Circular Economy Leading Sustainability Transition

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- Director, Cluster on Sustainability Transition
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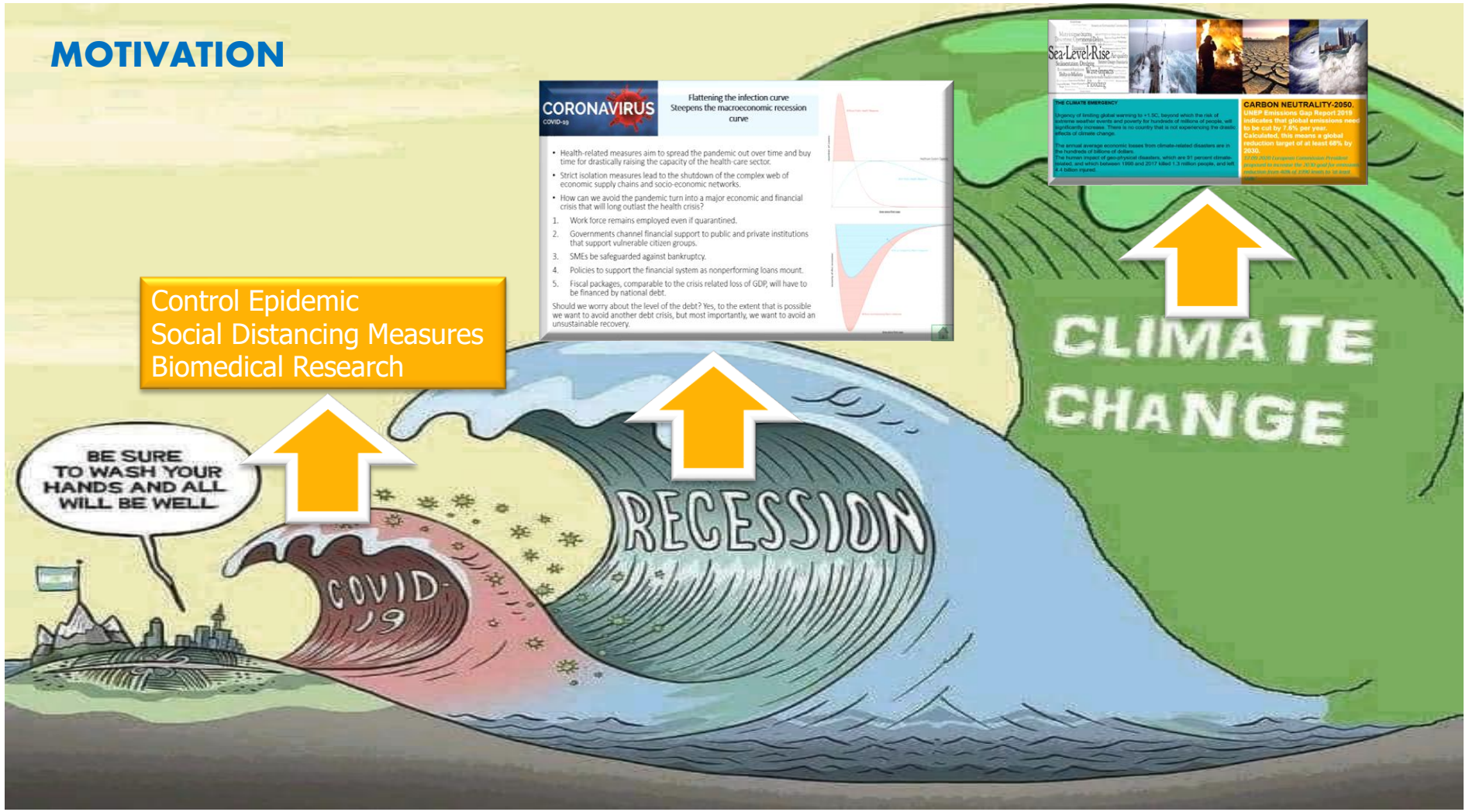
- Director, EIT Climate KIC Hub – Greece, ATHENA RC
- Chair SAB, European Forest Institute
- Member of Greek Prime-Ministerial Committee on Recovery and Development Plan
- Member of the Greek Ministerial Climate Change Committee, Ministry of Environment and Energy

Climate-KIC is supported by the EIT, a body of the European Union

MOTIVATION


CORONAVIRUS
COVID-19
Flattening the infection curve
Steepens the macroeconomic recession curve
Health-related measures aim to spread the pandemic out over time and buy time for drastically raising the capacity of the health-care sector.
Strict isolation measures lead to the shutdown of the complex web of economic supply chains and socio-economic networks.
How can we avoid the pandemic turn into a major economic and financial crisis that will long outlast the health crisis?
1. Work force remains employed even if quarantined.
2. Governments channel financial support to public and private institutions that support vulnerable citizen groups.
3. SMEs be safeguarded against bankruptcy.
4. Policies to support the financial system as nonperforming loans mount.
5. Fiscal packages, comparable to the crisis related loss of GDP, will have to be financed by national debt.
Should we worry about the level of the debt? Yes, to the extent that is possible we want to avoid another debt crisis, but most importantly, we want to avoid an unsustainable recovery.
Sea-Level-Rise
THE CLIMATE EMERGENCY
CARBON NEUTRALITY-2050.
UNEP Emissions Gap Report 2019
indicates that global emissions need to be cut by 7.6% per year.
Calculated, this means a global reduction target of at least 68% by 2030.
Control Epidemic
Social Distancing Measures
Biomedical Research
BE SURE TO WASH YOUR HANDS AND ALL WILL BE WELL
COVID-19
RECESSION
CLIMATE CHANGE

Sustainability Policy Framework

2015

UNITED NATIONS SUSTAINABLE DEVELOPMENT SUMMIT 2015
25-27 SEPTEMBER

193 Countries

17 SDGs

169 Targets

2015

PARIS2015
UN CLIMATE CHANGE CONFERENCE
COP21-CMP11

197 Countries

Limiting global temperature to well below +2°C

2018

ipcc
INTERGOVERNMENTAL PANEL ON climate change

Global Warming of 1.5°C

An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty

- Limiting global temp. to 1.5°c
- This implies zero net emissions globally by 2050

2019

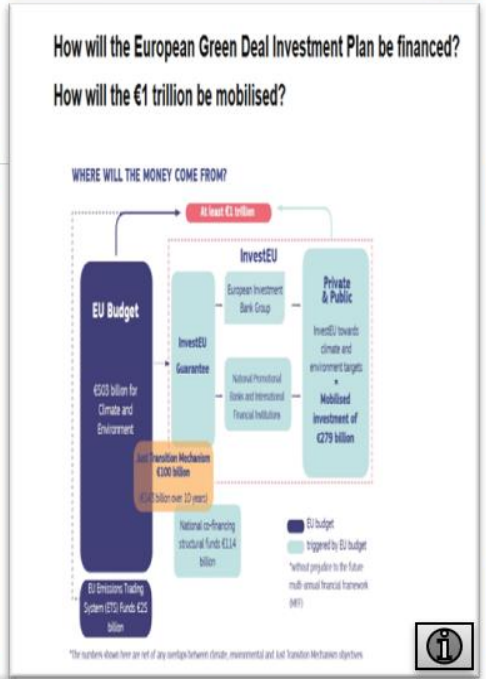
SUSTAINABLE DEVELOPMENT REPORT 2019

TRANSFORMATIONS TO ACHIEVE THE SUSTAINABLE DEVELOPMENT GOALS

6 Major Transformations to achieve SDGs

Dec 2019

EGD Policies Overview



2020 …

CORONAVIRUS
COVID-19

Flattening the infection curve steepens the macroeconomic recession curve

Enhanced EU MFF & Recovery Plan Next Generation EU

Senior WG for the EU Green Deal

Top-Down Mobilization
Green New Deals around the World

Canada
The Pact for a Green New Deal
Proposed on May 2019

USA
Green New Deal
Proposed on March 2019

South Korea
Green New Deal
Agreed on 14 July, 2020
$94.5 billion

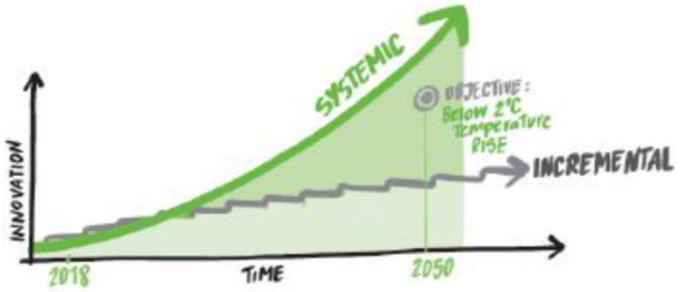
Israel
Green recovery plan
June 2020

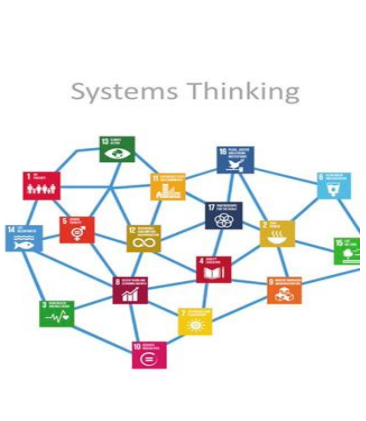
China
Carbon neutral before 2060
Announced on 22 September, 2020

European Green Deal CLIMATE PACT

Systems Innovation Approach: Co-Design Systemic Change with Stakeholders

Integrated & Coordinated Interventions in economic, financial, political and social systems and along whole value chains. In systems, by means of the relations, elements are arranged in such a fashion that gives rise to a **new structure** functioning.





Working through gradual, incremental changes is not enough!

What is needed now is a **fundamental transformation** of economic, social and financial systems that will trigger exponential change in decarbonisation rates and strengthen climate resilience.

IPCC report: “**rapid, far- reaching and unprecedented changes in all aspects of society**”.

CIRCULAR ECONOMIC
A MAJOR DRIVER FOR SUSTAINABILITY TRANSITION

Although we will never reach 100% circularity, CE is transformative
Scope to address structural waste in current systems

Circular Economy sets a direction for travel!

OUTLINE OF A CIRCULAR ECONOMY

PRINCIPLE

1

Preserve and enhance natural capital by controlling finite stocks and balancing renewable resource flows
ReSOLVE levers: regenerate, virtualise, exchange

PRINCIPLE

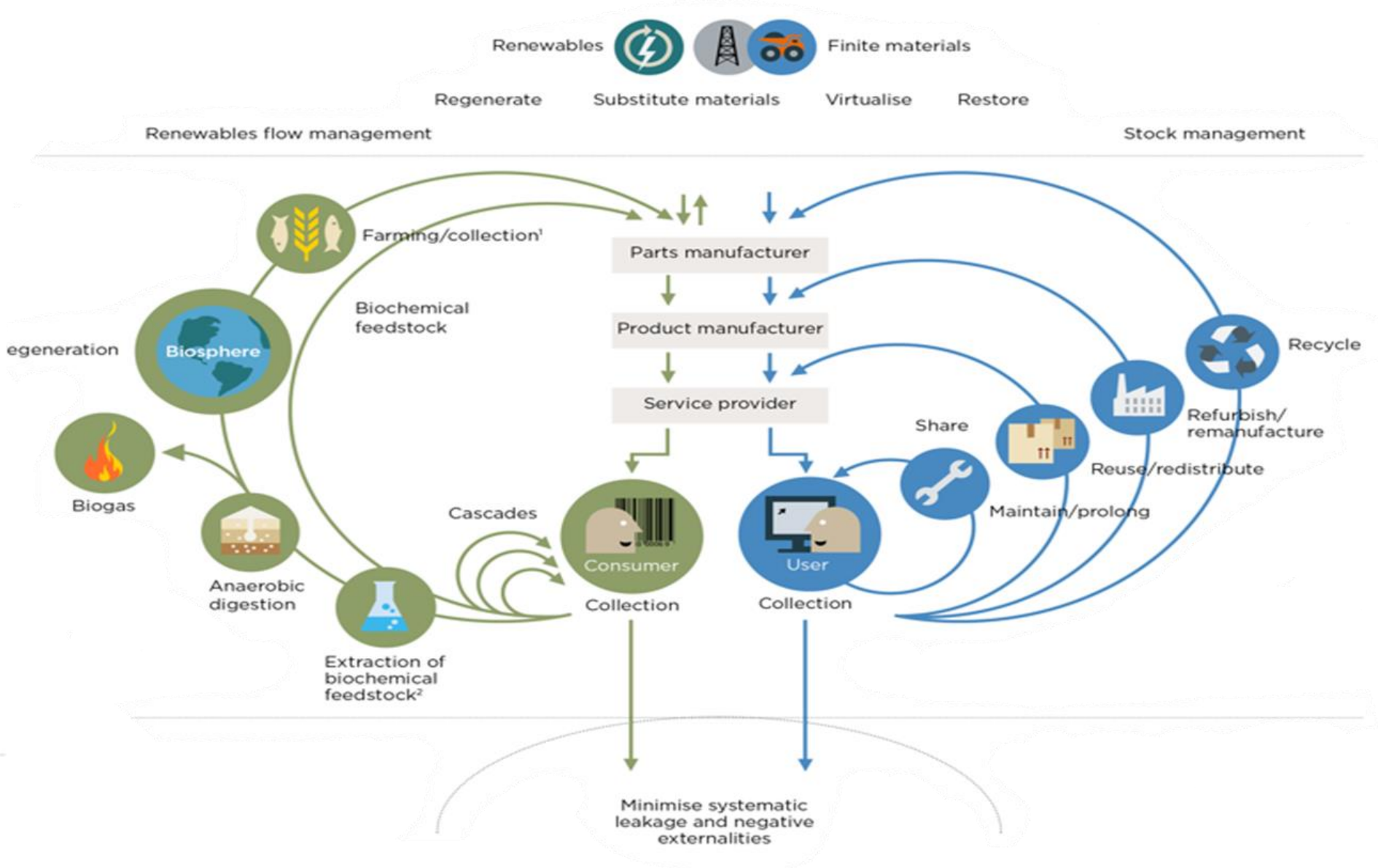
2

Optimise resource yields by circulating products, components and materials in use at the highest utility at all times in both technical and biological cycles
ReSOLVE levers: regenerate, share, optimise, loop

PRINCIPLE

3

Foster system effectiveness by revealing and designing out negative externalities
All ReSOLVE levers

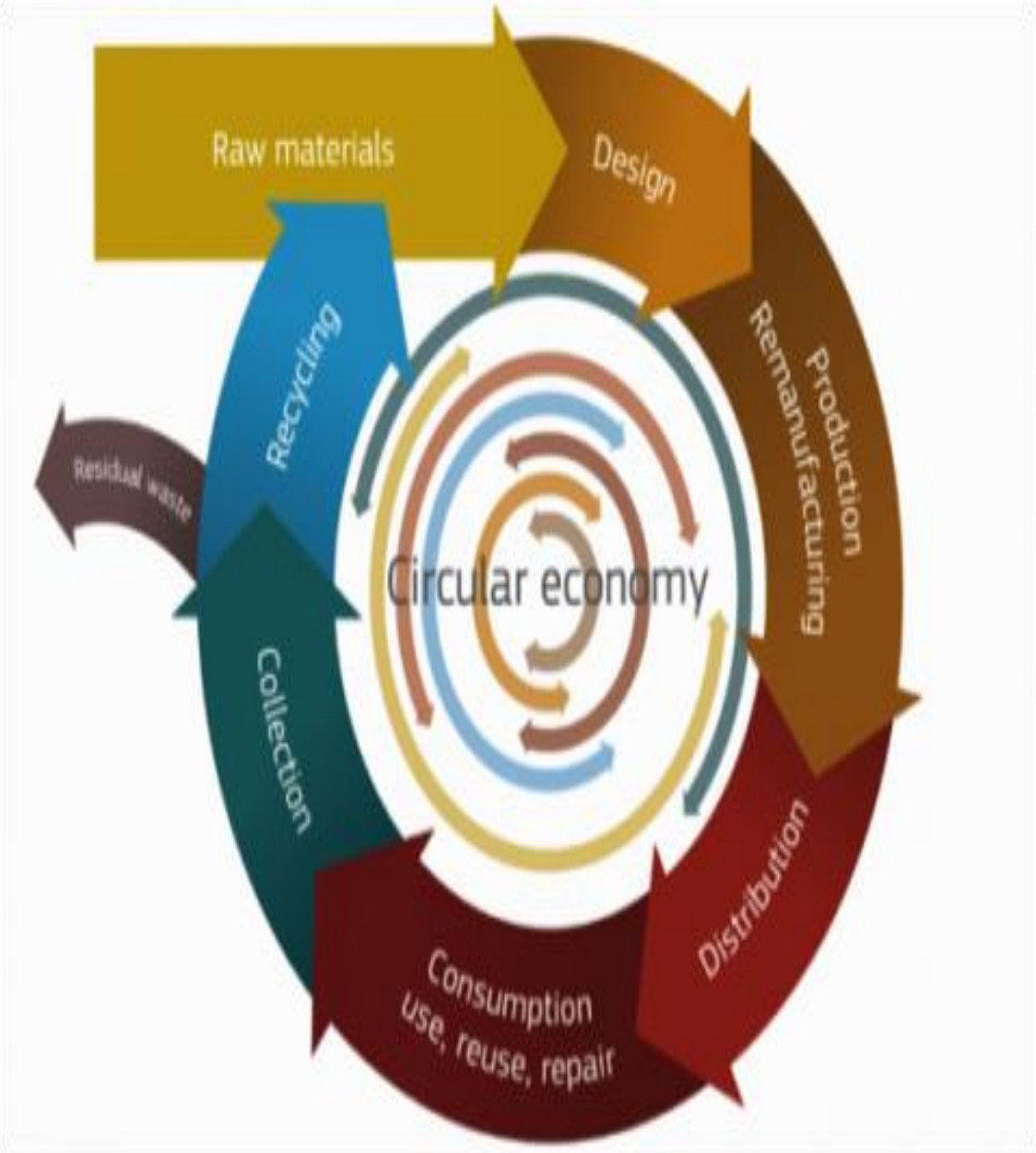


How Can Circular Economy Contribute to CC

Design out waste and pollution
to reduce GHG emissions
across the value chain

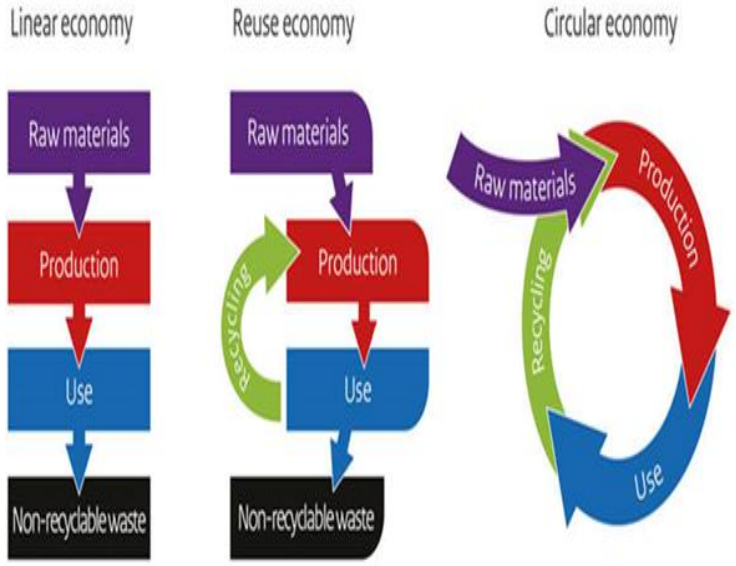
Keep products and materials in use
to retain the embodied energy
in products and materials

Regenerate natural systems
to sequester carbon
in soil and products



CIRCULAR ECONOMY

- Savings of 600 billion euro for EU Business, 8% of their annual turnover, Relevant for SMEs
- Creation of 580,000 jobs in innovative design and business models, research, recycling, re-manufacturing and product development
- Reduction of EU carbon emissions by 450 million tones by 2030
- Reducing Environmental Footprint: Optimize waste management will boost recycling and reduce landfill
- Public-Private Partnerships best model for financing the transition to CE.



Circular economy: based on principles of designing out waste and pollution, keeping products and materials in use, and regenerating natural systems.

By 2050 CE:
56% cut in EU emissions from heavy industry
45% cut global emissions from steel, cement, plastic and aluminum products.

THE ECONOMIC **BENEFITS**

What are the macroeconomic impacts of shifting to a new economic model?

The circular economy has been gaining traction with business and government leaders alike. Their imagination is captured by the opportunity to gradually decouple economic growth from virgin resource inputs, encourage innovation, increase growth, and create more robust employment. If we transition to a circular economy, the impact will be felt across society. The slider below illustrates some of the potential macroeconomic benefits of shifting to a circular economy.

THE OPPORTUNITY FOR **COMPANIES**

How will companies benefit from the circular economy?

Businesses would benefit significantly by shifting their operations in line with the principles of the circular economy. These benefits include the creation of new profit opportunities, reduced costs due to lower virgin-material requirements, and stronger relationships with customers. The sliders below expand on these and more benefits.

THE OPPORTUNITY FOR **INDIVIDUALS**

What does the circular economy mean for individuals?

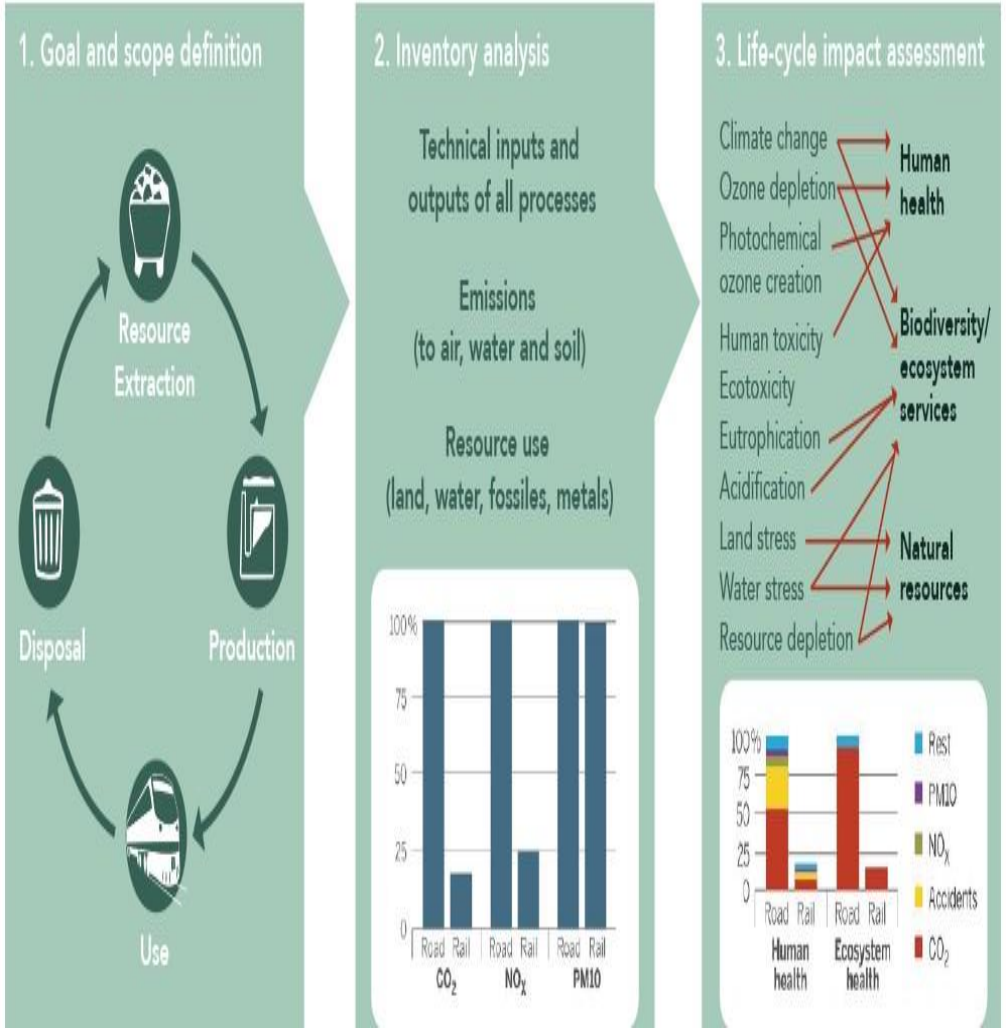
The circular economy will not only benefit businesses, the environment, and the economy at large, but also the individual. Ranging from increased disposable income to improved living conditions and associated health impacts, the benefits for individuals of a system based on the principles of circularity are significant.

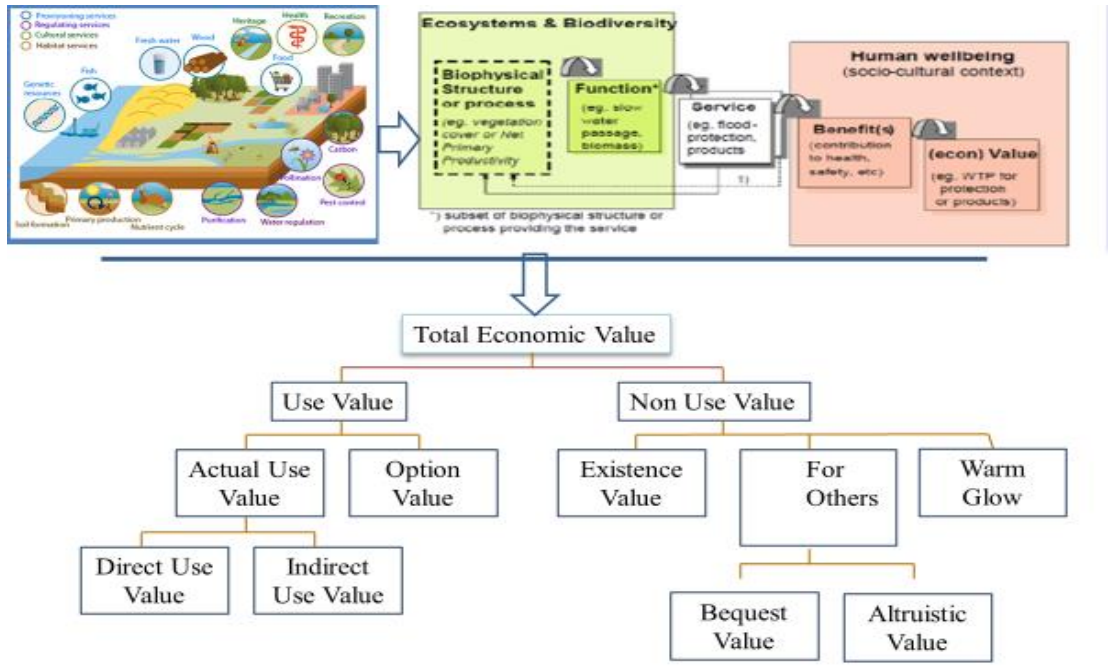
ENVIRONMENTAL AND SYSTEM-WIDE **BENEFITS**

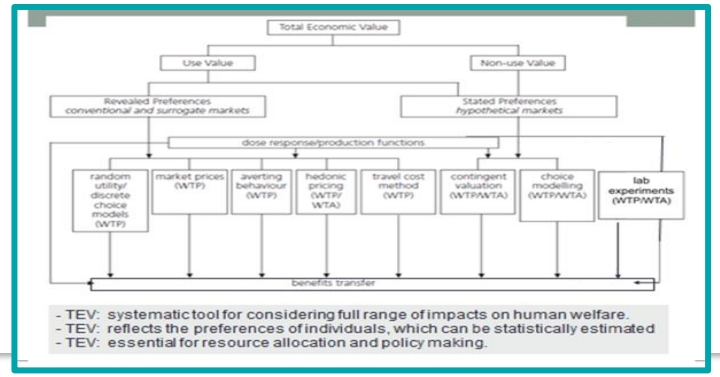
What impact will shifting to a circular economy have on the environment?

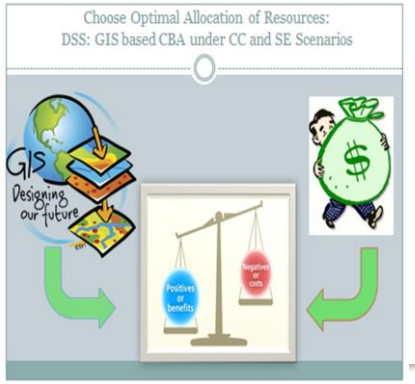
The potential benefits of shifting to a circular economy extend beyond the economy and into the natural environment. By designing out waste and pollution, keeping products and materials in use, and regenerating, rather than degrading, natural systems, the circular economy can be the mechanism by which we achieve global climate targets.

Measuring Socio-Economic Benefits of CE
Life Cycle Analysis (LCA) and Total Economic Valuation









The European Commission has adopted a new Circular Economy Action Plan - one of the main blocks of the European Green Deal, Europe's new agenda for sustainable growth.

The new Action Plan announces initiatives along the entire life cycle of products, targeting for example their design, promoting circular economy processes, fostering sustainable consumption, and aiming to ensure that the resources used are kept in the EU economy for as long as possible.

It introduces legislative and non-legislative measures targeting areas where action at the EU level brings real added value.

Actions

The new Circular Economy Action presents measures to:

- Make sustainable products the norm in the EU;
- Empower consumers and public buyers;
- Focus on the sectors that use most resources and where the potential for circularity is high such as: electronics and ICT; batteries and vehicles; packaging; plastics; textiles; construction and buildings; food; water and nutrients;
- Ensure less waste;
- Make circularity work for people, regions and cities,
- Lead global efforts on circular economy.

Climate-KIC is supported by the EIT, a body of the European Union

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SDSN GREECE

Cluster for Sustainability Transition: Transforming Research and Innovation into Climate Action

Director: Professor Phoebe Koundouri

The Cluster on Sustainability Transition (CST)

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ATHENS UNIVERSITY OF ECONOMICS AND BUSINESS

ReSEES, AUEB
https://www.dept.aueb.gr/en/ReSEES

SDSN GREECE

UN SDSN GREECE
http://www.unsdsn.gr/

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EIT Climate-KIC HUB GR
https://www.athena-innovation.gr/en/eit-climate-kic-greece-hub

CLUSTER ON SUSTAINABILITY TRANSITION

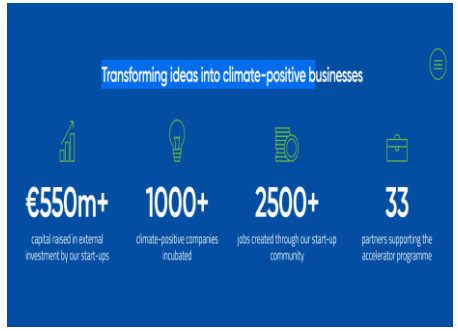
Research - Innovation Acceleration
Deep Demonstration - Education & Training

Research and Innovation Projects
Global Initiatives

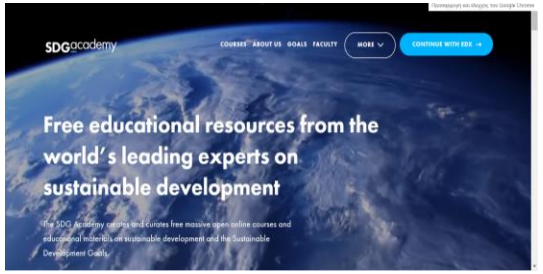
BRIGAID
OpenAIRE
simra Social Innovation in Marginalised Rural Areas
AMAre
COASTAL Collaborative Land-Sea Integration Platform
eit Climate-KIC
SMIRES Science and Management of Intermittent Rivers and Ephemeral Streams
Interreg Balkan-Mediterranean RECONNECT
BlueBRIDGE
MERMAID
GENESIS groundwater and dependent ecosystems
TROPOS
GLOBAQUA
THERMO
DAFNE
H2Ocean
Euro-limpacs
CIGESMED
AquaSTRESS
erc European Research Council Supporting top researchers from anywhere in the world

Smart Water Futures:

Innovation Acceleration
Deep Demonstration



Education & Training
Awareness



MSc in Law and Economics in Energy Markets

ΟΙΚΟΝΟΜΙΚΟ ΠΑΝΕΠΙΣΤΗΜΙΟ ΑΘΗΝΩΝ
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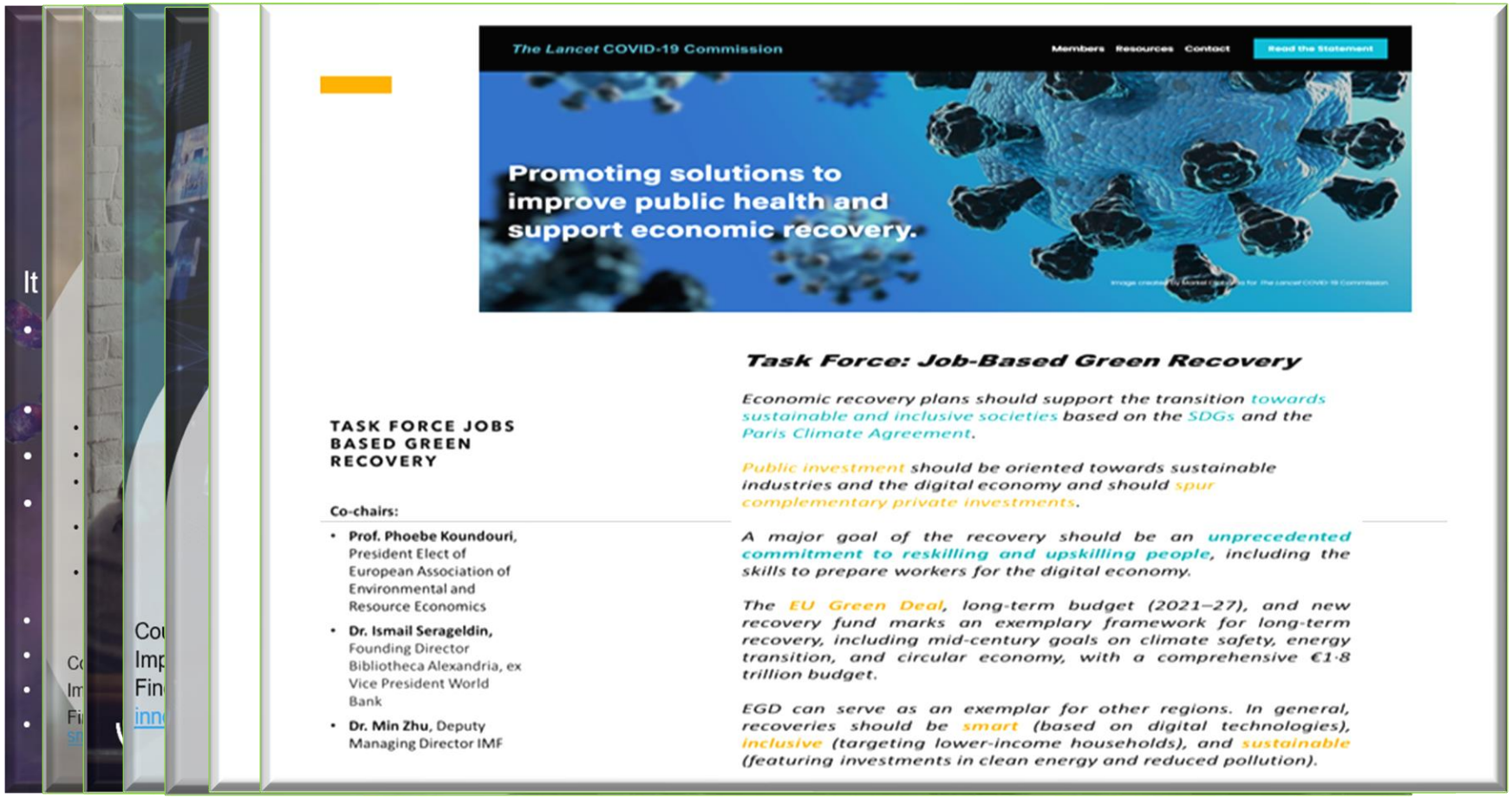
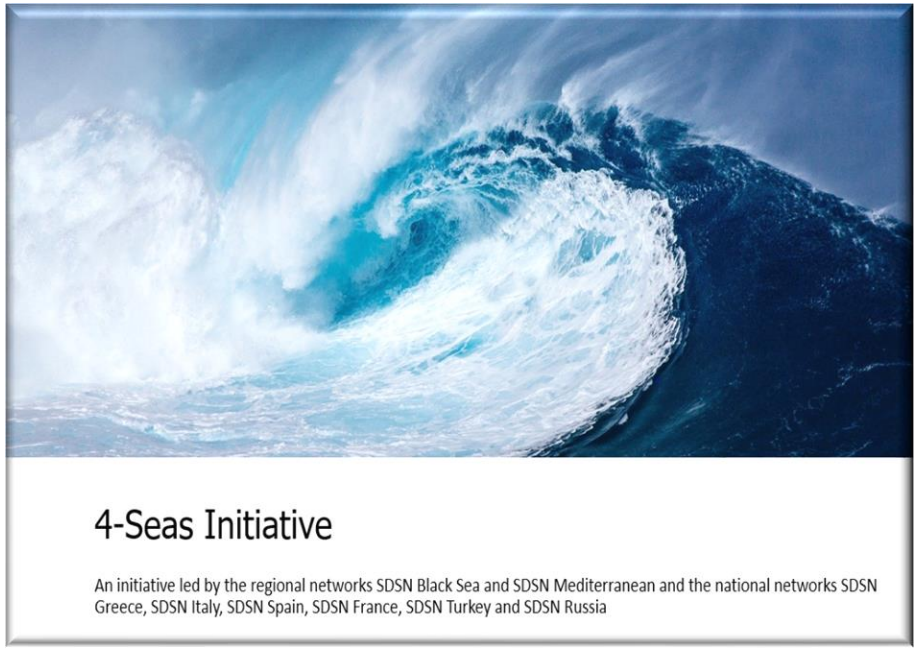
ΚΕΝΤΡΟ ΕΠΙΜΟΡΦΩΣΗΣ ΚΑΙ ΔΙΑ ΒΙΟΥ ΜΑΘΗΣΗΣ

Projects

Circular Economy
Green-Digital-Just Recovery
Climate Change Mitigation and Adaptation





4-Seas Initiative

An initiative led by the regional networks SDSN Black Sea and SDSN Mediterranean and the national networks SDSN Greece, SDSN Italy, SDSN Spain, SDSN France, SDSN Turkey and SDSN Russia

GLOBAL ROUNDTABLE FOR SUSTAINABLE SHIPPING AND PORTS

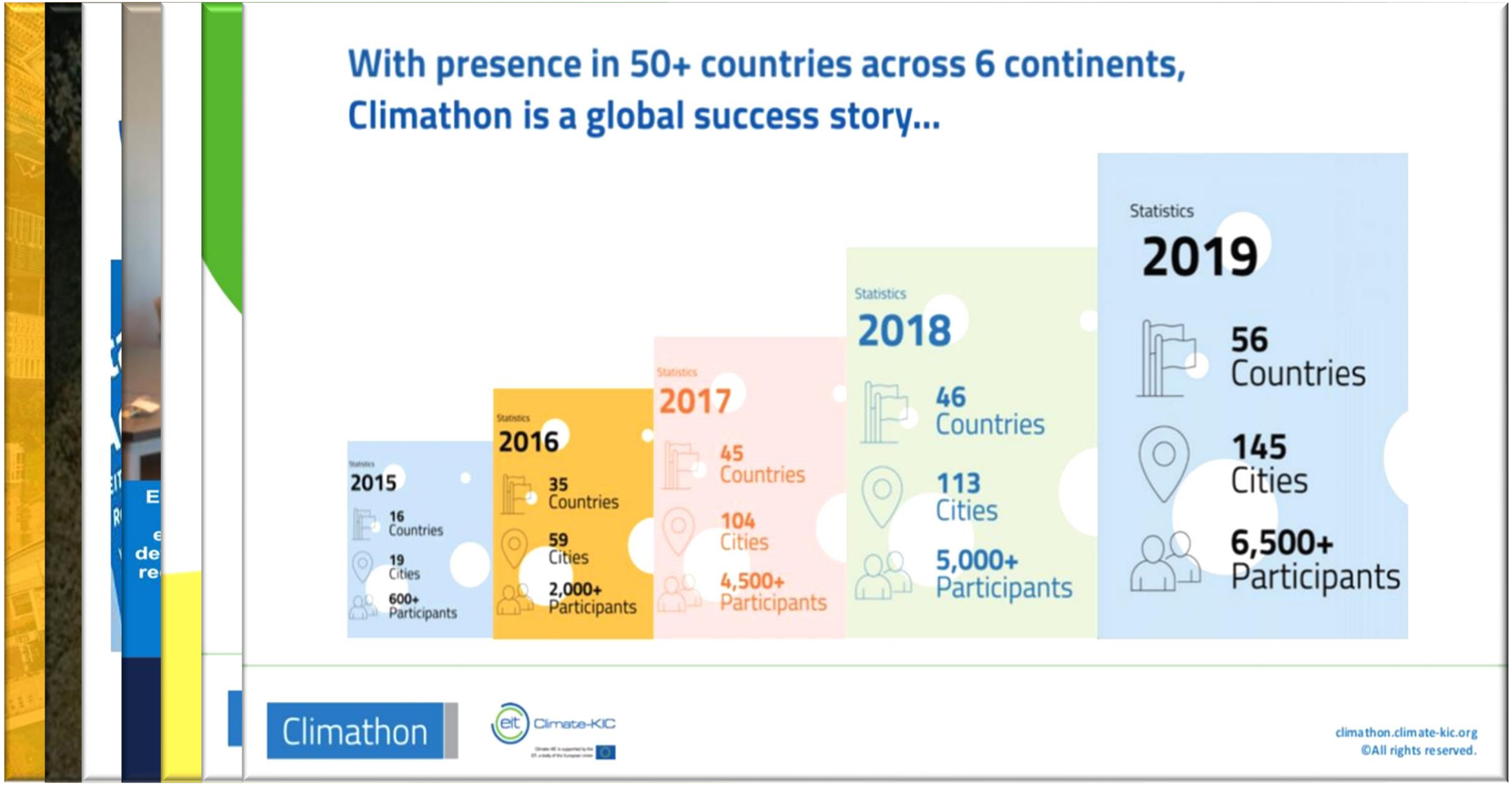
- Aims at bringing together **researchers and technology developers, shipbuilders, shipowners, ports, policy makers and politicians**, from across the globe, to work on technological and policy innovations, related to zero emissions shipping, to target net-zero emissions by 2050.
- Find more at: http://www.unsdsn.gr/global-roundtable-for-sustainable-shipping-2

Projects

Blue Growth

Projects Water-Food-Energy Nexus
Smart Agriculture & Smart Urban Water Systems

EIT Climate KIC **Programs**



EarthFund Global

New international non-profit organization founded by pioneers in renewable energy & sustainability in the US and Greece. Partners with **Global Green** on a 10 Year Climate Mission.

THE MISSION

EMPOWER COUNTRIES TO MEET & EXCEED THEIR NATIONAL CLIMATE, CLEAN ENERGY & SUSTAINABILITY GOALS

HOW DO WE DO IT?

- INNOVATIVE EDUCATION PROGRAMS
- BREAKTHROUGH TECHNOLOGIES
- RELIABLE CAPITAL

3 PILLARS OF CHANGE

- COMMUNITY-FOCUSED HOLISTIC CLIMATE SOLUTIONS
- COOPERATION & PARTNERSHIPS ACROSS ALL SECTORS
- GROUND-BREAKING TECHNOLOGY

earthindex

EarthFund supports emerging technologies such as EarthIndex, the world's first clean energy platform designed to accelerate a country's ability to rapidly scale to 100% clean energy by 2030.

To achieve this, EarthIndex works with world-class technology companies, such as ESRI, and advisors from Google and EIT-Climate-Kic Silicon Valley, to develop a country/state level solution to change the game in clean energy development, starting in Greece and in California.

GLOBAL GREEN

earthfund

www.earthfundglobal.org

earthfund greece

Climate-KIC

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Deep Demonstration on Zero-Net Emissions, Resilient Maritime Hubs

Maria Loloni, Maritime Programme Manager, EIT Climate-KIC

Lydia Papadaki, Manager EIT Climate-KIC Hub Greece

Prof. Phoebe Koundouri, Director EIT Climate-KIC Hub Greece

@ClimateKIC

Our 10-year track record in climate innovation

Climate-KIC is supported by the EIT, a body of the European Union

1600+
climate-positive start-ups incubated

€3.4bn+
climate funding leveraged

595
new products and services

€550m+
total value of funds managed

391+
formal partners, across 33 countries *(including Linked 3rd Parties)*

>€1bn
investment attracted to start-ups

>2,300+
full-time jobs created since 2010

44,000
participants in our education activities

Climate-KIC

Deep Demonstrations

Place-based

Vehicle for fair transformation

Collaborative

Systems innovation service

Addressing problems across levers of change

Rapid-connected experiments

Deep Demonstration for Zero-Net Emissions in the Port of Piraeus

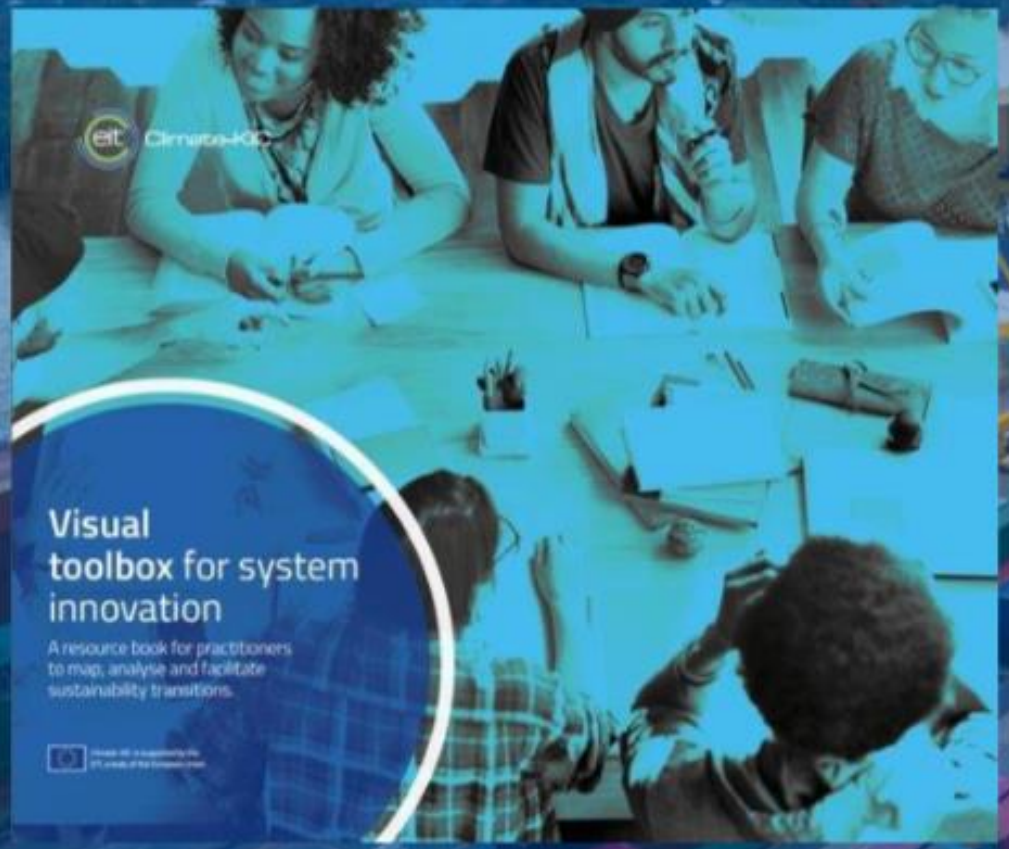
create conditions for the unexpected

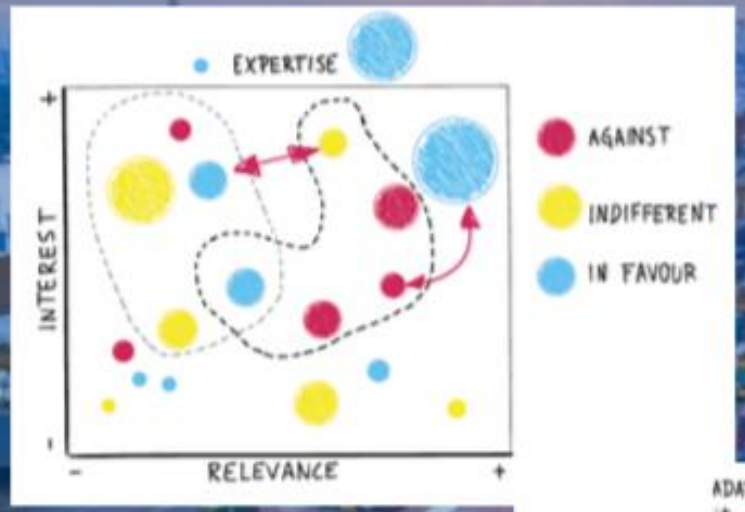
- decarbonization of the Port of Piraeus
  - the second maritime cluster globally
  - and a particular hotspot of waste and shipping industry emissions
- identify **cause and effect relationships**, dependencies and opportunities to look for breakthrough possibilities
- Create **innovation clusters**

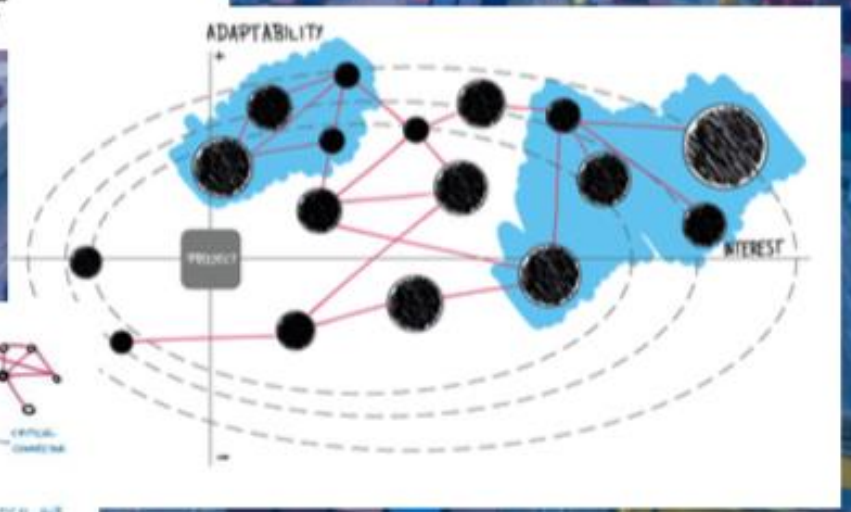
Challenge owners: Piraeus Port Authority, Valencia Port, Ministry of Shipping, Cyprus
Implementation period: 2019-2022
Find more at: https://www.athenarc.gr/el/deep-demonstration-projects-sustainability-transition-european-ports

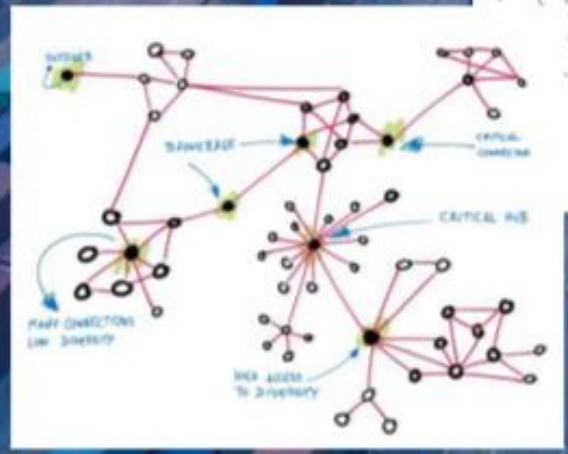
eit Climate-KIC

Who do we Work with? Stakeholder Mapping









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Working Vision Port of Piraeus

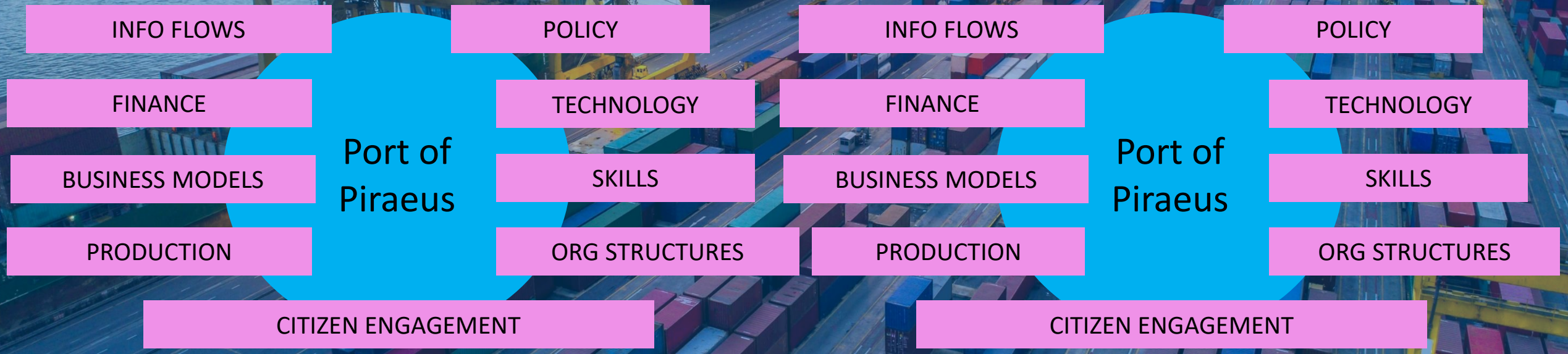
"A green and innovative port, delivering high quality services to the global value chain, driving economic prosperity, maintaining a healthy environment, and enabling thriving communities, through shared aspirations and collective accountability."

Sustainability Transformation

TODAY: 2020

FUTURE: 2050

A green and innovative port, delivering high quality services to the global value chain, driving economic prosperity, maintaining a healthy environment and enabling thriving communities through shared aspirations and collective accountability."



CURRENT STATUS & NEXT STEPS

VISION 2030/2050

PRIORITY AREAS
(eg Energy, Mobility, Waste Management)

Technology

Energy

Mobility

Waste Management (circularity)

Community engagement

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CURRENT STATUS & NEXT STEPS

VISION 2030/2050

PROBLEM SPACES
(eg Community engagement)

PRIORITY AREAS
(eg Energy, Mobility, Waste Management)

Organisational Structure / Information flows

Technology

Policy not aligned, slow

Skills for the new economy are lacking

Citizen & stakeholder engagement poor + cultural distance

Financial System supports economic values (not socia/environmental)

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Circular Economy Transition (CE) in Smart Specialization Strategy (S3)

Hamanova-Rondini, Mariyana, Cleantech Bulgaria Ltd

Alexieva, Dianka, Cleantech Bulgaria Ltd

Ilieva, Desislava, Cleantech Bulgaria Ltd

Papadaki, Lydia, Cleantech Bulgaria Ltd

Shtereva, Eli, Cleantech Bulgaria Ltd

Prof. Phoebe Koundouri, Athens University of Economics and Business

Prof. Lena Tsipouri, National and Kapodistrian University of Athens

Lydia Papadaki, PhD Candidate Athens University of Economics and Business

Maria Argirou, PhD candidate National and Kapodistrian University of Athens

Funded by EIT Climate-KIC
Implementation period: June 2019 – December 2019
Budget: €47,000

Find more at: https://www.athenarc.gr/el/circular-economy-transition-ce-smart-specialization-strategy-s3

SSS is a **regional development tool**, aiming at maximising economies of agglomeration and economies of scope

The CE is a **way of producing and consuming**, a priority for the UN and the EU leading to an encompassing strategy with common elements across the globe

A key question then is **whether**, **to what extent** and **how** the two could become mutually reinforcing

GREECE: CE in S3	Level	Type of Intervention	Description
RIS	National	Action	Increase investment in existing companies to introduce new products and services to the market and to develop and implement modern production methods
RIS	Regional - Attica	Indicative actions	Products and processes for the management and exploitation of trash, residues and waste
RIS	Regional - Central Greece	Action	Modernizing and applying sustainable farming methods
RIS	Regional - Central Macedonia	Action	"Synthesis of artificial marble using recyclable aggregates"
RIS	Regional - Crete	Indicative Implementation Priorities	Utilization of agricultural waste products for the production of high nutritional value feed
RIS	Regional - Eastern Macedonia & Thrace	Priority of Intervention	Utilizing alternative uses of primary by-products, including their use as an energy resource.
RIS	Regional - North Aegean	Project	3 pilot projects for the management of organic plant materials and waste for compost and / or pellet production
RIS	Regional - Eastern Macedonia & Thrace	INTEGRASTE	Utilizing alternative uses of primary by-products, including their use as an energy resource.

Whether, to what extent and how the two can become mutually reinforcing: lessons from Greece

Problems

1. The 2014-2020 O.P. was too ambitious to be implemented
2. RISs could not (yet) play the ambitious role they were expected to play
3. Governance issues indicate reluctance to change

Opportunities

1. CE could be used as an opportunity to leapfrog for the economy
2. SSS can include CE aspects tailor-made to their competitive advantages
3. Identify and support regions willing to use their revised RIS as a CE model


eit Climate-KIC
Circular Learning Hub
Climate-KIC is supported by the
EIT, a body of the European Union

Circular Learning Hub

A learning hub for the engagement and ecosystem transition towards circular thinking

Countries: Italy, Greece, Bulgaria
Implementation period: 2019-2020
Budget: € 331,186
Find more at: https://www.athenarc.gr/el/circular-learning-hub-cl-hub-learning-hub-engagement-and-ecosystem-transition-towards-circular

Virtual reality experiment

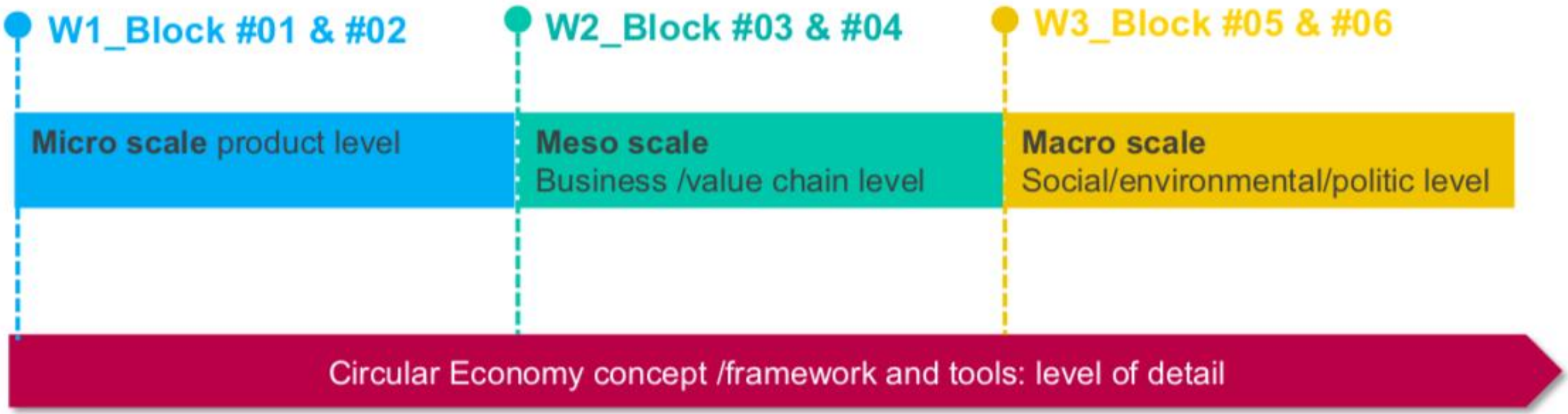
- an **awareness-intention-action path** of intervention
- fostering problem-owners in the ecosystem (firms, investors, citizens, policy makers, regulators, universities, associations, etc.) to a deeper understanding and involvement in the **circular thinking.**
- testing on a defined group of investors and entrepreneurs a **multi-sensor and multi-virtual experiment**

Climate-KIC

Experiment phase in Greece

We are testing on a defined group of investors and entrepreneurs some de-biasing videos specifically designed to overcome the hyperbolic discount bias on one of the priorities for the contrast to the climate change, which is the implementation of circular thinking in the industry production to reduce waste and gas emissions coming from the materials' processes and the re-orientation of capitals towards circular models.

Outline of CE local training:



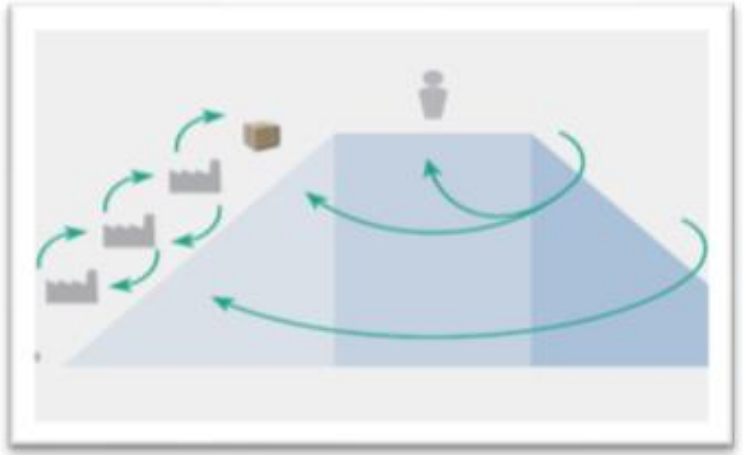
Identify problems/key factors and find solution for CE transition

How to identify worthwhile **CE approaches**

day 1

goal

Map resource flows and Identify structural waste using a fictional case



tools

- Value Hill
- Structural waste
- Circularity compass

Guest speaker

Bill Stenos, CEO and Founder, Solmeya

day 2

How to develop worthwhile CE approaches into **realistic action plans**

goal

Ecodesign strategies, stakeholder, risk factors and opportunities. Start working on a business model

tools

- Circularity grid
- SWOT Analyisis
- Circularity strategy scanner
- Circular business model

Guest Speaker

COMING SOON!

How to make worthwhile CE approaches a **success**

Day 3

Goal

Systemic factors are integrated in the BM. Scenarios in a larger timescale. Preparing for experimentation.

tools

- Pestle
- Backcasting
- Cynefin framework
- Lean startup cycle

Guest Speaker