

Summary

SSCC-CG final report

Smart and Sustainable Cities and Communities
Coordination Group

January 2015

1 Introduction

The growing awareness that the world has been considerably weakened, by unsustainable development and rampant overconsumption has resulted in an increased focus on sustainable development. One result is that many initiatives are being developed in the area of “sustainable and smart cities/communities” (SSCC). Because of this, a Coordination Group (SSCC-CG) was established in 2012 by the CEN-CENELEC Technical Boards along with the ETSI Board, to coordinate standardization activities and foster collaboration around standardization work on SSCC in Europe. The group is chaired by Mr Jean Felix (France)(representing Syntec Ingenierie and EFCA/FIDIC), with a secretariat provided by AFNOR and composed of 44 organisations representing NSBs, the European Commission, ESO partner and liaison associations, city networks and other organisations.

SSCC-CG members noted a general consensus that

- **Sustainable development in Europe depends** on the development of **sustainable cities**, which can only be achieved through the wide-reaching roll out of integrated, scalable, sustainable Smart/sustainable-city/community solutions.
- **Sustainable, smart cities and communities will contribute to sustainable development and resilience**, through soundly based decision - making, and the adoption of both a long and a short term perspective.

City purposes

They agreed to base the work on **the 6 purposes of sustainability and smartness for cities and communities**, as proposed by ISO TC 268 "Sustainable development in communities"; to strengthen:

- **Attractiveness**, supporting European businesses and providing a level playing field
- **Social cohesion**, population consensus, inclusivity (participation of all)
- **Well-being** creativity and innovation
- **Resilience**
- **Responsible resource use**
- Preservation and improvement of **environment**

Key issues to take into account

They also agreed to take into account **the 12 major relevant issues for SSCC** identified by ISO TC 268:

- Governance
- Education
- Innovation
- Health and care
- Culture
- Living together
- Economy
- Living and working environment
- Safety and security
- Smart community infrastructures
- Biodiversity
- Mobility

The benefits of Standards to Smart and Sustainable cities and communities

The group quickly identified four important benefits that standards could bring to this area. It was agreed that standards could help by:

- Enabling integration between systems, and between the physical and the digital
- Underpinning common understanding
- Helping to obtain funding, and to prevent vendor lock-in
- Enabling scale
- Standards on physical and digital environments that ensure accessibility for all citizens

Recommendations

R1 - SSCC-CG recommends that the three ESOs (CEN, CENELEC, ETSI) continue to collaborate with regard to standards for Smart and Sustainable and Cities and Communities and ensure a coordinated approach between the different technical groups involved, in particular for three reasons:

- to ensure that the principles outlined in sections above are taken forward coherently;
- to interface with the European Innovation Partnership (EIP) on smart cities and communities activity - specifically in relation to the selected SSCC-CG invitation for commitment (n°7352) and proposed Action Cluster "Standards";
- to ensure an overview is available of European needs in this area, so that, as far as possible, these needs would be reflected in the work on global standards.

It is also recommended that, should this collaboration continue in the form of a Coordination Group (SSCC-CG or successor arrangement), the need for such an arrangement should be reviewed on a roughly annual basis.

2 A city or community can be understood as a ‘system of systems’

	<p>City/Community history and characteristics What is the city or community story, its “brand” and values? Is it a stand-alone city, a hub city or satellite city, or is it a network of rural towns and villages? What is the size of population? Is it growing, stable or shrinking? What is its demographic mix?</p>	
<p>Environmental context</p> <p>How flat or hilly</p> <p>On what kind of rock it is built</p> <p>If it is by the sea or inland</p> <p>Climate</p>	<p>City/Community actors Local authority, Health trusts, service providers, electricity and gas suppliers, police, bus and tram companies, voluntary groups, businesses, banks, investors, and, most important of all, the citizen.</p> <p>Activities Planning, managing, purchasing, regulating, building and repairing, providing services, generating profit, gaining finance ...</p> <p>Community facilities and buildings Homes, hospitals, schools, electricity substations, sports facilities, cinemas, water treatment plants, district heating plants, factories, offices, shops ...</p> <p>Infrastructures Gas, electricity, water, sewerage, telecoms, roads and rail, district heating systems ...</p> <p>Soft Infrastructures Business / Science / Community / Innovation networks and collaboration structures</p> <p>Technical systems Traffic light management, ticketing, billing and payment, automatic number plate recognition ...</p> <p>City/Community functions or service areas Employment, Housing, Education, Health, Security, Mobility, Energy, Water, Waste Management, Food Supply chain, Consumer Goods Supply Chain ..</p> <p>Scale Citizen, building, block, neighbourhood or village, district or town, city, metropolis ...</p>	<p>Societal context Laws & regulations</p> <p>Division of power between national and city/community governments</p> <p>Division of power between agencies within the city or community</p> <p>Cultural norms</p> <p>Economic structures and situation</p> <p>Political context</p>
	<p>City/Community Governance The task of City and Community Governance is to ensure that all of the functions of the city or community are delivered effectively at all levels of scale, and are properly co-ordinated to best deliver on the purposes the city or community has set itself.</p> <p style="text-align: center;"></p> <p>City/Community Purposes The key challenges facing the city or community that need to be tackled and the opportunities that need to be grasped. Social, Economic, Environmental ...</p>	

Because of this, a smart/sustainable-city/community can be represented by a model proposed by the SSCC-CG, which can clarify the evaluation of needs and overlaps for standards in this area.

The model lists the many different entities and relationships in the city, in order to indicate the boundaries across which interoperability, integration and coherence are needed.

Standards therefore need also to cover the interoperability and cohesion of all of these different entities, relationships and systems at every layer.



Recommendations

R2 - The next stage of the work of developing the smart/sustainable city model therefore needs to be done in partnership with cities and communities, particularly those who are already implementing strategies to become smarter and more sustainable.

The next stage mentioned above, should be done jointly with existing city networks within Europe. This could be done through the EIP proposal to the group to launch an Action Cluster on standards.

3 The importance of collaboration within the city

Stakeholders and interested parties

The collaboration between a set of key stakeholders and interested parties is a key component of the achievement of a sustainable and smart city. These may belong to one or several specific categories:

- **Public authorities:** national, regional, local government and municipalities ... ,
- **Developers and investors:** Public or private, promoters trades ...
- **Industry and operators** of public or private services
- **Public interests groups,** and associations
- **Permanent or temporary residents,** inhabitants, businesses, consumers
- **Banks, insurers**
- **Consumers/citizens**
- **Prosumers** i.e. consumers who also produce

Within this, the key perspective to focus on is that of the “citizen”, this term being taken, in the SSCC context, broadly to mean individual citizen and their families.

4 The value of collaborating with existing work in this area

Standardization work could accelerate and help the work of many on-going major National, European and International identified initiatives in moving existing cities to become smarter and more sustainable. The groups that could be supported include European city networks and associations, The European Innovation Partnership for Smart and Sustainable Cities, work by NSBs within Europe, International Standards Organisations and International organisations working in this area.

European city networks, associations and groups

There are many exiting European city networks and groups whose work has already resulted in recognized charters, best practice guidelines and tools, along with initiatives that provide funding and supporting programmes, assessment methods, and certification schemes¹.

The “European Innovation Partnership” (EIP) for smart cities and communities

The “European Innovation Partnership” (EIP) for smart cities and communities. This is a stakeholder-driven initiative with the European Commission in a facilitating role; bringing together cities, industries and citizens to tackle key societal challenges in cities and communities through an integrated approach encompassing the areas of energy, transport and ICT. The policy goals are the EU 20/20/20 energy and climate targets.

The SSCC-CG has already responded to the EIP invitation for commitment for the implementation of the EIP OIP-Operational Implementation Plan Standards Potential Action 2 *“Develop an interoperability framework for smart/sustainable-city/community standards including the identification of relevant existing standards and the gaps and overlaps between them”*.

Recommendations

The SSCC-CG recommends that links with the European Commission initiatives be strengthened:

R3 - Work towards the alignment of the future activity of the CEN-CENELEC-ETSI SSCC-CG and the EIP/OIP for the development of a common landscape and strategic programme for smart/sustainable-city/community standards.

R4 - In terms of developing a holistic and integrated approach (breaking the ‘vertical silos’ approach) for standardization for smart and sustainable cities and communities, not to limit the SSCC-CG range of actions to the three vertical areas of the SIP (Sustainable Urban Mobility; Sustainable Districts and Built Environment; Integrated Infrastructures and process across Energy, ICT and Transport) but to widen the focus to ‘other aspects’ such as for example: integrated care, lifecycle assessment (water, waste, etc), well-being, citizens’ and cities’ awareness and engagement in standardization, accessibility, privacy management, etc.

R5 - The three ESOs (CEN, CENELEC and ETSI) to play an active role in the EIP, specifically in relation to the proposed Action Cluster for ‘Standards’.

R6 - To engage cities and city representatives part of the online Marketplace of the European Innovation Partnership (EIP) on smart cities and Communities (www.eu-smartcities.eu), to get feedback from them on smart/sustainable-city/community projects that they have already undertaken, or are in the process of doing (possibly through the use case template model). As general consideration, to suggest the online Marketplace of the European Innovation Partnership (EIP) on smart cities and Communities (www.eu-smartcities.eu) as member of the SSCC-CG as ‘Interested parties platform’ for the SSCC-CG (see ToR point 7.3), acting in a purely advisory capacity to the SSCC-CG.

¹ For example, SSCC-CG pinpointed a few major ones: European Energy Award, Energycities, INTA, City protocol, Covenant of mayors, ICLEI ...

R7 - To take into consideration the HORIZON 2020 Call for Proposal (opening 10/12/2014 closing 05/05/2015) SCC 3 – 2015 (Coordination and Support Action) 'Development of system standards for smart cities and communities solution as possible source of funding for ESOs activities in standardization for Smart/sustainable-cities/communities.

R8 - A possible collaboration with/participation in the Lighthouse Projects (LHP) to be set up for the identification of relevant and existing standards or development of new standards to deliver innovative smart/sustainable-city/community solutions to be implemented on a large scale.

R9 - To implement as far as possible the potential actions of the priority area (10) "Standards" of the EIP-OIP actions and the SSCC-CG activities together with the international and global standardization organisations (ISO/IEC/ITU-T).

Many standardization activities within European countries,

Part of the reason for setting up the SSCC-CG is that a number of National Standardisation organisations within Europe are already active in this area, for example

- **In Poland**, a coordination group on SSCC was set up in the beginning of 2014 to monitor any national standardization activities. It has two thematic groups; one on terminology and links with the technical bodies in PKN, the other for the development of a work programme.
- **In Germany**, a joint steering body and a joint working group for DIN and DKE have been working for some time to develop a common approach to SSCC
- **In the UK** the British Standards Institution has been running a standards programme in the area of Smart Cities for over two years and has already published three PASs and one PD relating to Smart Cities
- **In Spain**, AENOR is running a standards programme made of 13 projects. These standards will promote smart cities in Spain and publications are expected during 2015-2016. A report has been published in July 2014 a report that includes the National standardization strategy for smart cities.

Activities of major countries outside of Europe

A number of countries around the world have set up initiatives to develop standards in these areas. For instance:

- In China: a coordinated strategy for standards on SSCC has been established for internal and external Chinese works, based on three principles overall planning, coordination, and application, with local cities participating in the standards development.
- In the US: An American networks for SSC was started in May 2014 by ANSI, a forum for information sharing and coordination on voluntary standards.

Work by International Standards Organisations

- A new ISO standard on Global City Indicators has been agreed, along with three sets of other ISO standards on SSCC (smart infrastructure, management, terminology) to be proposed in 2015.
- The ISO advisory group on smart and sustainable cities, which was set up in June 2014 to advise ISO/TMB for coordinating ISO internal works, and with external initiatives.
- ISO/IEC Joint Technical Committee 1 set up a Smart Cities Study group and this has recently put together its recommendations for work on ICT standards
- IEC (The International Electrotechnical Commission) has set up a System Evaluation Group (SEG 1) to evaluate whether a Systems Committee needs to be set up to cover standards for smart cities.

- An ITU (International Telecommunications Union) Focus Group on smart and sustainable cities has been developing technical reports to help identify the standardization requirements in this area.

Relevant work by other international organisations

- **The UNEP initiatives**, GIREC (Global initiative for resource efficient cities) , SBCI (Sustainable building construction initiative), MAC (Multi stakeholders advisory committee of the 10 YFP (10 years frame work programme) ...
- **A World Council on City Data**, created by GCIF in 2014 to implement and test the ISO standard 37.120 on city global indicators
- **The City Protocol Society: a cross-sector but city-led NGO** that is developing common approaches to tackle city needs with a variety of experts of the City protocol task force to tackle challenges identified by cities through the implementation of projects or policies.

Recommendations

R10 - The SSCC-CG recommends that a review should be undertaken of how the topics and issues of a sustainable and smart city, as identified by SSCC-CG, are addressed by each of those initiatives.

5 Standardization in SSCC field will create added value

The development of relevant standards will help to deliver a smarter City in four ways:

- developing and managing an overall SSCC strategy
- Implementing and managing major SSCC projects,
- doing things smarter
- putting in place a solid foundation.

Developing and managing a smart/sustainable city strategy:

Smart cities offer opportunities for integrated thinking and planning. The development of an overall smart/sustainable-city/community strategy is attractive for local authorities seeking to make best use of the available technologies. The use of standards is essential to enable a strategy to be drawn up, and to ensure the different city services can operate correctly in line with it. The focus is on the sort of guidance and standards that would help a city in developing and managing its overall smart/sustainable-city/community strategy.

The role of standards here is to:

- ensure that there is a common understanding amongst all the stakeholders of what makes the city into a smart one,
- Provide with relevant and consistent guidance to integrating the different city services
- To help with indicators to measure how well a city is doing overall
- To help manage overall city resilience, industrial regeneration and other key citywide issues.

Recommendation

R11 - The SSCC-CG recommends CEN members (as members of ISO) to track the relevant work in ISO TC268 and the SSCC-CG to recommend to take up this work if relevant at European level.

R12 - ESOs to draw up in the first instance a TR to assess smart citizen related standards and requirements, including aspects related to accessibility and to data protection/privacy, with reference to existing and planned standardization activities and which would highlight the more general legal/ethical aspects needing further investigation'

Implementing major new smart/sustainable city projects

The implementation of major new smart sustainable city projects presents many key challenges. They are often cross-cutting – needing joint investment procurement and management by a variety of agencies within the city that may not be used to working together. They tend to be transformational in nature, requiring completely new ways of working by those agencies involved. They are also new and pioneering and it can be difficult to get the evidence needed to support the investment required. Standards can help here in a number of ways. They can help with:

- **Improving Assessment and Funding of Smart/sustainable City Initiatives:** with common agreed references and tools for stakeholders,
- **Improving and facilitating Procurement** especially of these tailor-made solutions adapted to different circumstances.
- **Supporting the take-up of new practices for industry**
- **Supporting the implementation of new infrastructure/equipment platforms;** standards can contribute to lowering investments costs, facilitating integration with existing infrastructure and controlling operational costs.

Doing things smarter

- **Widening out sector specific standards:** existing best practice in individual organisations and systems can be built on to provide city-wide best practice.
- **Through Data sharing with the support of key standards,** for concept model, technical data to be stored and aggregated, effective data exploiting
- **With planning Guidelines based on standards,** to ensure that developments and infrastructure projects are designed and built in a way that facilitates the city's progress towards becoming smarter.
- **With urban modelling tools** as guidance document for city/community leaders and planners to help them understand how best to utilize these new tools.
- **Through Skills and Education,** an important item even critical to smart cities development that should be addressed taking into account all the above issues.
- **Facilitating financing projects** as for example use of energy saving performance contracts (ESPCs), long term concession-based contracts or public private partnership (PPP) and new business models are today being used or under development.

Putting in place a solid foundation for

- **Smart cities for all citizens needs:** standards programmes, necessarily taking an overall approach, can redress the balance and include ensure that citizen needs are covered.
- **Legal issues and ethics:** "Big data" in a smart/sustainable-city/community environment raises issues that badly need to be addressed. Central legislation - supported by proper standards on the technical implementation of personal data protection and privacy - should help reduce these problems,
- **Supporting Inclusivity and accessibility:.** Smart/sustainable-cities/communities can give more inputs to the CEN-CENELEC standardization activity on M/473 'Accessibility following 'Design for All' approach and M/420 'Accessibility requirements for public procurement in built environment' " ensuring physical accessibility will also imply more use of electronic devices.

Recommendation

R13 - The SSCC-CG suggests any future standardization work to take into consideration the activities of the EIP on smart cities and communities and its Strategic Implementation Plan highlighting 8 enabling priorities areas (one of them being standards) and the actions described in the EIP-Operational Implementation Plan, priority area 10 "standards".

6 SSCCs need specific standards work

SSCC standards work has to address the following challenges:

- To ensure interoperability between different city systems.
- To take into account the challenges of complex organisational requirements.
- The need for the city or community to be able to manage issues such as privacy, security, resilience, data flows on a whole-system basis.
- The needs of non-specialist city or community leadership.
- The need to ensure that standards being developed within Europe in relevant technology areas take into account the requirements of SSCC
- The need to ensure consistency with SSCC standards being developed by national standards bodies within Europe and by international standards bodies

Areas for SSCC standards-related work

Because of this, the following types of standards work are needed:

- **Developing standards** related to ensuring interoperability and coherence between different city systems
- **Studying SSCC related issues** (such as City Security, City Resilience, City Privacy etc.) in partnership with the relevant Standards development organisations within Europe,
- **Developing guides to the key technologies and trends,**
- **Liaising** with relevant **European city networks** and with other **national and international standards bodies** to ensure a consistent approach.

Tackling the priority areas identified by the EIP Smart Cities & Communities

These areas relate to the intersection of the 3 horizontal sectors (Energy, Transport and ICT, that will later be broadened to more sectors) with 8 horizontal areas (see section 4.2) ²

7 Strategy for standardization

An SSCC standards programme has to consider an overall approach

The standards programme needs to take into account the impacts on the society, the behaviour of the citizens, their position and relationships in that society and so on. A consistent management of European standards programme on SSCC has to also consider the other internal and external initiatives on SSCC, and European specificities.

The general context of Europe in 2014 and the challenges this brings to the implementation of standards work at a European level. There has come about a sort of systematic reluctance against any initiatives coming from European institutions or assimilated ones, in the field of regulation and standards. There is also a genuine confusion between standards and regulation, as well as regards the respective roles of partners involved in standardization and in its process.

Recommendations

R14 - The recommendation is therefore that, the three ESOs should focus on problems that European cities and communities face, within the framework of international activities on Smart Cities' standardization.

² Citizen focus Integrated planning & management, Knowledge Sharing Funding & Finance, Procurement & Financing, Business Models Information & Decisions, Open data governance, Standards, Baselines, Performance Indicators and Metrics

The need to tackle potential resistance for standardization programmes on SSCC,

There is a need to improve the image of “standards” among European Cities. The best way to do this is to involve a large number of representatives of all parties and domains in the development of standards and to consider technological issues as well as societal ones.

- **New stakeholders** need to be engaged
- **Public authorities have a major role:** standardization programmes should involve the upper level authorities in charge of such policies
- **Business stakeholders should also be** involved in the selection of standards to be developed, revised or transposed
- Recognising the way that **citizen behaviour and attitudes contributes to the success of standardization policies in SSCC**, a link between good practices and research centres would contribute significantly
 - **The involvement of SMEs and micro businesses must be improved**, for example through the engagement with agencies such as Citymart, who act as brokers between cities and developers
 - **Public authorities and Business stakeholders favour frameworks standards (on definition, methodology ..)** rather than very specific and detailed technical standards, in order to support an open system
- Given that SSCC technologies are rapidly developing, **there needs to be a much quicker method of developing standards than standards bodies have been used to.** Creating horizontal standards for the urban space may be an opportunity to rethink the standardization process
- **The negative image of standards, linked to supposed added costs, administrative burden and implied constraints, has to be addressed**
 - **Standardization bodies need to join initiatives** such as, for example, the European Commission ones, **to bringing standardization closer to SMEs, start-ups and the general public**, linked with effective communication policies
 - In order to address the worry of many communities regarding the extra costs and administrative burden that they assume come from standards, **there is a need to develop effective support and guidance standards to ease the way into the adoption of a standardised approach**
 - **The proliferation of organisations dedicated to standards and good practice in the area of SSCC contributes to a negative image towards standard.** It is therefore vital that all the standards organisations and other key bodies are able to present a united front.

Recommendation

<p>R15 - The SSCC-CG recommends launching a campaign that should start before the launch of the standards on smart and sustainable cities, so that they are perceived as “a common language” to face common challenges, for example for climate change</p>

- **The publication of a comprehensive European standardization roadmap is an important step**
 - **to help clarify the complexity of the situation** and the diversity of the stake holders,
 - **to make the potential work packages** and SDOs interested in leading this work transparent,
 - **to lay out all the facets of SSCC development** and make them clearer in a by providing comprehensive description of what the proclaimed "smartness" might be all about.

This would involve:

- Identifying the key areas and prioritising these
- Gaining agreement about the role of each standards body
- Gaining the involvement of the key stakeholders, in particular the cities, in this process.

Recommendation

R16 - Smart/sustainable-city/community standards require standards organisations to bring input from new types of stakeholders such as cities, communities, citizens and small businesses into the standards making process.

R17 - A communication policy including contacts with the media should be drawn up to promote the value of standards.

R18 - Ways should be explored to reduce the costs of participation and the time to develop standards for SSCC while ensuring that all relevant stakeholders are included in the process and their requirements are met.

R19 - The proliferation of systems dedicated to SSCC imposes some upper global concepts for a common understanding worldly recognized that could not be questioned, for example some definition extracted from ISO TC 268 "Sustainable development in communities" or other international institutions works, like the definition of smartness proposed in the draft ISO 37101 "Sustainable development and resilience of communities – Management systems – General principles and requirements" that creates a link between smartness and sustainability, avoiding opposing their approaches.

R20 - Cities, communities and other relevant stakeholders should be encouraged to participate in the development of a 'Smart Cities standardization roadmap'.

R21 SSCC-CG would be prepared to take a leading role in the development of smart cities standardization roadmap if this was felt to be appropriate by the ESOs.

A Communication Strategy is inherent to standardization policy on SSCC

- **Standard setting committees need to ensure communication at the enlarged round table of standardization, which involves all stakeholders, interested parties and citizens**
- **Every aspect the individual stakeholders considers important in their individual professional field, needs to be shared with every participant.**
- **The public needs to be involved and must be given the opportunity to voice their concerns.**
- **Working with key city networks is of paramount importance,**

Conclusion and other general recommendations:

CEN-CENELEC and ETSI should be available to provide the "roundtable" for sorting out the organisational process, bringing the right people together and explaining the benefits of standardization in the context of urban development.

R22 - The SSCC-CG should continue its work by:

- draw up a clear roadmap for future standardization activities in Europe and promote it amongst affected stakeholders;
- analyse and recommend standards for development, adaptation, or revision by CEN, CENELEC, ETSI;
- monitor a dedicated communication policy;
- develop adequate partnerships.

