The European Green Deal Call

4.6.2020 MT-webinaari

European Union

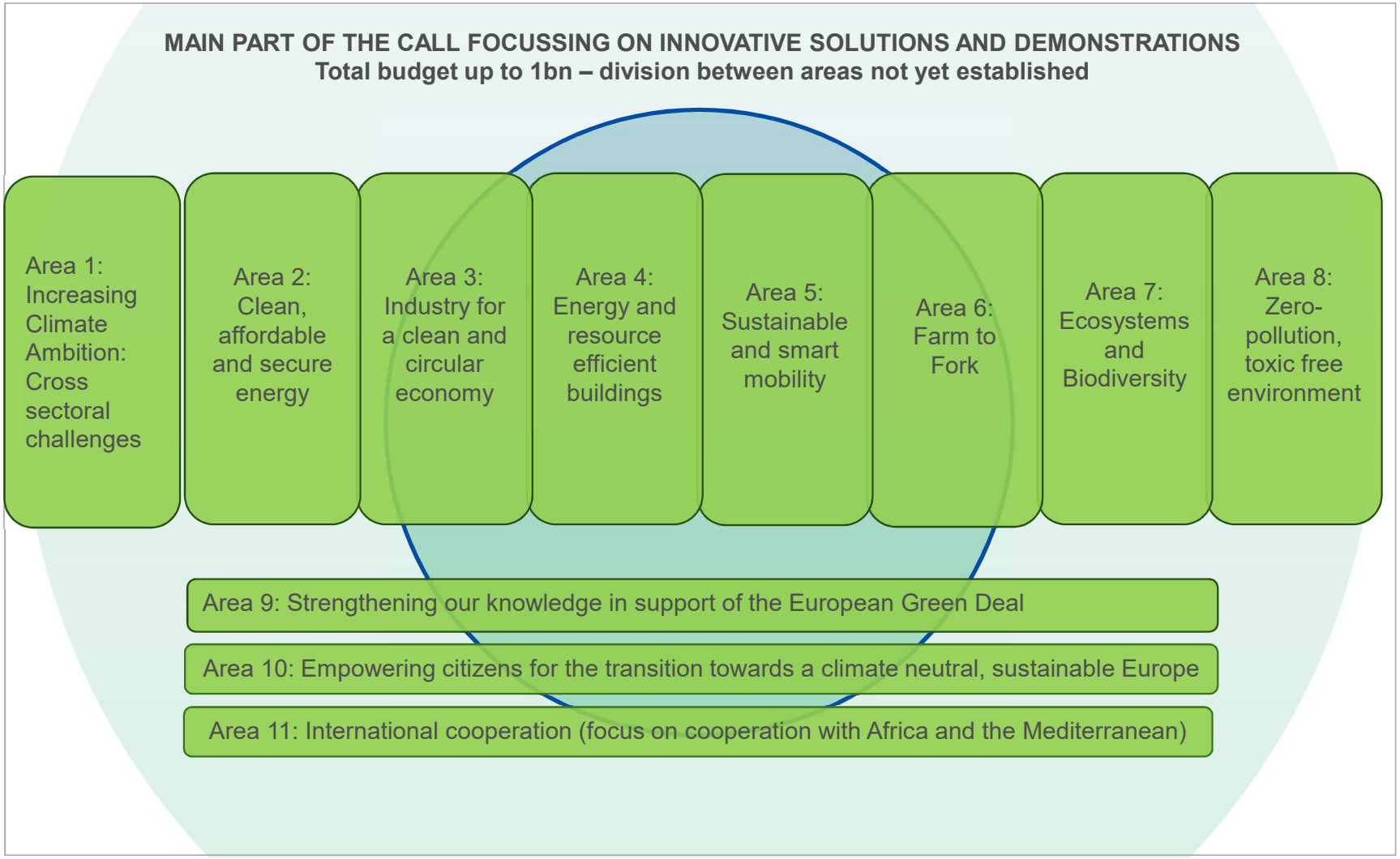
Timeline

- 1st of June – DL for contribution from thematic programme committees
- 3rd of June – Closing of stakeholder engagement (public consultation)
- Mid-June (the week 15-19 June) – Last Strategic committee meeting
- July/August – Interservice consultation & opinion of the Strategic committee
- **Mid-September** – adoption of the WP update by the Commission and **call opening –> only single stage calls!**
- **End of January 2021 – Expected closing of the call**
- Q4 2021 – Signature of grant agreements (obligatory!)

Overview

- The structure of the **Green Deal Call (GDC) reflects the eight key** European Green Deal (EGD) work streams and is complemented by **three horizontal areas** (strengthening knowledge; empowering citizens; and international cooperation), which cut across the eight areas and offer a longer-term perspective in support of the transformations required by the EGD.
- **GDC is a different call. It aims to**: produce tangible results - visible to the citizens - in a relatively short time frame
- To increase impact and visibility, proposed actions are limited in number, with a strong focus on impact, supporting primarily (but not exclusively) innovation and demonstration actions. Research Actions and Coordination and Support Actions will also be included in the call

The European Green Deal Call



Preliminary Topics - 1

AREA OF THE CALL	TOPIC NUMBER	TITLE OF TOPIC	TYPE OF ACTION
Area 1: Increasing Climate Ambition: Cross sectoral challenges	1.1	Preventing and fighting extreme wildfires with the integration and demonstration of innovative means	RIA
	1.2	Towards Climate-Neutral and Socially Innovative Cities	RIA
	1.3	Climate-resilient Innovation Packages for EU regions	IA/CSA
Area 2: Clean, affordable and secure energy	2.1	Demonstration of innovative critical technologies to enable future large-scale deployment of offshore renewable energy technologies (with the possibility to address also hydrogen applications)	IA
	2.2	Develop and demonstrate a 100 MW electrolyser upscaling the link between renewables and industrial applications	IA
Area 3: Industry for a clean and circular economy	3.1	Closing the industrial carbon cycle to combat climate change	IA
	3.2	Demonstration of systemic solutions for the territorial deployment of the circular economy	IA
Area 4: Energy and resource efficient buildings	4.1	Building and renovating in an energy and resource efficient way	IA
Area 5: Sustainable and smart mobility	5.1	Green airports and ports as hubs for sustainable and smart mobility	IA

Topics – 2

Area of the call	Topic Number	Title of topic	Type of action
Area 6: Farm to Fork	6.1	Testing and demonstrating systemic innovations for sustainable food from farm to fork	IA
Area 7: Ecosystems and Biodiversity	7.1	Restoring biodiversity and ecosystem services	RIA
Area 8: Zero-pollution, toxic free environment	8.1	Innovative, systemic zero-pollution solutions to protect health, environment and natural resources from persistent and mobile chemicals	RIA
	8.2	Towards better regulation of chemical and pharmaceutical mixtures: from science to evidence-informed policies	RIA
Area 9: Strengthening our knowledge in support of the EGD	9.1	European Research Infrastructures capacities and services to address European Green Deal challenges	RIA
	9.2	Developing end-user products and services for all stakeholders and citizens supporting climate adaptation and mitigation	RIA/IA
	9.3	A transparent & accessible ocean: Towards a Digital Twin of the Ocean	IA

Topics – 3

AREA OF THE CALL	TOPIC NUMBER	TITLE OF TOPIC	TYPE OF ACTION
Area 10: Empowering citizens for the transition towards a climate neutral, sustainable Europe	10.1	European capacities for citizen deliberation and participation for the Green Deal	RIA
	10.2	Behavioural, social and cultural change for the Green Deal	RIA
	10.3	Enabling citizens to act on climate change and environmental protection through education, citizen science, observation initiatives, and civic involvement	RIA/IA
Area 11: International cooperation	11.1	Accelerating demonstration of clean energy solutions in Africa and the Mediterranean	IA/CSA

IA	RIA	RIA/IA	IA/CSA
8	8	2	2

More information from

Horizon 2020 – Commission Green Deal call web page:

- https://ec.europa.eu/info/research-and-innovation/strategy/european-green-deal/call_en

Funding & Tenders portal:

- https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/programmes/h2020

22-24 September 2020: European R&I Days,Brussels:

- https://ec.europa.eu/info/research-and-innovation/events/upcoming-events/european-research-and-innovation-days_en

Horizon 2020 National Contact points (NCPs) in Finland:

- https://www.businessfinland.fi/suomalaisille-asiakkaille/palvelut/rahoitus/horisontti-2020/horisontti-yhteyshenkilot/#ncp

AREA 1. Increasing climate ambition: cross sectoral challenges

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European Commission

European Commission

1.1 Preventing and Fighting Extreme Wildfires with the integration and demonstration of innovative means (RIA)

What to do?

Accelerate R&I, integrate, adapt & demonstrate holistic solutions ready to up-scale/deploy at local/regional/national/EU and international level, including demonstration pilot sites, making best use of existing data, technologies and services and closely engaging all concerned actors and communities for each phase.

General Approach

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1.1 Preventing and Fighting Extreme Wildfires with the integration and demonstration of innovative means

Activities are further described in the call text in three categories:

A. Prevention & Preparedness

- Develop an EU centralised database with socioeconomic and environmental information on wildfire causes and impacts,
- Innovative and sustainable approaches for fuel management of both public and private lands (including agricultural lands),
- Enhanced access to reliable fire danger rating and warnings in cooperation with existing EU initiatives (e.g. EFFIS),
- Support the integration of wildfire resilience into governance and insurance model,
- New operational forecast climate-vegetation-fires model,
- Better understanding of the link between the smoke exposure from fires and illness or death in local communities.

B. Detection & Response

- Stimulate investments from private sector in new technologies for detection & response,
- Fast-track research and innovation in space, ground and aerial means for detection, targeting and/or extinction of fires,
- More effective modular firefighting units, scooping/tanking and capable fire-fighting helicopters & planes (e.g. night operations),
- Near real-time high-fidelity fire propagation forecasting,
- Better and more interoperable incident management and communication, coordination and command systems,
- Better firefighter and ground/air vehicles' location, route management, training and automation of simultaneous operations,
- Advanced personal monitoring and protective equipment,
- Better integration of early warning systems with search & rescue and evacuation procedures.

C. Restoration and Adaptation

- Evaluate and upscale ecosystem-based restoration solutions and adaptation protocols for resilient wildland-urban interfaces
- Common EU legal framework for the governance systems regarding forest and communities protection from wildfires,
- Public-private cooperation mechanisms to stimulate the development of preventive measures and reduce loss and damages,
- Sustainable post-fire restoration solutions of damaged ecosystems.

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1.1 Preventing and Fighting Extreme Wildfires with the integration and demonstration of innovative means

Measurable targets to be achieved by 2030:

- 0 fatalities from wildfires
- 50% reduction in accidental fire ignitions
- 55% reduction in emissions from wildfires
- Control of any extreme and potentially harmful wildfire in less than 24 hours
- 50% Natura 2000 protected areas to be fire-resilient
- 50% reduction in building losses
- 90% losses from wildfires insured
- 25% increase in surface area of prescribed fire treatments

For up-scale/up-take e.g. in National climate change adaptation and disaster risk strategies, The European Forest Fire Information System, Horizon Europe's Mission on Adaptation to Climate Change including Societal Transformation, Copernicus Emergency Management System

Multilateral international cooperation can further leverage knowledge, resources, best practices and global impact e.g. United States, Canada, Russia, Brazil, Japan and Australia.

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1.2 Towards climate–neutral and socially innovative cities (RIA)

What is at stake:

- Cities occupy 2% of the planet's landmass, consume over 65% of the world's energy and account for more than 70% of the global CO2 emissions
- Cities and local communities can benefit from social innovation and EU R&I towards the transition to climate neutrality, leaving no one behind
- 75% of the European citizens live in cities and possibly 80% by 2050: *Cities will play a crucial role in reaching the targets of the Green Deal*

Objective of the topic: to support cities into using Green Deal-targeted technological, non-technological and social innovation to co-create, test and implement holistic & integrated solutions with citizens and trigger changes in social practices and behaviour

Targeted Impacts

- ➢ Climate neutrality by 2030 of the participating cities (and districts)
- Empower cities and local communities through social innovation to cross social tipping points and make the Green Deal happen
- ➢ Mobilise the demand (citizens' needs) to lead the transition to climate neutrality

1.2 Towards climate–neutral and socially innovative cities

SCOPE: Establish a one-stop shop in partner cities to help them implement their climate action plans and related social innovation action plans

- Providing technical, regulatory, financial & socio-economic expertise and assistance to cities
- Partnership involving research organisations, academia, industry including social entrepreneurs, the financial sector including impact financiers, investors, philanthropists, NGOs, national and local authorities and citizens

Proposed activities (non-exhaustive list):

Activity 1: Climate action plans and Green Deal innovation:

- Develop: science-based indicators for assessing cities' climate neutral action plans (emissions reduction); innovative urban greening assessment methodologies for planning & monitoring emissions reduction; inter-operable and comparable cities evidence repositories
- Identifying regulatory, institutional, governance, financing, public acceptance, and other barriers preventing progress towards climate neutrality
- Sharing of experience and good practices between cities

1.2 Towards climate–neutral and socially innovative cities

Activity 2: Financial engineering

- Identify strategies and financing solutions for cities to reach climate neutrality, building on existing practices developed by global, European and national initiatives and programmes

Activity 3: Social innovation and citizens' engagement

- Combine existing results of EU R&I with social innovation, and take advantage of the digital transformation to co-create and test solutions with local communities, including changes in social practices and behaviour
- Support twinning and mentoring on Green Deal objectives between cities from different countries and different sizes and creating a European ecosystem of social innovation hubs and local communities

Activity 4: Research and Innovation for climate-neutral transformation of cities

- Support large scale pilots for deployment of systemic solutions combining technological, social, cultural, regulatory and/or financial aspects, building on good practices available at local, national and/or European level

1.3 Climate-resilient Innovation Packages for EU regions (IA & CSA)

Why?

- The world is on a trajectory of 3°C to 4°C warming
- Radical and transformative adaptation is urgently needed to reduce climate vulnerability and build resilience

What?

Stimulate major innovations in key community systems central to resilience building and serve as early facilitator for the Horizon Europe Mission on Adaptation to Climate Change, including societal transformation

How?

- **scale up and demonstrate** at large scale **systemic solutions** for regional adaptation to trigger behavioral change and new ways of decision-making
- **develop efficient adaptation pathways** tailored to support the most vulnerable regions and communities

European Commission

Climate-resilient Innovation Packages for EU regions: Scope

Area 1 : Development of Innovation Packages for transformational adaptation (IA)

- focus on **key systems (health, agriculture, water, environment incl. biodiversity, and infrastructure incl. energy)** that most urgently need to be protected from climate impacts
- target **regions with the highest exposure and/or least adaptive capacity**
- rely on **wide citizen and stakeholder engagement**
- **take stock of existing best practices** and solutions already available

Area 2 : Citizen engagement, monitoring and testing of Innovation Packages (CSA)

- conduct early **multi-stakeholder dialogue and citizens engagement**
- develop a **set of indicators to monitor and assess** the Innovation Packages
- **foster an enabling environment** so the activities under area 1 can thrive (e.g. digital services; finance; education and capacity building; business models and insurance; innovative coordination approaches, etc).
- Identify and support the **overcoming of institutional, regulatory and financial barriers** preventing the implementation of Innovation Packages

Climate-resilient Innovation Packages for EU regions - Expected Impacts

- Accelerate the **economic restart from the Covid 19 crisis** and foster **transformative change** to increase climate resilience
- Massive **increase of community resilience** and capacities to cope with unavoidable effects of climate change
- Fully functioning **online and free-access platform** with user-friendly information **on Innovation Packages** covering all relevant aspects (financial, social, technological and regulatory) and all relevant areas (health, agriculture, water, environment including biodiversity, and infrastructure including energy, etc.)
- Support the **European Green Deal targets**, in particular the new EU Strategy on Adaptation to Climate Change, the EU biodiversity, bioeconomy and circular economy strategies

AREA 2. Clean, affordable and secure energy

Topic 2.1

Demonstration of innovative critical technologies to enable future large-scale deployment of offshore renewable energy technologies (with the possibility to address also hydrogen applications) (IA)

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European Commission

The European Green Deal Call

Demonstration of innovative critical technologies to enable future large-scale deployment of offshore renewable energy technologies and their integration into the energy system.

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To decarbonise Europe, clean renewable power production must become the main source of energy. A Clean planet for all, provides estimates for the offshore wind capacity in Europe of 240-440 GW by 2050. This increase would represent a paradigm shift in the European energy system and require a modern infrastructure to transport offshore renewable energy power to onshore, including through the option of power-to-X. This buildout needs to be attained while also protecting the environment and biodiversity and securing a just transition, all while ensuring cost-efficiency. There is a need for more efficient and cost-effective technologies using wind, wave and/or tidal resources, considering the potential of the different European sea basins.

Targeted Impacts:

- To accelerate the development of innovative critical offshore technologies for the realization of a clean renewable power production system needed to transform the EU into a fair and prosperous society, with a modern, resource-efficient and competitive economy where there are no net emissions of greenhouse gases in 2050.
- To accelerate the future roll-out of large-scale deployment of offshore renewable energy, considering market perspective and social, environmental and economic impacts.
- To increase incentives for investment and economies of scale in offshore bringing down costs and it will create new business models and services

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Demonstration of innovative critical technologies to enable future large-scale deployment of offshore renewable energy technologies and their integration into the energy system.

Proposed activities:

Demonstration of critical offshore renewable energy innovations at sea considering the efficiency, reliability and sustainability that is needed in all areas of the offshore renewable energy system notably:

-**Offshore renewable energy power generating systems**: innovative large scale integrated systems, floaters and substructures, mooring and anchoring systems specifically conceived for floating offshore considering the varied subsea conditions for floating offshore systems.

-**Grid infrastructure**: demonstration of innovative High Voltage Direct Current (HVDC) technologies and systems (like multi-vendor Multi Terminal HVDC (MT HVDC) systems, grid forming converter, and DC circuit Breaker); for floating renewable energy technologies innovative dynamic inter-device/inter-array cables and connections to converter stations at sea or offshore hubs have to be considered.

-**Power to X /storage systems**: innovative storage and/or green power to X (including hydrogen) systems to maximise the use of offshore resources.

It shall address at least the offshore renewable energy power generating systems and the related energy system integration requirements, and may address grid infrastructure and/or power to X/storage systems.

Proposals shall address marine spatial planning (making multi-use of the seas possible), industrial design and manufacturing processes, installation methods, transport and operation & maintenance and supply chains.

AREA 2. Clean, affordable and secure energy

Topic 2.2

Develop and demonstrate a 100 MW electrolyser upscaling the link between renewables and industrial applications (IA)

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European Commission

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Develop and demonstrate a 100 MW electrolyser upscaling the link between renewables and industrial applications

Demonstrate energy system integration through hydrogen: produce hydrogen from RES and use it in a commercial/industrial application (e.g. chemical or petrochemical industry)

Targeted Impacts

Impact 1: Establish a European industry capable of developing a novel 100MW electrolyser using a European value chain

Impact 2: Increase the efficiency of the electrolyser reaching an energy consumption of 49 (ALK) to 52 (PEM) kWh/kg H2 at nominal power

Impact 3: Increase the current density to 1A/cm2 (ALK) or 3A/cm2 (PEM) and delivery pressure to 30 bar

Impact 4: Reduce the plant's footprint by 30% thanks to the larger modules and the plant layout as well as the higher current densities

Impact 5: Reduce the electrolyser CAPEX by 20% down to €480/kW and €700/kW for Alkaline and PEM electrolysers respectively

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Develop and demonstrate a 100 MW electrolyser upscaling the link between renewables and industrial applications

Proposed activities:

1. Develop modules of 4-5 MW (or larger) with reduced balance of plant, managing efficiently the input power, the output hydrogen streams and the heat flows, while ensuring the reliability of the system and reducing the footprint
2. Assemble the modules into a 100MW electrolyser system
3. Test and demonstrate the 100MW electrolyser in real life conditions, operating flexibly to harvest maximum renewable power and provide grid-balancing services, and supplying renewable hydrogen to a commercial/industrial application
4. Assess the performance and the durability of the electrolyser operating dynamically
5. Address potential safety issues

AREA 3. Industry for Clean and circular economy

Topic 3.1

Closing the industrial carbon cycle to combat climate change (IA)

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European Commission

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Closing the carbon cycle in industry: renewable energy driven reduction of CO_2 using innovative catalytic materials and technologies

Energy intensive industries, such as steel, chemicals and cement are key to Europe's economy, but they account for 20% of the EU's greenhouse gas emissions. R&I is proposed on innovative catalytic materials and technologies using renewable energy driven conversion of CO_2 emissions into fuels, polymers and chemicals.

Targeted Impacts:

- Impact 1 - Demonstrate technical and economic viability of renewable energy driven conversion of CO_2 as feedstock, at pilot plant level, to produce climate-neutral fuels, polymers and chemicals.
- Impact 2 – Affordable and efficient production, storage and distribution of renewable energy carriers.
- Impact 3 - Significant reduction of industrial CO_2 emissions (~200 Mt p.a. by 2050).
- Impact 4 - Improvement of air quality by reducing the direct flue gas emissions.
- Impact 5 - Contribution to industrial circularity and to meet the GHG emissions reduction target for 2030 and climate neutrality by 2050.

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Closing the carbon cycle in industry: renewable energy driven reduction of CO_2 using innovative catalytic materials and technologies

Proposed activities:

Develop and deploy highly innovative catalytic materials and renewable energy driven technologies for the production of synthetic fuels, polymers and chemicals from industrial waste gas emissions (CO_2 and CO streams)

- with a 50% increase in the overall efficiency compared to the state-of-the-art
- at a sufficiently large scale with a demonstrated cost effectiveness
- with a demonstrated exploitability of the developed technology through the full value chain

Topic 3.2

Demonstration of systemic solutions for the territorial deployment of the circular economy (IA)

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Territorial circular economy & policy challenge - Policy response

Implement and demonstrate concrete systemic solutions for the territorial deployment of the circular economy (including circular bioeconomy) in at least three territorial clusters.

- Circular territorial cluster
- Actors
- Circular systemic solution

Territorial contribution to
- European Green Deal
- Circular Economy Action Plan and
- Bioeconomy Strategy

Close cooperation with the European Commission's ***Circular Cities and Regions Initiative*** (CCRI): https://ec.europa.eu/research/environment/index.cfm

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Demonstration of systemic solutions for the territorial deployment of the circular economy

- Build sustainable, regenerative and just circular economy to reconcile with the limits and boundaries of our planet;
- focus on local and regional levels as suitable for closing material loops and creating sustainable circular ecosystems;
- demonstrate concrete systemic solutions for the territorial deployment of the circular economy in at least three territorial clusters in Europe;
- facilitate their replication.

Targeted Impacts:

Demonstrate R&I systemic solutions for the territorial deployment of the circular economy at the level of governance closest to citizens:

- increase the clusters' overall resource efficiency and reduce GHG emissions;
- increase circularity in clusters' key economic sectors;
- create jobs and new business opportunities.

Replication:

- lay the foundation for systemic solutions for the territorial deployment of circular economy in other areas;
- multiply the territorial economic, social and environmental benefits provided by each cluster to achieve policy targets at national and European level.

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Demonstration of systemic solutions for the territorial deployment of the circular economy

Proposed activities:

- engage, train, support, coordinate and facilitate the cooperation between key actors constituting each cluster: administrations, industry (including SMEs), scientific community and civil society;
- develop and demonstrate science, technology, governance, economic, social and environmental solutions to increase the circularity in key economic sectors such as waste, water, food, feed, wood, terrestrial and aquatic bio-based value chains, textile, plastics, electrical and electronic equipment, construction and buildings;
- ensure the exchange of relevant information and experiences within and across clusters and also with other actors not involved in the proposals.

Criteria:

- sustainability, inclusiveness, and social justice at the heart of each systemic solution;
- replicability potential of each solution is essential;
- totality of the territorial clusters should reflect a geographical spread within Europe and should be of different sizes and socio-economic structures;
- TRL 7-8 at the end of the project.

AREA 4. Energy and resource efficient buildings

Topic 4.1.
Building and renovating in an energy and resource efficient way

NCP Tom Warras, Business Finland, tom.warras (at) businessfinland.fi

Based on presentation
by Maria Getsiou (DG RTD)
on 25 May 2020

The European Green Deal Call

Building and renovating in an energy and resource efficient way

To design and construct new or retrofit existing buildings as zero-emission / zero-pollution, positive energy powerhouses. Multiplication of such buildings in green neighborhood / district "living labs".

Proposals are expected to deliver large-scale, real-life demonstrations of promising technology and social innovations based on:

- **Scalability design of green, positive energy neighborhoods**
- **Industrial construction/renovation workflows with recycling, minimized disruption, etc**
- **Highly energy-efficient building designs (BIM, integrated photovoltaics, etc)**
- **Renewable ES electricity generation in buildings and district level (also: revers.heat pumps)**
- **Energy storage systems (eg. 2nd life batteries from electric vehicles, eg. interoperability with the grid)**
- **Highly energy-efficient building operation at reduced maintenance costs (eg. smart home services**
- **Citizen awareness raising, training for sustainability**
- **Coordination on standards and regulatory aspects for efficiency of buildings and HVAC technologies.**

Innovation action (IA)
TRL up to 7

Expected impact:

- Primary energy savings (in GWh/year);
- Investments in sustainable energy
- High energy performance / positive energy buildings;
- Reduction of GHG emissions
- Reduction of the embodied energy 50 %
- Reduction of air pollutants towards zero
- Shortened construction time/cost by 30%
- Improved indoor environment quality and reduction of dust and noise by >30%

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Building and renovating in an energy and resource efficient way

Proposed activities /1:

- **Scalability design of green, positive energy neighborhoods well embedded in the spatial, economic, technical, environmental, regulatory and social context of the demonstration sites.**
- **Energy and resource efficient, seamless industrial construction/renovation workflows from design through to offsite manufacturing, installation and post-construction monitoring:**
  - **With recycling/reuse of construction materials (or industrial by-products) or reduction of the amount of materials and components, in order to reduce the embodied energy of buildings;**
  - **Proving high replicability, reduced maintenance costs and long-term performance as well as and socio-environmental performance (e.g. air quality/natural ventilation, natural lighting, etc.);**
  - **Minimizing disruption for building occupants and the time spent on site;**
  - **Delivering post-construction / renovation monitoring of operational energy performance, durability of the construction/renovation components.**

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Building and renovating in an energy and resource efficient way

Proposed activities /2:

- Sustainable and highly energy-efficient building designs (incorporating thermal design and orientation), adapted to local environments and climatic conditions; active-passive solutions for the building envelope, with:
  - Digital methods of design and construction (e.g. building information modelling);
  - Innovative and more energy efficient Building Integrated Photovoltaics (BIPV) converting structural elements/surfaces (e.g. facades, windows, roofs, etc.) into electricity-producing surfaces while satisfying building functions in addition to architectural and aesthetic considerations.
- Innovative and more energy efficient RES electricity generation in the buildings and at district level combined with urban service facilities (e.g. charging facilities) and highly energy efficient and cost effective RES heating and cooling solutions:
  - PV (BAPV where BIPV is not an option);
  - Reversible heat pumps with refrigerants, which are not greenhouse gases, or less developed clean heating options such as hydrogen.
- Energy storage systems (e.g. using second life batteries from electric vehicles) without limiting the use of living space (e.g. neighborhood optimized storage including management systems for optimal integration, flexibility and interoperability with the grid).

Building and renovating in an energy and resource efficient way

Proposed activities /3:

- Highly energy-efficient building operation at reduced maintenance costs and long-term performance with the help of digital technologies for monitoring yield, energy system flexibility (matching demand to generation) and "peak shaving" at neighborhood scale, as well as digital solutions to increase energy efficiency of building systems' and appliances' secure operation ensuring optimal comfort for users:
  - Optimal dynamic matching of on-site renewable energy generation and building consumption;
  - Smart home services, advanced automated controls, i.e., smart meters, smart water control, smart EV charging, smart elevators, smart security etc.; understanding the occupants preferred usage of the building and harmonise the buildings' interaction with its occupants;
  - Integration between building energy management systems / building automation control systems, renewable electricity/energy generation, storage, urban service facilities and the grid;
  - Potential for local flexibility to be aggregated and bundled; possibility to trade and commoditize energy flexibility creating new services and revenue streams for building owners/tenants;
- Citizen awareness raising, as well as, education and training for sustainability, conducive to competences and positive behavior/good habits for a resource efficient and environmentally respectful energy use.
- Coordination on standards and regulatory aspects for efficiency of buildings and HVAC technologies.

AREA 5. Sustainable and smart mobility

Topic 5.1.

Green Airports and Ports as hubs for sustainable and smart mobility (IA)

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Based on presentation of
Dimitrios Vartis (MOVE.B.3)
on 28 May 2020

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***Disclaimer**: these slides provide only preliminary information. They do not present a draft of the Green Deal call to be part of the Horizon 2020 work programme update, nor any future position of the European Commission.*

The European Green Deal Call

Green airports and ports as hubs for sustainable and smart mobility

The European Green Deal Communication (Dec-2019)

- *"Transport should become drastically less polluting"*
- *"Accelerating the shift to sustainable and smart mobility"*
- *"Ramp-up the production and deployment of sustainable alternative transport fuels"*
- *Aviation: "air quality should be improved near airports by tackling the emissions of pollutants by aeroplanes and airport operations"*
- *Shipping: "[the Commission] will take action in relation to maritime transport, including to regulate access of the most polluting ships to EU ports and to oblige docked ships to use shore-side electricity."*

Sectoral and policy analysis

- Decarbonisation progress in Road / Rail (e.g. electrification)
- Aviation: 14% of EU transport GHG emissions (rising): x2 traffic by 2050
- Shipping: 13% of EU transport GHG emissions (rising), 90% of global trade
- Significant and immediate impact required by 2025-2030
- Further policy action foreseen in aviation and waterborne transport

Green Deal Call (2020)

Green airports and ports as hubs for sustainable and smart mobility

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Green airports and ports as hubs for sustainable and smart mobility

Targeted Impacts:

- Accelerated deployment of sustainable alternative fuels (e.g. biofuels, hydrogen, ammonia) and electromobility for aviation, shipping and other transport modes
- Green energy / fuel production, distribution and supply (e.g. hydrogen, electricity, biofuels), with re-fuelling and re-charging capabilities for multiple vehicles/purposes
- Zero-emission ports and airport operations and improved air quality by 2030
- Reduced emissions in aviation, shipping, multimodal mobility for passengers/freight
- Energy-efficient and smart operations and buildings, logistics, inter-modal connections and modal shifts
- Reduced emissions for cities, urban mobility, better city integration for ports/airports

The European Green Deal Call

Green airports and ports as hubs for sustainable and smart mobility

Proposed activities in draft (19 May 2020):

- Large-scale, real-life high TRL demonstrations of green airports, maritime and inland ports, of different sizes, across Europe
- Pilot/demo plants of zero-emission energy production and supply at airports and ports (electricity, hydrogen, sustainable alternative fuels)
- On-site supply systems, storage, distribution and power/re-charging/alternative re-fuelling infrastructure for aircrafts, ships and other vehicles / purposes
- Integration with green and smart operations and logistics, innovative construction, dredging, infrastructures, effective and green land/sea/river use
- Smart tools for optimisation of passenger/freight traffic flows into/out of airports and ports, from/to the city and for inter-modal connections/modal shifts
- Non-technological framework conditions, new multi-actor governance and investment analyses

Minimum 3 Airports or 3 Ports per project (1 lead, 2 associated)

Major projects spanning 4–5 years

Innovation action project type (IA)

Examples of the draft topic texts

The European Green Deal Call

Green airports and ports as hubs for sustainable and smart mobility

Separate ranking lists for AIRPORTS and PORTS

Green airports:

- **Transport**
  - low-emission energy use for aircrafts, airports, road vehicles, public transport and carpooling
  - use of green de-icing and anti-icing;
  - innovative digital solutions, MaaS
  - infrastructure for small and medium airports
  - sustainable alt.fuels production facilities on-site
  - EU Clearing House for Sust.Kerosene (EU-CHSK)
- **Terminal**
  - green and smart logistics and infrastructures;
  - green built environment (construction / demolition) and procurement processes;
  - energy efficiency of buildings
  - Biodiversity, green land planning
- **Energy**
- **Cross-cutting aspects**

Green ports:

Perform large-scale, real-life high TRL demonstrations of green maritime and inland ports, addressing all of the following aspects:

- low-emission energy supply and production at ports and on-shore supply systems
- Demonstrate seamless and highly efficient logistics operations, for integrated port-hinterland connections
- Perform pilot activities of digitalisation in ports, particularly with connected and automated vehicles and cranes, port systems
- waste recovery, use / recovery of fatal energy produced by industrial players
- Reinforce biodiversity issues
- Deliver a Master Plan for the future Green Port

***Disclaimer**: these slides provide only preliminary information. They do not present a draft of the Green Deal call to be part of the Horizon 2020 work programme update, nor any future position of the European Commission.*

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Green airports and ports as hubs for sustainable and smart mobility

Main features:

Sustainable

- Green energy production, distribution, supply
- Use of clean energy for transport and other purposes
- Green hydrogen, electricity, biofuels, ammonia, sustainable alt. fuels

Smart

- Connected and automated vehicles, cranes, etc.
- Dynamic traffic optimisation into/out of airport/port, from/to city
- Smart operations, logistics, inter-modal connections/modal shifts

Multimodal

- Aviation, Maritime, Inland Waterway Transport
- Road, Rail, multimodal connections/modal shifts
- System-wide door-to-door multimodal mobility for passengers/freight

Other

- Green logistics, infrastructures, energy-efficient buildings
- Links with cities, urban environment, urban mobility
- Biodiversity, circular economy, effective land/sea/river use

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Green airports and ports as hubs for sustainable and smart mobility

Topic modalities:

Action type	Innovation Action (IA)
Project duration	4-5 years
Consortia	Minimum 3 Airports or 3 Ports per project (1 lead, 2 associated)
Call model	Single-stage
Evaluation	Separate ranking lists for Green Airports and Green Ports

AREA 6. Farm to Fork

Topic 6.1.

Testing and demonstrating systemic innovations for sustainable food from farm to fork (IA)

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Farm-to-Fork

6.1 (New title:) "*Testing and demonstrating systemic innovations for sustainable food from farm to fork*."

An **Innovation Action (IA)**, that calls for projects to test, pilot and demonstrate innovative systemic solutions to **5 pressing food systems' challenges**:

1. Achieving **climate neutral farms** (on land, water and sea) by reducing GHG emissions and by increasing farm-based carbon sequestration and storage;
2. Achieving **climate neutral food businesses** by mitigating climate change, reducing energy use and increasing energy efficiency in processing, distribution, conservation and preparation of food;
3. **Reducing the dependence on contentious pesticides and antibiotics**; **reducing the use and increasing the efficiency of fertilisers**; reducing the losses of nutrients from fertilisers, towards zero pollution;
4. **Reducing food losses and waste**, while **avoiding unsustainable packaging;**
5. **Shifting to sustainable healthy diets , sourced from land, water and sea, and accessible to all EU citizens**, including the most deprived and vulnerable groups.

Projects will:

1) maximise synergies and minimise trade-offs between the three dimensions of sustainability (social/health, climate/environmental and economic) & respect planetary boundaries.

2) address one of the 4 challenges & integrate the following elements:

- Systemic approach at the basis of a plan to tackle the challenge: from identifying drivers and root causes of systemic challenge to assessing impact of solutions
- Multi-actor approach, engaging partners to co-create, test and demonstrate solutions
- Most appropriate mix of innovations: technologies, business models, governance models, and social innovations, taking into account the place-based context
- An action plan for communication and engagement, in and beyond the

Farm-to-Fork – Key Inputs retained

- Reference to safe & just operating space;
- link to sustainable circular bioeconomy;
- animal welfare;
- agro-ecology;
- Inclusion of sustainable food from the oceans and aquaculture; protein sources other than meat;
- Link to health; definition “sustainable healthy diet”;
- packaging; digital technologies;
- Engagement with SMEs, citizens, consumers;
- social inequalities; affordability;
- population & demand growth; understanding behavior;
- The terms ‘place-based’ and ‘harmful nutrients’ were replaced

AREA 7. Ecosystem and bioversity

Topic 7.1.

Restoring biodiversity and ecosystem services (RIA)

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7.1. Restoring biodiversity and ecosystem services

General observations

- This call comes exactly at the right moment – it delivers to the EU Biodiversity Strategy for 2030 which has been adopted 20/05/20. It asks for a new EU Restoration plan, and to double up transformative change.
- The co-creation process across different sectors - climate change, biodiversity, marine, agriculture and forestry - worked extraordinarily well
- This call is on grasping opportunities for testing upscaling restoration techniques. It is not on identifying or closing knowledge gaps, modelling, understanding ecological processes, nor on pure nature protection, or developing methodologies for monitoring for restoration. All this is covered in earlier Horizon 2020 projects or in HE, including the biodiversity partnership.
- The call requires to demonstrate on how upscaling and replicating restoration can be deployed (i) under the existing governance systems, and (ii) which transformational change in governance and policy making is necessary to implement them

Restoring biodiversity and ecosystem services

Accelerating transformative change through upscaling restoration of ecosystems at sea and on land

Targeted Impacts:

- Tested up-scaling of large-scale and urgent restoration actions on the ground, to prepare resilient ecosystems and their services at sea and on land
- Restoration actions are implemented which will enhance natural carbon sinks and reduce the effects of emissions, locally reverse biodiversity decline and improve the delivery of a range of ecosystem services (in the short- to long-term)
- Nature-based solutions are adapted, integrated and demonstrated in governance, financing, public procurement, economic development, infrastructure and regional strategic landscapes
- Demonstration of how restoration activities enable sustainable, climate-smart, inclusive, transformative approaches
- Value created for communities affected by transformative change through the restoration of their degraded terrestrial and marine environment
- Showcase how massive restoration can help enabling transformative change including of social and behavioural factors, which will be beneficial for biodiversity

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Restoring biodiversity and ecosystem services

Proposed activities:

- Restore degraded ecosystems at sea and on land at large scale
- Test innovative methods for upscaling restoration
- Replicate deployment of restoration towards resilient ecosystems and their services at regional, national and cross-border levels
- Address barriers to the implementation of nature-based solutions
- Showcase in practice how to maximize synergies and avoid trade-offs between priorities for restoring biodiversity, mitigating and adapting to climate change
- Support the development of specific demand and supply chains in restoring ecosystems
- Work for communities in transition affected by transformative change through the restoration of their degraded terrestrial and marine environment
- Developing answers on how to frame transformational change, which supports a just transition by investing in nature, to explicitly help vulnerable regions and communities to improve their resilience when rapid changes in climate and environment, economies and social conditions occur.
- Generate knowledge on how enabling transformative change can be beneficial for biodiversity and climate change, and bring this information into IPBES and IPCC processes

AREA 8. Zero-pollution, toxic free environment

Topic 8.1

Innovative, systemic zero-pollution solutions to protect health, environment and natural resources from persistent and mobile chemicals (RIA)

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Mitigating the effects of persistent and mobile chemicals

The European Green Deal (Zero Pollution Ambition) calls for rapidly addressing the risks posed by very persistent chemicals. This call topic aims at demonstrating innovative solutions to protect health, environment and natural resources from persistent and mobile chemicals, such as PFAS

Targeted Impacts

- Better understanding of an emerging and persistent pollution problem of human and environmental health relevance
- Better (bio)remediation and detection technologies, including real time monitoring approaches
- Support the aims of the new Circular Economy Action Plan calling for methodologies to minimise the presence of substances that pose problems to health or the environment in recycled materials
- Improved risk assessment to facilitate optimal risk management
- Harmonisation of hazard and exposure data and databases
- Data of regulatory relevance accessible to policy makers and for risk communication

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Proposed activities

- Development of innovative, cost-effective (bio)remediation technologies of contaminated soil and water for persistent and mobile substances;
- Development of new cost-effective, high-resolution methods to measure and separate persistent and mobile chemicals in different media;
- Environmental and human (bio)monitoring of persistent and mobile chemicals;
- Gathering of toxicity and toxico-kinetic information to allow characterising all risks to human health, including on the immune system, arising from the exposure to the entire group of these substances;
- Development of best practices for the management of waste containing persistent and mobile substances

Topic 8.2

Towards better regulation of chemical and pharmaceutical mixtures: from science to evidence-informed policies (RIA)

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Towards innovative regulation of chemical and pharmaceutical mixtures

The new Chemicals Strategy for Sustainability, proposed under the EGD, calls for the regulatory framework to rapidly act on the risks (underestimated) posed by combination effects of different chemicals to better protect both citizens and the environment against hazardous substances. This call topic aims at demonstration studies to show how innovative solutions can be applied in risk assessment to identify, prevent and manage harmful co-exposures to industrial chemicals and pharmaceuticals.

Targeted Impacts:

- Identification of most commonly encountered mixtures, their impacts on different parts of the ecosystem and human health, and implementation of solutions to reduce the most critical exposures;
- More targeted and innovative risk assessment of mixtures of chemicals and pharmaceuticals to better assess their presence in drinking water, soil, food and feed.

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Towards innovative regulation of chemical and pharmaceutical mixtures

Proposed activities:

- Demonstration of innovative solutions to quantify and prevent the most harmful co-exposures to industrial chemicals and pharmaceuticals.
- Advanced solutions for the establishment of causality between co-exposures and effects
- Development of targeted and non-targeted high-throughput technologies for screening, and advanced bioinformatics approaches, such as artificial intelligence and other data mining methodologies, to identify the most representative real-life mixture scenarios in humans
- Identification of lead components in mixtures, responsible for the impact on human health and the ecosystems

AREA 9: Strengthening our knowledge in support of the EGD

- NCP Suvi Broholm (SA): **Topic 9.1. European Research Infrastructures capacities and services to address European Green Deal challenges (RIA);**

- NCP Heini Günther (BF): **Topic 9.2. Developing end-user products and services for all stakeholders and citizens supporting climate adaptation and mitigation (RIA/IA);**

- NCP Jaana Lehtimäki (SA): **Topic 9.3. A Transparent & Accessible Ocean: Towards a Digital Twin of the Ocean (IA)**

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9.1 European Research Infrastructures capacities and services to address European Green Deal challenges

Mobilisation and advancement of world-class capacities and resources such as those offered by European Research Infrastructures (RIs) for **energy storage** and **climate/environment observation**.

Scope: Proposals will address one of the following sub-topics:

(a) Support EU leadership in clean energy storage technologies

- Enabling breakthrough research and innovation in **energy storage** across the whole value chain and with a life-cycle approach.
- Anchoring European RIs in an efficient and competitive **research and industrial ecosystem** for energy storage.

(b) European RIs and monitoring networks for GHSs observing (b1), air quality and citizens' health (b2) in cities

- **Strengthening** the observation and monitoring of **GHG emissions, ultrafine particles** and **air quality**, in particular in and around urban areas.
- One of the two objectives b1) or b2) should be addressed. All proposals should propose a roadmap for upscaling.

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9.1 European Research Infrastructures capacities and services to address European Green Deal challenges

Proposed activities:

The activities will focus on:

- transnational and virtual **access** to advanced R&I infrastructures, including users' training and scientific and technical support and data analysis to accelerate the transition toward a decarbonised energy/transport EU system
- provision of **integrated** and **customised services** and **innovative solutions** for the observation and monitoring of GHG emissions, ultrafine particles and air quality, in particular in and around urban areas: interoperable data, tools/equipment and models for the scientific community and public authorities/decision makers
- development of **synergies** between research infrastructures and relevant local, European and global initiatives in different disciplinary areas, including health and social sciences

Topic 9.2

Developing end-user products and services for all stakeholders and citizens supporting climate adaptation and mitigation (RIA/IA)

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Developing end-user products and services for all stakeholders and citizens, supporting climate adaptation and mitigation

Provide more detailed information in space and time, relevant to real-world decision-makers to identify which modes of production, consumption and lifestyle are compatible with climate **resilience and pathways** achieving climate neutrality by 2050.

Targeted Impacts:

- Improved delivery of climate service delivery in the last mile of the value chain, across the priority sectors of the European Green Deal
- Increased accessibility of information on climate effects to citizens
- Improved quality of data and information on climate adaptation and mitigation
- Well characterised social and behavioural factors necessary for the climate transition
- Improved climate adaptation and mitigation solutions enabling overcoming societal and economic barriers
- Better informed citizens and stakeholders on options for climate action in their own communities, regions and sectors
- More opportunity for stakeholders to test adaptation/mitigation solutions on the ground.

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Developing end-user products and services for all stakeholders and citizens, supporting climate adaptation and mitigation

Proposed activities:

- **Advancing climate science and models, and downscaling their findings to improve their user relevance**
- Delivering the next-generation of climate services for end users (building on GEOSS and Copernicus services, in collaboration with ESA).
- Testing these services on demonstrations sites with the provision of guidance services.
- Making the above findings accessible to the public, going beyond existing tools in both scientific robustness and user relevance.
- Synthesising this knowledge by bridging the gap between the expert tools already generated by European science, and the stakeholders who are making decisions today that will both affect and be affected by climate change and its impacts.
- Converting the mitigation pathways that are compatible with our climate goals into clear information on how production, consumption, infrastructure and lifestyle need to change.

9.3. A Transparent & Accessible Ocean: Towards a Digital Twin of the Ocean (IA)

Development of an integrated digital ocean through interoperable twins:

- building on existing EU assets (eg Copernicus, EMODNET, ERICs or the Blue Cloud)
- addressing concrete cases in local or regional sea basins
- demonstrating their usefulness with regard to several of the Green Deal priorities

An Innovation Action (IA), that calls for projects to test, pilot and demonstrate innovative systemic solutions to **address the need to:**

- integrate a wide range of data sources,
- transform data into knowledge
- connect, engage, and empower citizens, governments and industries
- provide capacity for informed decision-making

→ empower a shared responsibility to monitor, preserve and enhance marine habitats, and support a sustainable blue economy

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A Transparent & Accessible Ocean: Towards a Digital Twin of the Ocean

Expected Impacts

- Increased capacity to observe coastal and marine waters, the sharing, availability, visualisation and use of data;
- reinforce conservation and ecosystem-based management of marine habitats/green infrastructure, planning of marine areas, and safeguard productivity and biodiversity of marine ecosystems
- increase citizen engagement;
- encourage and enable the infusion of ‘non-scientific data streams’ from a community composed of users of the sea, including private companies, public authorities, social innovators, researchers, citizens and policy makers;
- allow for knowledge-based decision-making, reduce risk and increase efficiency of coastal and marine economic activities and implementation of legal requirements (MSFD, Water Directive, etc…)
- encourage industry to look for business opportunities in ocean data and related services.

AREA 10: Empowering Citizens for the Transitions towards a Climate Neutral, Sustainable Europe

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10.1. European Capacities for Citizen Deliberation and Participation for the Green Deal (RIA)

Targeted Impacts:

- Feeling of ownership and engagement through citizen deliberation and participation across Europe
- Enhanced **involvement of citizens** in the implementation of the European Green Deal and of the future Horizon Europe missions.
- Stronger **trust in policy and science institutions** among citizens on Green Deal issues.
- Long-term commitment and buy-in from a broad spectre of social groups across Europe to support the Green Deal targets in the long term and to engage **in co-creation and co-implementation of transition pathways.**

Proposed activities:

- Establish transnational networks of experts, researchers and practitioners **specialized in deliberative democracy and civic participation**
- **Implement deliberation processes** and **behavioural research** on priority issues to deliver on the Green Deal
- Ensure balanced overall coverage of EU and associated countries, associating national/local governments and administrations
- Establish independent boards of guarantors to ensure scientific soundness, ethical and unbiased character of these activities.

10.2. Behavioural, Social and Cultural Change for the Green Deal (RIA)

Targeted Impacts:

- New knowledge and networks…
- New strategies to induce **behaviour change** and long-term commitment, trust and buy-in from people, communities and organisations.
- **Recommendations and incentives** that **consider differences** between EU regions and social groups
- Bottom-up approaches to manage, inter alia, the uncertainty derived from climate change.
- **Greater societal resilience** against climate change and environmental crises
- Behaviour **change at both individual and collective levels**

Proposed activities:

- Establish transnational networks **on behavioural, social and cultural change.**
- **Analyse social and behavioural change** processes, share good practice, tools and resources and implement behavioural experimentation on priority issues to deliver on the Green Deal
- Experimentations should also build on the **bottom-up initiatives** stemming from groups of citizens, notably from the younger generation, as well as from various communities and organisations
- Address feedback-loops between behaviour change and evolutions of the broader context.

10.3. Enabling Citizens to Act on Climate Change and Environmental Protection through Education, Citizen Science, Observation Initiatives, and Civic involvement (RIA/IA)

Area 1: Enabling citizens to act on climate change and for sustainable development through …**education (RIA)**

- European **competence framework** within the context of lifelong learning;
- ..Specific **educational programmes** curricula, trainings, networking activities and exchange of good practices;
- **Implementations of the FW** by schools, universities, municipalities etc.
- Intergenerational dialogue
- Concrete **demonstration sites** (e.g. schools and universities) and **innovation activities** (incubators for citizen…).

Area 2: …better monitoring and observing of the environment

- Active **collection of environmental and socio-economic data** through individual new or improved devices;
- provision of **personalized information** to citizen and consumers about their environmental impact;
- better **monitoring of the environment**:
- **Behavioral change** processes on the part of citizens and consumers towards more sustainable patterns…

AREA 11. International cooperation

Topic 11.1

Accelerating demonstration of clean energy solutions in Africa and the Mediterranian (IA/CSA)

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Accelerating the Partnership for green transition and energy access with Africa

As recognised in the Joint Communication for a Comprehensive Strategy with Africa (adopted on 9/3/2020), innovation is key to enable African countries to pursue sustainable pathways to development through a low-carbon, climate resilient and green growth trajectory, leapfrogging fossil fuel based and inefficient technologies.

Experience has shown that existing innovative solutions and technologies deployed in developed markets need to be adapted, tailored and demonstrated to the multi-faceted context of Africa and local conditions to bring not only economic, but also environmental and social benefits.

Proposed activities

- Demonstration of innovative climate adaptation, climate mitigation and sustainable energy solutions, in the African social, economic and environmental contexts
- Proposals are expected to develop tailored value chain approaches, based on the most suitable manufacturing value chains in the local contexts, including material supply chains, and skills levels. Identification of technical, vocational and educational needs, proposed training and qualification activities, definition of market and business strategies.
- Proposals should include a life cycle analysis, showing the impacts of the proposed solutions on the environment, on climate change targets, and on the social and the economic dimensions, from a cradle to grave viewpoint.

European Commission

Accelerating the Partnership for green transition and energy access with Africa

Targeted impacts

- The short term impact of the proposals will focus on providing the evidence of technological reliability, economic viability, and of the environmental, climate, social and economic impacts of its renewable energy solutions.
- The medium term impact will be in the creation of new markets opportunities for both European and African companies in the African continent and technological uptake, to accelerate the achievements of the targets of the Paris Agreement for both continents, in line with Europe's Green Deal ambition of climate neutrality, and its external dimensions.
- In the long-term, economic growths and job creation, in line with the sustainable development goals 4, 5, 7, 8, 11, 12, 13, in Africa and in the EU are envisaged.
- Overall, the topic is expected to contribute to the strengthening of the joint EU-AU Climate Change and Sustainable Energy Partnership efforts, with emphasis of improving the visibility of EU Science Diplomacy actions in Africa.