Brussels, 8 October 2014

POLICY RECOMMENDATIONS ON SMART CITIES AND COMMUNITIES

EXECUTIVE SUMMARY

Orgalime is the European engineering industries association, representing Europe's key enabling technology sector of any future infrastructures. Our industries offer all the technology solutions for cities and communities to stand societal challenges and for becoming generally smarter, more efficient and more competitive. For this to succeed, however, we believe that citizens should be at the centre of the development towards a smart city/community.

We generally welcome the European Innovation Partnership (EIP) on Smart Cities and Communities and its objective to demonstrate and scale up major innovative solutions through the Lighthouse Projects and other initiatives.

However, we have a number of substantiated views and recommendations to shape the EIP, which we would like to provide in this position paper.

Overall, our industry is hopeful that the EIP will indeed lead to smart cities projects and technology deployment in European cities. In doing so, we recommend that all EU funding opportunities available for smart cities should be fully exploited and experiences of projects should be shared.

Today, cities are challenged by an expanding urbanisation. Present urban infrastructures are largely outdated. Upgrading them one-by-one is not sufficient, however doing this in an integrated manner would allow exploiting synergies and increasing the effectiveness of individual solutions while achieving overall more sustainable and cost effective results.

The EIP on Smart Cities and Communities focuses on the areas of energy, transport, information and communication sectors, which we welcome, considering the potential benefits they offer. More can be done for making cities truly smart, by including further sectors, too, notably buildings, healthcare, safety and security, water and waste management.

Citizens expect improvements in the quality of their lives. Consequently, cities need to become "smart", meaning they need to apply a whole new range of actions and an integrated approach to tackle the challenges they face, including for underpinning economic activity and assuring business and city service continuity also during times of increased stress.

To achieve this, interoperability, the development and usage of standards and the rightful handling of data are key elements for smart cities and communities. New collaborative models at business and local level and across the value chain should also be promoted throughout the EIP in order to develop services and solutions.

European regulators should coordinate the progress of developing a common understanding of a smart city, which is holistic and remains valid and useful even with future innovations in technology.

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1. INTRODUCTION

Orgalime welcomes the European Commission's European Innovation Partnership (EIP) on Smart Cities and Communities, which aims to support cities and urban areas to become more competitive and tackle the challenges of today.

Today, 72%[1] of the EU population is living in urban areas and urbanisation will increase in the coming decades. People's life expectancy will also increase, therefore resulting in new needs for older citizens.

By 2050, more than 6 billion people will live in cities that will generate 80% of global emissions and account for 75% of the world's energy consumption. Estimates also suggest that by 2030 the major part of the global economic output - about 80 percent - will be created in urban areas.

These trends result in tremendous challenges that cities face today in energy supply, security issues, transportation, waste management and access to water. Meeting these challenges will require cities to become "smart" and to apply a whole new range of solutions to accommodate such changes in an environmentally, cost-efficient and socially acceptable way.

We consider an intelligent infrastructure in cities and communities as one key element amongst several to achieve Europe's 2020 and soon to come 2030 targets.

European cities generally have considerable infrastructure and building stock in place, which however is often outdated and inefficient. Therefore, they require extensive renovation of existing infrastructures in buildings, energy or transport systems, which of course leads to funding requirements.

Upgrading existing infrastructures does not mean starting from scratch in most cases. One must also consider that space in cities is usually constrained and that noise and security are matter to citizens.

Next to energy and climate goals and the wider EU 2020 objectives, the EU member states have endorsed ambitious broadband targets through the Communication "The digital agenda for Europe – Driving European growth digitally". Accordingly, cities must also invest in new ICT networks with high-speed broadband connections to underpin information flows and to boost city economies.

It is also important to improve the management of large data infrastructures with the aim of achieving real-time control of increasingly automated processes in cities.

Our industries offer solutions to all market segments, including in the areas of energy, transport, information and communication technologies, such as, for example, in the areas of active energy management of the home or e-mobility. Moreover, we believe citizens should be at the centre of the development of smart cities.

We also provide the technological solutions for environmental issues, such as renewable energies systems, waste and waste water treatment facilities. Thus, our industry provides a wide range of technological solutions and systems to rapidly support Europe's progress towards smarter and more sustainable, efficient and inclusive cities.

However, Europe's engineering industries are facing strong competition from other regions in the world such as China, Japan or the USA, all of which boost a number of smart city initiatives that

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[1] COM (2014) 490_EU Urban Agenda

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are already broader in scope and contain key sectors, such as buildings, healthcare, or safety and security.

Our industry is particularly committed to help cities and urban areas to tackle their challenges to become smart and we see Orgalime as a key partner to the European Commission for achieving the transition towards a low carbon and resource efficient economy in cities.

We would like to contribute to the debate with our main views on the EIP, an explanation on key issues for our industries and descriptions of key sectors that we feel should be included into the EIP.

2. ORGALIME´S MAIN VIEWS ON THE EIP ON SMART CITIES AND COMMUNITIES

Orgalime is contributing to the European Innovation Partnership (EIP) on Smart Cities and Communities and is committed to continue this.

For its success, the EIP should encompass a strong and appropriate representation of the key industry sectors, including the European engineering industry to identify bottlenecks blocking the development of innovative technologies and their market uptake. Industry expertise will also help for identifying solutions for overcoming these bottlenecks, thereby contributing to shape the EU policy for smart cities.

We provide hereafter our views on the EIP in more detail and present recommendations that should help cities and urban areas to tackle challenges properly, and should guide the European Commission, when facilitating the process through the EIP.

2.1 Definition

A definition of smart cities and communities is missing in the European Commission's Communication (EC 2012/ 4701) final that launched the EIP.

The High Level Group of the Smart Cities and Communities EIP found a definition of smart cities, which, in our view, generally points in the right direction: "Smart cities should be regarded as systems of people interacting with and using flows of energy, materials, services and financing to catalyse sustainable economic development, resilience, and high quality of life; these flows and interactions become smart through making strategic use of information and communication infrastructure and services in a process of transparent urban planning and management that is responsive to the social and economic needs of society."

All players involved, including standardisation bodies, should however strive for a common understanding of a smart city taking the following vision of our industry into account: the European engineering industry envisions that smart cities and communities combine competitiveness, environmental sustainability and quality of living, the three elements being intimately entwined. It is a "System of Smart Systems" addressing the different layers of cities such as infrastructures (ICT, energy, water, transportation, waste), facilities (buildings, dwellings, office and commercial buildings, factories, hospitals, schools, recreation facilities) and services (education, healthcare, safety and security, tourism).

We recommend that regulators should coordinate the progress of developing a common understanding, which is holistic and remains valid and usable even in the face of future innovations in technology and services. It would give businesses, investors and citizens an important political signal.

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2.2 Guidance, governance and involvement of cities and citizens

It is in our view essential that projects take a collaborative approach in terms of governance and technologies, when developing a smart city.

The same approach should be taken for the EIP: a balanced participation from government, private sectors, NGOs, research institutes and citizens in the governance structure of the EIP on Smart Cities and Communities, as well as a transparent communication to ensure a close collaboration from the start are required.

We welcome therefore the establishment of the High Level Group and the Smart Cities stakeholder platform, and we support a proper involvement of stakeholders, as well as a technology neutral approach.

We also urge the involved Directorates General of the European Commission, notably the Directorates General (DG) for transport, ICT and Energy to collaborate closely with each other and to drive the EIP towards focusing on concrete projects on the ground.

We appreciate the European Commission's efforts to include the Convenant of Mayors and ERRIN in the EIP. Other initiatives have been established at EU level, and we recommend that their experiences and findings should be taken into account: these include CONCERTO, the Energy Efficient Buildings Public Private Partnership (EeB PPP), CIVITAS, the Green Digital Charter, Urban Europe JP Initiative, the European Green Cars Initiative, the European Energy Research Alliance (EERA) and others.

Improvements are still required to achieve better coordination between European and national initiatives. EU and national policymakers have a key role to play in promoting smart cities through EU and national legislation.

Orgalime's observation is that the EIP is lacking participation of city authorities, urban planners and city developers. We would suggest that the Commission might consider reimbursement of travel to meetings or the installation of web-based meetings would facilitate their participation as city budgets are constrained. It is indeed essential that all relevant stakeholders are taking part.

We recommend that more citizens and consumer groups should become involved. Otherwise, the EIP risks to become too much pushed by technology and ICT-shifted movement. To us, it is of huge importance to raise the public awareness for the need to upgrade our buildings and urban infrastructures.

We believe that only public acceptance will determine the success of smart city projects and their replication as envisaged through this EIP. It is important to drive those projects from the beginning in a transparent way, including thorough involvement of citizens.

2.3 New organisation of the stakeholder platform, commitments and action clusters

Orgalime is in favour of a strong and appropriate representation of the key industry sectors, including the European engineering industry, in the EIP. A close cooperation between government, firms, universities and citizens, is, in our view, necessary to develop the overall EU's smart cities objective.

We highly appreciate the EIP's Smart Cities' stakeholder platform and its bottom-up approach. It should continue to focus on technically neutral solution proposals leading to key innovations.

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Furthermore, we support the European Commission's plan to establish an online marketplace within the EIP.

We welcome the deliverables of the High Level Group, the strategic implementation plan (SIP) and the operational implementation plan (OIP).

We understand that the present working groups of the stakeholder platform will be replaced by action clusters. They are to be built through the 350 commitments which were submitted to the European Commission in the first invitation for commitments[2]. The action clusters will tackle the eleven priority areas that have been set by the SIP.

While we acknowledging that the European Commission is still in the process of organising this, we recommend the following should be considered when establishing the action clusters and around future invitations for commitments:

- Better outreach: cities and companies should immediately understand the benefits of participating since no funding is available.
- Openness: we understand that eligible commitments should be privileged to be first in the action cluster. However, cities and companies that have not yet submitted a commitment should be allowed to do so at a later stage.
- Technology neutrality and availability: all action clusters should maintain the principle of technology neutrality and consider technologies that are already available on the market, so as to speed up deployment of projects.
- Result-oriented: each action clusters should lead swiftly to concrete projects or implementation of the action on the ground.
- Participation: members of action clusters should be reimbursed for travel expenses, especially if they are representatives from cities or citizens groups to ensure their participation. Overall, the European Commission should ensure a balanced participation of stakeholders.

2.4 Lighthouse Projects under Horizon 2020 and other R&D programmes

Around 200 Million Euro are allocated in the first calls for proposals for Lighthouse projects on Smart Cities and Communities (SCC-01-2014; SCC-01-2015) of the Horizon 2020 (H2020-SCC-2014/2015). It is stated that the lighthouse projects are large scale demonstration and first of a kind projects. We recommend that that the demonstration projects need to show measurable and impacting results. According to the description of the call, the lighthouse projects should integrate three sectors (transport, energy and ICT) in the same location.

These sectors are crucial, and generally our priority, too. More can be done for making cities truly smart, by including further sectors, notably buildings, healthcare, safety and security, water and waste management.

We also support that strategic partnerships between cities and communities and innovation-driven companies should be established through the building of a consortium of industries and cities.

It is important for the European wide scale-up of smart cities that committed "follower cities" cooperate closely with the Lighthouse Project city. Orgalime appreciates that the first Horizon 2020 calls for lighthouse projects are aiming for a high replication potential.

In Orgalime's view, the smart cities lighthouse projects must increase the chances for deployment of smart cities technologies. They could foster the implementation of these technologies, showing that they can be implemented in a city at a reasonable cost.

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[2] For more details on the process, see http://ec.europa.eu/eip/smartcities/

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Our industries call on cities to embrace the opportunity and submit robust application for ambitious projects. The European Engineering industries are ready to support cities in the application process.

Multiple impacts to increase urban efficiency for example could be reached, if single metropolitan regions could also be considered as "follower cities".

We suggest that the European Commission must thoroughly promote other EU funding opportunities since there is no specific funding under the Horizon 2020 programmes available for the follower cities of the lighthouse projects.

European policy makers and European industry should work hand in hand, so that Europe acts as world leader in the development and deployment of innovative technologies and pursues proactive technology transfer.

This will increase Europe's global competitiveness, but also make European cities among the most attractive places to live and work in the future. At a time where expatriates do not want to go to polluted cities elsewhere in the world, Europe has an asset and a smart city will double the value of this asset.

We believe that the European Union and Member States should foster more R&D and Horizon 2020 programmes for smart cities related technologies.

Moreover, we suggest that the EIP on Smart Cities and Communities should also make use of existing schemes, such as the Lead Market Initiative and the SET-Plan.

3. WHAT ARE THE KEY ISSUES FOR SMART CITIES AND COMMUNITIES?

3.1 Interoperability & Standards & Data

Today, we are experiencing the massive integration of ICT into society and particularly in cities. Europe's engineering industry is a technology champion. Interoperability, the development and usage of standards and the rightful handling of data are key issues for all market segments, but especially for smart cities and communities.

The European Commission's Communication on Smart Cities and Communities points out that interoperability is a "clear prerequisite for smart technologies", which we fully support.

Interoperability along the value chain will be the key driver to enable that machines and systems communicate with each other seamlessly.

The EIP on Smart Cities and Communities, the smart city lighthouse projects and commitments must therefore jointly overcome the lack of interoperability of technologies in the areas of energy, transport and ICT in order to enable these technologies to release their full potential. This issue is also tackled by the CEN-CENELEC-ETSI Smart City coordination group, to which Orgalime is a member.

However, we advocate for coordination and joint action between European and international standardisation organisations, such as ISO, IEC and ITU. In our view it is vital that all efforts of European and International standardisation on smart cities are joint and synchronised projects. We have strong concerns about the mushrooming of coordination groups in different standardisation organisations.

We advise that all standardisation coordination groups should support a similar scope to lead to equal results:

- definition of smart cities
- description of the smart cities landscape, shareholders, initiatives
- review of existing standards
- Gap analysis to identify areas for standards development
- Draw some sort of standardisation roadmap
- Collaboration with other standardisation bodies

The acknowledgement of the ongoing work in smart grids standardisation (Mandate 490) is crucial and any overlapping, duplicating and eventually conflicting standards should be avoided. Cities must be encouraged to make use of these standards and get actively involved in the development of standards.

Data collection and management are one of the vital areas for smart cities. Data on energy consumption, transport patterns, priority infrastructure bottlenecks, and current and expected demand trends are essential to predict the development of the city, a district, a building block or a street.

Big data has helped predicting the GDP of cities almost exactly. MIT Media Lab researchers could find out that it was bringing together of ideas from different communities that resulted in innovation that raised the GDP. This is another proof that cities' authorities should engineer cities that have better transportation infrastructure, that have IT infrastructure to support sharing experiences and ideas among people and thereby to encourage a more creative and more innovative society.

Europe's engineering industry believes that developing open data rules for open access to data will allow for optimal decision-making by the different stakeholders. Open access means publicly accessible, non-proprietary and transparent data.

Orgalime echoes the High level Group that data in smart cities is both an 'open data' and a 'big data' challenge and that we need to speed up from experimentation stage towards the value adding stage.

3.2 Automation

More automation in conjunction with ICT solutions will lead to a better management of cities. Today, cities have to face the management of complex physical flows. Therefore, it is necessary to significantly progress in understanding, monitoring and controlling the "power" flows such as electrical power, gas, water, mobility, emergency management, waste management and others.

Electrical engineering companies are currently developing and installing systems to control those flows. However, there is a need to go further in increasing significantly the usage of automation based on numerous existing "best practices".

The consolidation through ICT solutions of key data generated in more automated processes will facilitate the work of decision makers and operators and lead to a better management of cities.

3.3 Energy efficiency

There is immense potential in Europe to increase energy efficiency, especially in urban areas. This can be achieved through behavioural changes and education, as well as through better and faster exploitation of cost-effective technologies.

The engineering industries already deliver solutions for cities for water – such as (drinking) water efficiency and hygiene standards.

Orgalime's industries provide ever more energy efficient products to consumers as well as technology solutions to implement resource efficiency in practice, for example through high tech monitoring, control or process automation or ICT solutions.

The challenge remains to convince and make the market respond to these products and solutions.

3.4 Performance indicators, metrics and best practice sharing

We support the sharing of best practices and examples and introduction of Europe-wide harmonised performance criteria or metrics for smart cities, which are holistic and remain valid and usable even with future innovations in technology.

For Orgalime, a central question is how improved quality of life can be measured in a city. For example, it can be evaluated through the measuring of energy efficiency for different sectors, reduced air pollution and carbon emissions, traffic delays reduction, public lighting energy use reduction, buildings operating costs reduction and water losses reduction.

It is also important to check the cities' ability to keep the city infrastructure functional, assuring business and city service continuity during times of increased stress (for example, man-made or natural hazards), to reduce loss of life and assets.

Moreover, one can evaluate if the smart city has experienced an economic boost in terms of cost-savings, improved security and more local jobs: any demonstration projects, therefore, should need to show such measurable and impacting results.

Orgalime welcomes the European Commission's approach that the level of ambition of indicators would be defined by the cities in collaboration with the industry consortia of the respective lighthouse projects.

The SIP suggests "developing and providing data for an EU-wide smart cities indicator framework by using "agreed top-level smart indicators" The use of key performance indicators is absolutely necessary, and the set should furthermore include features related to project finance, customer and citizen satisfaction, market regulation, fair competition and supply chain.

We fully recognise that each city is different. However, we believe the development of common indicators for smart cities is crucial and that cities should be fully involved in defining them.

We recommend that the European Commission combine strong ties between frontrunner cities and followers, to ensure its objective to demonstrate and scale up major innovative solutions across Europe.

Furthermore, a list of existing smart city projects within the EU should be establish and regularly updated as for example the list of Project of Common Interest in the TEN-E framework.

3.5 Business model, finance and procurement

We recommend an integrative approach between all stakeholders within a smart city towards an engaged community, by promoting new business models in order to develop services and solutions. This could happen through new collaborative models at business level (across the value chain) and at city level with local stakeholders such as urban planners, utilities, investors and businesses.

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Currently, multiple stakeholders are working in silos on different urban challenges. Therefore, Orgalime wishes to make the remarks that the real impact on deployment of smart cities projects and technologies comes with the creation of new business models and through collaboration.

We believe that public authorities at European, national and local levels should play a major role in developing ambitious and visible investment plans in public infrastructures, energy infrastructures, buildings and transport to ensure the transition towards smart cities. We also support using, where appropriate, public private financing to accelerate investment as well as EU Green Public Procurement criteria.

Cities and communities must be enabled to develop demonstration projects and to act as "living labs" through the use of European Structural and Investment Funds (ESIF).
Other EU funding opportunities for smart cities such as the European Regional Development Fund (ERDF), which priorities the development of low-carbon economies and funding initiatives like ELENA, JESSICA, RSFF, COSME must be fully exploited.

We appreciate that DG Regio developed the idea for the funding period between 2014 and 2020 to combine Horizon 2020 with ERDF, European Social Fun and European Agricultural Fund for Rural Development funding programmes together with the operational programmes of European countries to mobilise investments.

Furthermore, we strongly support the use of Energy Performance Contracting (EPC) and Energy Service Companies (ESCOs), especially in the current context of austerity. Having already proved their costs effectiveness in a number of EU Member States, the use of EPC and ESCOs would accelerate the speed of building renovations. The use of performance contracting models can be utilised for building renovation, but also in other fields such, as street lighting management systems.

Instruments for innovative public procurement in which municipalities and operators of urban infrastructures can test new technologies and provide their competencies for faster and more economic should also be extensively implemented.

Finally, we highly recommend to city planners and developers to read the final publications **Financing models for smart cities**, **Using EU funding mechanism for smart cities** and **Public Procurement for smart cities** of the EIP's Smart Cities stakeholder platform.

ANNEX: EXAMPLES OF TECHNOLOGIES THAT SUPPORT THE PROGRESS TOWARDS SMART CITIES AND COMMUNITIES

Smart buildings and homes

Buildings are a key issue in cities since nearly 40% of the final energy consumption is spent in buildings. Considering that new buildings represent only about 1% of the housing stock annually, over 80% of existing buildings will still exist in 2020.

Refurbishment of all existing buildings, including technical installations and internal equipment, should therefore be the top priority to successfully achieve EU's policy objectives and smart cities.

Technological solutions already exist today to cut existing buildings consumption by three quarters, but renovation rate is too low. New "intelligent" building management systems help to reduce energy costs and CO2 emissions by 20-30%.

Building automation systems (BAS), intelligent networks of electronic devices, that monitor and control the energy supply, lighting systems, heating, cooling, air handling and water management as well as security systems in an integrated network are significantly reducing maintenance and energy costs.

Energy efficiency can vary across European Cities, depending on local conditions and circumstances:
For example, in central and north Europe, energy efficiency is focused on refurbishment measures in order to improve heating, while Mediterranean countries energy efficiency measures focus more on cooling improvement.

However, the common challenge is to foster market uptake of efficient technologies and appliances and to overcome barriers to energy efficient buildings.

Safety and security

Protecting citizens, city infrastructure and assets is another key aspect to be taken into account in urban areas. For example, in case of an urban infrastructure emergency, the optimal measures need to be taken in order to minimise negative impacts on citizens, assets and the economy. This focus is especially relevant to public alert and mass notification systems and the provision of detailed information on the incidents' causes and effects.

To improve citizens' quality of life, the neighbourhood has to be considered with a global approach in urban areas, including buildings and other aspects, such as lighting, but also safety and security.

Artificial light is needed, since daylight is not available everywhere and at any time. Lighting and lighting control technologies have undergone major evolutions in the past decade offering cities new perspectives and possibilities for, the development of their urban lighting strategies. Intelligent lighting systems can help cities to save more than 40% of energy, but can also decrease light pollution significantly.

Investments in safety and security for urban critical infrastructure generate benefits for the cities' overall competitiveness as they are essential enablers for business continuity and guarantee city services delivery at all times

Energy market and energy infrastructures

Smart grids are the cornerstone to achieve smart cities, since it is the entrance point for future energy system technology applications, including e-mobility, smart lighting, electric health infrastructures or the use of buildings as energy storage and sink systems.

In Europe, energy infrastructures in cities and communities are outdated and need urgent investment to be upgraded and modernised to preserve stability. Security of supply and reliability are of great importance for the whole society. For a successful EU economy, a competitive energy infrastructure is needed.

The electrical energy system, especially in cities needs to be transformed from a largely centralised production and managed system to a much more decentralised and consumer-interactive, flexible and intelligent system so as to notably manage the increased share of renewable energies by creating a smart low-to-medium distribution network based on smart grid technology and equipment. Consequently, it will enhance the energy efficiency from production to end-consumers.

Moreover, Orgalime pursues a fully completed, interconnected, consumer centric internal energy market in Europe. We support the liberalisation of the energy retail market as an important element of a well-functioning European energy market that allows consumers to enjoy the benefits from available, innovative energy efficiency and low carbon technologies and services.

We invite the Commission to encourage retail models that facilitate greater involvement of energy end users through demand response, self-consumption of home produced energy and distributed generation.
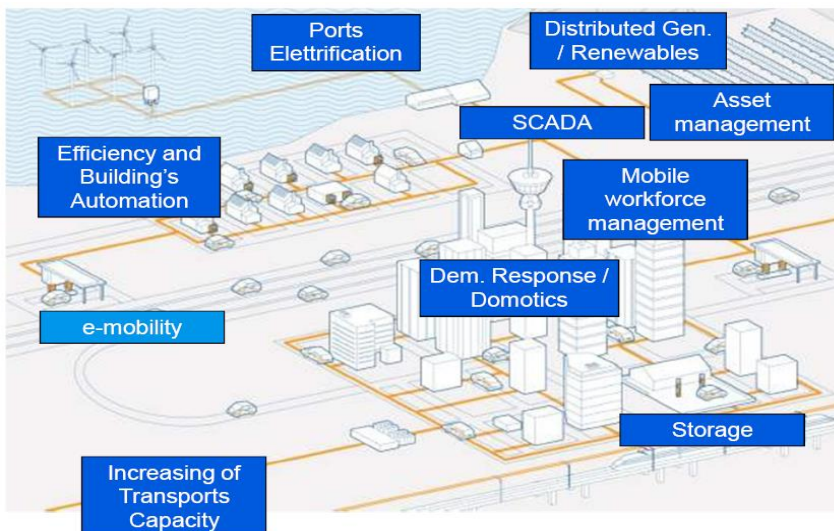

Illustration of the concept of smart grids (source: Electra 2 report, *the Smart World*)

The engineering industry can provide the technology for many possible changes in the energy infrastructure network, for example to upgrade and expand the existing distribution and transmission networks or to enhance physical security for key nodes of the energy infrastructure network (such as sub-stations), thus improving the system's overall reliability.

We produce the energy management systems and smart appliances that consumers need to be able to achieve better control of their energy costs, consumption and overall autonomy.

We pursue an integrated approach of smart grids deployment which would focus on managing the whole system, including, for example, balancing the system through storage capabilities.

These systems should function as the central hub of the smart grid and should be interoperable with other utility systems already in place.

The electrical system and other energy systems, such as district heating and gas distribution systems, need to be highly integrated in order to fully harvest efficiency benefits across energy systems.

For example, district heating systems of a city could be used to absorb surplus production of wind power or using small distributed combined heat and power plants to supplement electricity production with a low production of renewable energy.

In conclusion, reliable and easy access to energy at affordable costs, avoiding pitfalls and guaranteeing network stability are prerequisites for economic growth, competitiveness and social welfare of cities in Europe.

Transport

The optimum utilisation of a transport system is achieved through the development of efficient communication and information systems that allow passengers to make good decisions in real-time based on the options available at that moment.

There are different transport modes such as railway, buses, ships, cars or cycling, which should be used at their optimum. The increased use of smart phones and mobile communication systems will support this move.

Today, in Europe, traffic congestion costs the EU over 1% of GDP (or over €100 billion per year) and one quarter of the EU´s greenhouse gas emissions in 2008 was caused by transport, of which 71.3% can be attributed to road traffic.

As a result, there is a need for an improved network of intelligent transport systems that are accessible, secure, reliable and sustainable, without curbing people's mobility.

Cities need to accelerate adoption of intelligent transportation systems to reduce congestion levels and associated emissions. These changes are a prerequisite to move towards smart mobility and therefore contribute to make our cities "smart".

Smart mobility enables the movement of people and goods in an efficient and comfortable way while minimising the environmental impacts. Smart mobility should, therefore, reduce energy consumption, air emissions, noise pollution and use of space, while increasing safety.

Our industries develop technologies that can already bring better efficiency in terms of energy efficiency and air quality to road transport. The electrification of transport offers a major potential in urban areas. However, a significant advance in battery technology is still needed to lower the cost and increase the performance of electric vehicles in the coming years.

The development of smart charging infrastructures is a necessity, particularly in private homes, offices and commercial buildings. The efficient management of the charging of electric vehicles, the use of renewable resources and off-peak electricity will require the introduction of smart grid networks and smart metering systems, which our industries already produce

As cities evolve towards smart cities, it also becomes more important for governments to have holistic visibility and management of multi-modal transportation networks in the city. Breaking the traditional silos and operating the network as a system-of-systems enables cities to optimise network performance and improve their decision-making on long-term transportation policy.

ICT

Significant improvement of large data management infrastructures requires higher intensity of ICT networks and usage with the aim of achieving real-time control of increasing automated processes in cities.

ICT networks with high-speed broadband connections are therefore needed to underpin information flows and to boost city economies. We are fully aware that investments in such new ICT networks are huge for cities.

Therefore, Orgalime welcomes Directive 2014/61 on "measures to reduce cost of deploying high-speed electronic communication networks" that incentives telecoms and utilities to work together when upgrading their networks. We urge member states to fully implement the Directive without delay.

Smart ports & harbours

Ports and harbours are the main economic assets for a number of European cities, irrespective of their size. Over 90% of the world's goods are transported by sea, and the efficiency of European ports will be a positive asset for the European economic integration. The transport of goods is also a key issue, especially for industry since it impacts costs along the whole goods supply chain.

Cities should address the issue of better and more competitive ports. Getting "smart harbours" may be an asset and may have an impact on local pollution, especially for health and noise.

We recommend disseminating the best practices of energy efficiency and CO2 emission in harbours across Europe. It would stimulate investments in the electrical infrastructures to cope with the new elements of a smarter grid.

Furthermore, as many ports grow in importance for the local economy due to integrated tourism and cruise ship terminals, smart harbour safety and security technologies are needed to manage the flow of goods and of people unfamiliar with their surroundings. Port command & control centres, voice-evacuation and mass notification systems contribute to the smooth operation of harbours under all circumstances.

Existing technologies can already bring better energy efficiency and air quality such as shore side electricity. This technology enables to switch off the ship auxiliary engine and to power it through electricity coming from the grid in order to cut down to zero all ships emissions (PM, Sox, NOx and CO2)

It is therefore a key challenge contributing to make "urban areas" smart, ensuring the sustainability of transport modes, such as maritime transport.
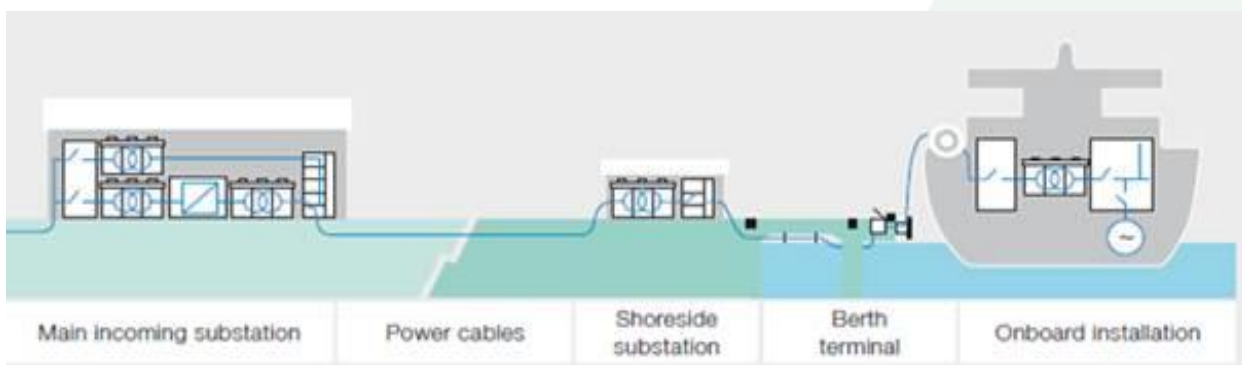

| Main incoming substation | Power cables | Shoreside substation | Berth terminal | Onboard installation |

Illustration of the concept of shore side electricity (source: Electra 2 report, *the Smart World*)

Water management

Water is a key resource that needs to be used as efficiently as possible, but is also linked to the energy efficiency issue. First, water supply and treatment are major users of energy: the electrical energy used represents about 7% of electrical energy used in a city.

This is required for water distribution pump systems as energy represents 60% of the cost for operating water pumping stations, 45% for water treatment plants and 50% for waste water treatment plants.

There are potential energy savings of 30% to 50% in water pumping systems possible by using the latest high efficiency technologies for motors and drives. As cities are major users of water, there is a growing need to manage water usage and increase water re-use, including through the use of technologies, such as water supply and water treatment technologies in cities and energy production. For example, park irrigation is an important issue in many Mediterranean cities

The European engineering industry is a leading provider of water and wastewater solutions for industries and municipalities to help them reduce energy consumption, recycle and reuse water, minimise water leakage and reduce life-cycle costs, thereby helping to achieve the targets of the Waste Water Treatment Directive.

Waste

Cities produce a majority of the waste and cities are sifting out what can be recovered or recycled. The remainder can be burned to provide heat and power by applying the waste management technology that our industries are providing.

Hence, the city can reduce its dependence on imported raw materials whilst adding value to waste streams. Local authorities need to regulate in a holistic manner and consider the effect of their regulations on all aspects of the city infrastructure.

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