

Vision

IEC everywhere for a safer, more efficient world

Mission

Our mission is to achieve worldwide use of IEC International Standards and conformity assessment services that ensure the safety, efficiency, reliability and interoperability of electrical, electronic and information technologies, to enhance international trade, facilitate broad electricity access and enable a more sustainable world.

Message from the IEC General Secretary & CEO

The pace of change is accelerating. Technologies are adopted at a faster rate than ever before. All around us, we can witness the rapid transformation brought by digitization.

Homes, factories and cities are becoming smarter. Devices are connecting to collect and analyze data with the goal of simplifying tasks at home and at work. Data is driving the personalization of services. The virtual world is catching up to our physical environment.

This digital transformation brings many opportunities. However, there is still much uncertainty and insecurity. Cyber attacks, lack of interoperability and data privacy are just a few examples. Ethical and societal concerns arise with the introduction of new technologies such as artificial intelligence.



This is where the IEC is essential. We are well-positioned to find common ground on some of these key concerns. The IEC, with its worldwide network of experts, develops international standards that ensure the safety, efficiency, reliability and interoperability of electrical and electronic devices and systems. The IEC Conformity Assessment Systems ensure that products adhere to our standards.



Safety includes the physical well-being of individuals. But, increasingly, it also includes ethical aspects such as the safety of data and automated decision-making. Interoperability is indispensable as various systems, from operational to information technology to city utilities, are integrated.

Our standards and conformity assessment systems make the technologies we use not only safe but also offer an assurance of quality. This is what allows innovation to thrive and new ideas to flourish.

However, we have still much work to accomplish. With climate change, a new type of infrastructure resilience is needed that can cope with disruptions and forestall electricity blackouts.

Ensuring universal energy access is another herculean task. This is a United Nations Sustainable Development Goal that we are committed to enable. Our

standards offer solutions for rural electrification, microgrids or distributed energy resources using renewable energy with an emphasis on sustainability. And our conformity assessment system for renewable energy, IECRE, represents a step towards a more sustainable future.

The IEC is built on values such as inclusiveness, trustworthiness and independence. We believe that all nations need to work together to find the best solutions to the challenges society is facing. In 2018, the IEC formally approved the implementation of the new IEC Masterplan. We are taking the necessary steps to ensure that the IEC can achieve its vision for a safer, more efficient world for all.

Frans Vreeswijk

IEC General Secretary & CEO

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Key highlights

The IEC (International Electrotechnical Commission) brings together thousands of experts to develop the technical rules to ensure the performance, safety and interoperability of electric and electronic devices and systems used around the world.

The IEC is the world's leading developer and publisher of international standards for electrical and electronic technologies and the only organization today providing the world's best practice for testing and certification with four global conformity assessment (CA) systems.

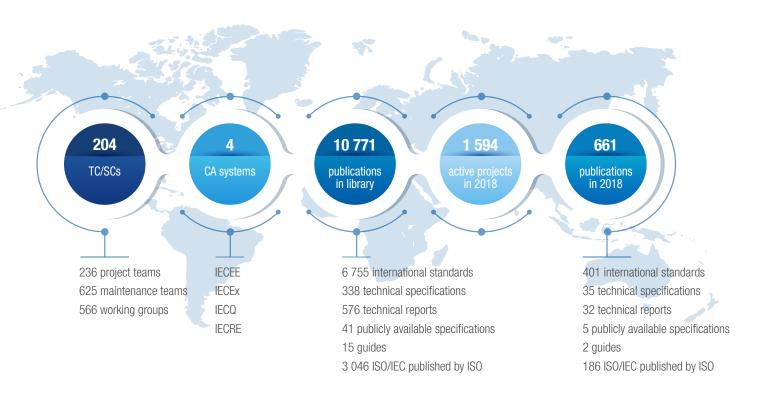
The IEC is a neutral, independent, not-for-profit membership organization. Each IEC member represents all national stakeholders in electrotechnology and has a single vote within the organization.

IEC International Standards are developed by international consensus among IEC members. Thousands of experts from the private and public sectors cooperate in over 200 technical

committees and subcommittees (TC/SCs) to develop state-of-the-art, globally relevant IEC International Standards. Participation is open to all IEC members. No matter how big or small, each IEC member has the same weight in the decision-making process.

The IEC supports all forms of CA and administers four systems whose members certify components, equipment, installations, services and personnel competencies from around the world. The IEC CA Systems are the largest working multilateral agreements based on one-time testing of products globally and provide international harmonization of certification practices. They bring together more than 150 certification bodies and hundreds of testing laboratories which have issued over one million certificates that are accepted by most countries.

For over 110 years, the IEC has supported innovation, global trade and development.



Powering the world



Electricity is the most versatile and easily controlled form of energy. It can be produced emission-free from renewable energy sources. At the point of use it is practically loss-free and essentially non-polluting. It is weightless and represents the most efficient way of consuming primary energy. Electricity enables our modern lives, facilitates economic development and fosters industrial activity. Electricity, electronics and information and communication technology (ICT) power the world.

The demand for electrical energy is increasing as the world's population continues to grow and developing countries industrialize. Innovative solutions can help satisfy these growing needs, from the roll-out of smart grid technology to the increasing reliance on renewable energies, while also contributing to the reduction in harmful greenhouse gases.

IEC International Standards ensure that these electrical systems can be used safely and reliably. From the generation to the storage and usage of electrical energy, the whole energy chain can rely on internationally agreed specifications published by the IEC. The testing and certification provided through the IEC CA Systems ensures that components, equipment and systems comply with IEC International Standards no matter where in the world they originate.

Smart energy

The conventional electricity grid needs to be modernized to meet increasing worldwide demand for electrical energy. In many countries, legacy systems need to be updated to deliver electricity at all times, including during periods of high demand. Sources of renewable energy, such as sunlight and wind, need to be integrated into the existing grid. This brings new challenges, since the energy output of these renewables fluctuates during the day and with the seasons. Conventional large-scale centralized energy generation is increasingly complemented by localized small-scale energy generation which is located close to the point of energy consumption. New intelligent systems are being rolled out to cope with these multifaceted demands, making the generation, transmission and storage of energy smarter.

The IEC Systems Committee Smart energy (SyC Smart energy) provides systems level standardization for smart grids and smart energy as well as coordinates the work of the many IEC technical committees which publish standards in this field. In 2018, the IEC published the white paper *Stable grid operations* in a future of distributed electric power, which makes a number of recommendations for utilities and grid operators facing these new challenges.



The demand for electrical energy is increasing as the world's population continues to grow and developing countries industrialize.



The IEC published IEC 62055-41 to enhance the security of electricity metering prepayment systems that are widely used in developing countries. Issued by IEC TC 13 on electrical energy management and control, this standard is based on new cryptographic algorithms to allow prepayment meters to be ready for smart grid technology.

LVDC

Low voltage direct current (LVDC) is a disruptive technology that can fundamentally change how energy is produced and consumed in the future. In direct contrast to the traditional centralized model of electricity distribution via alternating current (AC), LVDC is a distributed way of transmitting and delivering power. Interest in LVDC has been sparked by the technology's suitability in providing electricity in rural areas that are currently not served by the electrical grid. LVDC can be generated anywhere using renewable energy and, because solar, wind and water energy all yield direct current (DC) electricity, it is more efficient to use the DC electricity directly for DC driven devices rather than converting it to AC and back to DC again.

LVDC is seen as an efficient method of delivering energy as well as a way of bringing electricity to the hundreds of millions of people without electricity access. LVDC is an important tool to achieve the United Nations Sustainable Development Goal 7 (UN SDG 7) of providing universal access to affordable, reliable and modern energy services by 2030.

The IEC is leading global efforts to make LVDC technologies safe for use and has published a number of standards relevant to LVDC. The IEC Systems Committee LVDC (SyC LVDC) has begun standardization work through a systems-based approach, identifying gaps where IEC International Standards are needed.

Energy efficiency

A more efficient use of energy is one of the most obvious ways of making electrical energy sustainable yet its potential remains largely untapped.

Throughout the electrical energy chain, from generation to usage, multiple technologies can be applied to make the process more energy-efficient. IEC International Standards and IEC CA Systems help to measure performance and pave the way for more efficient technologies.

The IEC Advisory Committee on energy efficiency (ACEE) has been set up to coordinate activities between different IEC technical committees that contribute to this area. It encourages a systems perspective for developing standards.

In 2018, IEC TC 82 on solar photovoltaic (PV) energy systems issued two standards which enable the testing of the performance and energy rating of PV modules. IEC 61853-3 establishes the energy rating of PV modules and IEC 61853-4 describes the reference time periods and environmental data set to be used for energy-rating calculations.

Finding ways to increase energy efficiency is relevant to all industries, including transportation. IEC 62888-1 is part of a series of standards for railway applications. The standard, developed by IEC TC 9: Electrical equipment and systems for railways, establishes the energy measurement system (EMS) which provides measurement and data suitable for energy management, energy saving as well as billing.

The IECEE (IEC System of Conformity Assessment Schemes for Electrotechnical Equipment and Components) helps verify manufacturers' energy efficiency claims based on IEC Standards. It offers the IECEE E3 programme to test and verify the energy efficiency of electrical and electronic equipment such as refrigerators, washing machines and motors.



Many countries have established mandatory minimum energy performance requirements for electric motors but regulations vary. To address the trade barriers resulting from differing country regulations, the IECEE global motor energy efficiency (GMEE) programme has been set up to offer a harmonized motor efficiency test method and common certification process.

Renewable energy

The global transition from fossil fuels to renewable energy is well under way, as many countries look to increasing the amount of renewables in their national energy mix.

Renewable energy represents a growing percentage of the world's total energy generation. The increased reliance on sustainable energy sources, such as sunlight or wind, is expected to reduce CO_2 emissions as well as fill the mounting gap between energy production and demand, especially in developing countries. IEC International Standards and IEC CA Systems enable the safe and efficient use of renewable energy systems, whether integrated into the grid or installed off-grid to help remote communities gain access to electricity.

Nano-enabled photovoltaics (NePV) are a new form of photovoltaic technology that uses nanomaterials and organic semiconductors and can be manufactured into large-area, flexible, thin photovoltaic sheets. They improve the conversion of sunlight into free electrons which results in a higher energy output. Furthermore, nanomaterials are used as boundary layers and act as protective coatings to increase the stability of the PV device. IEC TC 113 on nanotechnology for electrotechnical products and systems published the technical specification IEC TS 62876-2-1, which establishes a general testing programme to verify the stability of nanomaterial performance and nano-enabled photovoltaic devices used in PV modules.

Low-voltage surge protective devices (SPDs) are placed on PV installations to protect against lightning effects. IEC SC 37A issued IEC 61643-31, part of the IEC 61643 series dedicated to low-voltage SPDs. This standard specifies the requirements and test methods for SPDs used in PV installations.

Portable fuel cells are highly mobile electricity generation units that are used to directly power electronic equipment or recharge batteries for various consumer electronic products. They can be used to provide emergency power in a home or in areas where grid power is either non-existent or unpredictable. IEC TC 105 prepares standards relating to fuel cell technology. In 2018, it published IEC 62282-5-100, a new standard which looks at safety aspects of portable fuel cell power systems.

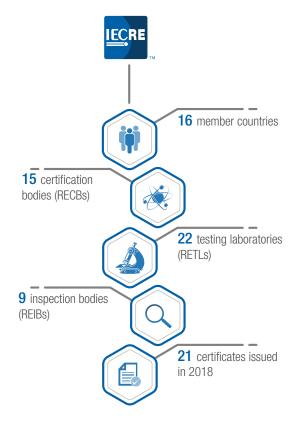


IFCRF: first solar PV certificate issued

The IECRE (IEC System for Certification to Standards Relating to Equipment for Use in Renewable Energy Applications) was established to facilitate trade of equipment and services for the marine, solar PV and wind sectors, while maintaining the required level of safety and expected performance.

IECRE schemes for each sector cover products, services and personnel, to provide testing, inspection and certification.

In May 2018, IECRE issued its first solar PV certificate. The certificate, based on IEC TS 62941, has raised the industry standards for PV module product design, development, product certification, process control, raw material control and procurement, as well as product testing and monitoring.





Safety and quality assurance

The work of the IEC helps protect people, critical infrastructure, economies and the environment. IEC International Standards ensure the safety and performance of electrotechnical devices and installations while the IEC CA Systems certify conformance to these internationally recognized standards.

Health

Demand for healthcare services is growing rapidly and, in parallel, the need for medical electrotechnical equipment. Patients place their trust in these devices and expect them to function safely and reliably. The technology is evolving quickly and becoming smaller, smarter and delivering enhanced performance and functions.

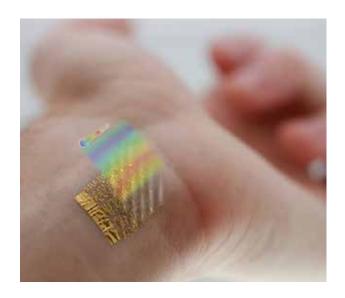
IEC Standards cover a vast array of product categories that include devices such as heating blankets and wheelchairs, incubators or magnetic resonance imaging (MRI) scanners.

The market for in vitro diagnostic (IVD) devices is being driven by aging populations, rising rates of obesity and chronic diseases. IEC TC 66 developed the third edition of IEC 61010-2-101 which updates the safety specifications for IVD analyzers for use in clinical chemistry, immunochemistry, haematology, microbiology, nucleic acid probe systems or self-test equipment.

Manufacturers must ensure the safety and essential performance of their medical electrical equipment. The IEC 60601 series of standards, developed by IEC SC 62A, is used by the IECEE CB scheme for testing and certifying that such equipment is reliable and meets expectations in terms of performance, safety, durability and other criteria. In 2018, IEC SC 62A developed the second edition of IEC 60601-4-3 which considers a number of safety aspects not addressed previously and offers proposals for new requirements, for example, air clearance for dental equipment and diverse leakage current tests.

Magnetic resonance imaging equipment is used widely in hospitals and clinics for diagnosis of health conditions and diseases. In 2018, IEC SC 62B on medical diagnostic imaging equipment developed the second edition of IEC 62464-1 which specifies measurement procedures for determining many essential image quality parameters for magnetic resonance equipment used in medical imaging. These procedures are suitable for quality assessment in acceptance tests and quality assurance in constancy tests. The standard can be used by manufacturers who wish to show compliance to these tests, organizations who want to perform such tests and is referenced by regulators.

Evolving technology is enabling the production of flexible devices, such as healthcare wearables. For example, a printed conductive layer on an insulating substrate can be used as an electrode or interconnect for flexible devices. However, these fine layers are very sensitive to mechanical stresses. IEC TC 119 on printed electronics developed IEC 62899-202-5 which describes a mechanical bending test to evaluate the electrical property of a printed conductive layer on the supporting material on which a circuit is fabricated, under repeated mechanical deformations.



Transport

Whether in the air, over the sea or land, transport is evolving to meet new sustainability and mobility requirements. With rapid urbanization, new mobility systems are needed that can transport people from one place to another sustainably and efficiently while maintaining and even improving people's quality of life. Electric vehicles (EVs) are becoming more widespread and autonomous forms of transport are gradually being introduced.

The IEC publishes a wide number of standards pertaining to EVs, autonomous vehicles and the electricity supply of vehicles as well as personal mobility devices. Its work supports the safety, performance and energy efficiency of various ways of transporting both goods and people.

IEC TC 18 publishes standards relating to electrical installations on board ships. In 2018, it issued a new edition of IEC 60092-101, the latest publication in the IEC 60092 series, an internationally recognized set of guidelines applicable to all electrical installations on board ships. They are employed worldwide by any company involved in the shipping industry, from naval design to cable and electrical equipment manufacturers. These standards are prepared in line with the International Convention for the Safety of Life at Sea (SOLAS), an international maritime

treaty which sets minimum safety standards in the construction, equipment and operation of merchant ships. IEC 60092-101 is a technical revision of the previous edition and includes new clauses concerning environmental impact and degrees of pollution.

IEC 62660-1 is a new edition of the standard on the performance testing of secondary lithium-ion cells for the propulsion of EVs. Published by IEC TC 21: Secondary cells and batteries, it specifies the test procedures for lithium-ion cells for EV traction, including capacity, power density, energy density, storage life and life cycle. IEC TC 21 also published IEC 62660-2 which provides the procedures to test the reliability of lithium-ion cells used for EVs.

Increasingly, personal mobility devices are being used in cities and in workplaces. In 2018, IEC TC 61: Safety of household appliances, developed the new standard IEC 60335-2-114 which addresses the electrical safety of self-balancing personal transport devices that use batteries.





A new IEC Standard provides a comprehensive overview of application scenarios for transparent LCDs and OLEDs and introduces the observation and illumination aspects needed for measurement methods.

Consumer goods

Many of the appliances used in homes rely on IEC International Standards and IEC Conformity Assessment Systems to ensure their safety, reliability and performance. In 2018, the IEC published standards for such household goods as television screens, lights and the safety of electric heat pumps.



IEC SC 61D developed a new edition of IEC 60335-2-40 which addresses the safety of electric heat pumps for households, including hot water heat pumps, air conditioners and dehumidifiers, incorporating motor-compressors and hydronic fan coil units.

Liquid crystal displays (LCDs) and organic light-emitting displays (OLEDs) are two different technologies, which produce electrically generated images shown on thin, flat panels. They are used in diverse home-electronics systems, mobile phones, cameras, computer monitors, watches and TVs. IEC TC 110: Electronic displays, developed IEC TR 62977-2-4 which provides a comprehensive overview of application scenarios for transparent LCDs and OLEDs and introduces the observation and illumination aspects that are needed for appropriate measurement methods.

A number of factors, such as voltage fluctuations or dimming technology can cause changes in light intensity. This can result in flickering or stroboscopic effects, the latter of which may become visible for an observer when a moving object is illuminated. While this effect may be acceptable in very specific entertainment, scientific or industrial applications, for most everyday use of lighting in a home or workplace, it can be dangerous to a person's well-being. The new technical report IEC TR 63158 provides an objective stroboscopic effect visibility (SVM) meter for performance testing of lighting equipment under different operational conditions.

Homes, as well as offices rely on cables for their digital services, from internet access to television. These cables must not only perform reliably but conform to safety requirements. IEC TC 20 developed IEC 60754-3, which provides a method to measure the level of halogen content in the gases emitted by data, fibre optic or electric cables during a fire. While halogen insulation has been used to protect cables from fire propagation, it results in the emission of toxic and corrosive fumes if ignited. As a result, halogen-free cables are increasingly used in many critical environments such as public buildings where these fumes can be dangerous to human life.



Electromagnetic compatibility

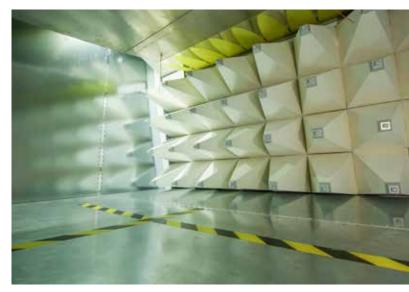
On airplanes, passengers are asked to shut off their computers during take-off and landing. Individuals with cardiac pacemakers or implantable defibrillators must limit their exposure to certain appliances such as induction hobs or wireless charging stations since their medical equipment could malfunction. These are examples of devices generating electromagnetic interference that disturbs the proper functioning of surrounding equipment.

Electromagnetic compatibility (EMC) is the process in which such electromagnetic interferences are contained so that all surrounding equipment can operate safely and reliably. In 2018, the IEC developed several standards related to EMC.

IEC 61000-6-4, a standard developed by Subcommittee H of CISPR, the international special committee on radio interference, addresses the emission requirements applicable to electrical and electronic equipment used in an industrial site to ensure the adequate protection of radio reception. Industrial sites are generally characterized by the significant generation and/or consumption of electrical power thus requiring different emission limits for the equipment used in comparison with other locations.

The proliferation of electronic devices in homes has greatly increased the disturbances caused by harmonic currents, a type of spurious emission, on the public electricity grid. IEC SC 77A on low frequency phenomena developed IEC 61000-3-2 which specifies the limits of harmonic currents emissions that domestic appliances can inject into the grid.

With the increase in the number of electric vehicles on the road, the demand for their electric energy supply is growing. IEC TC 69 on electric vehicles developed IEC 61851-21-2 which is part of a series of international standards addressing the supply of electric energy to EVs. It defines the EMC requirements for off-board components and equipment used to charge EVs with electric power.



Interior of gigahertz transverse electromagnetic (GTEM) cell for electromagnetic compatibility testing

IECEE: harmonizing processes and fostering mutual trust and recognition

IECEE (IEC System of Conformity Assessment Schemes for Electrotechnical Equipment and Components) offers different schemes to test the safety, quality, efficiency and overall performance of electrical and electronic components, devices and equipment for homes, offices, workshops and health facilities, to ensure they comply with relevant standards.



A core part of the Conformity Assessment Board (CAB) policy for IECEE work, is the peer assessment programme, which allows new peer assessors to become qualified and existing peer assessors to maintain their qualifications; without it, they cannot operate within IECEE.

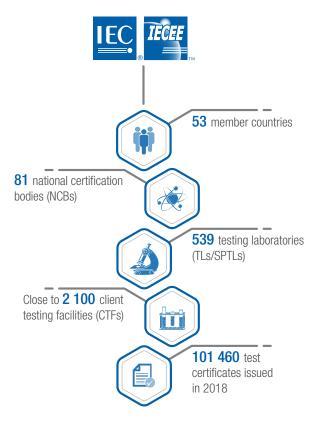
Assessing the assessors ensures that national certification bodies (NCBs), CB testing laboratories (CBTLs) and other laboratories operating in the IECEE System can trust that they can carry out testing, by applying standards' requirements consistently and

providing robust assessments of their competencies by qualified assessors.

The programme aims to ensure:

- conformity of member organizations with specified requirements
- equivalence of test and assessment results generated by the members
- mutual recognition of the results from one member, by all other participating members

In 2018, the IECEE lead and technical assessor training was held in the US. Training contributes towards harmonizing processes and helps to foster mutual trust and recognition of NCBs and CBTLs. The next training is expected to take place in Europe in 2019, followed by Asia in 2020. Assessors are required to maintain their qualifications by participating in training every three years.

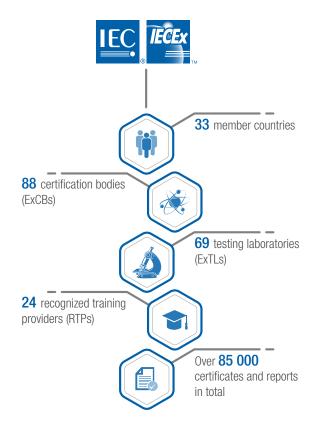


IECEx: safety in explosive atmospheres

IECEx (IEC System for Certification to Standards Relating to Equipment for Use in Explosive Atmospheres) operates the only global online certificate system dedicated to the Ex sector, allowing instant verification of claims of compliance of certificates issued by more than 80 IECEx certification bodies (ExCBs). IECEx certificates of conformity are issued via the following three schemes: IECEx certified equipment scheme, IECEx certified service facilities scheme and IECEx certification of personnel competence scheme.

The IECEx recognized training provider (RTP) programme, launched a few years ago to assist applicants in their preparation for the certificate of personnel competence (CoPC), is growing fast. The RTPs provide candidates with knowledge and understanding of the terminology and protection concepts for electrical and non-electrical equipment used in explosive atmospheres, based on the IEC 60079 and the ISO/IEC 80079 series of international standards prepared by IEC TC 31: Equipment for explosive atmospheres, and its subcommittees. The number of certificates issued by the IECEx certification of personnel competence scheme has seen a rapid increase in 2018.

IECEx maintains endorsement by the United Nations through the United Nations Economic Commission for Europe (UNECE) as THE certification system for the assessment of conformity in Ex areas.





IECQ: supply chain verification tool for industry

IECQ (IEC Quality Assessment System for Electronic Components) is a worldwide approval and certification system that covers the supply, assembly, associated materials and processes of a large variety of electronic components that are used in millions of devices and systems. IECQ provides manufacturers with independent verification that the requirements in IEC International Standards and other specifications were met by suppliers who hold an IECQ certification.

In 2018, the system launched the IECQ Avionics Users Forum (AUF) via its IECQ Hub, a discussion platform that aims to bring together professionals working in the avionics field as well as in counterfeit avoidance.

IECQ provides industry with a supply chain verification tool for seeking assurance that electronic components, assemblies, processes and related materials conform to declared technical standards and specifications. Because technically-competent personnel are an integral part of the IECQ System, IECQ facilitate standardized training through IECQ training workshops and IECQ standard training course material, in support of the

IECQ System and its schemes/programmes. In 2018, IECQ continued its series of training sessions, mainly in Asia, on the IECQ hazardous substance process management (HSPM) scheme.





Technology innovation

Technology innovations are becoming an inextricable part of modern life. Billions of connected devices and systems make up the Internet of Things (IoT) and help to simplify many tasks in homes, businesses and cities. Advances in digitalization, artificial intelligence (AI) and automation are redefining many processes and enabling faster decision-making.

However, these systems are also prone to data biases and cyber security hacks and the IEC has an important role in safeguarding these technologies.

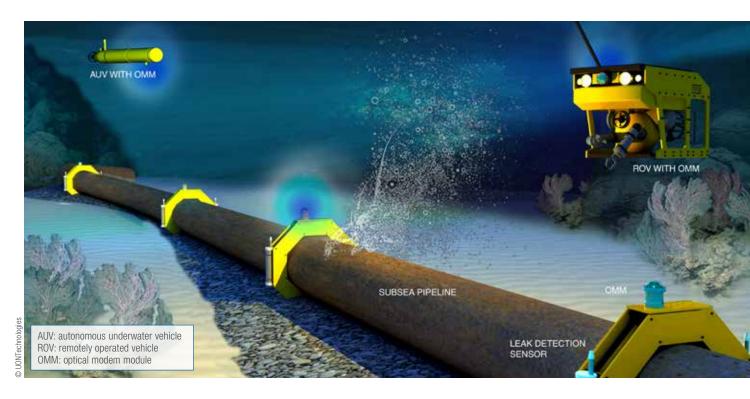
A common language for IoT

IoT is fast becoming the internet of everything: the technology is impacting a huge number of sectors, from the transmission and distribution of electricity to the devices used in cities and homes. Several IEC technical committees provide essential standards used for IoT. Their work covers a broad range of technologies including sensors, processors and displays as well as automation, cloud computing and functional safety.

The new all-encompassing joint publication ISO/IEC 30141 establishes the first reference architecture for IoT, using a common vocabulary, reusable designs and industry best practices.

Technology for underwater applications uses underwater acoustic sensor networks (UWASNs) to survey and collect environmental data, and monitor pollution from, for instance, pipeline leakages. They are also used for surveillance and disaster prevention and recovery. The ISO/IEC 30140 series of standards for UWASNs provides general requirements, guidance and facilitates the development of UWASNs for different applications and services. Two new parts were published recently: ISO/IEC 30140-3, describing UWASN interfaces between different physical and functional entities, and ISO/IEC 30140-4, which specifies interoperability between the selected physical entities of UWASNs.

These standards have been developed by Subcommittee 41 of the ISO/IEC Joint Technical Committee 1 for information technology. ISO/IEC JTC1/SC 41 covers the Internet of Things and related technologies.



Artificial intelligence

The speed with which technologies using AI, such as machine learning and analytics, have pervaded industries, cities and homes, has prompted the urgent need to address governance implications for the use of Al.

In 2018, the Market Strategy Board (MSB) published the white paper Artificial intelligence across industries which describes the main systems, techniques and algorithms that are in use today and indicates what kinds of problems they typically help to solve. It provides a detailed overview of four areas that are likely to encounter significant developments by deploying Al technologies: manufacturing, transport, energy and homes.

The IEC is a founding member of the Open Community for Ethics in Autonomous and Intelligent Systems (OCEANIS), a global forum for collaborating in the development and use of standards for Al established in 2018.

The IEC is actively involved in identifying ethical issues and societal concerns related to new technologies that are relevant to our standardization activities. In 2018, the IEC Standardization Management Board (SMB) established a standardization evaluation group (SEG) on ethics in autonomous and artificial intelligence applications. IEC SEG 10 has been developing guidelines for IEC technical committees on ethical aspects related to both autonomous and Al applications, as well as ensuring work consistency across IEC technical committees. SEG 10 is collaborating closely with the ISO/IEC JTC 1 subcommittee on artificial intelligence, ISO/IEC JTC 1/SC 42.

ISO/IEC JTC 1/SC 42 held its inaugural meeting in Beijing, China, in April 2018. JTC 1/SC 42 is working with a number of technical committees, including IEC TC 65, which deals with industrial-process measurement, control and automation, among others.



A smarter world

The emergence of smart manufacturing, smart cities and smart energy is benefitting from the recent developments in Al and IoT. Increasingly, smart technology is becoming a part of our daily lives.

To avoid fragmentation into numerous incompatible silos, smart technologies need to be built based on interoperable systems. IEC International Standards are being developed to help harmonize systems and allow for interoperability, while IEC CA Systems ensure that devices and systems, sourced from all over the world, comply with these standards.

Smart cities

Smart cities rely on sensor networks and hardware such as computing equipment, data and control centres. Over 1 800 IEC



IEC has established a new systems committee to provide coordination and advice in the area of smart manufacturing.



International Standards ensure that they are safe and reliable as well as interoperable so that new devices can work with existing installations from different vendors.

The IEC systems committee SyC Smart cities coordinates the electrotechnical systems standards that are needed to move cities towards greater connectivity, efficiency and safety. SyC Smart cities works closely with IEC technical committees and other systems committees to develop overarching smart city standards as well as to ensure that existing standards are adapted to the needs of cities. In December 2018, SyC Smart cities organized a workshop in partnership with the Bureau of Indian Standards (BIS) in the city of Varanasi, India.

To help make smart cities a reality through a more coordinated approach on standards, the IEC initiated the World Smart City Forum in partnership with ISO and ITU. The most recent World Smart City Forum, organized by ITU, took place in November 2018 in Santa Fe, Argentina.

Smart manufacturing

Smart manufacturing (SM) is gaining traction all around the globe. Much of the value of SM will depend on understanding opportunities for automating operations and data analytics to improve manufacturing performance and feedback mechanisms, exploring new business models and delivering value to the end user.

With these challenges in mind, the IEC has established a new systems committee, SyC Smart manufacturing. Its scope is to provide coordination and advice in the area of smart manufacturing and to harmonize and advance related activities in the IEC and with other standards developing organizations (SDOs) and consortia.



IEC has been working with UNECE to develop a common regulatory framework for cyber security.

Mitigating cyber threats

Cyber security is often associated with, and led by, information technology (IT). However, it is important to remember that the primary focus of IT is to ensure that data is able to flow freely in the virtual world. On the other side, critical infrastructure and the automated environment have security requirements that are part of the real world. They rely on operational technologies (OT) to ensure the correct execution of automated actions such as shutting down a valve to avoid the overflow of chemicals or bringing a generator online to avoid a blackout.

The IEC has published more than 200 cyber security standards that help increase the resilience and robustness of critical infrastructure and IT systems in the face of a rapidly-evolving cyber threat.

IEC TC 65 developed the new standard IEC 62443-4-1 on the lifecycle requirements for secure product development in industrial automation and control systems. The publication is the latest in the IEC 62443 series of standards, a comprehensive set of cyber security guidelines that applies to manufacturing as well as critical infrastructure, such as power plants, hospitals, water or transport networks.

IECEE has put in place a global cyber security certification against the IEC 62443 series of international standards. The aim is to verify that cyber security measures have really been implemented.

The new edition of ISO/IEC 27005 is a key component of the ISO/IEC 27000 family of standards, providing guidelines for information security risk management. It is applicable to all types of IT systems where it helps manage risks that can compromise an organization's information security. In response to requests from industry to harmonize the certification of compliance with international standards on information security management systems (ISMSs), IECQ set up a working group to consider a global certification scheme covering ISO/IEC 27001.

IEC has been working with the UNECE to develop a common regulatory framework for cyber security. The draft proposal document received endorsement by the 56 member states of the UNECE at the 28th annual session of UNECE Working Party 6 (WP.6) in Geneva on 15 November 2018 and is expected to be approved as a final framework at the 2019 annual meeting.

The IEC Advisory Committee on information security and data privacy (ACSEC) produced IEC Guide 120, which provides guidelines on the security topics to be covered in IEC publications and aspects of how to implement them.





Trade and development

Countries are increasingly interdependent. Products are manufactured, assembled and sold in countries that span the globe. Harmonized, globally agreed technical rules ensure that components are able to work together correctly so that the final product is safe and functional for the end user.

International standards provide the technical rules that ensure the safety and performance of products and help reduce barriers to trade. They provide the basis for conformance testing and allow electrical and electronic devices to enter markets around the world.

Overcoming barriers to trade

The World Trade Organization (WTO) recognizes that international standards, together with conformity assessment, play a critical role in improving industrial efficiency and encouraging trade.

Harmonized rules allow countries and industries to participate in global trade and supply chains. With the intention of eliminating technical barriers to trade, a majority of WTO members commits to using IEC International Standards as a technical basis for their regulations on electrical and electronic devices and systems. The IEC has observer status to the WTO and regularly attends WTO Technical Barriers to Trade (TBT) Committee meetings.



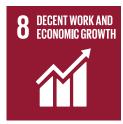




















Sustainability

IEC standardization and conformity assessment work helps manufacturers improve resource use and minimize the negative impact that electrical and electronic products can have on the environment. IEC work is focused on such areas as renewable energy, energy efficiency, environmentally conscious design (ecodesign), the management of hazardous substances and e-waste.

The IEC Advisory Committee on environmental aspects (ACEA) coordinates IEC work on environmental topics to ensure that IEC Standards address environmental protection issues. In 2018, it began work on circular economy and material efficiency to gain a better understanding of their impact on IEC activities.





















IEC TC 111 provides horizontal standards across various IEC technical work areas. It recently published the second edition of IEC 62474 on substance reporting with the aim of improving transparency up and down the electronics supply chain and helping suppliers and manufacturers to comply with existing regulations.

IECQ provides conformity assessment services to protect against hazardous substances. In 2018, it set up the IECQ green approach working group to consider environmental aspects in its IECQ hazardous substance process management (HSPM) scheme.

Other IEC CA Systems ensure international safety and performance standards are adhered to for equipment and services for renewable energy (IECRE) and electrotechnical equipment and components (IECEE).

The Sustainable **Development Goals**

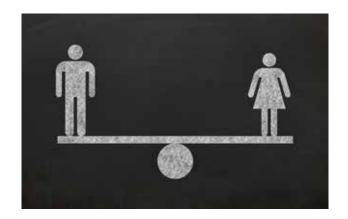
The United Nations has recognized energy as a cornerstone for economic development. Energy, and especially electricity, is the golden thread that impacts most of the 17 Sustainable Development Goals (SDGs). IEC work directly impacts 16 of the 17 SDGs. It provides the technical foundation for the entire energy chain and all equipment that is driven by electricity.

IEC work improves the safety of devices, workers and populations. It enables energy efficiency gains and increases the resilience and long-term viability of infrastructure.

Focus on SDG 5: gender equality

UNECE Working Party 6 (WP.6) created the Gender Responsive Standards Initiative in 2016 with the aim of improving gender balance in standards development and ensuring standards, when implemented, are gender-responsive. With the input from standards development organizations, the WP.6 adopted the Declaration for Gender Responsive Standards and Standards Development in November 2018.

The IEC has undertaken several initiatives to strengthen the participation of women in IEC technical work and to make IEC Standards more relevant to women around the world. Since 2016, the IEC General Secretary is an International Gender Champion (IGC).



Embracing all countries

The IEC Affiliate Country Programme provides developing and newly industrialized countries with a form of involvement in the IEC without the financial burden of actual membership. The WTO has complimented the IEC on this programme which provides affiliate countries with an appropriate tool to enhance their involvement in international standardization and understanding of conformity assessment. The programme helps remove technical barriers to trade and stimulates economic development, while giving countries greater control over the safety and quality of products and electrical installations.

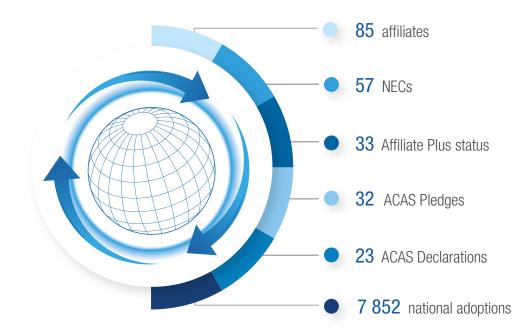
Affiliate countries are able to select up to 200 IEC International Standards for national adoption and, with the Affiliate Conformity Assessment status (ACAS), they can learn about IEC CA activities.

The Affiliate Plus status is available to affiliate countries that have established a national electrotechnical committee (NEC) with representatives from the private and public sectors and have officially adopted at least 50 IEC International Standards. With the Affiliate Plus status, countries can access 400 IEC Standards and participate in the IEC Affiliate Mentoring Programme.

Growing the family

In March 2018, São Tomé and Principe joined the Affiliate Country Programme. In addition, six countries - Antigua and Barbuda, Eswatini, Gabon, Jamaica, Myanmar, and Niger adopted their first IEC Standards.

Two affiliates became IEC members in 2018: Bangladesh and Côte D'Ivoire. Both had fully benefitted from the IEC Affiliate Country Programme for over 15 years, each adopting over 300 IEC International Standards at the national level.



Regional activities

The IEC has offices on five continents. Regional promotion and coordination is handled through offices located in Africa, Asia-Pacific and Latin America. Offices in Asia-Pacific, North America and Australia also provide operational support and training for IEC standardization and conformity assessment activities.

IEC-AFRC



IEC-AFRC - Africa Regional Centre

The IEC Africa Regional Centre (IEC-AFRC) is the regional focal point for Africa. It assists countries in the region in adopting and implementing IEC Standards and becoming more familiar with IEC CA Systems.

IEC-AFRC works closely with regional organizations to promote participation in the work of the IEC. Throughout 2018, it participated in meetings with the African Electrotechnical Standardization Commission (AFSEC), the African Organization for Standardization (ARSO), the Economic Community of West African States (ECOWAS) and its Quality Infrastructure Forum (ECOQUAF), the Southern African Development Community (SADC), the East African Standards Committee (EASC) and the Arab Industrial Development and Mining Organization (AIDMO).

IEC-AFRC also provides extensive support to IEC members and affiliates. This includes workshops and training seminars on IEC work and on topics such as LVDC, conformity assessment, smart energy and photovoltaic panels.

IEC-APRC



IEC-APRC - Asia-Pacific Regional Centre

The IEC Asia-Pacific Regional Centre (IEC-APRC) promotes the use of IEC Standards and IEC CA Systems while also engaging closely with IEC members in the region. In addition, it provides support to 71 IEC technical committees as well as to the IEC Advisory Committee on electricity transmission and distribution (ACTAD) and the IEC Advisory Committee on energy efficiency (ACEE).

Throughout 2018, IEC-APRC supported IEC members through the organization and participation in seminars and workshops on topics such as smart cities, LVDC and rural electrification. It also provided support to several IEC national committees for their national young professional programmes. Training workshops were held to help experts participate effectively in IEC technical committees and to develop competency requirements for standards professionals.

IEC-APRC supports the activities of regional organizations such as the Association of Southeast Asian Nations (ASEAN) and its Consultative Committee on Standards and Quality (ACCSQ); the Asia-Pacific Economic Cooperation (APEC), the Pacific Area Standards Congress (PASC) and the South Asian Regional Standards Organization (SARSO). As part of its support, IEC-APRC participates in meetings and workshops to encourage the use of IEC Standards and IEC CA Systems.

IEC-LARC



IEC-LARC - Latin America Regional Centre

The IEC Latin America Regional Centre (IEC-LARC) is the focal point for IEC activities in Latin America and the Caribbean. It serves as the local hub for IEC members and affiliates in the region.

As part of its support to IEC national committees, IEC-LARC organized workshops and training programmes to promote the work of the IEC with regulators and industry as well as on topics such as conformity assessment, energy efficiency, and how to participate effectively in IEC technical committees.

IEC-LARC also cooperates extensively with regional organizations involved in standardization and conformity assessment. In 2018, IEC-LARC participated in meetings with the Pan American Standards Commission (COPANT), the Council for Harmonization of Electrotechnical Standards of the Nations in the Americas (CANENA) and the Forum of IEC National Committees of the Americas (FINCA).

IEC-ReCNA



IEC-ReCNA - Regional Centre for North America

The IEC Regional Centre for North America (IEC-ReCNA) provides support to 45 IEC technical committees as well as several management committees including the IEC Market Strategy Board (MSB), the IEC Advisory Committee on electromagnetic compatibility (ACEC) and the IEC SyC Smart energy. It also offers training sessions for technical committee officers.

IECEx/IECQ secretariat



IECEx/IECQ secretariat

The secretariat of two IEC Conformity Assessment Systems, IECEx and IECQ, is located in Sydney, Australia. Both systems operate from there in close relation with the IEC Central Office in Geneva.

Information on IECEx and IECQ activities is provided in the section Safety and quality assurance.

Global partners





































































The IEC cooperates with many international and regional organizations. Agreements, memorandums of understanding (MoUs) and pledges have been signed with over 34 partner organizations with the aim of coordinating work efforts and implementing IEC Standards. In addition, technical liaisons have been established with over 200 organizations.

In 2018, the IEC signed an MoU with the International Medical Device Regulators Forum (IMDRF) and a pledge with the Caribbean Community Regional Organization for Standards and Quality (CARICOM CROSQ). In addition, the IEC signed updated MoUs with the International Organization of Legal Metrology (OIML) and the International Federation of Standards Users (IFAN).

World Standards Cooperation

The IEC works closely with ISO and ITU to promote the voluntary, consensus-based international standards system under the banner of the World Standards Cooperation (WSC).

As part of its goal to increase the worldwide visibility of international standardization, the WSC organizes a number of events and, each year during World Standards Day on 14 October, pays tribute to the collaborative efforts of thousands of experts worldwide. In 2018, a global competition called for video submissions based on the theme International standards and the 4th industrial revolution.

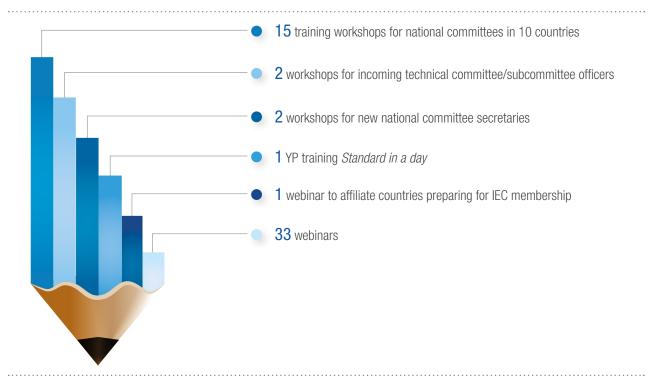
The WSC also organized the annual Academic Day which took place in Yogyakarta, Indonesia on the topic of using internetbased technologies to teach standardization.

Outreach and learning

IEC Academy

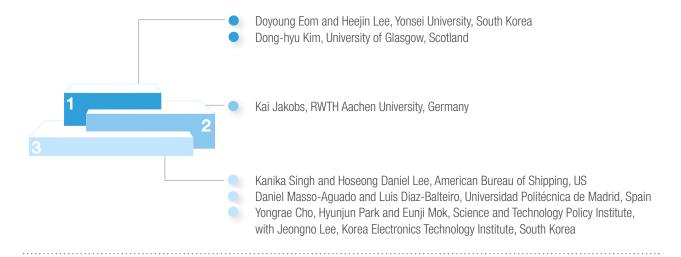
The IEC Academy delivers continuous training and capacity building to the entire IEC community. It provides high-quality training through webinars, capacity building events and

workshops in various countries and at the IEC Central Office. In 2018, the IEC Academy conducted:



To strengthen the relationship between the standardization community and academia, the IEC Academy, together with IEEE and the Korean Agency for Technology and Standards (KATS),

organized the competition Future Challenges in Standardization. Five prizes were awarded for the best academic publications during the IEC General Meeting in Busan, South Korea.





IEC Young Professionals Programme

The IEC Young Professionals Programme serves as a gateway for professionals from all over the world to learn about the IEC and become more involved in its standardization and conformity assessment work. This has been the case for Stina Wallström. who was a YP in 2013, and is now President of the IEC National Committee of Sweden.

In 2018, 80 participants from 39 countries attended the Young Professionals workshop held in Busan, South Korea, alongside the IEC General Meeting. They demonstrated their enthusiasm by presenting ideas on projects that they plan to lead in 2019 including the IEC One standard - One day initiative and the development of an app for the ISO/IEC directives.

In March 2018, the programme organized a future leaders industry forum in Germany. The results from the forum were published in the paper Cybersecurity in the smart grid.

IEC Regulator forum

The IEC hosted its first regulator forum in Busan, South Korea, which was attended by 150 stakeholders from across the renewable energy sector. Energy producers, suppliers and transmission and distribution systems operators joined representatives of regulatory bodies and standardization experts for an engrossing exchange of ideas. The consensus was that standards development organizations and regulators need to find ways to work together more closely in order to achieve key societal and economic goals.

A full report and recommendations of the IEC Regulator forum is available on the IEC website.

Awards

Each year, the IEC presents awards in recognition of the leadership and commitment of its experts.

Lord Kelvin Award

This year, the IEC bestowed its highest honour, the Lord Kelvin Award, to Wim De Kesel for his outstanding contribution to the development of IEC Standards over the past 20 years. Wim De Kesel has brought his leadership skills to standardization work in such areas as energy efficiency, LVDC, electric vehicles as well as home and building automation.







This year's Lord Kelvin Award honours excellence and outstanding commitment that has helped advance the IEC field of activity as a whole and the mission of the IEC in particular.

James M. Shannon, IEC President

Thomas A. Edison Award

The IEC also honours excellence and expertise with its Thomas A. Edison Award. This year, the IEC recognized the outstanding work of the following seven experts:

- → Thorsten Arnhold, Chair IECEx
- → George Kelly, Secretary IEC TC 82: Solar photovoltaic energy systems
- → Shigeyuki Kondo, Vice-Chair IECEE
- → Gerard Kuyt, Chair IEC SC 86A: Fibres and cables
- → Dejun Ma, Vice-Chair IEC TC 61: Safety of household and similar electrical appliances, and Vice-Chair IEC SyC Active assisted living (AAL)
- → Hiroyuki Ohsaki, Chair IEC TC 77: Electromagnetic compatibility
- → Hiroaki Sugiura, Technical Area Manager IEC TC 100/TA 2: Colour measurement and management

Fumio Ueno, Past Chair IEC TC 105: Fuel cell technologies, one of the 2017 Thomas A. Edison awardees, also received his award in Busan, South Korea.









Leadership

James M. Shannon **IEC President** (United States)



Terms of office:

President-Elect: 1 January 2016 President: 1 January 2017 -31 December 2019

Recent career highlights:

From 2002 to 2014, James Shannon was President and Chief Executive Officer of the National Fire Protection Association (NFPA). Prior to that, he served as Attorney General of the Commonwealth of Massachusetts and was a Senior Partner at the law firm of Hale & Dorr in Boston, USA. He was elected to the United States House of Representatives in 1978 and served in the House until 1985.

Junji Nomura IEC Immediate Past President (Japan)



Terms of office:

President-Elect: 1 January 2013 President: 1 January 2014 -31 December 2016 Immediate Past President: 1 January 2017 - 31 December 2018

Recent career highlights:

Junji Nomura is currently the Corporate Solution Business Advisor, Energy Promotion at Panasonic having previously held several leadership positions, including CTO, since joining the company in 1971. He is a member of the industrial technology committee of Nippon Keidanren, a study group within the Japanese Ministry of Economy, Trade and Industry (METI) and a fellow of the Operations Research Society of Japan (ORSJ).

Jo Cops **IEC Treasurer** (Belgium)



Terms of office:

First term: 1 January 2018 -31 December 2020

Recent career highlights:

Since 2012, Jo Cops leads the Belgian Electrotechnical Committee (CEB-BEC) as the Secretary General. He is also a member of the Working Group Policy and the Technical Board on Efficiency in CENELEC. Jo Cops started his career in 1990 with Sony Belgium and subsequently held various management positions within Sony Europe, the Belgian cable operator Telenet and Alpha Technologies.

Ralph Sporer

IEC Vice-President Chair of IEC Standardization Management Board (SMB) (Germany)



Terms of office:

First term: 1 January 2017 – 31 December 2019

Recent career highlights:

Ralph Sporer joined the Siemens Company in 1996 and is at present Manager for Standardization and Regulation after having held various positions in research and development, and consulting within the company. He was Chair of the IEC Advisory Committee on energy efficiency (ACEE) from 2013 to 2016 and has served as Chair of the European Smart Grid Coordination Group since 2010.

Yinbiao Shu

IEC Vice-President Convenor of IEC Market Strategy Board (MSB) (China)



Terms of office:

First term: 18 January 2015 – 31 December 2015 Second term: 1 January 2016 – 31 December 2018

Recent career highlights:

As IEC Vice-President since January 2013 and Convenor of the MSB since June 2012, Yinbiao Shu has had the specific responsibility of leading both the MSB membership renewal and its technology-watch effort. At present, he is Chairman of the China Huaneng Group (CHNG) and is also a senior member of IEEE. Until November 2018, Yinbiao Shu served as Chairman of the State Grid Corporation of China (SGCC).

Shawn Paulsen

IEC Vice-President Chair of Conformity Assessment Board (CAB) (Canada)



Terms of office:

First term: 1 January 2018 – 31 December 2020

Recent career highlights:

Shawn Paulsen is Manager of Conformity Assessment within the CSA Group in Canada. Previously, he was Chief Electrical Inspector in the Department of Public Safety for the New Brunswick Provincial Electrical Regulator and was the Provincial representative on national codes, standards and conformity assessment committees. Shawn Paulsen was a member of the CAB from 2012 to 2017 and has wide experience in both technical and policy standards work having been involved with a number of Canadian and international activities.

Frans Vreeswijk
IEC General Secretary & CEO
(Netherlands)



Frans Vreeswijk became IEC General Secretary and CEO in October 2012, having served as Deputy General Secretary since March 2012. Prior to joining IEC Central Office, he worked for 30 years for Philips in the Netherlands, Austria and the US, notably in research, healthcare and consumer electronics. Previously Frans Vreeswijk was President of the IEC National Committee of the Netherlands (NEC) and served on the IEC Council Board and SMB as well as representing the Netherlands in CENELEC.



Ambassadors

IEC ambassadors help reach key stakeholders in industry, government and academia to endorse the work of the IEC. They are appointed by the IEC Executive Committee (ExCo) for a two-year term, renewable twice.

Hiromichi Fujisawa

Advisor Perceptual Computing Laboratory Waseda University

Appointed IEC Ambassador to reach out to regulators in the area of conformity assessment and to enhance the involvement of academia in IEC work





Lim Say Leong **Technical Director** Sunlight Electrical

Appointed IEC Ambassador to represent the interests of the IEC in the area of energy efficiency



Jingyi Hu Director, Internet of Things (IoT) Research Centre China Electronics Standardization Institute (CESI)

Appointed IEC Ambassador to represent the interests of the IEC in the areas of IoT and smart manufacturing

Vimal Mahendru

President Legrand-India

Appointed IEC Ambassador to represent the interests of the IEC in the areas of LVDC and rural electrification

Richard Schomberg

Vice-President, Smart Energy Standardization **EDF** Group

Appointed IEC Ambassador to represent the interests of the IEC in the area of smart energy







James E. Matthews III

Director of worldwide standards engineering activities for multiple business divisions across Corning Inc.

Appointed IEC Ambassador to represent the IEC in the areas of the systems approach to standardization and ICT activities

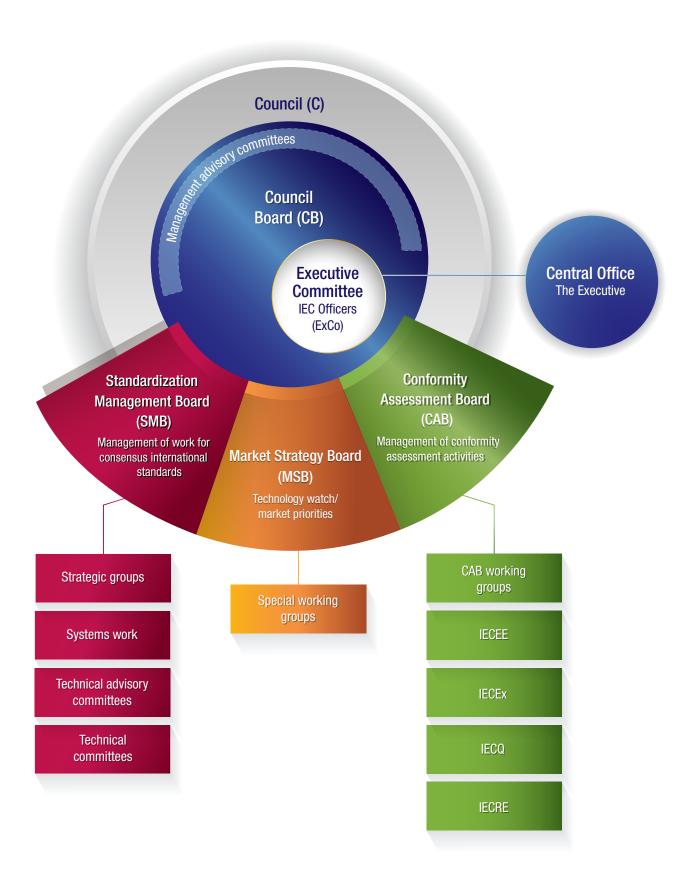


Hao Wei

Director General China Information Security **Certification Center**

Appointed IEC Ambassador to represent the interests of the IEC on issues related to cyber security

Governance structure



Members and affiliates

IEC member countries (86) at 31 December 2018

Albania (AM)	Greece	Norway
Algeria	Hungary	Oman
Argentina	Iceland (AM)	Pakistan
Australia	India	Peru
Austria	Indonesia	Philippines, Rep. of the
Bahrain (AM)	Iran	Poland
Bangladesh (AM)	Iraq	Portugal
Belarus	Ireland	Qatar
Belgium	Israel	Romania
Bosnia-Herzegovina (AM)	Italy	Russian Federation
Brazil	Japan	Saudi Arabia
Bulgaria	Jordan (AM)	Serbia
Canada	Kazakhstan (AM)	Singapore
Chile	Kenya (AM)	Slovakia
China	Korea, Rep. of	Slovenia
Colombia	Kuwait	South Africa
Côte D'Ivoire (AM)	Latvia (AM)	Spain
Croatia	Lithuania (AM)	Sri Lanka (AM)
Cuba (AM)	Luxembourg	Sweden
Cyprus (AM)	Malaysia	Switzerland
Czech Republic	Malta (AM)	Thailand
Dem. People's Rep. of Korea (AM)	Mexico	Tunisia (AM)
Denmark	Moldova (AM)	Turkey
Egypt	Montenegro (AM)	Ukraine
Estonia (AM)	Morocco (AM)	United Arab Emirates
Finland	Netherlands	United Kingdom
France	New Zealand	United States of America
Georgia (AM)	Nigeria (AM)	Vietnam (AM)

(AM) = associate members

IEC affiliate countries (85) at 31 December 2018

<u>Afghanistan</u>	Eswatini, Kingdom of	<u>Niger</u>
Angola	<u>Ethiopia</u>	<u>Palestine</u>
Antigua and Barbuda	Fiji	Panama
Armenia	<u>Gabon</u>	Papua New Guinea
Azerbaijan	<u>Gambia</u>	Paraguay
<u>Bahamas</u>	<u>Ghana</u>	<u>Rwanda</u>
<u>Barbados</u>	Grenada	Saint Kitts and Nevis
Belize	<u>Guatemala</u>	Saint Lucia
<u>Benin</u>	<u>Guinea</u>	Saint Vincent and the Grenadines
<u>Bhutan</u>	<u>Guinea Bissau</u>	São Tomé and Principe
<u>Bolivia</u>	<u>Guyana</u>	<u>Senegal</u>
<u>Botswana</u>	<u>Haiti</u>	Seychelles
Brunei Darussalam	<u>Honduras</u>	Sierra Leone
Burkina Faso	Jamaica	South Sudan, the Rep. of
<u>Burundi</u>	Kyrgyzstan	<u>Sudan</u>
<u>Cabo Verde</u>	Lao PDR	Suriname
<u>Cambodia</u>	<u>Lebanon</u>	Syrian Arab Republic
<u>Cameroon</u>	Lesotho	<u>Tanzania</u>
Central African Republic	<u>Liberia</u>	<u>Togo</u>
Chad	<u>Madagascar</u>	Trinidad and Tobago
Comoros	<u>Malawi</u>	Turkmenistan
Congo	Mali	<u>Uganda</u>
Costa Rica	<u>Mauritania</u>	<u>Uruguay</u>
Dem. Rep. of the Congo	<u>Mauritius</u>	Uzbekistan
<u>Dominica</u>	<u>Mongolia</u>	Yemen
<u>Dominican Republic</u>	<u>Mozambique</u>	<u>Zambia</u>
Ecuador	Myanmar	<u>Zimbabwe</u>
<u>El Salvador</u>	<u>Namibia</u>	
Eritrea	Nepal	

in blue: countries with Affiliate Plus status underlined: affiliate countries with NECs

Financial and sales highlights

The IEC is financed by a combination of membership dues and revenues from the sales of its publications, certificates and services.

In the IEC global statutory accounts, total membership dues amounted to CHF 12,46 million while net revenues from sales and royalties came to CHF 12,43 million.

This - along with IEC CA Systems and other miscellaneous income - resulted in a total net operational income of CHF 28,63 million. With total operational expenditure for the year at CHF 26,68 million, of which personnel costs represented CHF 19,67 million, the IEC produced an operational result for 2018 of CHF 1,95 million. Taking into account depreciation, net financial result and after compensation for the extraordinary expense, a net result of CHF 0,91 million was allocated to capital & reserves.



Balance sheet as at 31st December 2018	2018	2017
Accete	CHF	CHF
Assets Current assets	50 418 712	52 126 193
Cash & cash equivalents	10 669 021	15 562 440
Securities	30 795 814	29 083 633
Securities (IEC pool investment)	24 085 325	21 788 141
Securities (guarantee fund)	6 710 489	7 295 492
Accounts receivable	3 080 779	2 594 93 ⁴
Publications and royalties	1 292 622	1 323 527
Membership dues (all years)	896 600	552 148
CA products receivable	421 502	719 259
Pension fund	470 055	71020
Other receivables	119 210	87 10
Prepaid expenses and accrued income	5 753 888	4 798 080
. Topale orporess and assume mostle	0,000,000	
Long term assets	2 441 672	1 084 12
Rental guarantee	136 565	139 01
Tangible fixed assets, net	102 753	24 75
Intangible assets in progress	2 202 354	920 35
Total assets	52 860 384	53 210 318
Liabilities, capital & reserves		
Current liabilities	11 517 540	9 975 930
Short-term liabilities	8 121 015	8 960 01
Suppliers	302 758	751 18
Royalties to be paid	7 108 525	7 174 41
Corporate accounts (note + revenue recognition)	236 889	196 02
Current account with pension fund	0	224 469
Social charges and insurances to be paid	24 737	35 25
Accrued liabilities	448 106	578 668
Deferred income	371 676	612 80
Membership dues received in advance	371 676	612 80
Provisions	3 024 849	403 12
Provision for untaken holiday	387 274	403 12
Provision for extraordinary expense	2 637 575	
Capital & reserves	41 342 844	43 234 38
Free capital	16 252 533	17 148 52
Capital fund IEC-only	9 339 861	9 339 86
Capital fund IEC CA Systems	6 912 672	6 547 72
Capital fund IECEE	4 143 156	4 111 06
Capital fund IECEx	2 275 863	2 075 98
Capital fund IECQ	787 640	702 26
Capital fund IECRE	(293 987)	(341 589
Other free capital	0	1 260 93
Designated funds	17 492 119	18 092 55
Designated funds IEC-only	16 592 119	17 192 55
Reserve for operational & financial risk	277 493	3 077 49
Reserve for fluctuation of investment portfolio	1 300 000	1 300 00
Reserve for equipment depreciation & renewal	2 028 350	2 074 32
Reserve for standards development & business platform	2 896 000	2 896 00
Reserve for general meeting	800 000	800 00
Reserve for masterplan implementation	2 539 930	294 39
Reserve for innovation	6 750 346	6 750 34
Designated funds IEC CA Systems	900 000	900 00
IECEE reserve for risks on surcharges	1900 000	900 00
Guarantee fund	7 598 192	7 993 30
Total liabilities, capital & reserves	52 860 384	53 210 318

Statement of income & expenditure as at 31st December 2018	2018	2017
	CHF	CHF
Income	40.457.404	44 740 055
Membership dues	12 457 461	11 740 955
IEC only	11 222 433	10 873 400
IEC CA Systems	1 235 028 607 528	867 555 271 805
IECEE	298 000	292 250
IECEx IECQ	197 500	192 500
IECR	132 000	111 000
	2 722 765	2 765 932
Net sales	6 454 275	6 176 336
IEC-only gross sales	(144 410)	(124 383)
Commission & other expenses	(3 595 320)	(3 298 405)
Royalties to NCs	8 220	12 384
IEC CA Systems sales	9 707 362	8 617 729
Net royalties	13 238 284	11 368 077
Gross royalties		
Royalties to NCs	(3 530 922) 3 698 606	(2 750 348) 3 283 525
IEC CA Systems operations IECEE	1 031 365	946 899
	1 662 472	1 764 489
IECEX	644 619	520 673
IECQ IECRE	360 150	520 673
Other income	41 612	36 337
	28 627 806	26 444 478
Total operational income	20 027 000	20 444 470
Expenditure		
Personnel expenses	19 668 545	19 772 444
IEC-only personnel	16 997 365	17 172 443
Gen Sec office & admin	4 921 689	4 824 138
Standards development	6 714 087	6 620 143
Promotion	2 789 660	2 876 532
IT	2 571 929	2 851 630
IEC CA Systems personnel	2 671 180	2 600 001
IECEE	1 037 697	1 034 783
IECEx	911 852	867 368
IECQ	421 136	401 084
IECRE	300 495	296 766
Rent & maintenance	927 422	908 709
IEC only	777 848	755 332
IEC CA Systems	149 574	153 377
Office & administration	3 172 399	2 874 762
IEC only	2 093 930	1 688 711
IT	596 161	395 012
Legal & audit	300 074	328 243
White papers	153 367	119 168
Other office & administration	1 044 328	846 288
IEC CA Systems	1 078 469	1 186 051
IECEE	241 994	239 808
IECEx	571 302	724 948
IECQ	211 140	180 976
IECRE	54 033	40 319
Communications & printing	756 509	623 353
IEC only	686 755	580 172
Communications	567 335	427 144
Printing	119 420	153 028
IEC CA Systems	69 754	43 181

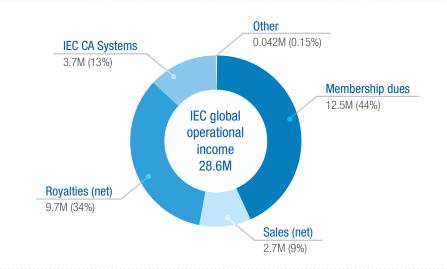
Meetings & travel expenses	2 154 510	2 313 936
IEC only	1 644 427	1 739 105
Meeting	304 928	225 449
Travel	1 281 586	1 421 852
Special events	57 913	91 804
IEC CA Systems	510 083	574 831
IECEE	191 191	233 088
IECEx	171 459	200 636
IECQ	89 457	89 753
IECRE	57 976	51 354
Total operational expenditure	26 679 385	26 493 204
Operational result	1 948 421	(48 726)
Depreciation	(45 972)	(11 178)
Net financial revenue	(993 986)	774 163
IEC-only	(501 022)	121 737
IEC CA Systems	(97 847)	58 946
Guarantee fund	(395 117)	593 480
Operational & financial result	908 463	714 259
Operational & financial result before allocations	908 463	714 259
IEC only	938 633	455 810
IEC CA Systems	364 947	(335 031)
IECEE	32 089	(299 262)
IECEx	199 883	162 944
IECQ	85 373	37 262
IECRE	47 602	(235 975)
Guarantee fund	(395 117)	593 480
Extraordinary expense	2 800 000	0
Extraordinary result	(1 891 537)	714 259
Allocations		
Allocation from reserves for extraordinary expense	2 800 000	0
Reserve for operational & financial risk	2 800 000	0
Operational & financial result	908 463	714 259
oporational & intanolar result	300 403	714 200
Allocations (to)/from capital & reserves after extraordinary expense	(908 463)	(714 259)
Capital fund IEC only	0	(466 988)
Capital fund IEC CA Systems	(364 947)	335 031
Capital fund IECEE	(32 089)	299 262
Capital fund IECEx	(199 883)	(162 944)
Capital fund IECQ	(85 373)	(37 262)
Capital fund IECRE	(47 602)	235 975
Guarantee fund	395 117	(593 480)
Other free capital	1 260 934	(000 700)
Standards development & business platform	1 200 934	0
Reserve for equipment depreciation & renewal	45 972	11 178
Reserve for masterplan implementation	(2 245 539)	0
Annual position after allocations	(2 243 339) 0	0
rainada pootaon ditor diiooddoilo	0	0

Condensed IEC financial operational activities as at 31st December 2018

		2018				2017	17	
		CHF				CHF	4	
	IEC total	IEC only (Guarantee fund	CA Systems	IEC total	IEC only	Guarantee fund	CA Systems
Operational income								
Membership dues	12 457 461	11 222 433	0	1 235 028	11 740 955	10 873 400	0	867 555
Sales (net)	2 722 765	2 714 545	0	8 220	2 765 932	2 753 548	0	12 384
Royalties (net)	9 707 362	9 707 362	0	0	8 617 729	8 617 729	0	0
IEC CA Systems operations	3 698 606	0	0	3 698 606	3 283 525	0	0	3 283 525
Other	41 612	41 612	0	0	36 337	36 337	0	0
Total operational income	28 627 806	23 685 952	0	4 941 854	26 444 478	22 281 0144	0	4 163 464
Operational expenditure								
Personnel	19 668 545	16 997 365	0	2 671 180	19 772 444	17 172 443	0	2 600 001
Rent & maintenance	927 422	777 848	0	149 574	908 709	755 332	0	153 377
Office & administration	3 172 399	2 093 930	0	1 078 469	2 874 762	1 688 711	0	1 186 051
Communications & printing	756 509	686 755	0	69 754	623 353	580 172	0	43 181
Meetings & travel	2 154 510	1 644 427	0	510 083	2 313 936	1 739 105	0	574 831
Total operational expenditure	26 679 385	22 200 325	0	4 479 060	26 493 204	21 935 763	0	4 557 441
Operational result	1 948 421	1 485 627	0	462 794	(48 726)	345 251	0	(393 977)
Depreciation	(45 972)	(45 972)	0	0	(11 178)	(11 178)	0	0
Financial income (net)	(983 886)	(501 022)	(395 117)	(97 847)	774 163	121 737	593 480	58 946
Operational & financial result before allocations	908 463	938 633	(395 117)	364 947	714 259	455 810	593 480	(335 031)

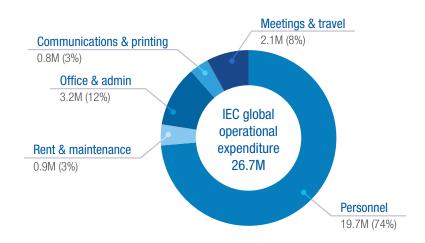
IEC - Global income

The major component of IEC income (87%) is derived almost equally from membership dues and net sales & royalties of IEC Standards. Income from IEC CA Systems represents 13% of global revenue.



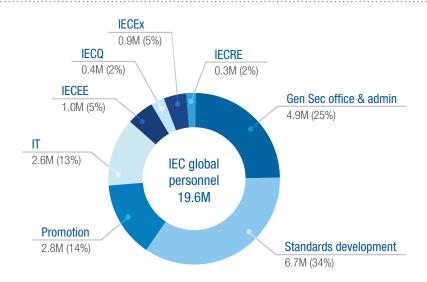
IEC – Global expenditure

As a service organization, it is logical that personnel should account for the majority (74%) of IEC expenditure.



IEC - Global personnel

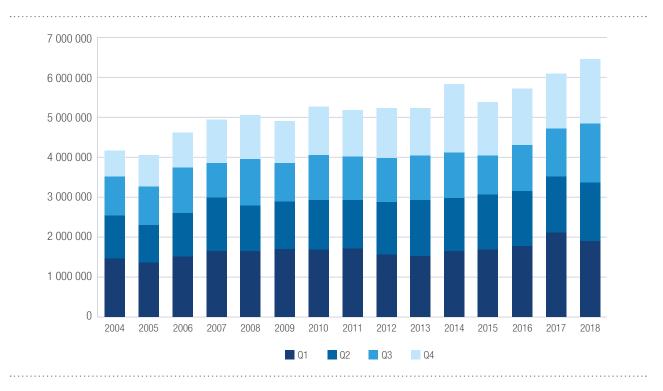
A breakdown of personnel costs shows that the largest concentration of effort and expenditure is centered on the development of standards.



In a move to increase transparency, comprehension and comparability of its financial data, the IEC decided to transition to Swiss GAAP accounting standards during 2018. This has entailed a change in the presentation of the comparative 2017 accounts in the 2018 financial statements. Swiss GAAP has been adopted to give management, members and the community a better overall insight into the operations of the IEC, thus facilitating understanding, planning and decision-making.

Sales

The IEC Central Office total gross sales of IEC publications reached a record CHF 6,45 million in 2018 which is 4,5% higher than in 2017. A total of CHF 3,6 million in royalties was re-distributed to IEC national committees.



Webstore sales

The IEC Webstore makes IEC publications available for purchase in a variety of formats. It also offers value-added products such as consolidated versions, redline versions and series packages for best-selling standards.

Further information

Please visit the IEC website at www.iec.ch for further information. In the "About the IEC" section, you can contact your local IEC national committee directly. Alternatively, please contact the IEC Central Office in Geneva, Switzerland or the nearest IEC Regional Centre.

Global

IEC - International **Electrotechnical Commission**

Central Office 3 rue de Varembé PO Box 131 CH-1211 Geneva 20 Switzerland

T +41 22 919 0211 Fax +41 22 919 0300

info@iec.ch www.iec.ch

IEC Regional Centres

Africa

IEC-AFRC - Africa Regional Centre

7th Floor, Block One, Eden Square Chiromo Road, Westlands PO Box 856 00606 Nairobi

Kenya

T +254 20 367 3000 /

+254 20 375 2244

M +254 73 389 7000 /

+254 70 493 7806

Fax +254 20 374 0913

eod@iec.ch fya@iec.ch

Asia Pacific

IEC-APRC - Asia-Pacific Regional

2 Bukit Merah Central #15-02 Singapore 159835 T +65 6377 5173 Fax +65 6278 7573 dch@iec.ch

Latin America

IEC-LARC - Latin America Regional Centre

Av. Paulista, 2300 - Pilotis Floor -Cerqueira César São Paulo - SP - CEP 01310-300 Brazil T +55 11 2847 4672 as@iec.ch

North America

IEC-ReCNA - Regional Centre for North America

446 Main Street, 16th Floor Worcester, MA 01608 USA

T +1 508 755 5663 Fax +1 508 755 5669 tro@iec.ch

IEC Conformity Assessment Systems

IECEE / IECRE

c/o IEC - International Electrotechnical Commission 3 rue de Varembé PO Box 131 CH-1211 Geneva 20 Switzerland

T +41 22 919 0211 Fax +41 22 919 0300 secretariat@iecee.org secretariat@iecre.org www.iecee.org / www.iecre.org

IECEx / IECQ

The Executive Centre Australia Square, Level 33 264 George Street Sydney NSW 2000 Australia

T +61 2 4628 4690 Fax +61 2 4627 5285 chris.agius@iecex.com chris.agius@iecq.org www.iecex.com / www.iecq.org

