In the framework of

SESEI | Seconded European Standardisation Expert in India

Enabling Europe-India Cooperation on Standards

In association with

CII

Confederation of Indian Industry

CEN CENELEC ETSI EFTA European Commission

3rd Indo-European Conference on Standards and Emerging Technology

26th April 2018 - New Delhi

SESEI | Seconded European Standardisation Expert in India
Enabling Europe-India Cooperation on Standards

Confederation of Indian Industry

CONFERENCE REPORT
ON
3rd Indo European Conference of standards and Emerging Technology

Table of Contents

1. Glossary 4
2. Conference Summary 6
3. Detailed Agenda 9
4. Release of study reports 13
5. Recommendation & Way forward 14
6. Conference Participants 17
7. Conference Partners 18
8. Conference supporting organizations 20
9. News and Social Media Coverage 23
10. Annexure 1: Detailed session proceeding 29

Session 1: Plenary Session 29
Session 2: Release and presentation of three study reports 36
Parallel Sessions and Key Take Away 46
Parallel Session I on: ICT covering M2M/IoT & its role in Smart Cities and Cyber Security 46
Session 1: Presentations by European and Indian Subject Mater Experts 46
Session 2: Panel Discussions 46
Parallel Session II on: Electric mobility and ITS 59
Session 1: Presentations by European and Indian Subject Mater Experts 59
Session 2: Panel Discussion 69
Parallel Session III on: Smart Grid, Smart Meter, LVDC, Micro Grid 74
Session 1: Presentations by European and Indian Subject Mater Experts 74
Session 2: Panel Discussions 81
Valedictory Session 86

11. Acknowledgement 91

1. Glossary

S. No.	Acronym	Expansion
1	3GPP	3rd Generation Partnership Project
2	5G	Fifth Generation
3	AC	Alternative current
4	AI	Artificial Intelligence
5	ANSI	American National Standards Institute
6	ASSOCHAM	Associated Chambers of Commerce and Industry of India
7	AUSPI	Association of Unified Telecom Service Providers of India
8	BIF	Broadband India Forum
9	BIS	Bureau of Indian Standards
10	CAGR	Compound annual growth rate
11	C-DoT	Centre for Development of Telematics
12	CEA	Central Electricity Authority (India)
13	CEN	European Committee for Standardization
14	CENELEC	European Committee for Electro-technical Standardization
15	CII	Confederation of Indian Industry
16	COAI	Cellular Operators Associations of India
17	CPRI	Central Power Research Institute
18	DC	Direct current
19	DG	Directorate-General
20	DoT	Department of Telecommunications
21	EBG	European Business Group
22	EBTC	European Business Technology and Research Centre
23	EC	European Commission
24	EFTA	European Free Trade Association
25	EMC	Electromagnetic Compatibility
26	ETSI	European Telecommunications Standards Institute
27	EU	European Union
28	EVs	Electric Vehicles
29	FAME	Faster Adoption and Manufacturing of (Hybrid &) Electric Vehicles
30	FDI	Foreign Direct Investment
31	FICCI	Federation of Indian Chambers of Commerce and Industry
32	FTAs	Free-Trade Agreements
33	GDP	Gross Domestic Product
34	GoI	Government of India
35	GST	Goods and Services Tax

36	ICT	Information and Communications Technologies
37	IEC	International Electrotechnical Commission
38	IEEE	Institute of Electrical and Electronics Engineers
39	IoT	Internet of Things
40	IPR	Intellectual Property Rights
41	ISGF	India Smart Grid Forum
42	ISO	International Organization for Standardization
43	ISPAI	Internet Service Providers Association of India
44	ITS	Intelligent Transportation System
45	ITU	International Telecommunication Union
46	LED	Light-Emitting Diode
47	LITD	Electronics and Information Technology Division Council
48	LTE	Long-Term Evolution
49	LVDC	Low Voltage Direct Current
50	M2M	Machine to Machine
51	MEITY	Ministry of Electronics and Information Technology
52	MNRE	Ministry of New and Renewable Energy
53	MoHUA	Ministry of Housing & Urban Affairs
54	MoP	Ministry of Power
55	MoU	Memorandum of Understanding
56	MOUD	Ministry of Urban Development
57	NCIIPC	National Critical Information Infrastructure Protection Centre
58	NFV	Network Functions Virtualization
59	NSGM	National Smart Grid Mission
60	OEMs	Original Equipment Manufacturer
61	R&D	Research and Development
62	SDN	Software-Defined Networking
63	SDOs	Standards Developing Organizations
64	SESEI	Seconded European Standardization Expert in India
65	SGAM	Smart Grid Architecture Modeling
66	SMEs	Small and Medium Enterprises
67	TBT	Technical Barriers to Trade
68	TEC	Telecom Engineering Centre
69	TSDSI	Telecommunications Standards Development Society, India
70	UNECE	United Nations Economic Commission for Europe
71	WTO	World Trade Organization

2. Conference Summary

The SESEI (Seconded European Standardization Expert in India) is a project co-funded by five European partners (EC, EFTA, CEN, CENELEC & ETSI), and is operating from New Delhi, India since 2013, with an objective to increase the visibility of European Standardization System in India and promote EU/EFTA - India cooperation around standards and related policies around emerging technologies with priority sectors as:

- **Information and communication technology (ICT):** M2M/IoT, e-Accessibility, Security, 5G, NFV/SDN…
- **Electrical Equipment including Consumer Electronics**: Smart Grid, Smart Meter, LVDC, Micro Grids…
- **Automotive**: Connected Cars, e-Mobility, ITS…
- **Smart Cities**…

The SESEI project, while focusing mainly on the above-mentioned priority topics, also keeps track and extends possible support to both EU/EFTA and India on the topics of WTO-TBT, Market Access, IPR, R&D and Innovation, National Manufacturing Policy: Make in India, EU-INDIA FTAs, Environment (Energy Efficiency) etc.

India has dynamically modified and transcended into a fastest growing economy owing to various reforms, policy changes, and new vision of the Indian Government. As per the World Bank's latest edition of Global Economic Prospects, India is the world's fourth fastest growing economy in the world. India's gross domestic product (GDP) grew 7.6 per cent in 2015-16, up from 7.2 per cent a year ago. With such a high growth number, India has managed to retain its tag of the world's fastest growing major economy — outpacing even China. The European Union (EU) and India trade relations have steadily progressed over the past years with India ranked 9th overall as EU trade partner. The EU and India will strive to further increase their trade flows in goods and services as well as bilateral investment and access to public procurement also through the Free Trade Agreement negotiations that should restart soon. The standardization element is an important factor, the importance of which has grown immensely over the past years with new Indian actors being created and the role of standards unanimously recognized in India as critical for meeting the ambitious Government of India's current policy goals.

The SESEI project has been engaging with the stakeholders around these priority sectors by attending and organizing various workshops and conferences to understand the market dynamics, challenges and opportunities and bring experts from both Europe and India to share their respective perspectives and identify areas of collaboration and co-operation for harmonization of standards. In view of the resounding success and positive feedback from its first two major conferences held in India, SESEI expert organized the **3rd edition of the "Indo-European conference on Standards & Emerging Technology", on 26th April 2018 at Hotel, The Lalit, New Delhi. The main aim of the conference** was to delve further into these priority topics and come out with "**Actionable Insights"** through immersive deliberations amongst the stakeholders and forge stronger partnership & develop strategies to proliferate identified Standards, Policies and Regulations.

The Conference "**3rd edition of the "Indo-European conference on Standards & Emerging Technology "was** brought together by the European Standards Organizations (CEN, CENELEC, ETSI) along with European Commission (EC) and European Free Trade Association (EFTA) in the framework of their Project SESEI (Seconded European Standardization Expert in India) and in association with the Confederation of Indian Industry (CII). The objective of the conference was to bring together high-level representatives, technical experts from the EU community as well as Indian stakeholders with a view to share and learn from each other, further strengthening the ongoing dialogue in the key standardization topics considered for the conference.

The **3rd Indo – European Conference on Standards & Emerging Technology** was a conscious effort to further strengthen the existing dialogue in key standardization areas by sharing European updates and hearing Indian perspective, their specific requirements and specifications which will help bridging the two regions even more and create a true long-lasting Indo-European dialogue and relationship. This conference presented another opportunity to provide stakeholders with an update of present and future standardization activities and triggered dialogue between European and Indian stakeholders for assessing potential standardization gaps which can be bridged and where new avenues for collaboration can be established.

The topics identified for this 3rd dialogue were in line with key ongoing technology trends and policy needs for both India and Europe. The 3rd Indo-European Conference focused on the following three topics:

- **ICT covering M2M/IoT & its role in Smart Cities and Cyber Security**
- **Automotive covering Electric mobility and Intelligent Transport System (ITS)**
- **Smart Energy covering Smart Grid, Smart Meter, LVDC, Micro Grid & Cyber Security**

Prior to the conference, three Study Reports on these above subjects were commissioned to provide an overview of each sector profile, future developments, challenges & opportunities i.e. the regulatory, policy, technical and technological challenges limiting the market potential, related opportunities, latest developments and current state of play covering standards development & policy initiatives in each of the sector. These study reports were released and presented during the conference. The entire proceedings of the conference were built around the study reports and their findings.

With these study reports and through further deliberation at the "3rd Indo-European Conference on Standards & Emerging Technology", the SESEI project aimed to determine a list of actions as a way forward which should further enable the stakeholders in India and Europe in achieving desired objectives. This will further strengthen the cooperation and collaboration between EU/EFTA and India in contributing to reduce Technical Barriers to Trade (TBT) and facilitate trade.

The conference concluded with the valedictory session. In this session, detailed findings as determined through session deliberations and study reports covering gaps and challenges and way forward including recommendations were presented by Session Chairs and concluding remarks were given by both EU & Govt. of India representatives.

Beyond a few 'sector specific' recommendations as covered below, the major recommendations turned out to be common across all sectors as summarized below:

Awareness on Standards: Presently Standards & even SDOs (Standards developing organizations) are not at the forefront of city planners', utilities', service providers or users' minds. There are misconceptions on what standards are for, and, the case for use of standards has not been made. A key imperative is to create standards awareness among policy makers, planners, utility suppliers and service providers. **Webinar, Conferences, Workshop and Training program shall be conducted to address this gap as a way forward.**

National & Global Co-ordination & Collaboration: To keep pace with the global developments in technology & standards, Indian stakeholders must leverage the initiatives, participation, best practices & work done in global & regional SDOs and collaborate closely to speed up the adoption and implementation of required standards and best practices. A few initiatives that could be taken up without any complications and delays could be:

- ⇨ Bureau of Indian standards (BIS) to keep close tab on and adopt (without much delay) the relevant standards from ISO, IEC, ISO/IEC JTC1 and any other regional or global standards development organization to speed up proliferation of standards based interoperable M2M/IoT deployments in Smart Cities or Smart Infrastructure.
- ⇨ Telecommunications standards development society of India (TSDSI) to maintain close co-ordination with 3GPP, oneM2M, ETSI and other global & regional SDOs in the domain to understand, participate and contribute relevant Indian requirements, as well develop National Standards concurrently to keep pace with global technological advancements…
- ⇨ TEC/DoT and all its wings to monitor and sync up with activities in ITU and encourage & enable harmonization of Indian telecom policies, Standards and other related activities…
- ⇨ TEC/DoT, Ministry of Electronics and Information Technology (MEITY), TSDSI, BIS and all other ecosystem stakeholders to leverage the initiatives by EU viz.: **"Project SESEI"** and the **"India-EU Cooperation on ICT-Related Standardization, Policy and Legislation"** to co-operate and collaborate on areas of mutual interests like M2M/IoT, Security, 5G, NFV/SDN, ITS, E-Mobility, Smart Grid/Meter etc. and ensure that Indian stakeholders are technologically at par with global technology advancements.
- ⇨ Learn from best practices in standardization, policies & regulations from European Union initiatives and emulate them by constituting high level co-ordination groups on important focus areas to harmonize and share the standardization and other relevant activities in individual national SDO or industry bodies.

The conference was a resounding success and received an overwhelming response with participation of over 300 delegates and more than 70 international and national speakers. The Plenary and valedictory session of the conference were streamed live during the conference.

3. Detailed Agenda

The detailed agenda as below, was structured to provide equal emphasis towards all three topics as identified for the conference with an objective to reach a list of actionable items, which shall become the basis of the activity roadmap for both European and Indian stakeholders to work together, collaborate and cooperate.

The conference began with the plenary session consisting of keynote addresses by the leaders and experts from the key stakeholder organizations both from India & Europe. Plenary session was followed with a release and presentation of three study reports on conference topics as below:

- **ICT covering M2M/IoT & its role in Smart Cities and Cyber Security**
- **Automotive covering Electric mobility and Intelligent Transport System (ITS)**
- **Smart Energy covering Smart Grid, Smart Meter, LVDC, Micro Grid & Cyber Security**

Post release of study reports, three parallel sessions were held on each of the conference topics i.e. ICT, Automotive & Smart Energy. Each parallel session was further divided into two sessions as below:

- First session was dedicated with presentations from both European & Indian experts sharing state of play and different aspects of each topics covering policy, legislation and standardisation and providing a comprehensive insight into the Indian & European perspective on each of these conference topics

- Second session was dedicated for a panel discussion with European Expert as a moderator and panellist comprise of Indian experts to discuss and validate the Gaps & challenges as identified through respective study reports and together determine the actionable insights & inputs for the recommendations and way forward for collaboration and co-operation between Europe & India.

The conference concluded with a valedictory session, in which detailed findings as recommendations and way forward were presented to address the gaps and challenges in each of the identified topics/ sectors. Final concluding remarks were given by European Commission & Govt. of India representatives.

For copy of presentations please click here and for Picture Gallery please click here

Agenda - Speakers	
1000 – 1130 hrs	**Opening Plenary Session**
	Session Moderator: Mr. Dinesh Chand Sharma (SESEI)
	- **Mr Wim De Kesel**, Vice President Policy, CENELEC
	- **Ms. Pamela Kumar**, Director General, Telecom Standards Development Society of India
	- **Mr. Simon Hicks,** Chairman ETSI General Assembly, UK Department for Digital, Culture, Media and Sport (DCMS)
	- **Shri. Vipin Tyagi**, Executive Director, Centre for Development of Telematics C-DOT)
	- **Mr. Joaquim Nunes de Almeida**, Director - Single Market Policy, Regulation and Implementation, European Commission, DG-GROW
	- **Smt. Surina Rajan,** Director General, Bureau of Indian Standards
	- **H.E. Mr. Tomasz Kozlowski**, Ambassador of the European Union to India and Bhutan
	- **Shri Anup Wadhawan**, Special Secretary, Ministry of Commerce, Government of India
	Vote of Thanks: Mr. Anupam Kaul, Principal and Head, QMS, Institute of Quality**,** Confederation of Indian Industry
	Release of Three Study Report by dignitaries as prepared by CII, EBTC & IET India
1130 – 1200 hrs	**Networking Tea/Coffee Break**
1200 – 1300 hrs	**Presentation of Study Reports**
	- **Mr. Narang N. Kishor, Study Report Author (CII):** ICT: M2M/IoT & its role in Smart Cities and Cyber Security
	- **Mr. Dibyendu Sengupta, Study Report Author (EBTC):** Automotive: Electric mobility and ITS
	- **Mr. Mustafa Wajid, Study Report Author (IET IoT Panel):** Smart Energy: Smart Grid, Smart Meter, LVDC, Micro Grid
1300 – 1400 hrs	**Lunch Break**
1400 - 1630 hrs	**Parallel sessions (Presentation & Panel Discussion)**
	- Session 1 – Presentation for 90 minutes **(1400 – 1530 hrs)**
	- Session 2 – Panel Discussion for 60 minutes **(1530 – 1630 hrs)**
Three parallel sessions to "share status updates from EU and INDIA around standardization & related policies on conference topics" and "conduct a panel session to identify how best the gaps/challenges could be addressed as identified in these study reports:	

ICT M2M/IoT & its role in Smart Cities and Cyber Security	AUTOMOTIVE Electric mobility and ITS	SMART ENERGY Smart Grid, Smart Meter, LVDC, Micro Grid
Session 1: Presentations	**Session 1: Presentations**	**Session 1: Presentations**
Key note address: **Shri Mahabir Parshad Singhal** Senior DDG, Telecom Engineering Centre (TEC) **Moderator: Mr. NSN Murty,** Partner & Leader, Smart Cities **Europe:** - **Mr. Christophe Colinet**, Smart city Bordeaux & Chair Standards & inter-operability Eurocities KSF forum - **Ms. Margot DoR**, Director Strategy Development, **ETSI** - **Dr. Mihai Bilauca**, Head of Digital Strategy & EU Programmes, Limerick City & Council, Ireland - **Mr. Jesus Canadas**, Head of Unit, Cabinet of Secretariat of State, Spain **India:** - **Shri. Aurindam Bhattacharya,** GL Technical Services, CDOT - **Dr. Prashant Mishra**, Scientist TCS Research & Innovation - **Shri. G. Narendra Nath**, DDG Security, DoT - **Dr. Rishi Bhatnagar**, Chairman IET IoT Panel	**Key note addresses:** **Shri. Anil Srivastava** Adviser (Transport) & DG, DMEO NITI AAYOG **Moderator: Mrs. Rashmi Urdhwareshe** Director ARAI **Europe:** - **Mr. Adrian Scrase**, Chief Technical Officer, ETSI - **Mr. Emilio Dávila-Gonzalez,** Head of Sector ICT Standardisation, DG CONNECT - **Mr. Antonino Pirrotta**, UNI - **Mrs. Silvia Vaccaro,** Policy officer standardization, DG GROW **India:** - **Mr. Sajid Mubashir**, Scientist G, Department of Science and Technology - **Mr. Alok Sethi**, GM Transportation Technology Solution DIMTS Ltd. - **Ms. Aditi Sethi & Mr. Enoch Eapen**, Deputy Manager ICAT - **Mr. Vinosh James**, Lead - Technical Standards - Qualcomm India Pvt. Ltd.	**Key note address:** **Shri. Pankaj Batra** Member-Planning, Central Electricity Authority (CEA), **Moderator: Mr. Vimal Mahendru**, IEC Ambassador, **Europe:** - **Mr. Laurent Guise**, Chairman, CEN-CLC-ETSI Smart Energy Grid Coordination Group - **Mr Wim De Kesel,** Vice President Policy, CENELEC - **Mr. Alain Staron**, VP strategy at Veolia - **Mr. Pierre Jean Cherret**, VP strategy, ITEMS International **India:** - **Mr. B.A Sawale**, Additional Director & Head Energy Meter laboratory, CPRI - **Dr. G. Ganesh Das,** Head - Strategy, Business Excellence & Collaborations, TPDDL - **Mr. Sandip Sinha**, Vice President – Renewables, ABB India

Session 2: Panel	Session 2: Panel	Session 2: Panel
Moderator: **Mr. Klaus Pendl**, First Counsellor – ICT, Delegation of the European Union to India assisted by Mr. Narang N. Kishor, Study Report Author (CII) **Panelist:** 1. **Shri. Rajiv Sinha,** DDG Networks & Technologies, DoT 2. **Mr. Vikram Tiwathia**, DDG COAI 3. **Mr. T.V.Ramachandran**, President BIF 4. **Dr. B. K. Murthy,** Scientist G & Group Coordinator,MeiTY 5. **Mr. Vijay Madan**, Advisor & Mentor, TSDSI 6. **Smt. Reena Garg**, Head Electronics and IT, BIS 7. **Mr. Bipin Pradeep Kumar**, Co- Founder & Director, Gaia Smart Cities	**Moderator**: **Mr. Adrian Scrase**, CTO, ETSI assisted by Mr. Dibyendu Sengupta, Study Report Author (EBTC) **Panelist:** 1. **Mr. Balraj Bhanot**, Chair TED 28, BIS 2. **Mr A. A. Deshpande**, Deputy Director & Head of Automotive Electronics Department, ARAI 3. **Shri Sushil Kumar**, DDG – IoT, TEC 4. **Mr. Sharad Arora**, Managing Director, Sensorise 5. **Mr. Ravi Jakhodia**, Founder and CEO - Minda iConnect 6. **Mr. Surya Jeedigunta**, CEO 3P Foundation 7. **Mr. Sumit Monga**, Head Govt. Affairs Unlimit IoT	**Moderator**: **Mr. Wim De Kesel**, Vice-President Policy CENELEC assisted by Mr. Mustafa Wajid, Study Report Author (IET IoT Panel) **Panelist:** 1. **Mr. Arun K. Mishra**, Director, National Smart Grid Mission, 2. **Mr. Ajoy Rajani**, Head - IT, Technology & Cyber Security, Reliance Infra Ltd. 3. **Mr. Reji Kumar Pillai**, President India Smart Grid Forum 4. **Mr. Shrikant Shitole**, Senior Director & Country Head, Fire Eye, India 5. **Mr. Rajeev Sharma**, Head Electrotechnical, BIS 6. **Mr. Vikram Gandotra**, GM Strategy & Marketing, Digital Grid, Energy Management, Siemens Ltd. 7. **Mr. Rahul Tongia** Fellow, Brookings India, and Founding Advisor, ISGF

1630 - 1700 hrs	**Networking Tea/Coffee Break**
1700 - 1800 hrs	**Valedictory Session: (Senior Officials from EU and India)** - **Mr. Joaquim Nunes de Almeida**, Director - Single Market Policy, Regulation and Implementation, European Commission, DG-GROW - **Shri. Sudhanshu Pandey**, Joint Secretary, Department of Commerce, Ministry of Commerce & Industry, Govt. of India - **Mr. Chandrajit Banerjee,** Director General Confederation of Indian Industry (CII)
	- Summary, Conclusion, and Recommendations from all the three parallel sessions: Presented by "Session 2" moderators - Concluding remarks by EU & INDIA representatives

For detailed session proceeding please refer annexure 1.

4. Release of study reports

3rd Indo European Dialogue, Conference was agreed to be focused on following three topics:

- ICT (M2M/IoT and its role in Smart Cities, Cyber Security),
- Automotive (ITS and e-mobility), as well as
- Smart Energy (Smart Grid, Smart Meter, LVDC, Micro Grid and Cyber Security).

Prior to this 3rd Indo European conference, a call for proposal was launched to carry out three independent study reports on above topics, which were expected to cover "a brief Sector Profile, Challenges & opportunities in India, i.e. the regulatory, policy, technical and technological challenges in India which are limiting the market potential, Latest Developments and current state of play covering Standards development & Policy Initiatives in India to support the sectorial growth and tentative projection on future developments and impact on market perspectives.

In total eleven proposals were received from various agencies and after following a due process of scrutiny with the help of Project Steering Committee members on following parameters, Agency CII for ICT, IET IoT Panel for Smart Energy and EBTC for Automotive were awarded to carry out these study reports.

- Agency credentials
- Prior experience to carry out study report
- Resumes/Profile of Expert consultants

During the conference these three study reports were released. Each of these study reports succinctly, yet comprehensively covered the desired following aspects:

- Brief Sector profile in India:
  - Details on the ecosystem,
  - Main stakeholders and key players,
  - Existing market dynamics of the sector
  - Market potential
- Challenges & opportunities in India, i.e. the regulatory, policy, technical and technological challenges in India which are limiting the market potential, and the related opportunities.
- Latest Developments and current state of play covering Standards development & Policy Initiatives in India to support the sectorial growth;
- Tentative projection on future developments and impact on market perspectives.

Keeping the expectations in context, the three study reports were structured uniformly into following four sections:

- Eco-System, Market Dynamics & Potential
- Policy Initiatives & Standardization
- Opportunities & Challenges

- Conclusions and Recommendations

These study report especially the identified Gaps & Challenges and recommendation became an important basis of the dialogue and helped extensively to have a structured discussion and determine the actionable activities as a way forward.

Copy of these study reports are available in following hyperlinks:

Study report on ICT **Study report on Automotive** **Study report on Smart Energy**

5. Recommendation & Way forward

The Plenary & Parallel sessions in the Conference brought out different perspectives around three topics of conference covering ICT, Automotive & Smart Energy to provide the audience a 360-degree view of the paradigms. During the interactive panel discussions on each subject, experts discussed & deliberated on the gaps and challenges identified in the respective study reports. Barring a few additional perspectives, it was observed that the study reports had accurately identified the gaps and challenges around these three domains of emerging technologies. In addition, the participating experts concurred with the recommendations provided in the reports.

A summary of recommendation sector wise is summarized below:

Smart Energy

The three trends - Electrification, Decentralization and Digitization are expected to transform the future of electricity. In brief following are key outcome from it around Smart Energy:

- Investment in R&D across the sector needs to be increased
- More incentives for local manufacturing should be explored.
- The implementation of Phasor Measurement Units (PMU) should be accelerated.

- Technology Development in coming up with ultra-fast remedial action schemes in Transmission & Distribution.
- Distribution Utilities to be incentivized for maintaining Grid Reliability and keeping losses under control.
- Distribution Utilities to be encouraged to invest in new technologies.
- Policies for managing Distributed Energy Resources (DER) need to evolve fast.
- The policies to address regulating prices for Mini grid projects and streamlining regulatory approvals.
- Standardization Imperatives are needed:
  - For Net Metering & Roof Top PV Solar deployments.
  - For Distribution Automation, DER management, EV integration etc.

India should leverage the Electrical, Communication and IoT standards developed/implemented globally in each of the Smart Grid segments (Renewables integration, Transmission, Distribution, Micro grids) and tune them for local application without affecting interoperability, thereby accelerating the transformation of the Indian electricity ecosystem.

Automotive

For innovative transport, the future seems quite exciting in India. Despite the scant number of electric vehicles on the roads today, enough progress is being done on the ground for a better future. The electric mobility and ITS initiatives would need to be developed in an integrated manner with peripheral infrastructure and renewable energy sources to attain the goal of energy efficiency and clean environment.

All the on-going schemes are adding their weight to the burgeoning areas of electric mobility and ITS in India. The availability of widely recognized standards, and compliance to them, will allow vehicle and technology manufacturers to present their products in India and improve on them with changing circumstances. As a caveat, it must be noted that monetary incentives alone have not been able to drive the sales of EV in several places like the US and Europe.

Along with other recent initiatives towards easing business environment in India, it is expected that proper policy formulation and institutional development that take into consideration the standardization aspects of both ITS and EVs, would pave way for a better all-encompassing transport system in Indian cities and a cleaner environment for healthy and livable cities.

Standardization is an important activity around the building of an ITS architecture and e-Mobility as it will provide consistency, enhance interoperability and help in expanding market. Developing ITS and e-Mobility technical and service standards are important as it ensures sustainability, compatibility and capacity to expand ITS services.

ICT

Convergence of the multitude of stakeholders of the IoT ecosystem to **common standards** is essential for the wide acceptance of the IoT wave by the masses. We should expect to see acceleration and a maturing of common standards, more cross-sector collaboration and creative approaches to business

models. India has been a global leader in the development and implementation of information and communication technologies (ICT) products and services. In case of ICT, interoperability is a key component hence its standardization shall be a global one.

- **Framework for Interoperability**

There is an immediate need to develop/adopt standardized frameworks and architectures to bring comprehensive inter-operability in this heterogeneous, diverse and fragmented ecosystem to enable stakeholders monetize their respective resources and investments that shall further encourage them to offer more solutions and services to the society, business, industry and infrastructure. There is also a need to create and suggest frameworks to achieve the Interoperability among all the devices & layers at every interface in the networks, be it a smart home network, a smart building network, a smart city/community network or the smart grid network that shall enable the stakeholders to prepare a set of detailed standards-based specifications to cater to specific/defined/fixed use cases followed by development of a Compliance & Interoperability Testing Framework.

- **Common Service Layer Standardization**

It is imperative to standardize a Common Service Layer in the heterogeneous world of M2M/IoT to bring interoperability by creating a distributed software layer – like operating system- which shall facilitate the unification by providing a framework for interworking with different technologies to enable re-use of what is already available as much as possible.

The key to unified smart infrastructure adoption by the diverse stakeholders shall also lie in the design of the Standards based Gateways (or Data Concentrator Units) with Standardized Common Service Functions like Device Management, Registration, Discovery, Communication Management & delivery Handling, Data Management and Repository, Security etc. Only if all the smart devices are easy to install and use, require little or no maintenance activity, and provide useful services, will stakeholders readily adopt them. Work carried out by oneM2M partnership project is commendable and is an available matured system for its implementation in India.

- **Security Framework for Infrastructure**

There is a need for defining a security Framework for Telecom Infrastructure assets such as Fibre & Telecom Towers deployed across the country. This framework should allow the assets to be treated as essential infrastructure, which enables telecom connectivity and provision of Internet services to the public and stringent penal provisions should be in place to mitigate risk of damage to these assets.

The IoT is an increasingly attractive attack plane for cybercriminals. Hence, getting security right in the age of the IoT could mean the difference between chaos and order, not just in cyberspace but in the physical world, as well. In face of the increased vulnerabilities due to the large Attack Surface Area in the M2M/IoT paradigm it's imperative to move from the "EXTRINSIC SECURITY" (Add on Security) paradigm to an "INTRINSIC SECURITY" (Security by Design) paradigm. A successful IoT security shall require a multilayered approach to design new systems based on secure software and architectures.

It would be critical to comprehensively address the challenges created by IoT in the integrity & confidentiality of the data and privacy of an individual.

Bringing the "Internet of Things" to life requires a comprehensive systems approach - inclusive of intelligent processing and sensing technology, connectivity, software and services, standardized & harmonized architectures and frameworks along with a leading ecosystem of partners.

The action items emerging from the report and conference discussions as summarized above will help Project SESEI creating a set of activities to be taken up collectively with Indian stakeholders in consultation with European project partners for a better coordination and cooperation with each other.

6. Conference Participants

The 3rd Indo – European Conference received overwhelming response with over 350 delegate registrations. All the key Government Ministries, BIS, TSDSI, TEC, DoT and Meity provided full support by endorsing the event and participating at senior levels.

Industry bodies and association were also actively engaged and ensured participation of their technical officials. The Conference witnessed participation of more than 70 international and national Subject matter experts in the focused sessions. Special Secretary and Joint Secretary Department of Commerce along with Director General of Bureau of Indian Standards and Heads of TSDSI and C-DoT presided over the plenary and valedictory session along with Mr. Joaquim Nunes De Almeida, Director, Single Market Policy, Regulation and Implementation, DG GROW.

SESEI also received immense support from the office of the European Delegation to India. His Excellency Tomasz Kowalski, Ambassador and Head of Delegation of the EU to India, participated in the plenary session. ICT and trade counsellors from EU embassies and many EU Projects in India also participated in the conference. Overview of the profile of the participants is as under;

Institutional

- Ministries of Central / State Governments
- Standard Development Organization
- Academia / Technical Institutions engaged on the topics of ICT/Smart cities / Smart Energy / Intelligent Automotive/e - mobility
- ICT/ Automotive /Energy Companies, Manufacturers
- Certification / Inspection bodies
- EU Projects / Embassies

Professionals

- Policy Makers / Government officials

- Chief Technical Officers
- Product / Technology developers
- Networking specialists /System Integrators
- Quality and Standard Heads
- Product Strategy Specialists

7. Conference Partners

SESEI - SECONDED EUROPEAN STANDARDIZATION EXPERT IN INDIA PROJECT

The **Seconded European Standardization Expert for India (SESEI) project** was launched in March 2013. Its general objective is to raise awareness on the European Standardization System, values and assets in India. The project is supported and operated by the European Committee for Standardization (CEN), the European Committee for Electrotechnical Standardization (CENELEC) and the European Telecommunications Standards Institute (ETSI), as well as by The European Commission's Directorate General for Internal Market, Industry and Entrepreneurship (DG GROW) and by the European Free Trade Association (EFTA).The SESEI's mission is to **enhance the visibility of European standardization activities**, **increase the cooperation between Indian and European standardization bodies** and **support European companies facing standardization related issues hampering market access to India**. The project also supports India in standardization related aspects of its integration in the WTO trading system, by identifying all potential opportunities for enhanced international cooperation and global harmonization of standards. Ultimately, **the SESEI project aims at reducing the Technical Barriers to Trade (TBT) both between EU and India and globally**, thus supporting European and Indian industries by facilitating international trade. For more information about SESEI visit: www.sesei.eu

EUROPEAN COMMITTEE FOR STANDARDIZATION (CEN) & EUROPEAN COMMITTEE FOR ELECTROTECHNICAL STANDARDIZATION (CENELEC)

CEN (European Committee for Standardization) and CENELEC (European Committee for Electrotechnical Standardization) are recognized by the European Union (EU) and the European Free Trade Association (EFTA) as European Standardization Organizations responsible for developing standards at European level. These standards set out specifications and procedures in relation to a wide range of materials, processes, products and services. The members of CEN and CENELEC are the National Standardization Bodies and National Electrotechnical Committees of 34 European countries. European Standards (ENs) and other standardization deliverables adopted by CEN and CENELEC, are accepted and recognized in all of these countries. European Standards (ENs) contribute to enhancing safety, improving quality, facilitating cross-border trade and strengthening the European Single Market. They are developed through a process of collaboration among experts nominated by business and industry, research institutes, consumer and environmental organizations, trade unions and other stakeholders. CEN and CENELEC work to promote the international alignment of standards in the framework of technical cooperation agreements with ISO (International Organization for Standardization) and the IEC

(International Electrotechnical Commission). For more information about CEN / CENELEC visit: www.cencenelec.eu (www.cen.eu / www.cenelec.eu)

EUROPEAN TELECOMMUNICATIONS STANDARDS INSTITUTE (ETSI)

The European Telecommunications Standards Institute (ETSI) provides members with an open and inclusive environment to support the timely development, ratification and testing of globally applicable standards for ICT-enabled systems, applications and services across all sectors of industry and society. ETSI is a not-for-profit body with more than 800 member organizations worldwide, drawn from 66 countries and five continents. Members comprise a diversified pool of large and small private companies, research entities, academia, government and public organizations. ETSI is one of only three bodies officially recognized by the EU as a European Standards Organization (ESO). For more information about ETSI visit: www.etsi.org

EUROPEAN COMMISSION (EC)

The European Commission is an institution of the European Union, responsible for proposing legislation, implementing decisions, upholding the EU treaties and managing the day-to-day business of the EU. The European Commission's Directorate General for Internal Market, Industry and Entrepreneurship (DG GROW) has the mission to promote a growth-friendly framework for European enterprises. It has a key role in the Europe 2020 agenda of smart, sustainable and inclusive growth. DG Grow is playing an active role to promote smart, sustainable and inclusive growth throughout all industrial sectors, including service industries like tourism. The policy of Grow contributes to making Europe a more competitive, innovative and resource-efficient economy, ready to tackle today's and tomorrow's challenges. For more information about European Commission visit: https://ec.europa.eu/info/departments/internal-market-industry-entrepreneurship-and-smes en

EUROPEAN FREE TRADE ASSOCIATION (EFTA)

The European Free Trade Association (EFTA), founded in 1960, is an intergovernmental organization set up for the promotion of free trade and economic integration to the benefit of its Member States – Iceland, Liechtenstein, Norway and Switzerland. Relations with the European Union have been at the core of EFTA activities from the beginning. The Agreement on the European Economic Area brings together the EU Member States and three of the EFTA States – Iceland, Liechtenstein and Norway – and extends the EUs internal market to these three EFTA States. Switzerland's economic and trade relations with the EU are governed through bilateral agreements. The EFTA countries also have a number of Free Trade Agreements covering countries outside the EU. For more information about EFTA visit: www.efta.int

CONFEDERATION OF INDIAN INDUSTRY (CII)

The Confederation of Indian Industry (CII) works to create and sustain an environment conducive to the development of India, partnering industry, Government, and civil society, through advisory and consultative processes. CII is a non-government, not-for-profit, industry-led and industry-managed

organization, playing a proactive role in India's development process. Founded in 1895, CII has over 8,300 members, from the private as well as public sectors, including SMEs and MNCs, and an indirect membership of over 200,000 enterprises from around 250 national and regional sectoral industry bodies. For more information about CII visit: http://www.cii-iq.in/

8. Conference supporting organizations

Bureau of Indian Standards (BIS)

BIS is the National Standard Body of India established under the BIS Act 1986 for the harmonious development of the activities of standardization, marking and quality certification of goods and for matters connected therewith or incidental thereto. BIS has been providing traceability and tangibility benefits to the national economy in a number of ways - providing safe reliable quality goods; minimizing health hazards to consumers; promoting exports and imports substitute; control over proliferation of varieties etc. through standardization, certification and testing. BIS is involved in various activities which are primarily, Standards Formulation, Product Certification, Compulsory Registration Scheme, Foreign Manufacturers Certification Scheme, Hall Marking Scheme, Laboratory Recognition Scheme, Sale of Indian Standards, Consumer Affairs Activities, Training Services, etc. (http://www.bis.gov.in/index.asp).

Department of Telecommunications (DoT)

Department of Telecommunications, Ministry of Communications, is responsible for formulating developmental policies aimed at accelerating growth of the telecommunication services in the country. The Department is also responsible for grant of licenses for various telecom services like Unified Access Service Internet and VSAT service. The Department is also responsible for frequency management in the field of radio communication in close coordination with the international bodies. It also enforces wireless regulatory measures by monitoring wireless transmission of all users in the country. Dot is responsible for Policy, Licensing and Coordination matters relating to telegraphs, telephones, wireless, data, facsimile and telematic services and other like forms of communications. International cooperation in matters connected with telecommunications including matters relating to all international bodies dealing with telecommunications such as International Telecommunication Union (ITU), its Radio Regulation Board (RRB), Radio Communication Sector (ITU-R), Telecommunication Standardization Sector (ITU-T), Development Sector (ITU-D), International Telecommunication Satellite Organization (INTELSAT), International Mobile Satellite Organization (INMARSAT), Asia Pacific Telecommunication (APT). Promotion of standardization, research and development in telecommunications is also one of the prime objectives of DoT. (http://www.dot.gov.in/)

Telecommunications Standards Development Society, India (TSDSI)

TSDSI is an SDO that aims at developing and promoting India-specific requirements, standardizing solutions for meeting these requirements and contributing these to international standards, contributing to global standardization in the field of telecommunications, maintaining the technical standards and other deliverables of the organization, safe-guarding the related IPR, helping create

manufacturing expertise in the country, providing leadership to the developing countries (such as in South Asia, South East Asia, Africa, Middle East, etc.) in terms of their telecommunications-related standardization needs. A consensus-based approach is followed towards standards development by involving all stake holders - Government, Academia and Industry. TSDSI follows the principles of Openness, Transparency, Fairness, Consensus and Due Process in conducting its activities. It maintains technology neutrality and provide a uniform playing field for all of its members. The TSDSI is not for profit legal entity in Public-Private Partnership (PPP) mode with participation from all stake holders including Government, service providers, equipment vendors, equipment manufacturers, academic institutes, and research labs. (http://www.tsdsi.org/).

EU Delegation to India

The European Union (EU) is a political and economic union of 28-member states that are located primarily in Europe. Having an area of 4,475,757 km2 (1,728,099 sq. miles), and an estimated population of over 510 million, the EU has developed an internal single market through a standardized system of laws that apply in all member states. EU policies aim to ensure the free movement of people, goods, services, and capital within the internal market, enact legislation in justice and home affairs, and maintain common policies on trade, agriculture, fisheries, and regional development. Within the Schengen Area, passport controls have been abolished. A monetary union was established in 1999 and came into full force in 2002 and is composed of 19 EU member states which use the euro currency. (https://europa.eu/european-union/index_en).

Cellular Operators Associations of India (COAI)

COAI was constituted in 1995 as a registered, non-governmental society. The Association is dedicated to the advancement of modern communication through the establishment of world-class mobile infrastructure, products and services and to delivering the benefits of innovative and affordable mobile communication services to the people of India. Over the years COAI has emerged as the official voice for the Indian telecom industry and interacts directly with Ministries, Policy Makers, Regulators, Financial Institutions and Technical Bodies. It provides a forum for discussion and exchange of ideas between these bodies and the Service Providers, who share a common interest in the development of mobile telephony in the country. COAI collaborates with other Industry Associations such as CII, FICCI, ASSOCHAM, AUSPI, ISPAI, VSAT association etc., with the objective of presenting an industry consensus view to the Government on crucial issues relating to the growth and development of the Indian telecom Industry. COAI's core membership includes private cellular operators, namely - Aircel Ltd., Bharti Airtel Ltd., Idea Cellular Ltd., Reliance Jio Infocomm Limited, Telenor (India) Communications Private Limited, Videocon Telecom and Vodafone India Ltd. operating across the whole country. (https://coai.com/).

European Business Technology and Research Centre (EBTC)

EBTC was constituted in 2008 as a programme co-funded by the European Union. It transitioned to an independent organisation in March 2016, continuing the EU mandate to facilitate Europe-India cross-border collaboration. EBTC as an organisation is coordinated by EUROCHAMBRES, the Association of European Chambers of Commerce and Industry. EBTC is promoting and indigenising European

technologies as well as innovations to suit the local needs in India through various projects, programmes and initiatives, enabling Indo-European collaborations. EBTC endeavours to support the governments and private sector in India with in-depth information, knowledge of available technologies and frameworks, as well as access to the innovations and solutions created in European countries. (http://ebtc.eu/).

European Business Group (EBG) Federation

The EBG federation was established in the year 1997 as EBG by the joint efforts of the European Commission and the European Business community in India. Since then, EBG has come a long way to be recognised by the Government of India and the European commission as the industry advocacy group representing interests of the European companies in India. EBG Federation is supported by the Delegation of the European Union to India and represents the 27 Member States of the European Union, United Kingdom as well as accession countries and its partners in European Economic Area (EEA). The EU Ambassador is the Patron of the EBG Federation. Currently, EBG has Chapters in Delhi, Mumbai, Bangalore and Chennai with approx. 170 companies as members. The primary objective of EBG is to actively support the growth in Indo-European trade relations, become the most relevant advocate for European businesses in India. (http://ebgindia.com/Index.aspx).

IET IoT Panel

The IET office started operations in India in 2006, in Bangalore. Today, they have over 13,000 members and have the largest membership base for the IET outside of the UK. Its vision is to become the most relevant and therefore the most preferred institution for engineering and technology professionals in India. Given the increasing global importance of India as an engineering hub its aim is to make an impact that has relevance both locally and internationally. Its strategy is to make a meaningful impact on the overall competency and skill levels within the Indian engineering community and play an influencing role with industry in relation to technology innovation and solving problems of public importance. The technologies that IET IoT Panel has chosen to focus on are:

a) The Internet of Things (IoT)
b) Future of Mobility and Transport

To drive this focus forward, it has created volunteer-led panels for each. (http://theiet.in/IET-India).

India Smart Grid Forum (ISGF)

ISGF is a Public Private Partnership initiative of Ministry of Power (MoP), Government of India for accelerated development of smart grid technologies in the Indian power sector. Mandate of ISGF is to advise government on policies and programs for promotion of Smart Grids in India, work with national and international agencies in standards development and to help utilities, regulators and the Industry in technology selection, training and capacity building. ISGF work closely with government institutions such as CEA, CPRI, CERC, NSGM and NCIIPC; ministries such as MNRE, DoT, MoUD, MoHI etc. and other stakeholders like state governments, electric utilities and electricity regulatory commissions. With 200+

members comprising of ministries, utilities, technology providers, academia and research, ISGF has evolve as a Think-Tank of global repute on Smart Grids and Smart Cities. (http://www.indiasmartgrid.org/index.php).

Broadband India Forum

Broadband India Forum (BIF) works exclusively to enhance the potential of the entire ecosystem to deliver broadband across the whole of India. With a mission that BIF to be one of the most competent, credible and respected institution in the sector dedicated to Broadband Thought Leadership and exponential expansion of the eco system. BIF is working to help propel the nation to achieve the ambitious vision of our Honorable Prime Minister of creating a Digital India. To achieve this, BIF works to promote the rapid development of affordable and high-speed broadband throughout the country on a technology-neutral basis through the development of the entire broadband eco-system. The Forum's membership comes from all parts of the eco-system, including Technology Providers, Telecom Operators, Internet Service Providers, Cable TV Operators, Value-Added Service Providers and seasoned Industry professionals who are familiar with different technologies, operations, regulations and policies. (http://www.broadbandindiaforum.com/)

m2miot paper

Inaugurated in April 2013, www.m2m2iotpaper.com is a world-class news and resource portal of latest machine-to-machine (m2m) and internet of things (IoT) information. m2m2iotpaper.com is an initiative in the domain of machine-to-machine (m2m) and internet of things (IoT) technologies and its applications on key Industry Verticals namely, Agriculture, Automotive, Automation, Electronics, Healthcare, Oil & Gas, Security, Supply Chain, Telecom, Transportation, Telematics, Utility and a dedicated section on Smart Cities. m2m2iotpaper.com has very high-quality collection of resources and references such as; articles, case studies, white papers, videos, interviews and events from across verticals of the machine-to-machine (m2m) and internet of things (IoT) eco-system and value chain. The portal is an interactive medium for machine-to-machine (m2m) and internet of things (IoT) stakeholders to connect through several innovative mediums like Facebook, Google+, LinkedIn, Meet-up and Twitter.

9. News and Social Media Coverage

- https://www.facebook.com/Getmeexperts/posts/1453565708086457
- https://twitter.com/Get_Me_Experts/status/979642713808166912
- https://www.linkedin.com/feed/update/urn:li:activity:6385415979660304384
- https://www.facebook.com/events/157998168209103/
- https://www.youtube.com/watch?v=g4rPiAP3VgQ
- https://www.facebook.com/Getmeexperts/posts/1456424391133922
- https://twitter.com/Get_Me_Experts/status/980771789365116929
- https://www.linkedin.com/feed/update/urn:li:activity:6386533335350513664
- https://www.facebook.com/Getmeexperts/posts/1459120420864319

- https://twitter.com/Get_Me_Experts/status/981848276243767296
- https://www.linkedin.com/feed/update/urn:li:activity:6387612170670182400
- https://www.facebook.com/Getmeexperts/posts/1462722187170809
- https://twitter.com/Get_Me_Experts/status/983223007714852865
- https://www.linkedin.com/feed/update/urn:li:activity:6388987577822736384
- https://www.facebook.com/Getmeexperts/posts/1463572600419101
- https://twitter.com/Get_Me_Experts/status/983564033130348544
- https://www.linkedin.com/feed/update/urn:li:activity:6389334535791833088
- https://www.facebook.com/Getmeexperts/posts/1464784763631218
- https://twitter.com/Get_Me_Experts/status/984041078180331520
- https://www.linkedin.com/feed/update/urn:li:activity:6389804691945029632
- https://www.linkedin.com/pulse/standards-iot-m2m-ecosystem-euinstandards-get-me-experts/
- https://www.facebook.com/Getmeexperts/posts/1467514866691541
- https://twitter.com/Get_Me_Experts/status/985032305973444610
- https://www.linkedin.com/feed/update/urn:li:activity:6390808088022212608
- https://tv-gme.blogspot.com/2018/04/meet-speaker-mrs-surina-rajan-director.html
- https://tv-gme.blogspot.com/2018/04/speaker-for-3rd-indo-european.html
- https://tv-gme.blogspot.com/2018/04/joaquim-nunes-de-almeida-speaker-of-3rd.html
- https://tv-gme.blogspot.com/2018/04/simon-hicks-speaker-of-3rd-indo.html
- https://tv-gme.blogspot.com/2018/04/latest-updates-in-area-of-electric.html
- https://tv-gme.blogspot.com/2018/04/cybersecurity-for-iot-ecosystem-3rd.html
- https://tv-gme.blogspot.com/2018/04/3rd-indo-european-conference-on.html
- https://plus.google.com/u/1/101961831126159264297/posts/K7Qy9U6Ncja
- https://plus.google.com/u/1/101961831126159264297/posts/frrapcqWy83
- https://plus.google.com/u/1/101961831126159264297/posts/9SDkzAiUGYM
- https://plus.google.com/u/1/101961831126159264297/posts/XS1RVNenJAp
- https://plus.google.com/u/1/101961831126159264297/posts/VDAE7MZC5kd
- https://plus.google.com/u/1/101961831126159264297/posts/6bryfeife5a
- https://www.getmeexperts.com/blog/detail/Get-Me-Experts-3rd-Indo-European-conference-on-Standards--Emerging-Technology-EUINStandards-euroindostandards
- https://www.getmeexperts.com/pages/teaser/SESEI-Speaker-Simon-Hicks-ETSI-General-Assembly-Chairman,-UK---DCMS
- https://www.getmeexperts.com/pages/teaser/Speaker---Mrs-Surina-Rajan,-Director-General,-Bureau-of-Indian-Standards
- https://www.getmeexperts.com/pages/teaser/3rd-Indo--European-Conference-on-Standards-&-Emerging-Technology
- http://tv-gme.blogspot.com/2018/04/sesei-is-organizing-3rd-indo-european.html
- http://tv-gme.blogspot.in/2018/04/3rd-indo-european-conference-standards.html
- https://plus.google.com/u/0/+NipunSourishiya/posts/9bbMREWasGo
- https://plus.google.com/u/0/+NipunSourishiya/posts/chWQBp2Rha7
- https://plus.google.com/u/0/+NipunSourishiya/posts/NWpK14gPAqV
- https://plus.google.com/u/0/+NipunSourishiya/posts/fqS5AT4CFe4
- https://plus.google.com/u/0/+NipunSourishiya/posts/j4dUBBWwa52
- https://plus.google.com/u/0/+NipunSourishiya/posts/XRAUzL89fcS
- https://plus.google.com/u/0/+NipunSourishiya/posts/TuXxe45oJhx

- https://plus.google.com/u/0/+NipunSourishiya/posts/YYYgXfWgrXW
- https://medium.com/@nipun.sourishiya/3rd-indo-european-conference-standards-and-emerging-technology-iot-m2m-ecosystem-dd5155216fd
- https://medium.com/@nipun.sourishiya/sesei-is-organizing-3rd-indo-european-conference-on-standards-and-emerging-technology-iot-m2m-24a4e41d1868
- https://www.linkedin.com/pulse/3rd-indo-european-conference-standards-emerging-iot-sourishiya/
- https://zanycupcakeking.tumblr.com/image/172954026496
- https://zanycupcakeking.tumblr.com/post/172953976496/3rd-indo-european-conference-standards-and?is_related_post=1
- https://github.com/sourishiya/numerology/wiki/SESEI-is-organizing-3rd-Indo---European-Conference-on-Standards-and-Emerging-Technology-(IoT-&-M2M-Ecosystem)
- https://www.evernote.com/shard/s419/sh/87ec4ee1-2d2f-4d16-8c4c-439b67784970/0d4a8af77a8658acfc9c30b1cbe4fa15
- http://tv-gme.blogspot.in/2018/04/currently-india-is-fastest-growing.html
- http://articles.pubarticles.com/how-to-participate-in-3rd-indo-european-conference-on-standards-and-emerging-technology-1523963508,1747995.html
- https://medium.com/@nipun.sourishiya/3rd-indo-european-conference-on-standards-and-emerging-technology-by-sesei-cyber-security-iot-ab563fc91e54v
- https://plus.google.com/u/0/+NipunSourishiya/posts/FFbsB1kUqmB
- https://plus.google.com/u/0/+NipunSourishiya/posts/S4kBjpNpBuM
- https://plus.google.com/u/0/+NipunSourishiya/posts/GhAMagvR2uv
- https://plus.google.com/u/0/+NipunSourishiya/posts/P5TG1kXrN6m
- https://zanycupcakeking.tumblr.com/image/173026670696
- https://zanycupcakeking.tumblr.com/post/173026723436/since-the-early-1960s-india-and-europe-both-are
- https://www.facebook.com/Getmeexperts/posts/1471080869668274
- https://twitter.com/Get_Me_Experts/status/986462505395539969
- https://www.linkedin.com/feed/update/urn:li:activity:6392229311763578880
- https://www.getmeexperts.com/index.php?/pages/teaser/H.E.-Tomasz-Kozlowski-
- https://www.getmeexperts.com/index.php?/blog/detail/Get-Me-Experts-H.E.-Tomasz-Kozlowski---Ambassador-of-the-European-Union-to-India-and-Bhutan
- https://plus.google.com/u/0/101961831126159264297/posts/81EZFYEA3Sx
- https://www.articleyard.com/3rd-indo-european-conference-on-standards-and-emerging-technology-by-sesei
- https://www.slideshare.net/sourishiya/3rd-indo-european-conference-on-standards-and-emerging-technology-by-sesei-euinstandards
- https://www.linkedin.com/pulse/standards-iot-m2m-ecosystem-euinstandards-get-me-experts
- https://www.youtube.com/watch?v=15A1bhgJ6ho
- https://www.youtube.com/watch?v=-h9nInr3VdI&t=152s
- https://www.youtube.com/watch?v=PwJQxjhXZig&t=406s
- https://www.youtube.com/watch?v=FuEVlYCPjC8&t=133s
- https://www.youtube.com/watch?v=xWXrsKeb6-4&t=154s
- https://www.youtube.com/watch?v=nizitj2tPiE&t=301s
- https://www.youtube.com/watch?v=rPR6ZWWp6NI&t=158s
- https://www.youtube.com/watch?v=m7j3skNk7EU

- https://www.youtube.com/watch?v=HxKn7CUl9n0&t=1s
- https://www.youtube.com/watch?v=XYgf1UyJK1Y&t=25s
- https://www.youtube.com/watch?v=HSPQ6GFpnxw&t=28s
- https://www.youtube.com/watch?v=ev-COnjKMbE&t=74s
- https://www.youtube.com/watch?v=C0TczMu74AE&t=44s
- https://www.youtube.com/watch?v=jmO7ty2pp9M
- https://www.youtube.com/watch?v=XiKdzUxCRRo&t=174s
- https://www.youtube.com/watch?v=BFjJYK-ZOdo&t=164s
- https://www.youtube.com/watch?v=MNt04OU8qO8&t=266s
- https://www.youtube.com/watch?v=4slTzyCsaMc&t=176s
- https://www.youtube.com/watch?v=8Az_G0vV_eY&t=276s
- http://tv.gme.network/tv/video/Get-Me-Experts-Indo-European-Collaboration-for-Standards-in-Electrotechnical-domain--Wim-De-Kesel--CENELEC
- http://tv.gme.network/tv/video/Get-Me-Experts-LVDC---in-Indian-Context--Vimal-Mahendru--IEC-Ambassador--Legrand--EUINStandards
- http://tv.gme.network/tv/video/Get-Me-Experts-Smart-Cities-Learning-Interoperability--Christophe-Colinet--Mairie-de-Bordeaux
- http://tv.gme.network/tv/video/Get-Me-Experts-Limerick-Smart-City---Implementation-insights--Mihai-Bilauca--EUINStandards
- http://tv.gme.network/tv/video/Get-Me-Experts-EFTA---Role-in-bringing-Standards--Ms-Gudrun-Rognvaldardottir--EFTA-EUINStandards
- http://tv.gme.network/tv/video/Get-Me-Experts-Role-of-DG-Grow-in-EU-Standards--Silvia-Vaccaro--Policy-Officer-Standardisation--EUINStandards
- http://tv.gme.network/tv/video/Get-Me-Experts-How-Standardization-can-help-in-Innovation--Emilio-Gonzalez--EC-DG-CONNECT--EUINStandards
- http://tv.gme.network/tv/video/Get-Me-Experts-ETSI--Telecom-Standards--Simon-Hicks--Chairman-ETSI-General-Assembly--EUINStandards
- http://tv.gme.network/tv/video/Get-Me-Experts-OneM2M-Project--ETSI--Adrian-Scrase--ETSI-CTO--EUINStandards
- http://tv.gme.network/tv/video/Get-Me-Experts-Cyber-Security-in-IoT--Narang-N-Kishor--Narnix-Technolabs--EUINStandards
- http://tv.gme.network/tv/video/Get-Me-Experts-Telecom-Standards--Indo-European-collaboration--Pamela-Kumar--Director-General-TSDSI
- http://tv.gme.network/tv/video/Get-Me-Experts-Technological-development-in-EV--Rashmi-Urdhwareshe--Director-ARAI
- http://tv.gme.network/tv/video/Get-Me-Experts-IoT-Infrastructure---Challenges--Opportunities--T-V-Ramachandran--Global-Advisor---IET-IoT-Panel
- http://tv.gme.network/tv/video/Get-Me-Experts-Smart-Grid---Challenges--Arun-K-Mishra--Director-NSGM--EUINStandards
- http://tv.gme.network/tv/video/Get-Me-Experts-Smart-Electrification--Mustafa-Wajid--MD--CEO--MEHER-Group--EUINStandards
- http://tv.gme.network/tv/video/Get-Me-Experts-IoT-Solutions-on-Smart-cities-Bipin-Pradeep-Kumar--Co-founder--Gaia-Smart-Cities--EUINStandards
- http://tv.gme.network/tv/video/Get-Me-Experts-Development-of-IoT-Ecosystem--Dr-Rishi-Bhatnagar--Chairman-IET-IoT-Panel

- http://tv.gme.network/tv/video/Get-Me-Experts-Electric-Vehicle-Growth-sync-with-Renewable-Energy-Growth--Anil-Srivastava--Niti-Aayog
- http://tv.gme.network/tv/video/Get-Me-Experts-How-to-create-success-story-on-Electric-Vehicle Ecosystem--Surya-Jeedigunta--Smart-Cities-Expert
- https://www.linkedin.com/feed/update/urn:li:activity:6397701740795392000
- https://www.linkedin.com/feed/update/urn:li:activity:6397785860049338368
- https://www.linkedin.com/feed/update/urn:li:activity:6399971227162767360
- https://www.linkedin.com/feed/update/urn:li:activity:6399933677119344640
- https://www.linkedin.com/feed/update/urn:li:activity:6400204892086067200
- https://www.linkedin.com/feed/update/urn:li:activity:6400297345061351424
- https://www.linkedin.com/feed/update/urn:li:activity:6402827811597451264
- https://www.linkedin.com/feed/update/urn:li:activity:6401695282697994240
- https://www.linkedin.com/feed/update/urn:li:activity:6401728917203456000
- https://www.linkedin.com/feed/update/urn:li:activity:6402842980771823616
- https://www.linkedin.com/feed/update/urn:li:activity:6403116655764955136
- https://www.linkedin.com/feed/update/urn:li:activity:6403126191284420609
- https://www.linkedin.com/feed/update/urn:li:activity:6403138240492199936
- https://www.linkedin.com/feed/update/urn:li:activity:6403184536066326528
- https://www.linkedin.com/feed/update/urn:li:activity:6403240419278315520
- https://www.linkedin.com/feed/update/urn:li:activity:6400309921463799808
- https://www.linkedin.com/feed/update/urn:li:activity:6403196781563338752
- https://www.linkedin.com/feed/update/urn:li:activity:6403945954864652289
- https://www.linkedin.com/feed/update/urn:li:activity:6403949410643996672
- https://tv-gme.blogspot.in/2018/05/indo-european-collaboration-for.html
- https://tv-gme.blogspot.in/2018/05/lvdc-in-indian-context-vimal-mahendru.html
- https://tv-gme.blogspot.in/2018/05/smart-cities-city-of-bordeaux_20.html
- https://tv-gme.blogspot.in/2018/05/limerick-smart-city-implementation.html
- https://tv-gme.blogspot.in/2018/05/efta-role-in-bringing-standards-ms.html
- https://tv-gme.blogspot.in/2018/05/role-of-dg-grow-in-eu-standards-silvia.html
- https://tv-gme.blogspot.in/2018/05/smart-cities-city-of-bordeaux_20.html
- https://tv-gme.blogspot.in/2018/05/etsi-telecom-standards-simon-hicks.html
- https://tv-gme.blogspot.in/2018/05/onem2m-project-etsi-adrian-scrase-etsi.html
- https://tv-gme.blogspot.in/2018/05/cyber-security-in-iot-narang-n-kishor.html
- https://tv-gme.blogspot.in/2018/05/telecom-standards-indo-european.html
- https://tv-gme.blogspot.in/2018/05/technological-development-in-ev-rashmi.html
- https://tv-gme.blogspot.in/2018/05/iot-infrastructure-challenges.html
- https://tv-gme.blogspot.in/2018/05/smart-grid-challenges-arun-k-mishra.html
- https://tv-gme.blogspot.in/2018/05/smart-electrification-mustafa-wajid-md.html
- https://tv-gme.blogspot.in/2018/05/iot-solutions-on-smart-cities-bipin.html
- https://tv-gme.blogspot.in/2018/05/development-of-iot-ecosystem-dr-rishi.html
- https://tv-gme.blogspot.in/2018/05/electric-vehicle-growth-sync-with_15.html
- https://tv-gme.blogspot.in/2018/05/how-to-create-success-story-on-electric.html
- https://plus.google.com/u/0/s/%23EUINStandards/posts
- https://plus.google.com/u/0/114965357741775049895/posts/bfD6erhMhMn
- https://plus.google.com/u/0/114965357741775049895/posts/45koYVSdk1G

- https://plus.google.com/u/0/114965357741775049895/posts/BK8qR3gkM3h
- https://plus.google.com/u/0/114965357741775049895/posts/SVF6YUbPtyB
- https://plus.google.com/u/0/114965357741775049895/posts/ApMeNdNz72W
- https://plus.google.com/u/0/114965357741775049895/posts/fEsyZPS2A8b
- https://plus.google.com/u/0/114965357741775049895/posts/gNQuHC4j3u3
- https://plus.google.com/u/0/114965357741775049895/posts/GY7dRnHBFd2
- https://plus.google.com/u/0/114965357741775049895/posts/AiCbp98X22u
- https://plus.google.com/u/0/114965357741775049895/posts/WM5y9a66eBC
- https://plus.google.com/u/0/114965357741775049895/posts/ENLU8k8PKw8
- https://plus.google.com/u/0/114965357741775049895/posts/CGtT7movEmc
- https://plus.google.com/u/0/114965357741775049895/posts/C494aKZEX2R
- https://plus.google.com/u/0/114965357741775049895/posts/e6xjxJffzBm
- https://plus.google.com/u/0/114965357741775049895/posts/MK86Ki481Gr
- https://plus.google.com/u/0/114965357741775049895/posts/UGPadLQwS73
- https://plus.google.com/u/0/114965357741775049895/posts/GrLjWUwxHJm
- https://plus.google.com/u/0/114965357741775049895/posts/HdQw5zH74c7
- https://plus.google.com/u/0/114965357741775049895/posts/geLNMF7T1Fe
- https://www.facebook.com/adbhut.kriti
- https://www.facebook.com/Getmeexperts/
- https://twitter.com/Get_Me_Experts
- https://in.pinterest.com/tvgme/3rd-indo_european-conference-on-standards-and-emer/

For more information including copy of presentations, study report downloads, Picture Gallery etc. around 3rd "EU-INDIA conference on Standards and Emerging Technology" please visit here

- **http://www.cii-iq.in/Indo_European_Conference.php?page=Indo_European_Conference_on_Standards**

10. Annexure 1: Detailed session proceeding

Session 1: Plenary Session

Session Moderator

Mr. Dinesh Chand Sharma – SESEI Expert

Welcome Address (Speakers)

Mr. Wim De Kesel - *VP Policy, CENELEC*
Ms. Pamela Kumar - *DG TSDSI*
Mr. Simon Hicks - *Chairman GA, ETSI*
Shri. Vipin Tyagi - Executive Director, Centre for Development of Telematics (C-DoT)
Mr. Joaquim Nunes de Almeida – *Director, Single Market Policy, Regulation and Implementation, European Commission, DG GROW*
Smt. Surina Rajan – *DG, Bureau of Indian Standards (BIS)*
H.E. Tomasz Kozlowski - *Ambassador and Head of Delegation of the EU to India*
Shri Anup Wadhawan - *Special Secretary, Ministry of Commerce*

Vote of Thanks

Mr. Anupam Kaul, *CII*

Key Takeaways of the Addresses by the dignitaries in the Plenary Session

---

Mr. Dinesh Sharma
Director - Standards & Public Policy EU Project SESEI

- Introduction, objectives and deliverables of Project SESEI.
- Importance of standards in trade, symbolic of commonality between buyers and sellers.
- Stressed on the importance of harmonization and adoption of standards.
- Convergence and technological evolution for non-ICT stakeholders making use of ICT.
- Emphasized shifting of paradigms to the smart paradigms be it the Mobility, Homes, Building, Cities or any other Transport etc.
- Project SESEI is focused on collaboration between India & EU on Smart Energy, M2M, ICT etc.
- Imperatives of the study reports being released and focus on gaps & challenges addressed in the study reports.
- Cooperation and stronger ties amongst India & EU is critical

---

Mr. Wim De Kesel
Vice-President Policy, CENELEC

- CEN & CENELEC – EU standardization & Regulations initiatives since 2005 and their role in digital transformation
- Inclusive approach in standard development for European market.
- Ambition 2020 –
  - Foster active engagement of experts in Standardization.
  - Strengthened relations with IEC/ISO.
- Active engagement through projects to bring harmonization of standards across various industries.

- MOU with India to bolster collaboration.
- Role of innovative technologies like Big Data, 5G, Cloud Computing, Cyber Physical Systems, IoT, AI etc. in Digital Transformation of the Infrastructures & Society.

Ms. Pamela Kumar
Director General, TSDSI
& Founder Chair & Vice President, Cloud Computing Innovation Council of India

---

- Standards have a different paradigm in ICT, as ICT standards are defined before the emergence of new technology in order to lay a pathway unlike all the other areas of technology.
- Convergence of technologies, like IT and Communication have taken a new Avtar in the name of IoT, encompassing the areas of Automation, Automotive, Life & Business etc. This has led to operations facilitation: Healthcare innovation in one but delivery and infusion of the same is another.
- New technologies in India lead to a paradigm/fundamental shift unlike other developed countries where it happens like an incremental shift. An example - intelligent transport in Barcelona will be different from intelligent transport in New Delhi.
- Developing real standards is quite resource intensive
- Participation, understanding challenges and then developing standards, should be the way to go about it.

Mr. Simon Hicks,
Chairman
ETSI General Assembly

- India's major interest in Digital Technologies.
- Similarities & differences in the needs of the respective societies in India & Europe.
- 30 years journey of ETSI and its contribution & leadership in Global Standardization in ICT domain.
- Collaboration with other standard development partners for cohesion of different ideas into building solid standards. ETSI's leading role in 3GPP & oneM2M.

- He assured that ETSI offers a global working space that Indian companies can work in but also work with.
- ETSI works closely with TSDSI in India and has extended its cooperation for unified standard development.

Shri. Vipin Tyagi
Executive Director
C-DoT

- Importance of Standardisation in India
  - IPR is owned by people and it's exchanged among people/countries.
  - Standardization helps Connects with right set of people in the respective global ecosystems.
  - Fairness in business and offer products, technologies & services in a common way.
- C-DoT playing an active role in oneM2M & Security standards
- Adoption of OneM2M specifications as common service layer for Smart Cities in India
- IoT in Smart City, Security, Connected Cars, Robots, Drones & AI engines etc.
- Important to understand that standardization is also a political process along with being a technical activity.
- India is open and responsive to standards development.
- India is the largest supplier of Data for the Global Stakeholders of the Digital Paradigm.

Mr. Joaquim Nunes de Almeida
Director, Single Market Policy, Regulation
and Implementation, European Commission, DG – GROW

- Globalization leads to change which in turns further leads to protectionism and finally culminating in closing of national markets.
- EU and India should cooperate as strategic and economic partners.

- Digitization offers benefits indicative of great infusion of technology in markets.
- Single Digital Market in Europe and its ramifications.
- Europe's focus on ITS, as mobility facilitates lives, and its vital role in EU and societies undergoing Digital Transformation.
- European scenario in Energy and the imperatives of Energy Security & Sustainable Energy.
- EU targets 20% decrease in greenhouse gas by 2020 and energy savings increased savings by 20% through renewables.
- Cooperation in standardization is good for India, Europe and the whole world together.

Smt. Surina Rajan
Director General,
Bureau of Indian Standards

- Important for India to be Standards partner besides being trade partner with Europe.
- Role of BIS – being the National Standards Body with statutory status which mandates it to do standardization for India akin to CEN/CENELEC for Europe and map & synchronize with standardization work in ISO & IEC.
- Standardization is at the core of Smart Cities helping them to really be truly smart.
- Current focus and work at BIS in sync with Global SDOs:
  - Smart City Reference Architecture & Smart Infrastructure ICT Reference Architecture
  - LVDC (providing clean access to remote areas through exiting grid connectivity)
- Requirements and needs of developing countries are not well articulated on global and international platforms, which need a special focus by supporting initiatives, but primarily pro-active participation by indian domain experts to participate in global standardization activities.
- Innovation, standardization and Research & Development are the major pillars of development, where India needs to focus and work with renewed impetus.

H.E. Mr. Tomasz Kozlowski
Ambassador and Head of Delegation of the EU to India

- EU and India cooperation in ICT, Energy, Mobility is highly relevant.
- Overview of the forward-looking vision for EU India partnership for next 15 years that has been developed by the two nations last year.
- EU-India partnership on climate change and clean energy that took place two years ago, and has resulted in new and exciting projects on renewable energy, biogas etc.
- Standardization is a classic case of win-win cooperation, as it:
  - Benefits big, small companies and start-ups: with increasing markets
  - Benefit consumers: with interoperable, reliable, safe & secure devices
  - Benefit government and law makers: with improved ease of doing business
- India a key partner because of growth perspectives, great services and new technologies.

Dr. Anup Wadhawan
Special Secretary,
Ministry of Commerce

- Highlighted deep ties shared by India and EU in all dimensions including political, socio-cultural, economic.
- His perspective on standards:
  - Emerging technology in context of standards.
  - Standards need to be science based, risk-based approach in developing standards with a public purpose to be kept in mind.
  - standards provide great opportunity, at the same time, should not become barriers to trade
  - Standards are the key means of promoting welfare of our citizens

- Policymakers need to realize that in the long term we have efficiency in production as an important cornerstone interest & welfare of consumers is also another long-term cornerstone interest that we need to keep in mind.
- Moving beyond standards, certain principles can apply to various aspects that affect modern technologies, emerging technologies especially the digital area, in the IT area, telecommunications area, including things like data flows, things like movement of professionals.
- All aspects need to be seen in the perspective of regulatory concerns related to safety, security, and public health.
- Balance those with a risk-based approach; balance those with a need to promote engagement, to reduce barriers, to enhance welfare of citizens.

Vote of Thanks:

Mr. Anupam Kaul
Principal and Head, QMS, Institute of Quality, Confederation of Indian Industry
presented the vote of thanks to the dignitaries on the dais.

Session 2: Release and presentation of three study reports

Presenters:

- **Mr. Narang N. Kishor,** *Study Report Author (CII): ICT: M2M/IoT & its role in Smart Cities and Cyber Security*
- **Mr. Dibyendu Sengupta**, *Study Report Author (EBTC): Automotive: Electric mobility and ITS*
- **Mr. Mustafa Wajid**, *Study Report Author (IET IoT Panel): Smart Energy: Smart Grid, Smart Meter, LVDC, Micro Grid*

Mr. Narang N. Kishor
Technology Philanthropist, Innovation & Standardization Evangelist - Narnix Technolabs

ICT: M2M/IoT & its role in Smart Cities and Cyber Security

The study report covers essentially 4 broad areas:

- M2M/IoT Eco-System, Market Dynamics & Potential
- Policy Initiatives & Standardization
- Gaps & Challenges
- Conclusions and Recommendation

- To set the context, need to understand the challenges that we as a society are facing today? Our major challenge is digitalization & the kind of data that this is going to generate in the coming times.
- Some of the numbers – for internet population are astonishing. Out of 7.5 billion of planet earth's population we have about 3.8 billion internet users. Out of them 2.8 billion are active social media users, 4.9 billion are unique mobile users & 2.6 billion are active mobile social media users. Data generated is currently 2.5 petabytes per minute.
- In a given scenario with implementation of IoT, it will further complicate the digital world. With over 3.4 million things that will be added to internet every minute by 2020.
- In market dynamics, the report covers the following aspects:

- Connectivity & M2M/IoT
- M2M/IoT & Roll Out of 5G Networks
- Common Service Layer

- Application Protocols and Messaging Middleware
- Cloud, Big Data & Analytics
- M2M/IoT Networks – Security
- M2M/IoT in Smart Cities & Smart Infrastructure
- M2M/IoT Industry Growth in India - Key Drivers
- Adoption of M2M/IoT in India
- Communication and Network Infrastructure
- M2M/IoT - Technology Innovations
- M2M/IoT – Readiness of Major Indian Operators

- M2M essentially was, and, in the industrial parlance *is,* still application-specific machine-to-machine communication with very definite functionality and expectations, with a controlled mode of communication. While IoT could be termed as its next avatar, it is going to see a whole set of new avatars in next few years and decades.
- Some define it as a vague and generalized glossy scenario of Smart Buildings, Smart City, Smart Lighting, Smart Grid, Smart Health and Industrial Automation Systems & Solutions. Some other define IoT as telemetry-like services over cellular network. Another group defines at as a One Box Solution for each Home.
- The developments in the last few decades in the pervasive embedded processing and revolutions in communication and sensors technologies have catapulted the homogenous M2M networks into heterogeneous global neural networks of “aware” and interconnected devices with unique IDs, interacting with other machines/objects, infrastructure, and the physical environment.
- The IoT value chain is perhaps the most diverse and complicated value chain of any industry or consortium that exists in the world. In fact, the gold rush to IoT is so pervasive that if you combine much of the value chain of most industry trade associations, standards bodies, the ecosystem partners of trade associations and standards bodies, and then add in the different technology providers feeding those industries, you get close to understanding the scope of the task.
- In this heterogeneous scenario, coming up with common harmonized standards is a major hurdle.
- The study report enumerates the importance of common service layer framework for interoperability. Global efforts to bring some harmonization & homogenization under the aegis of oneM2M in common service layer have come up with a standardized way of defining multiple common service functions. The 12 CSFs have been standardized.
- Security is of paramount importance in IoT & ICT ecosystem because of the heterogeneity of IoT paradigm itself bringing unforeseeable complexities. It is imperative to emphasize on an intrinsic security approach & a comprehensive security architecture.
- The report also discusses IoT in context with smart cities & smart infrastructure. There are 24 important aspects in a smart city that our Ministry of Housing & Urban Affairs identified are the right candidate for ICT & IoT opportunities.
- India itself is going to need about 5-10 billion communication modules to be integrated into smart sensors, controllers & 10-50 million gateways that shall be needed to operate & maintain nationwide critical infrastructure that needs to be deployed. These figures are for the infrastructure vertical only, not considering consumer, industry, enterprises applications.
- The kind of volume (4-5 Billion) that we are looking at within India itself, will surpass the mobile market that we are getting so bullish about for last few years.

- The report also provides details on policy on IoT and M2M, i.e. National Telecom Policy, the M2M Roadmap that DOT released quite some time back.
- Under Policy & standardization initiatives, study report provides detail on:
  - Government Policies on M2M/IoT- Centre and States
  - National Telecom Policy
  - National Telecom M2M Roadmap
  - IoT Policy – Centre and States
  - M2M/IoT standardization
  - Convergence of Vertical and Horizontal Standardization
  - European Telecommunications Standards Institute (ETSI)
  - Current Policy & Standardization Activities in India
  - BIS LITD 27
  - BIS LITD 28
  - TSDSI
  - MoC/TEC & MoC/WPC
  - TRAI
  - MeitY
  - Testing and Certification
- The study report also maps the convergence of horizontal & vertical standardization paradigm in the global market & ETSI 's approach that India needs to learn from.
- It also enumerates the current policy & standardization initiatives in India. The committees addressing the different aspects of the policy, standardization & other regulatory aspects.
- Another interesting thing is when we try to map the IoT paradigm to the smart cities or smart infrastructure these are some supposed to be the 4 pillars for any smart city or smart infrastructure & we realize that the application need stake as part of the legal requirement to derive value from different infrastructure pillars but the ICT & IoT backbone remain same or should remain the same in smart city paradigm.
- That means there is scope for formalization, standardization, unification & in BIS smart infrastructure sectional committee LITD 28 we have done some work on these lines & our pre-standardization study report talks about this particular architecture called Classic Soccer Champagne Glass Architecture.
- The evolved comprehensive unified ICT architecture is modelled as Classic Soccer Champagne Glass Architecture. The wide flat bottom base depicting the multitude of field devices & sensors, etc. The saucer shaped bowl on the top depicting being filled with an ever-increasing spectrum of city applications and citizens' services. The long stem depicts all the common layers viz.: unified last mile communication, common service layer representing the common service functions in the gateways, as well as, in the cloud… and the smart city middleware & city data reservoir in the cloud.
- In BIS Smart Infrastructure Sectional Committee LITD 28 has undertaken a pre-standardization study on ICT & IoT Architectures in context of Smart Cities and identified the Common Layers which are strong candidates for Unification, Harmonization & Standardization. The evolved Comprehensively Unified ICT Architecture has been modelled as a **"Classic Saucer Champagne Glass"** with a **wide Flat Bottom Base** depicting the multitude of Field Devices & sensors etc. The **Saucer Shaped Bowl** on the Top depicting being filled with an ever-increasing spectrum of City Applications and Citizens' Services. The **Long Stem** depicts all the **Common Layers** viz.: The Unified Last Mile Communication, Common Standardized Gateways (application or Vertical Agnostic), Common Service layer

representing the Common Service Functions in the **Gateways**, as well as, in the **Cloud**… and the Smart City Middleware & City Data Reservoir in the Cloud.

- It is the "Long Stem" of the **"Champagne Glass Model"** instead of the short & narrow neck in the "hourglass model" that brings the comprehensive harmonization, standardization & interoperability in the architecture leading to optimization in operational efficiency & life cycle cost of the ICT infrastructure in any smart city.
- The study has identified some gaps & challenges & which were discussed in detail during panel discussion session.
  - IoT Paradigm & Challenges
  - Challenges in fast growth of IoT
  - Service provider challenges
  - The Security aspect of the IoT
  - Current Challenges in Smart Cities including Smart Infrastructure
  - Other important Smart City issues
  - Standardization Imperatives
- The study report has also enumerated a few conclusions and recommendations:
  - Convergence of the multitude of stakeholders of the IoT ecosystem to **common standards** is essential for the wide acceptance of the IoT wave by the masses.
  - There is an immediate need to develop/adopt standardized frameworks and architectures to bring comprehensive inter-operability in this heterogeneous, diverse and fragmented ecosystem
  - It is imperative to standardize a Common Service Layer in the heterogeneous world of M2M/IoT to bring interoperability.
  - The key to unified smart infrastructure adoption by the diverse stakeholders shall also lie in the design of the Standards based Gateways (or Data Concentrator Units) with Standardized Common Service Functions.
  - In face of the increased vulnerabilities due to the large Attack Surface Area in the M2M/IoT paradigm it's imperative to move from the "EXTRINSIC SECURITY" (Add on Security) paradigm to an "INTRINSIC SECURITY" (Security by Design) paradigm.
  - A successful IoT security shall require a multi-layered approach to design new systems based on secure software and architectures.
  - It would be critical to comprehensively address the challenges created by IoT in the integrity & confidentiality of the data and privacy of an individual.
  - A key imperative is creating standards awareness among policy makers, planners, utility suppliers and service providers.
  - Harmonization of Policies, Regulations & Standards.
- In conclusion, the study report highlights the importance of National & Global Co-ordination & Collaboration.
  - To keep pace with the global developments in Technology & Standards Indian Stakeholders must leverage the initiatives, best practices & work done in Global & Regional SDOs and collaborate closely to speed up the adoption and implementation of required Standards and best practices.
  - BIS and TSDSI to work in close collaboration and synchronization; and BIS to adopt the relevant TSDSI deliverables as National Standards.
  - MoC, MeitY, TSDSI, BIS and all other ecosystem stakeholders to leverage the initiatives of the **"Project SESEI"** by **EU** and another platform such as "India-EU Cooperation on ICT-Related Standardization, Policy and Legislation" to co-operate and collaborate on areas of mutual

interests like M2M/IoT, Security, 5G, NFV/SDN and ensure that Indian stakeholders are technologically at par with global technology advancements.
- Learn from best practices in Standardization, Policies & Regulations from European Union initiatives; and emulate them by constituting High Level Co-ordination groups on important focus areas to harmonize and share the Standardization and other relevant activities in individual National SDO or Industry Bodies.

Click here to download presentation of study report on ICT covering M2M/IoT & its role in Smart Cities and Cyber Security.

Mr. Dibyendu Sengupta
Advisor – Transport Cluster
European Business and Technology Centre

Automotive: Electric mobility and ITS

- The all-encompassing issue for transport professionals has been sustainability and its links with energy, environment and economic growth. This is particularly true with respect to the developing world. Most cities in India have seen an exponential growth in number of vehicles on the road in the last two decades. The high growth rate of population and motor vehicles simultaneously has led to this greater complexity of vehicular traffic and consequent increasing rates of congestion and number of accidents.
- Why are electric mobility & Intelligent Transport Systems (ITS) so important? Because they offer 2 very different ways to attain sustainability in the transport area, the transport market. Both offer potential of improving energy efficiency, reducing emissions. ITS also offers potential of improving traffic management, safety operations in the entire transport sector. So, both of these areas have lot of potential & in improving some of the challenges that India faces at this point were rapid motorization & automotive market.
- This study report looked at the sectors electric mobility & ITS individually their market dynamics, policy initiatives & standardization aspects of both of these sectors. It also defined the opportunities & challenges, have the stakeholders examined both of these sectors from policy & standardization aspects.
- The study report then finally distilled the entire information in the form of way forward, recommendations & conclusions, gaps were existing in these 2 areas & what is the best way to move ahead & what is the way in which facility between EU & India can actually successfully shape this motive.

- The study report starts with discussing the very commonly used paradigm in the transport sector which is called the ASI which is Avoid Shift Improve & how both electric mobility & ITS offer elements of all the 3 steps of Avoid Shift Improve in improving the various problems that can come up in the transport sector & are quite prevalent in the Indian market.
- The study covers the following aspects of the Intelligent Transport System -
  - Indian ecosystem for ITS
  - ITS for Public Transport Systems
  - Signalization and Traffic Management
  - Electronic Toll Collection
  - Citywide ITS for enforcement and surveillance
  - Parking Management
  - Market dynamics and potential
- Under Electric Mobility chapter it covers –
  - Indian ecosystem for EVs
  - Two- and three-wheelers
  - Hybridization
  - Charging Infrastructure
  - Market dynamics and potential
- Electric Mobility has been in the news of late quite for a bit much more than ITS, for good reasons. Like ITS, E-Mobility also offers a lot of potential in improving the emission issues that the cities of India are facing & reducing dependency on fossil fuels, so it is imperative to understand what's the uniqueness of the Indian automotive market in efforts to adapt E-Mobility. India has a uniqueness like the large market of 2 wheelers & 3 wheelers.
- It's been roughly more than a decade where the highways & roads, the transport market has rapidly evolved, a lot of infrastructure getting dealt & this has brought in a lot of issues mostly in the urban sector but also in the rural sector.
- Globally, the 3 main epicentres of ITS have been the US, the EU, and Japan. Most of the technology development and implementation concerning ITS has happened in these areas.
- The Indian market is quite different due to heterogenous traffic conditions, heavy pedestrian issues, lack of good roads, etc.
- For innovative transport, the future seems quite exciting in India. Despite the scant number of electric vehicles on the roads today, enough progress is being done on the ground for a better future. The electric mobility and ITS initiatives would need to be developed in an integrated manner with peripheral infrastructure and renewable energy sources in order to attain the ultimate goal of energy efficiency and clean environment.
- A slew of incentives and projects have been announced in the last several years, of which many have been kick-started including Smart Cities Mission, FAME and Digital India. Make in India is a GoI initiative to encourage companies to manufacture their products in India and includes aspects like enhancing skill development and protecting intellectual property rights. Among the many sectors, several are related to electric mobility and ITS including Automobile, Automobile Components, Aviation, Roads and Highways, Railways, and Renewable Energy. The Ministry of Housing & Urban Affairs (MoHUA) has also recently announced the Green Urban Mobility Scheme to address urban mobility needs of cities. It covers areas like ITS in public transport, promotion of alternate fuels and electric mobility for environmental benefits and urban freight. Starting from the middle of 2017,

under the new Goods and Services Tax (GST) regime, EVs are being taxed at 12%, compared to 28% for ICE engines.

- At the state level, some states like Maharashtra have announced special subsidies and tax exemptions on EVs and charging stations.
- GoI has already shown its intent in leading from the front by opening a bid for 10,000 EVs for government use. Private players are gearing up, with new ventures with foreign collaborators and start-ups being announced in rapid succession.
- All of the on-going schemes are adding their weight to the burgeoning areas of electric mobility and ITS in India. The availability of widely recognized standards, and compliance to them, will allow vehicle and technology manufacturers to present their products in India and improve on them with changing circumstances. As a caveat, it must be noted that monetary incentives by themselves have not been able to drive the sales of EV in several places like the US and Europe.
- How standardization can help is an important step towards completing electrification of the automotive market & how charging infrastructure or the lack of it in India at this point can be of issue but can also be a lot of potential for the global market.
- The study report also looks at the milestones of the E-Mobility. What has happened in the last couple of decades may be not much except for the last 5-10 years when things have rapidly arrived.
- The market potential of E-Mobility was also looked at, how the growth of the electric vehicle market will be dependent also on the existing internal combustion engine market, how the desire to be seem as the developed nations of the world in terms of transport & automotive can also be big motivator in trying to go towards electric mobility.
- The implementation of ITS and Electric Vehicles (EVs) to alleviate the effects of uncontrolled automotive growth and urbanization have gained ground in the recent past. Two things stand out – that the Indian market is rapidly evolving, and new technologies need the right support to flourish. The study focuses on the use of standardization in paving the way for adoption of these technologies in the nascent Indian market.
- ITS for enforcement & surveillance, a very important issue that has recently come up & finally parking management. The study briefly looked at transport challenges in trying to adopt these technologies to be in the Indian market. Stakeholders obviously need to understand the technologies better to adapt them to the local conditions, interoperability & standardization is of immense importance in this aspect.
- Policies and regulations play an important role in developing the right ecosystem by identifying visions, clarifying objectives and strategic intent and exploring incentives. This supportive ecosystem then indirectly prompts the higher adoption of technologies. The Chapter on Policy initiatives & Standardization enumerates the current status of National & Global Policy initiatives and Standardization activities and its stakeholders in the domains of Intelligent Transport Systems (ITS) and Electric Mobility.
- The chapter on opportunity and challenges in the report also covers crucial aspects like replication issues, contractual and procurement issues, technical issues, coordination and planning, lack of charging infrastructure, consumer acceptance and price sensitivity, supplier base and lack of local manufacturing and financing challenges.
- As a conclusion, it would be fair to state that there is no quick fix to urban transport problems caused by automotive growth. However, if proper resources and infrastructure are developed, sustainable development options are possible. It is in this context that standardization and technology architecture is important.

- Along with other recent initiatives towards easing business in India, it is expected that proper policy formulation and institutional development that take into consideration the standardization aspects of both ITS and EVs, would pave way for a better all-encompassing transport system in Indian cities and a cleaner environment for healthy and liveable cities.
- Standardization is an important activity around the building of an ITS architecture and e-Mobility as it will provide consistency, enhance interoperability and help in expanding market. Developing ITS and e-Mobility technical and service standards are important as it ensures sustainability, compatibility, and capacity to expand ITS services.
- India through its standardization stakeholder community such as BIS, TSDSI, TEC etc. shall more actively participate and engage with global standards development organizations and put forth their local requirements to global platforms such as ETSI, 3GPP, oneM2M. ISO/IEC/JTC1, ITU etc. and get the Indian requirements accepted and harmonized for their standard development and implementation.
- Standardization stakeholder community shall also cooperate and collaborate more with regional Standards Development Organizations (SDOs) directly or through their local chapters such as Project SESEI, India-EU ICT Standardization Collaboration (http://www.indiaeu-ictstandards.in/) to learn, contribute and partner towards creation of global standards. This cooperation and collaboration is potentially valuable for development of indigenous technologies in transport that are suited for the heterogenous traffic conditions of India.
- Based on the study, several opportunities have been outlined which include:
  - Use of ITS technologies for traffic management and traffic control systems, accessibility of public transport, commercial vehicle operations and fleet management, non-motorized transport (NMT) and pedestrians and safety.
  - Use of EVs for electrification of corporate fleets, provision of electric feeder services and battery and motor technologies.
- In order to do that, a three-prong approach has been suggested as follows:
  - Development of physical infrastructure in a way that supports implementation of ITS and electric mobility
  - Development of standards that account for the Indian uniqueness and complexity and ensure interoperability on a global platform
  - Development of technologies focused on ITS and electric mobility that foster energy efficiency and a clean environment
- Several initiatives have already been started to increase cooperation between EU and India in standardization of these technologies. It is hoped that this study will enable further progress in the areas of ITS and EVs between EU and India for harmonizing standards and improving bilateral trade.

Click here to download presentation of study report on Automotive covering Electric Mobility and ITS.

Mr. Mustafa Wajid
Managing Director & CEO
MEHER Group

Smart Energy: Smart Grid, Smart Meter, LVDC, Micro Grid

- The broad purpose of the report is classified into 4 categories:
  - To determine what the current sector profile, future developments & the challenges & opportunities specific to India.
  - To assess the current state of the standards development & policy initiatives within India
  - To identify holistic list of actions for the way forward.
  - To identify areas where cooperation & collaboration amongst India and EU can be strengthened.
- The transformation of the Indian electricity sector has begun. There are a couple of changes that are driving this. One is advanced power electronics which is becoming pervasive in all forms of utilization by the ecosystem. Communication, ICT & IoT have a profound impact on the way of utilities operate and conduct their business.
- The new thought processes of the grid edge technologies that will come into play (comprehensively enumerated in a detailed report published last year by the World Economic Forum) shall define the directions for the Smart Energy Ecosystem in near future.
- Solar energy prices in India have come down to below 3 Rs. /KWh & the storage cost are dipping. They are not dropping as dramatically as expected, yet they are coming down fast enough to disrupt the ecosystem.
- The Electric Mobility is expected to go mainstream. It is against this backdrop India is at an important inflection point.
- India is the 3rd largest producer of electricity. The real time information on what's happening in terms of power generation in India can be seen on a portal & App launched by the Government of India. It gives real time demand, deficits, services available etc.
- However, India has a serious challenge of last mile power delivery. At one level India is power surplus but there are still electricity access issues in some remote areas in India. India is a country where load shedding is used as a planning tool not as an emergency measure.
- Generation & Transmission systems in India are geared towards centralized operation. Significant activity has happened in reducing losses but much more still needs to be done. A new term for calculating & defining the Distribution Losses is used in India - AT&C losses. It is Aggregate Technical & Commercial losses.
- The Government policy in India is power for all. 100% FDI is permitted in the sector, major investments have already been permitted.
- There is a strong push for renewables, emphasis on solar, a strong push for energy efficiency, LED lighting & LVDC based appliances. Effective regulatory mechanisms already in place. India has made a lot of progress in that direction.

- Policies & standards of course need to evolve & harmonize globally to enable economies of scale as India goes forward as harmonization of standards will actually bring down cost.
- The smart energy ecosystem in terms of transmission has been grouped into many areas in the report. The key drivers for transmission in India will be to continue to build capacity & enhance reliability. India has the largest synchronous grid in the world with 5 regions connected at one frequency & this poses lot of challenges.
- The use of new technologies particularly on the digital side & power electronics are expected to minimize impact of disturbances, faults.
- Integration of large scale renewables is going to be an important challenge. India has a plan of 175GW of renewable of which 100GW is going to be solar. Stability of the grid to be maintained when this happens is a new challenge at that scale & therefore there are opportunities to be addressed in that area.
- Application of machine learning & AI is important, it will have to go hand in hand. There is a serious effort on how this can be done. It's a gap today & therefore it's an opportunity for tomorrow.
- In distribution, the challenges are completely different. The key drivers for decision making in India will be to improve profitability, enhance quality of service, customers & improve on safety.
- Lot of solutions particularly using digital & ICT technologies can be used to optimize & make things far more efficient. Corrective measures are needed however, financial health of this sector is poor. The Government is cognizant of this & they have recently announced a scheme to re-balance the financial liability of this sector.
- Deeper application of smart grid technology is a must & there is pervasive push towards smart metering, cloud connectivity & analytics going hand in hand. Efficient operations in the grids technology scenario is extremely vital.
- Integration of rooftop solar, some streamlining issues are there, there is a lot of discussion around tariffs, net metering, monitoring etc.
- Intra urban E-Mobility is going to be an important part of this future in distribution. The utilities in distribution can obviously see a new business model. They can probably take some of the revenue from the oil companies into their fields. That's a major opportunity.
- LVDC & Micro Grids are a completely new paradigm with the drop in renewable energy's production cost, the storage cost dipping & a lot of appliances capable of working on DC not just LED lighting but ceiling fans etc. it is possible to create a micro grid concept working purely on DC provided there is a strong policy & standardization support. This will be a new area, again an area where India can leapfrog.
- Policy initiatives & standardization:
    - Various initiatives have been rolled out, the National Smart Grid Mission, the UJALA Scheme, various amendments to the Electricity Act in India have been taken up.
    - Over the last few years, several distribution utilities are deployed in smart grids & various technologies have been tried but not gone mainstream.
    - Some policies need revision & updating because technology is moving faster than, bandwidth in India is now the cheapest in the world.
    - Some key areas where efforts need to be refocused are Advanced Metering Infrastructure, energy management, power quality control & management as well as outage management.
- In India, Power equipment standards are fairly mature.
- In Conclusion –

- Judicially deploy the technologies that shall enhance reliability & efficiency and enable communication & full visibility.
- Leverage Digital Platforms with AI based Analytics
- Integrate Robust Cyber security mechanisms
- Evolve, develop & harmonize standards in the various areas
- Intensify collaborative efforts in this endeavour to facilitate interoperability & minimize market fragmentation.

Click here to download presentation of study report on Smart Energy covering Smart Grid, Smart Meter, LVDC, and Micro Grid.

Parallel Sessions and Key Take Away

Parallel Session I on: ICT covering M2M/IoT & its role in Smart Cities and Cyber Security

Session 1: Presentations by European and Indian Subject Mater Experts

Key Note Address:

- **Smt. Deepa Tyagi**, DDG Future Networks, Telecom Engineering Centre (TEC)

Moderator:

- **Mr. NSN Murty**, Partner & Leader, Smart Cities

Speakers:

Europe:

- **Mr. Christophe Colinet**, Smart city Bordeaux & Chair Standards & inter-operability Eurocities KSF forum
- **Ms. Margot Dor**, Director Strategy Development, *ETSI*
- **Dr. Mihai Bilauca**, Head of Digital Strategy & EU Programmes, Limerick City & Council, Ireland

India:

- **Shri. Aurindam Bhattacharya**, GL Technical Services, C-DoT
- **Dr. Prashant Mishra**, Scientist TCS Research & Innovation
- **Shri. G. Narendra Nath**, DDG Security, DoT
- **Dr. Rishi Bhatnagar**, Chairman IET IoT Panel

Key Take Aways from the presentation from the Speakers:

Smt. Deepa Tyagi
DDG Future Networks
Telecom Engineering Centre

- Internet and Mobile Communication are two technological revolutions changed the way we live, work & play. They are converging into Mobile Broadband.
- The next wave is about the M2M/IoT and 5G.
- Standards are an enabler for consumers, industry players and government.
- Objectives, activities and deliverables of TEC (Telecom Engineering Centre). Test Labs in TEC for IPv6, SAR and other Telecom Testing requirements.
- Upcoming mandatory testing regime for licensed frequency spectrum (direct network, through gateway) products w.e.f. October 2018.
- DoT's initiative of constituting a High-Level Forum on 5G to facilitate quick deployment of 5G.
- Focus to be on the demand side (consumers) rather than solely the supply side.
- Standardization for the stakeholders with key focus area - Global Standards, India specific National Standards and Harmonization
- Use case labs as a prior activity to standardization for infusing an experience for people of what IoT technology is all about.

Mr. Christopher Colinet
Chairman
ETSI ATTM SDMC
(Sustainable Digital Multiservice for Cities)

- Standardization should not be confused with solely inter-operability. Shared perspective on why Cities need to get involved in Standardization.
- EU approach and initiatives in context of Standardization in Smart Cities:

  - H2020 Lighthouse Project
  - Eurocities – a network of European cities.
  - eG4U - NGO of ICT dedicated to energy management & waste monitoring.
  - Technical committee ATTM focused on Sustainable Digital Multiservice Cities
  - ETSI ISG CIM addressing the context information management.
- EU perspective on pivotal points of interoperability the 3 zones are - app zone, data zone & device zone
- All procurements to be oneM2M compliant to provide choice amongst interoperable solutions by the vendors.
- Shared perspective on SYNCHRONICITY which could provide opportunity to involve Indian cities in many EU projects.
- Information on open call on 1st June this year & to be associated with the cities: Milan etc. to be funded in order to deploy the consortia including the cities from India.

Click here to download presentation on "AN INTEROPERABILITY FRAMEWORK BUILT BY AND FOR CITIES AND CITIZENS"

Ms. Margot Dor
Director Strategy Development,
ETSI

- In today's digital age, It's all about data.
- In 2018 itself, the number of IoT devices shall surpass mobile phones & computers, 20 billion connected devices are likely to be connected to Internet by 2020.
- By 2025, 8 times more data shall be generated that shall need to be ingested, processed and analysed
- Every company is now becoming a data company.
- Importance of data interoperability and the dilemma of data ownership and privacy, which has different meaning for different people.
- Importance of GDPR and its various nuances that shall come in force in EU from 25th May 2018.
- Information on single set of rules in EU & for players operating in EU and/or with EU data shall be applicable for all the stakeholders irrespective of their diverse political/historical backgrounds.
- Implications of single set of rules and some approaches to make it work with mutual collaboration amongst nations and may be thru WTO, self-regulation/ co-regulation and certification.
- Data protection is a journey and not a destination.

Click here to download presentation on "AT THE END OF THE DAY, IT'S ABOUT DATA"

Dr. Mihai Bilauca
Head of Digital Strategy & EU Programmes, Limerick City & Council,
Ireland

- 100 definitions of Smart Cities available therefore even the definition of smart cities itself is not standardised
- His understanding of the smart cities reality stating that cities are complex, with many stakeholders & many views. There are new expectations for urban transformation by the citizens. And the paradoxes of cities as they need to handle diverse needs. How to develop standards in such complex realities?
- Stable communities are developed by a balanced approach.
- Smart City Strategy must focus on:
  - Citizen Experience, as the key driver for new or better services
  - Examine & Rationalize systems & structures
  - Organize around the needs of the citizen
  - Remove unnecessary bureaucratic steps
  - *Urban digital transformation for a better quality of life*
- Shared details of this approach as being leveraged in Ireland.
- Proposed to use the Enterprise architecture to develop the blueprint of smart city.
- Key recommendations about Smart Cities:
  - Look at city's long-term vision & goals
  - Develop Strategy to tackle Urban Challenges - not Technology
  - Break the silos by collaboration & partnerships
  - Build a Smart City Roadmap with essential emphasis on Urban Digital Transformation
  - Citizen First Philosophy: engagement, participation, innovation
  - Standards enabled Smart City Enterprise Architecture
- Any city of any size can become a smart city.

Click here to download presentation on "STANDARDS ADOPTION FOR SMART CITIES"

Shri Aurindam Bhattacharya
GL Technical Services
C-DoT

- Smart City is much more than ICT (in fact only 40% of the requirements of Smart City is IoT/M2M), yet ICT plays an underpinning role in making the cities smart & sustainable.
- Challenges posed by this massive proliferation
  - Standardization and/or lack of it, impacting data sharing and total life cycle cost of deployment of multiple ICT infrastructures.
  - Security – device security, authentication, communication security, data integrity, data privacy, lawful interception
  - Inadequate network resources
  - Device Ownership: ownership of the devices communicating, kyc
  - spectrum availability
  - Addressability of Devices - limited address space for mobile devices
  - Power Supply (long battery life, energy harvesting), software complexity, semantics, self-management and self-healing of IoT/m2m devices and
  - Regulatory aspects (licensing, service provider registration etc.)
- Explained the correct approach in such scenario-
  - Interoperability - applications, devices, networks, semantics (no vendor locking!)
  - Data sharing among divergent applications
  - Security & privacy
  - Prevent deployment of unauthorized, unsolicited devices & applications
  - Management interfaces & dashboards
  - Seamless integration of divergent applications
  - Quick & easy development & rollout of new applications, Promote innovations
  - All the above can only be achieved if there is a standardized horizontal common service layer providing device, network & vertical agnostic pluggability
- Emphasized on the importance of a Common Service Layer in Smart Cities ICT Architecture.
- Explained merits of Common Service Layer as a potential solution of introducing a management layer on top of the different verticals working in silos and isolation making data sharing quite difficult.
- He further elaborated on the much-needed interoperability enabled Common Service Layer:
  - It's a middleware agnostic to vertical devices
  - Converges common functionalities to a single platform.
  - Developers do not need to worry about fragmentation and hence provides a pluggable solution.

- Information on oneM2M Framework for the Common Service layer and C-DoT's contributions in the on-going developments.

Click here to download presentation on "THE NEED FOR STANDARDIZED COMMON SERVICE LAYER IN SMART CITIES"

Dr. Prasant Misra,
Scientist
TCS Research & Innovation

- Imperatives of unifying and harmonizing the last mile communication architecture in light of proliferation of confusion, madness and heterogeneity in the M2M/IoT domain.
- Current way of deploying M2M/IoT solutions in smart cities/infrastructure domain and the challenges they are creating for the system integrators and city administrators.
- Elaborated on the gaps in smart infrastructure for smart cities:
  - Closed & vertically siloed solutions: available solutions are extremely closed with an ecosystem that is highly locked-in by vendors.
  - Force fitting solutions developed for mature markets/advanced economies: May not be the right approach given the requirements, constraints & challenges in India.
  - Lack of interoperable, standards-based solutions: Existing "last-mile" technology space is a highly fragmented segment with no common framework for the various physical infrastructures to work in an integrated, harmonized & optimized manner.
- The approach India is taking to resolve these issues & challenges by
  - Defining a unified stack from layer 3 to layer 7 based on global open standards.
  - Defining interfaces between this unified stack with multiple PHYs & MACs for different contemporary and upcoming Communication Technologies.
  - Also Standardizing the data semantics for the smart infrastructure domain by developing or identifying a standardized framework to define standardized data semantics.

Click here to download presentation on "UNIFYING & HARMONIZING THE "LAST-MILE" MADNESS IN M2M/IOT".

Shri G Narendra Nath
DDG Security
Department of Telecommunications
Government of India

- Apprised about the 2 critical aspects regarding the M2M/IoT paradigm -
  - One being the security of IoT because it has got a relation to the physical world and we could have real serious injury or failure of systems affecting the citizens of country.
  - The other is the volume of devices & the amount of traffic they generate, multiplies the types of attacks that can be generated from IoT devices.
- The focus must be to look for plug & play security so that the devices are secure because of the volume of deployments that happen & the type of people who will be deploying them.
- Common Service Layer takes the security functionality into it & ensures that we have functions of authentication, authorization, identity management built into it.
- The assurance mechanisms, testing has always been talked about. However, there is reluctance & confusion about implications of getting a test, a regiment place in terms of bottlenecks that are created in the supply chain. So, in this regard vendor community has to understand, as national security concerns are there to stay.
- Keeping in mind the volume of devices that are predicted in the near future, the testing infrastructure has to be comprehensively established and to scaled up to meet the requirements.
- Lots of these devices would also get deployed in the critical infrastructure of the nation. Many infrastructures which is not yet critical shall become critical infrastructures.
- Harmonized efforts in Security paradigm is also required instead of current practices of Siloed focus on Security in Individual Domains.
- Another highly critical aspect is the device identification, unique secure identifiers of the devices are imperative. With the current IMEIs we are facing difficulty in the type of unique identifiers.
- Availability of security assurance protocols for customers & national governments
- It is crucial to make people aware about Security implications in M2M/IoT paradigm and need to up-skilling people in the domain.

Dr. Rishi Bhatnagar
Chairman
IET – IoT Panel

- Overview of IET (The Institution of Engineering & Technology) being a 148-year-old global professional body, based in the UK, with focus on bringing engineers from across the globe to share knowledge & insights and ultimately solving problems impacting the society.
- IET-IoT Panel Working Groups on Healthcare, Smart Living, Standards, Telecom, Ganga Rejuvenation, Social Impact, Skills, Cyber Security and the work being undertaken therein.
- Enterprises being under siege from a rising volume of cyberattacks. and hence, main focus on cybersecurity and the prevalent skills crisis as too many threats in the cyber space while too few professionals to tackle.
- New working group Cyber Security at IET - IoT and its activities at a high level-
  - Education on IoT Security for Enterprise users thru Workshops, discussions, use cases & “Return on investments” & “Business Cases” building.
  - Recommend “Checklists” Best Practices Generic that are specific to verticals of the industry and are India centric.
  - Public Policy – thru a different experimental self-help group approach to IoT Security with shared resources and offensive defence.
  - Security - Capability to assess vulnerability for Non-internet Industrial IoT protocols, Best practices to manage deployed devices & network infrastructure outside IT data centre & in public places and Techno legal approach to enabling self-help groups & safe network & managed services for IoT devices.

Please click here to download presentation on “M2M/IOT & ITS ROLE IN SMART CITIES AND CYBER SECURITY”

Session 2: Panel Discussions

Session Moderator:

Mr. Klaus Pendl, First Counsellor – ICT, Delegation of the European Union to India assisted by: Mr. Narang N. Kishor

Panellists:

- Mr. Vikram Tiwathia, DDG COAI
- Mr. TVR, President Broadband India Forum
- Dr. B. K. Murthy, Scientist G & Group Coordinator MeitY
- Vijay Madan, Advisor TSDSI
- Ms. Reena Garg, Head LITD, BIS
- Mr. Bipin Kumar, GAIA Smart City

List of Gaps/Challenges for Panel Discussion

1. How does lack of standards & inter-operability impacts the adoption/proliferation of IoT in different ecosystems? And, which IoT ecosystem can truly bring the much-needed adoption of the IoT in the mainstream? Consumers, Enterprises, Industrial, Infrastructure or any other?
2. What, are the critical aspects that need standardization on priority to get the desired benefits from IoT paradigm? And, what are the challenges of the SDOs in standardization in IoT paradigm?
3. How can Security concerns be addressed in the IoT deployments? Shall Privacy & Trustworthiness concerns have adverse impact on proliferation of IoT deployments?
4. What kind of standards/standardization help Smart Cities ICT infrastructure deployments? Shall standardizing the Common Service Layer bring the much-needed interoperability and optimization of the ICT infrastructure? Or, we shall need comprehensive standardization of the ICT Architecture? Or any other aspects?
5. What policies and regulatory interventions are needed for holistic proliferation of the M2M/IoT paradigm?

Please click here to download presentation on “Gaps and Challenges in ICT sector in India”

Mr. Vijay Madan
Advisor & Mentor
Telecom Standards Development Society India (TSDSI)

(Q3): In response to Question on Security, Privacy & Trustworthiness –

- We need to build a comprehensive Security Architecture including the Trustworthiness Mechanism to address the security aspects in M2M/IoT paradigm in a wholistic manner that shall ensure that there is no adverse impact of proliferation of the M2M/IoT deployments.
- We talked about, let us link trustworthiness with standards. Standards are expected to be mature thoughts coming from guidelines, notification, and/or best practices. Initially start with all these things & gradually when everything gets matured, it becomes standard.
- Therefore, standards are evolutionary outcome of first, best practices, need some gap analysis as to why things are not behaving like they should. So, it's imperative to setup some quality standards, some security standards, some working standards, some interfacing standards & all that.

Smt. Reena Garg
Head of 'Electronics and IT' Standardization Division of BIS

(Q2): In response to Question on standardization priorities in IoT paradigm and challenges of the SDOs

- Prioritising the area where standardization is very critical, with the help of the stakeholders BIS has identified these 4 critical areas
  - Unified Last Mile Communication Protocol
  - Common Service Layer
  - Unified Data Semantics for smart infrastructure
  - Architecture for end to end unified ICT Backbone
- Challenge for SDOs is there are so many conflicting standards & views, everyone is working in their own way.

Dr. B.K. Murthy
Senior Director (Scientist G) and Group Coordinator R&D in IT,
HRD, E- Learning, E-infra, IoT

(Q3): In response to Question on Security, Privacy & Trustworthiness –

- IOT security is different than device security, network security. When you are going for a complete ecosystem of IoT devices connected to the network, the complexity increases manifold.
- The major areas to work on are - the privacy concerns, insufficient authorization, authentication problems or the access or lack of encryption; ethical, liability & privacy issues bring another category of issues, hence, Security in IoT domain needs a comprehensive approach completely unlike any other areas of concerns.

Mr. Bipin Pradeep Kumar
Co-Founder and Director, Gaia Smart Cities

(Q4): On standards/standardization imperatives for Smart Cities ICT infrastructure -

- It is a little too late, standardization in smart cities should have happened ideally by now. As part of the MOHUA initiatives in 100 Smart Cities, lot of tenders have been out. If possible then companies should be suggested to adhere to the standards typically when the tenders are announced it's already a very thin margin that companies have. If standards need to adopted at this moment it should be done in a very homogeneous manner. After tenders are announced you can't say now let's do standardization. All the stakeholders need to be aligned at the earliest to ensure adoption of standardisation.

Mr. T.V. Ramachandran
President, Broadband India Forum

(Q5): On policies and regulatory interventions needed for holistic proliferation of the M2M/IoT paradigm -

- Conceded with the views of Mr. Bipin Pradeep Kumar with regard to being late on adoption of uniform standards for the Smart Cities in India. Firm position should be taken from the regulator & policy perspective to catch the standards bus. Excellent regulatory recommendations have come recently & hopefully will get adopted by Government. Flow has started in that sense. But what you like to see is that in such an area where the margin is very low if you expect small time players, small time cities to be very busy setting up standards, ensuring they are harmonized with global standards, you'll have to think again. Hence there is a need for central body to drive this process. Firm regulatory or policy direction required to ensure that all players small or big, follow the standards route automatically. Small players were already on a pressure for margins. Incentives and other support should be provided to small players for adoption of standards. This support should be initiated by the Policy makers.
- On the security aspect, apart from security of billions of sensors & devices strict protocols for the Gateway & Interfaces should also adhered.
- Thirdly for getting an impetus on the market adoption of IOT devices, there could be policy actions like some countries have done. For example, transportation safety brought through IoT devices in Brazil. Such measures help in expediting the execution of IoT devices as citizens and Government both can analyse the tangible benefits of IoT / M2M. There is a need to initiate such policy actions to give an impetus to the movement of IoT & M2M in India.

Mr. Vikram Tiwathia
Deputy Director General, COAI

(Q5): On policies and regulatory interventions needed for holistic proliferation of the M2M/IoT paradigm -

- It is all about data with all the IoT devices & sensors. How is that data going to be transported? Transportation of the data over networks & how you look at the data in motion & data at rest.
- As far as the telecom sector goes in terms of standardization, we have been doing fairly good job. With the 3GPP release on track & defined time schedule by which different use cases will get attended to.
- Regarding the policies & regulations impetus, we need to identify some priority use cases & sectors to start. Further, we need to have policies covering the ecosystem and stakeholders comprehensively, be it municipalities, states, vendors, system integrators, start-ups and technology providers.
- Need to prioritize within security, carry out vulnerability assessment & penetration tests. Then you put priorities around which are the critical segments & how do you apply. You cannot apply the same level of security across the domain.

Comment by Ms. Margot Dor:

- We are talking about standards like there is particular time for it like Before Christ, and/or After Death. That's not how it works. It's something that goes along with market development.

Parallel Session II on: Electric mobility and ITS

Session 1: Presentations by European and Indian Subject Mater Experts

Key Note Address:

- **Shri. Anil Srivastava**, Adviser (Transport) & DG, DMEO NITI AAYOG

Moderator:

- **Mrs. Rashmi Urdhwareshe**, Director ARAI

Speakers:

Europe:

- **Mr. Adrian Scrase**, Chief Technical Officer, ETSI
- **Mr. Emilio Dávila-Gonzalez**, Head of Sector ICT Standardisation, DG CONNECT
- Mr. Antonino Pirrotta, Business Development Manager, AP-Crono
- Mrs. Silvia Vaccaro, Policy officer standardization, DG GROW

India:

- **Mr. Sajid Mubashir**, Scientist G, Department of Science and Technology
- **Mr. Alok Sethi,** GM Transportation Technology Solution DIMTS Ltd
- **Ms. Aditi Sethi & Mr. Enoch Eapen**, Deputy Manager ICAT
- **Mr. Vinosh James**, Lead - Technical Standards - Qualcomm India Pvt. Ltd

Key Take Aways from the presentation from the Speakers

Shri. Anil Srivastava
Advisor (Transport) & DG, DMEO, NITI AAYOG

- Conference is going to be of value to all stakeholder present, Indian as well as European. Around 30m Indians are working in auto industry, contributes to more than 7% of GDP, exports also significant around 25% from OEMs, Spare part dealers etc. Rate of growth of automobile in India is highest in the world nearly 7-9% CAGR due to growing economic conditions. 25m vehicles manufactured last year, major proportion of which is the 2 and 3 wheelers. Less than 5m are passenger vehicles
- Globally scenario is different from the Indian scenario in the sense that in India more than 60-70% vehicles manufactures are 2 and 3 wheelers and particularly 3 wheelers and the remaining is public transport systems.
- EU is the largest automobile manufacturers, exports from EU around 12b euros, great contributor to economy of Europe too.
- Signatory to COP 21 in Paris and committed to reduce carbon footprint by a third in a period of time. Massive inevitable disruption to swamp the country in the automobile sector. By 2030 we shall be the largest stock of EVs. And, India would need around 10 Gigafactory's to meet the Batteries demands based on the NITI AAYOG study.
- Deliberations and plans on how we can possibly bring about a healthy cohesion between one of the largest producer of vehicles(EU) and the largest consumers of vehicles (India) in order to create shift in ITS for the betterment of masses at large.
- ITS from a global viewpoint - different geographies require different treatments due to different conditions, desirability and solutions.
- To understand what kind of solutions we need, stakeholders' needs are required to be studied. ITS could be defined differently in US than in EU than in India. In fact, even in one country like India ITS could be different for a person living in Mumbai or Delhi than a person living in a town in Bihar or UP.
- Solution for the common man suffering from point to point connectivity, congestion, unavailability. We were late in developing metros, world is moving past metro to newer technologies. That poses some challenges for Indian researchers, stakeholders, practitioners.

Mrs. Rashmi Urdhwareshe
Director
ARAI

- Significance of EVs and ITS in Indian context, increase in mobility needs and penetration.
- Implementation to control uncontrolled growth of automotive.
- Focus on standardization
- Provisions for electric feeder services, EV power electronics, EV charging.

- Development of sustainable network in the country.
- 3 key factors should emerge:

  a) development of infrastructure,
  b) development of standards (harmonized on one side, catering to India needs on the other while not being a barrier to trade),
  c) Development of technologies.

Mr. Adrian Scrase
Chief Technical Officer,
ETSI

- Technology choice for ITS?
- ETSI is Technology neutral as an institute. Overview of ETSI work in ITS and informed the audience that very significant work has been for over a decade, along with different agencies like IEEE,3GPP etc.
- Highlighted diversity and work of ETSI and need to harmonize standards for products which are radio based. Also shared about the interdependence of devices for compliance used in a car which is based out of radio, for which harmonized standards are required to operate.
- Explained that in EU the standardization work is split between CEN and ETSI
- Over the last many years ETSI has done many plug tests to prove what has been standardized is robust and secure.
- He explained the details of standards for ITS and ITS infrastructure deployment approaches. He shared that now we are starting to see trials within the EU footprint.
- He talked about 5G creating a lot of disruption for connectivity with its recent and genuinely created buzz. Explained about adaptation of LTE cellular mobile network, low latency for vehicles network. And mentioned that you don't need to build your own infra for the roadside connected things, you already have a standard infra for those connected units with mobile cellular network.
- He mentioned that in the current scenario ETSI should rethink what's been done with 802.11p and try to see an alternative in the new technology proposed by the cellular mobile community. He talked about main features of the new proposal based on adaptation of mobile cellular technology. V2V requires no sim-based transaction between vehicles. But V2INFRA communication is based on commercial LTE type tech, 5g technologies.
- He further shared that to save the efforts of ETSI in regard to 802.11p it has been proposed to build an access layer on the top in the architecture to provide an option to radio access by either 802.11p variation or LTE cellular type solution, but in either case the protocol stack above should be same.

- He also informed the audience that first phase of cellular V2x was completed in March 17, 'theoretically' could be deployed today. 2nd phase is due in June 18 with rel. 15 of 3GPP and end of 2nd phase is expected in 2019.
- In conclusion, he shared the four guiding principles for ITS in Europe:
  - Uncompromised safety services for all users in case of multiple technologies implementation.
  - Technology Neutrality of Spectrum use
  - Efficient Spectrum use, and
  - Introduction in the longer-term of 5G for the further development of Connected, Co-operative and Automated Mobility (CCAM).

Please click here to download presentation on "ITS TECHNOLOGY CHOICES FOR EUROPE"

Mr. Emilio Davila
EC Directorate General CONNECT
Start-ups & Innovation Unit
Head of Sector ICT Standardisation
Brussels, Belgium

- At European Commission one of the main focus is on connected and automated mobility.
- Described the EU's focus on standardization for cleaner, safer and more efficient transport system. (EU 2013 document talking about importance of ITS to comply with this policy).
- Explained why standards are crucial in ITS? And how to achieve standardization through co-operation & collaboration amongst the stakeholders - manufacturers of cars and vehicles, telecom & ICT infrastructure operators.
- Emphasized on the cooperation needed among the different standardization organizations & groups; and international cooperation for harmonization of standards.
- Explained that harmonized standards should not be confused with same standards but at least use of same platforms (in this case, vehicles) to bring down cost of manufacturers.
- He informed the audience about the EU and national funded projects: A common communication module for Personal ITS station, Central ITS Station, Vehicle ITS Station, Roadside ITS Station.
- He described the "eCall", the first European initiative/system that will bring connectivity in the vehicle. Mandated within EU from April 18.
- In conclusion, he emphasized that CAVs have the potential to contribute tackling the mobility challenges in Europe and Worldwide; and standards are needed for wide take-up of ITS.

Please click here to download presentation on "ITS STANDARDS IN EUROPE – TOWARDS CAVS"

Mr. Antonino Pirrotta
ITS and ETC expert, Business development Manager AP-Crono

- Regulatory framework of C-ITS and role of CEN, ETSI and ISOs in helping formulate it.
- ITS framework in EU, is very complex.
- Directive 2010/40/EU: describes the common framework to implement interoperability services across all the European counties.
- Then mentioned the impact of EC Decision2008/671/EC: introduced throughout Europe a new frequency bandwidth (5875 to 5905 GHz) for safety-related ITS applications.
- Described ITS as a group of technologies and applications that allow data exchange vehicle-to-vehicle or V2V or vehicle-to-Infrastructure or V2I/I2V and with the objective of improving safety, sustainability, efficiency and comfort beyond the scope of stand-alone systems.
- Talked about M/453 mandate for C-ITS standardization. Standardization mandate was addressed to CEN, CENELEC and ETSI in the field of Information and Communication Technologies to support the interoperability of C-ITS in the European Community Objective and address the ESOs to prepare a coherent set of standards, specification and guidelines to support European Community wide implementation and deployment of Co-operative ITS systems.
- Discussed the role of different SDOs in-charge of different activities and standardization responsibilities for C-ITS; also, the Execution mandate for V2V and V2I communication made by CEN.
- Informed that ETSI TC ITS, CEN/TC278and ISO/TC204 WGs are committed to fulfil all M/453 requirements.
- Then he shared the work under ETSI TR 102 638 - basic set of ITS applications are grouped in:
  - Road safety
  - Traffic efficiency
  - Co-operative local services
  - Global internet services
- Also Explained different components of an ITS reference model:
  - ITS Station Architecture
  - System Architecture and Interfaces
  - C-ITS Vision
  - Use Case Example
  - C-ITS and New “connected vehicles”
- Described the push mechanism (support also "mandatory services" that may be locally and dynamically applicable and defined by local policies rather than global regulations) and pull mechanism (requiring a-priori knowledge of an available intended service) for bringing about awareness of services.

- Finally concluded by listing some VAS for next generation vehicles, for car makers and service providers.

Please click here to download presentation on "MOBILITY AND C-ITS SYSTEMS"

Ms. Silvia Vaccaro
Policy officer standardization
DG GROW, European Commission

- Provided overview of general automotive sector in Europe, challenges faced and plans ahead.
- Automotive is among the top 10 priorities for EC.
- Threw some light on why automotive extremely critical sector for EUs economic growth is:
  - It employs more than 11million people in Europe (about 5% of total employment)
  - Transport accounts for 13% of total household expenditure
  - 50% of products are shipped and transported by road vehicles
  - €90 billion positive trade balance
  - EU spends about €50 billion in R&D.
- Talked about the architecture of a new ideal green future.
- Discussed the Challenges:
  - New Technologies and Business Models
  - Climate, Environment and Health
  - Societal Challenges
  - Globalization
  - Structural Change
- Showed some statistics on growth in electric charging stations and electric passenger cars (91,519 and 157567 respectively) as of 2016.
- Shared that with the growing sector of EV a crucial challenge being faced is of batteries, which happens to be an Essential component and difficult to transport. And with growing time the demand will increase manifold. She opined that by 2025 EU could have a new market of around €250 billion p.a.
- Introduced European Battery Alliance (PPP) to set up in Oct 2017 by manufacturers of batteries in Europe. Already 3 consortia – 1 each in Sweden, Germany and France.
- Existing frameworks in Automotive Safety including General Safety Rules (GSR), eCall. Explained that GSR introduced more advanced features such as stability control, safety belt reminder, electric shock protection etc.

- Shared the new proposal of the European Commission on General Vehicle Safety to be adopted as part of the 3rdMobility Package on 16 May 2018.
- Discussed the Safe system approach for roads and tunnels.
- Illustrated the repercussions of not having standards through a very interestingly visual description of (with respect to plugs and sockets).
- In conclusion highlighted the major and broad areas of standardization with regard to the vehicle ecosystem, namely
  - Vehicles
  - Cables and Connectors
  - Charging Infrastructure.

Please click here to download presentation on "PRESENT AND FUTURE OF E-MOBILITY IN EUROPE"

Mr. Sajid Mubashir
Scientist G
Department of Science and Technology and Member,
BIS ETD 51 on eMobility

- Apprised about NITI Aayog mandate, to improve the air quality in major polluted cities, >53 cities >1m population, trying to make India's passenger mobility share, connected and electrical.
- Rationalized the initiatives at this juncture as to Why now? Because this is the inflection point in time:
  - Auto industry ~7% GDP & growing.
  - Low per capita car ownership ~ 20 vehicles/ thousand citizens.
  - 2-wheeler sales ~18 million/ year & 20% passenger travel
- Optimistic that EV may become equivalent in price to an IC engine vehicle in 5 years.
- Batteries account for nearly 40 to 50% of the cost of EV and the expected drop battery prices in future would drive e-mobility.
- In India the initial thrust will involve government as an aggregator of demand and the use of EV in public transportation.
- He opined that Bus Fleets used by large urban population (An ideal EV); doesn't have any range anxieties as routes are fixed, therefore easy for estimation on Batteries Size & Charging Infrastructure requirements.
- Shared some statistics, from the ministry of power, of EV penetration by 2030 entailing number of EVs, charging points and equipment cost.
- Discussed the Standardization with respect to connectors and cables as in charging, connector is a big thing.
  - Told us about Type-2 Connector proposed by Mennekes in 2009.

  - Today known as AC connector-> It's the vehicle that it in-charge of the power demand from EV supply unit.
  - Charging protocol: The control pilot responsible for checking safety and the charge is demanded the vehicle and it's done.
- Briefly covered the structural differences in AC Connectors in Germany and China.
- Discussed the various options in DC Fast Charging & their implications: Curb side charging, A big charging unit, slave to the battery requirements and hence for that role of communication is immense in EV charging. And continuous communication, for Fast Charging DC.
- Delved on CHAdeMO – PLC based, and CAN based; and asked which one should India use?
- Showed a connector for shared communication, i.e. same connector used for both AC and DC charging and talked about different EV infrastructures for different countries including Europe, China and India.
- Raised a relevant question, when the charging equipment were made and standardized, the markets and its needs were different. With the growing technology interfaces like V2X is it really the vehicle that will demand the charging requirement or is the Infrastructure?

Please click here to download presentation on "Electric Vehicle Infrastructure Standards"

Mr. Alok Sethi
General Manager- Transportation Technology Solution DIMTS Ltd.

- Shared examples of ITS applications in India - like Travel and Traffic management, Public Transport ITS, Information Management & Mobility Toll Payment etc.
- Emphasized on how ITS in India is adopting shifts in processes and designs especially in Public Buses ITS, shifting the display information from boards on the bus to mobile screens.
- He shared that BIS is looking into para-transit or share mobility ITS standards, where multiple shareholders share data making lives easier for consumers.
- He also shared that currently there is No standards working uniformly in ITS in India.
- Talked about e-Tolling project rolled out nationally where in all Toll Plazas are being made RFID based. However, he also mentioned that in these deployments challenges like throughput are still persisting.
- At present there are No standards covering the business model, architecture or methodology, therefore no national card which can be used everywhere.
- He also talked about the priorities shared by different SDOs across the globe including BIS, ISO, ANSI etc.
- He discussed the ISO standard adoption – framework for collaborative telematic applications

- He shared that India will shift from the concept of a national card to digital mobile payments.
- He concluded by discussing the near future trends in ITS like rise of IoT networks and strategies to leverage them; Open Transparent Data Platforms; Self Ticketing & Payment Apps; and ITS enabled Public transport Aggregation platforms with a difference, under flexible Govt. regulations.

Please click here to download presentation on "ITS TREND IN INDIA"

Mr. Enoch Eapen
Deputy Manager
Electromagnetic Compatibility Laboratory, Electrical & Electronics Group, International Centre for Automotive Technology, ICAT

- Provided an in-depth understanding about various compliances issues, relevant standards and Testing requirements:
  a. EMC aspects of e-vehicles,
  b. EV homologation standards,
  c. EMC testing for E vehicles
- Talked about ICAT, Manesar and Labs & testing facilities at ICAT
- Shared Testing & compliance requirement the components level tests like batteries, motor generators, lightings etc. Vehicle level, max speed, energy efficiency, range test; Dynamic tests, EMC tests, passive safety crash test. Talked in detail about electrical and mechanical component tests in EVs.
- Explained the finer nuances of EMC & EMC Environment. RF emissions, about the comprehensive Testing Facility at ICAT.
- Talked about behaviour of EV in that environment in context of immunity & susceptibility. Explained that when EV is connected to the power grid and also in charging mode, EMC can lead unexpected vehicle motion and/or incorrect charging conditions.
- Concluded by giving details about the EMC tests with high end resources and equipment at ICAT and facilities to conduct all tests in the EMC lab, on vehicle dynamic location test.

Please click here to download presentation on "ELECTRIC VEHICLE-EMC ASPECTS AND ITS (AIS:140 IMPLEMENTATION)"

Ms. Aditi Sethi
Deputy Manager
Automotive Electrical and Electronics Laboratory, ICAT

- Presented overview of Standardization of ITS in India.
- Gave detailed information about implementation of automotive industry standard AS140.
- Explained that AS140 was introduced in public service vehicles for quality, reliability, efficiency.
- Described that sub systems like CCTV, tyre pressure, reverse parking, vehicle location tracking unit all constitute ITS.
- Described the VLT – satellite-based tech to record location of vehicle at regular intervals. collect data, store send to control centres.
- Explained the Scope and Deadline – applied to VLT devices and emergency buttons in public vehicles

Please click here to download presentation on "ELECTRIC VEHICLE-EMC ASPECTS AND ITS (AIS:140 IMPLEMENTATION)"

Mr. Vinosh James
Lead - Technical Standards
Qualcomm India Pvt. Ltd.

- Shared detail on visible automotive trends like electrification, telemetry, driver assistance schemes, vehicle infotainment.
- Common aspects for most trends is strong connectivity enhanced by latest technology.
- Consumer driven aspects – devices, modules should be compatible with OSs like Android.
- Provided overview of prevalent Automotive Standards in Wired & Wireless Communication and Software.
- Emphasized that Basic safety is not enough if no communication of safety related issues to a remote infrastructure.

- Described the Functionalities a car will have to look into in the wireless and digital space
- Talked about the Cellular Vehicle to Everything – V2V, V2Pedestrain, V2Infra and V2Network
- Emphasized about the Safety, Security in Communication with Network-
- Explained that 3GPP Standards & LTE are capable of addressing all the V2x requirements in Automotive & ITS.
- Described the 5GAA, Ecosystem of 5GAA, the players and partners.
- In conclusion stressed on the points that Connectivity is core and at the centre of ITS, and developed nations have a mandate on ITS involving connectivity aspects.
- India, being at the cusp of Societal transformation has an opportunity to leapfrog into and doing the right things.

Please click here to download presentation on "ITS Standards and Technology, C-V2X Integration"

Session 2: Panel Discussion

Moderator:

- **Mr. Dibyendu Sengupta**

Panellists

- Mr. Balraj Bhanot, Chair TED 28, BIS
- Mr. Surya Jeedigunta, CEO 3P Foundation
- Shri. Sushil Kumar, DDG – IoT, TEC
- Mr. Sharad Arora, Managing Director, Sensorise
- Mr. Ravi Jakhodia, Founder and CEO –Minda iConnect
- Shri. Sumit Monga, Head Gov. Affairs Unlimit IoT

DISCUSSION POINTS

- Do you think the heterogenous/mix transport in India will pose a challenge in implementing certain ITS technologies like or is it an opportunity? And how do you think standardization can help?
- Considering the unique nature of transport systems in India, what do you think should be the biggest focus areas for ITS?
  - Public Transport
  - Pedestrians
  - Commercial vehicle operation
  - Anything else?
- Does India's highly dense urban environment present a challenge to development of EV charging infrastructure? Can standardization facilitate this process?
- Do you feel the rapidly expanding Indian automotive market, especially passenger cars, are ripe enough for a change to EVs? Or is the transition too soon? Or is this an opportunity to leapfrog technology?

- India is a market where infrastructure is being built rapidly. Do you think this can be leveraged to build in aspects of EV & ITS in a way that cannot be in the developed nations? How?

Please click here to download presentation on "Gaps and challenges in automotive sector in India"

Mr. Balraj Bhanot
Management & Homologation Expert (Former Director ARAI; Chairman CMVR-TSC; Chairman TEDC (BIS); DDG D/O Heavy Industry, GOI)

In response to - Challenges and market opportunities in ITS and e-mobility.

- ITS standardisation does not come under single domain. Innovations are more product driven rather than standards driven. Intention is to create as many relevant standards as required to move ahead.
- AS140 first standard which will transform into BIS standard soon. More standards in pipeline.
- 9 verticals of ITS standards- travel info system, traffic management system, public transport system, electronic payment system, commercial vehicle operation, emergency management system, vehicle safety and control system, info warehousing system; to begin with.
- Problem with this area: to draw a line between standard operation and tight regulation hindering innovation. Like standards for CCTV, sensors etc. Litigation is another challenge. As a nation we have to draw guidelines (different companies can't have different charging infrastructures)
- UNECE has benefited the automotive industries by providing many facilities and basically letting them have all that they can play with. A lot of investments have been made for ICAT after India decided to comply with the UNECE regulations.
- UNECE – only Europeans automotive manufactures comply with the UNECE regulations and not even countries like Japan and America do that.
- Since India complies with UNECE regulations, we have the edge and the potential for exporting our products and designs.
- Wish to have a similar ecosystem in ITS.

Mr. Surya Jeedigunta
CEO, 3P Foundation

- It's a very complex and huge system and hard to implement all at once. A better way to introduce gradually and implement what gives you max value out of what you invest
- Too expensive and time consuming to purchase hardware and then prototypes to verify systems on ground.
- The Solution could be to build software models to run simulations of various applications of ITS like emergency vehicle identification etc.
- EV- world's moving towards it. Countries are coming up with deadlines to come up with EVs.
- For EV – standards are must. Millions of charging stations, so for user satisfaction and flexibility in the charging stations has to be brought about keeping it standard and useable by everyone for any vehicle.
- IEC 15118, 61850 – standards need to be tested on a pilot and then scale up for investors and solution providers.

Shri. Sushil Kumar
DDG – IoT
TEC

- 3 areas important- Public Transport, Pedestrian, Commercial Vehicles operations
- TEC released around 11 Technical Reports in M2m/IoT domain along with industries, academia & international bodies. 2 Study reports are in Transport – The result is
  a. use case 1: Embedded SIM, has been adopted in AS140 (based on GSMA and ETSI standards)
  b. Use case2: e-call system, also submitted in ITU (both under discussion)
- Technology used: DSRC short range comm. Tech (used in Singapore, US, EU & Australia)
- Cellular LTE in release 14 in 3gpp provides unparalleled safety of vehicles.

- 5G after 2020/22 – possibility: DSRC, LTE further with 5G technology (can act as umbrella of technologies like DSRC, LTEV2V)

Mr. Sharad Arora
Managing Director,
Sensorise

- 3 important points:
  a. We are going digital in every aspect of life
  b. So, whole lot of DATA is going to be generated and consumed.
  c. When we deal with immense data there are going to be issues of integrity, security & privacy.
- Data Security is going to be crucial when you think about ITS or Connected Cars etc.
- We shall also need Vehicle Identity, User Identity Frameworks.

Mr. Ravi Jakhodia, Founder and CEO –Minda iConnect
Founder and CEO
Minda iConnect Pvt Ltd.

- Doing few things and doing them right is better than doing all the things together.
- It is critical to have clarity on expectations out of ITS from a standards standpoint and building the hooks which leave a scope of further technologies/further standards being latched on to those standards.
- To ensure effective implementation of standards – consistence is more important than getting it corrected. For the betterment of industry to give them confidence for investment.
- AIS140 is a great example of standardizing telematics to a large extent. But industry is confused with more disruptions coming along and thinking about the durability of these standards.
- Pedestrians are hugely important aspect of ITS. In the west, first mile and last mile of Transport System is pedestrian mode. Beautiful footpath and pavements for people to walk. In India, since people shy away from walking, so what is our first and last mile provision? If rickshaw is the answer,

how to integrate them within the ITS model and connect it with the larger public utility transport services.

Shri. Sumit Monga
Head of Government Affairs
Unlimit IoT Pvt. Ltd.

- Adapting these standards in the Indian context is the major concern given the traffic rules and regulations and compliances in our country.
- How Security and Sasfety built into the systems for Indian conditions - General conditions may be built into vehicles but the issues crop up when we break basic rules of roads.
- Harmonization of all ministerial work to bring a consolidated and cooperative standard. (different ministries involved in different standards, like one for Smart City, Ministry of Transport for Transportation System, Telecom by DoT) should be recommended in the report.

Questions from the Audience

Q1. View on Standardisation or policy for recycling and reusing of the vehicles? How to efficiently manage resources and bring them back into the economy making it circular?

Response by Mr. Bhanot:

- End-of-life principals are being evolved and are almost in the final stages ready to be out. Recyclable plants in pipeline. Also considering especially, the battery disposal mechanism. Maybe whatever happens for tv, computer, general electronic equipment will happen to these resources.
- Life of EVs is a matter for designers to speak about and also about procedures for its disposal. Recyclability is in the mind, especially for batteries and wires but electronic equipment will see the same light as of today apparently or maybe a new technology like in case of battery will emerge in the times to come.

Q2. Data protection, privacy and security are touted as major issues. What is the viewpoint on a standard data format, a sort of a set of data formats for devices generating data like a vehicle, which are common, useful and progressive?

Response by Mr. Bhanot

Deadline of AIS140 has been shifted to a year further is the lack of understanding as to who keeps massive amount of the data? (DoT, MoT, private entities?) or if it's the manufacturer who collects & maintains the data, but that doesn't make sense because n number of manufactures, n will maintain the data? That won't work. Work on back end work remains to be completed. Security and data keeping needs to be resolved.

Mr. Sharad Arora: Data packets are very deeply specified in the respective standards like AIS140.

Mr. Monga: Intelligence can't be brought about without interoperability. Systems working in silos not good enough for intelligence. TRAI recommended DoT and DoT has tasked TSDSI for evolving interoperable standards and porting for cloud services.

Parallel Session III on: Smart Grid, Smart Meter, LVDC, Micro Grid

Session 1: Presentations by European and Indian Subject Mater Experts

Key Note Address

- **Shri. Pankaj Batra**, Member-Planning, Central Electricity Authority

Moderator

- **Mr. Vimal Mahendru**, IEC Ambassador

Speakers

Europe:

- **Mr. Laurent Guise**, Chairman, CEN-CLC-ETSI Smart Energy Grid Coordination Group
- **Mr Wim De Kesel**, Vice President Policy, CENELEC
- **Mr. Alain Staron**, VP strategy at Veolia
- **Mr. Pierre Jean Cherret**, VP strategy, ITEMS International

India:

- **Dr. G. Ganesh Das**, Head - Strategy, Business Excellence & Collaborations, TPDDL
- **Mr. B.A Sawale**, Additional Director & Head Energy Meter laboratory, CPRI
- **Mr. Sandip Sinha**, Vice President – Renewables, ABB

Key Take Aways from the presentation from the Speaker:

Mr. Pankaj Batra
Member-Planning,
Central Electricity Authority

- In his keynote address Mr. Batra touched upon the definition of Smart Energy and Smart Grid how it improves the reliability of power system and the ultimate benefit to end consumer.
- He apprised the audience that the Revised Tariff policy mandates the SCADA in distribution system which will have multiple advantages.
- There are microgrids placed in rural parts of India and electricity act allows setting up of micro grids without license where grid supply is not available or very limited.
- Rural areas used to be connected to the grid, but the supply was a major issue. For a cost of Rs.100/200 per month the users used to get just about 3 hours of supply. After the intervention of some entrepreneurs they were able to get the supply up to 24x7 for the same cost per month for minimum loads like lights and fans.
- Talked about some business models for Smart Grid operations and functioning. Shared a case study for UP.
- He informed the audience that Standards on connectivity of Micro Grid to The Grid is under consideration, e.g. about a standard in this area: provision of mandatory data and Voice Communication Facilities to state load dispatch centres by microgrid operators.
- He deliberated on Importance of LVDC - small electronic devices/solid state devices use DC, latest washing machines, air conditioners use DC motors more efficient and allow speed control, DC used in generation side – solar PV, inverter-based wind DC generator.
- He emphasized that Standardization is critical in the emerging technology field because we need safety, competition, plug and play.
- He also demonstrated that how implementation of right technology will bring down the losses and recover the investment in certain period of time.

Please click here to download presentation on “POLICIES IN SMART ENERGY AND THEIR LINK WITH STANDARDS”

Mr. Wim De Kesel
Vice-President Policy
CENELEC

- Mr. Kesel focused on LVDC, its advantages and work in progress @IEC in developing the standards for LVDC.
- He emphasized that the Direct Current is the Technology of Future which is touching life of everyone on the planet earth in one way or the other.
- He clarified that everything we love and like today, uses DC - ranging from EVs, PVs generating DC, electronic equipment, lamps, laptops, phones etc.
- Further, everything today is going electric because for consumption devices electricity costs are going down and efficiency is going up due to renewables and storage technologies evolution.
- He shared that the discussion on LVDC started in 2009 in IEC by forming Strategic Group SG 4; then in 2014 – Standardization Evaluation Group SEG 4 was constituted to explore the areas where standardization is needed to fill the gaps in the LVDC domain. That was followed by formation of Systems Committee on LVDC. He further discussed about the structure of Systems Committee including CAG1, CAG2.
- He shared the 2 clear use cases identified by IEC: Last Mile & Energy Access; and Roles of different and relevant TCs in IEC.
- He illustrated the Focus on energy access today by sharing that on the planet earth even today 20% population doesn't have energy and 40% population doesn't have clean cooking medium. Within UN Sustainable Development Goals 12 goals are impacted by electricity, meaning areas with no access to electricity have to be duly exposed to electricity in terms of standardization and mankind responsibilities.
- He further elaborated that defining the levels of Access to Energy will require a pre-requisite definition of standards.
- He emphasized on the need for coordination among the different technical committees along with in-depth understanding of the market needs.
- Shared his thoughts on need for a coherent set of standards to guarantee safety, compatibility and interoperability and mentioned that it shall need a very close coordination between technical bodies.
- He also emphasized on the need for a good understanding of the market demand for which use case needs to contain clear and relevant information on the market needs. He suggested that use cases are only to be written when people with knowledge about the market needs discuss deeply and **together** with people with knowledge about the possible applications.

- Concluded with talking about willingness of CENELEC to contribute to standardization and work together with IEC and BIS especially for enhancing the world of LVDC.

Please click here to download presentation on "LVDC IN THE IEC"

Mr. Alian Staron
Senior V.P. Digital Strategy Offers and Partnerships,
VEOLIA
Member of the Board, ETSI

Focusing on the Smart Energy, Microgrid and Security and the shifting paradigms in the Energy domain.

- Cost of electricity has been brought down by solar, and prices have become very competitive. However, storage is still a huge factor for costs.
- He mentioned that going forward the relationship with technology will be changed because the consumers are now becoming prosumers hence while discussing standardization the consumer i.e. the citizen should be at the centre.
- He explained that though technology empowers yet has to also provide security. Can leverage blockchain technology to provide comprehensive security.
- He delved into governance aspects of regulations covering-
  a. Easing Platform Business,
  b. Ownership, by giving a good example that every time we log in to Facebook or Instagram we kind of authorize these platforms to share our activity data with user parties for business and lead to generation of new content from this content. The reason such things happen is because nowhere in the world is there any rule or guidelines that one's data belongs to oneself and has the right of discretion for distribution.
  c. Protecting Individuals, separate what can be separated.
  d. Security by design (intrinsic Security) should be the underpinning philosophy.
  e. Protect business as data cannot be transparent when it's key to business.
  f. No need to be too strong at regulating infrastructure because technology keeps on moving very fast.

Please click here to download presentation on "PARADIGM SHIFT FOR UTILITIES"

Mr. Dinesh Chand Sharma (On behalf of Mr. Lauren Guise)
Director - Standards & Public Policy EU Project SESEI

- Talked about work carried out by Smart Energy Grid Coordination Group, an overarching group. Doesn't develop standards but they oversee any duplicity or reinventing of the wheel and prepare different reports.
- Group has been there since 2010.
- Talked about the work on SGAM – Smart Grid Architecture Modeling and showed the mapping of SGAM in layers.
- Gave overview of the Reports mentioning gamut of standards around grid modernization which is a public document with recently venturing in interoperability and cyber security.
- Explained the process of standardization activity. Pre-standardization, standardization and post standardization.
- Coordination group has mostly worked on pre and post standardization.
- Structure: under the main coordination group is the steering committee, in coordination with smart meter coordination group and electric mobility coordination group.
- Shared that in Europe 534 standards exist in grid modernization, out of 40% are system specific and 60% are about cross cutting themes and 87% of them are available and rest are Work in Progress.
- Concluded by saying that Interoperability is important, yet interoperability is the starting point in standards formation.

Please click here to download presentation on "STANDARDIZATION WORK ON SMART GRIDS BY ESO'S"

Dr. G. Ganesh Das
Head- Strategy, Business Excellence & Collaborations,
TPDDL

- Dr. Ganesh started with emphasizing that Smart Grid, Smart Meter and Micro Grid are three critical areas as far as the standardization is concerned.
- He elaborated that the key drivers of distribution sector are the regulatory framework and technology, further implementation of technology is critical.
- It's imperative to Move from the traditional management of electrical network to managing everything.
- He deliberated that Smart grid looks at optimizing costs and increasing efficiency. And the key resides in how the implementation is executed.
- He delved on the importance of standards in integrating systems and integration that is both horizontal and vertical.
- He raised his concerns on the fact that Integration of data a challenge in standardization.
- And, the most critical challenge is Cyber security in Smart Grid Systems Deployments.
- He concluded with saying that Today we have Smart Grid at Transmission level and Smart Grid at Distribution level is evolving in this context; the Standards will play a very critical role in integrating the whole network.
- He made a concluding observation that as of now there is less automation in low voltage segment whereas the losses at Low Voltage side are higher; this is a critical area on which technology companies should focus on.

Please click here to download presentation on "Smart Grid, Smart Meter, Micro Grid The Gaps and Challenges"

Mr. B.A Sawale
Additional Director & Head Energy Meter laboratory,
CPRI

- In his presentation Mr. Sawale emphasized that Smart Grid and AMI cannot be achieved without Smart Meters.
- He took the audience through a journey of metering standards and guidelines from functional specifications laid down by CEA specifying the common minimum requirements to the inception of the meter standard IS13779 for conventional electronic meter when there were no smart meters and how this standard along with others helped in formation of IS16444 and how for that and evolving requirements these old standards were re-numbered and amended.
- For e.g.: IS15959 was restructures as IS15959 Part 1 and IS15959 Part 2 and similarly for 16444 Part 1 and Part 2.

- Mr. Sawle also apprised the audience about the Smart Meter Standards i.e. IS16444 Part-1 and IS16444 Part-2 and its amendments, and informed that India has best standards for Metering. While addressing the metering standards, Mr. Sawle considered Prepaid Meters and Net Meters under the category of Smart Meter.
- He explained that it is important to note that smart metering standards are not applicable to retrofitted switches on the legacy meters for whole current meter.
- He shared that all the electricity meters present in India comply to IS standard and must have a protocol of data exchange complying with IS 15959.
- In the end, he took the opportunity to clarify a prevalent confusion in industry in the present times that due to constant amendments of meter standards by BIS that manufactures are not able to manufacture smart meters, which is not true.

Please click here to download presentation on "IS 16444, AC DIRECT CONNECTED SMART METER SPECIFICATIONS"

Mr. Sandip Sinha
Vice President
Renewables, Power Grid Division, ABB India Limited

- Mr. Sinha mentioned Renewables are increasingly being part of the main grid, new energy mix with new application is emerging creating a paradigm shift.
- At the Lowest layer - consumers/prosumers are essential from commercial or industrial backgrounds. NEXT LAYER is digital services like asset health, microgrids. Layer above that is the grid.
- He explained about the Microgrid, sharing its IEEE definition as "a Smart System with its own Generation Sources and Loads interacting with Utility Grid with UPS".
- He elaborated about 2 types of Microgrid: Grid connected Microgrids & Off Grid Microgrids.
- He provided insights in the Off Grid Microgrids paradigm and ecosystem. He explained Off Grid microgrids are generally available for remote communities for village electrifications or used for catering to large system to avoid DG utilization.
- Operational Goals: Access to Electricity, Increasing Reliability, UPS, Reducing Environment Impact, Fuel Independence etc. Industry is catching up the Off Grid microgrids paradigm.
- Talked more about 2 products by ABB contributing to the ecosystem:
  a. PowerStore – heart and mind of power grid acting as a connection to various generations and loads with a distributed architecture for better and independent decision making.
  b. Small microgrid, utility in a box. Reduces the installation time of 6 weeks to 6 days for a distribution network

Please click here to download presentation on "MICROGRIDS AND STORAGE MAKING A RESILIENT GRID"

Session 2: Panel Discussions

Moderator

- **Mr. Wim De Kesel assisted by Mr. Mustafa Wajid**

Panellists

- Arun Kumar Mishra – Director National Smart Grid Mission
- Ishtiyaq – Fire Eye
- Rahul Tongia – Fellow Brookings India & Founding Advisor ISGF
- Vikram Gandotra – G M Strategy & Marketing, Siemens Ltd.

DISCUSSION POINTS

1. India has opportunity to leapfrog in the areas of Micro Grids, in the opinion of the panelist, what steps need to be taken to accelerate the development. Any key learnings from global experience that can be leveraged?
2. India is seeing a big growth of renewables, especially Wind & Solar. What are the key experiences in Europe (Technology, Policy, Standards) that can be leveraged in India for seamless integration and addressing the challenges of uncertainty and variability. What impact will EVs and Energy Storage have on Electricity Ecosystem.
3. Distribution Losses (especially non-technical) are very high in India. With the development of Smart meters coupled with advanced distribution management, what should be done to accelerate the implementation of these technologies?
4. Transmission Grid Stability and Reliability is always very critical, since the impact of blackout is huge. How can digitization technology coupled with standards help in making the grid more robust and resilient? What are the global learnings/experiences?

Please click here to download presentation on "Gaps and challenges in Smart Energy Sector in India"

Panellists Responses:

Rahul Tongia

Response on Q1:

Unlike Africa India has grid reaching most of the villages it's the last mile which is the problem. If you are consuming less power, then it doesn't matter whether you are a micro grid or traditional grid, the per unit cost will be high hence the focus comes towards the next generation of micro grid which is the grid interactive microgrid so that its able to signal , interface and react to local condition and grid condition as surplus at once and deficit at one place , we need the technical standards to make this happen and we need the economic standard i.e. the market system on how we are incentivizing the prosumers. House is typical example of the micro grid, where the EVs and storage system can be used for feeding power to the Grid.

Response to Q2:

Mr. Tongia mentioned that key issue is in RE balancing area, Germany has 35% renewables however Germany is interconnected with European grid strongly to the extent that Austria provides pumped storage for germen renewables and Europe is able to do better inter country flow of power than how India can do interstate. So, lack of technology is not problem, even lack of finance is not a problem, it's the framework that really matters and US and Europe are the models for this as both are federal structures.

Response to Q4:

Digital Technology really helps in sensing and thinking only "Act" is the missing link here. Recalling the US grid failure, he mentioned that Act portion has human control on it and is weakest link, as we get more ICT in the grid we get the visibility and we get the think however the ACT part will remain under human control.

Mr. Ishtiyaq Ahmad Shah
Fire Eye, India

Response on Q1:

Focused more on ICT part and it security, he mentioned that in Smart Cities, ICT and OT (operational technologies) component is going to be 40 % to 50%; ICT component out of which there are 80 to 90% of OT components, traditionally OT has always been in silos bring the Smart grid we are bringing OT out of silos hence it is open to cyber threats. Interoperability is an issue in OT.

Vikram Gandotra
Deputy Director General
COAI

Response on Q1:

He updated the Members about IEC PC118 working on the interface between grid side and the consumer side and its objective and informed that progress is very slow but besides that certain milestones have also been achieved. With new technical and business model's consumers are going to get empowered.

Response to Q2:

In response to the question mentioned above that a lot depends on what choices are available to the consumer and how they behave. He mentioned that in India, in Delhi itself, we already have storage capacity of more than 10000MW of batteries which are at residential and commercial places that is the size of storage that consumer has invested in because of low availability of Power. If the consumer had an option to store the power in off peak hours and send it back in peak hours consumer would have definitely done it. Micro grid and living in islanded mode is something which we Indians have mastered. This has been achieved without ICT intervention. However, needless to say that ICT will bring more control.

Response to Q4:

Large size grid is something that we as a nation, took a conscious decision considering the problem of shortage. Now that we have much larger grid, we do have the fear as to what will happen when one side

of the grid is affected. This required thorough study relook into protection scheme and changes in the way that we have designed our system and also the procedure of operations and once we have audited the Grid and weak areas have been spotted the gaps needs to be filled. We need to bring in technology as a driver to modulate the demand in line to the change in generation which is now always going to be there from renewables. Technology, in terms of visibility, in term of algorithms, in terms of suggestions on how to manage the demand etc. with the technology shall always be there. But, it's the regulations around these areas which will truly help the consumer.

Mr. Wim De Kesel

Response to Q2:

He presented the European perspective and shared that Europe is pushing the Renewable Energy sources and attempting to reduce CO2 emission, making sure that global warming is stopped however inclusion of renewable energy is causing the grid instability and it is becoming major challenge for the utilities to stabilize the grid. Utilities are exploring the ways and means to rescheduling the consumption, to make it in line with the production and Smart Grid is the only way forward.

Mr. A. K Mishra
Director
NSGM

Response to Q2:

Responding to what is the situation in India in relation to the integration of Renewables? Stated that last one year's sustained effort to increase flexibility in generation have been made. Current capacities are not the challenges, as we move forward we have regulation changes taking place in terms of support coming from existing thermal power as well as some regulations, which we have a pool with in nation where frequency is being treated as a balancing mechanism there are strong signal being sent to those

who are deviating, currently the Grid balancing takes place in 15 minutes and we are further refining it to 5 minutes.

On question of Microgrid to be integrated with traditional grid **Mr. Mishra** mentioned that theoretically it is possible however, we should also consider the practical part of it, till the time we do not come with regulatory framework and mode to incentivize the operators, practically it looks difficult that a microgrid operator will come forward to help and support grid balancing.

Regarding the question of EV with its storage or separate storage solution can support the Grid

Mr. Mishra mentioned that at this stage no judgment can be given unless there is an experience with in India. On the battery v/s Individual house hold for the EV's an effective market and consumer awareness on the usage of grid needs to be created. The consumer should be incentivised for pulling off the grid during peak hours and plug in when enough capacity is available. Also, there is not enough data which can be analysed and presented to regulator to come up with regulations however he mentioned that these are area that he is looking for entrepreneur, who can actually create the use cases which can be presented to the regulator.

Response to Q3:

The whole idea of use of ICT as a tool brought out in in 2004 -05 for addressing the distribution losses, and it was decided to tackle them at not at state level but individual city and Division level. Since then, there have been multiple interventions and now the losses are being counted and utilities are being measured. Certain percentage of distribution losses are basically unaccounted flow of energy and part of them is theft and part of them are stated choice of DISCOM, which DISCOM would rather not invest in measuring, they have the assumption the consumption will be in this pattern and bills does not translate into energy though revenue does come.

The skill set of DISCOM and interoperability of ICT intervention are also issues of major concern which allows the DISCOM put forward a statement that technology exists but that does not solve DISCOMs problem. However, GOI is incentivizing the technology. NSGM is providing up to 30% capital subsidy and intervening at the highest level with DISCOMs.

Response to Q4:

Stability comes from the players' predictability and discipline. Their behaviour is known and plotted over a period of time; consumer's behaviour is also known and tracked; however, with the Renewable Energy thrown in the challenges arise. Since the experience is limited on which way the balance will shift will only be known over a period of time when behaviour of Renewable Energy is defined. Kind of reactive traditional system behaviours, our ability to captured in all the versions & variations and analysed and learning over a period of time will make big difference. And that's where ICT and digitization will make a big difference, the life of future grid operator is much more stable and easier giving this experience

Valedictory Session

Summary of Key Take aways and Way Forward

ICT: Gaps & Challenges, Recommendations & Way Forward

Mr. Klaus Pendl

- There's a strong need for convergence towards global common standards which include also a common service layer.
- Need for common service layer came out strongly, which enables all the devices, all the applications to communicate to have interoperability, to make it work to have a common management dashboard etc.
- Architecture needs to be multi-layered. Standardization should not restrict innovation.
- Ensuring security is paramount.
- Importance of data protection & privacy is very important.
- Need for strong coordination at national i.e. Indian level & at global level. Cohesive working relationship between SDO's. E.g. BIS & TSDSI have an effective and harmonious working relationship.
- Stronger coordination for Internet of Things & also security. Example of 5G Forum was highlighted to create similar coordination and high-level Forum for IoT and Security as well.
- On the ICT front, India is at par with the world, through active engagement and participation of TSDSI in 3GPP, oneM2M.
- Lack of awareness about the importance of standardization. Importance of standards at all levels i.e. Government, Consumer, manufacturer, etc should be brought to the front.
- The most important gap / challenge which was highlighted during the panel discussion was that India is late in terms of adopting standards for smart cities particularly.
- It was also highlighted that 100 smart cities are only the light house projects for understanding and fine tuning the needs and way forward. It's not the full road of smart cities in India yet, India has 4041 Urban Local Bodies looking forward get smart.
- There is no defined time for standardization as it is an ongoing process.
- There are several versions of 3GPP. It's version 2 & also 3 of oneM2M. So, this is ongoing & it's a continuous process of improvement.

Automotive: Gaps & Challenges, Recommendations & Way Forward

Mr. Dibyendu Sengupta: Speaking on behalf of Mr. Adrian Scrase

- What was almost unanimous was that any move in standardization towards Electric Mobility & ITS has to keep Indian context in mind whether it is about the heavy volume of pedestrians or the frequent instances of violations that happen in India.
- Very balanced overview of the policy level happenings could be obtained because of involvement of panellist Mr. Bhanot who has been heavily involved in such activities who informed us about the main verticals that have been identified, the UNEC involvement.

- Need for security whether it is vehicle ID or user IDs have to be kept in mind while the different players are sorting out standardization issues & policy issues
- Business models to be encouraged for the necessary boost to corporate sector in getting to the market
- Need for an umbrella body which acts as single point contact & correlates all issues related to ITS. Such a body in entirely missing in India at present, for ITS cardholders in US. Therefore, strong need to create an umbrella body with representation from all the concerned stakeholders who make up this body which takes care of the policies, standardization issues at automation that might come up with regard to ITS.
- Pilots & demonstration projects can play a big role in sorting out standardization issues. New incentives including the FAME mission should play effective role and pilots / trials should be initiated in a big way.
- Necessity for policy consistency in ITS. Policies should be consistent as we go forward so there's not too much back & forth & disruption in the industry.
- Due though should be given on the end of life standards & how with new technologies coming in the recycle, reuse of materials that are being poured into such technologies are also kept in mind including railroads.

Smart Energy: Gaps & Challenges, Recommendations & Way Forward

Mr. Wim De Kesel:

- Importance of integration of micro grids. What this could do to help the stability of the grids in terms of delivery of energy to the consumers.
- How ICT could be further leveraged to support grid integration and ensure stability & reduction in o brownouts or blackouts.
- Fluctuations in weather especially I context of solar should be managed effectively.
- Grid, Renewable Energy sources and other processes can be managed optimally with the support of ICT. This can be achieved by digitalization of technologies, can be supported by storage whether it manages to fix storage in EVs or otherwise in Battery Banks.
- It was also highlighted ICT is not the silver bullet. ICT is a help but, in the end, it is what is essential & what is really the only thing that counts is - the user.
- ICT can be an enabler however digitization of process and execution of the activities need to be timey. Action is required from the agencies involved
- Also, adequate thought and trials should be carried out as the grids impact real lives, comforts of people, many things. So, there comes the human part in the whole smart grid which is very important & which we definitely need focus on.
- Even though India is rather different than Europe & other regions of the world still there are things where we can interact, that we can exchange ideas, that we can put forward certain issues that need to be solved. Collaboration is essential & we can both get the benefits for our communities.

Concluded remark:

Mr. Joaquim Nunes De Almeida

- India is synonyms with optimism & energy. It is a vibrant country that shows optimism & positivity.
- This enables positive, frank dialogue, problems are brought out in the light & one can discuss about them openly.
- As a general message in standardization going beyond the 3 subjects of today from the European point of view I would say that we very much welcome India, its brilliant experts to participate more widely in the international standardization system.
- It is important that this country understands that there are important things happening on standardization that should be thoroughly followed through.
- We think that we should work more together & all the big economies in the world that believe in open trade should work together to provide the standards that the world industry needs rather than all of us to go on our own.
- The goal you should set should be to become more of a provider of standards than standards receiver.

Shri Sudhanshu Pandey:

- Conveyed special thanks to the European Commission, various standards setting bodies. From the Indian side to BIS, TSDSI, TEC, of course CII who came as industry partner.
- India lags in standards setting. India is one of the least regulated market in context of standards & technical regulations, standards enforcement.
- India has lowest number of technical regulations, plethora of voluntary standards, but adoption of those standards remained elusive. However, in India, the problems may be numerous, but optimism & hope survives, energy remains high.
- India may make mistakes, but we are determined to correct those mistakes & go on with the life. This is a typical Indian approach & we want to move forward specially with societies & countries who share same values as India.
- India is open, democratic, plural, multi lingual & has whole range of challenges both on the social & economic side but is still willing to engage with their counterparts all over the world.
- We find a natural reflection in our partnership specially with EU. The 29 Indian states are often mapped with 29 EU members on a global map. India is having its unique challenges of population, diversity, languages but our historical linkages with Europe & the values that we share they have a common thread running across.
- Project SESEI is of great importance a very encouraging initiative from Europe. The dialogue started by SESEI continues to grow successfully with this valediction of 3rd conference.
- The sectors identified for the conference and study reports are very appropriate as these are the sectors of future and will have far reaching effect on our daily lives. ICT, automotive & the smart energy whether it is generation or grid, the national grid, international grid, institution, the devices which are linked to energy & their linkage with the IoT because that is what is going to change the entire face of the world tomorrow. Therefore, both opportunities & challenges are huge.

- EU is going to enforce the GDPR from the 25th of May which is going to be gold standard It will pose lot of challenges for businesses, it will provide lot of protection to individuals. How do you ensure that the challenges that technology brought today are legally addressed & while addressing those challenges you keep the vibrancy of the businesses going? That is going to be the challenge.
- The summary of the day's proceedings from all the 3 sessions and the recommendation are going to be determine the future of the human society. Actually, it is going to be having far reaching impact in every possible way.
- You must have also seen & known about now the ICT being used for pest mapping & then system prescribing various kind of pesticide or insecticide based on the diagnosis that is scanned & captured & analysed in a particular region.
- While ICT provides support and convenience, but with this comes a whole lot of challenges because where this data goes, where this data is stored, who has control over this data, how then subsequently the data is shared, who is the real economic owner, these are all issues which in many ways some of the societies & countries have addressed but many countries are still lacking & certainly India is one of them. We have still not been able to fix all these problems squarely & in a holistic manner.
- Same thing is true about the grid. Now smart grids are very good but I don't know if many of you are aware of the economic crisis of 2008 when the banks collapsed & lot of data of those banks & clients were maintained outside US & the IT system was purposely shut down & lot of data got taken way & it was not possible for bankers to actually find out because data was not stored within a particular territory & it became almost impossible for regulator to actually track the borrowers their liabilities & it became a challenge.
- Now while all of this is happening, the standards for everything that I just spoke is extremely important at every level, what kind of standards you set & how that standard balances interests of various stakeholders & then how that standard is adopted & enforced globally.
- Good learning out of these 3 sessions will help us further engaged, with countries like in EU & bodies like EC where we can have very frank, fair discussion.
- If societies share same values & principle then dialog can be really open, frank & transparent. I'm sure this is going to be a continuing dialog because this is something which is not going to end, this will grow, change, it is going to be very dynamic & standards that you set now may need to be revisited, modified tomorrow & this process will continue. But this engagement must also therefore continue.

Mr. Vipin Sahni:

- It has been a matter of great pride for CII to be involved in the discussion of standards & emerging technology areas. CII has been at the forefront of standards development & implementation for more than 20 years both at domestic & international level.
- We have been working very closely with the government to develop suitable strategies on standardization that would assist the development in each sector.
- With the various panel sessions & prominent speakers we had today, this conference has been a major success in highlighting the key challenges in the area of ICT, automotive & smart energy.
- Specifically, in the area of ICT, key imperative is the development of standards for interoperability & common architecture that would support the seamless operations of devices & applications for various uses.

- While in the automotive segment, the key need is to identify the best fit case of multi-mode transportation that is efficient, economically viable & reduces the energy specially the fossil fuel consumption.
- The real challenge would be to standardize the traffic systems, the charging infrastructures & the communication protocols for transport vehicles. That would include by default concerns related to cyber security.
- In the area of smart energy given the scale of capacity expansion envisaged by the Government of India, massive efforts will be required in creating the standards that would support the infrastructure, the low voltage supply system, smart metering & grid balancing.
- The standards community have the task cut out in not only developing the standards in good time but also ensure these do not impede free flow of trade across borders & on the contrary build synergies between the major economies.
- But we do need to approach all this with caution. India like many other countries has its own uniqueness, its own socio-economic structures.
- Focusing on the 4 pillars of standards which the speakers brought out in the session of physical, social & economical institutional framework. This gels very nicely with the CII's theme of 2018 & 2019 which is RISE, which means being Responsible, Inclusive, Sustainable, and Entrepreneurship. We need to keep that in consideration while we are working on creating the standards.
- CII is pleased to be associated with CEN, CENELEC, ETSI through the offices of SESEI to look forward to working with them in creating many more standards in for the future.

Vote of Thanks

Mr. Dinesh Chand Sharma:

- Thanked all the dignitaries on the dais, panellist, speakers, delegates & most importantly CII. SESEI has been closely engaged with CII Team headed by Mr Anupam Kaul for organisation of this conference.
- The Indian government is cognizant of the importance of standards. The INSS paper is a great initiative and displays positive approach of the government and various Ministries. CEN, CENELEC, even SESEI has commented on the INSS paper which is the Indian National Standardization Strategy paper.
- We have been participating with National Standards Conclave & will continue to do so.
- The conference provides with a beginning of working together between India and Europe in many areas of mutual interest.
- The outcomes from this conference based on these study reports which basically lay down the gaps, the challenges, the recommendations, the way forward & the recommendations will be consolidate in the event report.

Again, event report is not the closure, again it's the beginning. We have various cooperation agreements with Indian Standards stakeholders we'll transfer these action items as part of those agreements & take it forward whether we work through those groups or through conferences.

11. Acknowledgement

The Event Report was undertaken under the aegis of EU Project SESEI and is prepared by CII (Confederation of Indian Industry) through comprehensive Technical rapporteur carried out by Mr. N. Kishor Narang, Mentor & principal Design Architect, NARNIX TECHNOLABS PVT. LTD. (Lead Consultant & Technical Expert) and his Team comprising of Mr. Archit Batra, Manish Kaul, Nitin & Akeel. Review and additional inputs were also provided by Mr. Dinesh Chand Sharma (SESEI Expert) & Mr. Anupam Kaul, CII.