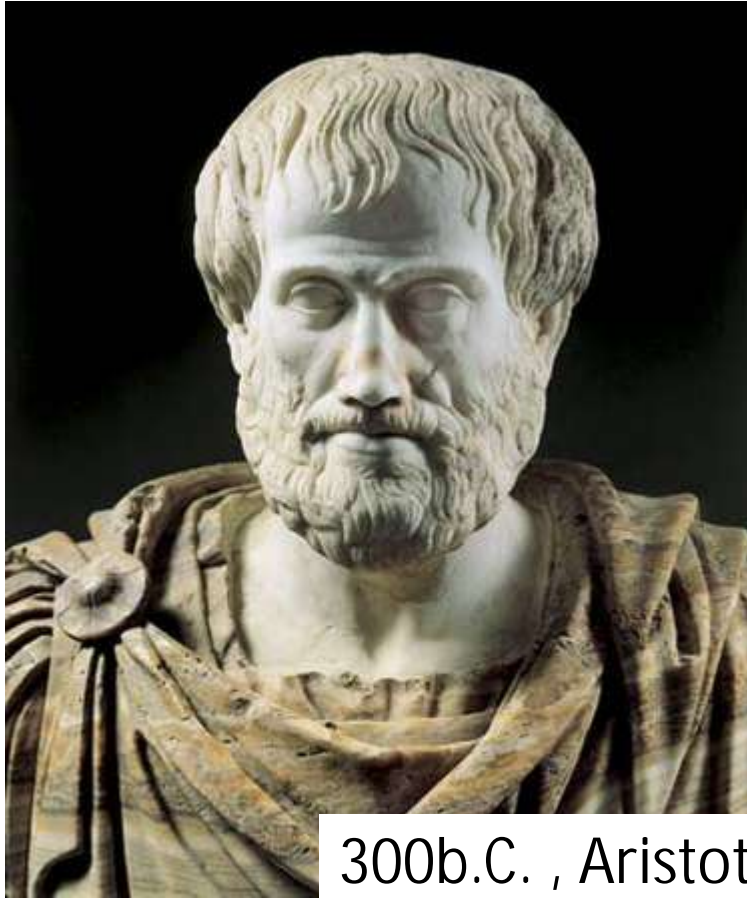


IEC Systems Committees and Technical Committees

Gennaro Ruggiero, PhD
Systems Technical Officer
Sec. SyC Smart Cities
Sec. SyC LVDC
Sec. Systems Resource Group

IEC Academy
11 June 2018

Systems Approach, Systems Work and Systems Committees at IEC



300b.C. , Aristotle

- Why?
- What?
- How?
- Who?

The Whole is Greater than the Sum of its Parts

The background of the slide is a light gray, semi-transparent image of several interlocking gears. The gears are rendered in a 3D style with soft shadows and highlights, giving them a metallic appearance. They are scattered across the frame, with some in the foreground and others receding into the background, creating a sense of depth and mechanical complexity.

why?

Systems Approach - Why?

Products have become multifunctional

A phone years ago...

...you could just make calls with it!



A phone today

Music, photos, video, GPS, Internet...

2G, 3G, 4G, WIFI, Bluetooth, NFC...

Touch screen, battery, USB, HDMI...

Accelerometer, gyroscope, proximity sensor ...

... and you can still make a call with it!



Emergence of more, new, functions, with an ever increasing number of technologies and standards involved

Why a Systems Approach?



Complexity of Technologies

- Multiplicity and convergence of technologies
- Large-scale infrastructures
- Need for inter-operability
- Many new and emerging markets

An ever increasing number of technologies and standards are involved

Why a Systems Approach?



A new level of collaboration

- Traditional TC to TC bilateral liaisons have reached their limits in such cases
- Need for a larger collaboration platform
- Need to outreach other standardization organizations

Why a Systems Approach?

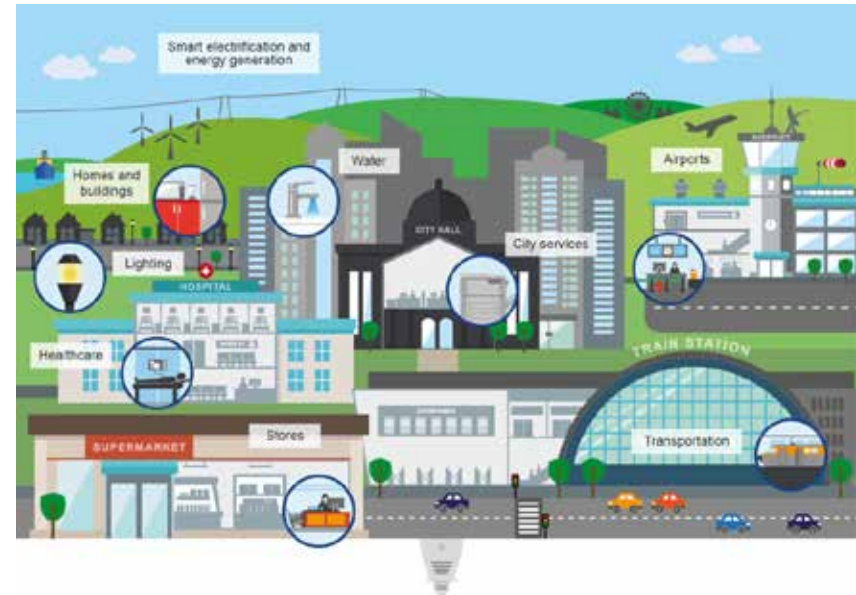


Future Challenges

Systems Approach is central when aiming at improved system capabilities and quality of life

- The awareness of the criticality of the human element in complex systems
- The growth of software functionality in systems

Smart cities



Ambitious projects!

- Smart energy grids
- Smart cities
- ...
- **Systems of Systems (SoSs)**

Systems Approach helps to address risks deriving from relying on:

- immature technologies
- combinations of technologies with incompatible objectives/ assumptions.



What?

Systems and Systems Approach

System: *a group of interacting, interrelated, or interdependent elements forming a purposeful whole of a complexity that requires specific structures and work methods in order to support applications and services relevant to IEC stakeholders.*

Systems Approach: *a holistic, iterative, discovery process that helps first defining the right problem in complex situations and then in finding elegant, well-designed and working solutions. It incorporates not only engineering, but also logical human and social aspects.*

A (man-made) Systems is...



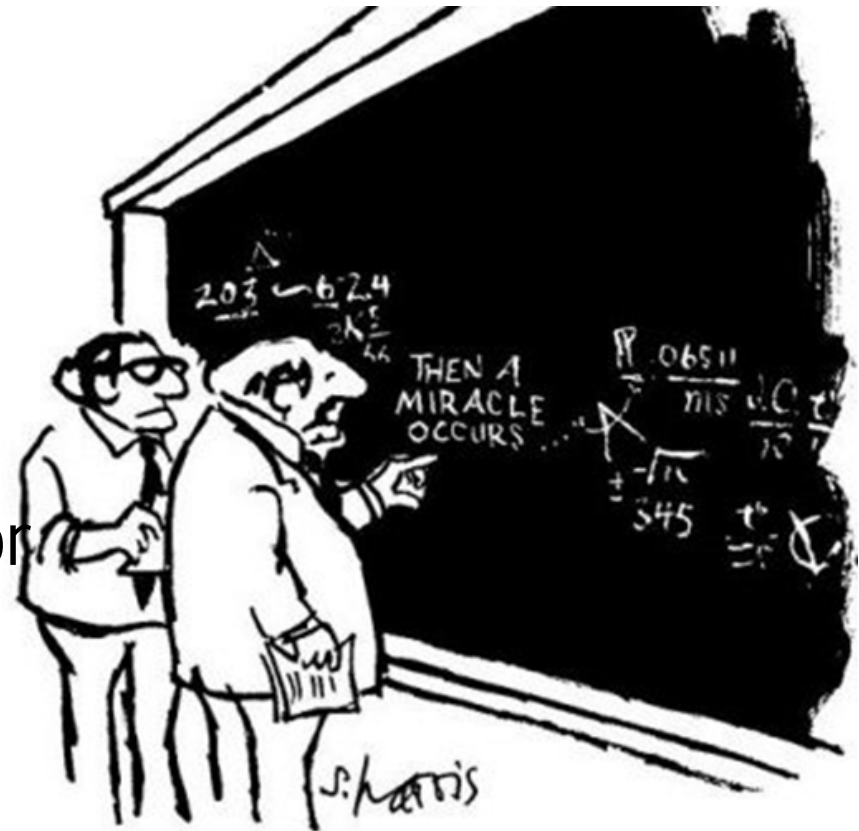
Which property emerges
from the System?

Systems Approach at IEC

Systems Resource Group:
Provides methods of work

Systems Committees:
Explore "systems" domains for
standardisation

Technical Committees



"I THINK YOU SHOULD BE MORE EXPLICIT HERE IN STEP TWO."

Complex Systems need a systems approach

SRG and Systems Approach*

(Ch:M. Viengkham, US/Sec: G Ruggiero, C.O.)

SRG Guide

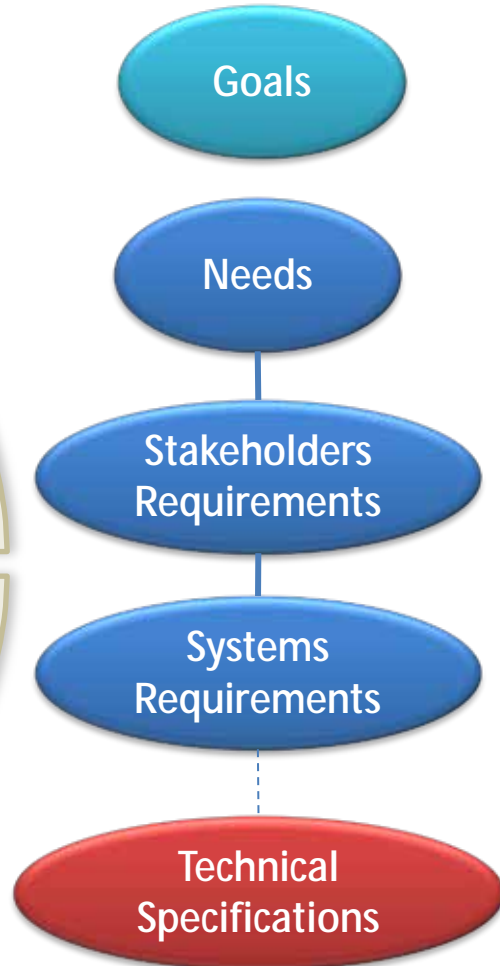
- Methodology to analyzing complex systems
- Systems Terminology
- Systems Tool Set
- Documentation
- Lessons Learn

SRG Tool

- Central repository
- Systems mapping
- Architecture
- Use Case
- Systems and data analysis

SRG Service

- Training
- Consulting
- Application support
- Feedback forum



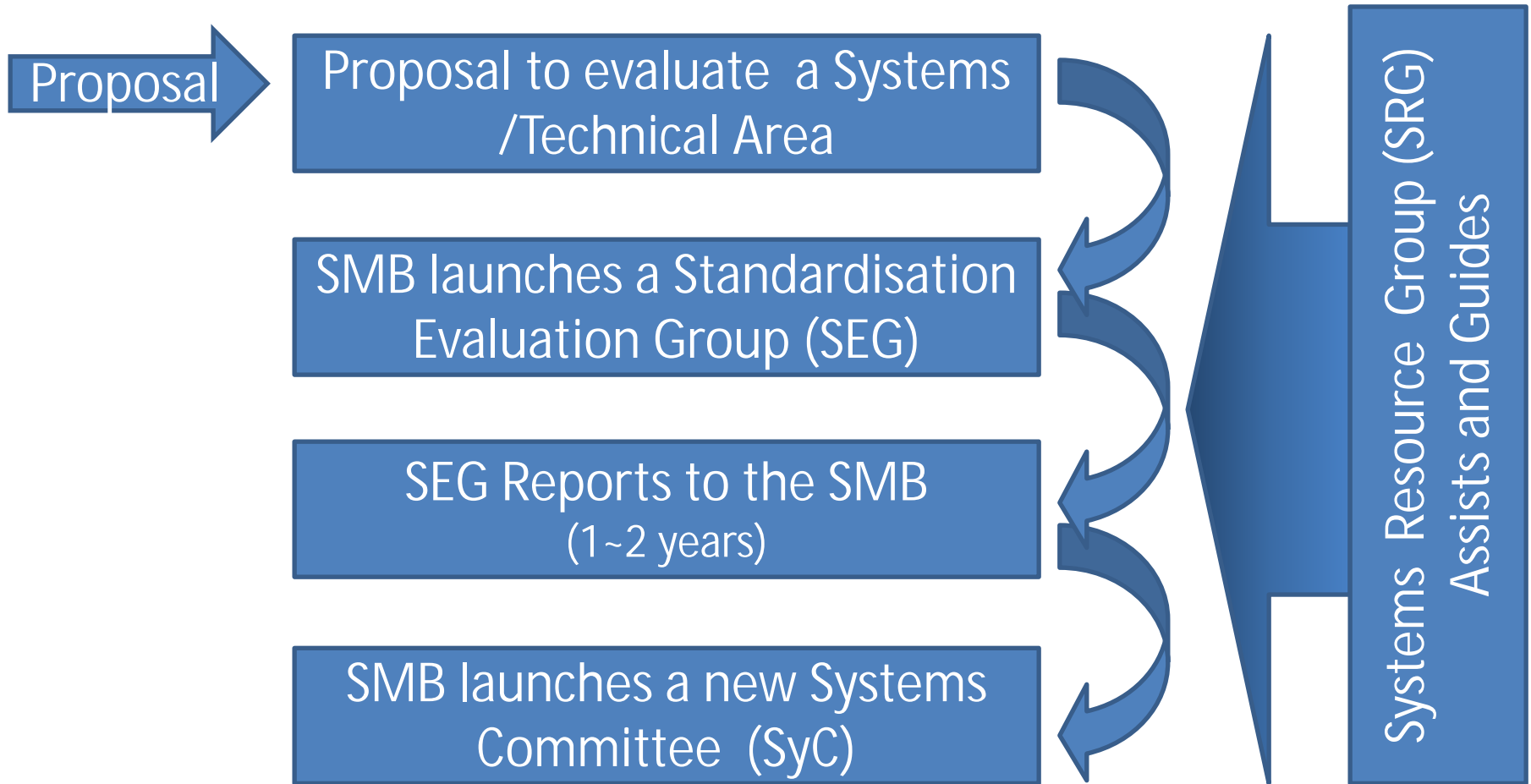
- ü Explorative
- ü Holistic
- ü Collaborative
- ü Inclusive
- ü Iterative
- ü Recursive
- ü Traceable
- ü ...

****There is no one-size-fits-all approach***

The background of the slide is a light gray, semi-transparent image of several interlocking gears. The gears are rendered in a 3D style with soft shadows and highlights, giving them a metallic appearance. They are arranged in a way that they seem to be meshing together, creating a sense of mechanical complexity and interconnectedness.

How?

How is a SyC formed?



How does a SyC work?

- **SyCs are structured and work very similarly to TCs**
 - Decisions are taken by P-members through votes
 - WGs experts nominated by NCs
 - Liaisons with the same mechanism as for TCs
 - Secretariat held by the IEC CO and Chair elected by the SMB
- **What changes: AhG 70, AC 22 (2017) and AC17 (2018)**
 - SyC may publish IS with prior approval of SMB
 - Systems Reference Document (SRD)
 - A SRD is a guidance document on the use and application of specific standards in the SyC domain.
 - New type of membership: Registered Member (R-member)
 - Pool of Experts
- **What is being revised: AhG 80**
 - Facilitate the cooperation between SyCs and TCs,
 - Clarify the status of SRDs (Systems Reference Documents)
 - Identify the conditions under which SyCs can prepare IS

The R-membership

FOR: Facilitating exchange of information & work for meaningful inputs to the work of the SyC

OPEN TO: Any committee (SyC, TC or SC) + any non IEC group (registered as legal entity) that is determined to have a meaningful input to the work

CAN: access to all official documents and submit comments to documents and nominate experts to the pool of experts and to the WGs (as guests)

CANNOT: Vote or propose an NP.

Pool of Experts

FOR: making SyC more open for participation to projects and groups rather than a specific work

OPEN TO: NCs and R-members that can appoint experts within the Pool of Experts based on their skillset which can add value to the work in The SyC

CAN: access to all official documents of all the SyC

Forums and Advisory Groups

SyCs are permitted hold open forums on topics of choice and with invited participants beyond the group of contributing members of an SyC.

SyCs decide the composition, participation and structure of their sub groups including Advisory Groups, Forums, Steering groups, etc.



who?

Systems Work @ IEC

Gathering Requirements

Systems Approach

Providing Guidance and Guidelines



Smart Energy

1st Established



AAL

2015



Smart Cities

2016



LVDC

2017

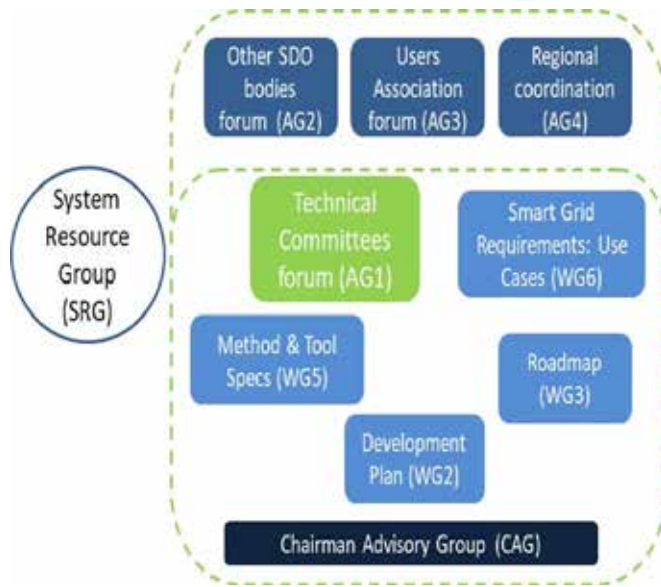
(since 2018 also Smart Manufacturing)

SyC Smart Energy



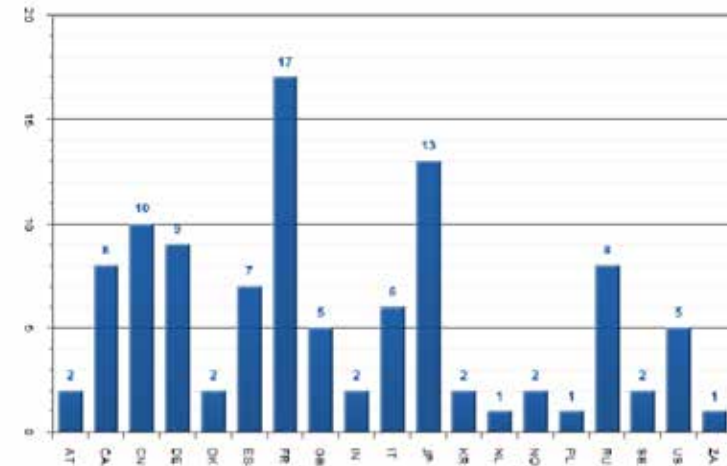
(Ch: R. Schomberg, FR/Sec: S. Dutnall, C.O.)

Key TCs: TC8, TC69... + SyCs



SyC Smart Energy

SyC Smart Energy - Distribution of experts by National Committee

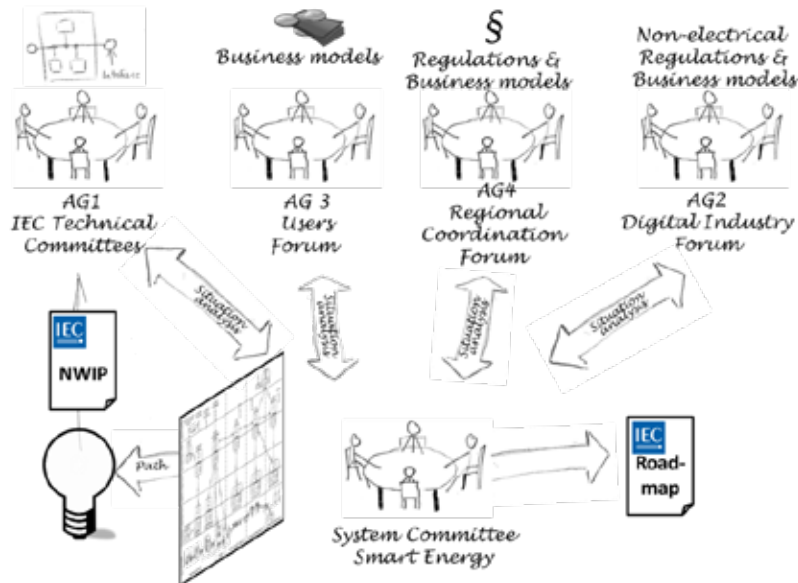


Participating countries

16

Observer Countries

11

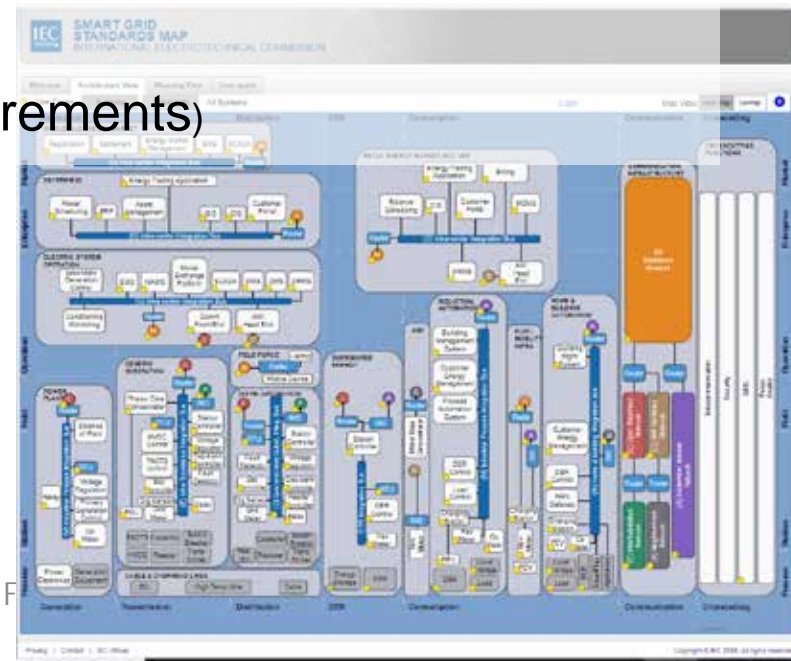


SyC Smart Energy Events and Deliverables

- **TC Forums x 2: AG 1** (2016 Geneva and 2018 Wash. DC)
- **Regional SDO Coordination Forum x 2: AG 4** (2017 & 2018) New Delhi.
- **IEC TR 63097** Smart Energy Roadmap publication & subsequent development plan
- **IEC 62559 series** Use Case methodology
- **IEC 62913 series** Generic Smart Grid requirements

Online Smart Grid Standard Mapping Tool.

www.smartgridstandardsmap.com



SyC AAL

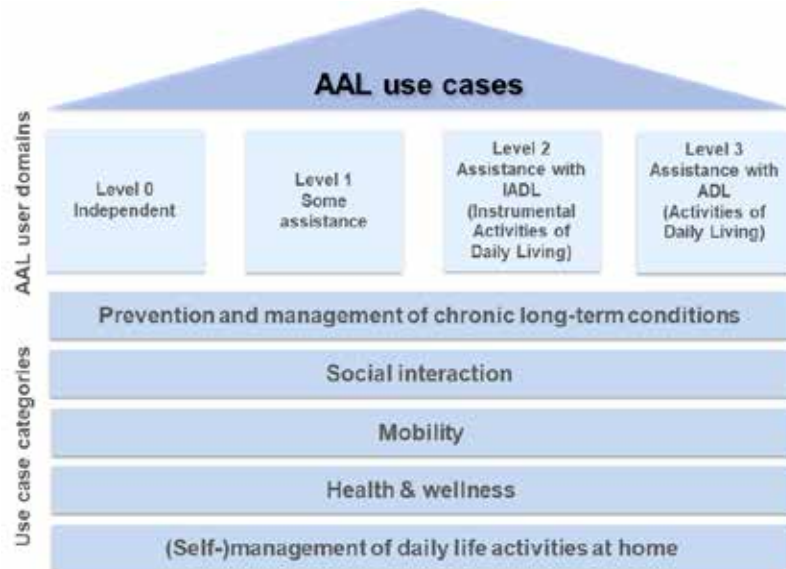
Active Assisted Living

(Ch:U. Haltrich, DE/Sc: M. Siket, C.O.)

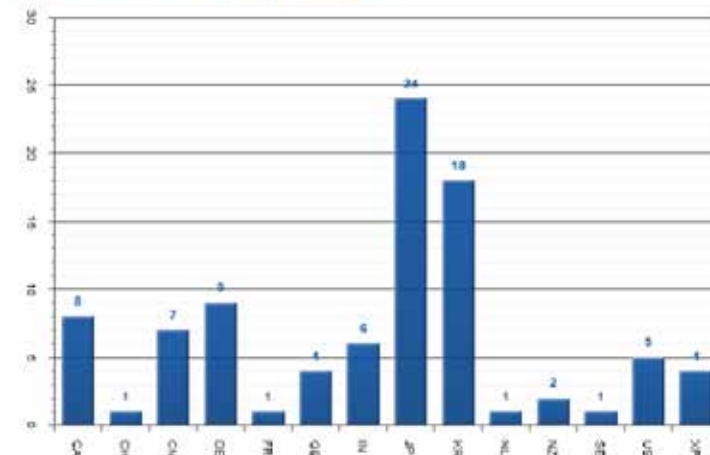


Key TCs: Many (see slide)

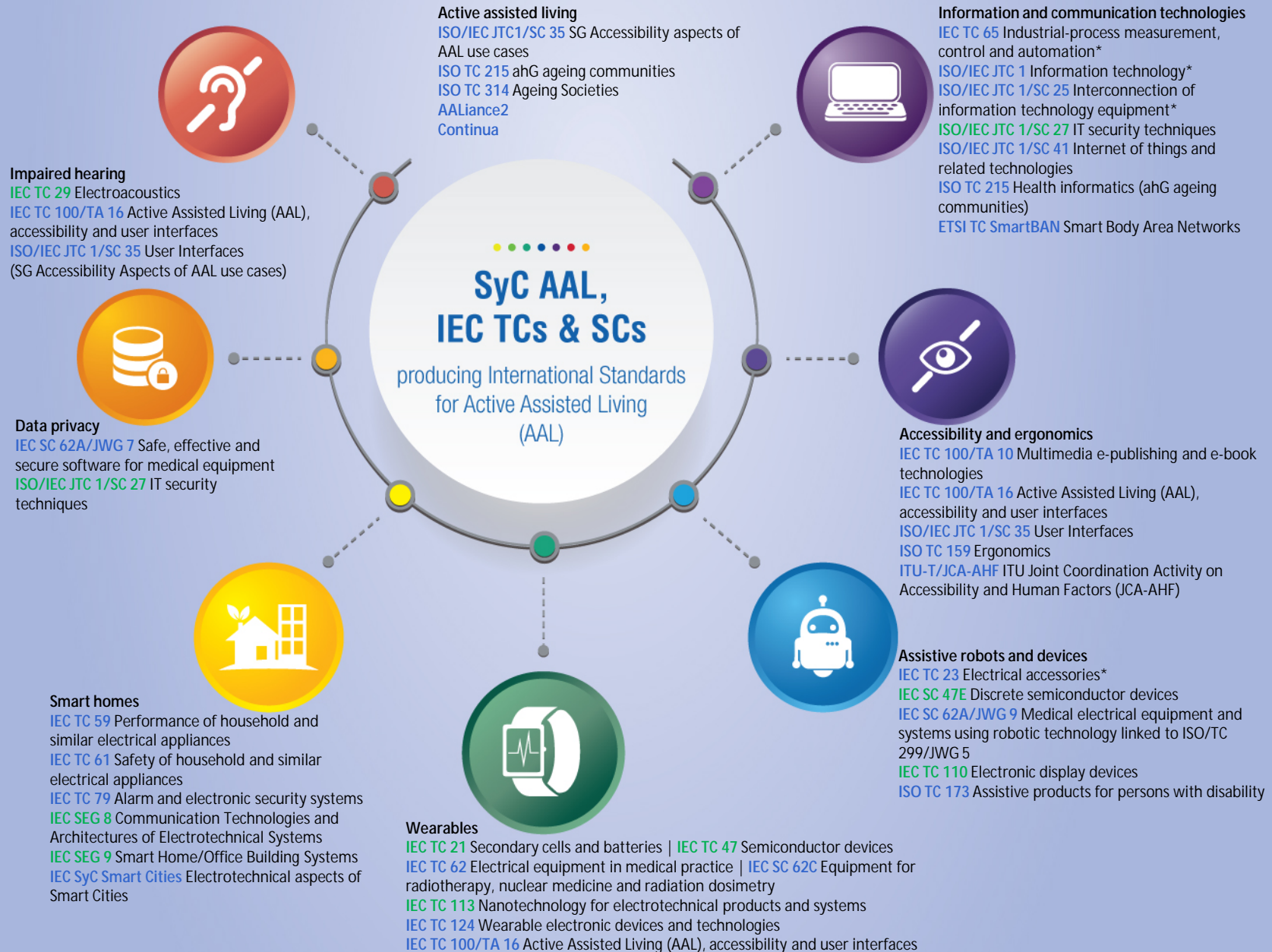
SyC AAL



SyC AAL - Distribution of experts by National Committee



Participating countries	16
Observer Countries	11



SyC AAL

Events and Deliverables

Plenaries: 6 (CN, DE x2, JP, NZ, US)

Workshops 6: 2015 JP, 2016 NZ, 2017 CN & US, 2018 JP & KR

Presentations at events: 2016 DE, 2017 CN, 2018 CH, CN & DE

IEC 60050-871:2018 International electrotechnical vocabulary- Part 871: Active assisted living (AAL)

IEC TS 63134 Active Assisted Living (AAL) use cases (currently CD)

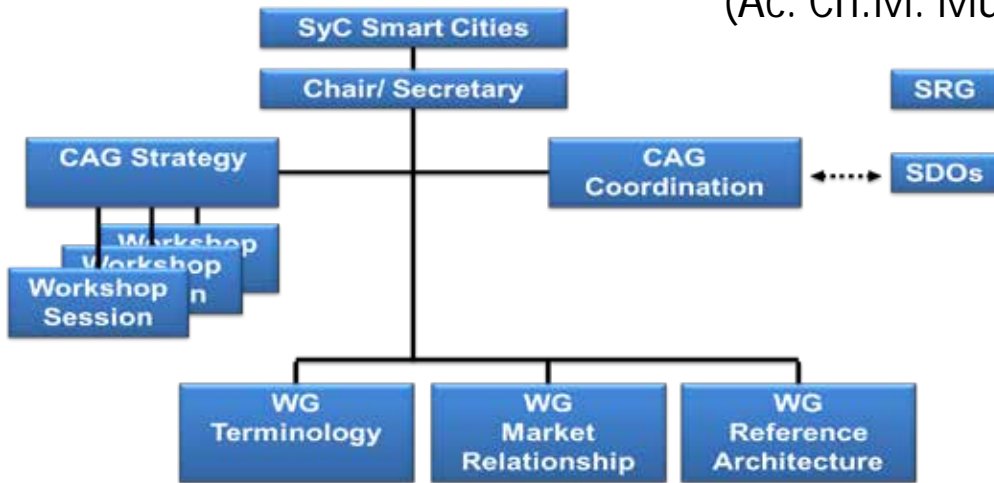
IEC 63168 Cooperative multiple systems in connected home environments - Functional safety of electrical/electronic safety-related systems - AAL aspects (currently NP)

Foreseen: AAL use case methodology (WG 1),
AAL architecture model and reference architecture (WG 2),
Conformity assessment scheme and verification method (WG 3),
Regulatory matters (WG 4),
Standards inventory, Gap analysis

SyC Smart Cities

Electrotechnical aspects of Smart Cities

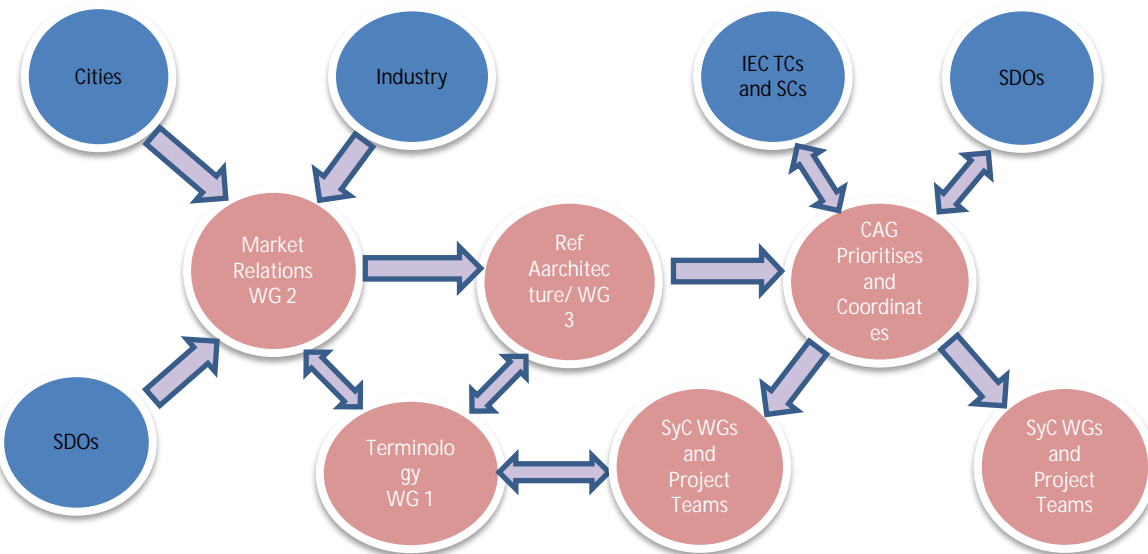
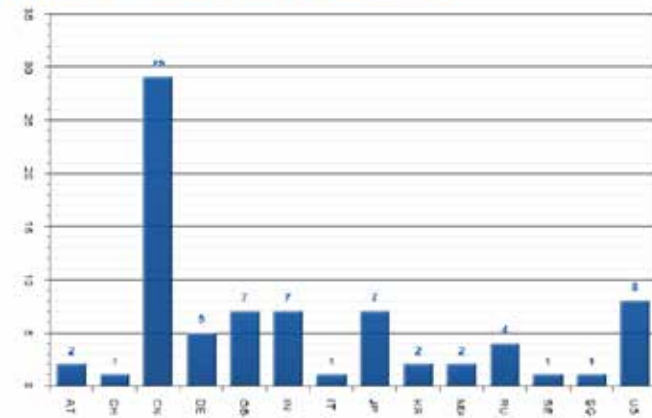
(Ac. Ch:M. Mulquin, UK/ Sc: G. Ruggiero, C.O.)



Key TCs in IEC, ISO, JTC1, ITU, IEEE...

SyC Smart Cities

SyC Smart Cities - Distribution of experts by National Committee



Participating countries	17
Observer Countries	11

SyC Smart Cities

Events and Deliverables

- WSCF -2016, 2017, 2018...



- IEC Smart Cities Workshop,
 - Tokyo and Shanghai, 2017;
 - Dortmund Washington, Busan and Varanasi 2018

6 Active Projects:

- [IEC 63152 ED1](#) Smart Cities - City Service Continuity against disasters - the role of the electrical supply
- [IEC TS 63188 ED1](#) Systems Reference Document - Smart Cities - Smart Cities Reference Architecture Methodology (SCRAM)
- [PNW SYCSMARTCITIES-42](#) Smart Cities Reference Architecture (SCRA)
- ...

SyC LVDC

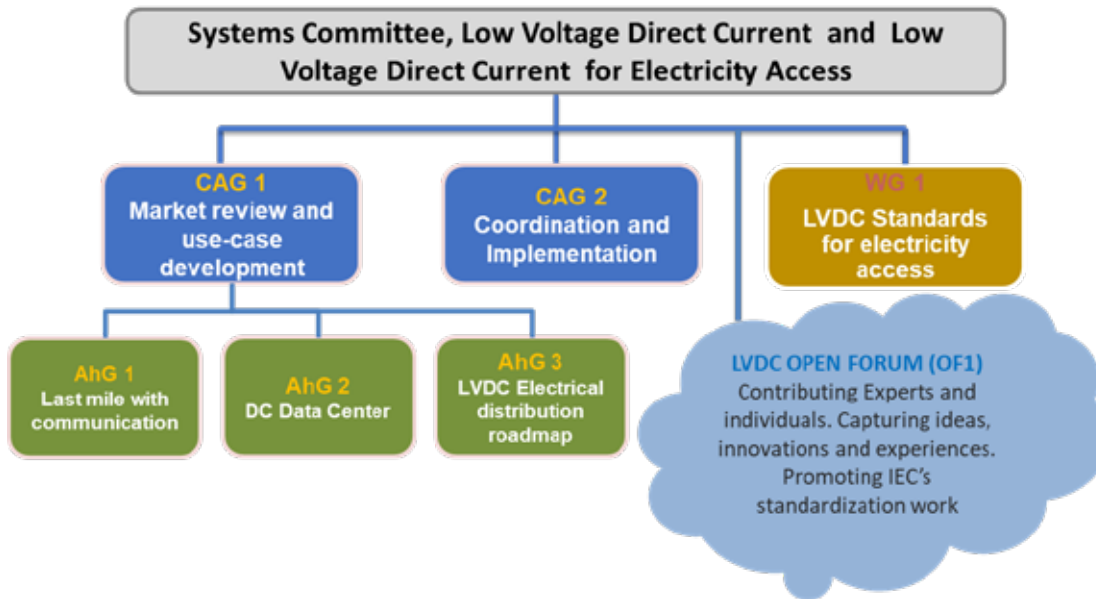


Low Voltage Direct Current and Low Voltage Direct Current for Electricity Access

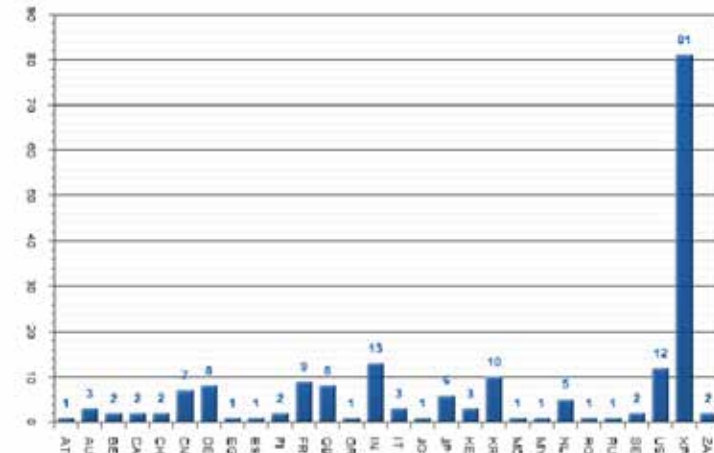
(Ch:V. Mahendru, IN/Sc: G Ruggiero, C.O.)

Key TCs: TC8, TC23,
TC64, TC 82... +SyCs

SyC LVDC



SyC LVDC - Distribution of experts by National Committee



Open Forum 1: SEG 4 legacy

Affiliates Program and SyC LVDC

Participating countries	17
Observer Countries	7

SyC LVDC Events and Deliverables

Conferences and Workshops: New Dheli (2016), Nairobi, Amsterdam (2017), Washington, Hangzhou (2018), Next: Abidjian...

**SyC LVDC Workshop for IEC Community
(June 13-14, 2019, Amsterdam)**

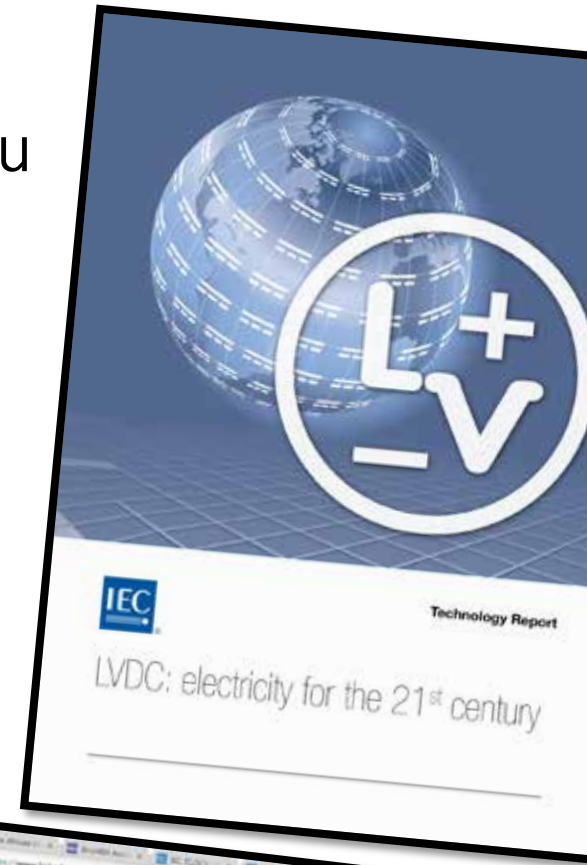
IEC LVDC Zone (www.iec.ch/LVDC)

Downloads area (brochures, mnemonic, public content)

E-Tech articles on LVDC

SyC LVDC, [LinkedIn Group](#)

The [LVDC Technology Paper](#): LVDC: electricity for the 21st century



...in conclusion

- Systems Committees are new and IEC is new to Systems work
- The SyCs share the spirit of Systems work, but are structured differently to better respond to their needs
- The success of these works will lie on the capacity to engage TCs and SyCs together



Thank you!

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IEC Academy
11 June 2018