Introduction to the IEC

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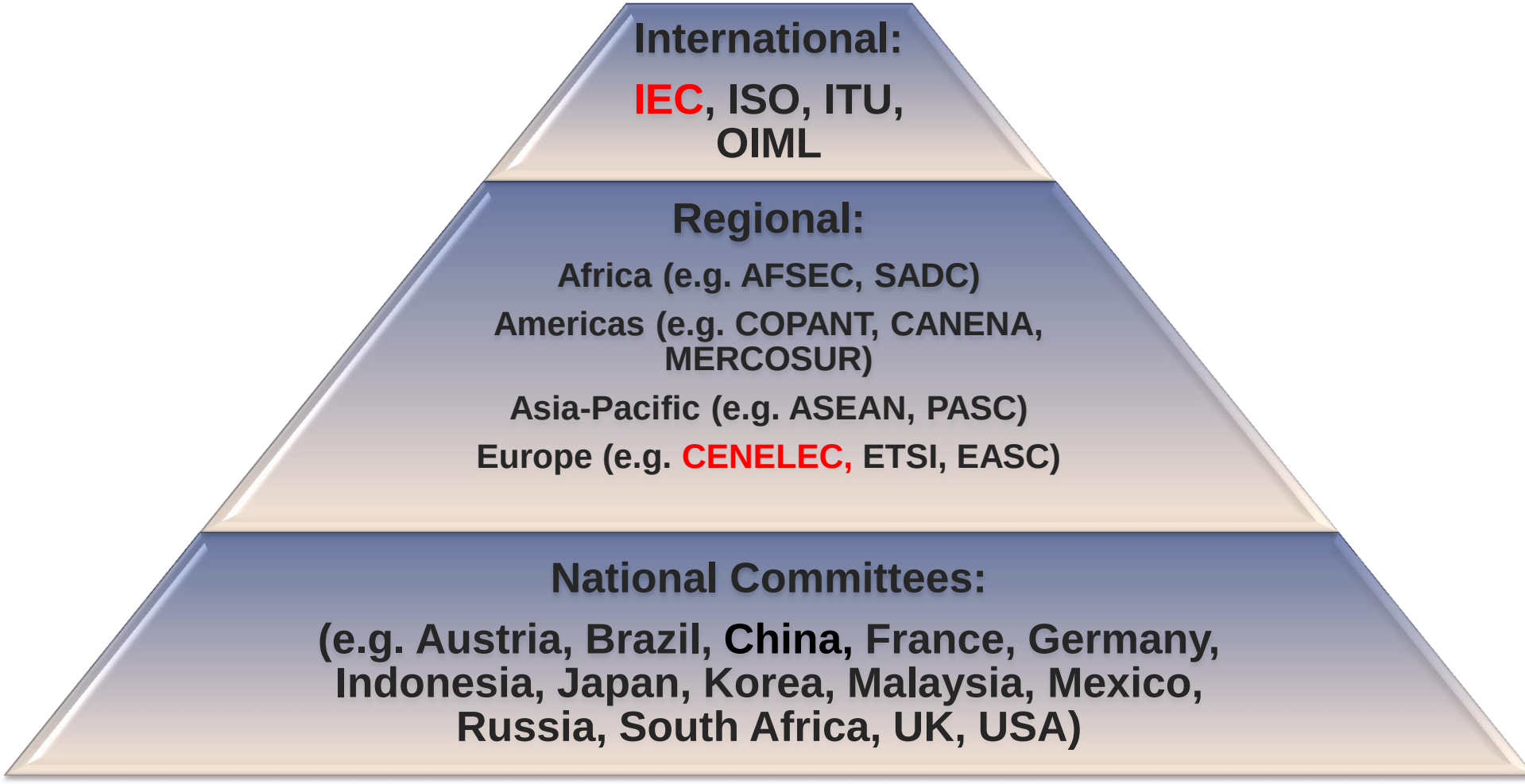
WTO TBT/SPS Workshop
Bangkok
2015-11

International Electrotechnical Commission

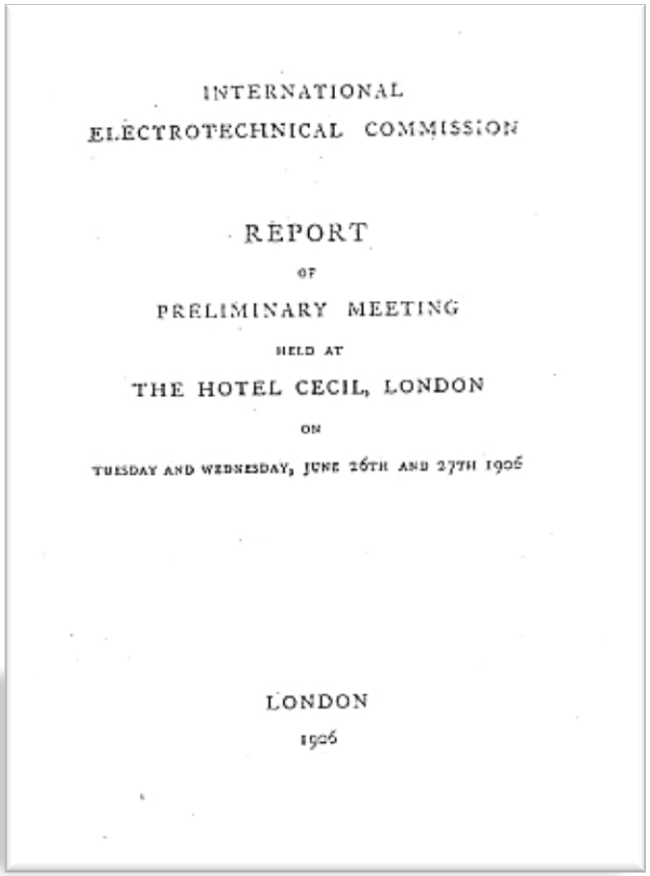
Contents

- What is IEC?
- How are IEC international standards developed?
- What are IEC conformity assessment systems?
- Supporting the IEC community

The world of standards



The organization



INTERNATIONAL
ELECTROTECHNICAL COMMISSION

REPORT
OF
PRELIMINARY MEETING
HELD AT
THE HOTEL CECIL, LONDON
ON
TUESDAY AND WEDNESDAY, JUNE 26TH AND 27TH 1906

LONDON
1906

- **The IEC is a not-for-profit, non-governmental organization founded in 1906**
- **One member per country**
- **International Standards and Conformity Assessment Systems for all electrical and electronic components, devices and systems**

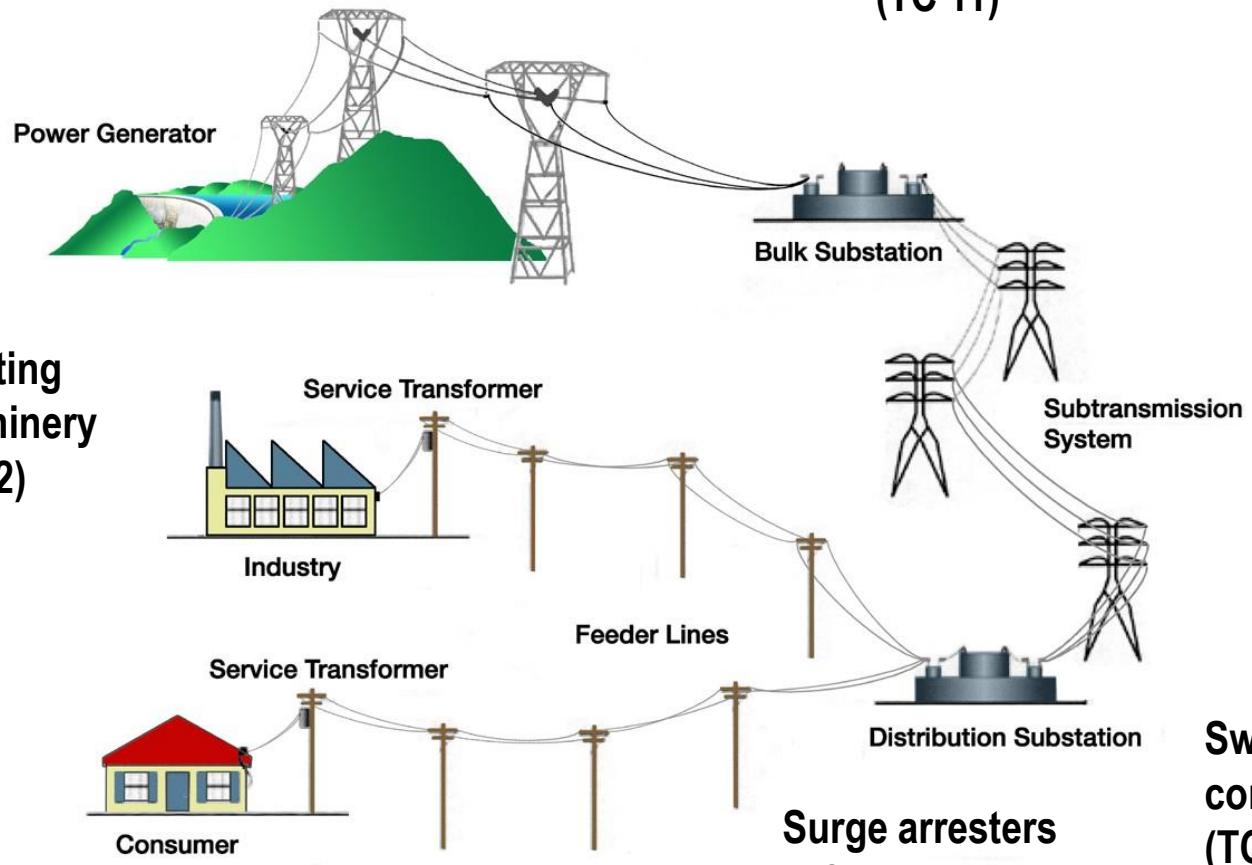
➡ About the IEC > Global reach

How you might "see" the IEC

Hydraulic turbines (TC 4)
Solar photovoltaic energy systems (TC 82)
Wind turbines (TC 88)
Solar thermal electric plants (TC 117)

Overhead electrical conductors (TC 7)

Overhead lines (TC 11)



Systems aspects for electrical energy supply (TC 8)
Grid Integration of Large-capacity Renewable Energy (RE) Generation (SC8A

Rotating machinery (TC 2)

Electric cables (TC 20)

Switchgear and controlgear (TC 17)

Surge arresters (TC 37)

But if you look further, at home

Electrical accessories
(TC 23)

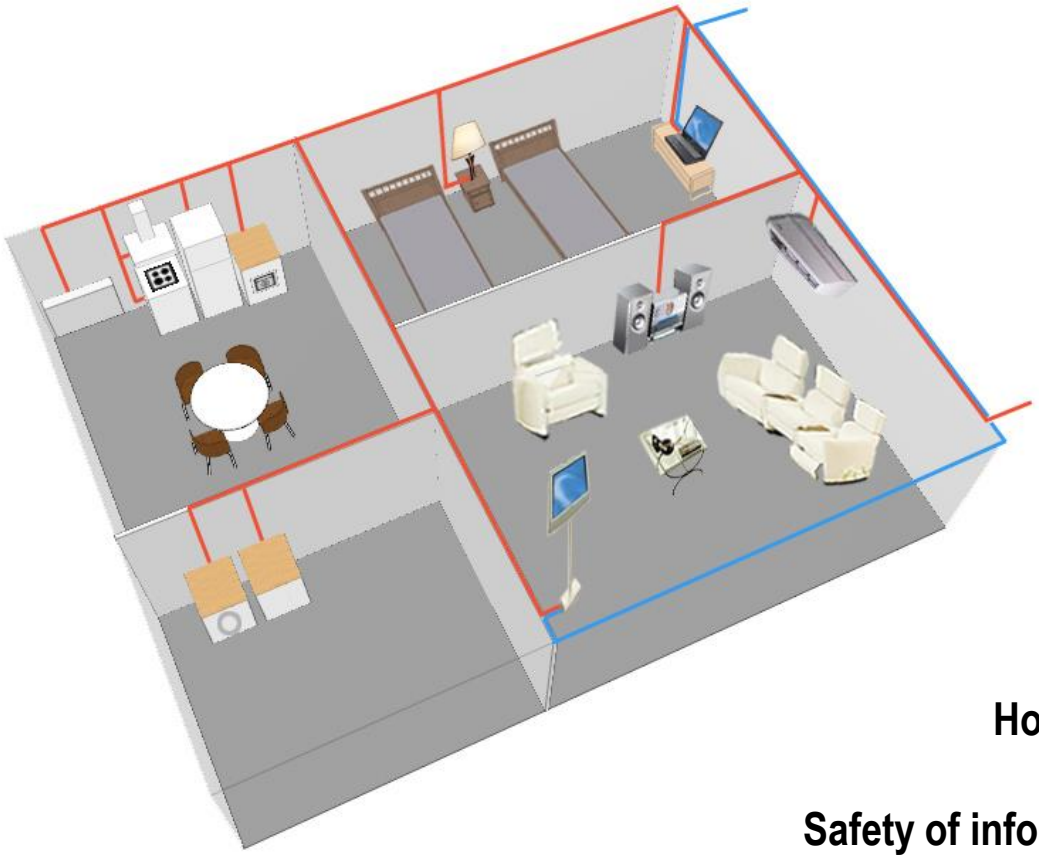
Fuses
(TC 32)

Winding wires
(TC 55)

Electric cables
(TC 20)

Lamps and related
equipment
(TC 34)

Electrical installations and protection
against electric shock
(TC 64)



Electromagnetic
compatibility
(TC 77)

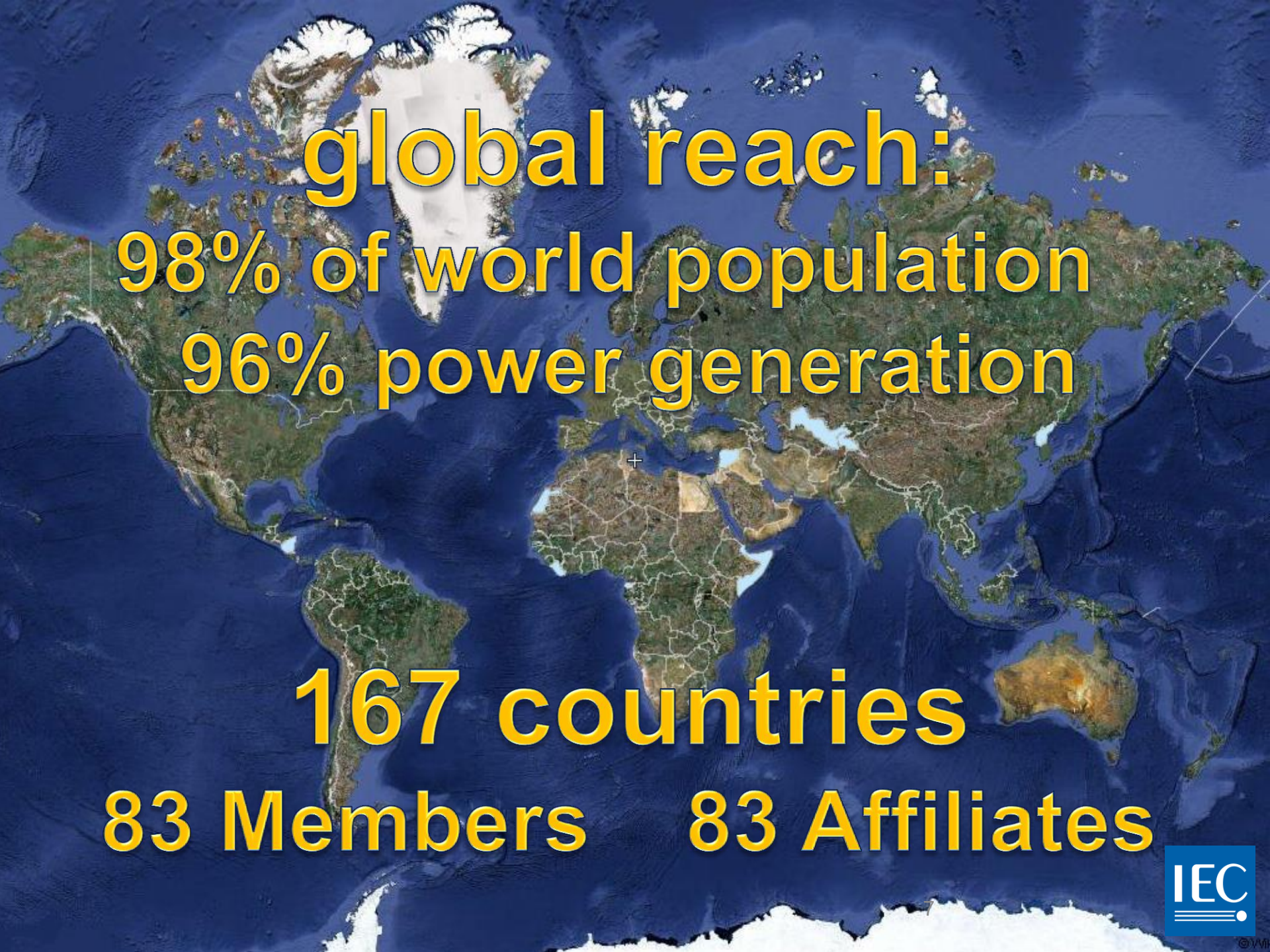
Multimedia
(TC 100)

Fibre optics
(TC 86)

Cables, wires,
waveguides
(TC 46)

Household appliances
(TCs 59 & 61)

Safety of information
technology equipment (TC 108)


global reach:
98% of world population
96% power generation
167 countries
83 Members
83 Affiliates
IEC

83 National Committees

ALBANIA (AM)
ALGERIA
ARGENTINA
AUSTRALIA
AUSTRIA
BAHRAIN (AM)
BELARUS
BELGIUM
BOSNIA-HERZEGOVINA (AM)
BRAZIL
BULGARIA
CANADA
CHILE
CHINA
COLOMBIA
CROATIA
CUBA (AM)
CYPRUS (AM)
CZECH REPUBLIC
DEM. PEOPLE'S REP. OF KOREA (AM)
DENMARK
EGYPT
ESTONIA (AM)
FINLAND
FRANCE
GEORGIA (AM)
GERMANY
GREECE
HUNGARY
ICELAND (AM)
INDIA
INDONESIA
IRAN
IRAQ
IRELAND
ISRAEL
ITALY
JAPAN
JORDAN (AM)
KAZAKHSTAN (AM)
KENYA (AM)
KOREA, REP. OF
LATVIA (AM)
LIBYA
LITHUANIA (AM)
LUXEMBOURG
MALAYSIA
MALTA (AM)
MEXICO
MOLDOVA (MD)
MONTENEGRO (AM)
MOROCCO (AM)
NETHERLANDS
NEW ZEALAND
NIGERIA (AM)
NORWAY
OMAN
PAKISTAN
PHILIPPINES
POLAND
PORTUGAL
QATAR
ROMANIA
RUSSIAN FEDERATION
SAUDI ARABIA
SERBIA
SINGAPORE
SLOVAKIA
SLOVENIA
SOUTH AFRICA
SPAIN
SRI LANKA (AM)
SWEDEN
SWITZERLAND
THAILAND
THE FYR OF MACEDONIA (AM)
TUNISIA (AM)
TURKEY
UKRAINE
UNITED ARAB EMIRATES
UK
USA
VIETNAM (AM)

23 Associate Members

IEC

IEC Affiliate countries and invited countries

AMERICAS

Antigua and Barbuda
Barbados
Bahamas
Belize
Bolivia
Costa Rica
Dominica
Dominican Republic
Ecuador
El Salvador
Grenada
Guatemala
Guyana
Haiti
Honduras
Jamaica
Nicaragua
Panama
Paraguay
Peru
St Kitts and Nevis
St Vincent & Grenadines
Saint Lucia
Suriname
Trinidad and Tobago
Uruguay

AFRICA

Angola
Benin
Botswana
Burkina Faso
Burundi
Cameroon
Cape Verde
Central African Rep.
Chad
Comoros
Congo
Côte d'Ivoire
DRC Congo
Djibouti
Eritrea
Ethiopia
Gabon
Gambia
Ghana
Guinea
Guinea Bissau
Gui.Equatorial
Lesotho
Liberia
Madagascar
Malawi
Mali
Mauritania
Mauritius
Mozambique
Namibia
Niger
Rwanda
Senegal
Seychelles
Sierra Leone
South Sudan
Sudan
Swaziland
Tanzania
Togo
Uganda
Zambia
Zimbabwe

ASIA

Afghanistan
Armenia
Azerbaijan
Bangladesh
Bhutan
Kyrgyzstan
Lebanon
Maldives
Mongolia
Myanmar
Nepal
Palestine
Syria
Tajikistan
Turkmenistan
Uzbekistan
Yemen

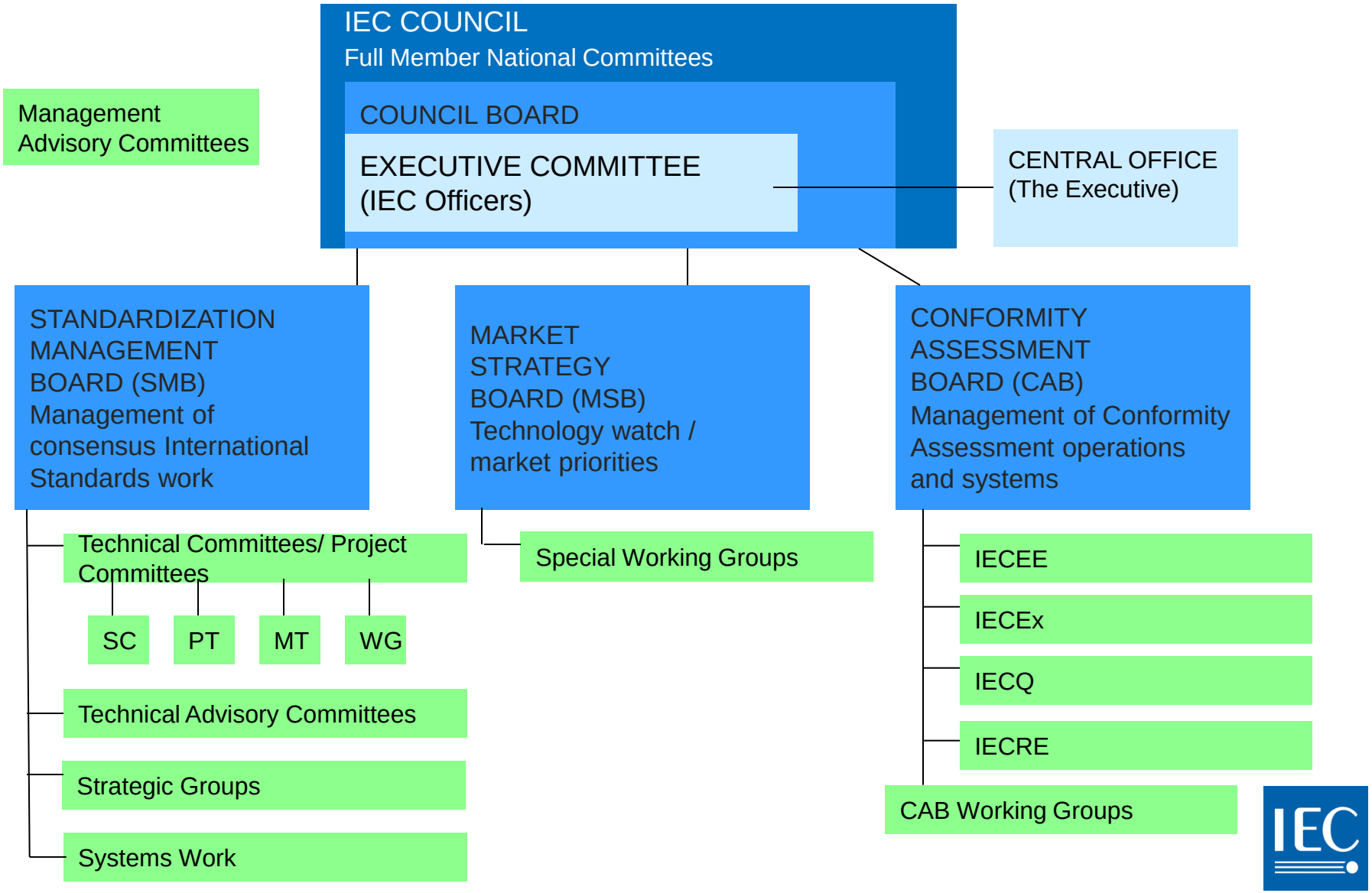
ASIA-PACIFIC

Brunei Darussalam
Cambodia
Fiji
Lao PDR
Papua New Guinea
Solomon Islands
Samoa
Tonga

Types of participation

- **IEC is a voluntary association of National Committees that fully represent electrotechnical interests in their countries**
  - **Government, industry, testing laboratories, academia, consumer groups…**
- **Membership – one member per country**
  - **Full Members (60) ex: China, India, Japan, Korea**
  - **Associate Members (23) ex: Sri Lanka, Viet Nam**
- **Affiliate Country programme**
  - **83 participants**
  - **18 in Asia-Pacific**

IEC structure



Council

- IEC policy
- Long-term strategic objectives
- Financial objectives
- Presidents of Full Member National Committees, IEC Officers, Past Presidents, CB members,
- One statutory meeting each year at General Meeting

CB: Council Board

- Implements Council policy
- Makes policy recommendations
- Receives reports from SMB, CAB and MSB
- 15 individual members elected by Council, IEC Officers
- Usually two meetings a year, one during GM, chaired by the President, Dr Junji Nomura

MSB: Market Strategy Board

Vice President Yinbiao Shu – Convenor

Top-level Technology Officers appointed from industry and (ex officio) the IEC Officers as members. The MSB meets at least once a year

- **Provides IEC CB (Council Board) with strategic recommendations based on market and technology trends**
- **Provides leading information, internally and externally, on fast moving markets industry trends, technology, and environmental developments**

Market Strategy Board

SMB: Standardization Management Board

Responsible for the technical work

- 174 TCs/SCs
  - Nearly 15 000 experts
- Strategic Groups
- Advisory Committees
- Systems Work
- 15 elected members
- Chaired by Vice President James E. Matthews III

➡ About the IEC > Who we are > Management Structure> SMB

CAB: Conformity Assessment Board

- **Responsible for setting the IEC's conformity assessment policy, promoting and maintaining relations with international organizations on conformity assessment matters**
- **15 elected members**
- **Chaired by Vice President Ulrich Spindler**

➡ About the IEC > Who we are > Management Structure> SMB

Key technical figures

Close to 15 500 experts

Number of publications (Q3 2014-Q2 2015):	**574**
• **New projects:**	**44%**
• **Maintenance:**	**56%**
Number of publications (Q1-Q2 2015):	**310**
Number of publications in catalogue:	**6 955**
New projects (Q3 2014-Q2 2015):	**236**
Average development time in months:	**34,5**

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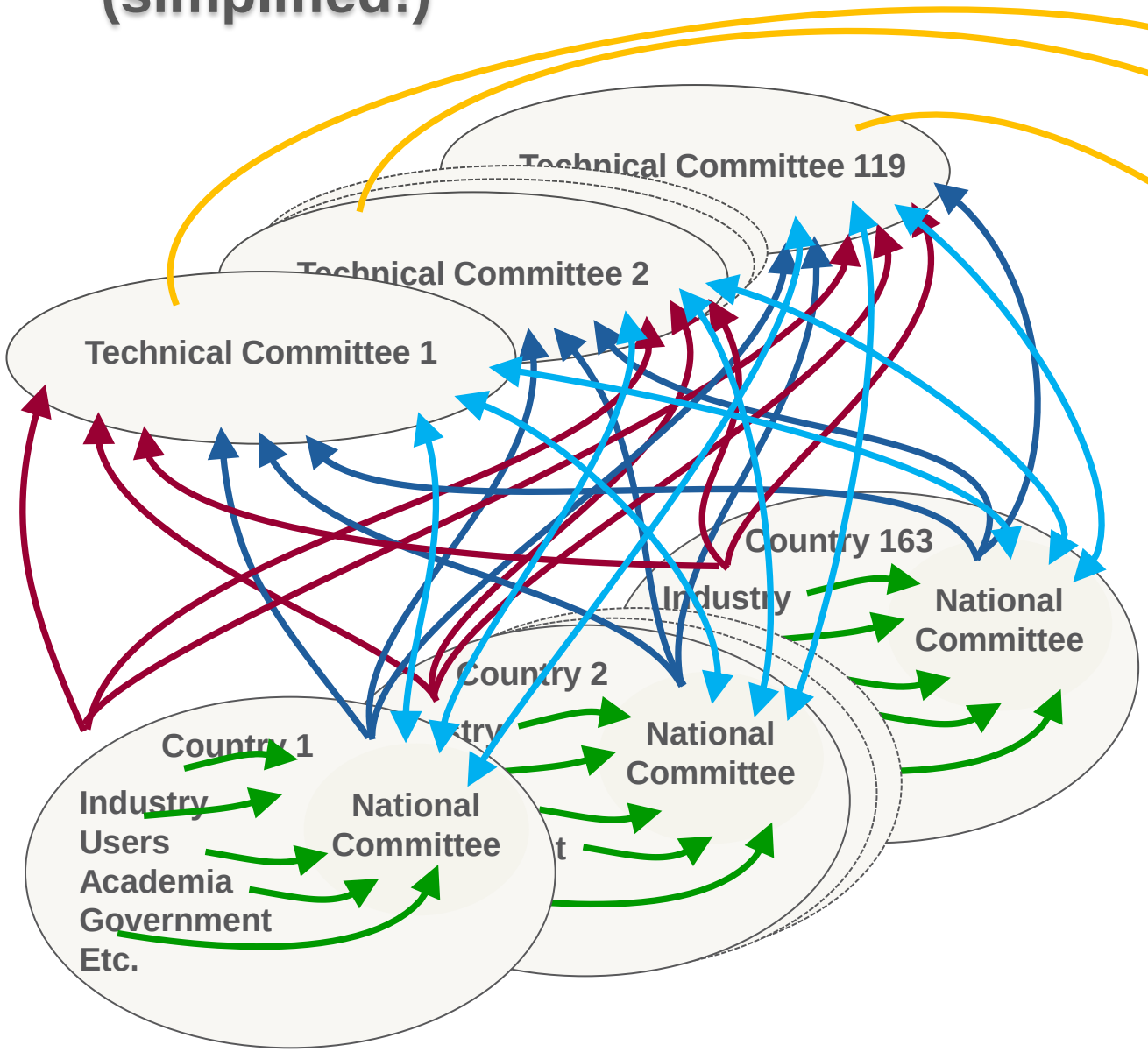
How IEC Standards are developed

- Technical Committees cover specific fields of activity
  - Working Groups/Project Teams
- Experts nominated by National Committees
- Established standards development process – ISO/IEC Directives

International Standards workflow
(simplified!)



Requirements

Work Items

Expert Resources

Votes Drafts

Standards Output

Standards development stages

- New Proposal — NP
- Working Draft — WD
- Committee Draft — CD
- Committee Draft for Vote — CDV
- Final Draft International Standard — FDIS
- International Standard — IS

Two broad categories

- **Normative publications**

  agreement on technical description of characteristics to be fulfilled by the product, system, service or object

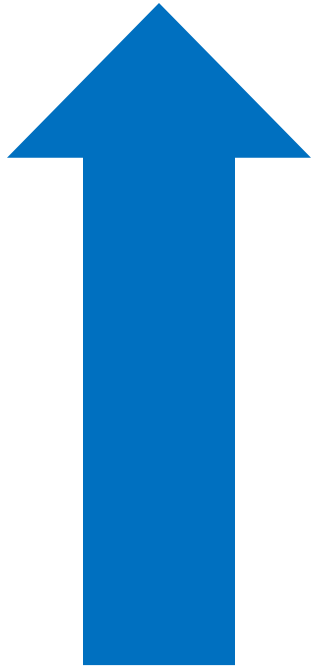
- **Informative publications**

  background information such as implementation, procedures or guidelines

Developed based on result of full or limited international consensus among IEC Members

Types of IEC publications

- Normative publications
  - International Standards (IS)
  - Technical Specifications (TS)
  - Publicly Available Specifications (IEC-PAS)
- Informative publications
  - Technical reports (TR)
- Guides



Increasing consensus

International Standard (IS)

A document, established by consensus and approved by IEC, that provides, for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context

Technical Specification (TS)

Published when :

- **Insufficient consensus for approval of an IS is available**
- **There is doubt that consensus has been achieved**
- **The subject is still under technical development**
- **Other reason precluding immediate publication of an IS**

Publicly Available Specification (PAS)

A publication responding to an urgent market need, representing either:

- **a consensus in an organization external to the IEC or,**
- **a consensus of experts within a working group**

Published after verification that no conflict with existing IS by the committee concerned

Technical Report (TR)

Informative document

Data of a different kind, e.g.

- **Scientific supporting material**
- **Data collection**
- **Results of surveys**
- **State of the art**
- **Supplementary information or explanation**

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A

Refrigerators

B

freeZwel

A

B

freeZwel

A

B

$ 500

$ 300

freeZwel

A

Refrigerator safety standard
IEC 60335-2-24

B

$ 500

SDoC

$ 300

SDoC

IEC

freeZwel

A

Refrigerator safety standard
IEC 60335-2-24

B

$ 500

Certified

$ 300

Certified

IEC

freeZwel

A

Refrigerator safety standard
IEC 60335-2-24

B

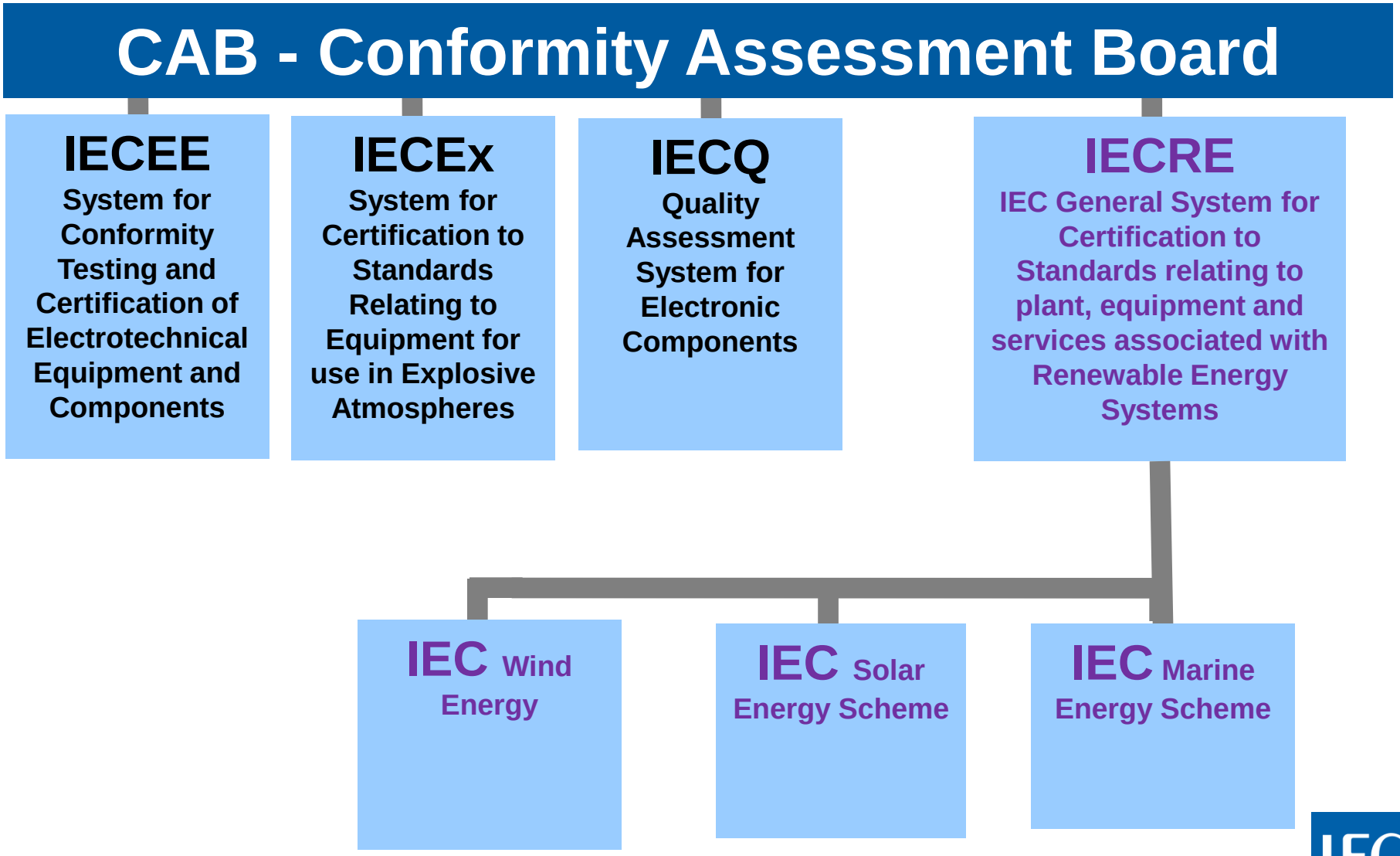
$ 500

Certified

$ 400

Certified

IEC


CAB - Conformity Assessment Board
IECEE
System for Conformity Testing and Certification of Electrotechnical Equipment and Components
IECEx
System for Certification to Standards Relating to Equipment for use in Explosive Atmospheres
IECQ
Quality Assessment System for Electronic Components
IECRE
IEC General System for Certification to Standards relating to plant, equipment and services associated with Renewable Energy Systems
IEC Wind Energy
IEC Solar Energy Scheme
IEC Marine Energy Scheme

What value do the IEC CA Systems create ?

World trade & a level playing field.

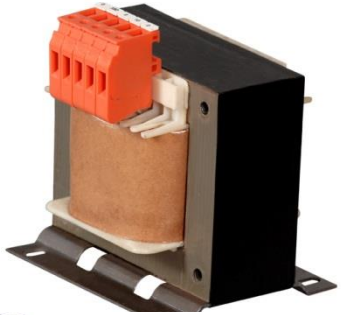
- One “reference” world-wide CA organisation
- Higher safety, quality & interoperability
- Aid regulatory recognition of safety & quality
- Create opportunity for smaller players
- Reduce industry’s time & cost to enter markets
- Global market access and encourage world trade

IECEE

System for conformity testing and certification of electrotechnical equipment and components










IECEE covers

- IT and office equipment
- Electronics, entertainment
- Electrical equipment for medical use
- Installation accessories and connection devices
- Safety transformers and similar equipment
- Luminaires
- Switches for appliances and automatic controls for electrical household appliances
- Industrial Automation
- Electromagnetic Compatibility
- Hazardous Substances Testing Service
- Miscellaneous
- Portable tools
- Photovoltaics
- Household and similar equipment
- Measurement, Control and Laboratory equipment
- Low voltage, high power switching equipment
- Installation protective equipment
- Capacitors as components
- Batteries
- Cables and Cords
- Energy Efficiency
- Electric Vehicles
- Electric Toys

Safety-Performance-Environment

Safety

IEC Standards for electrical safety

Energy efficiency

IEC Standards for energy efficiency

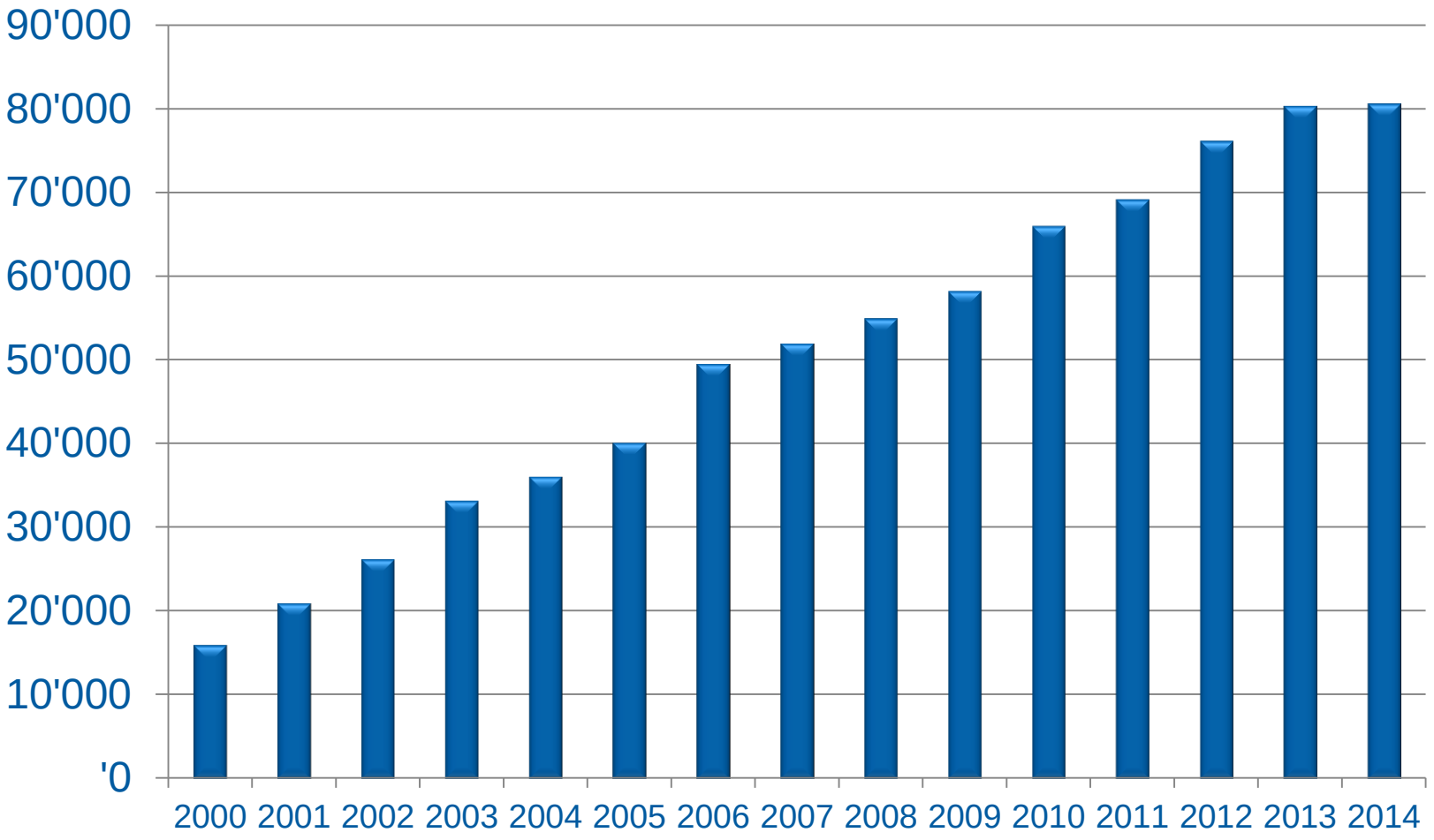
Environmental Protection

IECEE Hazardous Substances Programme

IECEE CB and FCS Schemes

- “de facto” the most accepted proof of compliance by authorities and regulators
- Passport to market entry without further testing

Test certificates



IECEx

Worldwide system for certification to standards relating to equipment for use in explosive atmospheres







Schemes within the IECEx System

IECEx System

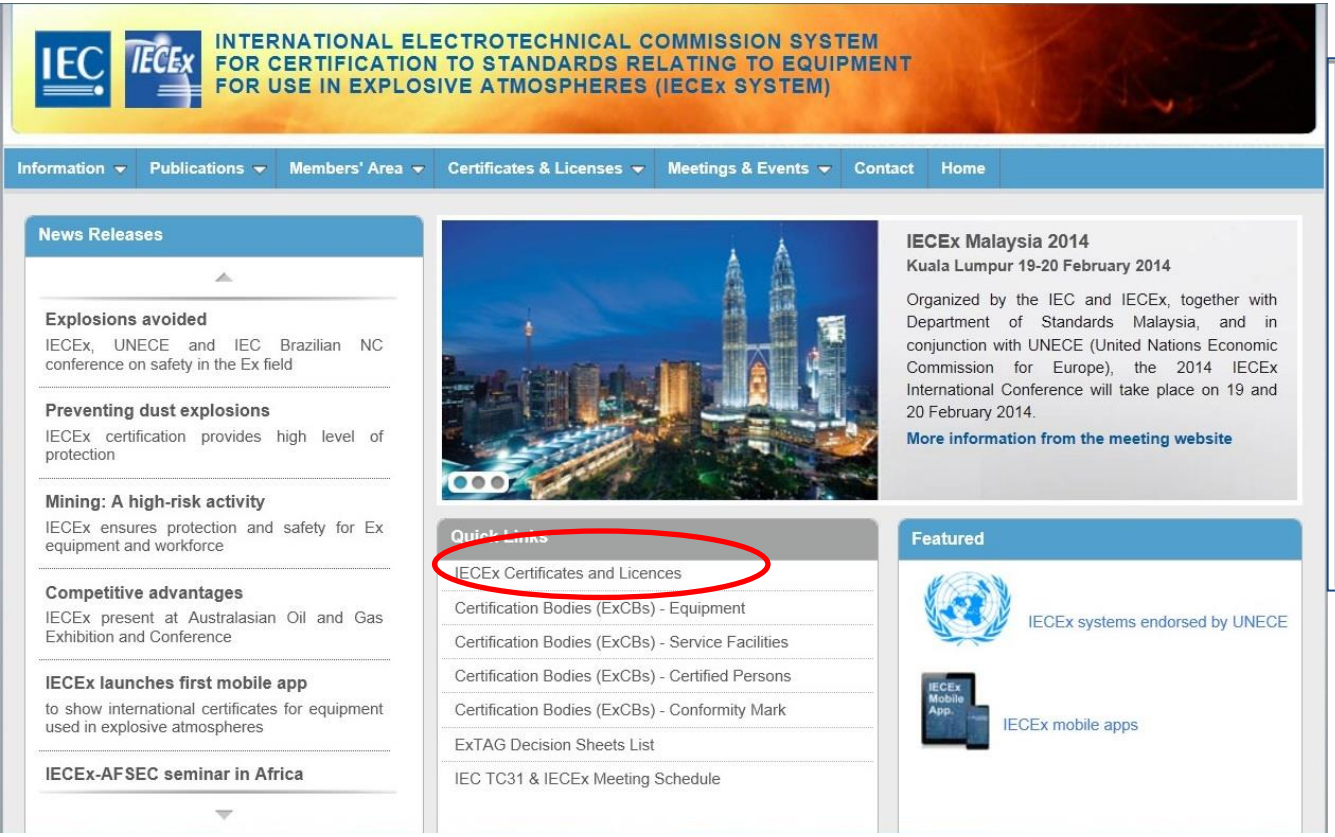
IECEx Equipment Scheme
Certification of Ex Equipment

IECEx Conformity Mark License Scheme

IECEx Services Scheme
Certification of Ex Service Providers

IECEx Certified Persons Scheme (CoPC)
Competency to work in Ex field (New)

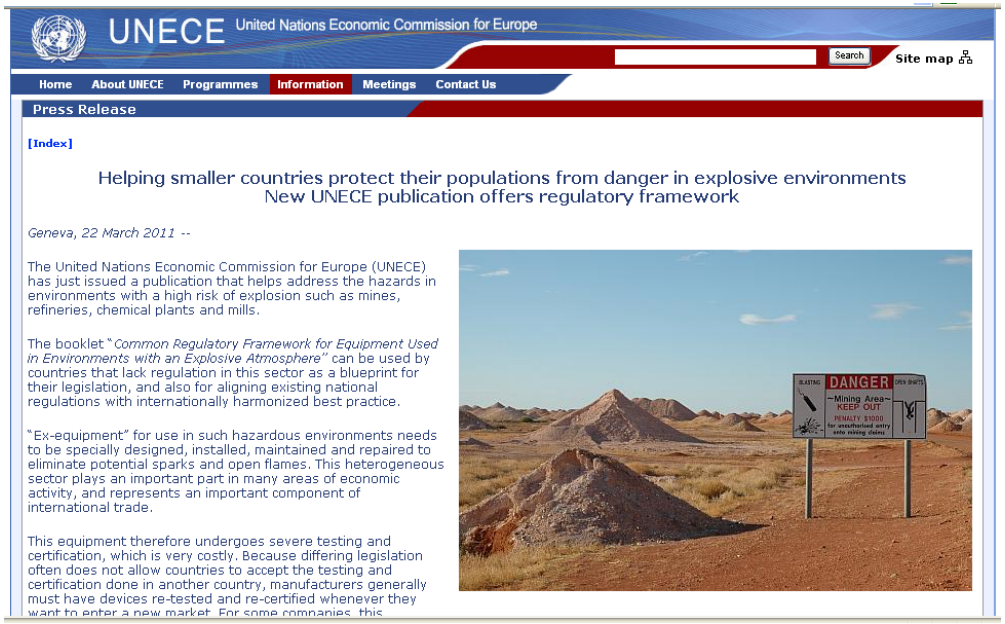
IECEx On-Line Certificate System



The IECEx app:

is available for Apple and Android devices for free
provides real time information
has a searchable database of IECEx certificates
data Is synchronized with the IECEx website (www.iecex.com)

United Nations Endorsement of IECEx



UNECE United Nations Economic Commission for Europe

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Press Release

[Index]

Helping smaller countries protect their populations from danger in explosive environments
New UNECE publication offers regulatory framework

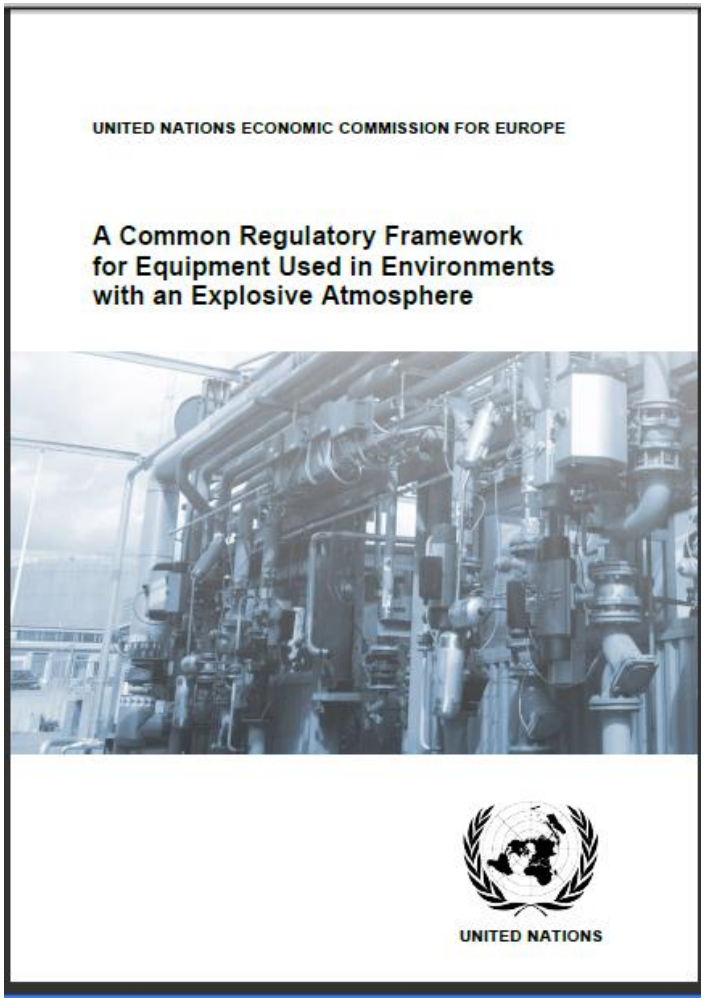
Geneva, 22 March 2011 --

The United Nations Economic Commission for Europe (UNECE) has just issued a publication that helps address the hazards in environments with a high risk of explosion such as mines, refineries, chemical plants and mills.

The booklet "*Common Regulatory Framework for Equipment Used in Environments with an Explosive Atmosphere*" can be used by countries that lack regulation in this sector as a blueprint for their legislation, and also for aligning existing national regulations with internationally harmonized best practice.

"Ex-equipment" for use in such hazardous environments needs to be specially designed, installed, maintained and repaired to eliminate potential sparks and open flames. This heterogeneous sector plays an important part in many areas of economic activity, and represents an important component of international trade.

This equipment therefore undergoes severe testing and certification, which is very costly. Because differing legislation often does not allow countries to accept the testing and certification done in another country, manufacturers generally must have devices re-tested and re-certified whenever they want to enter a new market. For some companies, this

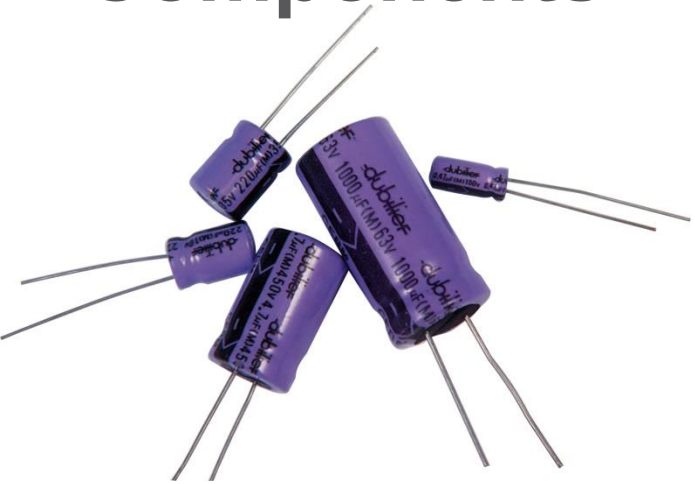


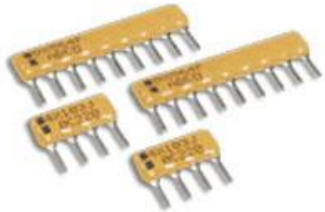
New United Nations Publication, March 2011 endorsing IEC TC 31 Standards + IECEx as "world's best practice".

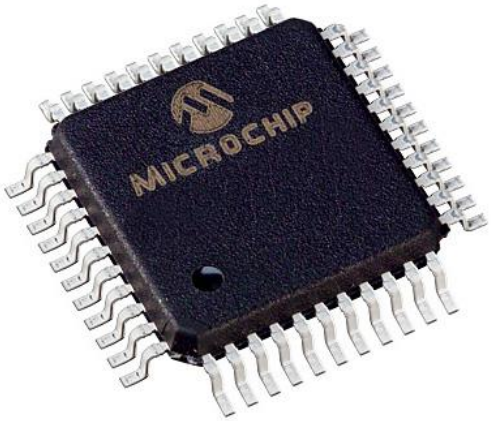
http://www.unece.org/press/pr2011/11trade_p03e.htm

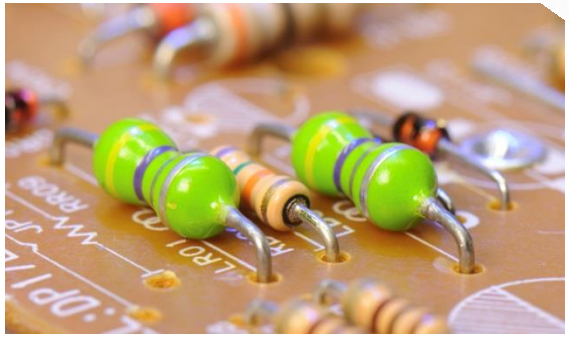
IECQ

Quality Assessment System for Electronic Components









What is IECQ

- IECQ (IEC Quality Assessment System for Electronic Components) is a worldwide approval and certification system covering the supply of electronic components and associated materials and assemblies (including modules) and processes.
- It uses quality assessment specifications that are based on International Standards /Specifications prepared by the International Electrotechnical Commission (IEC) or National Standards / Specifications where an IEC Standard does not exist.

Schemes within the IECQ System

IECQ System

www.iecq.org

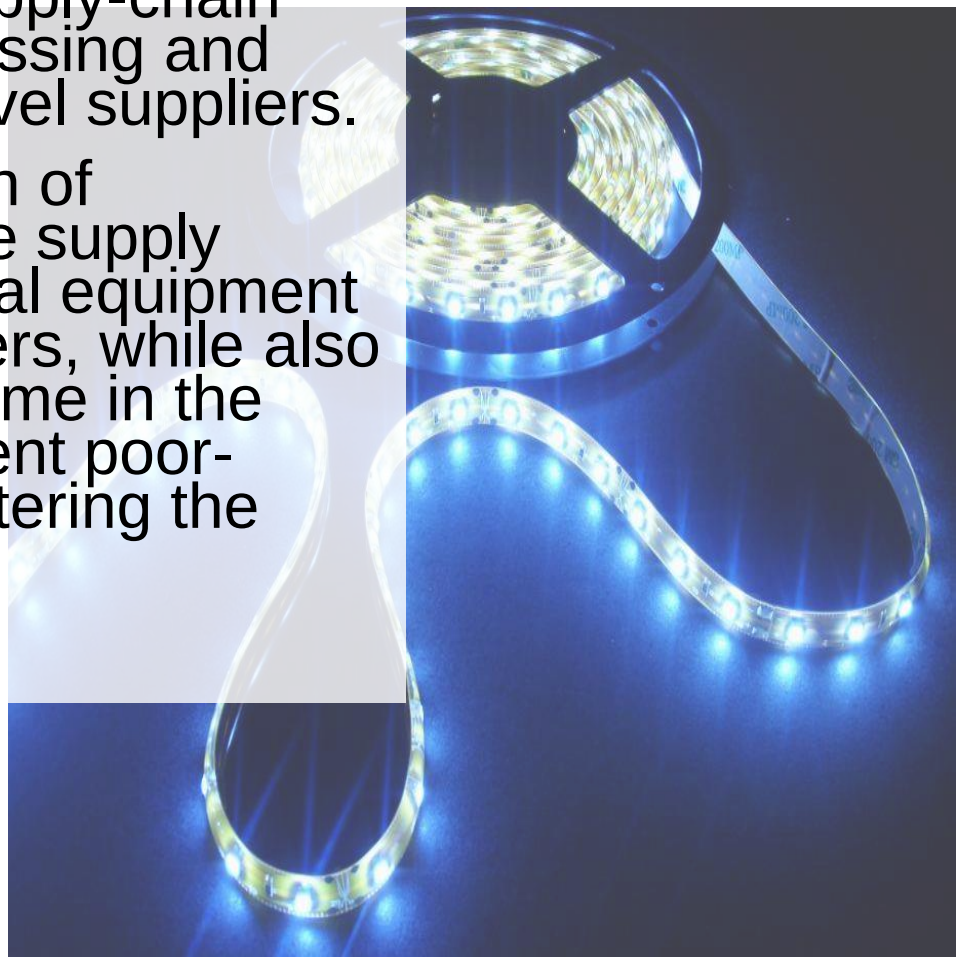
- **Approved Process Scheme (IECQ AP)** (E.g. Electro Static Discharge etc.)
  - **Counterfeit Avoidance Programme (IECQ CAP)**
- **Approved Component Scheme (IECQ AC)** (Production of Components + Assemblies)
  - **Automotive Qualification Programme (IECQ AQP)**
  - **Scheme for LED Lighting (IECQ LED) SSL Lighting**
- **IECQ HSPM Scheme "IECQ QC 080000"** (Hazardous Substance Process Management)
- **IECQ Avionics Scheme (IECQ ECMP)** (Electronic Component Management Plans)
- **IECQ Independent Testing Laboratory Scheme (IECQ ITL)**

IECQ Hazardous Substances Process Management HSPM

- IECQ HSPM provides the requirements used to demonstrate to the international market place that the organization has developed, documented, and implemented processes for managing the production, selection and use of electronic components, assemblies, processes and related materials in accordance with customer, local, national and international HSF requirements (like Sony SS 00259, Directive 2002/95/EC, Directive 2002/96/EC and other local environmental regulations) for their scope of activity.

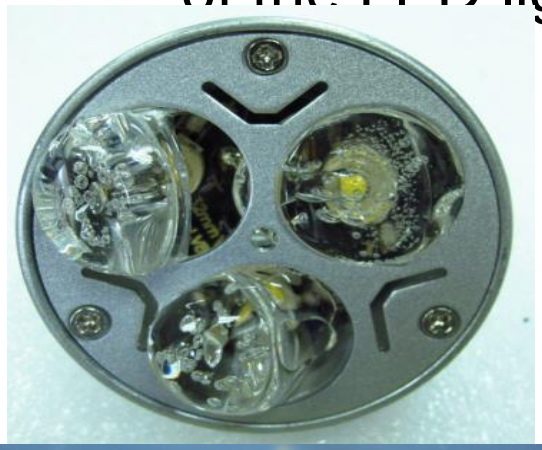
IECQ AC Scheme - LED Lighting

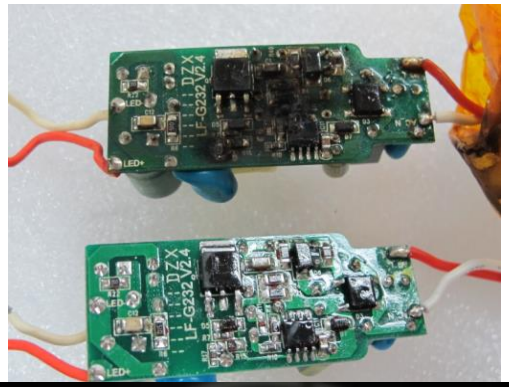
- The IECQ AC Scheme provides a “standardized way” of evaluating suppliers and is used as a powerful supply-chain management tool when assessing and monitoring the various tier-level suppliers.
- This removes the cost burden of monitoring and controlling the supply chain, from the OEMs (original equipment manufacturer) to their suppliers, while also protecting the OEM brand name in the market. This also helps prevent poor-quality LED systems from entering the market.

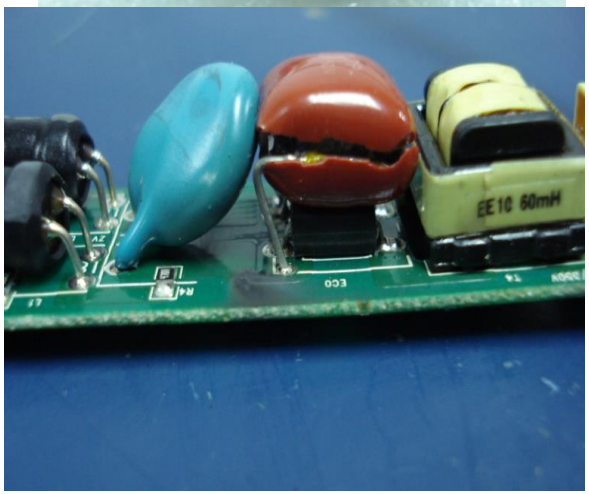


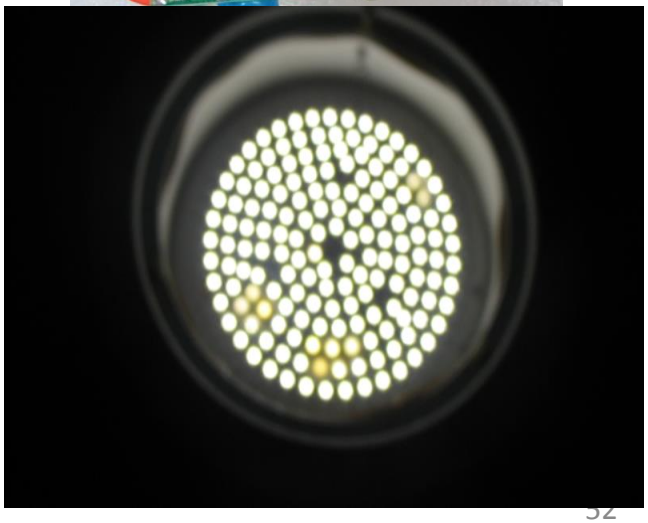
LED Industry concerns over quality and reliability

One faulty component can result in poor performance or even worse, the overall failure of the LED lighting system.

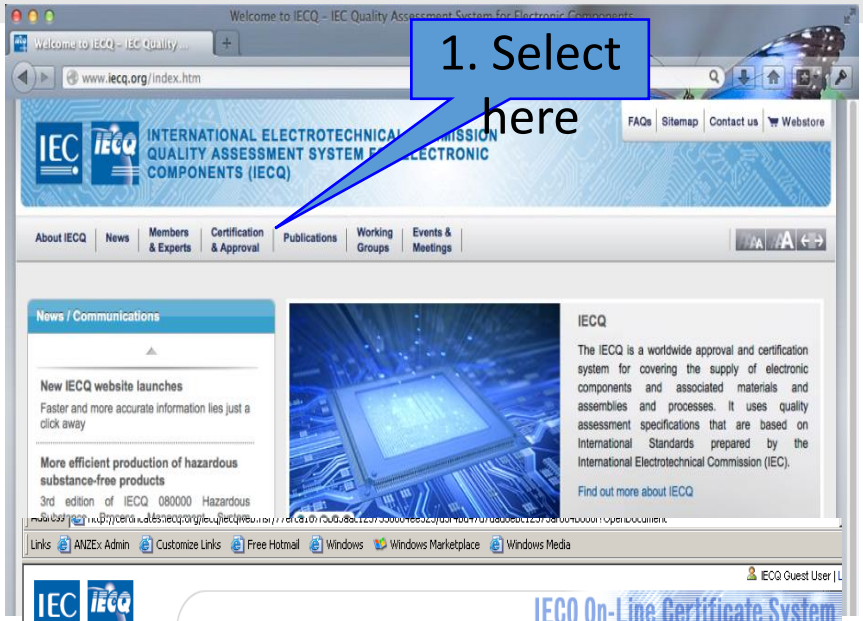


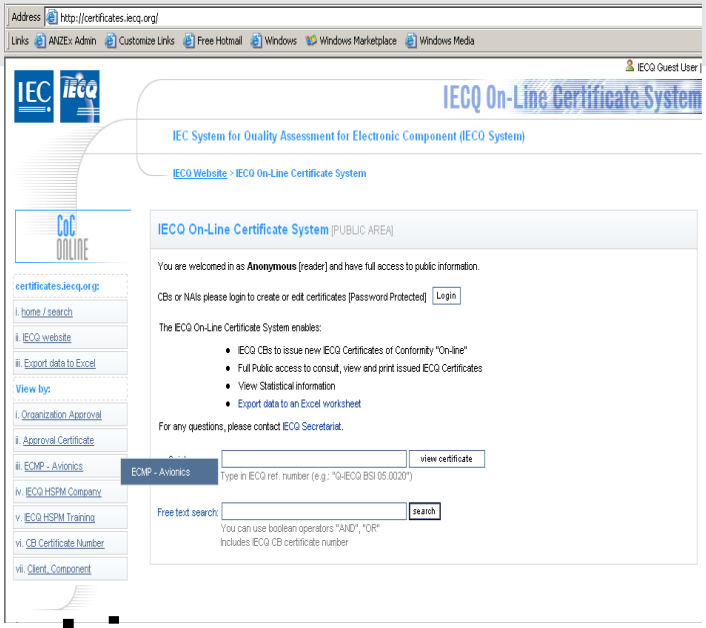






IECQ On-Line Certificates





IECQ On-Line Certificates

- All Certificates located
- Public access
- Search features
- On-Line version is

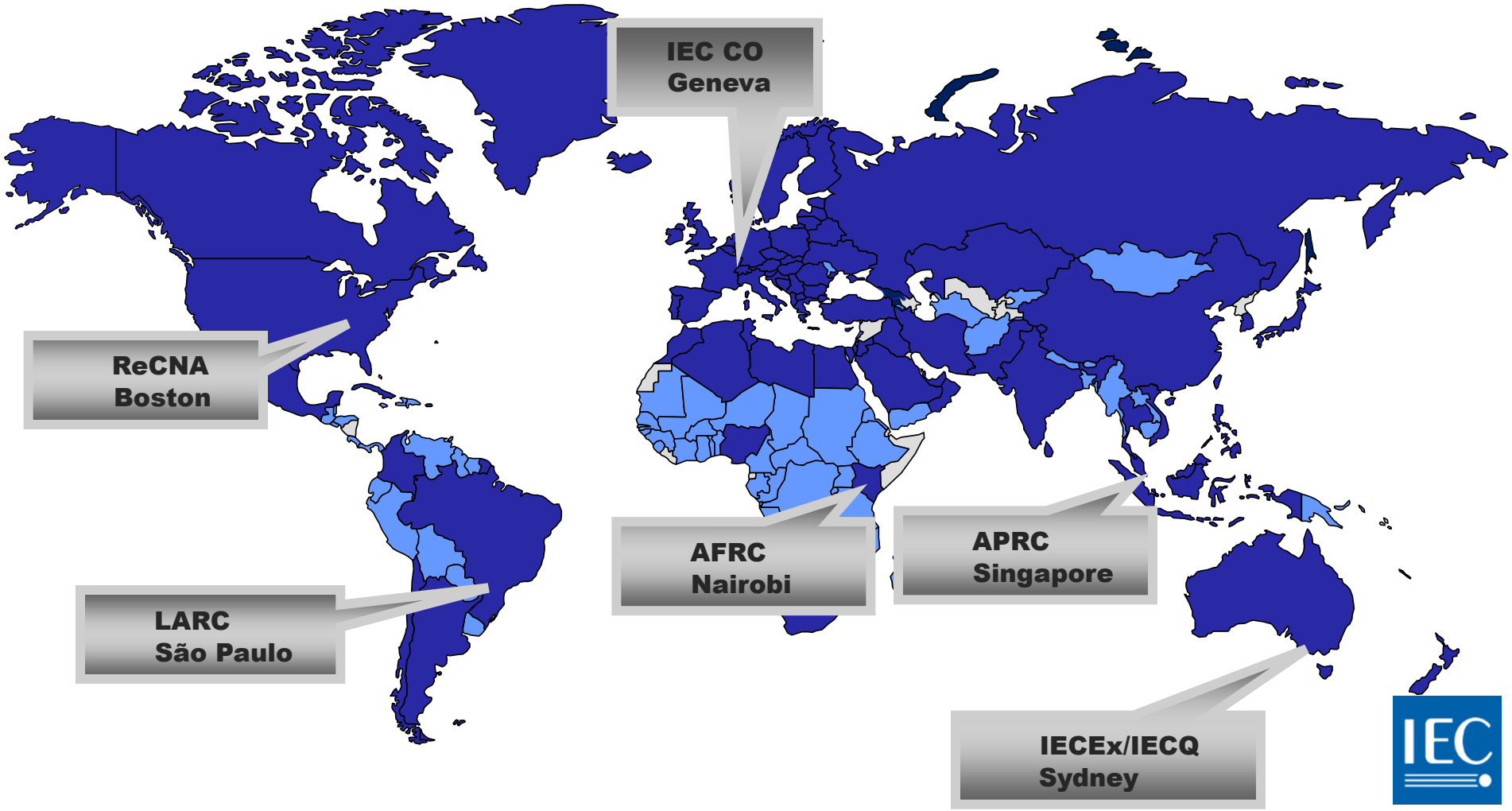
IECRE

- REMC Officers
- Operational Management Committee (OMC) Officers
- Draft Rules of Procedures for each sector
- 16 Members
- First certificates expected in 2016

Contents

- What is IEC?
- How are IEC international standards developed?
- What are IEC conformity assessment systems?
- Supporting the IEC community

IEC offices


IEC CO
Geneva
ReCNA
Boston
AFRC
Nairobi
APRC
Singapore
LARC
São Paulo
IECEx/IECQ
Sydney

IEC-APRC

- 21 February 2002
- Resource for members and affiliates
- Link to Central Office and IEC TC/SC Experts

Mission

- Promote awareness of IEC in the region
- Increase use of IEC International Standards
- Enhance participation of all countries in the region in the Commission's work

All of the above will be achieved by improved communications with businesses, industries and governments in the region

IEC-APRC key activities

- Promotional
  - Participation in Regional Groups/Events
  - Information Sessions and Training Activities
  - Venue for AC/WG/MT meetings
- Technical
  - Support to 54 TCs/SCs
  - Advisory Committees – ACTAD and ACEE

A Unique Approach

- Affiliate **commitment** to use International Standards
- No participation fee, no right to vote, ***not a form of membership***
- **200** free IEC International Standards for adoption
- Selection of **10 technical fields** and access to working documents
- Attendance to **IEC General Meetings**
- A **Leader**, a **Secretariat**, **Coordinator for Africa**, a website.

Affiliate Secretariat

- **Françoise Rauser**

Executive Secretary

- **Thomas Robertson**

Project coordinator: ACAS and Mentoring

- **Sei Yun Park**

Assistant

Affiliate Leader

Rosario Uría

INACAL– Peru

- Nominated by IEC General Secretary
- Voice of the Affiliates
- Promotes the Programme
- Chairs the Affiliate Forum
- Leads the Affiliate delegation during IEC General Meeting
- Presents a report to IEC Management boards (CAB and SMB)

IEC Coordinator IEC for Africa

Evah Oduor

AFSEC Vice-President

- **Coordinates IEC Family participation in Africa**
- **Assists the Leader and the Secretariat for African issues**
- **Liaises with AFSEC**
- **Represents the IEC at regional level**

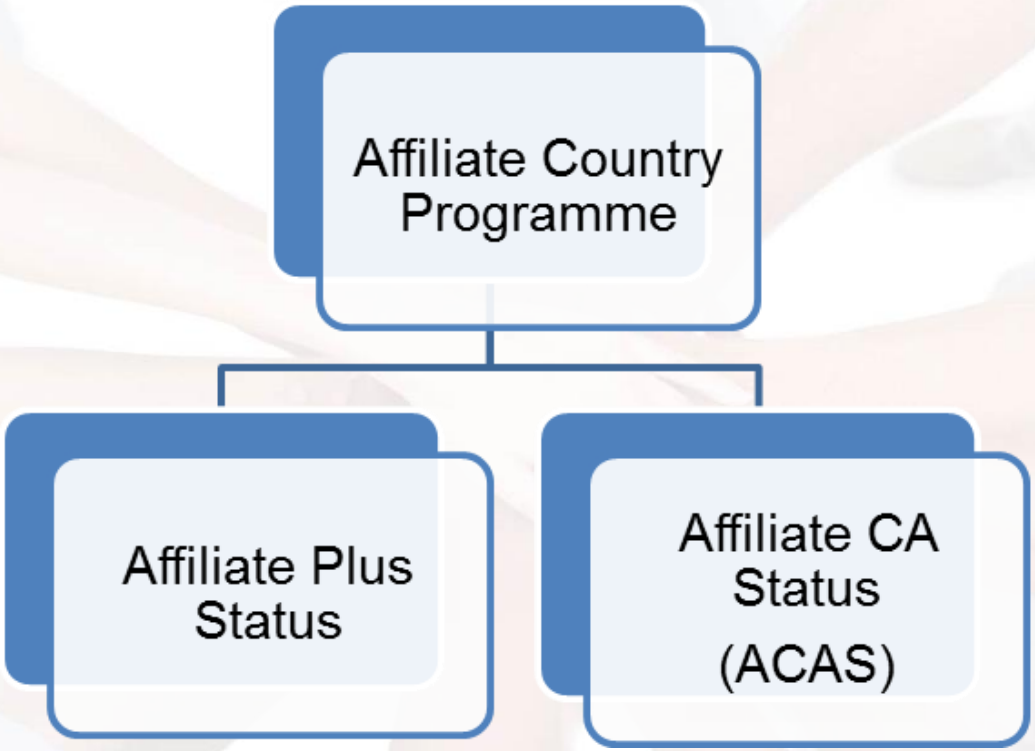
Results

- 84 Affiliates:
  - **Uzbekistan** (October 2015)
- 47 NEC (National Electrotechnical Committees):
  - **Antigua and Barbuda** (July 2015)
- Over 4900 national adoptions of IEC IS in Affiliate Countries:
  - **Cameroon** (January 2015)
  - Adoptions on line: http://www.iec.ch/affiliates
- Affiliate Plus: 23 countries
  - **Costa Rica** (May 2015)
- General Meeting 2015: 16 countries represented

Additional benefits

- Affiliate Plus in 2009
- Mentoring in 2013
- ACAS in 2013

Affiliate Country Programme Structure



Affiliate Plus

- Criteria
  - At least 50 adoptions of IEC IS
  - A NEC (National Electrotechnical Committee)
  - 24 countries have obtained Affiliate Plus
- New benefits
  - 400 free adoptions instead of 200
  - Priority for mentoring

Mentoring Programme

IEC Mentoring in a nutshell

- Partnerships between:
  - IEC NCs and IEC NCs
  - IEC NCs and Affiliate NECs
- Voluntary programme lasting up to two years
- Progress report after one year and another at the end of the period
- Two levels of mentoring: management and technical

Management mentoring for Affiliates

- Focus on reinforcing structure and functioning of the NEC
- Reaching out to stakeholders, including industry and SMEs
- Establishing mirror committees
- Adoption of IEC International Standards

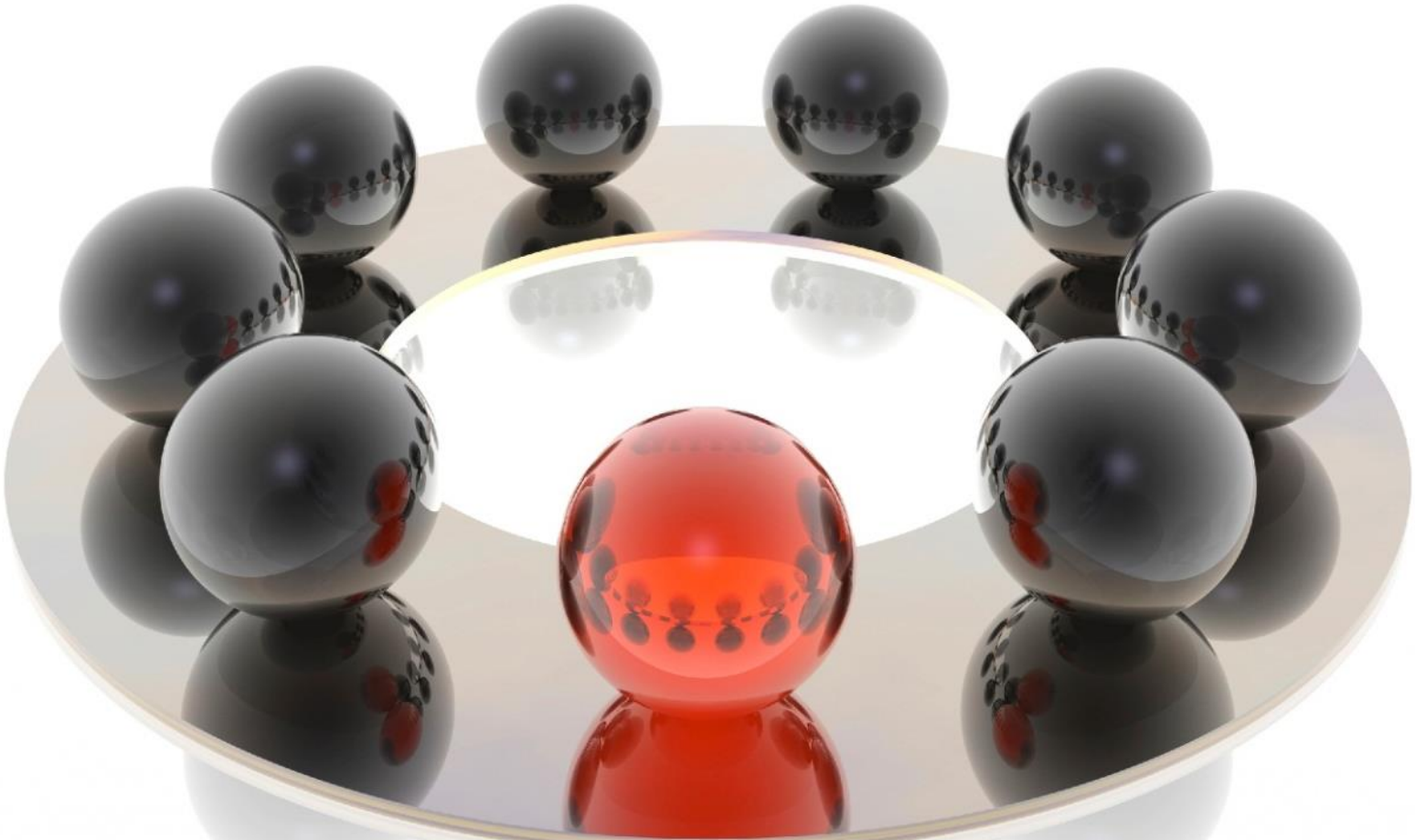
Technical mentoring for Affiliates

- Enhancing the participation of experts
- Focusing on working process for commenting on technical documents during their development
- Guidance for understanding the requirements in IEC International Standards
- Running of mirror committees

Mentoring partnerships

- Rwanda – Austria (2013)
- Afghanistan – Malaysia (2014)
- Côte d'Ivoire- France (2014)
- DRC – France (2014)
- Ethiopia – Germany (2014)
- Uruguay – Norway (2014)
- Zambia – Austria (2014)
- Mongolia – Germany (2015)
- Bhutan – Sweden (2015)
- Peru – Mexico (2015)

Affiliate Conformity Assessment Status (ACAS)



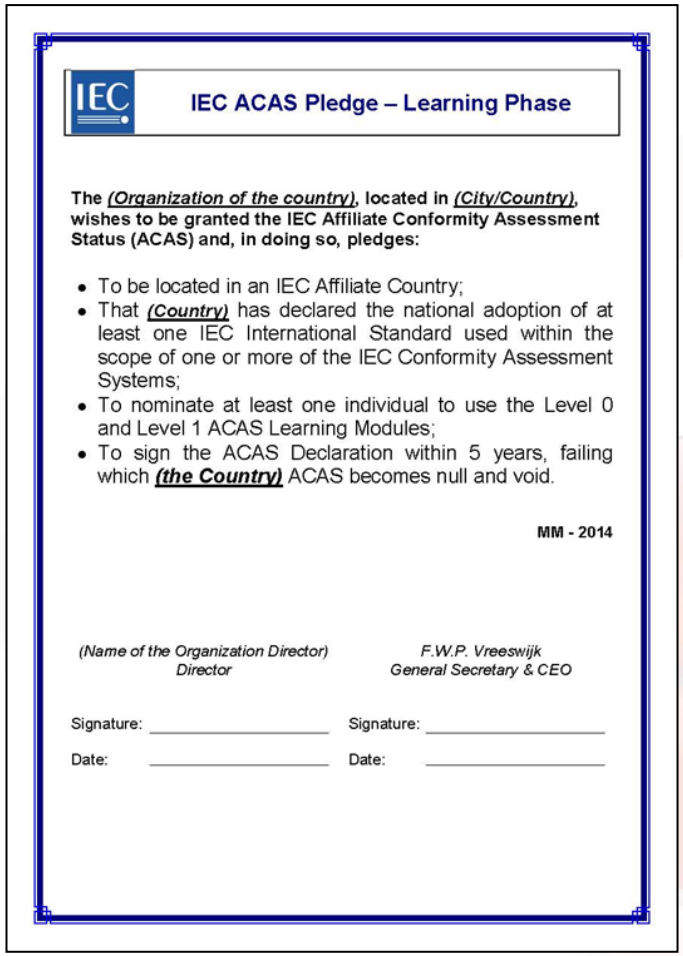
ACAS package benefits

- Regional awareness events
- ACAS section on IEC Affiliate website
  - http://www.iec.ch/affiliates/acas
- Webinars (upon request)
- E-learning modules on IEC ACAS website
- Observer status at IEC CA System management meetings (based on prerequisite training conditions)

Two steps

- **Status → Pledge**
  - National adoption of at least one IEC International Standard used within the scope of one or more of the IEC CA Systems
  - Nomination of at least one individual to use the Level 0 and Level 1 ACAS Learning Modules
  - Commitment to sign the ACAS Declaration within 5 years
- **Status → Declaration**
  - Willingness to accept IEC CA certificates related to national adoptions of IEC International Standard(s)
  - Allows access to Level 2 ACAS Learning Modules
  - Observer status in management meetings

ACAS Pledge and Declaration



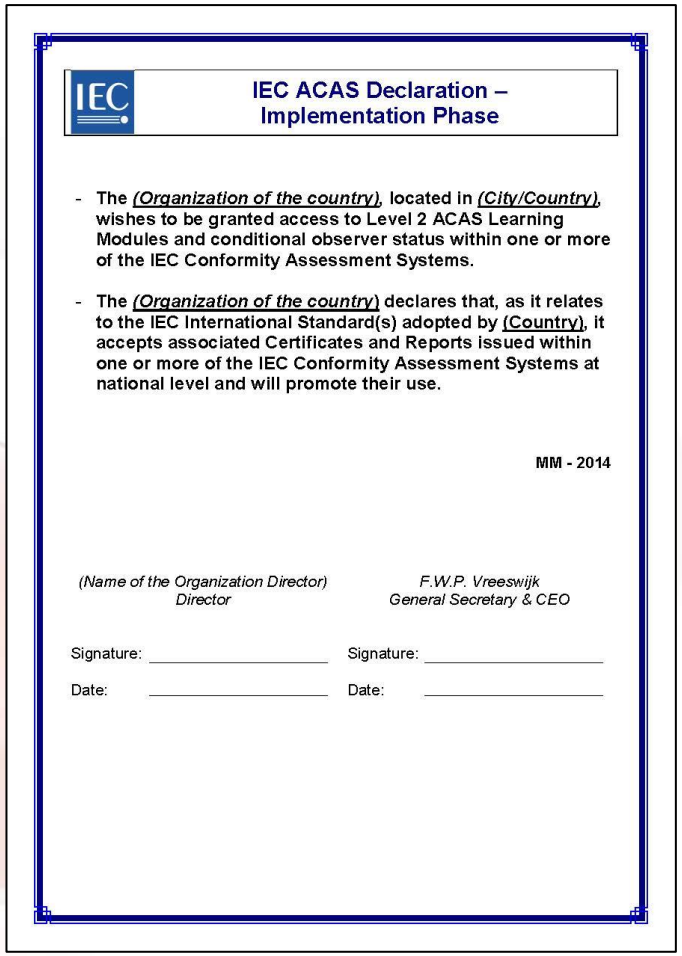
IEC ACAS Pledge – Learning Phase

The *(Organization of the country)*, located in *(City/Country)*, wishes to be granted the IEC Affiliate Conformity Assessment Status (ACAS) and, in doing so, pledges:

- To be located in an IEC Affiliate Country;
- That ***(Country)*** has declared the national adoption of at least one IEC International Standard used within the scope of one or more of the IEC Conformity Assessment Systems;
- To nominate at least one individual to use the Level 0 and Level 1 ACAS Learning Modules;
- To sign the ACAS Declaration within 5 years, failing which ***(the Country)*** ACAS becomes null and void.

MM - 2014

(Name of the Organization Director)	*F.W.P. Vreeswijk*
Director	*General Secretary & CEO*
Signature: _____	Signature: _____
Date: _____	Date: _____



IEC ACAS Declaration – Implementation Phase

- **The *(Organization of the country)*, located in *(City/Country)*, wishes to be granted access to Level 2 ACAS Learning Modules and conditional observer status within one or more of the IEC Conformity Assessment Systems.**
- **The *(Organization of the country)* declares that, as it relates to the IEC International Standard(s) adopted by (Country), it accepts associated Certificates and Reports issued within one or more of the IEC Conformity Assessment Systems at national level and will promote their use.**

MM - 2014

(Name of the Organization Director)	*F.W.P. Vreeswijk*
Director	*General Secretary & CEO*
Signature: _____	Signature: _____
Date: _____	Date: _____

ACAS events 2015

- IECEx-UNECE – Poland, April
- IECEE- APRC – Singapore, June
- IECEx-AFSEC – Ghana, July

ACAS countries

Afghanistan

Azerbaijan

Cameroon

Côte d'Ivoire

DR Congo

Ethiopia

Ghana

Mongolia

Peru

Rwanda

Sudan

Uruguay

Zambia

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Regional Director, APRC
dch@iec.ch

WTO TBT/SPS Workshop
Bangkok
2015-11

International Electrotechnical Commission