European Commission

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Horizon 2020 Work Programme for Research & Innovation 2018-2020

Rémy Dénos

Policy Officer New Energy Technologies and Clean Coal

Matinée d'information sur
les Réseaux et le Stockage d'Energie
18/10/2017
Ministère de l'Enseignement Supérieur, de la Recherche et de l 'Innovation

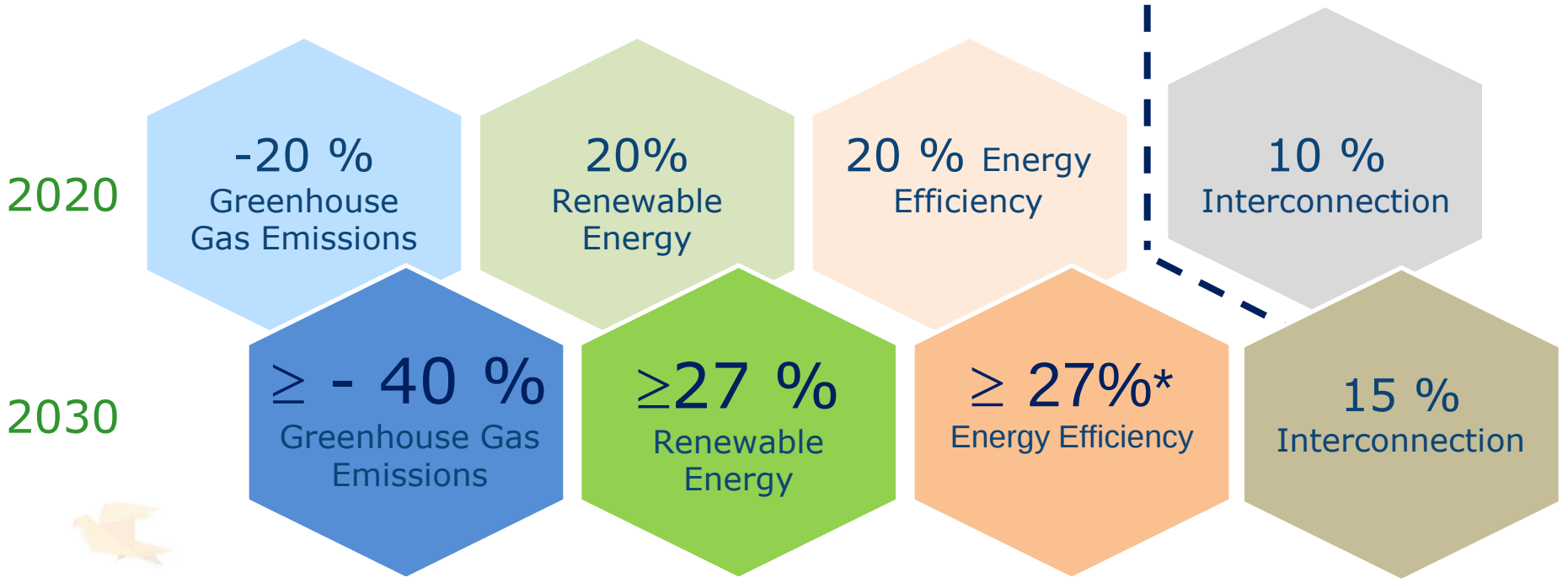
Secure, clean and efficient energy system

- Smart Citizen Centered Energy System
- Smart Cities

Research and Innovation

2030 Framework for Climate and Energy

Agreed headline targets



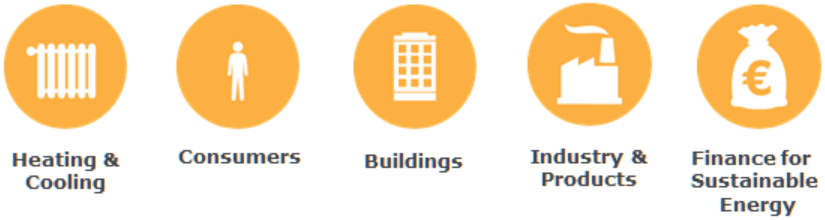
New governance system + indicators

Clean Energy for All Europeans

- Clean Energy for All Europeans
- Electricity market and consumers
- Energy Efficiency Directive (EED)
- Energy Efficiency of Buildings (EPBD)
- Ecodesign
- Renewables & bioenergy sustainability (RED II)
- Energy Union Governance
- Energy prices and costs
- Energy funding
- Accelerating Clean Energy Innovation (ACEI)
- European strategy on cooperative, intelligent transport system

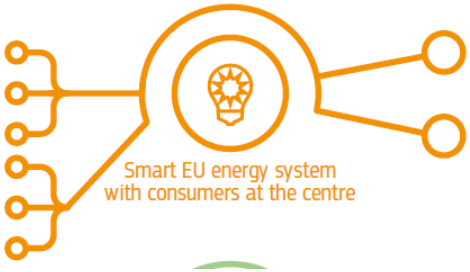
H2020 Challenge
Secure, clean and efficient energy system

Energy Efficiency



Global Leadership in renewables

Smart and Clean Energy for Consumers



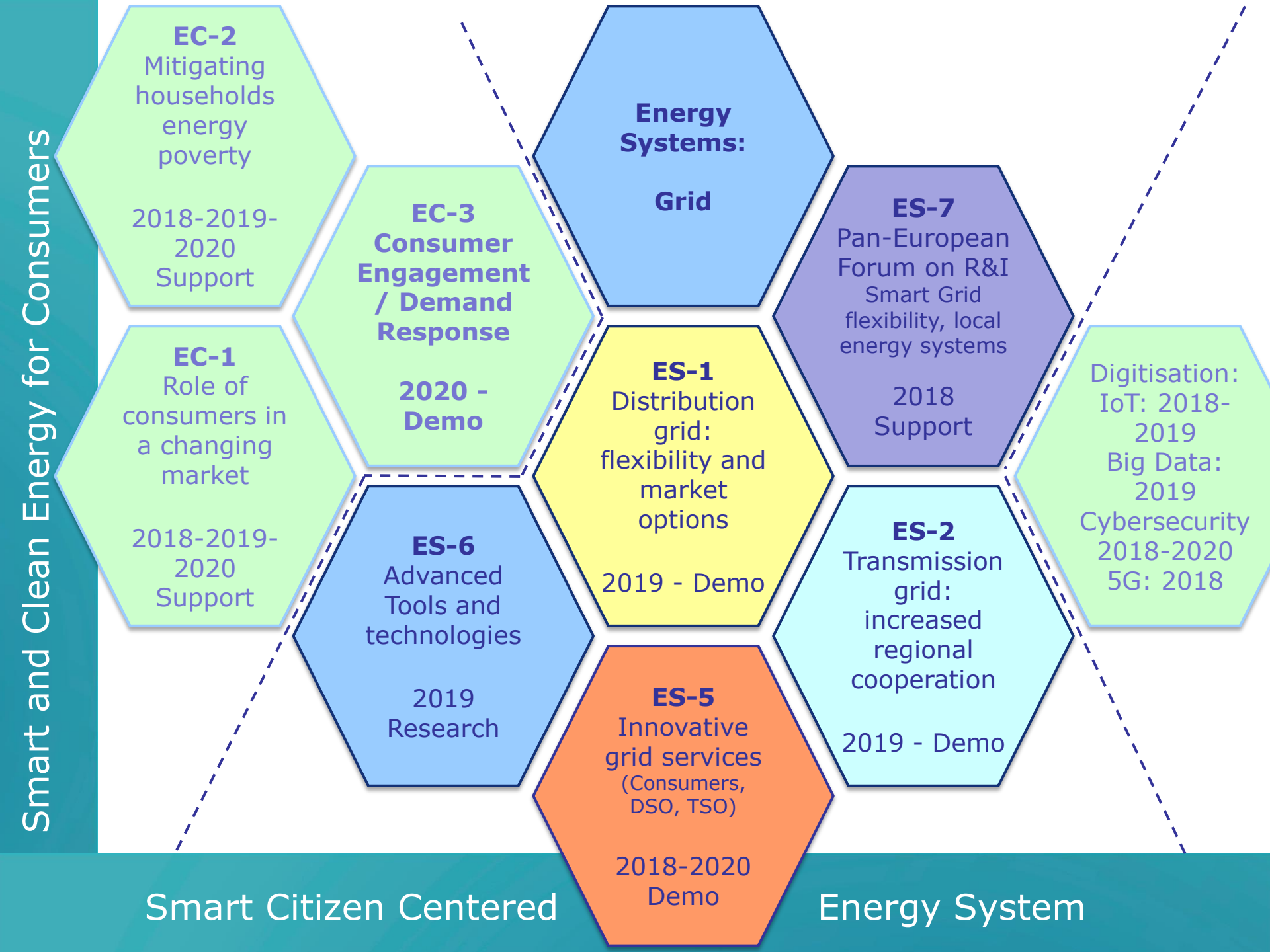
Smart Cities and Communities

Smart Citizen Centered Energy system

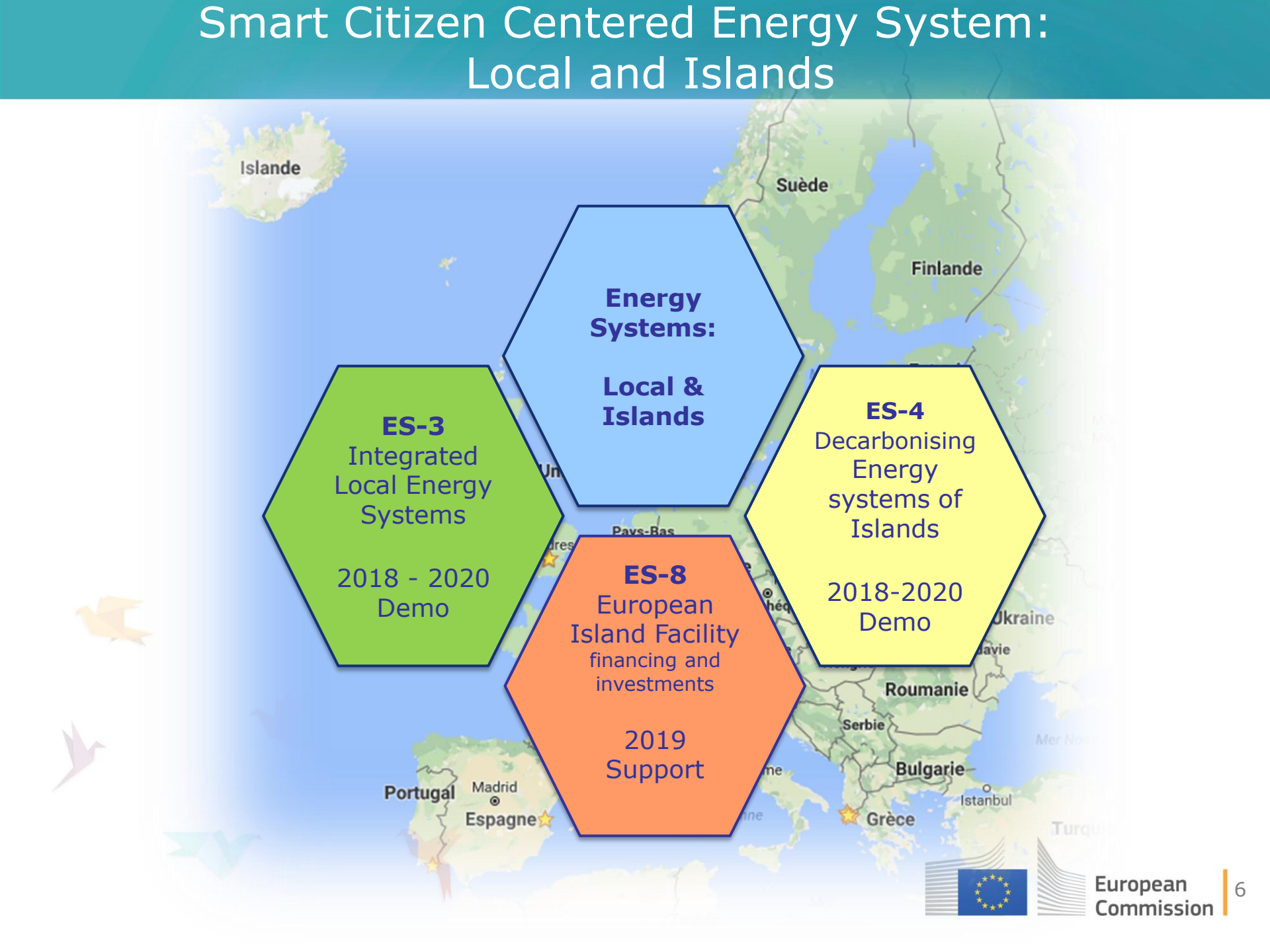
Near-zero CO2 emission

from fossil fuel / carbon intensive industries

Overall Indicative budget for 2017 ~ 540 MEur


Smart and Clean Energy for Consumers
EC-2
Mitigating households energy poverty
2018-2019-2020
Support
EC-3
Consumer Engagement / Demand Response
2020 - Demo
Energy Systems:
Grid
ES-7
Pan-European Forum on R&I
Smart Grid flexibility, local energy systems
2018
Support
EC-1
Role of consumers in a changing market
2018-2019-2020
Support
ES-1
Distribution grid: flexibility and market options
2019 - Demo
Digitisation:
IoT: 2018-2019
Big Data: 2019
Cybersecurity 2018-2020
5G: 2018
ES-6
Advanced Tools and technologies
2019
Research
ES-2
Transmission grid: increased regional cooperation
2019 - Demo
ES-5
Innovative grid services
(Consumers, DSO, TSO)
2018-2020
Demo
Smart Citizen Centered
Energy System

Smart Citizen Centered Energy System: Local and Islands



Overview of Topics

		Instrument	TRL	Ec. fund per Proj. MEur	2018 MEur	2019 MEur	2020
EC-3	Consumer Engagment						Open
ES-1	Distribution grid: flexibility and market	IA	5-8	6-8		37.3	
ES-2	Transmission grid: regional cooperation	IA	5-8	8-10		25	
ES-5	Innovative Grid services	IA	5-8	13-17	30		Open
ES-6	Advanced toosl and technologies	RIA	NA	2-4		25.35	
ES-3	Integrated local energy systems	IA	5-8	5-6	21		Open
ES-4	Decarbonising energy systems of islands	IA	5-8	7-10	19		Open
ES-8	European island facility	CSA	NA	10		10	
ES-7	Pan European	CSA	NA	3-4	3		
					73	97.65	

Specific Challenge:

- Proposal for the Electricity Directive, promotes that network operators procure balancing, congestion management and ancillary services from assets connected to the network both at transmission and at distribution level
- Enable More efficient and effective network management and optimisation
- Increased demand response, ability to integrate increasing shares of renewables
- TSOs and DSOs using a common pool of resources: define with market participants the services they need and set up ways to procure them

Define the needs

Offer new services

Scope: Demonstrate at a large-scale

- How markets and platforms enable TSOs and DSOs to connect and procure grid services relying on the relevant digital technologies and standardized products
- Procurement of energy services from large-scale and small-scale assets through a combination of local markets (in particular for congestion management), with wholesale & balancing markets, in a way that will increase cost-efficiency and creates consumer benefits.
- Develop a seamless pan-European electricity market that makes it possible for all market participants (if necessary via intermediaries such as energy suppliers or aggregators) to provide energy services in a transparent and non-discriminatory manner
- Coordinate their work with NRA's, ENTSO-E, the DSO organisations and other stakeholders

Define the needs

Offer new services

Expected Impact:

- Smart, secure and more resilient energy system through demonstrating cost-efficient model(s) for electricity network services that can be scaled up to include networks operated by other TSOs and DSOs
- Replicable across the EU energy system and provide the foundations for new network codes, particularly on demand-response.
- Opening up significant new revenue streams for consumers to provide grid services, and increase the share of RES in the electricity system.

Innovation Action
TRL between 5 and 8
EU funding per project
13 - 17 Meur
2018 budget: 30 MEur

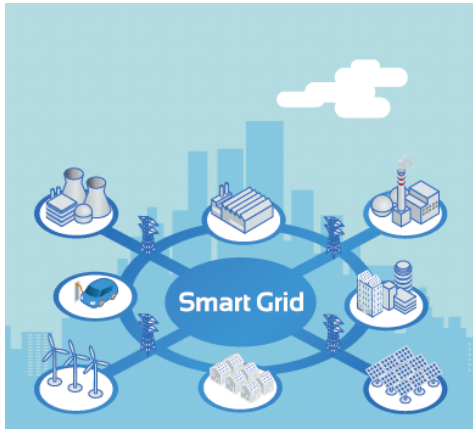
ES-1-2019: Flexibility and retail market options for the distribution grid

Specific Challenge

- Large share of variable renewables connected to the distribution grid
- Electrification for transport / heating and cooling
- Flexibility / versus infrastructure

Scope: develop and demonstrate integrated solutions with at least 2 of the following elements:

- Flexibility measures and grid services (storage, batteries incl. from EVs, power to X, demand response, variable generation
- Smart grid technologies, observability, automation, control
- Market mechanisms: dynamic tariffs, tools to resolve congestion, non-frequency ancillary services, better integration of wholesale / retail



ES-2-2019 Solutions for increased regional cross-border cooperation in the transmission grid

Specific Challenge

- Wholesale price varies across Europe
- Optimal use of interconnector
- Cooperation between TSOs across borders
- Grid services across border

Scope: at least 3 of the following points

- Tools for communication and grid operations (incl. intraday and real time market)
- Prediction of VRES production and DR forecast
- New cross border grid services
- Well-functioning wholesale market , real-time market coupling
- Enhance cross border flow, trading, exploitation of large scale storage assets
- Guidelines to avoid distortion resulting from the non-harmonisation of regulations between countries.

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ES-6-2019: Research on advanced tools and technological development

Specific Challenge:
Tools and future technologies to prepare the energy system of 2030 and beyond.

Scope: Proposals must address partially or entirely only one of the 3 following sub-topics:

1. Advanced modelling tools for
- The future electricity market (impact and the design of electricity pricing structure from the wholesale markets, to real time markets and retail markets;
- Modelling and forecasting energy production from variable renewables, associated frequency and voltage controls issues in the electricity grid and benefits associated with the use of storage.

ES-6-2019: Research on advanced tools and technological development

2. Advanced tools for

- Design and planning and operation of electricity grid infrastructure, distribution and transmission, taking into account environmental concerns, new constraints from variable renewable generation, the place of storage and flexibility; Optimisation of the use of existing assets and network
- Development of grid predictive management strategies for maintenance with uncertainty (forecasting plus stochastic grid management tools)
- 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; automated digital cross-border electricity market.

3. Technological developments:

- Reliable, robust and cost-effective energy storage technologies, storage management systems (high specific energy rates, large number of life cycles, fast response to demands and low maintenance);
- Power electronics for batteries and software to manage combined or hybridised decentralised energy systems combining several energy vectors, key focus on cost reduction

Research and Innovation Action
2 - 4 MEur EU funding per project
2019: 25.4 MEur

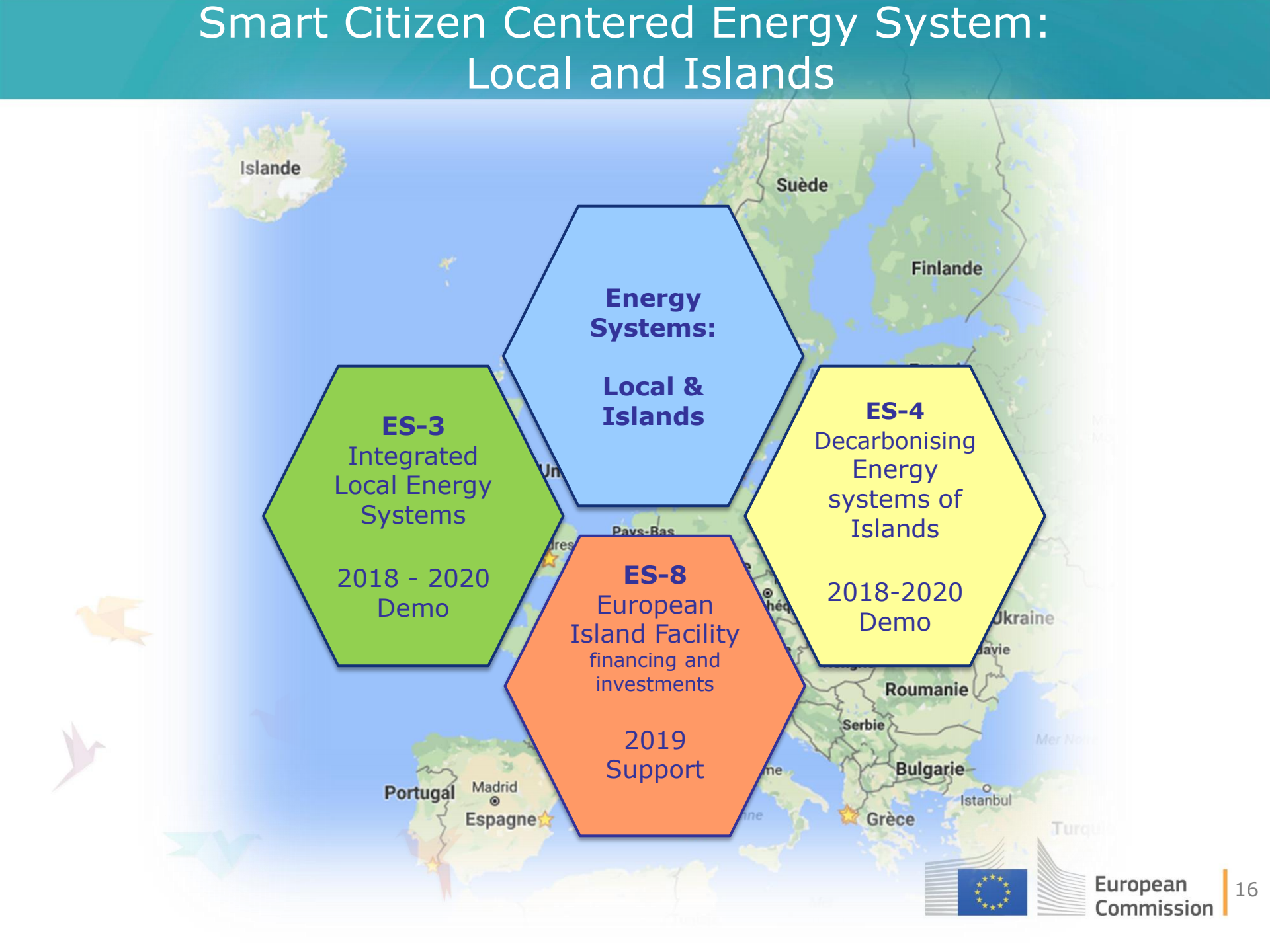
Topics on digitisation of energy

- SU-DS04-2018-2020: Cybersecurity in the Electrical Power and Energy System (EPES): an armour against cyber and privacy attacks

- DT-ICT-10-2018: Interoperable and smart homes and grids

- DT-ICT-11-2019: Big data solutions for energy

Smart Citizen Centered Energy System: Local and Islands



ES-3-2018-2020: Integrated local energy systems

Specific Challenge

- Decarbonisation of local energy systems on the mainland
- All energy vectors, storage, demand-response, digitisation
- Local economy and business cases

Scope: develop and demonstrate solutions

- Preliminary analysis of the local case
- Develop solutions and tools for the optimisation of the local energy network
- High replication potential
- Local consumers, small to medium industrial production facilities and commercial buildings should be involved

International cooperation is encouraged, in particular with India.

ES-3-2018-2020: Integrated local energy systems

Expected Impact: The supported projects are expected to contribute to:

- Validate solutions for decarbonisation of the local energy system, positive impact on the centralised energy infrastructure, on the local economy, local social aspects and local air quality;
- Involvement of local energy consumers and producers, create energy communities, test new business models;
- Safe and secure local energy system that integrates significant shares of renewables
- Develop an accurate prediction systems for the local generation of energy and adequate solutions to match with local consumption;
- Benchmark technical solutions and business models that can be replicated in many local regions and that are acceptable by local citizens.
- Identify and substantiate to which impacts the proposal contributes
- Include ad-hoc indicators to measure the progress against specific objectives (could be used to assess the progress during the project life)

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Innovation Action
TRL between 5 and 8
5 - 6 Meur
EU funding per project
2018: 21 MEur
2020: open

European Commission

ES-4- 2018 – 2020: Decarbonising energy systems of geographical Islands

'Clean Energy for EU islands' initiative

Specific Challenge:

- Energy prices on geographical island are typically 100% to 400% higher than on the mainland;
- Large-scale deployment of local renewable energy sources = economic benefits + decarbonisation
- Reduce greenhouse gases emissions and improve, or at least not deteriorate, air quality.

Scope: at least 4 of the following objectives

- High levels of local renewable energy sources penetration;
- Integrated and digitalised smart grids based on high flexibility services from distributed generation, demand response and storage of electricity, heat, water, etc.;
- Develop synergies between the different energy networks (electricity, heating, cooling, water, transport, etc.);
- Significant reduction of the use of hydrocarbon based energies
- Modelling, forecasting of demand (e.g. for touristic/non-touristic seasons) and supply (e.g. weather, wind, sun, etc.);
- Innovative approaches to energy storage, including avoidance or delay of costly grid upgrades of existing grids).

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ES-4- 2018 – 2020: Decarbonising energy systems of geographical Islands

Innovation Action
TRL between 5 and 8
7 – 10 Meur
EU funding per project
2018: -- MEur

Expected Impact:

- Developing RES-based systems (including heating and cooling and storage) that are cheaper than diesel generation;
- Reduce significantly fossil fuel consumption;
- Large-scale replication potential on the same island and on other islands with similar problems;
- Enhance autonomy for islands that are grid connected with the mainland (existing diesel generators shall be used primarily as security back-up in the long term).

- Identify and substantiate impacts to which the proposal contribute
- Include ad-hoc indicators to measure the progress against specific objectives (e.g. that could be used to assess the progress during the project life).
- Impact on future investment perspectives (see also topic LC-SC3-ES-8-2019).

ES-8-2019 European Islands Facility - Unlock financing for energy transitions and supporting islands to develop investment concepts

Specific Challenge:

Reduce islands dependency on energy imports

Local initiatives and/or public authorities have limited resources to access the analytic, financial and legal expertise needed to collect additional data and develop an investment programme of scale.

Access the various innovative financing streams which are being structured (e.g. PDA, ESIF Financial Instruments, National Investment Platforms), to increase the absorption rates of EFSI and to access private finance.

Support under the form of lump sum

Scope: Set up and run a 'European Islands Facility' which offers expertise and/or financial support and services to islands:

Transition plan and a coherent set of projects that will lead to a decarbonised, efficient and resilient island energy system using local energy flows and resources;

ES-7-2018: Pan-European Forum for R&I on Smart Grids, Flexibility and Local Energy Networks

Specific Challenge:

JRC smart Grid Outlook: 15 analysed countries (NO, CH, IE, PL, HU, SK, LT, RO, LV, HR, BG, LU, CY, EE, MT) account for less than 5 % of the R&I funds

Scope:

- R&I policy makers, R&I actors and experts ('community'), representative of the EU-28 energy system.
- Evolve towards a truly integrated pan-European Forum / R&I community
- Establish and spread the state of the R&I in the field in Europe e.g. with regional workshops
- Long term perspective development
- Make best use of ETIP SNET, ongoing Horizon 2020 projects (e.g. the BRIDGE project) existing associations with a true pan-European dimension
- Contribute to widen the representativity of European associations in the field which have weaknesses in their EU coverage.

ES-7-2018: Pan-European Forum for R&I on Smart Grids, Flexibility and Local Energy Networks

Expected Impact:

- Building a true pan-European R&I community in the field of smart grids & associated flexibility measures / energy systems;
- Establish new collaborations on a long-term perspective which has a potential to develop into industrial collaborations;
- Building, in the long-term, solidarity and trust for a well-functioning and resilient pan-European energy system

Coordination and Support Action
EU funding per project
3 - 4 MEur
2018: 3 MEur

Common requirements EC-3 ES-1 ES2- ES-5 ES-6

Proposers should demonstrate a good knowledge and compatibility with:

- Current regulations,
- Available or emerging standards and interoperability issues (see work of the Smart Grid Task Force and its Experts Groups in the field of Standardization - CEN-CLC-ETSI M/490),
- Smart grid deployment, infrastructure and industrial policy (http://ec.europa.eu/energy/en/topics/markets-and-consumers/smart-grids-and-meters/smart-grids-task-force).
- A high level of cyber security should be guaranteed in compliance with relevant EU security legislation and with due regard of best available techniques for ensuring the highest level of protection.
- Regulatory environment for privacy, data protection, data management and alignment of data formats (see "My Energy Data" and its respective follow-up, General Data Protection Regulation and industry standards, Data Protection Impact Assessment Template).

Participation in the BRIDGE initiative
EC-3 ES-1 ES2 ES-3 ES-4 ES-5

- Is a European Commission initiative
- Gather Horizon 2020 Smart Grid and Energy Storage demonstration projects
- Creates a structured view of obstacles to innovation.
- Fosters continuous knowledge sharing amongst projects
- Deliver-conclusions and recommendations with a single voice

http://www.h2020-bridge.eu/

http://www.h2020-bridge.eu/wp-content/uploads/2017/06/Brochure-of-BRIDGE-projects-V11-Revised.pdf

@BRIDGE_H2020

BRIDGE projects overview

Distribution grids	Distributed Storage	Transmission grids	Large-scale storage	RES and H&C
2014: **10 projects, 60 M€** AnyPLACE, EMPOWER, energise, Flex4Grid, FLEXICIENCY, FLEXMETER, Nobel Grid, P2P smarTest, SmarterEMC2, UP GRID	**2014:** **7 projects, 72 M€** Elsa, NAIADES, NETfficient, RealValue, SENSIBLE, STORY, FLLO	**2015:** **4 projects, 82 M€** PROMOTioN, FutureFlow, MIGRATE, SmartNet	**2015:** **2 projects, 25 M€** CRYOHUB, STORE&GO	**2016:** **2 projects, 8 M€** GRIDSOL, RESERVE
2016: **7 projects, 90 M€** GOFLEX, inteGRIDy, INVADE, integrid, InterFLEX, sm;)e, wisegrid				

Deadlines

05 April 2018

ES-5

ES-3

ES-4

ES 7

05 February 2019

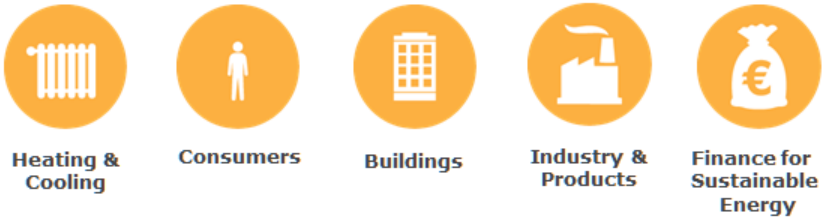
ES-1

ES-2

ES-6

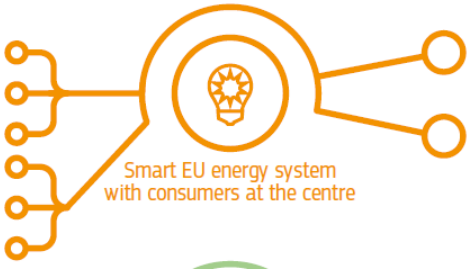
H2020 Challenge
Secure, clean and efficient energy system

Energy Efficiency



Global Leadership in renewables

Smart and Clean Energy for Consumers



Smart Cities and Communities

Smart Citizen Centered Energy system

Near-zero CO2 emission

from fossil fuel / carbon intensive industries

Overall Indicative budget for 2017 ~ 540 MEur

Smart Cities and Communities - SCC1

- **2018** will be the **5th year of lighthouse projects** and the network is steadily growing.
- We already have **36 Lighthouse cities** and **42 Follower cities**.
- They do not operate in isolation but are **working together** in the **lighthouse collaboration network**.
- They also formed **specific task groups** to intensively work on **common topics** like:
  - **Replication**
  - **Business models**
  - **Dissemination**

European Commission

2014

GROWSMARTER
Köln, Barcelona, Stockholm
& Graz, Cork, Valletta, Porto, Suceava

REMOURBAN
Valladolid, Tepebasi, Nottingham
& Seraing, Miskolc

TRIANGULUM
Eindhoven, Stavanger, Manchester
& Prague, Leipzig, Sabadell

2015

REPLICATE
San Sebastián/Donostia, Firenze, Bristol
& Lausanne, Essen, Nilufer

SHAR-LLM
Milano, Lisboa,London (Greenwich)
& Burgas, Bordeaux, Warsaw

SMARTENCITY
Sønderborg, Tartu, Vitoria/Gasteiz
& Asenovgrad, Lecce

SMARTER TOGETHER
Wien, München, Lyon
& Sofia, Santiago de Compostela, Venezia, Yokohama, Kiev

2016

mySMARTlife
Hamburg, Helsinki, Nantes
& Varna, Palencia, Rijeka, Bydgoszcz

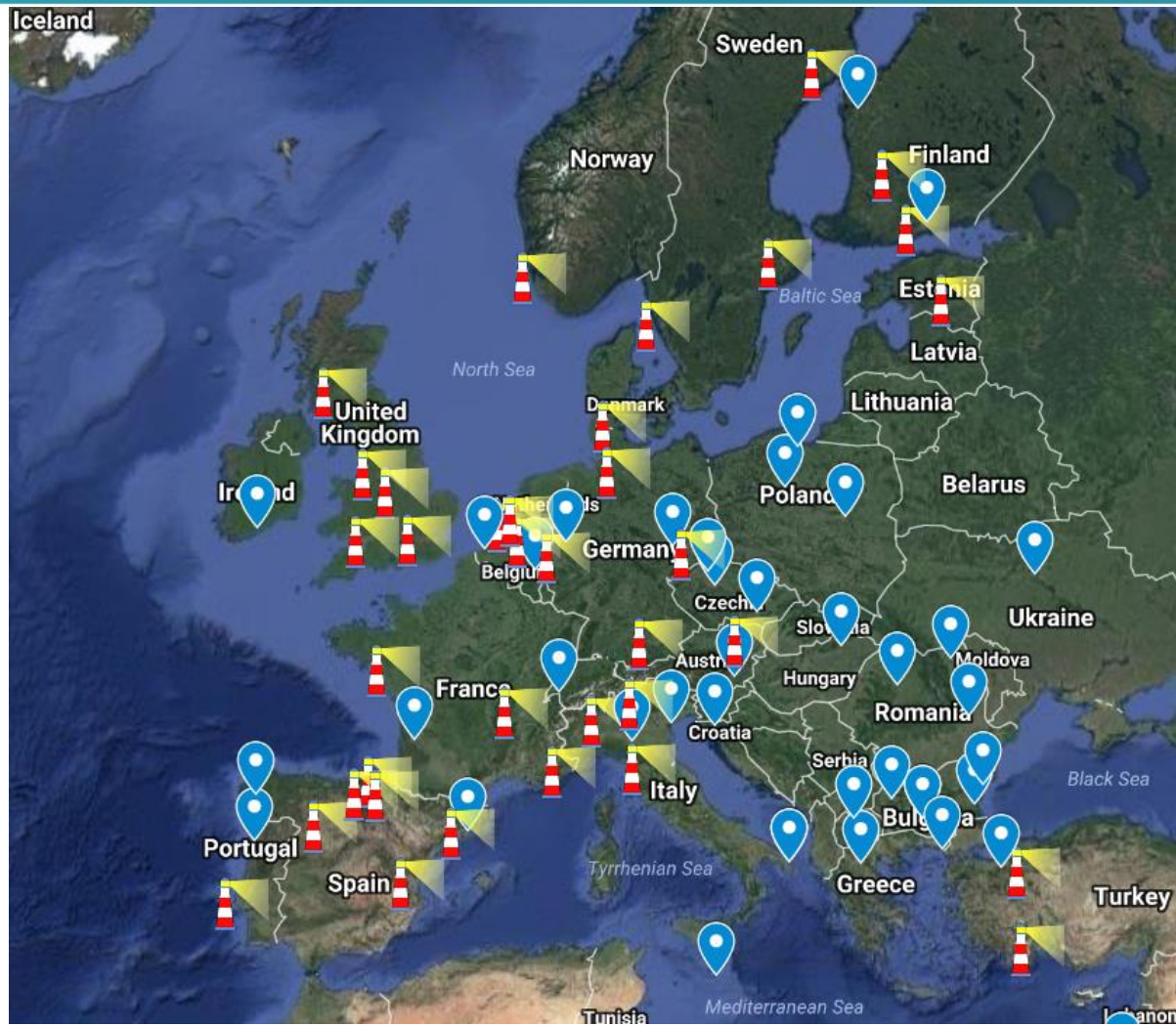
RUGGEDISED
Rotterdam, Ůmea, Glasgow
& Brno, Parma, Gdansk

2017

STARDUST
Pamplona, Tampere, Trento
& Cluj-Napoca, Derry, Kozani, Litoměřice

IRIS
Utrecht, Göteborg, Nice Côte d'Azur
& Vaasa, Alexandroupolis, Santa Cruz de Tenerife, Focsani

MatchUP
Valencia, Dresden, Antalya
& Ostend, Herzliya, Skopje, Kerava



European Commission

Lighthouse projects

- Consortia shall be composed of **2 lighthouse cities** and **at least 5 follower cities**.
- **By the call deadline**, all lighthouse cities **must have a validated**: i) Sustainable Energy Action Plans (SEAP) or ii) Sustainable Energy (and Climate) Action Plans (SECAP) or iii) a similar, at least equally ambitious, plan.
- A city can be funded as a lighthouse city **only once** under Horizon 2020.

Challenge

- **COP21, EU Energy/Climate goals**
- **Role of cities**
- Necessary **energy transition in cities**
- Increase **energy systems integration** and to push **energy performance levels** significantly

Scope

- Deploy and test integrated innovative solutions for **Positive Energy Blocks/Districts** in the Lighthouse Cities.
- Carry out extensive **performance monitoring** (ideally for more than **2 years**)
- **Interaction and integration** between the **buildings**, the **users** and the larger **energy system**.
- Implications of increased **electro-mobility**, its impact on the energy system and its integration in planning.

European Commission

City-vision 2050

- Each Lighthouse City and Follower City will develop, together with industry, its **own bold city-vision for 2050**.
- The vision should cover **urban, technical, financial and social** aspects.
- Each vision should come with its **guide for the city** on how to move from planning, to implementation, to replication and scaling up of successful solutions.

Proposals should also

- Focus on **mixed use** urban districts and positively contribute to the overall **city goals**
- Develop solutions that can be **replicated/gradually scaled up** to city level
- Make **local communities** and **local governments** (particularly city planning departments) an **active and integral part** of the solution, increase their **energy awareness** and ensure their **sense of ownership** of the smart solutions
- Promote **decarbonisation**, while improving **air quality**.
- Incorporate all relevant **performance data** into the Smart Cities Information System database (**SCIS**)

Projects should also deliver:

- **Effective business models** for sustainable solutions
- **Practical recommendations** arising from project experience on:
  - regulatory, legal aspects and **data security/protection**;
  - gender and socio-economics (Social Sciences and Humanities);
  - **storage** solutions (from short-term to seasonal);
  - **big data**, data management and digitalisation;
  - **electro-mobility**: i) its **impact** on energy system and ii) appropriate city **planning** measures to support large scale roll-out;

Eligible costs

- are primarily those that concern the **innovative elements**

Non eligible costs

- Costs of commercial technologies are **not eligible**, for example building purchase, retrofitting, electric vehicles, charging stations, etc.

Cooperation

- Projects are expected to cooperate with **other Smart Cities and Communities projects** funded under Horizon 2020 as well as the **European Innovation Partnership on Smart Cities and Communities** (EIP-SCC).
- earmark appropriate collaboration resources (5% of the requested EU contribution)

Expected Impact

- **Meeting EU climate mitigation and adaptation goals** and national and/or local energy, air quality and climate targets, as relevant;
- Significantly increased share of i) **renewable** energies, ii) waste **heat recovery** and iii) appropriate **storage** solutions (including batteries) and their **integration** into the energy system and iv) **reduce greenhouse gas emissions**;
- Lead the way towards wide scale roll out of **Positive Energy Districts**;
- Significantly **improved energy efficiency**, district level optimized **self-consumption**, reduced curtailment;
- Increased uptake of **e-mobility** solutions;

Research and Innovation Action
EU funding per project
12 - 18 MEur
2018: 40 MEur

Submission deadline:

05 April 2018

European Commission

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Rémy Dénos

Policy Officer New Energy Technologies and Clean Coal

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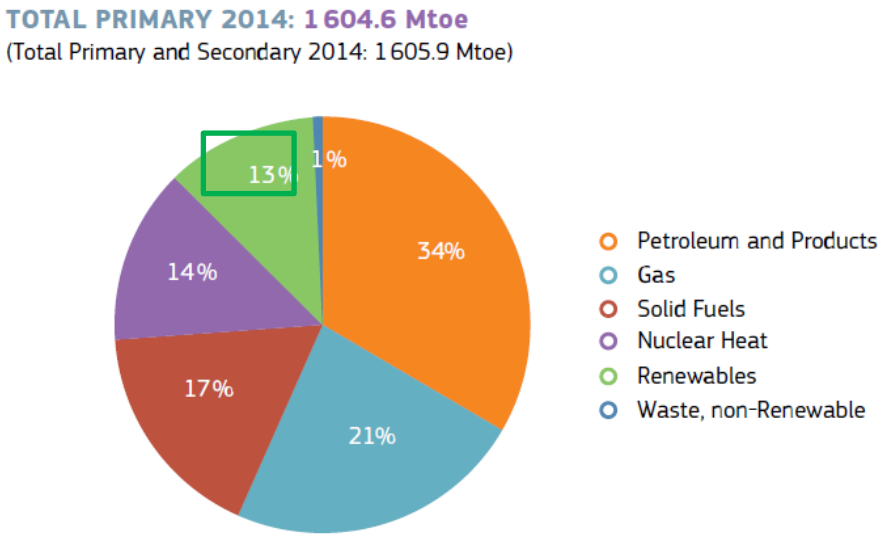
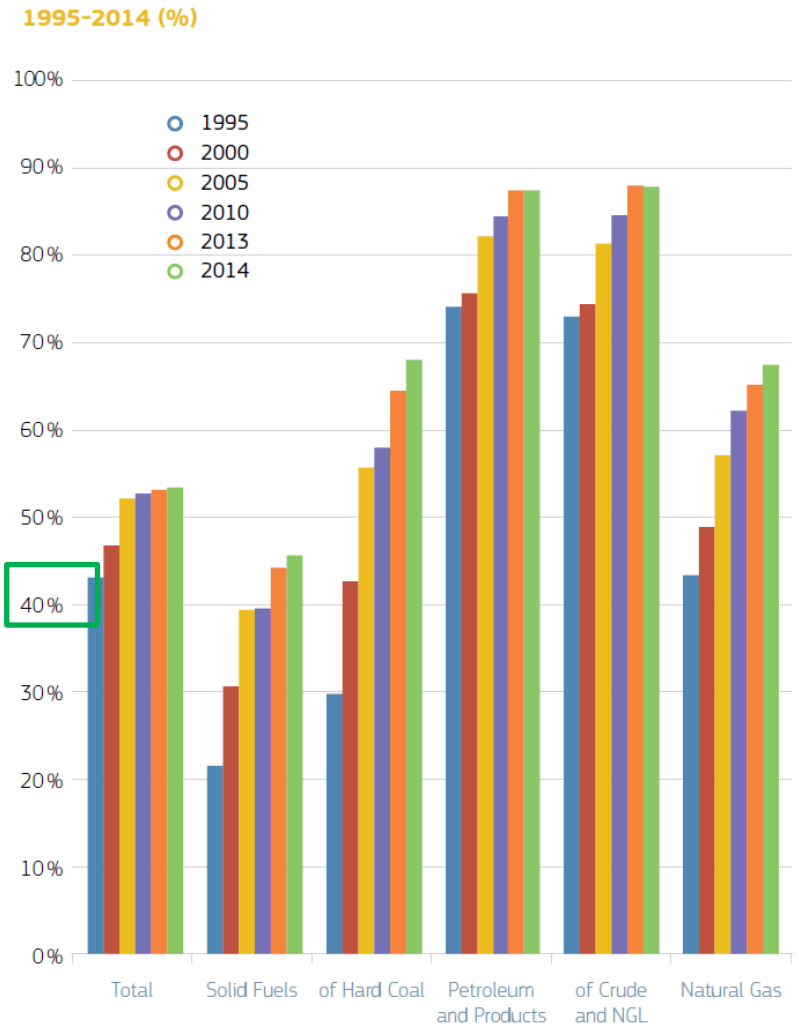
Research and Innovation

Other Actions

The European Union and Energy



Import Dependency



Pillars of EU energy policy:

- Sustainability / Renewable
- Security of supply
- Affordability

COP 21 Agreement: limiting the temperature increase to 1.5°C by 2100

400 bEur per year (~1 bEur per day)

Electricity system will be central

Today, 22% of our energy is consumed under the form of electricity

30% of electricity is produced from renewables, 11% from wind and solar

Electric vehicles have the potential to decarbonise the transport sector

Progressively, buildings will require less and less energy for heating and cooling

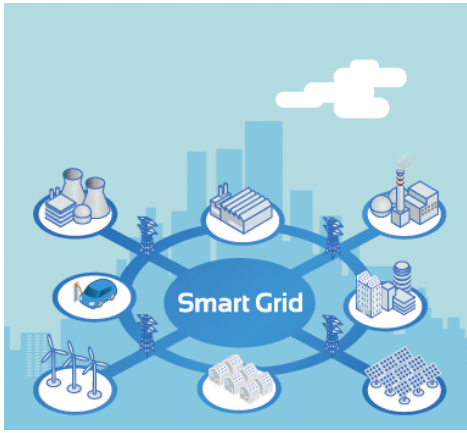
Heat pumps / power to heat have the potential to decarbonise the heating sector

Renewable energies could produce 50% of our electricity by 2030

ES-1-2019: Flexibility and retail market options for the distribution grid

Expected Impact: contribute to at least 2 elements

- Enhance flexibility of distribution grids
- define the conditions of a well-functioning market which creates business case for stakeholders willing to provide such flexibility and allow to sustain the necessary investments (e.g. variable price strategies);
- Improve the capability to manage future energy loads including electrical vehicles;
- Improve distribution grid operations which guarantee security of supply and the use of flexibility products while integrating large shares of variable renewables avoiding unnecessary investments by solving congestion;



+ include ad-hoc indicators to measure the progress against specific objectives of their choice that could be used to assess the progress during the project life

Innovation Action
TRL between 5 and 8
6-8 Meur
EU funding per project
2019: 37.3 MEur

ES-2-2019 Solutions for increased regional cross-border cooperation in the transmission grid

Innovation Action
TRL between 5 and 8
8 – 10 MEur EU funding per project
2019: 25.0 MEur

Expected Impact:

Contribute to enhance regional cooperation in:

- operation of transmission grids so as to bring additional flexibility
- optimising infrastructure investments and making best used of large scale assets
- improved functioning of the wholesale market across borders;
- development of future common approaches to grid services.

Proposals are invited to

- identify and substantiate impacts to which they contribute and include ad-hoc indicators to measure the progress against specific objectives of their choice that could be used to assess the progress during the project life.

ES-6-2019: Research on advanced tools and technological development

Research and Innovation Action
2 - 4 MEur EU funding per project
2019: 25.4 MEur

Expected Impact:

1. Advanced modelling tools are expected to: increase the knowledge on how to design of price structure and magnitude in order to be able to finance e.g. infrastructure and research and innovation; enhance the accuracy of the prediction of electricity production from variable renewables and better qualify and quantity associated issues and remedies

2. Advanced tools are expected to develop new approaches to electricity grid planning, monitoring and maintenance that are better suited to today's future characteristics of the grid and enable savings on infrastructure costs.

3. Technological developments are expected to reduce costs of key technology components to allow European Industry to keep and extend its leadership in power electronics for stationary battery systems of all sizes (from home to utility scale) and the integration of battery systems with high shares of renewable electricity and eventually also heating and cooling. Proposals are invited to include ad-hoc indicators to measure the progress against specific objectives of their choice that could be used to assess the progress during the project life.

ES-8-2019 European Islands Facility - Unlock financing for energy transitions and supporting islands to develop investment concepts

Expected Impact:

- Demonstration and documentation of increased leveraging of finance into energy transition investments by public authorities;
- Overall, for every million Euro of Horizon 2020 support the action should trigger energy transition investments worth at least EUR 10 million;
- Number of investment concepts delivered, and number of concepts that turned into tangible investments after the provided support;
- Number of public authority staff with increased capacity for developing investible energy transition projects;
- Innovation uptake by potential replicators;
- Primary energy savings, GHG reductions, renewable energy production and investments in sustainable energy (respectively in GWh/year and in million EUR of investments).

Coordination and Support Action
10 MEur EU funding
2019: 10 MEur

Impacts should rely on quantified indicators and targets wherever possible

Definition Positive Energy Blocks/Districts:

- consist of several buildings (new, retro-fitted or a combination of both) that **actively manage their energy** consumption and the energy flow between them and the wider energy system.
- have an **annual positive energy balance**.
- make **optimal use of elements** such as advanced materials, local RES, local storage, smart energy grids, demand-response, cutting edge energy management (electricity, heating and cooling), user interaction/involvement and ICT.
- are designed to be **integral part of the district/city energy system** and have a positive impact on it. Their design is intrinsically **scalable** and they are well embedded in the spatial, economic, technical, environmental and social context of the project site.