigate the impact on climate change of the growing use of Information and Communications Technologies (ICT). The ultimate goal is to ensure that ICT improve the quality of life for all.*

### Energy Efficiency for ICT

Our Environmental Engineering committee (TC EE) is supporting European Commission (EC) Mandate 462 in its goal “to enable efficient energy use in fixed and mobile information and communication networks” by defining the best environmental practices for telecommunication equipment and infrastructures in different situations. We also actively contribute to various global initiatives to reduce the environmental impact of ICT equipment.

In June 2012 we organised an Energy Efficiency workshop, at the University of Genoa, Italy, to bring standardisation experts together to share their views, discuss their current work, and to identify future standardisation needs.

We made good progress revising the European Standards (ENs) which define the climatic and mechanical requirements for telecommunication equipment. Three new ENs were produced which address the methods for transportation tests and for testing telecommunication equipment installed in weather-protected and non-weather-protected locations. We are developing a new ETSI Standard (ES) on thermal management requirements in outdoor enclosures.

Work is ongoing on a multi-part ES on the control and monitoring of power and cooling systems used in telecommunication and data infrastructures, with the aim of monitoring and reducing power consumption.

Other work focussed on the high voltage DC power supply interface requirements up to 400V, to reduce energy consumption in central offices and data centres, the DC source up to 400V and the grounding and bonding of telecommunication equipment connected to the 400V DC power source.

In the area of measurement methods to assess energy efficiency, we published an EN on customer premises equipment, an ES on core network equipment, and two Technical Reports (TRs) on radio base stations and radio access networks. Work on an ES on measuring the energy efficiency of transport telecommunication equipment and an ES for router and switching equipment progressed well.

Throughout 2012, TC EE and our Access, Terminals, Transmission and Multiplexing committee (TC ATTMM) worked together to develop the first sets of ratios, or ‘Global Key Performance Indicators’ (KPIs), to monitor the energy management of deployed broadband services, specifically operational telecommunication infrastructures, operators’ data centres and mobile access networks.

We are working with the Telecommunications Standardisation sector of the International Telecommunication Union (ITU-T) to publish a common methodology, which will define how to measure the environmental impact of a telecommunication product from the raw material/components until the end of its life, as well as the environmental impact of an entire telecommunication network or service.

We work closely with various European Research Projects on energy efficiency. In particular, co-operation with ECONET (low Energy CONsumption NETworks) has prompted work on the development of a new ES on the energy management capabilities of the future telecommunication fixed network nodes.

We also contributed towards the EC’s Joint Research Centre (JRC) in its revision of the Code of Conduct on the energy consumption of broadband equipment and data centres. Various ETSI publications have been adopted as reference methodologies to determine the energy efficiency of network and wireless access equipment.

In co-operation with the Home Gateway Initiative (HGI), we completed the first series of standards for global usage on common power supplies for communication equipment at customers’ premises.

In 2012, we established a new Industry Specification Group on Operational energy Efficiency for Users (ISG OEU) to develop performance indicators for environmentally efficient ICT, such as infrastructure, equipment and software in data centres and networks, taking into account, for example, power consumption and greenhouse gas emissions.



## Access for All

By making products, systems, services and environments easy for all to use, Human Factors can be crucial in the commercial success of any ICT product or service. Our Human Factors committee (TC HF) is internationally renowned for its expertise in this field.

In 2012, TC HF's work was concentrated on its response to EC Mandate 376 on the "Support of European accessibility requirements for public procurement of products and services in the ICT domain". Working in co-operation with the European Committee for Standardisation (CEN) and the European Committee for Electrotechnical Standardisation (CENELEC), final drafts of two TRs and an EN on ICT accessibility requirements and testing methods were produced. Together these documents will be used for conformance testing in public procurement processes, to help ensure that accessibility is taken into account and that the ICT environment of public organisations is accessible to all.

We published a TR on localisation, specifically the translation of dynamically generated text into different languages. This addresses problems encountered, for example, when users of one nationality use their mobile phones on a foreign network.

We completed a TR on mobile text telephony over Internet Protocol (IP), which will enable users who are deaf or hard of hearing to use a standard mobile terminal as a text communication device to communicate with other people.

In 2012 we initiated work on an ETSI Guide to provide recommendations for the design and development of mobile ICT devices for people with learning disabilities. Without some assistance or adaptations, people with cognitive disabilities may face difficulties in performing or completing even very simple tasks (such as reading or writing text or processing auditory information). TC HF's project includes the configuration of user interfaces and functionality using profiles, support for the spoken presentation of text content, support for viewing web content on devices with small screens, and support for remote assistance, so that users can obtain help when they encounter difficulties.

## Media Quality and the User Experience

In 2012 our Speech and Media Transmission Quality committee (TC STQ) made good progress on two new Technical Specifications, one on the transmission requirements for 'super-wideband' (bandwidth up to 14 kHz) and full-band headsets and a second for hands-free terminals and teleconferencing. We are also working on perceptually motivated parameters, defining more closely the audio quality, the loudness and fidelity of speech, as perceived by the user, for wideband and super-wideband speech terminals. We published a two-part ES for the inductive coupling of hearing aids to fixed line and cellular terminals.

We began to update our series of standards which define the transmission requirements for narrowband Voice over Internet Protocol (VoIP) terminals from a Quality of Service (QoS) perspective, as perceived by the user. Other ongoing work addresses the requirements and test methods for analogue handsets connected to PSTNs and QoS for video-streaming services. We began new work on the development of reference load and background traffic profiles.

We are also working on end-to-end transmission planning requirements for real-time services in the Next Generation Network, focusing on the delay introduced by network elements and jitter caused by the access bandwidth limitations of reference connection scenarios. 3G and LTE™ aspects have been added to the scope of this work.

During 2012, we examined the QoS of connections from current technologies to LTE, where delay problems have been encountered by operators. We published a new TR in November, which will help LTE stakeholders to maintain end-to-end speech quality at a high level when deploying the technology.

In 2012, we began work on a new TR on the QoS parameters and the related measurement methodology for smartphones, and we published a new ETSI Guide on throughput measurements.



We also address acoustic safety. For example, we are co-operating with CENELEC on the revision of the EN on personal music players in mobile phones to include relevant measurement standards to regulate the levels of output, particularly to protect children and young adults. At the same time, we need to ensure that conversational functions on mobile phones and equipment such as hearing aids and in-ear monitors used in broadcasting, where at times the location demands higher sound levels, are not adversely affected.

Our User Group works closely with our other committees, particularly those concerned with QoS, to ensure that our standards take into account the needs of users. In 2012, the User Group focused particularly on the quality of telecommunication services. The Group modified its ETSI Guide on the definition and methods needed to assess QoS parameters at the various stages of the customer relationship other than utilisation.

## Safety

Our Safety committee (TC Safety) monitors developments in electromagnetic fields, electrical safety and safety in cable television systems.

# Content Delivery

## Facilitating Content Consumption across Different Business Areas

*The Internet, mobile communications and broadcasting are converging. But the standardisation of these different areas has traditionally followed different paths, so they do not interoperate across the same platforms. Content providers therefore incur significant additional cost and customers' buy-in remains below expectations. ETSI is addressing the urgent need to align these diverse specifications and to harmonise solutions, for the benefit of both the business community and the consumer.*

### Content Delivery

In 2012, our Media Content Distribution committee (TC MCD) worked on the development of multimedia systems (television and communication) to meet present and future market demand for media content distribution. Specifically, it addressed the issues associated with the fragmentation and the non-interoperability of solutions for content distribution across platforms in a converged environment supporting Internet Protocol TV (IPTV), web TV, mobile TV and broadcast TV.

The major achievement of the year was the publication of a Technical Specification (TS) on the use cases and requirements for Content Delivery Network (CDN) interconnection. This provides an MCD CDN-CDN profile for CDN interconnection use cases and the necessary CDN-CDN protocol choice to make interconnection possible. Related work on interconnection architecture and protocols also progressed well.

Ongoing work includes the development of a TS on the multi-screen convergence service. When completed, this will include a definition of terminology, and will collect together use cases and scenarios, identify requirements, analyse the impact, and pinpoint the gaps in current standards and specifications.

We are analysing the architecture, the requirements and the mechanisms for interoperable and exchangeable Conditional Access/Digital Rights Management systems for multimedia platforms in a convergent environment.

### Broadcasting

Our standardisation of broadcast systems, programme transmission and receiving equipment is dealt with in a Joint Technical Committee which brings us together with the European Broadcasting Union (EBU) and the European Committee for Electrotechnical Standardisation (CENELEC) – JTC Broadcast.

JTC Broadcast achieved a major milestone in 2012 with the completion of the standards for the second generation of the Digital Video Broadcasting (DVB) interactive satellite system (DVB-RCS2). A European Standard (EN) on the lower layers for satellites was published in January and two TSs followed in May. DVB-RCS2 provides users with a broadband Internet connection, without the need for any local terrestrial infrastructure. Together, the DVB-RCS and DVB-RCS2 standards define the complete air interface specification for two-way satellite broadband Very Small Aperture Terminal (VSAT) systems.

In line with its revision of the DVB-T2 European Standard in 2011, in 2012 JTC Broadcast revised the DVB-T2 guidelines specification, to take account of 'T2-Lite', the new profile created specifically for mobile and portable TV.

One of the most popular DVB standards, on Service Information in DVB systems (DVB-SI), was also updated in 2012 to take account of new descriptors.

We revised one of the Connected TV standards, the Hybrid Broadcast Broadband TV specification, primarily to include Dynamic Adaptive Streaming over HTTP (MPEG DASH).

In the radio area, the DRM+ (Digital Radio Mondiale) ETSI Standard was updated to accommodate the extension of DRM's frequency range and to reflect operational experience. A specification for Digital Audio Broadcasting (DAB) on the rules for implementing service information features was also produced, which will help broadcasters and manufacturers of receivers to implement various service information features to ensure interoperability.

Finally, the TV-Anytime specifications, which allow for the controlled delivery of multimedia content to a user's Digital Video Recorder (DVR), were updated to take account of new developments.

### Cognitive Interference Mitigation Techniques

Our Electromagnetic Compatibility and Radio Spectrum Matters committee (TC ERM) is working on cognitive interference mitigation techniques for use by Programme Making and Special Events (PMSE) devices – the wireless microphones, in-ear monitors, talk-back links, audio links etc. which are used to support multimedia productions in TV broadcast, stage shows, theatre productions and sporting events. Following the advent of the Digital Dividend and the Digital Switch-Over from analogue to digital television, the PMSE market urgently needs access to new spectrum resources to satisfy existing and future demand. As an alternative to the allocation of new spectrum, we are investigating the possibility of using cognitive spectrum access methods to facilitate spectrum sharing.



# Fixed Networks

## Fulfilling the Promise of Unlimited Bandwidth

*The way we communicate changes as technology evolves. Nowadays consumers expect services to be easily accessible and available everywhere, on whatever devices they are using. Technically, this means networks must converge. Our fixed networks work provides a comprehensive set of standards for networks that meet today's – and tomorrow's – needs.*

Back in 1988, our activities began with ISDN and PSTN technologies. Technological evolution has subsequently enabled independence between access networks and the core network, allowing connection from any access network. On the core network side, Next Generation Networks (NGN) are enabling the use of Internet Protocol (IP) technology and more advanced services, including services embracing voice, Internet, TV and mobile. Our work addresses the ongoing needs of access network technologies, from Digital Subscriber Line technologies (xDSL), fibre and cable, through to the latest developments with IP/networking technology and the Cloud.

### Cloud

In September 2012, a European Commission (EC) Communication recognised the proliferation of standards and the resulting confusion as key factors holding back the widespread use of cloud computing. The EC has asked ETSI to co-ordinate with stakeholders and to identify a detailed map of the standards required in areas such as security, interoperability, data portability and reversibility. In December 2012, we held a Cloud workshop, at which, in co-operation with various partner organisations, we launched the Cloud Standards Co-ordination. Under this umbrella, interested parties, including non-members of ETSI, will meet for a series of brainstorming sessions throughout 2013 with the aim of identifying requirements for Cloud standards.



Also in 2012 we completed a new Technical Report (TR) which provides an overview of private sector user recommendations for public Cloud services. We published a second TR, on Service Level Agreements for Cloud, and we began new work on Cloud as a mitigating technology to reduce greenhouse gas emissions in other (non-ICT) sectors.

### Network Access

In 2012, our network access work focused on improvements to the Very High Bitrate DSL 2 (VDSL2) standards, Fibre to the Distribution Point (FTTdp) and Reverse Power Feeding. We completed a revision of the specifications covering DSL splitters and micro-filters.

We also addressed issues relating to the interoperation of customer premises equipment with the introduction of vectoring.

### Cable

We are developing a new ETSI Standard (ES) to define global Key Performance Indicators (KPIs) for Hybrid Fibre Coaxial (HFC) access networks and their application, and a report on energy efficiency and KPIs for cable access networks.

A TR is being prepared to describe the current and evolving electromagnetic environment following the introduction of new radio services in the Digital Dividend UHF frequency band 790 - 862 MHz compared with the current and evolving cable network equipment parameters defined by existing European Standards (ENs).

New work began at the end of 2012 on a Technical Specification (TS) on measurement methods for the network performance of broadband data services. We began to specify the equipment and end-to-end system requirements for broadband cable networks to enable the transition from IPv4 to IPv6, and we are preparing a specification for a methodology to verify that equipment and systems comply with ETSI standards that enable this transition.

### New Technologies

Our Industry Specification Group on Autonomic Network Engineering for the Self-managing Future Internet (ISG AFI) is working at the forefront of evolved technologies related to network management. It is defining an architectural reference model of a Generic Autonomic Network Architecture (GANA), with the aim of establishing a common understanding of what autonomic behaviour is and how an autonomic, self-managing network should be engineered.

Our ISG on Measurement Ontology for IP traffic (ISG MOI) published its second Group Specification in 2012, on the requirements for an ontology for IP traffic measurement.

In an exciting initiative at the end of 2012, we set up a new ISG on Network Functions Virtualisation (ISG NFV) to develop a new approach to the technologies and operations in telecommunications networks

### A New Approach in ETSI

In 2012, we reorganised our work on fixed network standardisation to better reflect the evolution of technology. We set up a new ETSI Project on End-to-End Network Architectures (EP E2NA) which brings together all the relevant ETSI players to oversee the development and maintenance of a global end-to-end system view of Information and Communication Technologies (ICT) networks. We will focus on fixed access and networking services, as well as interconnection to other networks (including mobile networks).

We have set up two new Technical Committees: TC CABLE, to give greater visibility to our ongoing cable and HFC work, and a new Network Technologies committee (TC NTECH) to standardise the detailed architecture and protocol specifications for use in networks, service interconnection and network interconnection, and Future Networks technologies.

# Home and Office

## Connecting Devices in the Home and Office

*The variety of devices that need to be interconnected is growing rapidly and most require broadband. The new services being developed are creating a 'Connected Home' and a 'Connected Office'. Our standardisation for home and office focuses on three aspects: home and office wireless, home and office interconnection, and home and office requirements, including Quality of Service (QoS) and security.*

### Cordless Voice and Broadband Communication



For many years the leading cordless system in Europe, Digital Enhanced Cordless Telecommunications (DECT™) is now also number one in the USA.

We are working on 'New Generation DECT', which builds upon the convergence of the Internet and telecommunications and is fully backwards compatible with existing DECT technology. It also introduces advanced features such as high quality wideband (7 kHz) and super wideband (14 kHz) voice, support of Internet telephony and broadband data connections. In 2012 we added improved phone book handling, answering machine control, handset capability enquiry, security enhancements and an energy-saving 'ECO mode'. The corresponding test specification is also being drafted.

We continued to develop Ultra Low Energy (ULE) DECT. ULE technology addresses many application scenarios not covered by any existing technology, since other current contenders suffer from a variety of drawbacks including high power consumption, spectrum access limitations, short range or a lack of standardisation. The low power consumption of ULE technology extends battery life (typically up to ten years) and, with New Generation DECT, connectivity to the Internet is already available, which makes the technology ideal for the burgeoning market in sensors, alarms, machine-to-machine applications and industrial automation. ULE technology may also be applied to utility meters and related devices and therefore has implications for the operation of smart grids.

The main usage of DECT ULE in its first phase of development is home automation. We are therefore updating the DECT base standard to include the necessary new protocol elements and procedures, and our first Technical Specification (TS) for DECT ULE Phase 1 was almost complete by the end of the year.

We also addressed security features (authentication and encryption), with new algorithms based on the Advanced Encryption Standard (AES). The DECT base standard and the Generic Access Profile were also updated.

### Powerline Communications

#### Smart Metering

In 2012, our Powerline Telecommunications committee (TC PLT) continued to work in response to the European Commission (EC) Mandates on Smart Meters (M/441) and Smart Grids (M/490). We made good progress with a new TS on smart metering and home automation, which will define the powerline communication requirements for smart meters, covering both in-home and outdoor networks and using low voltage and medium voltage electricity grids between the utilities and meters in the home. We also published a TS on tests and measurements for smart meters operating on electricity grids.



#### PLT and Premium TV services

The future digital home will share video content such as HD, HD 3D video, Multiple Views Video and 4K video. Current home networking technologies do not provide the required throughput, reliability and coverage for these forthcoming video formats. 4K is particularly challenging because of the volume of data involved.

Anticipating future demand, we have been studying the possibility of improving the performance and coverage of PLT systems by using MIMO instead of Single Input Single Output (SISO) technology. The new MIMO PLT-based networks offer the possibility of distribution throughout the home of premium services such as 4K video for customers with ultra high definition television (UHDTV). With the publication in February 2012 of Part 3, we completed a three-part Technical Report on the feasibility of MIMO PLT to measure the capacity MIMO channels in several European countries. Parts 2 and 3 were also revised during the year to take account of new products due to be launched in 2013.

In September we began work on a new TS on the requirements for very high bitrate services such as 4K video.

#### Small Cells

In the Third Generation Partnership Project (3GPP™) we are working with our international partners on small cells (pico-, femto-, micro-cells), which will become particularly important as data rates increase.

# Transportation

## Bringing the Power of ICT to People on the Move

*ETSI supports various transportation domains – road, railways, aviation and maritime services – with activities which are carried out by key industry players and therefore reflect true market demand.*

### Intelligent Transport Systems

As a world leader in the standardisation of Intelligent Transport Systems (ITS), we are developing standards for wireless communications for vehicle-to-vehicle and vehicle-to-roadside communications. Our ultimate priorities are road safety, traffic efficiency and reducing environmental impact (both in terms of CO<sub>2</sub> emissions and fuel consumption).

The main focus of our work in 2012 was 'Co-operative' ITS, which offers enormous potential, for example, in the provision of driver assistance and hazard warning, emergency services, traffic control, fleet and freight management and location-based services. The industry plans to deploy Co-operative ITS from 2015, and the need for standardisation is therefore pressing. In 2012 we completed our work in response to European Commission (EC) Mandate 453 on the establishment of standards to ensure interoperability. By the end of the year, we were in the process of finalising more than 65 standards, specifications and validation reports, and the first release of European Standards (ENs) for the deployment of Co-operative ITS was scheduled for publication in 2013.

Among the highlights, we finalised standards on access network and ITS channel configuration. We created a number of security specifications to support ITS, including trust and privacy management, confidentiality and access control. Three additional Technical Specifications (TSs) on applications to improve safety on the roads, and the two ENs on Co-operative Awareness Message (CAM) and Decentralised Environmental Notification Message (DENM) service functionalities were almost completed by the end of 2012.

In the network and transport area, a wide range of specifications was developed and published, including the important standards to enable GeoNetworking. These are now being upgraded into ENs.

We completed our work on mitigation between Dedicated Short Range Communication (DSRC) equipment and Co-operative ITS, which achieved widespread support from stakeholders.

Various quality, conformance and interoperability tests were produced.

We are also contributing to the EC Mandate on electric vehicle charging standards (M/468) with points of interest notification for charging stations.

### Automotive Radar

Good progress was made in the Ultra Wide Band (UWB) automotive radar area. The 24,25 - 26,65 GHz frequency band is available in EU Member States until 2018, by when 79 GHz equipment is expected to be ready for introduction. The relevant EN was published in March 2012 and is being revised to take the latest technology developments into account. The EN for surveillance radar in the 76 - 77 GHz range is being updated in the light of the EC's 'MOSARIM' project on radar interference mitigation. We began to revise the existing EN on radar equipment using Wideband Low Activity Mode (WLAM) in the 24,05 - 24,50 GHz band.

### Aviation

In 2012, our Aeronautics committee (TC AERO) completed the outstanding work items and revisions to ENs remaining from the EC's Single European Sky (SES) mandates M/390 and M/438. We continue to supply standards for air traffic management equipment and the Advanced Surface Movement Guidance and Control System (A-SMGCS). We have begun new work aimed at enabling airline passengers to connect to the Internet to send and receive email when travelling on continental, as well as long-haul flights.

### Railways

Following its successful roll-out, an additional 3 MHz of spectrum was allocated to GSM™ for Railways (GSM-R) to extend applications to urban and suburban transport needs. In 2012, we began to incorporate this additional spectrum into the Third Generation Partnership Project (3GPP™) radio access standard. The major development of 2012, however, was the introduction of Internet Protocol (IP) into the TSs for the core network and interfaces.

In addition, new work was initiated on core network redundancy, using RANflex, which was originally defined by 3GPP for point-to-point calls, in the context of group calls.

We also completed our response to the EC mandates on Urban Rail (M/486) and the Interoperability Requirement (M/483). Preparation of the standards themselves will now begin with a Technical Report on GSM-R on Urban Rail.

### Maritime

We made significant progress in 2012 in plugging some of the standardisation gaps in the area of maritime safety. We are developing an EN on the technical characteristics and measurement methods for equipment for the generation, transmission and reception of Digital Selective Calling (DSC), the new international standard for distress messages. We are also creating a three-part EN for maritime personal homing beacons, intended for search and rescue purposes. Work continues on two new ENs using DSC and Automatic Identification System (AIS) signalling in man overboard devices.



We completed a set of interoperability test specifications for marine DSC devices, publishing a multi-part TS which will improve the overall efficiency of the DSC system.

### Satellite

In the satellite area, we produced a new EN on Earth Stations on Mobile Platforms (ESOMPs) in the Ka band (27,5 - 30/17,3 - 20,2 GHz). When published early in 2013, this standard will facilitate the introduction of new equipment for satellite broadband access on-board aircraft and vessels.

# Security

## Standards for Secure, Reliable Communications

*Standards provide the means for protecting the user and creating a more secure and profitable environment for industry and commerce. Our security work addresses numerous aspects including mobile/wireless communications, information technology infrastructure, lawful interception and data retention, electronic signatures, smart cards, fixed communications and security algorithms.*

### Smart Cards

The 4th Form Factor for the UICC smart card was eventually agreed by vote in 2012, after many long and intensive discussions. The technical realisation of the 4th Form Factor has taken the miniaturisation of the existing three form factors, specified respectively in 1988 (ID-1 Card), 1989 (Plug-in Card) and 2004 (Mini-UICC), to the limit by removing nearly all plastic surrounding the contact area and shifting the two contacts needed for the high speed interface to the central part of the contact area.

We specified the MFF2 (M2M Form Factor 2) for use in Machine-to-Machine (M2M) applications. The MFF2 is a Surface Mounted Device (SMD) package which is soldered to a circuit board; it is an example of an 'embedded UICC' (eUICC), that is a UICC which is 'not easily accessible or replaceable'. The ability to change subscriptions on devices which utilise an eUICC necessitates new methods for provisioning identity and access credentials both securely and remotely. After long and difficult discussions about the management of the eUICC, a Technical Specification containing use cases and a fairly extensive set of requirements was produced.

We published important test specifications for the conformance requirements for the 'UICC Application Programming Interface for Java Card™ for Contactless Applications', and for the Secure Channel interface. This was developed by our Smart Card Platform committee (TC SCP) and is used by the Open Mobile Alliance (OMA) in the OMA BCAST specifications, and by the Third Generation Partnership Project (3GPP™) for secure communications between the USIM application on a UICC and a relay node.

We completed work on the security for both the Card Application Toolkit (CAT) and the encapsulated CAT, and on memory integrity monitoring in M2M applications. We have introduced the possibility for Java Card™ applications to indicate that certain data objects in the non-volatile memory of the chip are subject to high update activities.

In 2012 we closed all work on Release 11 of the Smart Card specifications and began the definition of the requirements for Release 12 and their technical realisation. Release 12 requirements include, in particular, the optimisation of the UICC access as well as use cases and requirements related to the addition of new contactless features.

### Electronic Signatures

In 2012, we continued to work on the first phase of our response to the European Commission (EC) Mandate on Electronic Signature Standardisation (M/460) and prepared for the second phase. Standards to support the use of electronic signatures and public key certificates are a primary driver in enabling the successful evolution of eCommerce. In collaboration with the European Committee for Standardisation (CEN), we published a rationalised standardisation framework which will allow mutual recognition and the cross-border interoperability of

electronic signatures. The framework provides an inventory of eSignature standards, a rationalised structure for the European eSignatures standardisation documents, a gap analysis and a future work plan.

We completed a number of 'quick fixes', providing urgently needed enhancements to existing standards. Four enhanced versions of the Advanced Electronic Signatures (AdES) basic baseline profiles were published which will ensure the preservation of the technical validity of signatures for a given time after signature creation. These baseline profiles provide the basic features necessary for a wide range of business and governmental applications. They ensure the interoperability necessary to enable electronic documents containing AdES signatures to be interchanged across borders.



We made good progress with the drafting of European Standards (ENs) on the general policy requirements for trust service providers supporting electronic signatures and on the policy requirements for certification authorities (CAs) issuing either qualified certificates or public key certificates. A new EN on the Qualified Certificate profile is also being prepared. A new Technical Specification (TS) on procedures and policies for signature validation was published, which will enable the technical validity of an electronic signature to be established. A Technical Report (TR) was created which provides guidance to CAs issuing publicly trusted TLS/SSL (Transport Layer Security/Secure Sockets Layer) certificates as to how they may be assessed, and for auditors in carrying out assessment of the conformance of such certification authorities.

In 2012 we published test specifications for PAdES interoperability testing, ASiC interoperability testing and XAdES baseline profile conformance testing. A XAdES baseline profile conformance checker tool was also developed.

As one objective of M/460 is to raise awareness, we organised a second workshop in February 2012 in McLean, USA, which brought together US and European stakeholders to share their views on the operation of electronic signatures in their respective regions. In November 2012 a second workshop on Trust Service Provider Conformity Assessment was held in Berlin, Germany.





### Lawful Interception and Data Retention

Lawful Interception (LI) and Data Retention play a crucial role in helping law enforcement agencies to investigate terrorism and serious criminal activity. In ETSI we are pioneering the development of Lawful Interception, and our LI standards are being adopted around the world. Updating of our LI and Data Retention standards is an ongoing exercise, particularly to add new services.

The main focus of 2012 was the development of two new TRs on Lawful Interception and Data Retention in Cloud and virtual services.

A TR on general requests for the handover and delivery of real-time or stored information – the ‘eWarrant Interface’ – was also completed, and we began new work on a specification to define a specific Warrant electronic interface between two systems for the exchange of information relating to the establishment and management of LI.

### Security Algorithms

ETSI is a global leader in the provision and maintenance of security algorithms. Our Security Algorithms Group of Experts (SAGE) produces authentication and encryption mechanisms for various technologies to prevent fraud and unauthorised access to public and private telecommunications networks, and to protect user privacy.

### ETSI Security Workshop

The seventh annual ETSI Security Workshop took place at Sophia Antipolis in January 2012. This event was just as successful as the previous workshops, attracting over 150 registered delegates. The ETSI Security Workshop is well established now as a premier event in security, bringing together standards developers and other experts from around the world. In 2012, key topics discussed included security in the Cloud and M2M communications.

SAGE began a major task in 2012, specifying a second set of 3G authentication and key generation algorithms, as an alternative to the existing Milenage algorithm. (3G algorithms can also be used for both LTE™ and GSM™/GPRS.) A particular motivation for this work is the growing interest in the development of eUICCs, where the SIM application can be delivered to the UICC after manufacture, either over the air or over a wire. Pre-installing a second algorithm set alongside Milenage will allow operators who initially use Milenage in their SIM applications to switch to the second algorithm if Milenage is ever compromised. This will help future-proof the application and give users greater confidence in devices with eUICCs which may have to remain operational for many years.

### Other Aspects of Security

Other ongoing security work includes a study into the possible replacement of the Terrestrial Trunked Radio (TETRA) air interface encryption algorithm, algorithms for Digital Enhanced Cordless Telecommunications (DECT™), Quantum Key Distribution and Intelligent Transport Systems (ITS), where we are addressing the protection of user privacy and developing standards to counter risks associated with Co-operative ITS.

Security issues are being addressed across the whole range of Reconfigurable Radio Systems (RRS) work; in particular we are working on a TR on security-related use cases and threats in RRS.

Our work on the security of networks includes the regular updating of specifications that identify appropriate interfaces, reference points and entities for the purpose of Lawful Interception in the Next Generation Network architecture, as well as the development of a report on assurance profiles for secured telecommunications operations.

Our Industry Specification Group on Information Security Indicators (ISG ISI) is working on the implementation and detection of monitoring systems.

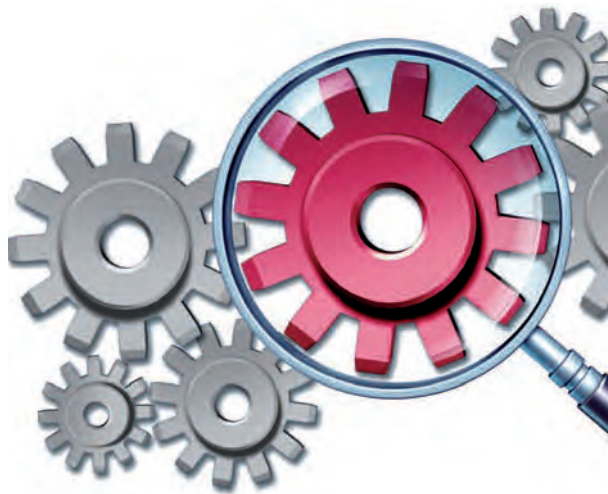
# Interoperability

## Interconnection in a ~Multi-vendor, Multi-network, Multi-service Environment

*Interoperability is one of the reasons why we develop communications standards. It is crucial in a multi-vendor, multi-network and multi-service environment. Interoperability gives users much greater choice of products, and enables manufacturers to benefit from the economies of scale of a wider market. The need to ensure interoperability is thus driven by market demand.*

### ETSI's Unique Approach to Interoperability

In their drive to deliver interoperable standards, our technical committees follow the principles of applying best practice specification techniques, the validation of standards and the development of test specifications related to our key technologies. Unique among Standards Developing Organisations, ETSI has pioneered the use of these best practices to deliver interoperable standards.



With over 20 years' experience, our Centre for Testing and Interoperability (CTI) is responsible for this horizontal activity, providing hands-on expertise in standards validation (especially through the organisation of our world-renowned Plugtests™ interoperability events), the development of test specifications, the application of protocol specification techniques and the use of methodologies.

### Test Specifications

In 2012 we continued our extensive development of conformance test specifications for LTE™, Intelligent Transport Systems (ITS), Digital Enhanced Cordless Telecommunications (DECT™) and the Internet Protocol Multimedia Subsystem (IMS).

In particular, the work on ITS included the development of a conformance test platform (the 'Conformance Validation Framework'), conformance test specifications for the Co-operative Awareness Message (CAM) and Decentralised Environmental Notification Message (DENM) services, GeoNetworking protocols, and security tests for vehicle-to-vehicle and vehicle-to-roadside network infrastructure communications services.

### Plugtests Events

Our Plugtests interoperability events provide valuable feedback to help improve our standards and at the same time offer manufacturers an opportunity to test their products and services against our standards, resolving any issues before entering the marketplace.

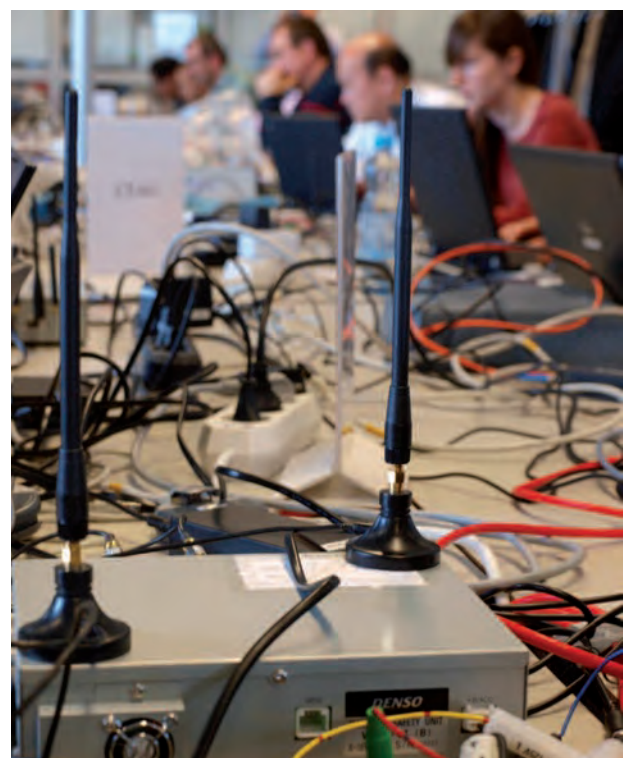
We offered twelve Plugtests events in 2012, on a variety of topics including electronic signatures, the Internet of Things, Cloud, ITS, IMS, Machine-to-Machine (M2M) communications, mobile applications and IPv6.

### RCS Interoperability

As one of the partners of the Third Generation Partnership Project (3GPP™), ETSI has played a key role in the deployment of IMS. Working with the Multi-Service Forum (MSF) and the GSM Association (GSMA), in 2012 we organised an interoperability event on Rich Communications Suite (RCS) Voice over LTE (VoLTE). This took place over three weeks in September-October at sites in Kranj, Slovenia, and Beijing, China. The event focused on validating key network and application interfaces to ensure multi-vendor deployment strategies for LTE/ Evolved Packet Core (EPC)/IMS technology for RCS and VoLTE. We held a workshop on 'Next Generation Services: RCS, VoLTE and beyond', which ran in parallel with the interoperability testing.

### Co-operative Mobility Systems

Together with the European Road Transport Telematics Implementation Co-ordination Organisation (ERTICO), we organised a second Co-operative Mobility Systems (CMS) Plugtests event in June 2012. The event attracted more than 15 companies with over 45 participants and provided an opportunity to test the interoperability of equipment implementing key ITS protocols. This event focused on GeoNetworking and included new tests such as contention-based forwarding, GeoUnicast and IPv6 over GeoNetworking. A public workshop was organised to coincide with the Plugtests event.





#### eCall

Together with ERTICO, we organised the first eCall Plugtests event, in May 2012 in Nuneaton, UK. eCall, the European Commission initiative to reduce road accidents and save life, involves a 112 emergency call, triggered either by the occupants of the vehicle or automatically, which transmits a minimum set of data and establishes a voice connection with a public safety answering point (PSAP). This event tested the eCall standards developed by ETSI and the European Committee for Standardisation (CEN) and verified the interoperability between in-vehicle devices produced by various manufacturers and PSAPs from different countries.

#### ASiC

Throughout 2011 and 2012, we worked on a test suite for Associated Signature Container (ASiC) signatures, which culminated in November and December 2012 in the first remote ASiC interoperability event.

#### Methods for Testing and Specification

Our Methods for Testing and Specification committee (TC MTS) creates standards related to testing and specification languages, and provides frameworks and methodologies to enable our other committees to produce documents that are easy to understand and easy to use. Its work is therefore critical to the market success of numerous technologies.

#### TTCN-3

ETSI developed the highly successful test specification language, Testing and Test Control Notation version 3 (TTCN-3), which is endorsed globally by the International Telecommunication Union (ITU). Originally designed for the telecommunications sector, TTCN-3 is widely deployed in a variety of areas including the automotive sector, transportation, the Internet, medical applications, web-based services, finance, industrial automation and distributed systems. Its use has also expanded from functional conformance testing to include load, performance and interoperability testing.

We update the TTCN-3 standards on an annual basis and, in April 2012, we published version 4.4.1 of the language. Revision of the TTCN-3 base standard, to take account of the new version, was completed by the end of the year and forwarded to the ITU for endorsement. In October, we began to upgrade the related conformance test suite, both in the light of TTCN-3 4.4.1 and to extend the coverage of the suite.

#### Model-Based Testing

Work on Model-Based Testing (MBT) is a key focus. The dominant topic during 2012 was the Test Description Language (TDL), where the user community is looking to ETSI to take a strong leadership role in testing development.

We are producing an ETSI Standard (ES) which will define a graphical notation for the specification of test descriptions and the presentation of test execution results, primarily for functional testing, but also potentially for other types of testing.

In 2012, we experimented with the use of commercial MBT tools to generate tests from standards related to the IMS and ITS. The results proved that commercial tools can be used in a standardisation setting. We produced a Technical Report (TR) outlining the case studies we examined and an ETSI Guide on the use of MBT in the development of standardised tests.

#### Security

We continue to address security issues; we are producing a TR describing case studies of where security testing has been used in industry, a Technical Specification on security testing terminology and a security design guide. In completing this project, we are co-ordinating with various European projects, including the ITEA2 – Diamonds project.

#### Major international user conferences

Over the last few years, TC MTS and the CTI together have organised two major annual user conferences: the TTCN 3 User Conference, which was held in 2012 in June in Bangalore, India, and the MBT User Conference, held in Tallinn, Estonia, in September 2012. We have decided to combine these two successful events into a single annual conference in 2013 – the User Conference on Advanced Automated Testing (UCAAT) – to broaden the scope we cover beyond just TTCN-3 and MBT and to include more on general specification techniques and requirements.

# Public Safety

## Mission-Critical Communications to Rely on

*We are working on standards for communications in a wide range of emergency situations, ranging from a man overboard to a major natural disaster.*

### TETRA

Terrestrial Trunked Radio (TETRA) continues to be a popular choice for critical communications users, and 2012 saw record sales of TETRA terminals.



Several key standards were updated in 2012 as part of our routine maintenance. We also completed a new User Requirement Specification (URS) for TETRA Direct Mode Operation (DMO), and a new URS for mission-critical broadband communications.

We completed a study which proved the feasibility of decreasing the minimum frequency at which TETRA can operate from 300 MHz to 138 MHz. Changes to allow the use of the lower range are therefore now being made to the core TETRA air interface standard. This VHF addition to the capability of TETRA is expected to be particularly important in areas of the world where there is a need for a more economical solution than can be provided in the UHF bands.

TETRA is moving towards a fully integrated and seamless solution, providing narrowband/wideband/broadband wireless communications for 'mission-critical' and traditional Professional Mobile Radio (PMR) applications. With standards successfully established now for narrowband and wideband TETRA, we are focussing increasingly on standardising a broadband extension to the TETRA standard, and we are working closely with the European regulators in an attempt to find the additional spectrum this would necessitate.

To minimise the work required and to speed up the standardisation process, the plan is to enhance existing standards for technologies, such as LTE™, to make them suitable for mission-critical applications. One benefit would be the ability to take equipment from off-the-shelf product lines to keep costs down. 3GPP™ communications systems are inherently secure and are perfectly adapted to data as well as voice services. National security forces are therefore starting to bring their requirements to 3GPP to standardise the additional features demanded by such services: group call, priority and pre-emption, and direct terminal-to-terminal communication ('proximity service').

### Emergency Calling

In January 2012, we published a Technical Specification (TS) on the requirements for a European public warning system (PWS) using the Cell Broadcast Service – EU Alert. This TS specifies how EU-Alert should support multiple languages. It ensures that, while an emergency alert is sent in the local language of a country, the recipient, who may, for example, be visiting from abroad and not speak the local language, can select a different language to receive the alert. With 23 different official languages, this is a significant issue for Europe. The TS also specifies different levels of severity for emergency warnings and how warnings are displayed on the user's mobile phone.

To help people with hearing or speaking disabilities, we are addressing 'Total Conversation' for the handling of emergency calls. Total Conversation combines video, real-time text and audio, so that people with disabilities who, for example, need video for sign language or real-time text for a text-based conversation or as a complement to a voice conversation can use conventional services and terminals. In November, we published a Technical Report (TR) on ways to implement Total Conversation on fixed and mobile devices, which will be followed by a TS which will enable, for example, a deaf person to make a three-way video call involving the public safety answering point (PSAP) and a sign language interpreter, using video and real-time text.

In response to European Commission (EC) Mandate 493 on the Location Enhanced Emergency Call Service, we are defining a single functional architecture to determine the location of an emergency caller. The solution will cover a situation, for example, where a Voice over Internet Protocol (VoIP) service provider and one or several network operators – all independent enterprises serving the customer in the establishment of an emergency call – need to co-operate to determine the caller's location.

We also continue to address eCall, the EC's road safety initiative.

### Other Aspects of Public Safety Standardisation

A TR on the use of Ultra Wide Band (UWB) technology to achieve high-precision local positioning (with a resolution to within a few centimetres), for safety applications on the railways, was published in October.

We published a TR which provides an overview of present satellite emergency communications resources.

Our Reconfigurable Radio Systems committee (TC RRS) produced a TR which defines the use cases for spectrum sharing and network usage for public safety communications.

We are also creating standards for maritime safety equipment and working on various mechanisms for road safety through the use of Intelligent Transport Systems.

# Working in Partnership

## Working with Europe



We value our status as a European Standardisation Organisation (ESO) in strategic terms, and we continue to place high value on our partnership with the European Commission (EC) and the European Free Trade Association (EFTA). We provide world-class standards and specifications to support European Union (EU) legislation and public policies. We have established and maintain good relations with relevant EC DGs including ENTR (Enterprise and Industry) and CONNECT, as well as DG MOVE (Mobility and Transport), DG RTD (Research and Innovation) and DG JRC (Joint Research Centre).

In 2012 we welcomed Council Regulation 1025/2012/EC on European standardisation which entered into force on 1 January 2013. We were proactive in ensuring that our position was made known as the text was being finalised (especially at the committee stage in the European Parliament), and the final text reflected many of our views. In particular, the direct participation model was formally recognised as part of the European Standardisation System. The Information and Communications Technologies (ICT) part of the regulation contains the most radical changes; for example, in relation to public procurement and ICT, all specifications from the ESOs can now be used, and public authorities (including the EC) may now request that specifications from other Standards Developing Organisations (SDOs), including fora and consortia, should be used, as long as they meet the criteria in the regulation (to be classified as ICT specifications).

We continue to support the ICT Multi-Stakeholder Platform and, as one of the members, we participate regularly in its meetings.

In 2012 we worked on existing mandates and responded to mandates developed during the year, commenting on drafts as they were prepared. We worked actively in the programming phase of the Smart Grids mandate (M/490) and we followed up issues under the smart metering mandate (M/441). We were heavily committed in mandated areas such as Co-operative Intelligent Transport Systems (ITS), electronic signatures and in response to the Space standardisation mandate (M/496) and Mandate M/493 on enhanced Emergency Calls. In many of these areas, we co-operated closely with our sister ESOs, the European Committee for Standardisation (CEN) and the European Committee for Electrotechnical Standardisation (CENELEC).

In December 2012, at the request of DG CONNECT, we launched the Cloud Standardisation Co-ordination.

We participated as an observer at various Member State committees and their working groups (for example, 98/34/EC (now replaced by the new Regulation), the Telecommunication Conformity Assessment and Market Surveillance Committee (TCAM), the Communications Committee (COCOM) and the Radio Spectrum Committee (RSCOM)). We also participated in the Radio Spectrum Policy Group (RSPG) and assisted in the development of opinions on radio spectrum policy in the EU.

Throughout 2012 we continued to develop Harmonised European Standards (ENs) in support of the Radio and Telecommunications Terminal Equipment (R&TTE) and Electromagnetic Compatibility (EMC) Directives, as well as ENs that have been listed in the Official Journal of the EU (OJEU) in support of the Single European Sky (SES) Interoperability Regulation. The improved regularity of listings in the OJEU has resulted in our Harmonised ENs providing presumption of conformity in a much more efficient manner.

## Partnership Agreements

We have put together a portfolio of partnership agreements with fora, consortia and international and regional SDOs, to foster collaboration with organisations around the world. We have long recognised that working with others is the best way to establish coherence between ETSI standards and those produced by others, to avoid the duplication of effort and to ensure that our standards are widely accepted and implemented. Co-operation is crucial to reduce fragmentation in standardisation and to address the convergence of technologies. Our investment in partnerships is also an important means by which we ensure our activities keep up with market needs.

By the end of 2012, our partnership portfolio numbered over 80 such agreements. During the year, we entered into new Memoranda of Understanding (MoUs) with the IPSO Alliance, the United Nations Economic Commission for Europe (UNECE) and the Wireless World Research Forum (WWRF). In addition, the existing Letter of Intent (LoI) with SAE International was upgraded to an MoU. A LoI was also signed with the TD Industry Alliance (TDIA).

Partnerships were renewed with the GlobalPlatform, the Institute of Electrical and Electronics Engineers (IEEE), the Open Grid Forum (OGF), the NFC Forum, ECMA International, the NATO Standardisation Agency (NSA), ERTICO-ITS Europe, the TETRA and Critical Communications Association (TCCA) and the European Patent Office (EPO). Together with CEN and CENELEC, we established a joint MoU with the Euro-Asian Council for Standardisation, Metrology and Certification (EASC).

A new partnership framework with the International Telecommunication Union (ITU) was concluded in July when the Director-General of ETSI and the ITU Secretary General together signed an MoU between the two SDOs. This MoU replaces the previous agreements with each of the three ITU sectors, encompassing all three sectors in a single framework. This will improve our exchange of information and increase co-operation in technical, political and marketing areas.

## Dialogue with Emerging Markets

We are aware of the opportunities for trade and investment offered by developing international markets, and we therefore maintain a dialogue with key partners in the different regions.

Our outreach to the Commonwealth of Independent States included running a workshop in Georgia in May on radio regulations, mobile and broadcast spectrum. In June, we took part in an Eastern Partnership Project meeting on standardisation and conformity assessment in Stockholm, Sweden, where we both established and renewed contacts with officials responsible for ICT standardisation and regulation in Armenia, Azerbaijan, Belorussia, Georgia, Moldova and Ukraine. We also addressed the TurkmenTel conference in Turkmenistan in September 2012.

In India, we are closely following the creation of a new player in the Indian standardisation landscape, the Development Organization of Standards for Telecommunications in India (DOSTI).

The Seconded European Standardisation Expert in India (SESEI) project was formally signed in 2012. Under this initiative, an Expert will work in India for three years, increasing the visibility of European standardisation and promoting co-operation between Europe and India on standards related issues. The SESEI project is financed jointly by the EC and EFTA with contributions from ETSI, CEN and CENELEC. As project leader, ETSI is responsible for managing this project.

A similar project has been running in China (the Seconded European Standardisation Expert for China, SESEC) for the last six years, which has been particularly successful in enabling us to develop our contacts with Chinese institutions. The second SESEC project came to a close at the end of August 2012, and we are preparing for the start of SESEC 3.



## Forapolis Support Services



We provide services, on a cost-recovery basis, for the benefit of ETSI members by delivering high quality support to third party organisations where our members are involved. This includes both forum management services and the provision of IT tools and technical support related to interoperability and testing – all delivered under the Forapolis™ brand.

Drawing on our two decades of experience, Forapolis offers personalised support services to various standardisation and partnership initiatives.



In 2012 we extended the Forapolis service to deliver tools and support for European Commission (EC) FP7 and other related projects including SUNRISE (Strengthening User Networks for Requirement Investigation and Supporting Entrepreneurship), in support of the European GALILEO initiative on satellite navigation systems and their applications.

During 2012, the Forapolis Portal Platform evolved even more to adapt better to the requirements of existing and potential partners. It is considered to be an essential time-saving forum management tool for documentation, meetings, voting, working groups and membership.

Following the continued success of our Centre for Testing and Interoperability (CTI) in providing Trusted service Status List (TSL) Conformance Checker services to the EC, in the context of verification of Electronic Signatures, in 2012 we were awarded a third contract with the EC to maintain the platform for the collection and analysis of EU Member States Trusted Lists.

## Intellectual Property Rights

ETSI operates a highly regarded Intellectual Property Rights (IPR) Policy. In response to the needs of our members, public authorities and the ICT industry in general, in 2012 we embarked on a new round of discussions to improve this Policy still further. We are consulting widely – with our members, the EPO, the EC, the United States Department of Justice and relevant partner organisations. Our members hold very diverse views on IPR issues, but discussions will continue in 2013 with the aim of clarifying and agreeing new statements and positions on a number of controversial points.

# 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 R&D projects funded by the European Commission (EC) and the European Free Trade Association (EFTA).

Altogether, 45 STFs and other funded projects were active during 2012, involving about 170 experts of 24 different nationalities, for an equivalent of almost 25 man/years.

The financial investment was about 2,7 M€ and, in addition, a voluntary contribution equivalent to 570 k€ was provided by experts working free of charge.

## EC/EFTA Funding

We continued to collaborate effectively with the EC and EFTA during 2012, with the successful negotiation of a slightly increased Operating Grant for 2012 as well as the acceptance and finalisation of the payments of the 2011 Operating Grant. The EC/EFTA contribution to the ETSI standardisation infrastructure for 2012 was set at just below 3,04 M€ via the Operating Grant. It is anticipated that the 2013 Operating Grant with the EC will be concluded for a slightly increased amount that will also reflect our management of the Seconded European Standardisation Expert in India (SESEI) project.

We managed and invoiced the action grants received from the EC/EFTA efficiently, and 2012 saw the finalisation and closure of actions started in 2009 and 2010 onwards. 2012 also saw an increase in the EC/EFTA financing of standardisation actions (more than 2,2 M€), as more requests were made, compared with 2011. The actions covered mandated work, especially for electronic signatures (TC ESI), while further grants were made for Plugtests™ interoperability events. A number of proposals for further action grants were submitted during the first quarter of 2012 to support activity by our Intelligent Transport Systems (TC ITS), Human Factors (TC HF) and Satellite Earth Stations & Systems (TC SES) committees.

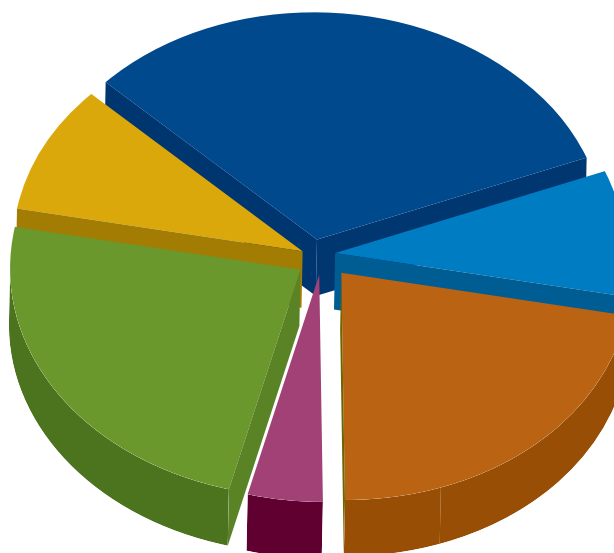
## Technical areas in which funded resources were invested in 2012

Technical area	Spent (k€)
3GPP TTCN test specifications – 3GPP partners funding	793
Intelligent Transport Systems (ITS)	509
EMC and Radio Spectrum Matters (ERM)	209
Digital Enhanced Cordless Telecommunications (DECT™)	189
IMS Network Testing (INT)	188
Human Factors (HF)	165
Electronic Signatures & Infrastructures (ESI)	133
R&D projects – EC/EFTA funding	125
Methods for Testing & Specification (MTS)	121
Speech and Multimedia Transmission Quality (STQ)	101
Integrated Broadband Cable Telecommunication Networks (CABLE)	56
Access, Terminals, Transmission and Multiplexing	49
Smart Card Platform (SCP)	33

Figures are rounded to the nearest k€.

## Funding sources in 2012

ETSI funding	32%
ETSI voluntary contribution	9%
EC/EFTA Mandates/ICT	22%
EC/EFTA R&D	4%
3GPP Partners funding	24%
3GPP voluntary contribution	9%



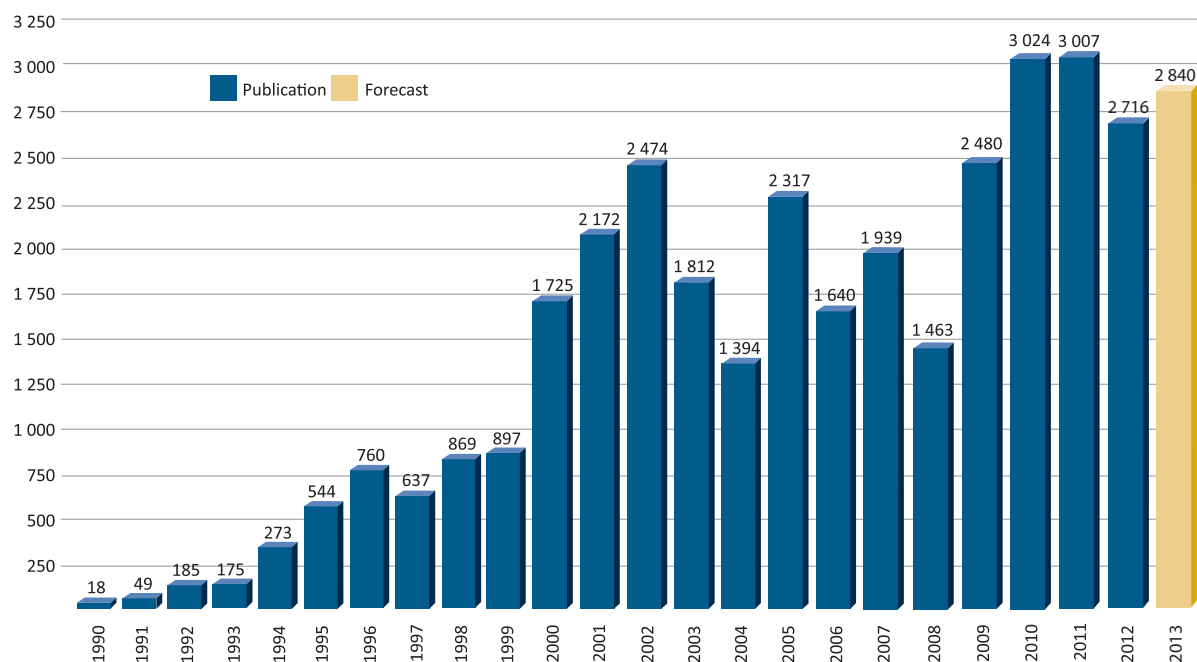
# Standards Production

In 2012 ETSI published over 2 700 standards and reports. By the end of the year, we had produced a total of over 32 000 standards, specifications, reports and guides since our establishment in 1988.

Production performance is still excellent. In 2012, we put further effort into reducing the lead times for producing our standards. We targeted support to new rapporteurs, to improve their familiarity with ETSI's editing rules and related tools, which resulted in higher quality drafting of documents, and thus shorter lead times.

In October, following three years of analysis and development, we introduced a new approval process for our European Standards (ENS) – the EN Approval Procedure (ENAP). With this procedure, the Public Enquiry and voting processes now run in parallel. After the resolution of any technical comments submitted at this stage, the standards are sent to a further national vote but, if no comments have been received, the standard can proceed straight to publication. This change is expected to improve the quality of standards produced and reduce delays.

**The number of deliverables published, for each of the years 1990 - 2012 and the prediction for 2013**



## Distribution by type of published document

	In 2012	Total since 1988
Technical Specification (TS) <sup>1</sup>	2 427	24 237
Technical Report (TR) <sup>2</sup>	198	2 813
ETSI Standard (ES)	19	680
European Standard (telecommunications series) (EN) <sup>3</sup>	53	4 503
ETSI Guide (EG)	4	235
Special Report (SR)	7	77
Group Specification (GS)	8	25
<b>TOTAL</b>	<b>2 716</b>	<b>32 570</b>

<sup>1</sup> Includes GSM™ Technical Specification (GTS)

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

<sup>3</sup> Includes amendments and old deliverable types: European Telecommunication Standard (ETS), Interim ETS (I-ETS) and Technical Basis for Regulation (TBR)



# Membership

ETSI membership increased again in 2012 and, by the end of the year, we had a total of 759 members. This total is made up of 619 Full Members, drawn from 40 European countries, 116 Associate Members and 24 Observers. Overall membership (all categories) is drawn from 62 different countries and provinces, from across five continents. 184 of our members are Small or Medium-sized Enterprises (SMEs), of which 86 are Micro-Enterprises.

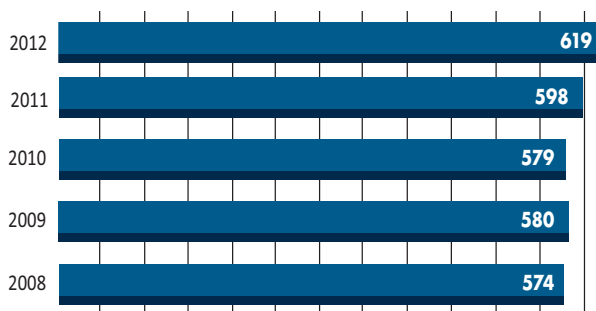
The European Commission and the European Free Trade Association Secretariat, which hold special roles as Counsellors, attend the General Assembly and the ETSI Board and continue to play an active part in our work.

## Upgrading our building

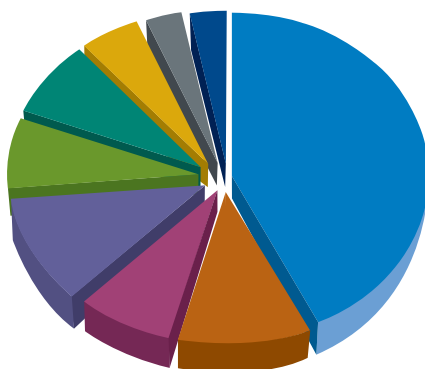
Every year, we organise some 300-400 technical meetings at ETSI, with up to 7 000 delegates passing through our doors. Recent trends indicated the need for larger rooms for growing standardisation groups and improved audio-visual facilities due to the increased use of web-conferencing.

Construction work began in July to upgrade our meeting rooms, to increase capacity and to comply with the latest French legislation on accessibility. Greater flexibility is being provided with the addition of removable partitions, and improved audio and video equipment is being installed. The Amphi Athena will also be extended from 170 to 240 seats to accommodate large workshops and other meetings.

## Evolution of ETSI Full Membership



## Full and Associate Membership by category



Manufacturers	312	(42%)
Network operators	72	(10%)
Administrations	59	(8%)
Research bodies	97	(13%)
Service providers	58	(8%)
Consultancies	64	(9%)
Users	29	(4%)
Others	26	(4%)
Other Government bodies	18	(2%)

## Overall membership by country/province

Albania	1
Andorra	1
Australia	4
Austria	15
Belgium	30
Bosnia Herzegovina	2
Brazil	2
Bulgaria	4
Canada	8
China	10
– Taiwan (Province of China)	12
Croatia	3
Cyprus	2
Czech Republic	5
Denmark	13
Egypt	1
Estonia	2
Finland	15
Former Yugoslav Republic of Macedonia	1
France	88
Georgia	1
Germany	111
Greece	6
Hungary	5
Iceland	1
India	7
Indonesia	1
Iran	1
Ireland	9
Israel	5
Italy	32
Japan	5
Jordan	1
Korea	4
Latvia	1
Lesotho	1
Lithuania	1
Luxembourg	7
Malaysia	1
Malta	2
Netherlands	31
Norway	12
Poland	8
Portugal	3
Qatar	2
Romania	7
Russian Federation	12
Serbia	1
Singapore	1
Slovakia	4
Slovenia	4
South Africa	3
Spain	21
Sweden	23
Switzerland	23
Turkey	8
Ukraine	2
United Arab Emirates	3
United Kingdom	119
United States of America	49
Uzbekistan	1
Yemen	1
<b>62 countries or provinces in total</b>	<b>759</b>

## Membership by type

	01-01-2012	31-12-2012
Full Members	598	619
Associate Members	117	116
Observers	24	24
<b>Total</b>	<b>739</b>	<b>759</b>

# 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 Patrick Aumeras, whose auditor's mandate had been renewed by the 55th General Assembly, has audited the 2012 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 2011, income increased by 4,8% and expenditure by 5,4% or 1,2 M€. The result of the year is a surplus of 20 k€ compared with a surplus of 154 k€ in 2011.

**Expenditure** – Secretariat costs were 3,1% over budget and higher by 5,4% compared with 2011, mainly due to a provision built into the 2012 accounts to cover lawyers' fees for defence costs related to a law suit in the US. The revision of the resources allocation remains an ongoing project that delivers benefits and enables us to adjust resources to the level of members' contributions while maintaining the targets set by our Long Term Strategy. Partners' services are delivered on a cost recovery model. 3,7 M€ were spent on experts' costs for Specialist Task Forces and other standardisation related technical experts.

**Income** – Members' contributions significantly increased compared with 2011 (+8,5%). Roughly 60% of the budget was funded by members' contributions (14 M€). EC/EFTA payments amounted to 4,1 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 amounted to 1,3 M€ (a 6% decrease).

## 2012 Budget Statements

Income	k€
Members' contributions and Observer fees	13 992
EC/EFTA contracts	4 126
3GPP™ Partners	1 858
Voluntary contributions	39
Partners' services	1 334
European Friends of 3GPP	605
Sales	290
Plugtests™	112
Financial income	194
Other income	991
<b>TOTAL INCOME</b>	<b>23 541</b>

Expenditure	k€
Secretariat staff costs	11 224
Other Secretariat costs	6 139
Special Projects	304
European Friends of 3GPP	489
Provision and losses	1 694
Experts costs	3 671
<b>TOTAL EXPENDITURE</b>	<b>22 521</b>

In 2012, there was a surplus of 20 k€.

## Financial Statements for the Year 2012

The final accounts and the balance sheet are summarised below. The fiscal accounting period is 1 January 2012 – 31 December 2012.

### Statement of Income and Expenditure Year 2012

	Income (€)	Expenditure (€)
Income	23 383 226	
Purchases		9 855 561
Expenses		13 689 375
Financial income and expenses	210 670	17 063
Extraordinary income & expenses	1 515	13 220
<b>TOTAL</b>	<b>23 595 411</b>	<b>23 575 219</b>

*There was a surplus of 20 192 € in 2012.*

## Summary of the Balance Sheet

### Assets

Net amounts at:	31 Dec 2011 (€)	31 Dec 2012 (€)
Fixed Assets	5 818 725	6 778 218
Debtors	14 464 476	17 687 605
Securities/cash	6 252 695	5 330 430
Adjustment accounts	131 962	255 061
<b>TOTAL ASSETS</b>	<b>26 667 858</b>	<b>30 051 314</b>

### Liabilities

Net amounts at:	31 Dec 2011 (€)	31 Dec 2012 (€)
Equity	8 278 661	8 278 661
Provisions	89 855	1 525 000
Balance carried forward	-133 980	211 522
Result of the year	153 960	20 192
Creditors	4 805 243	5 013 305
Adjustments	13 474 119	15 002 634
<b>TOTAL LIABILITIES</b>	<b>26 667 858</b>	<b>30 051 314</b>

*Figures are rounded to the nearest €.*



## World Class Standards

- Air Traffic Management
- Automotive Radar
- Autonomic Systems
- Broadband Wireless Access
- Broadcasting
- Cable Networks
- Cloud Technology
- Cognitive Radio
- DECT™
- Digital Mobile Radio
- eHealth
- Electromagnetic Compatibility
- Electronic Signatures
- Emergency Communications
- Energy Saving
- Environmental Aspects
- Fixed-line Access
- Human Factors
- Identity Management
- IMS Network Testing
- Intelligent Transport
- Internet
- Interoperability
- Lawful Interception
- Machine-to-Machine Communications
- Maritime Communications
- Media Content Distribution
- Mobile Communications
- Network Virtualisation
- Next Generation Networks
- Powerline Communications
- Protocols
- Public Safety Systems
- Quality of Service
- Quantum Key Distribution
- Radio
- Radio Regulations
- Radio Systems
- Railway Communications
- Satellite Communications
- Security
- Security Algorithms
- Short-range radio
- Smart Cards
- Smart Grids
- Smart Metering
- Software Defined Radio
- Testing
- Terrestrial Trunked Radio (TETRA)
- Wireless Medical Devices

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