SC3 : Secure, Clean and Efficient Energy
SC4 : Smart, green and integrated transport
SC5 : Climate action, environment, resource efficiency and raw materials

Mercè Griera i Fisa
Smart Cities and Sustainability
Communication Networks, Content and Technology
European Commission
CNECT involvement in SC3, SC4 and SC5

- In WP2014/2015 CNECT had sub-delegated budget:
  - \(~90\text{Meuro in SC3}\)
  - \(~63\text{M euro in SC4}\)
  - \(~22\text{Meuro in SC5}\)

- In WP2016/2017 CNECT participated in the WP elaboration but with no budget
  - ICT research is in much more topics
  - CNECT control is "relatively" lower
Societal Challenge 3: Secure, clean and efficient energy

**ENERGY EFFICIENCY**
- Buildings and consumers – ICT for energy efficiency
- Heating and cooling
- Industry and products
- Finance for sustainable energy

**COMPETITIVE LOW CARBON ENERGY**
- Renewable electricity and heating/cooling
- Modernising the European electricity grid
- Providing the energy system with flexibility through enhanced energy storage technologies
- Sustainable biofuels and alternative fuels for the European transport fuel mix
- Enabling the decarbonisation of the use of fossil fuels during the transition to a low-carbon economy
- Supporting the development of a European research area in the field of energy
- Social, environmental and economic aspects of the energy system
- Cross-cutting issues

**SMART CITIES AND COMMUNITIES in Cross-cutting Activities (Focus Areas)**
Energy Efficiency WP2016-2017

1. Heating and cooling
2. Engaging consumers towards sustainable energy
3. Buildings
4. Industry, services and products
5. Innovative financing for energy efficiency investments

Implementation of Energy Efficiency Call: EASME

ENER Contact: Margot PINAULT Margot.PINAULT@ec.europa.eu

Info Day EE-2016-2017: 8 December 2015 (place to be decided)
1. Heating and cooling:

- **EE-03-2016: Standardised installation packages integrating renewable and energy efficiency solutions for heating, cooling and/or hot water preparation**
  
  **Challenge:** The uptake of systems that use or combine renewable energy sources, energy storage or smart controls is still relatively low.
  
  **Scope:** Applications should: … allow for remote access and control. Proposals should also include consumer information system on the overall system performance. Projects should involve producers of different heating and cooling technologies and control systems, installer associations, designers and architects.)

- **EE-05-2016: Models and tools for heating and cooling mapping and planning**
  
  **Scope:** The planning tools should be able to process large and complex data sets to provide a detailed and comprehensive description of the existing energy system and the dynamic development of all relevant supply and demand elements within a given geography (…) and allow modelling of the possible scenarios reflecting hourly, seasonal and yearly variations in supply and demand to optimally reach energy goals. The modelling tools should be user friendly and open source yet able to model the full energy system, i.e. heating and cooling, electricity and transport.
2. Engaging consumers towards sustainable energy:

- **EE-06-2016-2017: Engaging private consumers towards sustainable energy**
  Scope: The proposed action should …
  - Facilitate wider deployment and consumer adoption of existing ICT-based solutions, for energy efficiency and information on energy consumption and costs, with a focus on action and resulting in improved understanding of ICT interfaces and information depiction (including smart metering and related systems).

- **EE-07-2016-2017: Behavioural change toward energy efficiency through ICT**
  Challenge: The objective is to demonstrate that ICT-based solutions can contribute to saving energy by motivating and supporting behavioural change of energy end-users.
  Scope: Activities are focused on the development of innovative user-friendly digital tools and applications or services making use of energy end-user generated information or captured from in-home equipment/sensors (...), in possible combination with intelligent controls and automation, with the purpose to significantly enhance energy efficiency by behavioural change of end-users taking informed decisions. … ICT solutions should primarily address energy efficiency, but may integrate other solutions including also indoor climate, building/home security or health monitoring. This "packaging" approach would need to demonstrate the added benefits for consumers, as well as the market potential.
3. Buildings:

- **EE-10-2016: Supporting accelerated and cost-effective deep renovation of buildings through Public Private Partnership (EeB PPP)**
  
  **Scope:** Proposals should ensure that the solutions guarantee high indoor environmental quality (thermal and visual comfort, acoustics, air quality, etc.). If necessary proposals should include smart controls to allow integration with the energy grid.

- **EE-12-2017: Integration of Demand Response in Energy Management Systems while ensuring interoperability through Public Private Partnership (EeB PPP)**
  
  **Scope:** At the building and building unit level (residential or non-residential) the focus should be on optimisation, integration and demonstration of cost effective and interoperable solutions, including testing of new technologies and systems in real life situations. The proposed solutions shall be demonstrated for buildings which incorporate intelligent Energy Management Systems and new technologies (smart home devices). They should ensure interoperability, evolving and adapting to the operational environment (self-learning), including indoor and outdoor conditions, the availability of energy from local RES generation, the availability and price of energy from grids and local energy storage capacities.
4. Industry, services and products:

- **EE-20-2017: Bringing to market more energy efficient and integrated data centres**

  **Challenge:** Following the increasing demand for cloud computing, big data, Internet of Things, dematerialization of documents and other ICT services, the demand for ICT processing is expected to grow exponentially in the coming years. Data centres should become more energy efficient and should maximise integration of renewable energy sources. … existing and new data centres should be better integrated into the various energy grids (electricity and/or heat) in order to turn their energy use and waste into a benefit for the whole energy system.

  **Scope:** Innovation Actions are needed to increase the energy efficiency, the use of renewable energy sources and integration of data centres in the energy system. … Proposals should build upon the results of previous projects such as the ones funded under the FP7-Smartcities Call 2013 (namely RenewIT, DC4Cities, Dolfin, Genic, GreenDataNet, GEYSER). Proposals should focus on new and existing data centres (indicatively from 500 kW to 1 MW IT load).
Societal Challenge 3: Secure, Clean and Efficient Energy
COMPETITIVE LOW CARBON ENERGY- LCE - 2016-2017

<table>
<thead>
<tr>
<th>Topic</th>
<th>Focus</th>
<th>Instrument</th>
<th>TRL</th>
<th>MEur per Project</th>
<th>Funding for 2016 MEur</th>
<th>Funding for 2017 MEur</th>
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<tbody>
<tr>
<td>LCE 1</td>
<td>Grid&amp;Storage: Distribution</td>
<td>Research (RIA)</td>
<td>3-6</td>
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<td>18.0</td>
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<td>R&amp;I Strategy</td>
<td>CSA</td>
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<tr>
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<td>Grid&amp;Storage: Transmission</td>
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<tr>
<td>LCE 5</td>
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</table>

- All single stage
- Deadlines for submission: 2016: 5th April 2017: 14th February

Implementation of the COMPETITIVE LOW-CARBON ENERGY Calls: INEA ENER Contact: Remy DENOS remy.denos@ec.europa.eu
Info Day on Smart Grids & Storage: 2 October 2015
LCE-01-2016-2017: Next generation innovative technologies enabling smart grids, storage and energy system integration with increasing share of renewables: distribution network

Scope: Proposals must target technologies, tools and/or services in one of the following areas:

In 2017:
- Demand-response: tools and technology validation for demand response forecast, profiling, segmentation, load forecasting, innovative and user-friendly services for customers based on smart metering; inclusion of Virtual Power Plant and microgrid as active balancing assets; associated innovative market and business models; secure data handling;

- Intelligent electricity distribution grid: tools for the optimisation of the distribution grid, technologies for autonomous and self-healing grids, energy management and control systems, technologies for advanced power electronics, for enhanced observability, e.g. real-time system awareness; secured communications in the smart grid in particular cyber security and big data analytics.
LCE-02-2016: Demonstration of smart grid, storage and system integration technologies with increasing share of renewables: distribution system

Scope: Proposals will target the distribution grid (medium and low voltage levels) and demonstrate a combination of at least 3 of the following aspects:

- Demand-response: mechanisms and tools allowing consumers to participate actively in the energy market and in demand response schemes (e.g. relying on smart metering); demonstration and validation of new business models for combining distributed energy resources, self-consumption and storage with optimized utilisation of distribution networks from all energy carriers;

- Smartening the distribution grid: methodologies for improved control and automation of distribution networks, network management and monitoring tools with particular improved observability of variable generation and consumption loads, integration of Virtual Power Plants and micro grids as active balancing assets;
LCE-02-2016: Demonstration of smart grid, storage and system integration technologies with increasing share of renewables: distribution system (continuation)

- Demonstration of energy storage technologies (e.g. batteries, fly wheel, etc.) and/or connections between the electricity network and other energy networks such as power to heat solutions under cost competitive conditions (e.g. through heat storage with water boilers, heat pumps, thermal inertia of buildings, etc.) and power to gas / fuel solutions; demonstration of associated energy management systems and of services provided to the distribution grid and the consumers;

- Smart integration of grid users from transport (e.g. electric vehicles, large ships and inland waterway barges while in ports) for charging, providing storage capacity or for their capacity to supply electricity to the grid.
LCE-04-2017: Demonstration of smart transmission grid, storage and system integration technologies with increasing share of renewables

Scope: Proposals will target the transmission grid and demonstrate a combination of at least 2 of the following aspects:

- Power transmission technologies and management of large scale generation in the context of an increased share of variable renewables;
- Large scale storage relevant to the transmission network (GWh scale);
- Communication / ICT technologies / control tools to enhance real-time awareness, introduce more flexibility the transmission grid, the integration of storage facilities, of more flexible generation, of demand-response mechanism and its interface to the distribution grid; cross-border collaboration;
- New approaches to the wholesale market facilitating the participation of variable renewable energy sources, remunerating adequately new flexibility services to the grid such as offered by storage, active participation of demand and new players such as aggregators and reducing the cost of operations.
LCE-05-2017: Tools and technologies for coordination and integration of the European energy system

Scope: Proposals must target the development of technologies, tools and systems in one or several of the following areas:

- Novel European grid and end-to-end energy system planning tools, including foreseeable features such as storage, aggregation, demand-response and integrating cost aspects;
- Enhanced TSO / DSO collaboration and coordination tools, secure data exchange across networks along whole the value chain, ICT tools for cross-border trading for nearly real-time balancing; definition of minimum set of specifications to allow automated digital cross-border electricity market;
- Solutions for the deployment of neutral data access points ensuring a fair and transparent data access to all energy actors (TSOs, DSOs, ESCOs, Telcos, ICT companies, consumers, etc.); validation of new business models resulting from the cooperation between them; investigation of incentives and possible commercial arrangements with a fair share of benefits across actors;
LCE-05-2017: Tools and technologies for coordination and integration of the European energy system (continuation)

- Synergies between electricity, gas and heat networks, associated business and market mechanisms and analysis of existing regulatory aspects; technologies for hydrogen production and storage are addressed in the frame of the Fuel Cell and Hydrogen JU and are therefore excluded from this call;
- Socio-economic aspects and environmental aspects related to large scale infrastructures relevant to renewable generation and changes to transmission infrastructure need for their integration; socioeconomic aspects of consumer behaviours in demand-response mechanisms, consumer engagement.
Societal Challenge 4: Smart Green and Integrated Transport

- Aviation
- Waterborne
- Safety
- Urban Mobility
- Logistics
- Intelligent Transport Systems
- Infrastructure
- Socio-economic

MOBILITY for GROWTH

AUTOMATED ROAD TRANSPORT

GREEN VEHICLES
SOCIETAL CHALLENGE 4, Promising areas for ICT

Mobility for Growth:
• Air transport, notably topics 1.1, 1.3 and 1.4
• Logistics, notably topic 5.2
• ITS
• Socio-economics, notably topic 8.2

Automated Road Transport:
Notably topics ART-01, ART02, ART03, ART05 and ART06

European Green Vehicle Initiative:
Notably topics GV07 and GV10
SOCIETAL CHALLENGE 4, Work Programme Scribes (1/2)

**Mobility for Growth:**
- **Air transport:** Ivan Konaktchiev (RTD.H.3)
- **Waterborne:** Ronald Vopel and Joost De Bock (RTD.H.2)
- **Safety:**
  - Air: Ivan Konaktchiev (RTD.H.3);
  - Infrastructure: Cristina Marolda (MOVE.C.2)
  - Road: William Bird (RTD.H.2)
  - Inco: Alessandro Damiani (RTD.H.1)
- **Urban:** Henriette Van Eijl (MOVE.C.2)
- **Logistics:** Geert Van der Linden (MOVE.C.2)
- **ITS:** Maria Carbone (MOVE.C.2)
- **Infrastructure:** Cristina Marolda (MOVE.C.2)
- **Socio-economics:** Artemios Kourtesyis (RTD.H.1)
Automated Road Transport:
Ludger Rogge (RTD.H.2)
Myriam Coulon Cantuer (CNECT.H.5) for ART01 and ART06

European Green Vehicle Initiative:
Maurizio Maggiore, Fred Sgarbi (RTD.H.2)
Nino Zambara (CNECT.H.5) for GV10
Objective ART-01-2017
ICT infrastructure to enable the transition towards road transport automation

Innovation Activities to support gradual progress towards automation level 3 and 4 by addressing one or more of:

- Connectivity over telecom networks and dedicated spectrum
- Data generation and processing including cyber security
- Tamper-proof in-vehicle platforms
- Localisation and mapping using cloud-based techniques

Consortia should include automotive, IT and telecoms
5-15 M euro /proposal
Objective GV-10-2017
Demonstration (pilots) for integration of electrified L-category vehicles in urban transport systems

Innovation Activities to support gradual progress towards automation level 3 and 4 by addressing one or more of:

• Deployment of ICT tool for driver support and services such as communication to back-office, booking, route scheduling, real-time monitoring of vehicle performance, etc.

Consortia should have at least 2 cities as beneficiaries

7-10 Meuro / proposal
Objective GV-10-2017
Demonstration (pilots) for integration of electrified L-category vehicles in urban transport systems

Innovation Activities to support gradual progress towards automation level 3 and 4 by addressing one or more of:

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7-10 Meuro / proposal
## Cross-cutting activities (Focus Areas)

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<th>Circular Economy</th>
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<td>• Pilots</td>
<td>• Eco-Innovative approaches</td>
</tr>
<tr>
<td>• Factories of the Future - FoF</td>
<td>• Water in the circular economy</td>
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<tr>
<td>• ICT for FoF</td>
<td>• Smart Specialisation</td>
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<td>• SPIRE</td>
<td>• New models and economic incentives</td>
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<td>• Urban organic waste</td>
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<thead>
<tr>
<th>IoT</th>
<th>Smart Cities</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Large Scale Pilots</td>
<td>• Lighthouse projects</td>
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<tr>
<td>• IoT Horizontal activities</td>
<td>• Nature based solutions</td>
</tr>
<tr>
<td>• R&amp;I on IoT integration and Platforms</td>
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</tbody>
</table>
CIRC-02-2016-2017: Water in the context of the circular economy

2016- 20 M€; Opening: 10 Nov 2015; Deadline: 08 Mar 2016 (First stage); 06 Sep 2016 (Second stage)

b) Towards the next generation of water systems and services– large scale demonstration projects (2017): The objective of this topic is to demonstrate innovative solutions at a large scale (i.e和地区es, cities and/or river basins). Projects should build on experience already gained... To enhance the systemic approach and the transformation of water services toward a more circular economy approach, digital technologies and ICT tools should be also considered.

Type of Action: Innovation action (EUR 10 million), TRL 5-7
Contact : GAJ Wanda (RTD) <Wanda.GAJ@ec.europa.eu>
SCC-1-2016-2017: Smart Cities and Communities lighthouse projects,

2016 - 60M€, opening: 08 Dec 2015; deadline 05 Apr 2016
2017- 71 M€, opening: 04 Oct 2016; deadline 14 Feb 2017

Specific Challenge: To demonstrate solutions at district scale integrating smart homes, smart grids (electricity, district heating, telecom, water, etc.), energy storage, electric vehicles and smart charging infrastructures, using the latest generation ICT platforms (and infrastructure) based on open specifications.

Type of Action: Innovation action (EUR 12 to 18 million)

Contact: Jens BARTHOLMES (DG ENER) Jens.BARTHOLMES@ec.europa.eu

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Thank you for your attention!

Merce.Griera-i-Fisa@ec.europa.eu

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