

Innovation for Sustainability Transition: A Challenge and an Opportunity for Greece

UN SDSN and EIT Climate KIC Greece

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Greece: Where can Economic Growth Come from?

National Account Identity

$$Y = C + I + G + X - M$$

PRIVATE
INVESTMENT
Greece's only
hope!

What Kind of
Investments
do we need?

Consumption is Anemic

1. Unemployment
2. Low Disposable Income: high taxation, direct & Indirect
3. No wealth effect: stock market historic low; property tax

Government
Spending is
Non-existent
due to
promised
Primary
Surplus of 3.5%

Modest
Increase lately.
Limited upside
due to "strong
currency"

What kind of Growth
do we need?

Sustainable Growth:

Organizing principle for
meeting human
development goals, **while**

sustaining the ability of
natural systems to provide
the natural resources and
ecosystem services , **upon**
which

the economy and society
depend.

Environmental Sustainability

Economic Sustainability

Social Sustainability

**Sustainable development meets
the needs of the present, without
compromising the ability of
future generations to do the
same.**



- We are on course for disastrous +3C.
- We have **12 years left** until the point of no return. Most of us will still be alive then!
- Urgent and unprecedented changes are needed to reach the target. The target is affordable and feasible. The final tick box is political/policy will!

- **Transforming our world: the 2030 Agenda for Sustainable Development**

10 OCTOBER 2018 REPORT
Intergovernmental Panel on
Climate Change (IPCC):

Urgency of limiting global warming to +1.5 C.

Beyond which risk of drought, floods, extreme heat and poverty for hundreds of millions of people, will significantly increase.



Greece Performance

Index Score: 70.6

Regional Average 76.9

Overall Rank: 48 out of 156

▼ CURRENT ASSESSMENT – SDG DASHBOARD



▼ SDG TRENDS



EEA/Norway Grants, Innovation Norway

Business Innovation Greece Programme aims to increase value creation & sustainable growth in the Greek business sector.

Programme will consist of three focus areas:

- Green Industry Innovation
 - Blue growth
 - ICT

Areas in which:

- Greece has a competitive advantage and considerable potential!
- Norway is a pioneer in these areas: Valuable Knowledge Transfer!



Renewable Energy Best prospect industry sector for Greece

- EU renewable energy target of at least 27% by 2030.
- Greece nearly doubled its share from renewable energy sources 2004-2016

Share of energy from renewable sources (in % of gross final energy consumption)

	2004	2012	2013	2014	2015	2016
EU	8.5	14.4	15.2	16.1	16.7	17
Greece	6.9	13.5	15.0	15.3	15.4	15.2

- Eurostat expects Greece to reach the 18% goal set for 2020.
- Best Prospects: Solar, Wind, Geothermal, Biomass & Biofuels

Blue economy is thriving – and Greece is a big part of it.



BE Represents:

- 3.5 million jobs
- GAV 174 billion / year

Greek Merchant Navy controls the world's largest merchant fleet

- BE encompasses all economic activities related to oceans, seas & coastal areas.
- BE sectors are growing steadily: total turnover of € 566 billion.
- Greece ranks among Europe's top five blue economies in spite of the previous years' economic recession.
- Blue economy significant positive impact on Greek GDP and employment.

*While the national GDP fell strongly (28.5%) between 2009 and 2016, **blue economy GVA rose (21%)**. The share of jobs covered by the **blue economy now amounts to around 9.2% (a 93% increase compared to 2009)**.*



The Information and Communications Technology sector is one of the most promising in the Greek economy

- **Skilled Workforce** – Greek engineers are included in the Economist's global top 20 ICT human resources.
- **Attractive Funding Opportunities** - Investments in the Greek technology market can benefit from several funding opportunities: EU structural funds, PPP initiatives (mainly in the areas of automation of state processes, homeland security and ICT infrastructure for the public transport system), private sources.
- **ICT Infrastructure** – Greece can cover all infrastructure needs for a major investment in ICT.
- **Research and Education** – Greece possesses an extensive network of science and technology parks and higher education centers, ICT clusters, incubators and accelerators.
- **Favorable Location** – Greece is the EU country with the best access to leading Asian ICT markets such as China, Japan and Korea.



**SUSTAINABLE DEVELOPMENT
SOLUTIONS NETWORK**
A GLOBAL INITIATIVE FOR THE UNITED NATIONS

A Global Network of :
Universities & Research and Innovation Centers
Businesses
Civil Society Organizations
Policy Making
Political Institutions

To support **SCIENCE DRIVEN** implementation of **SDGs**



www.unsdsn.gr

Co-Chairs

Prof. Phoebe Koundou
Prof. Andreas Papandr

Leadership Council

Business, NGOs,
Policy Making, Politici

3000+ universities & r
2000+ companies and

CROSS-CUTTING THEMES

Natural Capital Valuation & Integri
Sustainable Investment Allocation

Climate Change: Mitigation and A
Policies

Sustainable Development in
Times of Crisis

THEMATIC PRIORITIES

Sustainable Shipping and Marine Resources
Management

Sustainable Energy and Energy Security

Sustainable Water-Food-Energy Nexus

Sustainable Tourism and Biodiversity

Education and Training Courses in Sustainable
Development

Our Projects, currently 100 researchers



- €100+ million of research funding from: European Commission (DG RTD, DG MARE, DG ENV, DG ENER, DG REGIO), International Organizations (World Bank, OECD, EBRD, WHO, FAO, UN), Governments in all 5 continents, etc.
- 1000+ peer-reviewed research papers & books

Integrated and Interdisciplinary Methodology

Aim: Allocation of scarce resources across people, over time & space, while EnvS, EconS, Social Equity achieved.

MODELS ON INTERACTION

Dynamic, Spatial, Uncertainty

- Nature
- Society
- Economy

FRAMEWORK CHARACTERIZATION

- Natural Resources,
- Socio-Economic
- Institutional
- Stakeholders

EMPIRICAL APPLICATION of MODELS

Estimation of Economic Value

OPTIMAL ALLOCATION based on Value

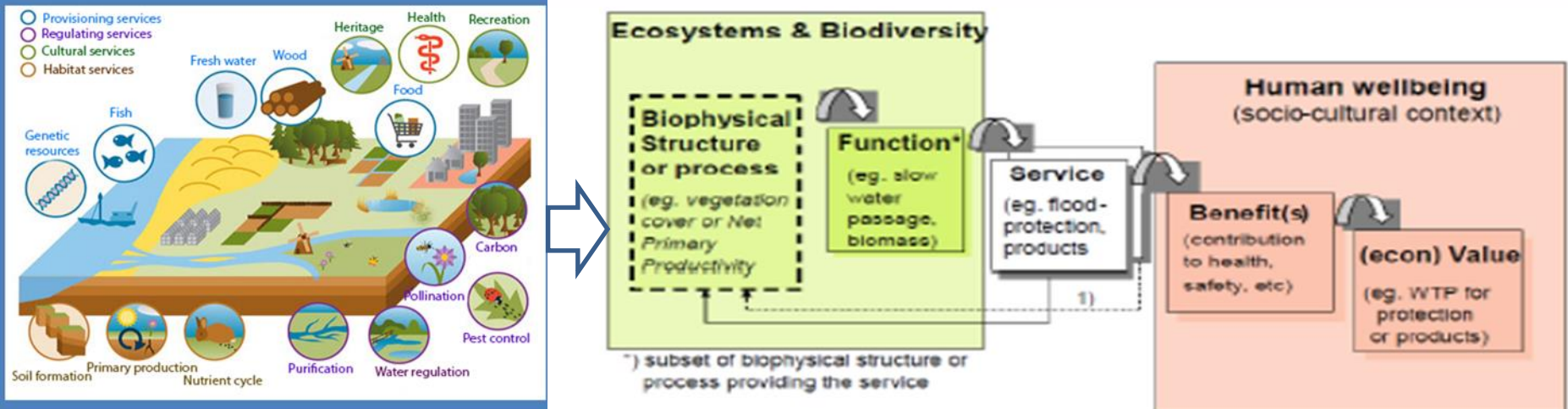
How?

- Socio-Economic, Legal Instruments
- Technological Innovations
- Social and Institutional Innovations
- Nature Based Solutions
- Infrastructural Solutions

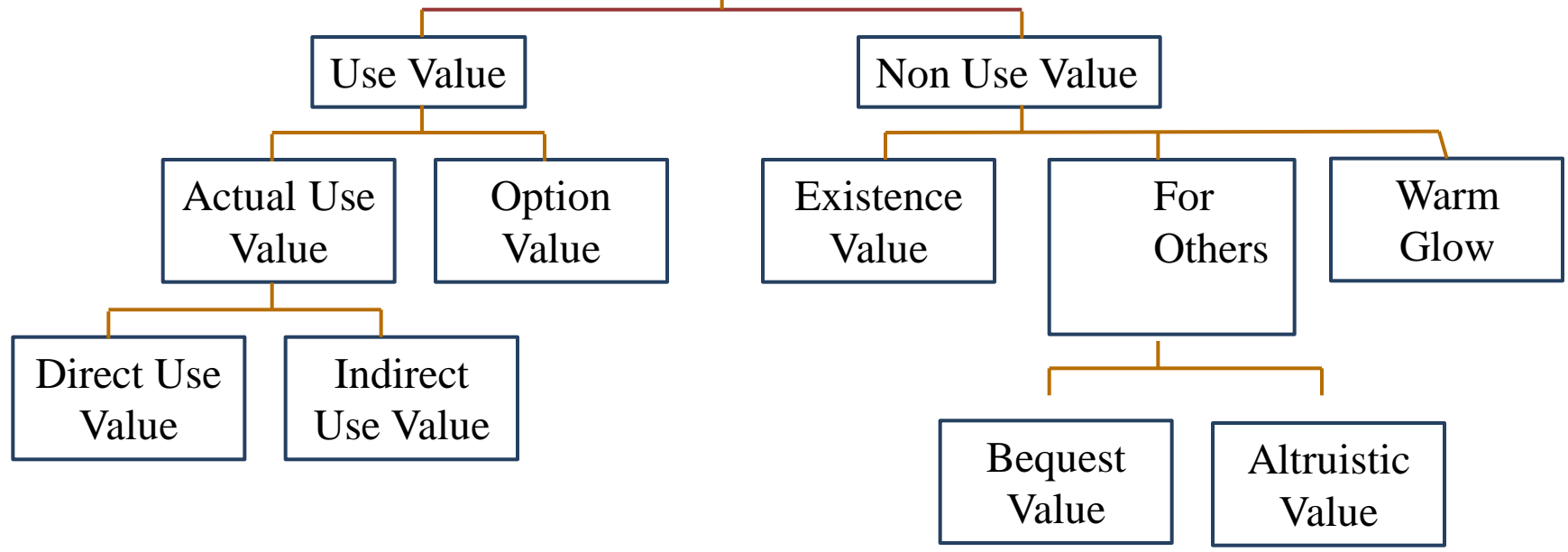
STRATEGIC MANAGEMENT PLANS &

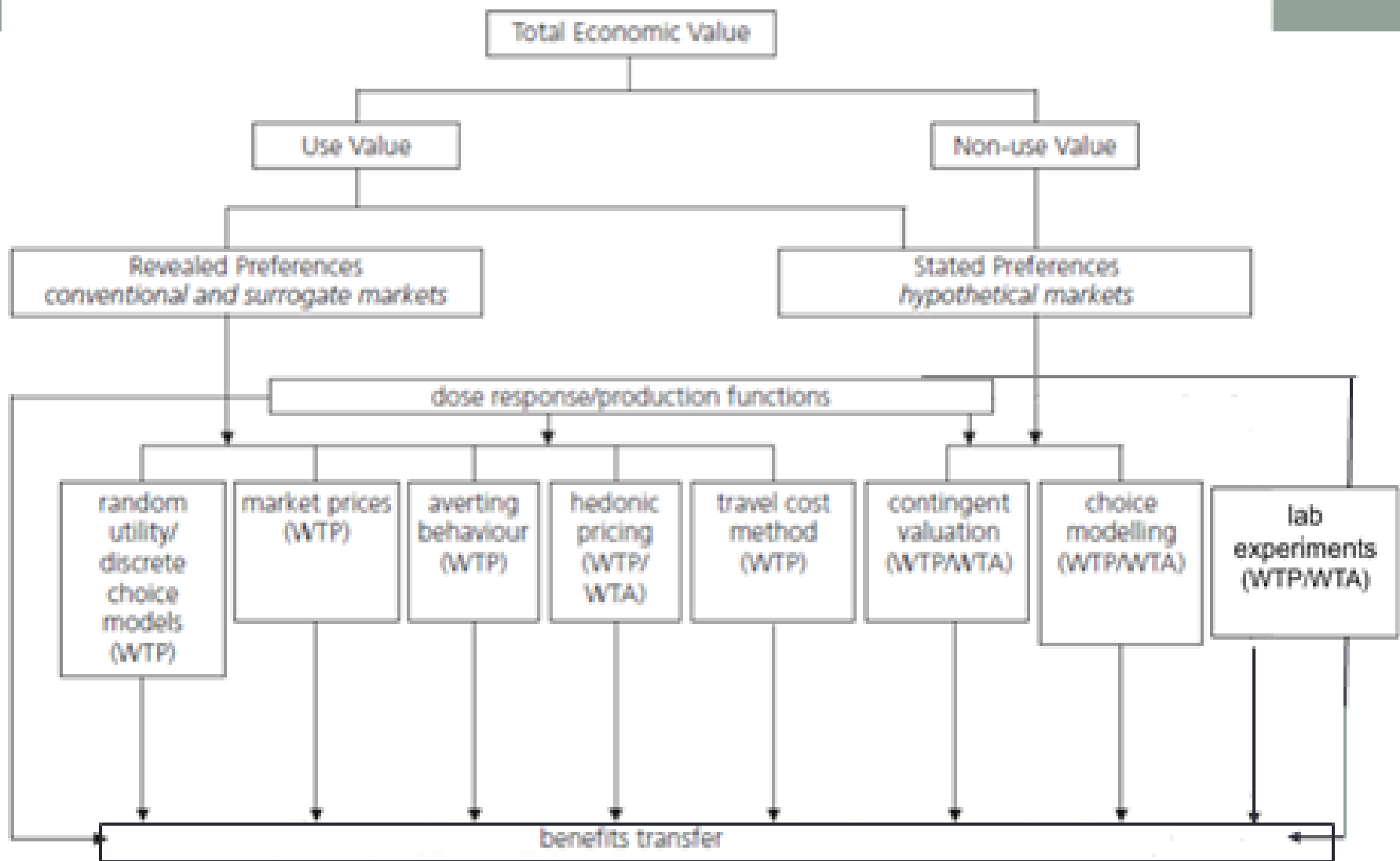
POLICY RECOMMENDATIONS:

Stakeholders engaged & convinced throughout the process



Total Economic Value





- TEV: systematic tool for considering full range of impacts on human welfare.
- TEV: reflects the preferences of individuals, which can be statistically estimated
- TEV: essential for resource allocation and policy making.

The Value of Distant Benefits & Long-Term Discount Rates

funded and endorsed by: EC DG ENV, World Bank, EPA USA

Governments Europe and Easter European Countries

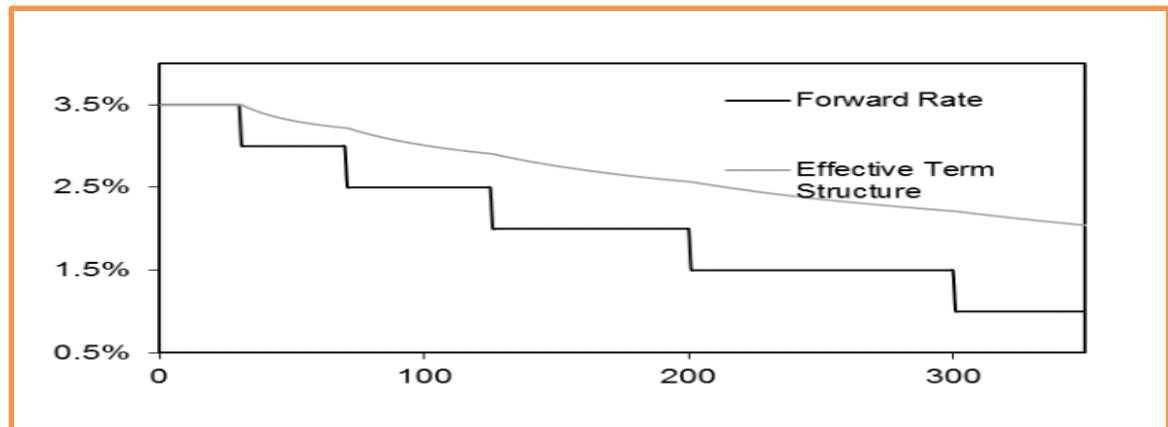
- *Humanity has the ability to make development sustainable: to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs.*

WCED, 1987

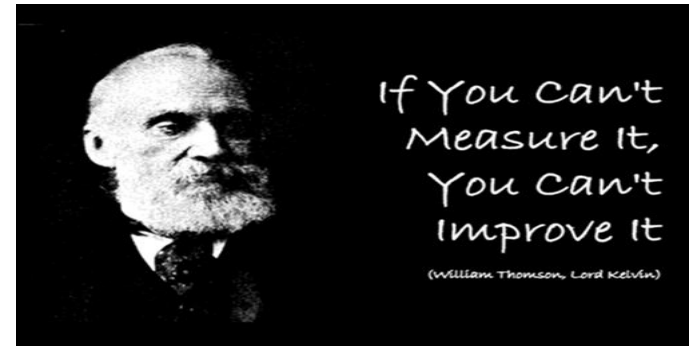
- *There is something awkward about discounting benefits that arise a century hence.. For even at a modest discount rate, no investment will look worthwhile.*

The Economist, 1991

Recommended Time
Declining Schedule



UNCERTAINTY!



- IPCC (2007) wrote:

*“In most instances, **objective probabilities are difficult to estimate.** ...a number of climate change impacts involve health, biodiversity, and future generations, and the **value of changes in these assets is difficult to capture fully** in estimates of economic costs and benefits..... The literature on how to account for **ambiguity in the total economic value** is growing, even if there is no agreed standard.”*

Our Books



**Hundreds of Applied Projects
Demonstrations and Implementation of Results ...**



Climate-KIC



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

**Transforming innovation
into climate action**





Climate-KIC

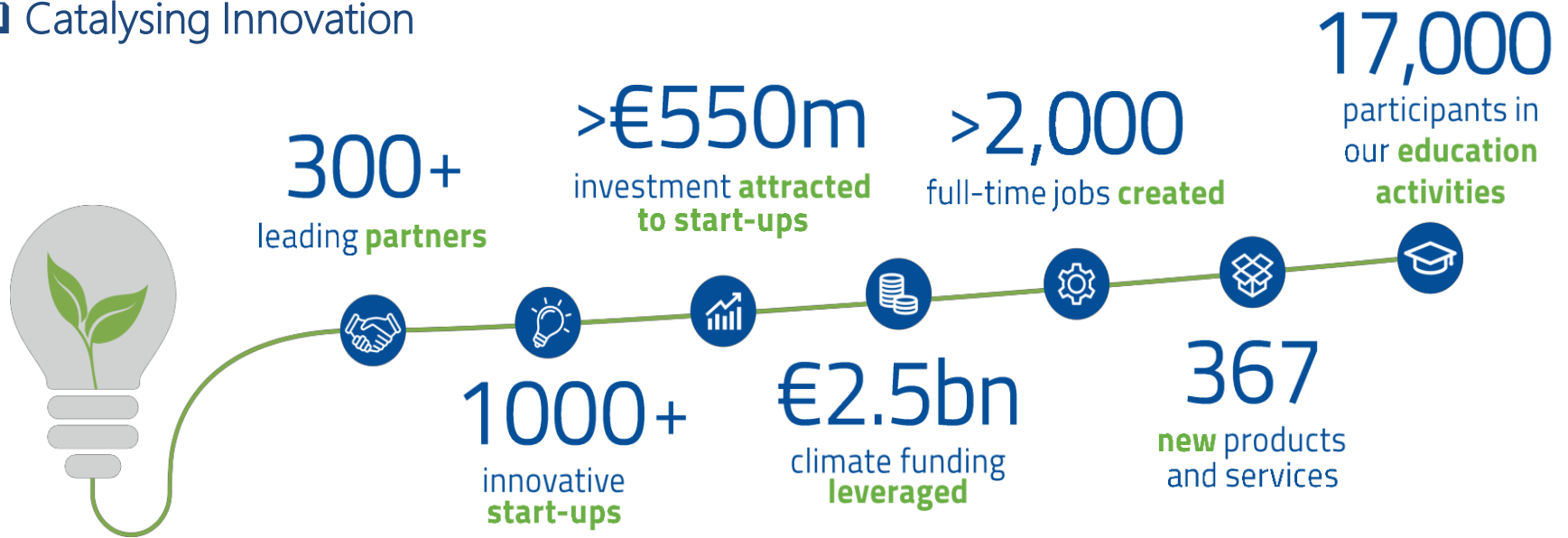
EIT Climate-KIC is a European **knowledge and innovation community** working to accelerate the transition to a **zero-carbon economy** through **whole systems** transformation.

The EIT Climate-KIC is part of the European Institute of Innovation and Technology (EIT) and the EIT Community.

The EIT is a body of the European Union and a global innovation leader, delivering world class solutions to societal problems

ETClimate KCEurope is Building a Movement of Climate Action

- ❑ Convening networks of expertise
- ❑ Leveraging Grants Smartly & Effectively
- ❑ Developing People & Capacity
- ❑ Catalysing Innovation





Greece



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Transforming innovation into climate action





EIT Climate - KIC Core Programs

EIT Climate KIC Accelerator - Greece

Accelerator



- Offers structured **business and commercial support** to European start-ups in the new climate economy. It is a **real-world business school** for clean tech entrepreneurs
- **Offers coaching, training, technology validation and office space**
- Selected start-ups benefit from funding, exposure to customers, partners and investors as well as access to an extensive relevant international network

<https://www.climate-kic.org/programmes/entrepreneurship/accelerator/>

- **Stage 1: Fundamentals**

Develop a **financial model** and figure out how to make money and scale your business. This stage comes with a **grant of up to €10,000**.

- **Stage 2: Validation**

Are you solving real customer problems? **Talk to customers and verify your business assumptions**. Grants in Stage 2 could add **up to €15,000**.

- **Stage 3: Delivery**

Find launching customers, development partners or investors. Form partnerships that make you grow fast. Get **up to €50,000**.

EIT Climate KIC Supported startups

- **Cyrus:** A Demokritos spin-off working on hydrogen technologies and designing non-mechanical high-pressure H₂ compressors using metal hydrides
- **Citipost:** Innovative waste and data management platform focusing on smart cities and sustainability through recycling
- **Cargoshare:** An automated freight brokerage services platform which results in a more transparent market, leading to less communication friction, while resulting to reduced emissions by freight ships traveling empty
- **Parity:** A two-sided Financing Platform, that makes Greentech investing accessible to retail investors and small funds
- **Trustporter:** A convenient, trust-centered and inexpensive system for shipping & transportation needs - designed to match requests to transfer goods or transport people, with other people that happen to travel along the requested routes anyway
- **Enaleia:** Educate, motivate, organize and track the fishermen, so as to be able to collect plastic from the sea through their bi-catch.
- **Shallows:** Zero-footprint architecture based on natural raw materials, using biological mechanisms as a living creature with a highly efficient life-cycle regarding sustainability, energy consumption and CO₂ emissions

**FROM PROTOTYPE TO MARKET READY INNOVATION
ADAPTING TO: FLOODS, DROUGHTS & EXTREME WEATHER**

BRIGAIID
Bridging the Gap for Innovations
in Disaster Resilience

**BRIGAIID: BRIdging the GAP for
Innovations in Disaster resilience
DG RTD, Budget: 9,000,000 euro**

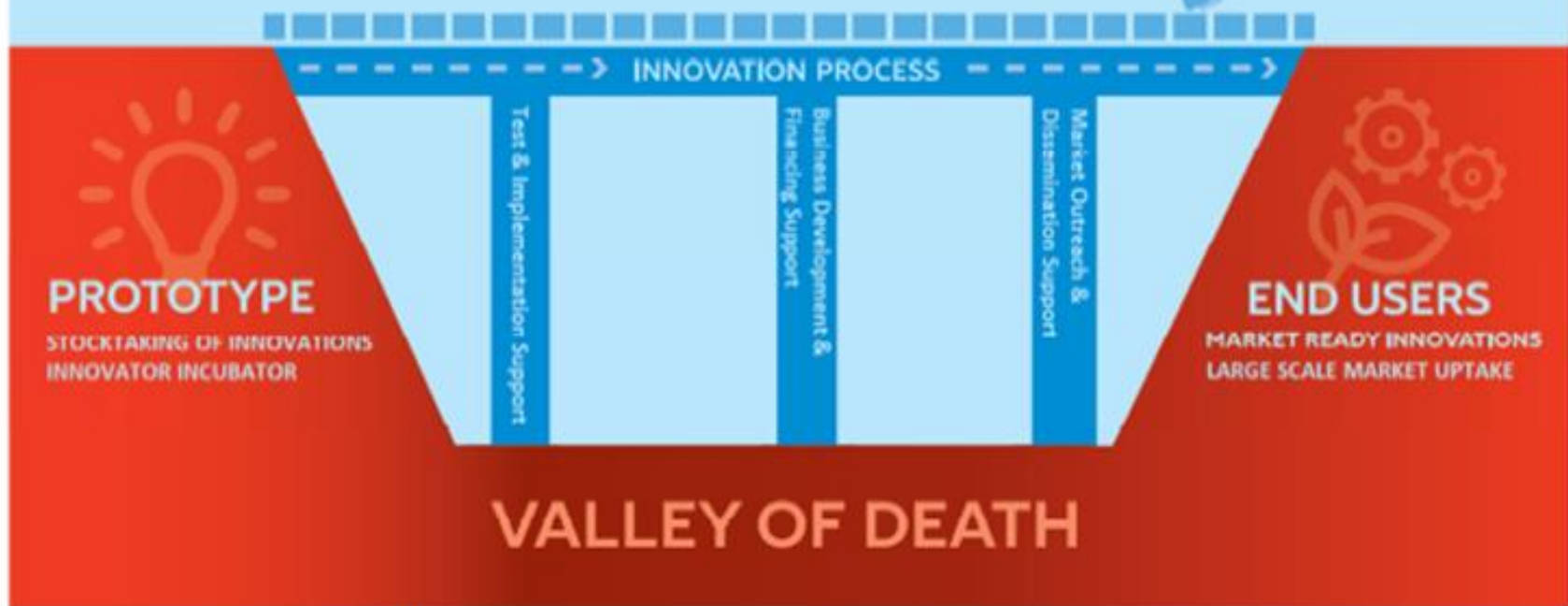


Figure 1.1: BRIGAIID's conceptual approach with three types support for innovations

SHARE AND DISCOVER CLIMATE INNOVATIONS

INNOVATIONS FOR CLIMATE CHANGE ADAPTATION

the EU reference marketplace where end-users and innovators can meet

Share your innovation

Show Innovations ▾ | All Hazards ▾ All Topics ▾ | View by Most Recent ▾



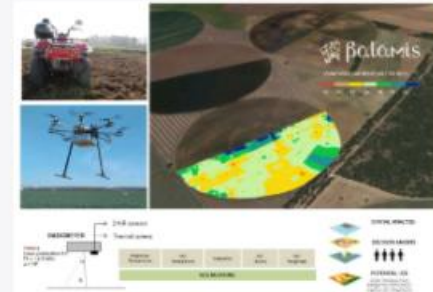
Disasters and ICT | Water Safety
MyFloodRisk (for business)

TRL 5



Disasters and ICT | Urban Areas
3C for Cities

TRL 6



Agriculture | Disasters and ICT
**ARIEL, soil moisture retrieval by
microwave remote sensing**

TRL 5

Pioneers into Practice

- Climate-KIC's professional mobility program Operates in over 16 locations across Europe
- Professionals from industry, small companies, universities, municipalities, governance, are offered an innovative blend of e-learning, workshops, coaching and placements by Host organizations active in the field of sustainability.
- Practical experience through 4 - 6 week placements
- 1 day International Workshop



<https://pioneers.climate-kic.org>

Climathon

<https://climathon.climate-kic.org/en/>

A **global movement** dedicated to solving the toughest climate challenges cities face today

This is manifested in a **24-hour hackathon** taking place simultaneously in major cities around the world

Citizens, city officials and partners connect under a shared vision for a healthier city and try to find innovative solutions

In 2018, 4 Climathons took place in Greek cities under the auspices of EIT Climate-KIC Hub Greece (Athens, Piraeus, Heraklion, Larissa)



ReSees Laboratory@AUERB

Selected Research Projects



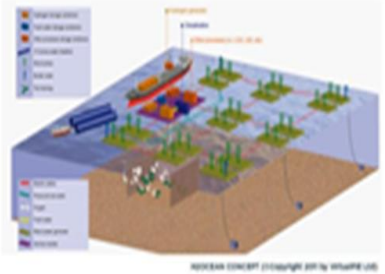
<https://www.dept.aueb.gr/el/ReSEES>

Innovative Multi-purpose offshore platforms: planning, design & operation

OCEANS of TOMORROW, EC-DG Research-FP6; Budget: 20,000,000



Development of a wind-wave power open-sea platform equipped for hydrogen generation with support for multiple users of energy
<http://www.h2ocean-project.eu/>



Innovative multi-purpose offshore platforms: planning, design and operation
<http://www.mermaidproject.eu/>



Modular multi-use deep water offshore platform harnessing and servicing Mediterranean, subtropical and tropical marine resources
<http://www.tropisplatform.eu/>



MERMAID ASSESSMENT TOOL
 Decision making process for the Socio Economic Assessment of MUOP on different Mermaid Sites

- Web based analysis platform
- Open Source Technologies
- Can take advantage of cloud based technologies
- Formalized language that enables correct workflow from data collection to results production and interpretation
- Automated assessment
- Capability of producing alternative scenario with / without Socio - Economic Externalities
- Technical & Legal Feasibility assessment / Environmental Impact Assessment interactive questionnaires

PHOEBE KOUNDOURI - ICREL, AUEB, L.I.E.
 IRANIS KAVANIDIA, ELIOCHIA MALLI - MAGGIK team, UGA, ATHENA, GR

Environment & Policy 56

Phoebe Koundouri Editor

The Ocean of Tomorrow

Investment Assessment of Multi-Use Offshore Platforms: Methodology and Applications - Volume 1

Springer



The BlueBRIDGE Project – Addressing the Blue Societal Challenge EC DG Research & Innovation H2020. Budget: 10,000,000 euro

Building Research environments fostering Innovation, Decision Making, Governance and Education to support Blue Growth

<i>Supporting assessment of stocks and fisheries</i>	<i>Improving performance and sustainability in aquaculture</i>	<i>Monitoring fisheries & habitat degradation</i>
A diagram illustrating the marine food web. It is divided into three horizontal layers: "Secondary consumers" at the top with large fish, "Primary consumers" in the middle with smaller fish, and "Primary producers" at the bottom with seaweed and small organisms.	An aerial photograph showing several large, circular aquaculture cages floating in the water. A small boat is visible near the cages.	An underwater photograph of a coral reef. The reef is covered with vibrant orange and red corals, with some white patches indicating degradation.



GLOBAQUA

Managing the effects of multiple stressors on biodiversity and functioning of aquatic ecosystems

<http://www.globaqua-project.eu>, Budget: 10,000,000 euro



Ecosystems & Biodiversity

Biophysical Structure or process
(eg. vegetation cover or Net Primary Productivity)

Function^{*)}
(eg. slow water passage, biomass)

Service
(eg. food-protection, products)

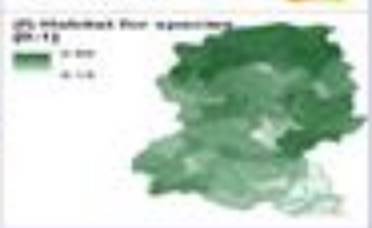
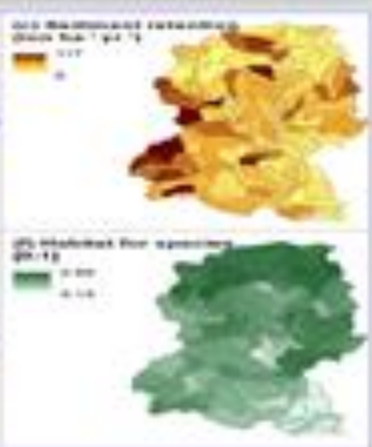
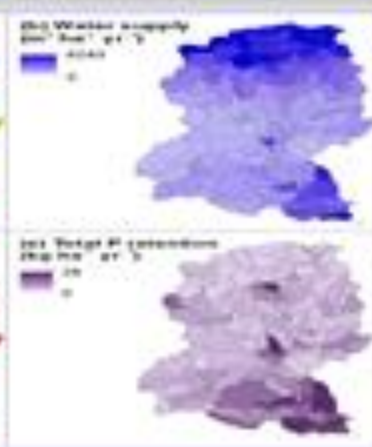
Human wellbeing (socio-cultural context)

Benefit(s)
(contribution to health, safety, etc.)

(econ) Value
(eg. WTP for protection or products)

^{*)} subset of biophysical structure or process providing the service

Adapted from Haines-Young & Pollock, 2001 and Muller (et al.) 2009





<http://www.theseusproject.eu/>

Innovative technologies for safer European coasts in a changing climate

European Commission

FP7, THEME 6 - Environment, including climate

Budget: (6,530,000 €)



DAFNE

A Decision-Analytic Framework to explore the water-energy-food Nexus in complex and transboundary water resources systems of fast growing developing countries

EC DG RTD, Budget: 5,000,000 euro

Aim: To establish a Decision-Analytic Framework for Participatory and Integrated Planning

Omo River Basin



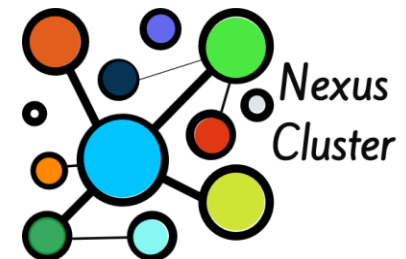
2 Case Studies

Zambezi River Basin



European Cluster of WEF Nexus Projects

Budget: 100 million euro





OpenAIRE

Coordination
OpenAIRE
Connect



OpenAIRE is the European online network that makes research output openly accessible to all.

It is all about sharing, reusing and linking research information.

Our Vision

An SDG E-library for Greece, Europe, Global

An Open Science directory of all past **20 years** completed and ongoing projects, research publications, data and related models relevant to the 17 SDGs

immediate & long-term benefits to:

Research Communities
Research Organizations
Funders, industry, Policy Making and... society

Education and Training

International, Regional, National
Conferences, Workshops, Training
Seminars & Research, Policy,
Business Events



Coordinator
The course is coordinated by Phoebe Koundouri, Professor of Economics and Econometrics, Athens University of Economics and Business (School of Economics) and London School of Economics (LSE), Scientific Director of ICRES, SDSN-Greece chair.



Coming Soon:

- MSc Energy Law and Economics
- Greek Sustainability Report
- Sustainability Summit, with the Economist, 16-17 Oct. 2019

Our Ongoing Projects



Institutional Support

