



Ade

Agencia de Innovación, Financiación e Internacionalización Empresarial

NORTH SWEDEN
EUROPEAN OFFICE



Smart Cities and Communities Lighthouse Projects: SCC-1- 2016-2017

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SCC-1-2016-2017: Smart Cities and Communities Lighthouse Projects



Smart Cities and Communities (SSC1) aims to demonstrate sustainable, cost-effective, replicable district-scale solutions, intersecting energy & transport enabled by ICT.

It continues the SC 'lighthouse' approach since 2014. The 2020 goal is to have a significant number of new lighthouse cities of all sizes all over Europe, in a very large number of Member States with various climatic and economic positions.

The budget for SCC1 is €60 million. Proposals will have an EU contribution of between **€12 and €18 million**.

The Call is published on 8th December 2015, with a deadline of 5th April 2016.

Smart Cities and Communities Lighthouse Projects is an **Innovation Action**.

SCC1 Challenge:



To demonstrate solutions at **district scale**, integrating:

- Smart buildings
- Smart grids (electricity, district heating, telecom, water, etc.)
- Energy storage and efficiency measures
- Electric vehicles and smart charging infrastructures
- Very high shares of renewables

using latest-generation ICT platforms (and infrastructure) based on open specifications.

To manage successful transformation to intelligent, user-driven, demand-oriented city infrastructures and services.

Scope: Lighthouse Cities



Lighthouse cities develop and test integrated innovative solutions at large scale (**at least district size**).

Lighthouse cities become the most advanced cities in Europe, and pave the way for replication, adapted to different sizes/conditions.

They will implement **Sustainable Energy Action Plans** approved by the Covenant of Mayors. Links with the Sustainable Integrated Urban Development Strategies of the European Structural and Investment Funds should be sought, and funds for upscaling/replicating (ESIF).

Scope: Lighthouse Cities



A city can be funded as a lighthouse city only once under Horizon 2020.

Technologies should exist already or be very near-to-market (**Technology Readiness Level 7+**). Innovation is in combining these technologies and the accompanying business models that enable deployment at large scale.

There must be **3 new lighthouse cities**, situated in different EU Member States or associated countries.

Scope: Follower Cities and Replication



Follower cities have not yet acquired the full technical competence to become a lighthouse city.

They are involved in the project from the beginning and have enough committed resources (in the project) to deliver a **replication plan** of most (if not all) the solutions developed within the project.

Proof of long-term commitment of follower cities to replicate validated solutions will be part of the evaluation. They will replicate measures within a few years after the end of the project (to do so, they could use ESIF).

Scope: Follower Cities and Replication



Follower cities shall study the lighthouse city solutions and, in a clearly structured and budgeted work plan, plan how to implement the demonstrated solutions in their city. Replication can also benefit from active knowledge transfer through e.g. active mentoring or staff exchange between cities.

There must be **at least 3 follower cities** from at least 3 different EU Member states or associated countries (that are different also from the countries of the lighthouse cities of the project).

Characteristics of this consortium – follower cities in sparsely-populated areas



- a) Emphasis on the "communities" aspect of the call - our follower municipalities are mainly in sparsely populated areas, with dispersed communities around a centre (the centre becoming the "district" at the heart of this Call). This type of municipality offers a very interesting dynamic for replicating the Lighthouse solutions.
- b) Follower cities to be as committed as possible to implementing the solutions of the Lighthouse cities - followers as active protagonists.
- c) Strong emphasis on technical solutions - therefore the need for a strong technology development organisation at the centre of the project.
- d) The inclusion not only of Lighthouse and follower cities, but of "friend" cities to fulfil the "inter-project cooperation" work package that is required in this Call.

Scope: Elements of an SCC1 proposal



A well-balanced combination of:

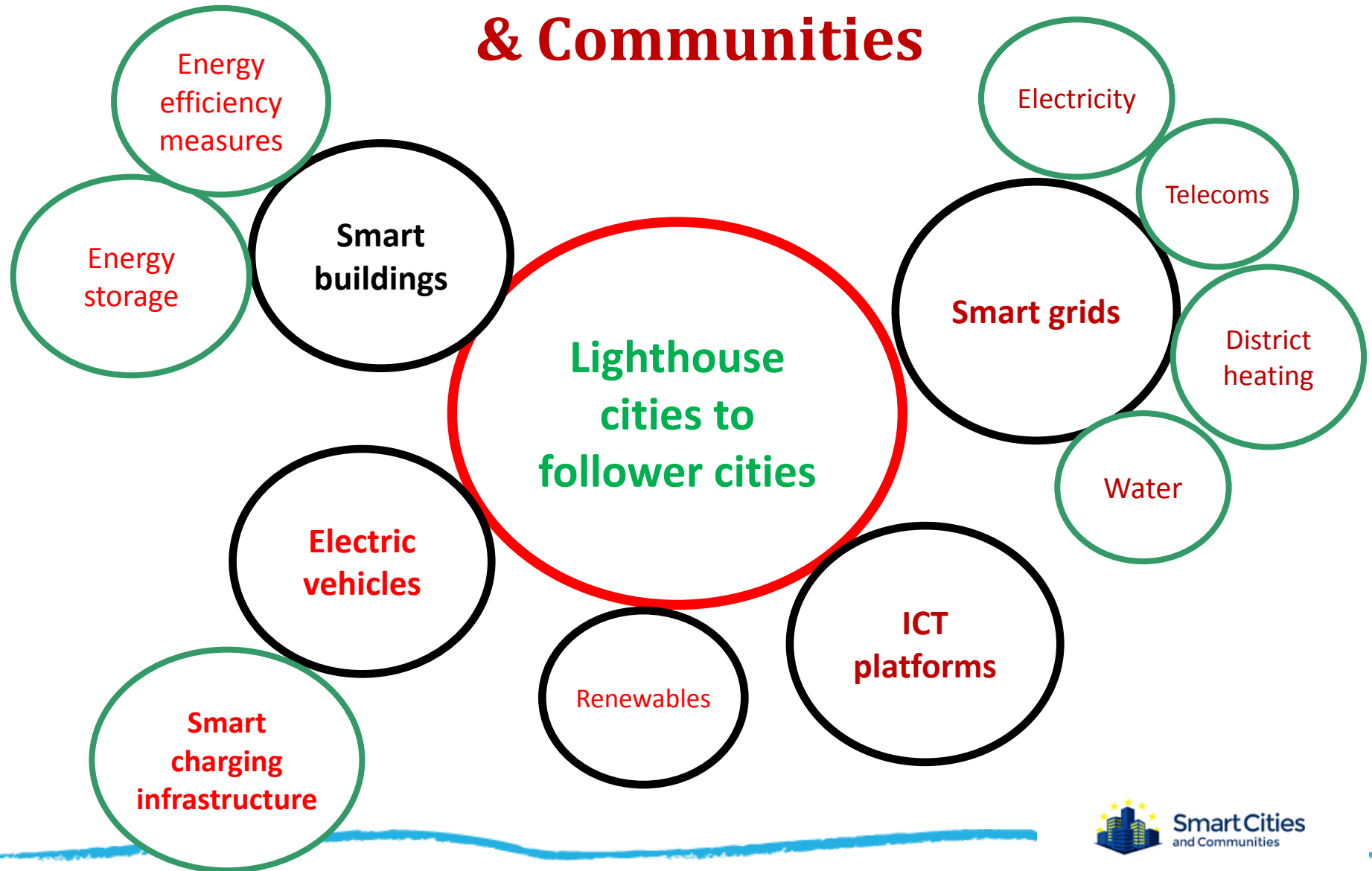
Smart homes

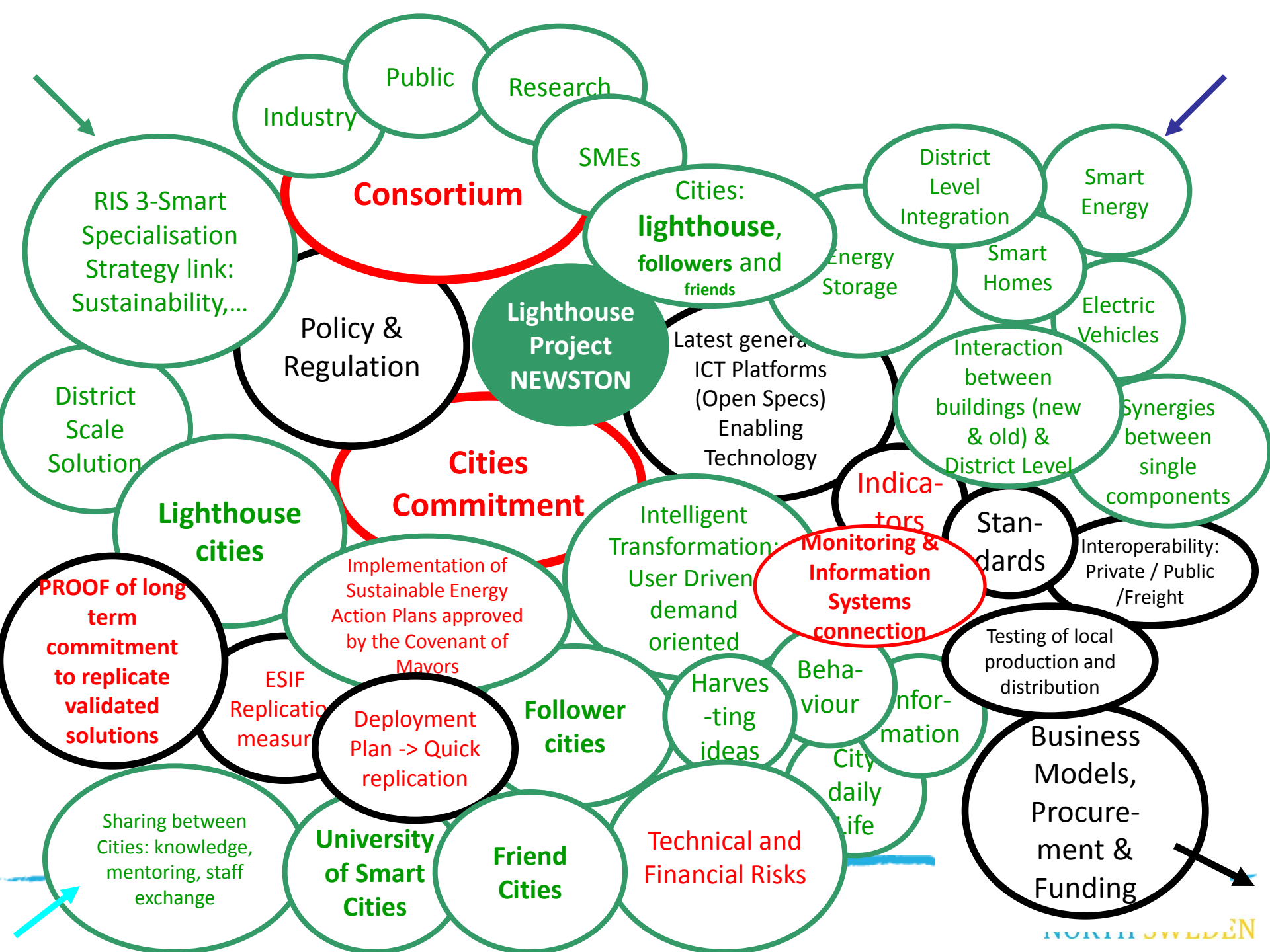
Smart energy

ICT systems

Electric vehicles

Smart Cities & Communities





Castilla y León



AREA: 94.225 Km² (18,62 % of Spain)

POPULATION (01/01/2012): 2.546.078 inh.

POPULATION DENSITY: 27,02 inh/Km² (in Spain 93,66 inh/Km²)



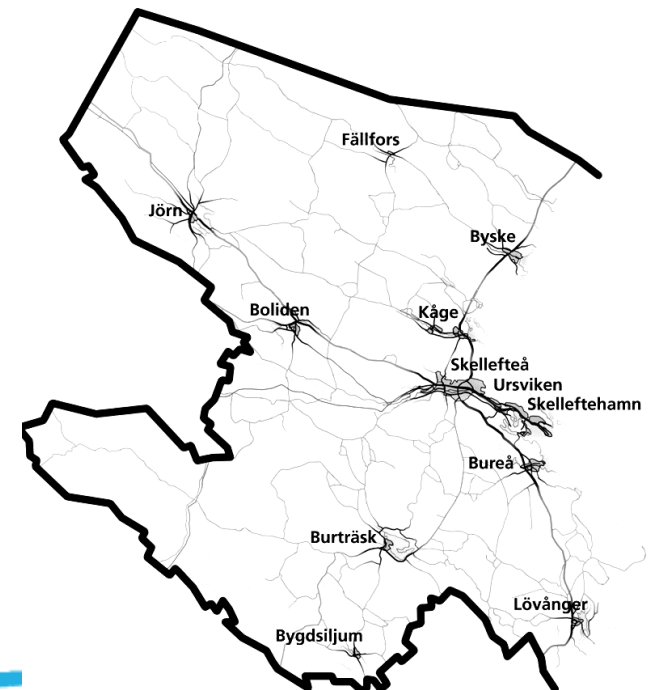
North Sweden: Umeå, Skellefteå, Kiruna



SKELLEFTEÅ MUNICIPALITY

72 000 RESIDENTS - 32 000 IN THE CITY

- Vision: A forward-thinking municipality of growth, to live and work in, with a goal to reach 80 000 inhabitants in 2030
- Leading region in mining, forestry and pulp and paper
- New high-tech industries and creative companies
- High-productivity manufacturing and processing sector
- Active development of eco-friendly power and heating solutions
- Skellefteå is the 2nd most broadband connected city in Sweden
- Two universities at the campus site
- Experienced in R&D projects, for example in the field of smart cities

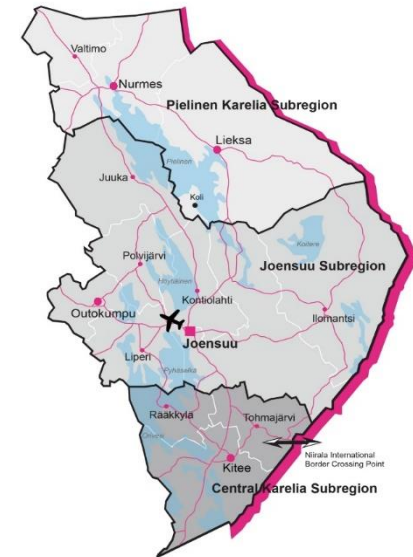


City of Joensuu

- Regional centre of North Karelia, Finland, with ca. 74,000 inhabitants (region 120,000)
- University town, 1/3 of population less than 25 years old, growing population
- City employs ca. 6,000 people
- City land area 2,751 km²
- City responsibilities/expertise related to smart cities:
 - city planning
 - municipal housing policy
 - public building
 - maintenance of the transport infrastructure
 - public transport
 - management of parks and outdoor areas
 - organisation of the water supply and waste management
 - diverse development projects with various stakeholders



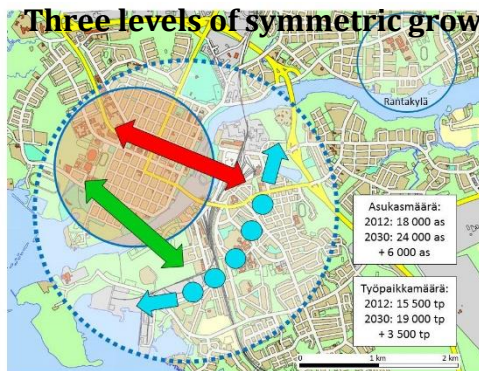
- Cities serve as physical platforms for smart city innovations
- Cities pool resources and facilitate the development of different sectors within its land area and build environment



Symmetric City Centre

- 3500 new jobs and 6000 new inhabitant in symmetric city centre
- New ways of living & accommodation by riverside
- Better accessibility and mobility
- City culture & events
- City tourism
- Mixed city structure
- Ecological construction
- Planned and controlled growth of the area
- Better strategic land use
- Development of border-crossing point Niirala and VT9 route
- Growth of commerce
- **Total budget of SCC € 1 billion by year 2030**

Three levels of symmetric growth:



1. Symmetric city centre



2. Symmetric city region



3. Exploitation of location

Lower Silesia

Area: 19,946.74 km²

Population:

Total: 2,914,362

Density: 150/km²

GDP per capita: \$16 350 (+2.0%)

Cities:

Wrocław city county (631,188)

Siechnice city county (3,851)

Szczawno Zdrój (5,506)

Transport: Wrocław–Copernicus Airport,
A4 motorway, A8 motorway and A18 motorway,
Railway station

Nature: 2 National Parks, 12 Landscape Parks, 67 Nature reserves,
20 protected landscape areas, 3100 Natural monuments



Poland/Lower Silesia: proposals for participation in the project

Option 1: New Smart District in Wrocław

The undertaking will demonstrate smart solutions at district level. The project includes WUWA2 district which is planned in municipal strategy, and first investments were made. The concept includes all smart elements such as smart grids, smart buildings, integration with municipal electric vehicles, open data ICT platforms. Incentive schemes focused on customer engagement and RES promotion are foreseen.

Option 2: Municipality of Siechnice as an Energy manager

Municipality of Siechnice have set up an agency SISK dedicated to production green energy, and its management on a municipality level. SISK possess diversified renewable energy sources and have experience in energy management in buildings. The strategy of Siechnice foreseen consistent development towards smart city.

Option 3: Spa Resort as a Smart District

Lower Silesia is a touristic region abundant in numerous spa facilities. The project foreseen an implementation of smart infrastructure in health center customized to seniors and disabled persons.

65°01'N, 25°28'E

Location

- *Hub of Northern Finland and the gateway to the Arctic areas*
- *Capital of Northern Scandinavia*
- *Located midway between Asia and North America*
- *Excellent global and local connections*



Finland

Sweden

Russia

Estonia

Oulu – Urban Centre in the Arctic

- 250,000 people, 120 nationalities
- #1 in R&D investment in Finland, among the top in the EU
- The second busiest airport in Finland
- One of the top universities in Finland
- Business operating costs 20% lower than in Helsinki
- Several city center development projects, 300-400 million EUR

Scope: Smart Homes



A larger district of buildings (old or new or mixed and ideally nearly zero or low energy).

These districts shall be adapted to the different sizes of the cities and the local conditions.

Each building shall become smart, i.e. featuring the latest generation ICT, smart meters, smart appliances, smart energy management, smart use of the thermal mass; smart management of cooling (where applicable) etc. and capitalizing also on synergies between these single components).

A larger number of smart buildings shall create a smarter district through intensive interaction between the buildings for increased synergies and decreased costs.

Scope: Smart Energy



Smart interaction of different energy systems at district level, going far beyond classical electricity grid management only.

Smart management of electricity, heat, cold, gas or other grid systems (including water) with solutions for storage, including use of thermal mass of buildings

Significantly improve energy efficiency, with innovative integration of existing buildings with new buildings (especially in areas of mixed use such as university campuses, innovation districts, etc.).

Incorporate RES based largely on a high level of local resources (including waste heat, electricity and/or heat storage), high shares of self-consumption. Participation of consumers (e.g. use of aggregators) must be demonstrated.

Scope: ICT Systems



Integration with and/or consolidation of low-carbon ICT systems at district level (communication networks, computing facilities, data centres).

ICT to improve planning management, control and maintenance of physical urban infrastructures and operational technologies in buildings, energy and transport, and that enable better services for individuals and businesses.

Prove interoperability between software modules to allow management of components and information flows. To ensure adaptability as new user requirements and technologies evolve, urban ICT platforms must be non-proprietary and based on open specifications

Scope: Electric Vehicles



Electromobility (in line with Directive 2014/94).

Smart EV charging (grid-to-vehicle and vehicle-to-grid), while ensuring a positive impact on the whole energy system from a technical and economic point of view.

Attention should be given to locally weak or old grids.

Integrate electricity fuelling infrastructure for electric vehicle fleets for public transport or private transport or logistics or freight distribution. Positive/negative impact of deployment of high numbers of vehicles on the grid must be assessed (cost of recharging infrastructure and vehicles are not eligible).

Scope: Business Models



Develop innovative Business Models to demonstrate that both technical and financial risks are low enough for large scale investments in all cities: large or small, rich or poor, and irrespective of location. Deployment plans for the lighthouse cities and quick replication in the follower cities and potentially other cities shall be submitted (and will be part of the evaluation).

Each Lighthouse City **must** have Sustainable Energy Action Plan (SEAP), positively evaluated by the Covenant of Mayors.

Scope: Special Conditions



Include partners from industry, public authorities, research communities and small and medium-sized enterprises.

Have a performance monitoring which lasts for a period of **at least 2 years**.

All projects will have a work package for cooperation with other selected projects on business models and legal, regulatory and other market barriers (2 % to 3% of the requested funds for inter-project cooperation).

Incorporate all performance data into the Smart Cities Information System database (SCIS)⁴⁶ and cooperate with CITYKEYS, the support action selected in the 2014 call for performance measurement across sectors.

Scope: Non-Eligible Costs



Non-eligible costs:

The costs of construction (including scale of unit costs), the costs of retrofitting (including scale of unit costs), the full cost of purchasing of electric vehicles, the costs of acquisition of standard ICT tools, conventional RES and their mounting are not eligible. Insulation of the building envelope, good windows; heat pumps, and other appliances are not eligible costs.

Scope: Eligible Costs



Eligible costs cover all those innovative aspects that transform the city into a smart city:

- Integration of storage with all grids (across electricity, telecom, heating, cooling, gas, water, etc.).
- Smart building management incorporating smart appliances, smart meters, domotics, of which only the smart/innovative part that is leading to a deep integration with the local energy system (electricity, telecom, heating and cooling, gas) is eligible.
- Smart integration of the electricity grid with RES, with electricity storage and heat storage (or cold storage for air conditioning or cooling or freezing, etc.) at the district level; the smart use of the existing thermal mass for better building management and the integration with good HVAC is recommended and eligible.

Scope: Eligible Costs



- Only the innovative parts of RES, suited for smart integration of PV modules, wind turbines, innovative integration of heat pumps or CHP combined with smart management of heat and electricity are eligible.
- Proposals should focus on the development of integrated approaches and testing of "business" models for the local production and distribution of electricity together with electric vehicle fleets, to create the conditions for market take up in urban and sub-urban areas.
- Smart electricity, heat or cold storage and its management for maximising self-consumption is eligible.
- ICT: only platforms based on open specifications with open APIs, and that cater for data security and cyber-security are eligible.

Scope: Eligible Costs



- Economic research and development of new business models that avoid lock-in situations and that lead to reduction of the energy bills for citizens is eligible as well as the development of new templates for easy understanding and transparency of the energy bills.
- Replication plans have to be submitted with the initial proposal; further refinements and creating more ambitious targets during the project are eligible.
- Training and education within and between cities is compulsory and thus eligible.
- Including additional cities in the training and education (if the benefit is clearly stated) is eligible.

Expected Impact



A successful Smart Cities Lighthouse Project will:

- Put in practice a solution for a challenge identified by the city;
- Increase the energy efficiency on district scale at least;
- Increase significantly the share of renewable energies, their integration into the energy system, stimulate self-consumption, reduce curtailment to the minimum;
- Increase local air quality;
- Reduce the technical and financial risks in order to give confidence to investors for investing in large scale replication;

Expected Impact



- Make the local energy system more secure, more stable and cheaper for the citizens and public authorities;
- Ensure the roll-out of electric vehicles in cities while containing the need for excessive upgrading of the electricity grid);
- Reduce transport based CO2 emissions , on the basis of CO2 intensity of the European electricity grid of 540 CO2/kWh (coherent with TEST format);
- Create stronger links and active cooperation between cities in a large number of Member States with a large coverage of cities with different size, geography, climatic zones and economical situations.



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