TURKEY in HORIZON 2020
COOPERATION, INNOVATION, COMPETITIVENESS

TURKEY IN HORIZON 2020
ALTUN/HORIZ/TR2012/0740.14-2/SER/005

This project is co-financed by the European Union and the Republic of Turkey
Bu proje Avrupa Birliği ve Türkiye Cumhuriyeti tarafından finanse edilmektedir

Theme Oriented Trainings:
Secure, Clean and Efficient Energy

CARTIF

CLEAN, SECURE AND EFFICIENT ENERGY IN H2020 PART 2

CENTRO TECNOLÓGICO CARTIF

SMART & CLEAN ENERGY FOR CONSUMERS

TURKEY IN HORIZON 2020
TURKEY IN HORIZON 2020
ALTUN/HORIZ/TR/301.2/07/40, 14-2/SER/005
Theme Oriented Trainings:
Secure, Clean and Efficient Energy

CENTRO TECNOLÓGICO CARTIF

CONTEXT

SMART & CLEAN ENERGY FOR CONSUMERS

- Consumers at the center of the energy transition

- The future consumer should be **better informed** and **more aware**, and have an increased capacity to fully engage in energy markets.

- The transition requires consumers to **change their energy consumption behaviour** and increase their uptake of different forms of active demand solutions and services, including collective actions

[CENTRO TECNOLÓGICO] CARTIF

CONTEXT

SMART & CLEAN ENERGY FOR CONSUMERS

- Remaining **regulatory and market barriers** for consumers should be addressed
- Innovative **engagement**
- Support schemes should be made more readily available to consumers, allowing for improved understanding of the **benefits of engaging actively in the energy system**.
- It is important to develop a better understanding of the **drivers of consumer acceptance** and behaviour change in relation to energy efficiency.

[CENTRO TECNOLÓGICO] CARTIF

TOPICS

SMART & CLEAN ENERGY FOR CONSUMERS

- **LC-SC3-EC-1-2018-2019-2020: The role of consumers in changing the market with informed decision or collective actions**
  - Develop activities **informing and motivating consumers** to change old and inefficient installed appliances leading to the highest energy saving potential (e.g. boilers, local space heaters, air heaters) to more efficient and clean energy heating and/or cooling solutions.
  - While financial aspects (cost saving, payback period) would be the main motivating factor and therefore should be presented in precise and credible manner, other aspects like increased **comfort and aesthetics, safety, improved air quality or possible participation in demand-response** should be the integral part of the actions in order to unlock the full potential of multiple benefits of energy efficiency improvement.
  - Involvement of **at least 5.000 consumers per million Euro** of EU funding.
- **CSA – 1-2 M€**

CENTRO TECNOLÓGICO CARTIF

TOPICS

SMART & CLEAN ENERGY FOR CONSUMERS

- **LC-SC3-EC-2-2018-2019-2020: Mitigating household energy poverty**
  - Actions should contribute to actively **alleviating energy poverty** and developing a better understanding of the types and needs of energy poor households and how to identify them, building on any existing initiatives such as the European Energy Poverty Observatory
    - **Facilitate behaviour change and implementation of low-cost energy efficiency measures tailored for energy poor households**
    - Support the set-up of financial and non-financial support schemes for energy efficiency and/or small scale renewable energy investments for energy poor households
- **CSA- 1-2 M€**

SMART CITIZEN-CENTRED ENERGY SYSTEM

CONTEXT

SMART CITIZEN-CENTRED ENERGY SYSTEM

- Electricity markets and consumers

- Decarbonisation of local energy systems whether on islands or on the continent

[CENTRO TECNOLÓGICO] CARTIF

CONTEXT

SMART CITIZEN-CENTRED ENERGY SYSTEM

- A first group of topics (LC-SC3-ES-1-2019, LC-SC3-ES-2-2019 and ES-5-2018-2020) is expected to **increase the capacity of the European electricity grid to host a larger share of variable renewables** so as to accelerate its decarbonisation.

- For this purpose, stronger **engagement of consumers** is needed, more **flexibility services** for both distribution and the transmission grids, higher levels of **regional cooperation** (i.e. cooperation between a group of neighbouring countries) at transmission levels and **well-functioning retail and wholesale markets** that are capable of financing necessary investments.

CONTEXT

SMART CITIZEN-CENTRED ENERGY SYSTEM

- A second group of topics (LC-SC3-ES-3-2018-2020 and LC-SC3-ES-4-2018-2020) is expected to impact on the decarbonisation of energy systems on **geographical islands** and at local levels on the **mainland** taking advantage of the availability of local renewables resources, the specificity of the demand and of the local energy networks to design and demonstrate low carbon local energy system.

TOPICS

SMART CITIZEN-CENTRED ENERGY SYSTEM

- **LC-SC3-ES-3-2018-2020: Integrated local energy systems (Energy islands)**
  - Proposals will **develop and demonstrate** solutions which analyse and combine, in a well delimited system, all the energy vectors that are present and interconnect them where appropriate.
  - Proposals should present a preliminary analysis of the local case as part of the content of the proposal and propose to develop solutions and tools for the optimisation of the local energy network, but having a high replication potential across Europe.
  - TRL 5-8
- **IA 5-6 M€**

[CENTRO TECNOLÓGICO] CARTIF

TOPICS

SMART CITIZEN-CENTRED ENERGY SYSTEM

- **LC-SC3-ES-4-2018-2020: Decarbonising energy systems of geographical Islands**
  - Achieve **high levels of local renewable energy sources penetration**;
  - Develop **synergies between the different energy networks** (electricity, heating, cooling, water, transport, etc.);
  - Achieve a very significant **reduction of the use of hydrocarbon** based energies (ideally achieve carbon neutral primary energy for all non-transport uses). Modelling, forecasting of demand (e.g. for touristic/non-touristic seasons) and supply (e.g. based on weather, wind, sun, etc.);
  - **Innovative approaches to energy storage** (including avoidance or delay of costly grid upgrades of existing grids.
  - TRL 5-8
- **IA – 7-10 M€**

[CENTRO TECNOLÓGICO] CARTIF

TOPICS

SMART CITIZEN-CENTRED ENERGY SYSTEM

- **LC-SC3-ES-5-2018-2020: TSO – DSO – Consumer: Large-scale demonstrations of innovative grid services through demand response, storage and small-scale (RES) generation**
  - The focus is on projects that demonstrate at a large-scale how markets and platforms **enable electricity TSOs and DSOs to connect and procure energy services from large-scale and small-scale assets connected to the electricity network** through a combination of local markets in a way that will increase cost-efficiency in (future) network operations and that creates consumer benefits.
  - The markets and platforms should enable the integration of relevant digital technologies like **Internet-of-Things, Artificial Intelligence, cloud and big data services**.
- **IA - 15-20 M€**

TOPICS

SMART CITIZEN-CENTRED ENERGY SYSTEM

- **LC-SC3-ES-7-2018: Pan-European Forum for R&I on Smart Grids, Flexibility and Local Energy Networks**
  - The action should set-up a European Forum composed of **R&I policy makers, R&I actors and experts ('community') in the field of smart grids** / storage and local energy systems that is representative of the EU-28 energy system.
  - The goal is to evolve towards a truly integrated pan-European R&I community with a high level of synergies, spread and representativity over a recommended duration of 4 years.
- **CSA 3-4 M€**

SMART CITIES AND COMMUNITIES

TOPICS

SMART CITIES AND COMMUNITIES

- **LC-SC3-SCC-1-2018-2019-2020: Smart Cities and Communities**
  - To achieve the necessary energy transition in cities, it is essential to **increase energy systems integration and to push energy performance levels** significantly beyond the levels of current EU building codes and to realize Europe wide deployment of **Positive Energy Districts** by 2050
  - Integrated innovative solutions for Positive Energy Blocks/Districts will be developed and tested and performance-monitored in the **Lighthouse Cities**

TOPICS

SMART CITIES AND COMMUNITIES

- **LC-SC3-SCC-1-2018-2019-2020: Smart Cities and Communities**
  - Lighthouse Cities will closely collaborate with the **Follower Cities** and should act as exemplars helping to plan and initiate the replication of the deployed solutions in the Follower cities, adapted to different local conditions.
  - As a sustainable energy transition will see increased electro-mobility, its **impact on the energy system** needs to be understood and well integrated in planning.

CENTRO TECNOLÓGICO CARTIF

TOPICS

SMART CITIES AND COMMUNITIES

- **LC-SC3-SCC-1-2018-2019-2020: Smart Cities and Communities**
  - 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. **Positive Energy Blocks/Districts have an annual positive energy balance** . They 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.

TOPICS

SMART CITIES AND COMMUNITIES

- **LC-SC3-SCC-1-2018-2019-2020: Smart Cities and Communities**
  - To increase impact beyond the demonstration part of the project, **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.
- **IA – 15-20 M€**

ENABLING NEAR-ZERO CO2 EMISSIONS FROM FOSSIL FUEL POWER PLANTS AND CARBON INTENSIVE INDUSTRIES

[CENTRO TECNOLÓGICO] CARTIF

CONTEXT

ENABLING NEAR-ZERO CO2 EMISSIONS FROM FOSSIL FUEL POWER PLANTS AND CARBON INTENSIVE INDUSTRIES

- CCS needs to become a **cost-competitive technology and prove its safety** (mainly regarding pipeline transportation and storage), so that it could start to be commercially deployed and thus contribute to the low-carbon transition of the European economy.
- Key challenges are the **demonstration of the full CCS chain**, the reduction of the energy penalty and cost of capture, the detailed appraisal of cost-effective storage capacity in selected regions, and establishing the necessary infrastructure for CO2 transport.

TOPICS

ENABLING NEAR-ZERO CO2 EMISSIONS FROM FOSSIL FUEL POWER PLANTS AND CARBON INTENSIVE INDUSTRIES

- **LC-SC3-NZE-1-2018: Advanced CO2 capture technologies**
  - The objective is the **validation and pilot demonstration of advanced CO2 capture technologies** that have shown a high potential for reduction of the energy penalty and a significant overall improvement of cost-efficiency of the whole capture process, but that are not yet commercial.
  - TRL 5-7
- **RIA – 5-10 M€**

TOPICS

ENABLING NEAR-ZERO CO2 EMISSIONS FROM FOSSIL FUEL POWER PLANTS AND CARBON INTENSIVE INDUSTRIES

- **CE-SC3-NZE-2-2018: Conversion of captured CO2**
  - Development of energy-efficient and economically and environmentally **viable CO2 conversion technologies for chemical energy storage** or displacement of fossil fuels that allow for upscaling in the short to medium term.
  - TRL 5-7
- **RIA – 3-4 M€**

CENTRO TECNOLÓGICO CARTIF

TOPICS

ENABLING NEAR-ZERO CO2 EMISSIONS FROM FOSSIL FUEL POWER PLANTS AND CARBON INTENSIVE INDUSTRIES

- **LC-SC3-NZE-3-2018: Strategic planning for CCUS development**
  - Elaboration of detailed plans for comprehensive European CO2 gathering networks and industrial clusters linked to **CO2 storage sites via hubs**, pipeline networks and shipping routes, with due attention to national and border-crossing permitting and regulatory issues.
  - Mapping and understanding the nature and longevity of emission sources, identification of transport corridors and performing initial impact assessments, and developing local business models for delivery of CO2 capture, transport, utilisation and/or storage within promising start-up regions. Industrial clusters may include for example power producers, cement and steel factories, chemical plants, refineries and hydrogen production facilities.
- **RIA – 2-3 M€**


CARTIF