'IoT and Smart City Standards and Policies: Global Perspective

ALTTC - 'IoT and Smart City Standards and Policies: Global Perspective

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European Project SESEI in India

Project is a permanent presence in India

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

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

Sector: 1. **ICT**: M2M/IoT, Security, 5G, NFV/SDN, e-Accesibility, eHealth, eCALL… **2. Electrical equipment including Consumer Electronics**: Smart Grid, Smart Meter, LVDC, Micro- Grid, Lift Escalator… 3**. Automotive**: Connected Cars, ITS, e-Mobility… 4**. Smart Cities**: Mobility, Waste, Energy, ICT..

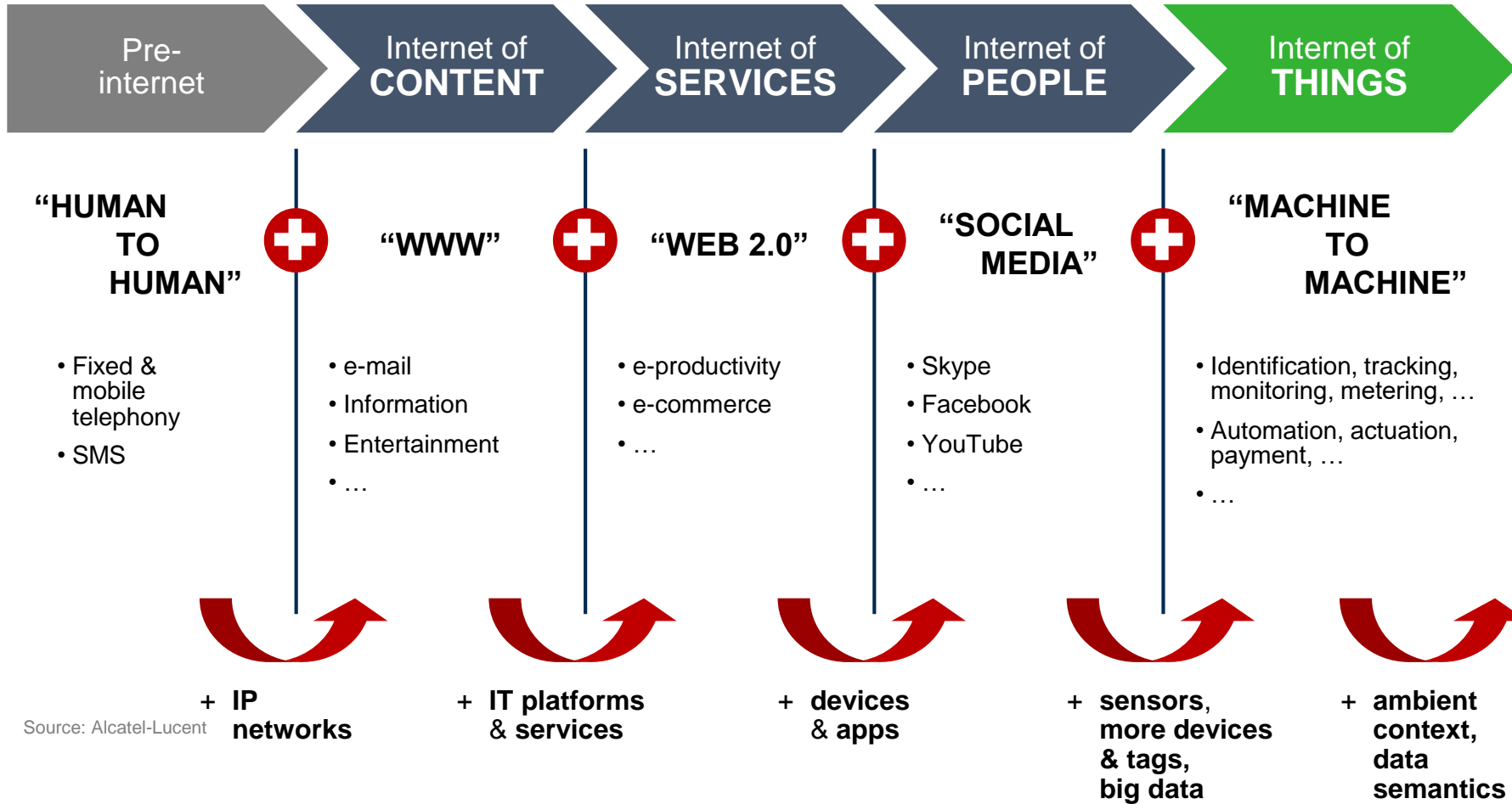www.sesei.eu , www.sesei.in , www.eustandards.in

M2M/IoT

Policy, Research and Standardisation

The next step in internet evolution

Pre-internet	Internet of **CONTENT**	Internet of **SERVICES**	Internet of **PEOPLE**	Internet of **THINGS**

"HUMAN TO HUMAN" ➕ **"WWW"** ➕ **"WEB 2.0"** ➕ **"SOCIAL MEDIA"** ➕ **"MACHINE TO MACHINE"**

- Fixed & mobile telephony
- SMS

- e-mail
- Information
- Entertainment
- …

- e-productivity
- e-commerce
- …

- Skype
- Facebook
- YouTube
- …

- Identification, tracking, monitoring, metering, …
- Automation, actuation, payment, …
- …

Source: Alcatel-Lucent

+ IP networks **+ IT platforms & services** **+ devices & apps** **+ sensors, more devices & tags, big data** **+ ambient context, data semantics**

The **Internet** gave us the opportunity to connect in ways we could never have dreamed possible.
The **Internet of Things** will take us beyond connection to become part of a living, moving, **global nervous system**

CEN CENELEC ETSI European Commission EFTA SESEI | Seconded European Standardisation Expert in India — Enabling Europe-India Cooperation on Standards

IoT Vertical and Horizontal Domains

IoT SDOs and Alliances Landscape
(Vertical and Horizontal Domains)
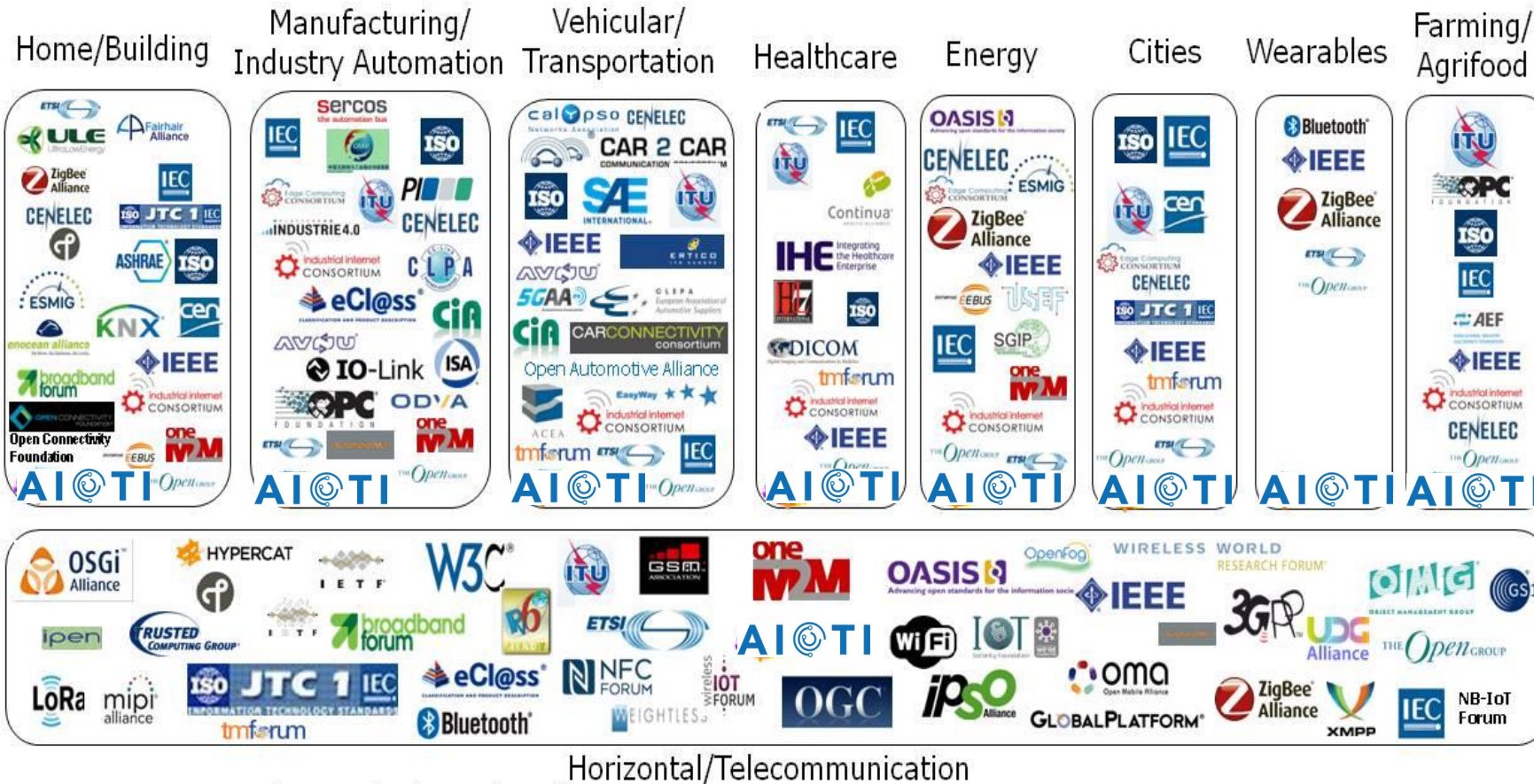
Source: AIOTI WG3 (IoT Standardisation) – Release 2.8

ETSI Specialist Tasks Force STF 505 - IoT

- The European Commission runs the EU Research and Innovation program Horizon 2020. It supports the emergence of an eco-system capable of delivering the Internet of Things with actions like
  - Validation of IoT technologies and approaches through **L**arge **S**cale innovation **P**ilots (LSPs);
  - Identification of required standards in support of global deployments and interoperability in order to support the LSPs

  ➔ For this purpose ETSI has been tasked to provide two reports on "IoT Standards Landscaping" and "IoT European LSP gap analysis"; ETSI TC SmartM2M launched a Specialist Task Force (STF505) to proceed this task

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ETSI TR 103375 and TR 103376 published

ETSI TR 103 375 V1.1.1 (2016-10)

TECHNICAL REPORT

SmartM2M;
IoT Standards landscape and future evolutions

ETSI TR 103 376 V1.1.1 (2016-10)

TECHNICAL REPORT

SmartM2M;
IoT LSP use cases and standards gaps

Analysing the standards landscape provides a list of existing standardised technology suggested for reuse by the LSPs

Identifying technical standards/ societal/business gaps as a good indication of the level of maturity of standardization in a given vertical domain

http://www.etsi.org/deliver/etsi_tr/103300_103399/103375/01.01.01_60/tr_103375v010101p.pdf

http://www.etsi.org/deliver/etsi_tr/103300_103399/103376/01.01.01_60/tr_103376v010101p.pdf

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oneM2M Partnership Project

Over 200 member organizations in oneM2M

oneM2M

atis
TIA
ETSI
CCSA
TTA
ARIB
TIC
tsdsi
India's Telecom SDO

broadband forum
oma Open Mobile Alliance
HGi
New Generation M2M Consortium
GlobalPlatform
cen
CENELEC
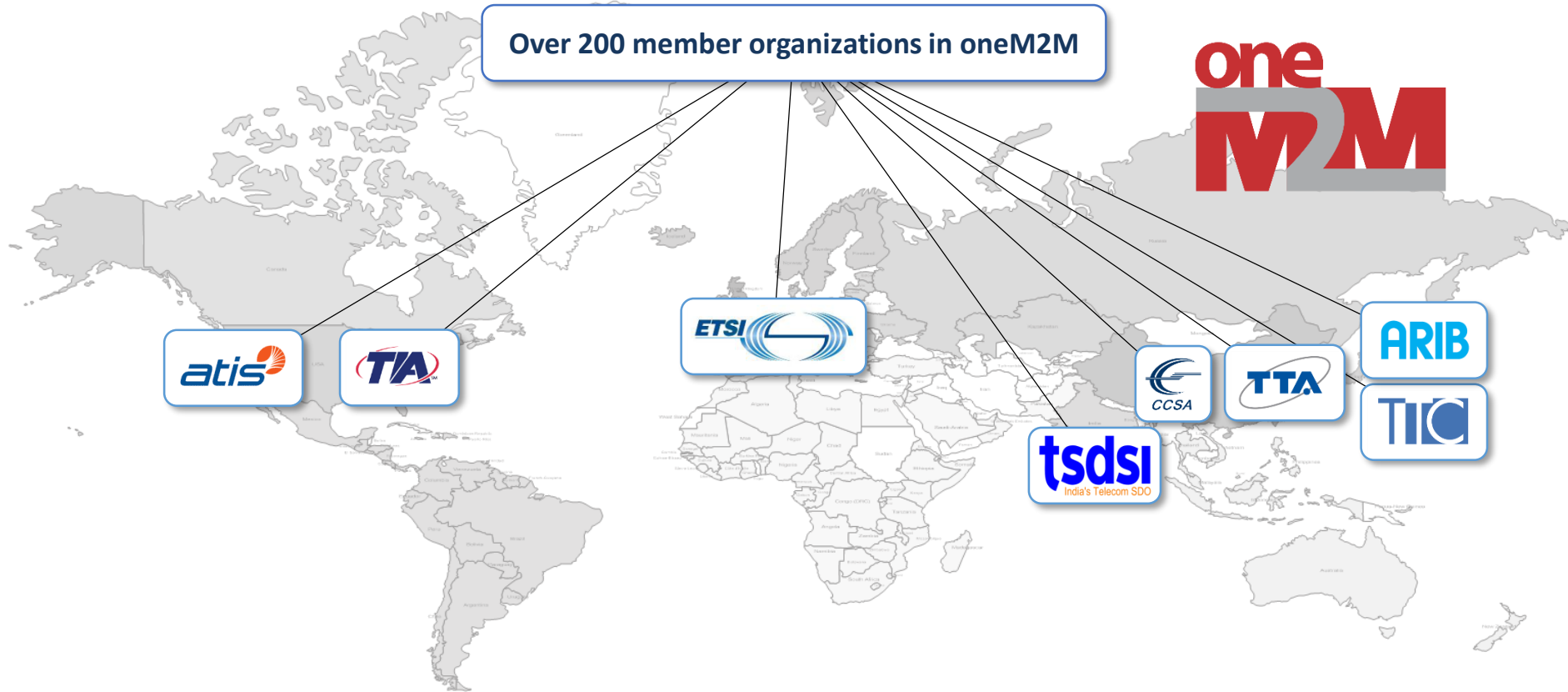
www.oneM2M.org

Source: oneM2M

All documents are publicly available

cen
CENELEC
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ETSI
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European Commission
EFTA
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200+ members organizations

Some of the 200+ active members of oneM2M

Ongoing oneM2M collaborations

Guidelines & Ref. Arch.

Interoperability standards

Protocols

Platforms

collaborations

uses

Uses/interworks

uses

interworks with

interworks with
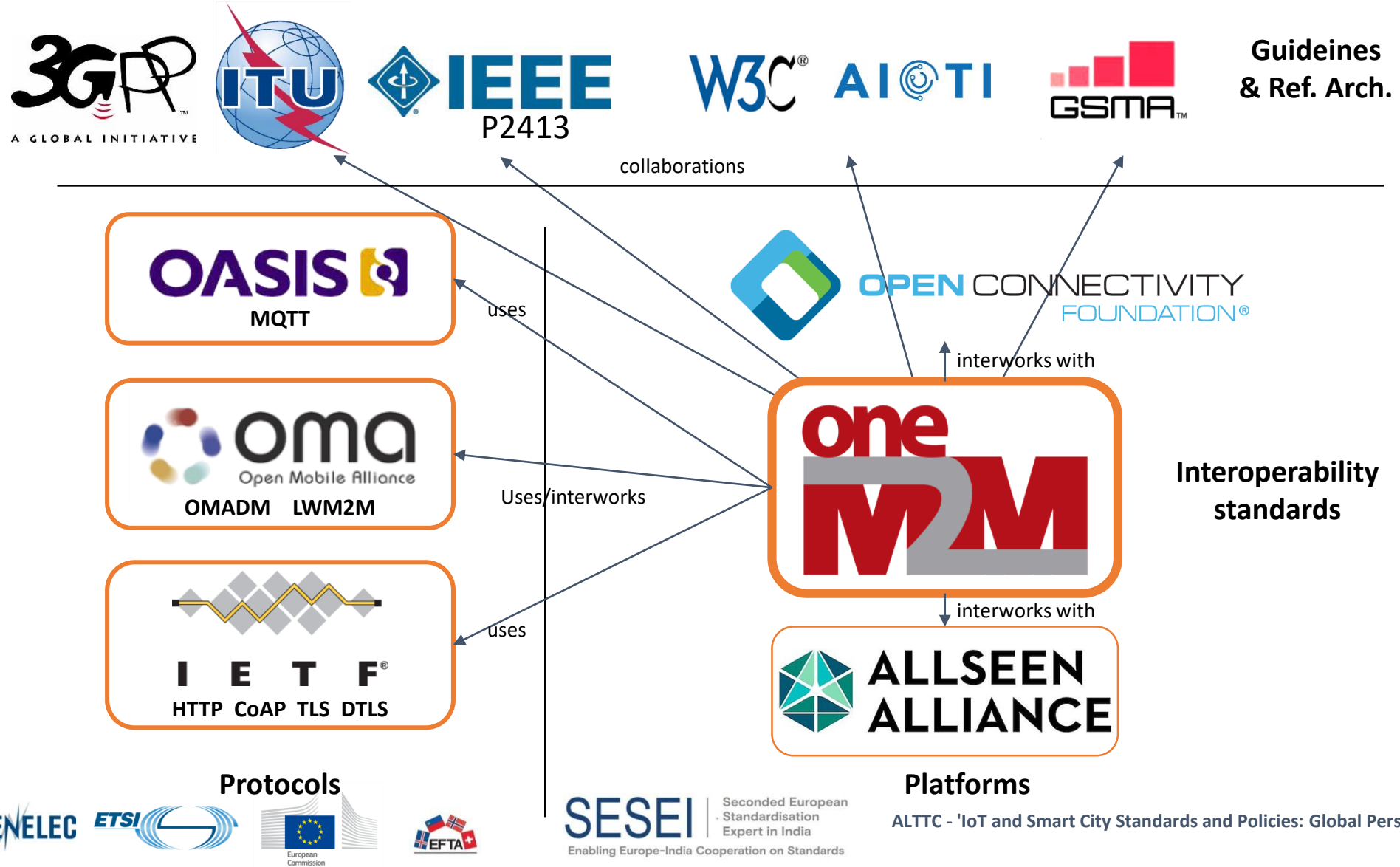
Smart Cities - Europe

Policy, Research and Standardisation

EC RnD Projects encouraged to Standardize: H2020 Lighthouse Projects

EC R&D Projects encouraged to Standardize: H2020 Lighthouse Cities (and others)

- **GrowSmarter**: Stockholm, Cologne, Barcelona

- **mySMARTLife**: Nantes, Helsinki, Hamburg

- **REPLICATE**: Bristol, San Sebastian, Firenze

- **RUGGEDISED**: Umeå, Rotterdam, Glasgow

- **Sharing Cities**: London (Greenwich), Lisbon, Milan

- **SmartEnCity**: Vitoria-Gasteiz, Sonderborg, Tartu

- **SMARTER TOGETHER**: Wien, Lyon, München

- **REMOURBAN**: Valladolid, Nottingham, Tepebasi/Eskisehir

- **Triangulum**: Manchester, Eindhoven, Stavanger

www.smartcities-infosystem.eu/sites-projects/projects

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EC R&D Projects encouraged to Standardize: H2020 IoT Large Scale Pilots

- Management of Networked IoT Wearables – Very Large Scale Demonstration of Cultural and Security Applications – www.monica-project.eu

- ACTivating InnoVative IoT smart living environments for AGEing well - www.activageproject.eu

- AUTOmated driving Progressed by Internet Of Things – www.autopilot-project.eu

- Internet of Food and Farm 2020 - www.iof2020.eu

- Delivering an IoT enabled Digital Single Market for Europe and Beyond – www.synchronicity-iot.eu

- User Engagement for Large Scale Pilots in the Internet of Things - www.u4iot.eu

- CRoss FErtilisation through AlignmenT, Synchronisation and Exchanges for IoT – www.create-iot.eu   www.european-iot-pilots.eu

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Why Standards for Smart Cities ?

- Underpinning common understanding

- Enabling integration between systems, and between the physical and the digital world

- Accelerating smart city solutions and deployment

- Provide confidence in the market

- Preventing vendor lock-in

- Enabling scaling and replicability of urban solutions

- Facilitating a collaborative, consensus-driven process open to all stakeholders
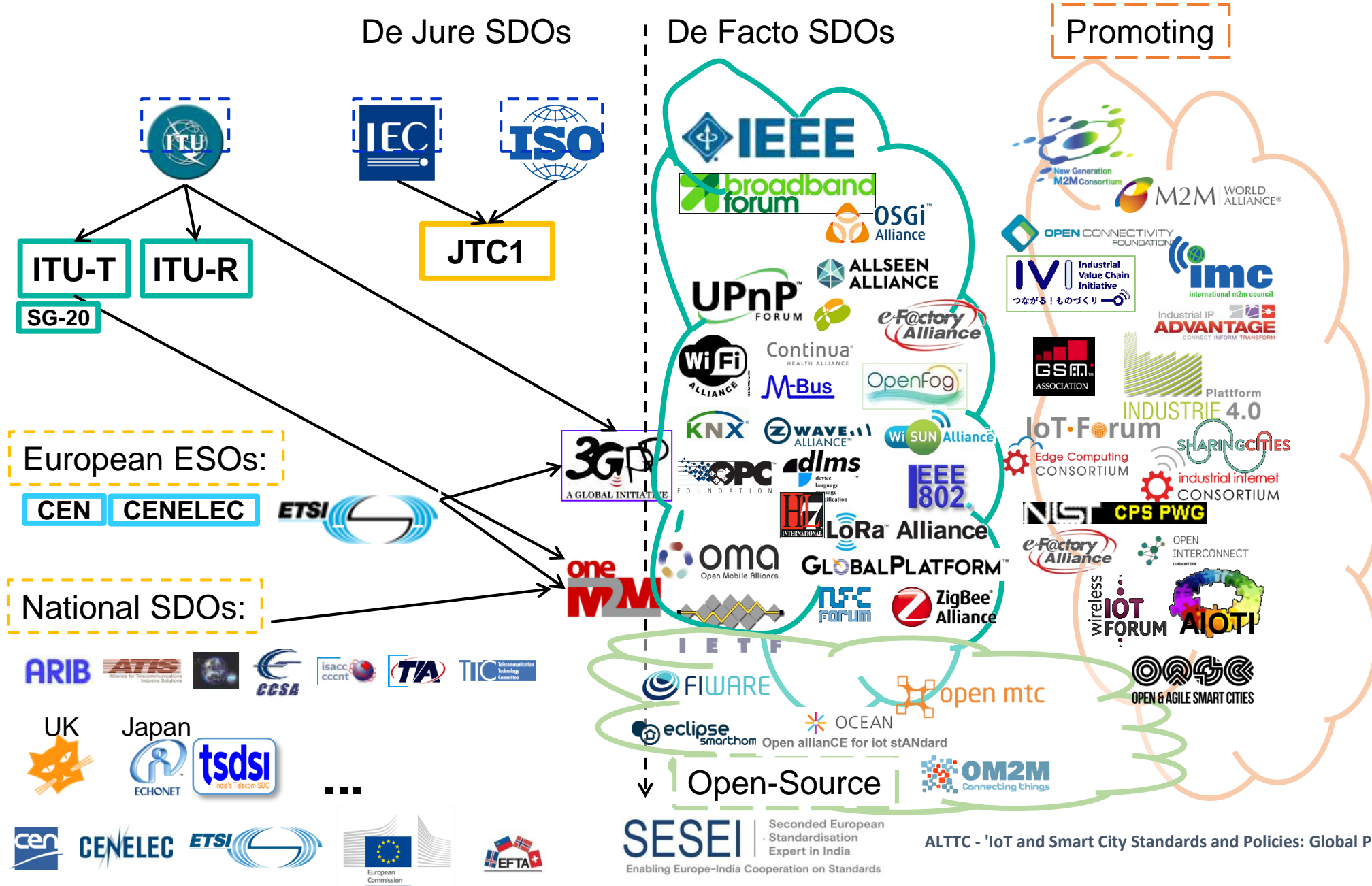
Because STD will create Smart Cities!

… in response to the market and final beneficiaries needs (cities and citizens)

Mapping of European standards and initiatives relevant to Smart Cities

Cities need help in the Specifications Jungle

De Jure SDOs | De Facto SDOs | Promoting

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Global & EU Standardization activity

ISO/TMB/
Smart Cities SAG
+ TF

Jointly with IEC and ITU

CEN-CENELEC-ETSI
Sector Forum on SSCC

Advisory & Strategic Group - ESOs
- ✓ Recommendations and coordination
- ✓ No standardization development
- ✓ channel EU requirements to relevant TCs

ISO/TC 268
ISO/TC 268/SC 1

IEC SyC
Smart cities

ISO-IEC/JTC 1
WG 11

ITU-T/FG
SSC

Technical Committees
- ✓ Standardization Development
- ✓ (Standards, TS, TR, PAS…)

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Standards shrink risks in Enabling Technologies

Fixed:

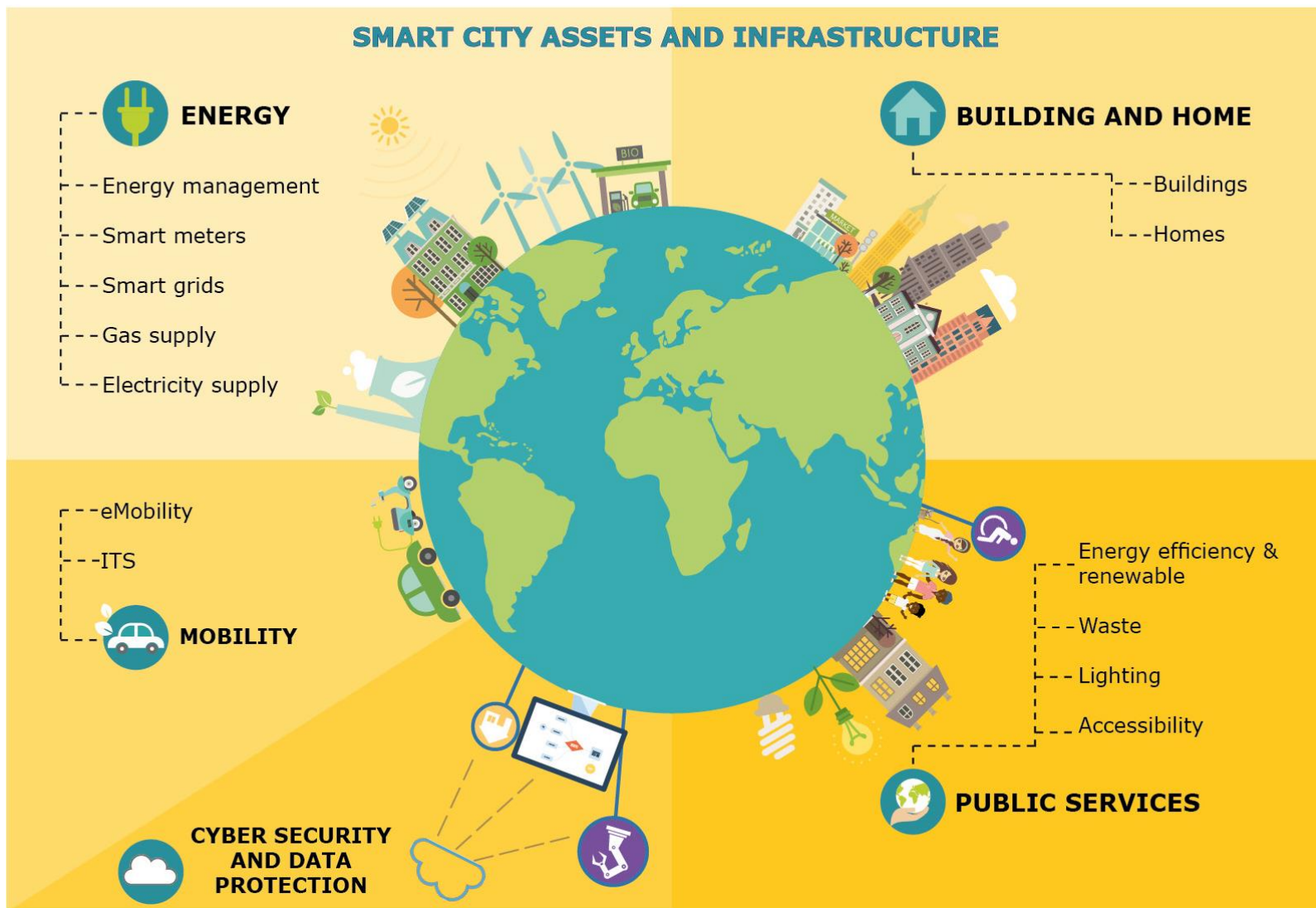xDSL, Fibre, PoF, PLT, NGN, SDN/NFV, co-axial (cable)

Wireless:

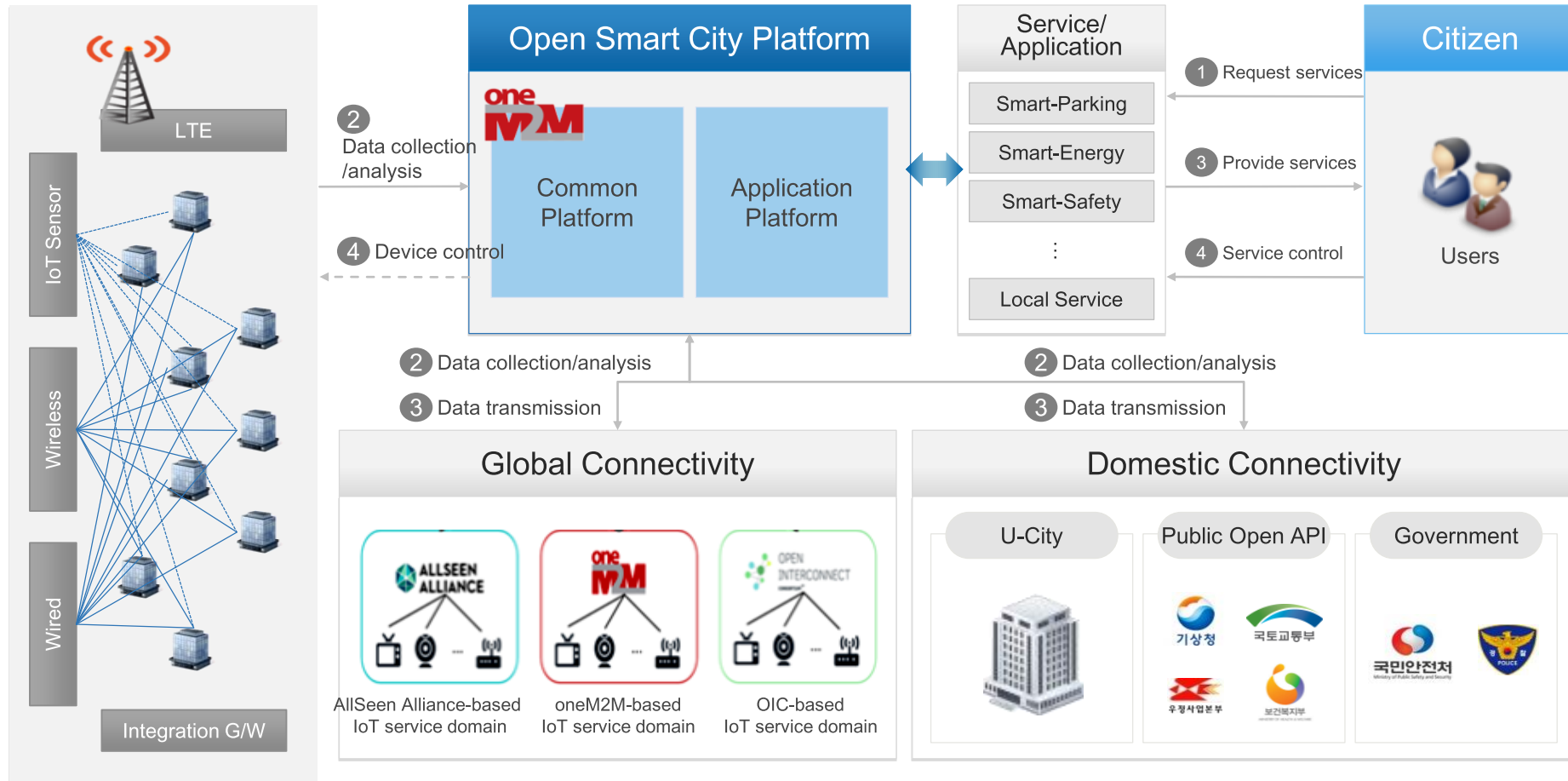Wi-Fi, Digital Radio, Wide band, narrow band, LTE -> 5G, Satellite, NFC, RFID

Horizontals / Platforms:

Security/privacy, Energy efficiency, M2M, QoS/QoE, Interconnect & Interop, Secure IT platform & data management, semantics, Human Factors

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All are looking for similar needs, but stages are different

SMART CITY ASSETS AND INFRASTRUCTURE

ENERGY
- Energy management
- Smart meters
- Smart grids
- Gas supply
- Electricity supply

BUILDING AND HOME
- Buildings
- Homes

- eMobility
- ITS

MOBILITY

- Energy efficiency & renewable
- Waste
- Lighting
- Accessibility

PUBLIC SERVICES

CYBER SECURITY AND DATA PROTECTION

oneM2M based smart city deployment example - Busan

Source: SKT

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Key requirements for smart city IoT platform

|	
Horizontal platform <u>for new deployments</u>	• Smart city is an incremental and participatory journey • New deployments should, where possible, leverage a converged networks and an horizontal service platform • Open standards are key to avoid lock-in and master the total cost of ownership
<u>Existing deployments</u>	• Do not disrupt existing "vertical deployment" but seek opportunities for an integration path with an horizontal approach • Build value through smash-ups and open data

<u>Participatory</u> and <u>innovative</u> approach	• Surveys
	• Address needs for innovation through app development:
	    • APIs
	    • Access to, eventually semantically enriched, Open data (where feasible and subject to privacy legislation/citizen consent)

<u>Security</u> and (device) <u>management</u> are key	• Despite initial focus on IoT data, there is an increased interest in security and device management (which go hand in hand). • Need arises from security threat analysis conducted recently: e.g. "Two researchers analyzed Smart meters widely used in Spain and discovered that can be hacked by attackers to harm the overall National power network.", source: <u>http://securityaffairs.co/wordpress/29353/security/smart-meters-hacking.html</u>

A possible smart city blue-print
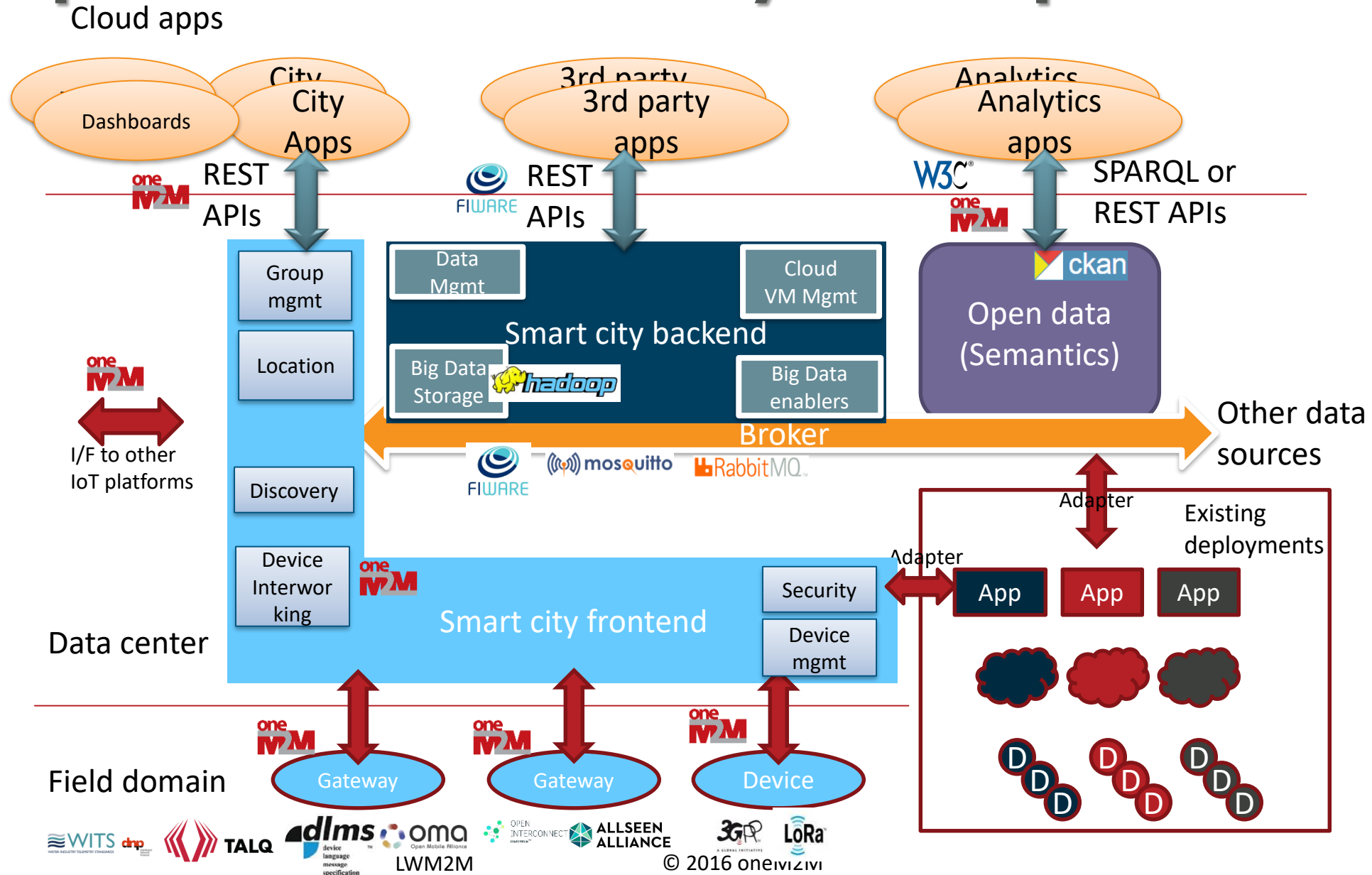
Smart Cities - India

Status Update

Selected cities with proposed investments

City Challenge (Year)	Selected Cities	Total cost of projects (bn. euro)	ABD (bn euro)	Pen city solutions (bn euro)	Total urban population impacted (Cr.)
Round 1 (2016)	20	6.02	4.65	1.37	3.74
Fast track (2016)	13	3.73	3.25	0.48	0.94
Round 2 (2016)	27	6.75	5.32	1.42	2.55
Round 3 (2017)	30	7.18	5.87	1.32	2.37
Round 4 (2018)	99	1.6	1.33	0.27	0.35
Total	**99**	**25.28**	**20.42**	**4.86**	**9.95**

- Total winning proposals – 100=> One more City Shillong (Meghalaya) gets selected as the 100th Smart City
- Total Cost of Projects – 25.28 billion euro
  - ✓ Area based development (ABD) investment - 20.42 billion euro
  - ✓ Pan city solutions investment - 4.86 billion euro
- Total impacted urban population – 99.5 Million

Projects completed and under progress

According to [report released](#) by Ministry of Urban & Housing Affairs (MoUHA):

- ✓ As on 17th January 2018, 2,948 projects worth Rs. 1,38,730 crore (17.36 billion euro) are in various stages of implementation

  - 189 projects have been completed

  - 495 projects projects have started work

  - Tenders have been floated for 277 projects and

  - 1,987 projects are at detailed project report (DPR) stage.

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Smart City - Standards

❑ BIS CED 45 drafted Smart City Indicators based on <u>ISO 37120:2014 Sustainable Development of Communities: Indicators for city services and quality of life'</u>

❑ BIS Panel on ICT New & Emerging Technology

— Panel 2: Title–Smart Infrastructure monitoring and contributing work carried out at ISO & IEC on the topics of Smart Cities (ICT Technology), Active Assisted Living, Smart manufacturing, Smart Energy

❑ NIUA and MoUD have also prepared and released Smart City Indicators that can be used by cities to measure their performance

— 45 core indicators and 22 supporting indicators

❑ MoUD with NASSCOMM and DSCI also prepared guindelines for the Security part of Smart Cities

Challenges

- ✓ Availability of master plan & retrofitting of existing cities
- ✓ Financial sustainability of Urban Local Bodies (ULBs)
- ✓ Technical constraints & Multi-tier governance
- ✓ Providing clearances in a timely manner
- ✓ Dealing with a multivendor environment
- ✓ Capacity building
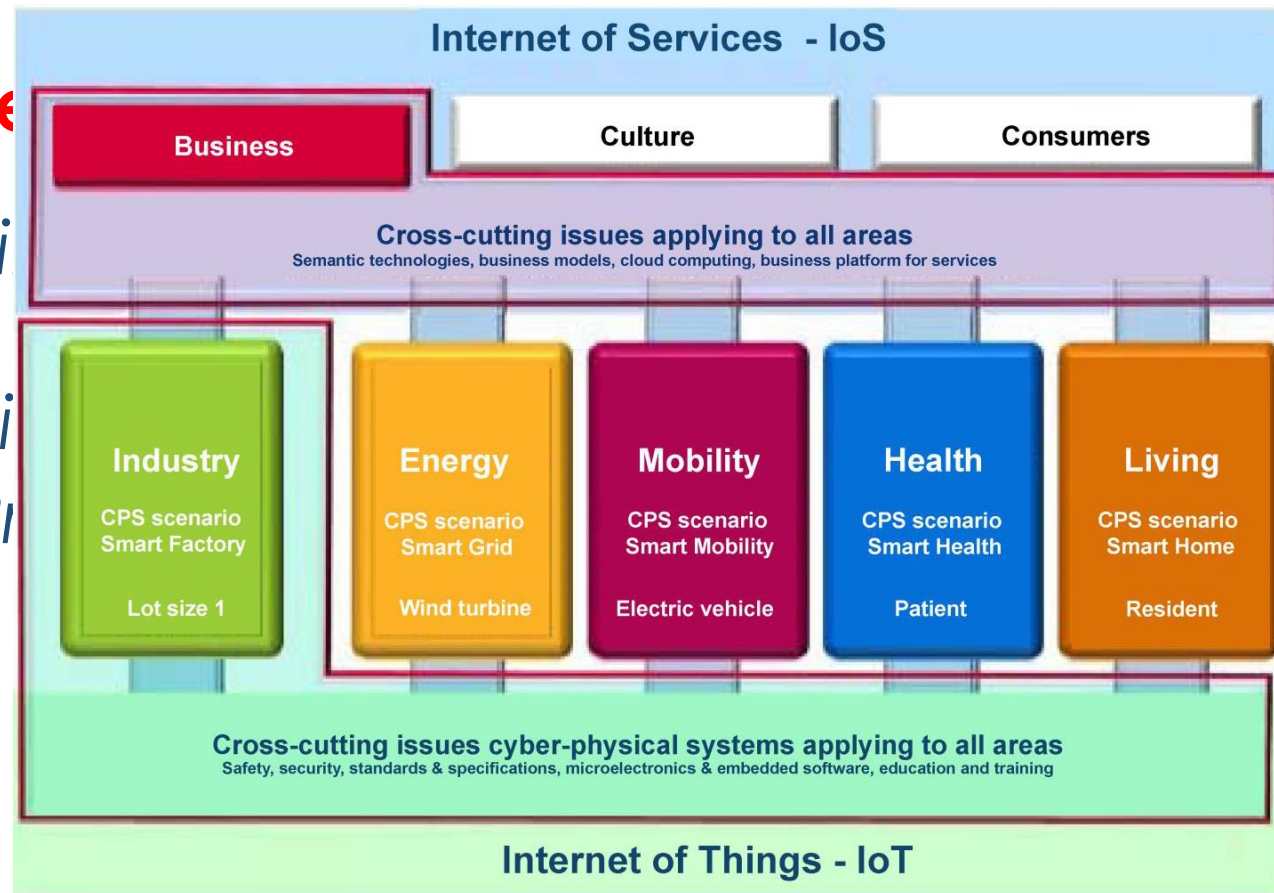- ✓ Reliability of utility services

Digital Infrastructure

Challenges

The world is changing - Digitization

- **The Challe**

  ✓changi   of services
  ✓Digital   verything is
    becomi
  ✓Data Pr

To remain relevant, standards must be timely, market-driven and produced in an inclusive way quickly

What can/should we do?

➢ **Awareness, Education and Understanding about the Standardisation System** i.e. increasing the use of standards and participation in the process at all levels

- **Education About Standardisation**

➢ **Coordination, Cooperation, Transparency, Inclusiveness**, i.e. ensuring adequate, high-quality, user-friendly and timely release standards

- **ESOs CGs on Smart Energy, Smart Cities, Accessibility, Mobility etc.**

- **Joint President Groups**

➢ **Competitiveness and International dimension**, i.e. standards supporting competitiveness in the global markets.

- **Yearly Work Program, Roadmap, Participation and Contribution to Research Program (H2020)**

Conclusions

➢ Concept of Smart Cities is great but lack of infrastructure & basic amenities are the biggest challenges

➢ In case of Smart Cities standards does exist, they need to stitched, and implemented

➢ Government is driving Smart Cities mission but progress is quite slow

➢ Strong need for Common ICT Architecture, Common Service Layer, Global Standards for the Smart Cities applications

➢ Common Service Layer is important and critical for its implementation as part of Smart Cities & oneM2M is global and interoperable standard

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