

Key message

For off-grid electricity systems to be “practical, reliable and durable” and for equipment and appliances meet energy efficient targets, there needs to be agreement among stakeholders on the technical standards to be applied.

Appropriate conformity assessment systems need to be in place and used to give the assurance that the performance criteria are being met.

Hence the “soft infrastructure” for standardization to implemented effectively needs to be in place.

AFSEC is developing to meet that need in Africa in collaboration with the IEC and other organizations.





IEC Family IN AFRICA

Paul Johnson
IEC ZA NC
AFSEC

Rural Energy Access
ECA Conference
Ethiopia 2013



**INTERNATIONAL
ELECTROTECHNICAL
COMMISSION**

Scope of the IEC

- Founded in 1906
- Promote international co-operation on all questions of standardization and conformity assessment
- International Standards and Conformity Assessment Systems for all electrical and electronic components, devices and systems



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)**
 - **Associate Members (22)**
- **Affiliate Country programme**
 - **83 participants**

82 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

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

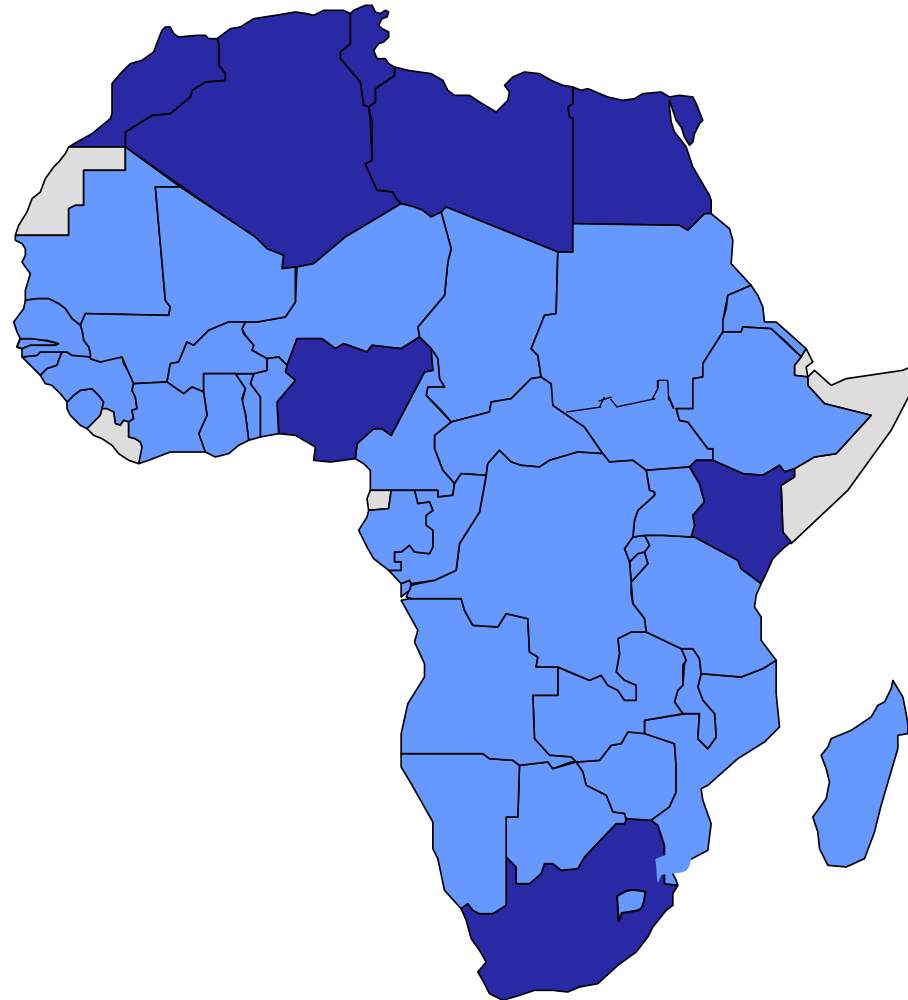
UK

USA

VIETNAM (AM)

22 Associate Members

IEC Family in Africa: 48 countries



40 Affiliates in Africa, 3 potential ones



Affiliate Programme in a nutshell (1/2)

- **Free Programme** to help developing countries comply with WTO TBT Agreement
 - Active participation, but not a kind of membership
- Affiliates **use IEC International Standards** on national level
 - Access to 200 IEC IS for national adoption
- Assistance to establish **National Electrotechnical Committees**
- Selection of **10 technical fields** to access and comment on working documents (up to and including CDV)
 - Experts with login

Affiliate Programme in a nutshell (2/2)

- **Guidance on IEC Conformity Assessment**
- **Active participation in IEC General Meetings**
 - Attendance to technical meetings as observers
 - Affiliate Forum
- **A Leader, a Secretariat, two Coordinators (Africa and Latin America)**
- **A dedicated zone in website and assistance through virtual meetings**
 - www.iec.ch/affiliates
- **Affiliate Plus status in 2009**

Affiliate Team

- **LEADER:**

- Phuntsho Wangdi – Bhutan



- **COORDINATORS**

- Carlos Rodríguez - Costa Rica
- Evah Oduor - Kenya
AFSEC Vice-President for CA



- **SECRETARIAT**

- Françoise Rauser / Executive Secretary
- Thomas Robertson / Project Coordinator
- Sei-Yun Park / Assistant



Coordinator for Africa: Role



- **To assist African Affiliates in using the Affiliate Country Programme to its full extent:**
 - **Benefit from IEC IS and adopt relevant ones as national standards**
 - **Participate in the preparation of IEC IS by commenting on IEC documents**
 - **Make use of IEC Conformity Assessment Systems (IECEE, IECEx and IECQ)**
 - **Establish NECs (National Electrotechnical Committees)**
 - **Guidelines prepared with Leader and IEC Central Office**
- **Close collaboration with Leader and Executive Secretary**
- **Collaboration with relevant regional organizations (SADC, EAC, ECOWAS...)**
- **Liaison with AFSEC**
- **Attends IEC General Meetings**
- **Co-chairs workshops**

Affiliate participation in Africa

- **New Affiliate country: South Sudan (April 2013)**
 - Initiative of the Ministry of Electricity and Dams to join the Programme
- **Electronic library: 4441 IEC IS used in 29 African countries**
 - 11 countries still passive
- **Adoptions**
 - 3782 IEC IS adopted by 37 Affiliate Countries ; of which
 - 1594 IEC IS as national standards in 16 Affiliate Countries in Africa
- **19 National Electrotechnical Committees (NECs) in Africa**
 - New : Burundi (Jan 13)
- **9 Affiliate Plus countries in Africa**
 - Criteria: have a NEC and adopted minimum 50 IEC IS
 - Ethiopia (Nov 12)

Top Affiliate national adoptions in Africa 2013

1. IEC 60099: Surge arresters (TC 37)
2. IEC 62561: Lightning protection system components (LPSC) (TC 81)
3. IEC 62053: Electricity metering equipment (a.c.) - Particular requirements (TC 13)
4. IEC 62056: Electricity metering data exchange - The DLMS/COSEM suite (TC 13)
5. IEC 62058: Electricity metering equipment (AC) - Acceptance inspection (TC 13)
6. IEC 62305: Protection against lightning (TC 81)
7. IEC 61869: Instrument transformers (TC 38)
8. IEC 62055: Electricity metering - Payment systems (TC 13)
9. IEC 62059: Electricity metering equipment - Dependability (TC 13)

Adoption of IEC IS by 16 Affiliates in Africa as per 2013-09-01

Benin 06 169 NB IEC	Botswana 04 97 BOS IEC	Côte d'Ivoire 06 51 NI IEC	DRC 06 52 OCC IEC
Eritrea 07 21 ES-F IEC	Ethiopia 06 197 ES IEC	Ghana 05 270 GS IEC	Malawi 06 200 MS IEC
Mauritius 07 48 MS IEC	Rwanda 05 100 RS IEC	Senegal 07 16 NS IEC	Sierra Leone 06 27 SLS IEC
Sudan 09 101 SDS IEC	Uganda 06 122 US IEC	Zambia 09 107 ZS IEC	Zimbabwe 07 16 SAZ IEC

IEC Mentoring programme - Background

- Dialogue 17: Survey sent in November 2012
- Objective: to assess Affiliate country current situation and their needs to establish true NEC and increase their participation in IEC technical work
- 56 countries participated
 - **50% Africa**, 25% Latin America, 25% Asia-Pacific
- Needs identified from the survey:
 - Establish or support NEC (45%)
 - Commenting on technical documents (79%)
 - National adoption (66%)
 - Establish mirror committees (59%)
 - Other (34%)
- Implementation July 2013
- Affiliate Forum 2013 on Mentoring at the General Meeting in New Delhi

Mentoring Programme in a nutshell

- **Partnerships between 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**

Target groups

Affiliates were split into four categories according to the following criteria:

- **AFF Group 1 - Affiliate Plus - Priority for mentoring**
 - NEC and 50 adoptions
- **AFF Group 2 - Potential Affiliate Plus**
 - NEC with less than 50 adoptions or no adoption
- **AFF Group 3 - Active Affiliates**
 - No NEC, with or without adoptions
- **AFF Group 4 - Passive Affiliates**

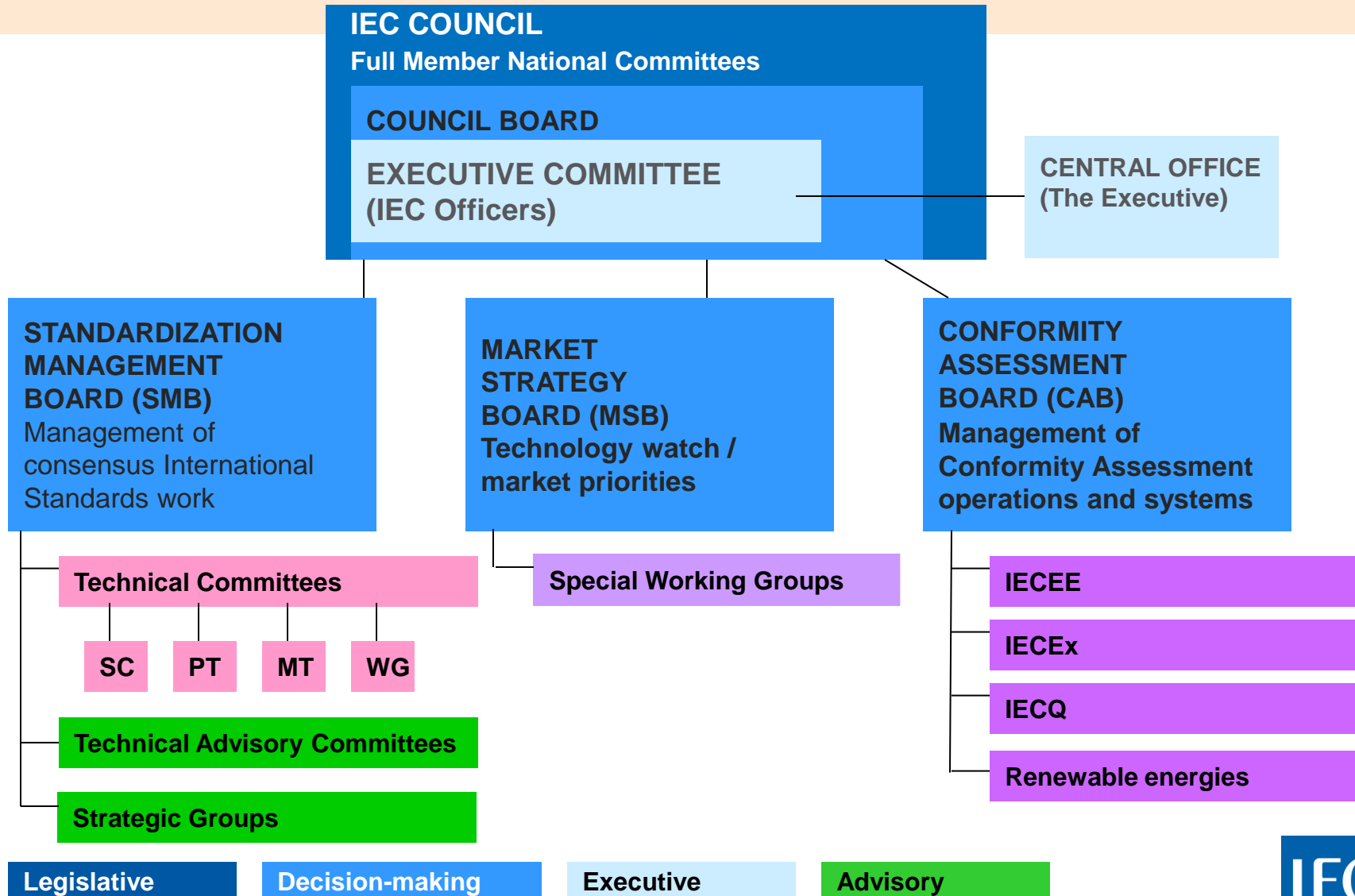
AFF Group 1 - Affiliates Plus (19)

Afghanistan >50 adoptions NEC	Bangladesh >50 adoptions NEC	Brunei Darussalam >50 adoptions NEC	Côte d'Ivoire >50 adoptions NEC	DRC >50 adoptions NEC	Ecuador >50 adoptions NEC	Ethiopia >50 adoptions NEC
Ghana >50 adoptions NEC	Guyana >50 adoptions NEC	Laos PDR >50 adoptions NEC	Lebanon >50 adoptions NEC	Malawi >50 adoptions NEC	Palestine >50 adoptions NEC	Peru >50 adoptions NEC
Rwanda >50 adoptions NEC	Sudan >50 adoptions NEC	Uganda >50 adoptions NEC	Uruguay >50 adoptions NEC	Zambia >50 adoptions NEC		

First case: Rwanda and Austria

- July 2013, Rwanda NEC requested to benefit from IEC Mentoring Programme.
- July 2013, Mentoring agreement signed between Austria and Rwanda.
- September 2013, Mentoring activities begin.
- Mentoring activities planned:
 - Reinforcement of the existing NEC
 - Adoption of IEC International Standards
 - Establishment of mirror committees of the IEC
 - Commenting on IEC draft standards
- October 2013, Affiliate Forum: Rwanda and Austria invited to share their experiences.

IEC structure



IEC CA Systems

CAB - Conformity Assessment Board

IECEE

System of Conformity Assessment Schemes for Electrotechnical Equipment and Components

CB Scheme

CB-FCS Scheme

PV Programme

E3 Energy Efficiency

Hazardous Substances

IECEX

System for Certification to Standards Relating to Equipment for use in Explosive Atmospheres

Ex Equipment

Ex Services

Ex Personnel

IECQ

Quality Assessment System for Electronic Components

Active & Passive components

Processes

HSPM

Avionics

ACAS for developing countries

- Survey sent in November 2012 (Dialogue 16)
- Identify Affiliate needs to support and find adapted solutions in conformity assessment within IEC
- 52 countries participated
 - **50% Africa**, 29% Latin America, 21% Asia-Pacific
- New IEC ACAS (Affiliate CA Status) was submitted for CAB decision in June 2013 and received formal approval
- Launch of ACAS July 2013

ACAS benefits

- **Regional awareness events**
- **Documentation and guides on conformity assessment at the IEC**
- **Webinars (upon request)**
- **Learning modules on IEC website and CD-ROMs (under development)**
- **A resource database (under development)**
- **Active participation in each system, based on prerequisite training conditions**

IECEX-AFSEC regional seminar in Abidjan

- IECEx and AFSEC in collaboration with AFREC, UPDEA, CODINORM, in partnership with the electrical utilities CIE and CIPREL
- International event for the benefit of Africa in Abidjan, Côte D'Ivoire, 28-30 November 2012
- 40 participants from 9 African countries
 - 3 IEC Members: Kenya, South Africa, Tunisia
 - 6 IEC Affiliates: Cameroon, Côte D'Ivoire, DRC, Ghana, Mali, Zimbabwe
- Seminar addressed professionals from different sectors:
 - oil (6), gas (6), electricity (9), standardization (8), hospital (3), ministerial agencies (2), building and development (3), telecommunications (1), ABB (2)
- Intervention of 2 experts involved with the work of IEC TC 31: Equipment for explosive atmospheres
 - Theoretical approach of the implementation of IEC IS 60079-14, 60079-17 and 60079-10-1 on classification of areas
 - Inspection of the CIE and CIPREL sites

IECEE-AFSEC regional seminar in Nairobi

- **IECEE and AFSEC organized a regional event for the benefit of Africa in Nairobi, Kenya, 26-27 August 2013**
- **Participation: IEC Members, IEC Affiliates, AFSEC Members**
- **62 participants from 14 African countries**
 - **4 IEC Members: Egypt, Kenya, Nigeria and South Africa**
 - **10 IEC Affiliates: Côte D'Ivoire, DRC, Ethiopia, Gabon, Ghana, Namibia, Rwanda, Tanzania, Uganda and Zambia**
- **Target: Utilities, NSBs, NCs/NECs, laboratories, retailers, regulators, consumers**
- **Seminar in English (French translation)**
- **Programme:**
 - **Electrical safety of electrical appliances (refrigerators, freezers, television, luminaires)**
 - **Testing and issuing certificates**

UN Foundation - SE4ALL Practitioners Network

- IEC TC 82 - SE4ALL webinar, May 2013
- Presentation of IEC work on renewable energy standards and its commitment to the UN Foundation SE4ALL (Sustainable Energy for All) initiative
- IEC offers three packages of standards relating to rural electrification at a discounted price
- Objective: to facilitate access to sustainable energy standards for stakeholders in developing countries
- More information on the webinar:
<https://cleanenergysolutions.org/training/rural-electrification-sustainable-standards>

IEC, World Bank and UN Foundation

- **Under UN SE4ALL discount on IEC 62257 series**
- **Access to important technical documents to support rural electrification in developing countries**
- **75% discount on IEC 62257-9-5 with or without normative references**
- **58% on entire IEC 62257 series with normative references**
- **50% on individual parts with or without normative references**



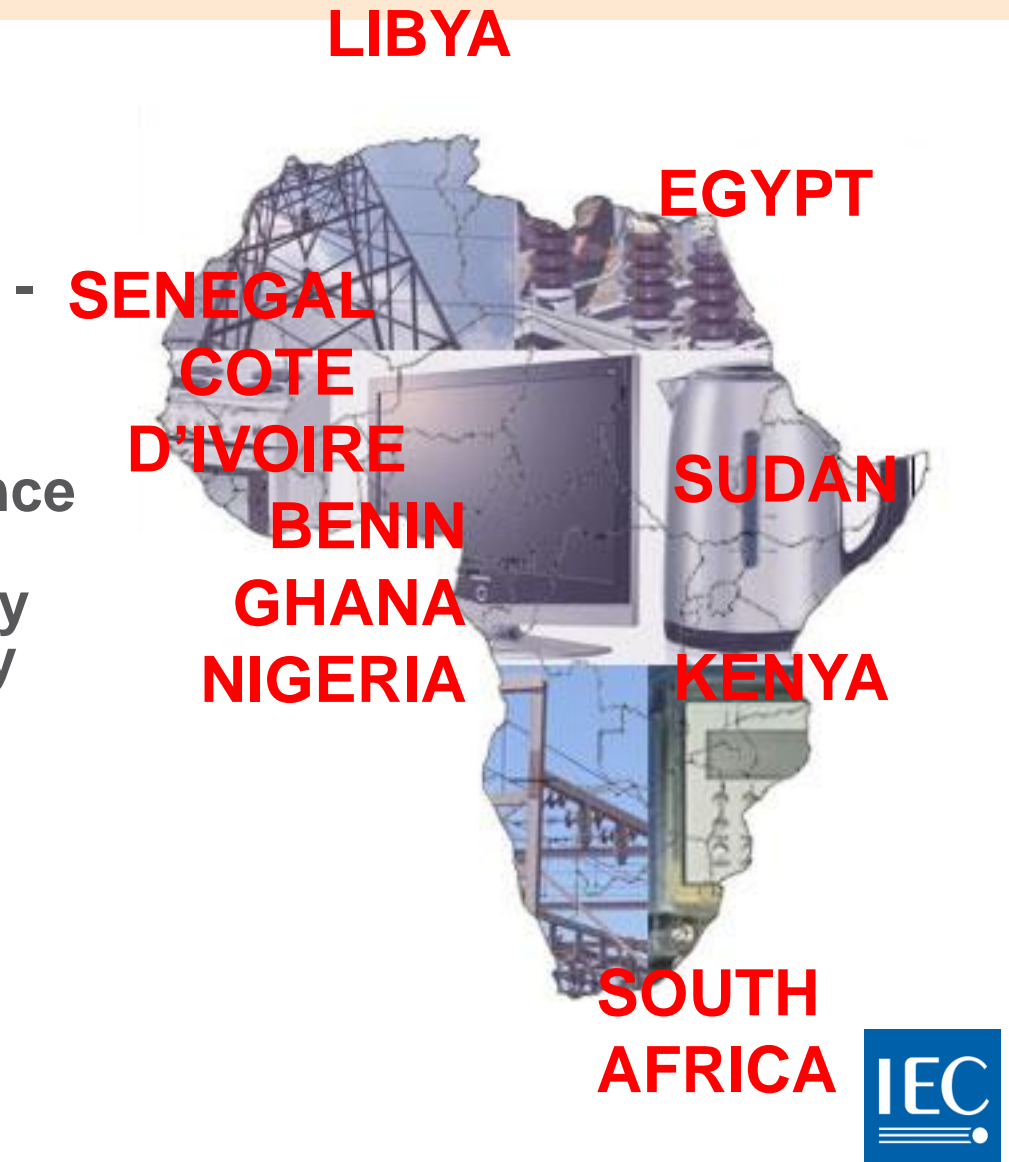
AFSEC

African Electrotechnical Standardization Commission

AFSEC

Where did we come from?

- Initiative of the African electricity utilities 2005 - In collaboration with AFREC
- Declarations of conference of ministers of Energy, March 2006 and February 2008 – to be a subsidiary body of AFREC
- Inaugurated in February 2008, in Ghana, with 10 founding members



Membership

- **Statutory members:**

National Electrotechnical committees

Currently 14: 10 founding members + Namibia, Rwanda, D R Congo and Zambia

- **Affiliate members:**

- **Regional Economic Communities**
- **Organizations with an interest in the electric power sector e.g. African power pools**
- **African Power Utilities Association (APUA)**
- **African Energy Commission**

Some similarities

CENELEC – European Union

- **Post second world war: need to promote inter-country trade in Europe – development of a regional trading block**
- **Harmonized standards: minimize national differences**
- **Started with a few countries**
- **Evolved to have close collaboration with IEC**

20th Century Africa

- Standards used were mainly NATIONAL (different) standards from the colonizing countries (British/French/German, etc)
- 1960's - "Unscramble from Africa" by Europe
- Hiatus in the standards infrastructure (if it existed)
- Few national standards bodies – cooperation though OAU/ARSO: 1970. But little capacity to consider electrotechnical standards
- Development of regional trading blocks (e.g. SADC/COMESA) – hampered by lack of infrastructure to agree on standards/regulations
- Porous borders – imports of poor quality goods
- Little capacity for local manufacture of electrical equipment/ even less to test for compliance to standards
- Little capacity/structure to evaluate/adopt international electrotechnical standards

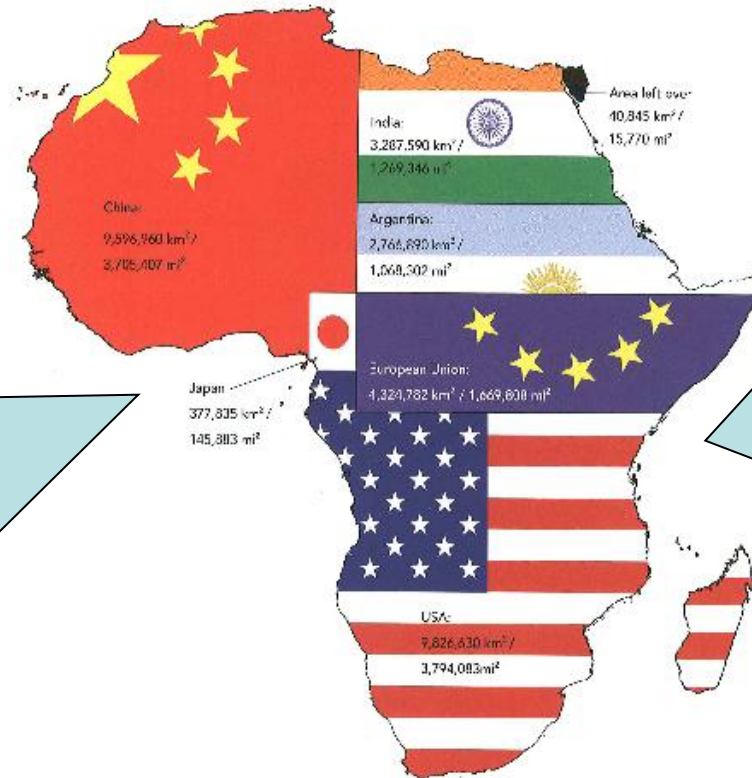
21st Century Africa

- **Recognition of need for improving the standardization infrastructure for the physical infrastructure in the founding documents of – NEPAD/AU and African Energy Commission AFREC**
- **Millennium development goals targets**
 - **Electrification – universal access**
- **Net generation shortage to meet the needs- alternative technologies – new standards (PV/Wind/tidal/CSP/electrical energy storage)**

Synergy among national electrotechnical committees in Africa

- Although some 40 African countries in IEC affiliate country programme, many have yet to adopted ANY IEC standards as national reference standards
- Among the remainder + 8 members/associate members, each country adopts standards according to national interests, but with no coordination of needs for regional integration. AFSEC is set to fill that role.

THE FOLLOWING COUNTRIES FIT INTO AFRICA, ILLUSTRATING THE SIZE OF AFRICA



Some 58% (580 million and growing) waiting for access to electricity and electrical appliances conforming to appropriate standards

The size implies massive needs and opportunities for infrastructure development – requiring appropriate standards

How big is Africa?

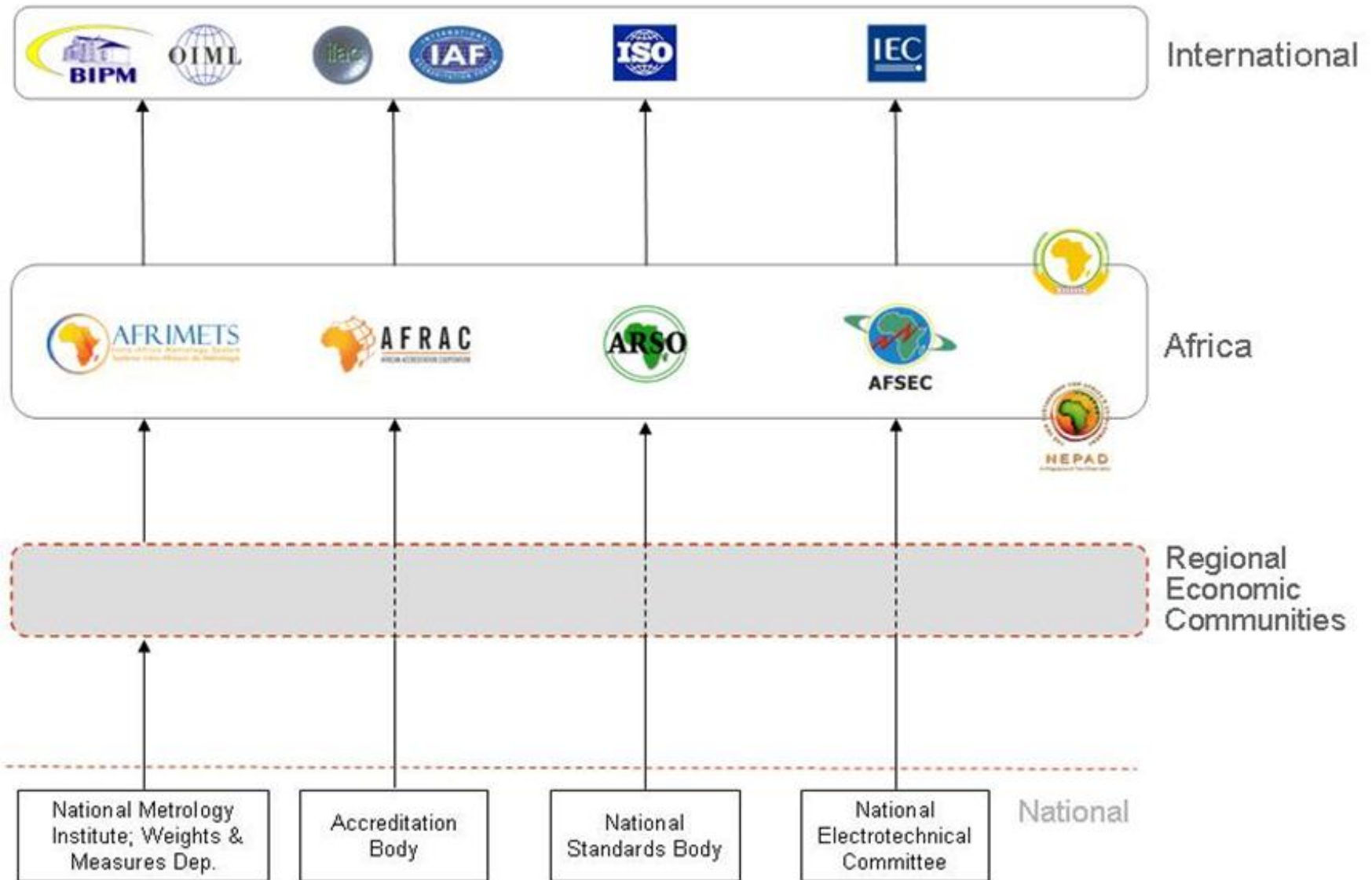
Africa: 30,221,532 km² / 11,668,599 mi²

Named countries: 30,180,687 km² / 11,652,828 mi²

Support for UN SE4ALL

- **AFSEC plans to prepare guides for application of appropriate standards for rural electrification in Africa**
- **Initial workshop on rural electrification August 2012 - Johannesburg**
- **Project team established**
- **IEC has provided access to IEC 62257 series**
- **Project plan established**
- **Funding now being sought to make progress**

Pan African quality infrastructure





Thank you