“Online Faculty Development Program on LI-FI TECHNOLOGIES AND APPLICATIONS”

Global Standards: Research & Innovation - VLC/Li-Fi”

Presented by Mr. Dinesh Chand Sharma

Agenda

- About Project SESEI
- ETSI
- 3GPP
- Standards and Research
- Conclusion

Project is a permanent presence in India

SESEI (**S**econded **E**uropean **S**tandardization **E**xpert in **I**ndia) ***is a local face for the European standardization community in India: Dinesh Chand Sharma***

Why SESEI: India is a major trade partners for Europe, Increasing role of standards to gain market access and Evolving & complex nature of regulatory and standardization landscapes, Sharing best practices, work together

Sector: 1. ICT: M2M/IoT, Security, 5G, NFV/SDN, e-Accesibility, eHealth, eCALL… **2. Electrical equipment including Consumer Electronics**: Smart Grid, Smart Meter, LVDC, Micro- Grid, Lift Escalator… 3**. Automotive**: Connected Cars, ITS, e-Mobility… 4**. Smart Cities**: Mobility, Waste, Energy, ICT and other topics of mutual interests such as Machinery Safety, Cableways, Circular Economy, Railways etc.

www.sesei.eu , www.sesei.in , www.eustandards.in

ETSI

- ETSI was conceived in the late 1980s to respond to particular needs in Europe
  - in support of the single European market: ESO
  - Works with industry and European regulation in creation of harmonized European Standards (ENs)
- ETSI continues to produce standards and other material to support European Union and European Free Trade Association (EFTA) regulation and legislation…
  - for which they are officially recognised at EU/EFTA and governmental levels…
- ETSI as well contribute ICT radio frequency requirements to the European co-ordination process
- ETSI works in close cooperation with CEN and CENELEC, the other two ESOs
- ETSI also works closely with National Standards Organizations (NSOs) in the EU countries
- ETSI has become highly-respected Producer of technical standards and specifications for the worldwide use & global application
  - More than 48 000, all available for free download
- ETSI also do Specification & testing methodologies
  - Interoperability testing

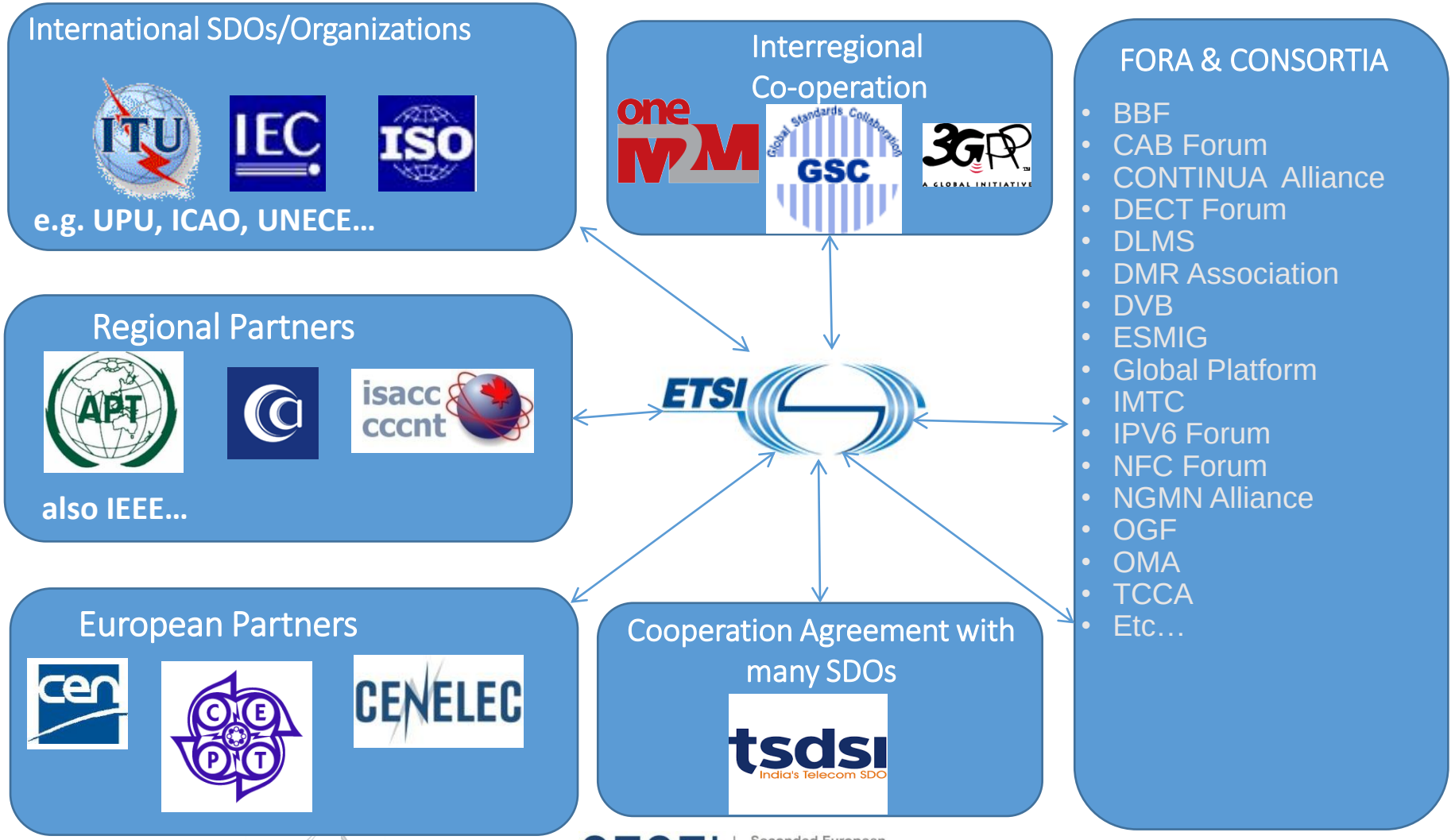
Emerging Technologies

- **List of Emerging Technologies standardized by ETSI or touched by our standardization:**

  - 3GPP Telecom Management
  - 5G
  - Internet of Things (IoT)
  - Mobile Communications
  - Multi-access Edge Computing (MEC)
  - Securing Artificial Intelligence (SAI)
  - Smart Body Area Networks
  - Smart appliances
  - Smart cities
  - Smart Grids
  - Smart Metering
  - Zero touch network & Service Management (ZSM)
  - Human Factors (HF) and accessibility
  - Augmented Reality
  - automotive Intelligent Transport Systems (ITS)
  - Broadband Satellite Multimedia
  - Broadband Cable Access
  - Broadband Wireless Access
  - Certification Authorities and other Trust Service Providers
  - Cybersecurity
  - Broadcast
  - Digital Enhanced Cordless Telecommunications (DECT)
  - Energy efficiency (EE)
  - Experiential Networked Intelligence (ENI)
  - Environmental Aspects

Complete list can be access here
https://www.etsi.org/technologies

ETSI partners



ETSI & 3GPP

- We are the home of the GSM™ family of standards…
- And a founding partner in

- ETSI provides the 20-person secretariat which coordinates some 140 meetings per year handling 100,000 contribution documents.

3rd Generation Partnership Project (3GPP)

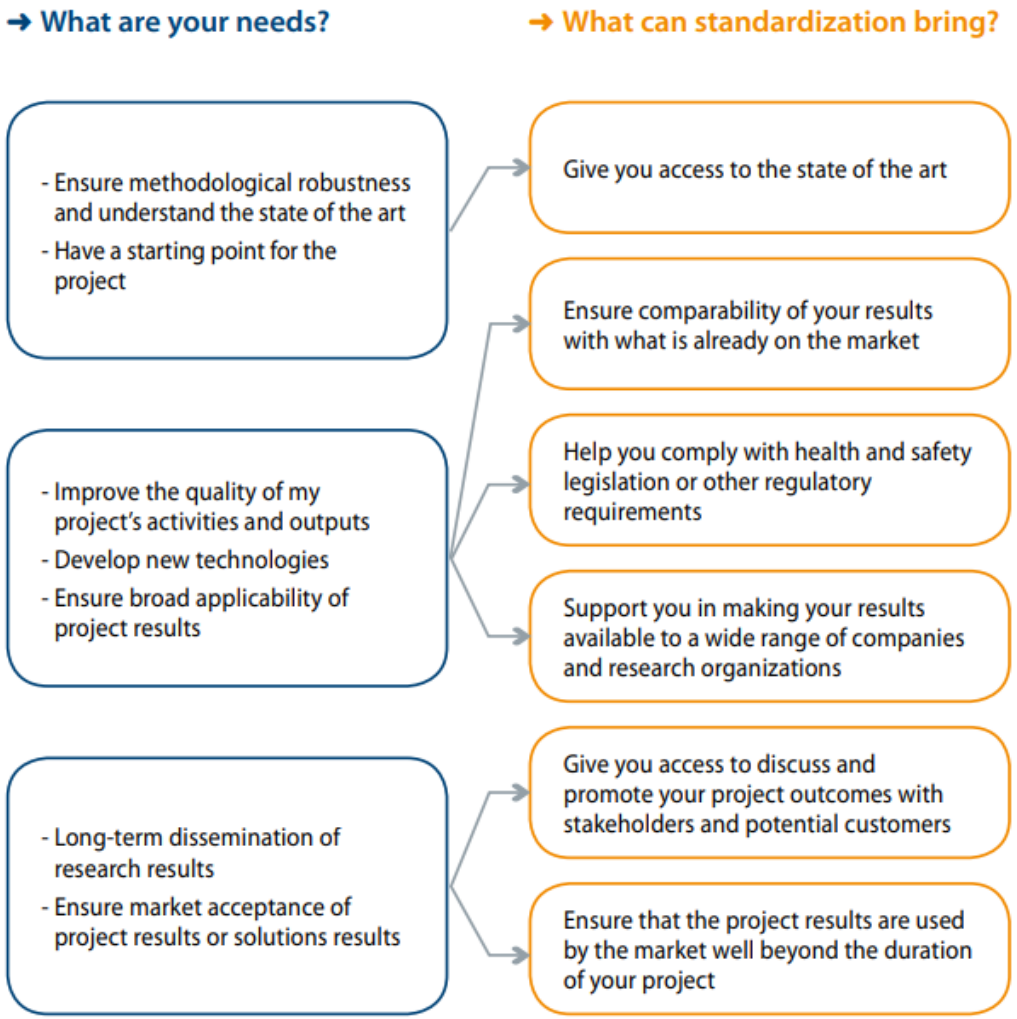
- A truly global initiative, unites 7 national telecommunications SDOs (Organizational Partners)
  - ARIB (Japan)
  - ATIS (USA)
  - CCSA (China)
  - ETSI (Europe)
  - TSDSI (India)
  - TTA (Korea)
  - TTC (Japan)

- 3GPP provides their members with a stable environment to produce the Reports and Specifications that define 3GPP technologies.
- 3GPP produces Technical Specifications, to be transposed by relevant Standardization Bodies (OP) into appropriate deliverables (e.g., standards).
- Project covers cellular telecommunications technologies, including radio access, core network and service capabilities, which provide a complete system description for mobile telecommunications.

Why Standards important for R&D Projects

- **Why include standardization in your project?**
  - Standardization helps bridging the gap between research and the market, by enabling the fast and easy transfer of research results to market
  - Engaging in Standards groups at the appropriate stages of R&I cycles is crucial to the development of new and evolved technologies.
- **ETSI's 8-point plan for Researchers:**
  - **Allocate Budget for Standardization**
  - **Develop a Standards Landscape**
  - **Compare Schedules and Workplans**
  - **Identify Research Topics for Standards**
  - **Identify SDOs for Research Topics**
  - **Identify Project Partners**
  - **Develop a Standards Action Plan**
  - **Track Standards Activities and Impacts**

Flowchart shows possible options for project proposers interested in including standardization in their project.



ETSI'S Research Strategy

- ETSI's Long Term Strategy identifies clear actions to "Strengthen the linkage between R&D and standardization". These include:
  - Increasing the participation and contributions by (Horizon 2020 / Horizon Europe and other) research programmes / projects to ETSI TCs and ISGs including 3GPP and oneM2M
  - Inform and educate both Academia and the global research community of the ongoing ETSI technical work, so it may be used as a basis for their research activities
  - Inform all ETSI members of new technological trends emerging from innovative research projects and seek to build bridges between such projects and ETSI activities
- ETSI has over 900 members with more than 120 of them from the categories Public Research Body (43%), University (37%) and Private Research Body (20%).
  - Universities, research bodies and SMEs have a reduced ETSI membership fees, which is designed to encourage participation to standards.
- ETSI seeks to increase the value and visibility of academic and research members through the use of dedicated events, webinars, educational materials, onboarding of research results into our technical groups and providing ETSI support / partnership in selected EU research projects.

Horizon 2020: Enhance Lighting for the Internet of Things (ELIoT)

- Horizon2020 ICT project ELIoT funded by the European Union and led by the Fraunhofer Heinrich Hertz Institute.
- Project aims to develop mass market IoT solutions using LiFi
- 10-partner, 36-month project started on 1 January, 2019 and will end on 31 December, 2021.
- ELIoT Use Cases: LiFi for-
  - Positioning
  - Manufacturing halls
  - Office
  - Digital Signage
  - Fixed Wireless Access
  - Consumer Homes
  - Keyless access
- Project Budget: € 7 313 322
- ELIoT partners participate in the standardization activities of light communication in the IEEE P802.15.13 group, IEEE P802.11.bb group, and ITU-T G.9991 (aka G.VLC).
- For more information, please click here

Horizon 2020: PeroCUBE

- Perocube project financed by European Commission will merge 3 different technologies. Lighting, energy harvesting and light communication
- PeroCUBE has two main objectives:
  - producing efficient, simple and low cost light sources closer to natural light sources and
  - supporting the development of more stable and sustainable, efficient and low-cost solar panels.
- The consortium brings together 14 industrial and academic partners from 10 European countries and seeks to develop a new generation of VLC and LiFi standard, widening the scope for human centric lighting (HCL), data transmission, wearables and IOT applications that do not cause harm to humans nor the environment.
- Start date: 1 April 2020, End date: 30 September 2023
- Project cost: €5.6m
- For more information, please click here

Horizon 2020: European Training Network on "Visible light-based Interoperability and Networking (VISION)"

- Project funded by EU's Horizon 2020 R&I programme under Marie Skłodowska-Curie grant agreement no. 764461.
- Project aims to train a new generation of early-stage researchers (ESRs) in the emerging area of VLC.
- The programme is structured around 15 Individual Research Projects within 3 main research topics:
  - Smart Cities, Offices and Homes
  - Smart Transportation
  - Manufacturing and Medical
- Project budget: 3.75 M€
- Project duration: 4 years, from Sept. 1st, 2017 to Sept. 30th, 2021
- 11 Partners which includes 6 Academia, 2 Research Institutes and 3 Industrial Partners

For more information, please click here

Conclusion

- 3GPP is industry driven - Standardization of interfaces enables an interoperable, multi-vendor approach to deployment
- While much of the ICT standardization work for the world is done in 3GPP, Several ETSI's TBs and ISG provide input to 3GPP and/or collaborate with 3GPP
- ETSI long term strategy has identified clear actions to "Strengthen the linkage between R&D and standardization".
- Standardization helps bridging the gap between research and the market, by enabling the fast and easy transfer of research results to market
- Engaging in Standards groups at the appropriate stages of R&I cycles at local SDO and Global SDO level is crucial to the development of new and evolved technologies, and in making it commercial faster (ROI).
  - TSDSI to 3GPP/oneM2M

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