

# EUROGEOSS WORKSHOP 2019



#EGW2019 3-5 JULY 2019, LISBON



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e-shape



The e-shape project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 820852

#EGW2019



**e-shape:** strengthens benefits for Europe of GEOSS and vice-versa – supports the EuroGEOSS Regional GEO

# What is e-shape?

**e-shape** allows Europe to position itself as global force in Earth observation through leveraging **Copernicus**, making use of existing European capacities and improving user uptake of data from European assets in the GEO context.

**e-shape vision:** To develop operational services with and for the users and to create a conducive environment whereby the strengths of Europe are exploited towards addressing societal challenges, fostering entrepreneurships and supporting sustainable development



**e-shape:** strengthens benefits for Europe of GEOSS and vice-versa – supports the EuroGEOSS Regional GEO

It **builds on existing EU GEO actions, GEO initiatives and flagships and Copernicus-related activities** by bringing together the key partners engaged therein.

# What is e-shape?

**Amongst the most prominent programmes** that shall be linked to the proposal are Copernicus, INSPIRE, the ERA-Net on EO, the GEO relevant H2020 projects (ECOPOTENTIAL, EDGE, NextGEOSS, GEO-CRADLE, SWOS, ERA-PLANET, GROUND TRUTH 2.0, etc.), and many National EO initiatives, infrastructures and programmes.





## Contribution to GEO Priorities

### Sustainable Development Goals (SDGs)

The Sustainable Development Goals are the blueprint to achieve a better and more sustainable future for all. They address the global challenges we face, including those related to poverty, inequality, climate, environmental degradation, prosperity, and peace and justice.



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## Contribution to GEO Priorities

### Paris Agreement

The Paris Agreement builds upon the Convention and for the first time brings all nations into a common cause to undertake ambitious efforts to combat climate change and adapt to its effects, with enhanced support to assist developing countries to do so.

### Sendai Framework

The Sendai Framework for Disaster Risk Reduction 2015-2030 (Sendai Framework) is the first major agreement of the post-2015 development agenda, with seven targets and four priorities for action.



© Copernicus Sentinel data (2015) / ESA



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## Objectives

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- O1: Develop operational EO services with and for users active in key societal sectors
- O2: Demonstrate the benefits of the EO pilots through the coordinated downstream exploitation of EO data and the utilization of existing EO resources
- O3: Promote the uptake of pilots at national and international scale, across vertical markets (private and public) and amongst key user communities
- O4: Enable the long-term sustainability of the numerous pilots, their penetration in public and private markets and support their upscaling
- O5: Increase uptake by raising awareness on the solutions developed through tailored and well-targeted communication, dissemination and outreach activities



● e-shape

Fast Facts for You

54  
partners

7 showcases

27 pilots

4  
years grant





# e-shape: 7 showcases



agriculture



health



renewable  
energy sources



ecosystem



water



disaster



climate

## 27 pilots

4

3

3

3

5

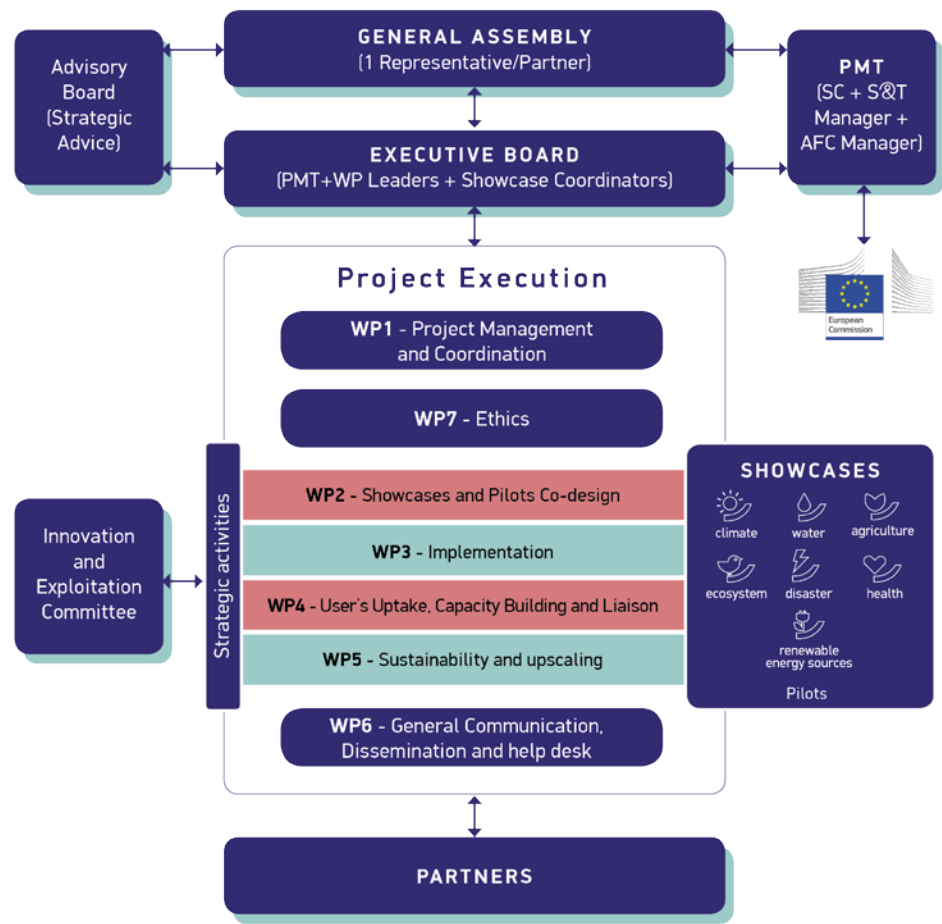
4

5



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## Structure of the project



# e-shape brings value to the pilots



Where you are now...



Where you want to be...



Where you can be...

Co-design

User uptake

Infrastructure



Synergies

Standards

Go-to-market

Communication

Sustainability

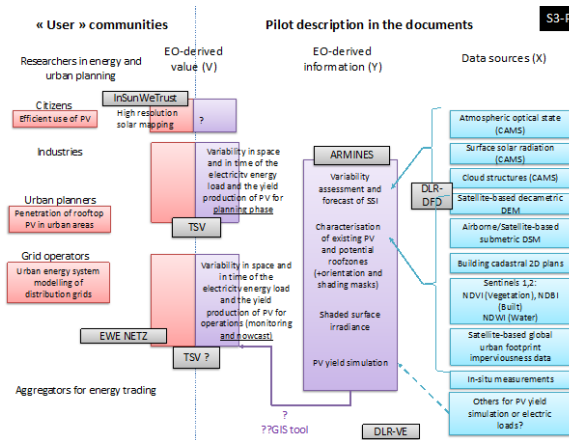
Help Desk



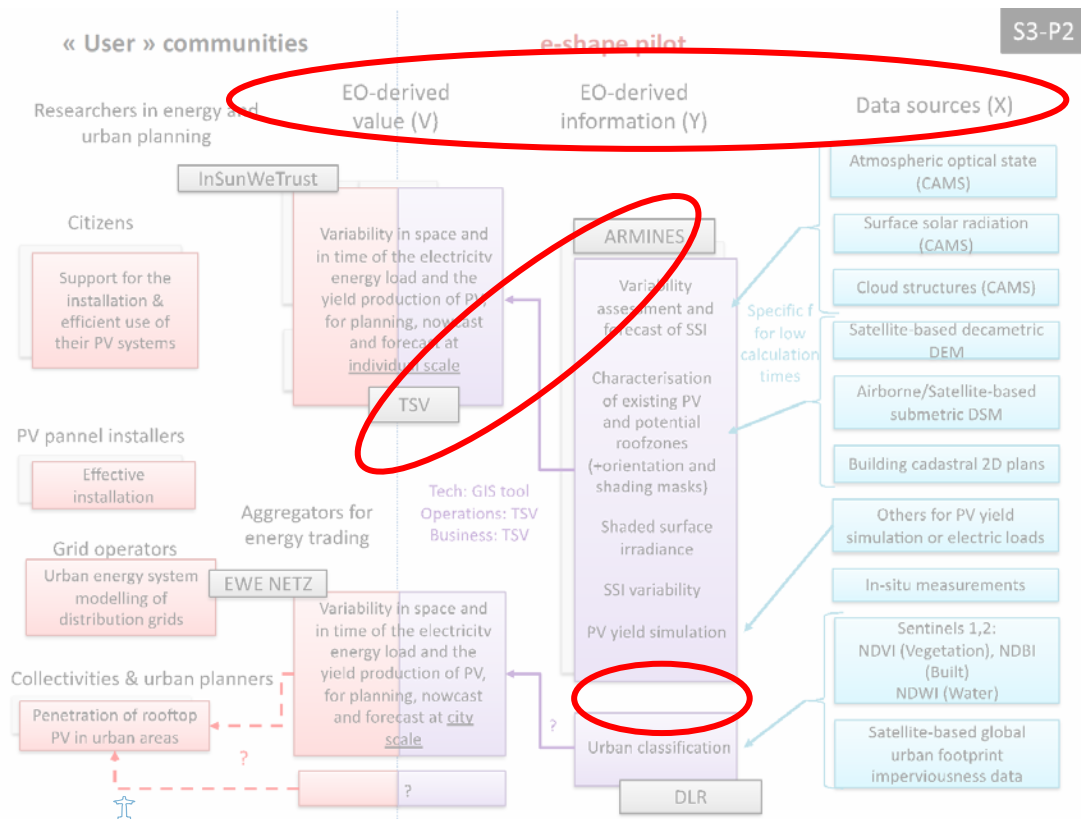
# e-shape's tools to support EuroGEOSS

## Co-design and co-creation with users

	Lead Partner	ARMINES	Key Users
			Urban planners, grid operators, industrial, aggregator for energy trading, researchers in Energy and Urban planning and citizens
			ASSIST, CLOROS, CLIVEX, TSV
Background			Rooftop PV systems in urban areas are very interesting because they do not emit air pollutants nor CO2e during their exploitation, they produce electricity where this electricity is consumed and they add value to unsealed urban roofs and reduce urban heat island effect. But, due to complex shading effects in urban context (vegetation, surrounding buildings, superstructures of roofs, etc.) and local atmospheric and meteorological effects, their massive penetration in urban areas will induce a significant variability in space and in time in the energy injected in the electric grid. As far as the electric demand side is concerned, a detailed modelling of energy requirements from residential, commercial and industrial buildings with varying demand profiles for electricity is also required. Therefore there is a need, in urban area, for GIS-like tool for grid operators, urban planning decision makers, industrial, aggregator for solar energy trading, citizen (PV self-consumption and researchers. This GIS-tool is meant to provide an urban energy system modelling of distribution grids to plan, monitor and forecast (i.e. for short term forecast) the spatiotemporal variability of the electric consumption on one hand and of the production of fleets of PV rooftop systems on the other hand. Existing GIS-tool for the Nantes (F) and Orléans (D) areas will be enhanced by new satellite-based datasets. The cost/benefit of using satellite-based data will be assessed in a number of specific use cases. ...
Objectives			<ul style="list-style-type: none"> <li>GIS tool for urban areas to simulate variability in space and in time the electric energy load and the yield productions of rooftop PV systems to assess for planning phase</li> <li>the temporal and spatial variability of the injected electric energy in the grid for grid operators and urban planning decision makers;</li> <li>the specific behavior of residential, commercial, and industrial buildings with their different electric load patterns;</li> <li>the optimal integration and placement of electricity stationary storage applications and the charging and battery exchange stations;</li> <li>the adequacy of a specific rooftop PV system with respect to the energy consumption profile of citizens trying to optimize their PV self-consumption with the help of PV system developers.</li> </ul> GIS tools for existing rooftop PV systems in an specific urban area, to monitor and forecast: <ul style="list-style-type: none"> <li>the temporal and spatial variability of the injected electric energy for grid operators and aggregator for solar energy trading;</li> <li>the temporal variability of the energy yield of a specific rooftop PV system for the citizen and the PV developers being contracted by the PV system owner.</li> </ul> The main challenges lies on the ability to merge the different sources of information, notably from Earth Observation, of various nature and spatial and temporal resolutions, to provide accurate and efficient information about the electric energy load profiles and for PV yield production simulations, monitoring and forecasting at very high resolution of urban scale : urban structure parameters and building properties (commercial, private, size of building satellite-based remote sensing, shadow effects assessed from decametric digital elevation model (DEM) and sub-metric digital surface model (DSM), solar radiation and cloud coverage information from meteorological geostationary satellites, atmospheric optical state from numerical weather and chemical transport models, and in-situ measurements (air pollution sensors, synoptic measurements, meteorology existing PV rooftop installations, ...).
Challenges			(S) satellite-based decametric DEM, (S) airborne- or satellite-based sub-metric DSM, (S) building cadastal 2D plans, (S) Copernicus Sentinel-1 and -2 for datasets analysis of Normalized Difference Vegetation Index (NDVI), Normalized Difference Built Index (NDBI) and Normalized Difference Water Index (NDWI) statistics, (S) satellite-based global urban footprint imperviousness data (S) atmospheric optical state (aerosol optical depth, aerosol moisture (black carbon, sea salt, mineral dust, sulphate, etc.), total column water vapour and ozone content) from Copernicus Atmospheric Monitoring Service (CMS), (S) surface solar radiation from CMS, using Meteorological geostationary satellite (Meteosat Second Generation, MSG), (A) cloud products as post processing product from CMS, (A) in-situ measurements (synoptic, air pollution, PV metering, ...).
Methodology			Classification of residential, commercial, and industrial buildings from OpenStreetMap data and as a cross referencing layer of information from satellite-based urban structure parameters (e.g. grid and overhang use, percent of impervious surface or estimated building height), making use notably of the ESA urban



# e-shape's tools to support EuroGEOSS



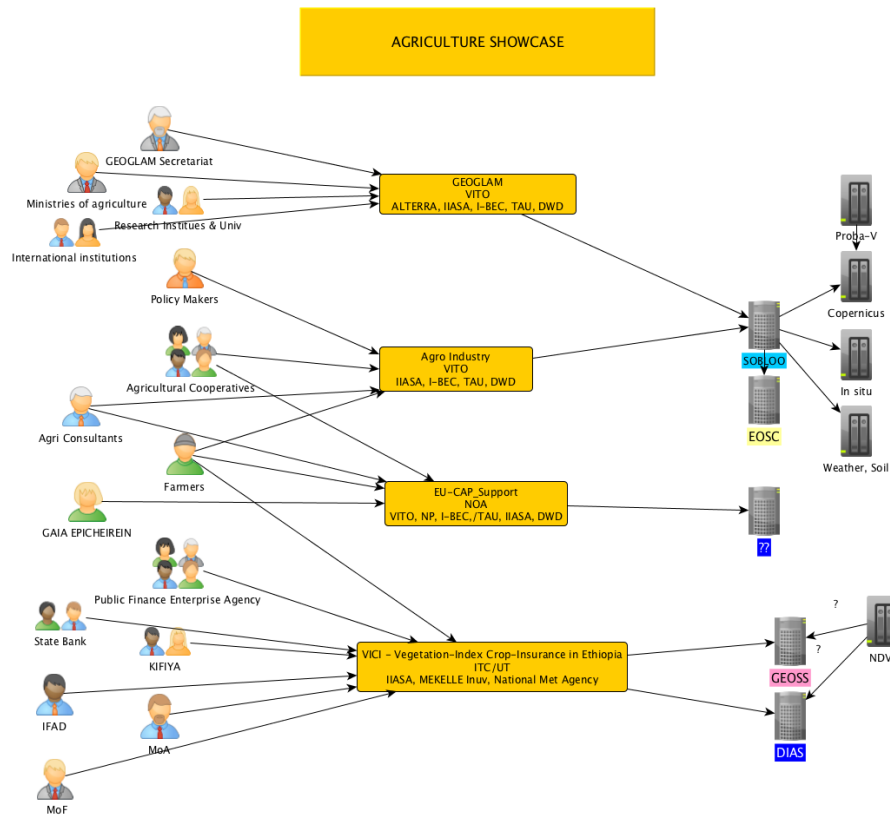
#3. Good ways of « showing » Y/V?

#2. From research to operations

#1. Aligning the two parts of the pilot

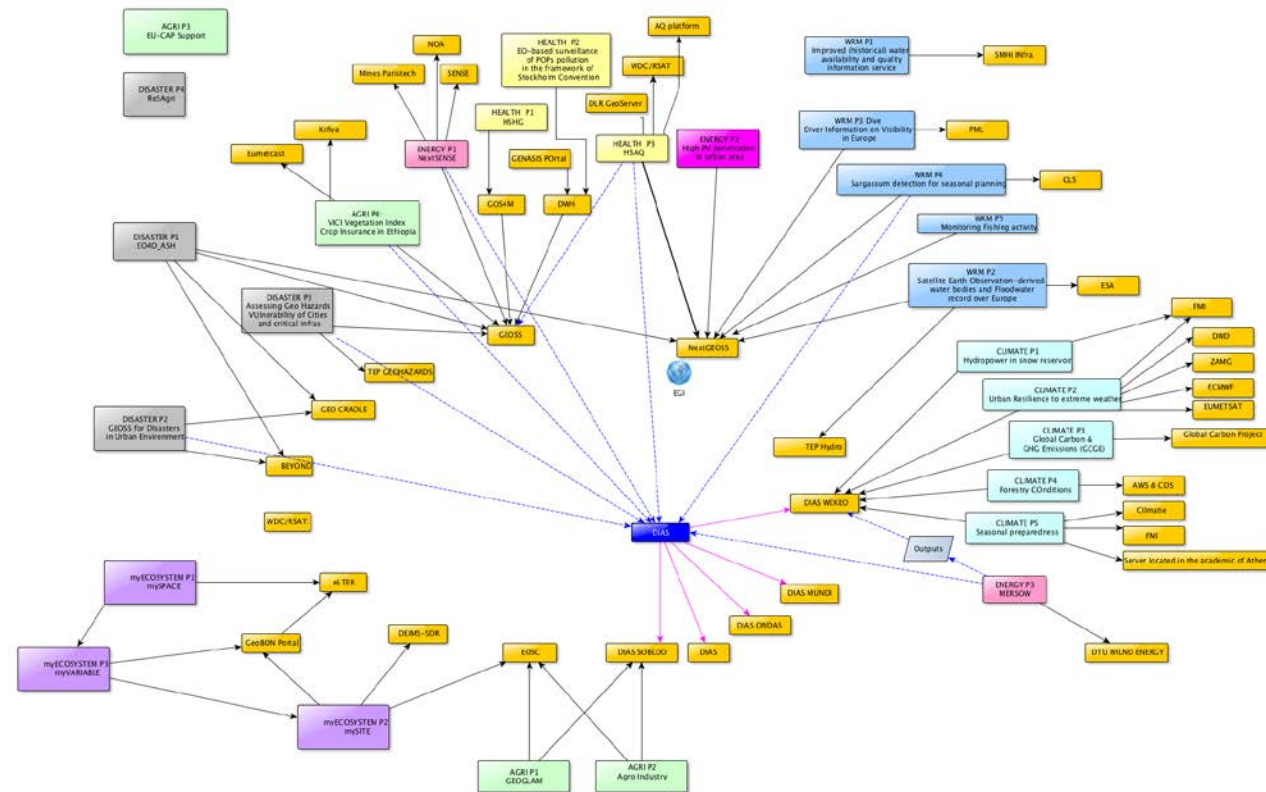
# e-shape's tools to support EuroGEOSS

## Implementation through different European IT architectures



# e-shape's tools to support EuroGEOSS

Implementation through different European IT architectures



# e-shape's tools to support EuroGEOSS

## Users' Uptake, Capacity Building and Liaison

Task 4.1: User Uptake		
<p><b>Sectoral</b></p> <ul style="list-style-type: none"> <li>• Sectors of application</li> <li>• Public and private</li> <li>• EARSC market taxonomy</li> </ul>	<p><b>National/Regional</b></p> <ul style="list-style-type: none"> <li>• Leverage Copernicus Relays/Academy</li> <li>• Mobilise GEO Offices</li> <li>• Link to Copernicus FPA's</li> </ul>	<p><b>International</b></p> <ul style="list-style-type: none"> <li>• Export Promotion (EARSC)</li> <li>• Link with IFI activities (WB, ADB ...)</li> </ul>

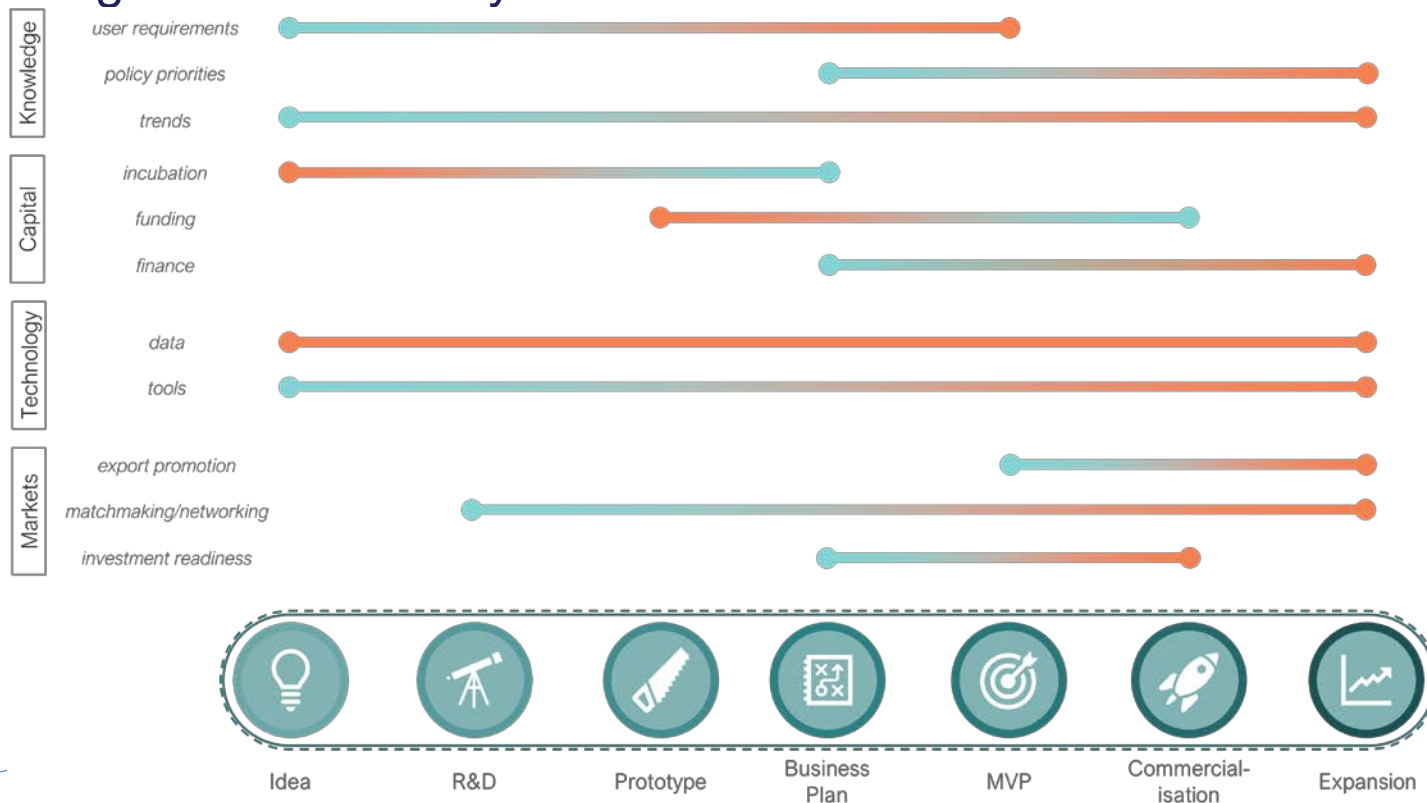
Task 4.2: Capacity Building			
<p><b>Best Practice</b></p> <ul style="list-style-type: none"> <li>• Use of resources</li> <li>• Building on platforms</li> <li>• Co-design</li> </ul>	<p><b>Maturity Indicators</b></p> <ul style="list-style-type: none"> <li>• Analyse capacity &amp; gaps at national level</li> <li>• European partners</li> <li>• GEO partners</li> </ul>	<p><b>Knowledge Hub</b></p> <ul style="list-style-type: none"> <li>• Develop <a href="#">EOWiki 2.0</a></li> <li>• Company register <a href="#">eoPages</a></li> <li>• Marketplace - <a href="#">eoMALL</a></li> </ul>	<p><b>Training</b></p> <ul style="list-style-type: none"> <li>• Best practice guides               <ul style="list-style-type: none"> <li>• Technologies</li> <li>• Markets</li> <li>• Business planning</li> </ul> </li> </ul>

Task 4.3: Liaison			
<p><b>UN – SDG's</b></p> <ul style="list-style-type: none"> <li>• <a href="#">UNStat</a> / UN GGIM</li> <li>• National Statistical Offices</li> <li>• EO4SDG's</li> </ul>	<p><b>GEO</b></p> <ul style="list-style-type: none"> <li>• Flagships / initiatives</li> <li>• Geo secretariat</li> <li>• Regional Activities</li> <li>• National Offices</li> </ul>	<p><b>Copernicus</b></p> <ul style="list-style-type: none"> <li>• DG GROW</li> <li>• Core Services – EEE's</li> <li>• ESA</li> <li>• National contacts</li> </ul>	<p><b>Other</b></p> <ul style="list-style-type: none"> <li>• PRIMA, IRENA</li> <li>• KIC's, EIP's</li> <li>• Regional Activities</li> <li>• National Offices</li> </ul>



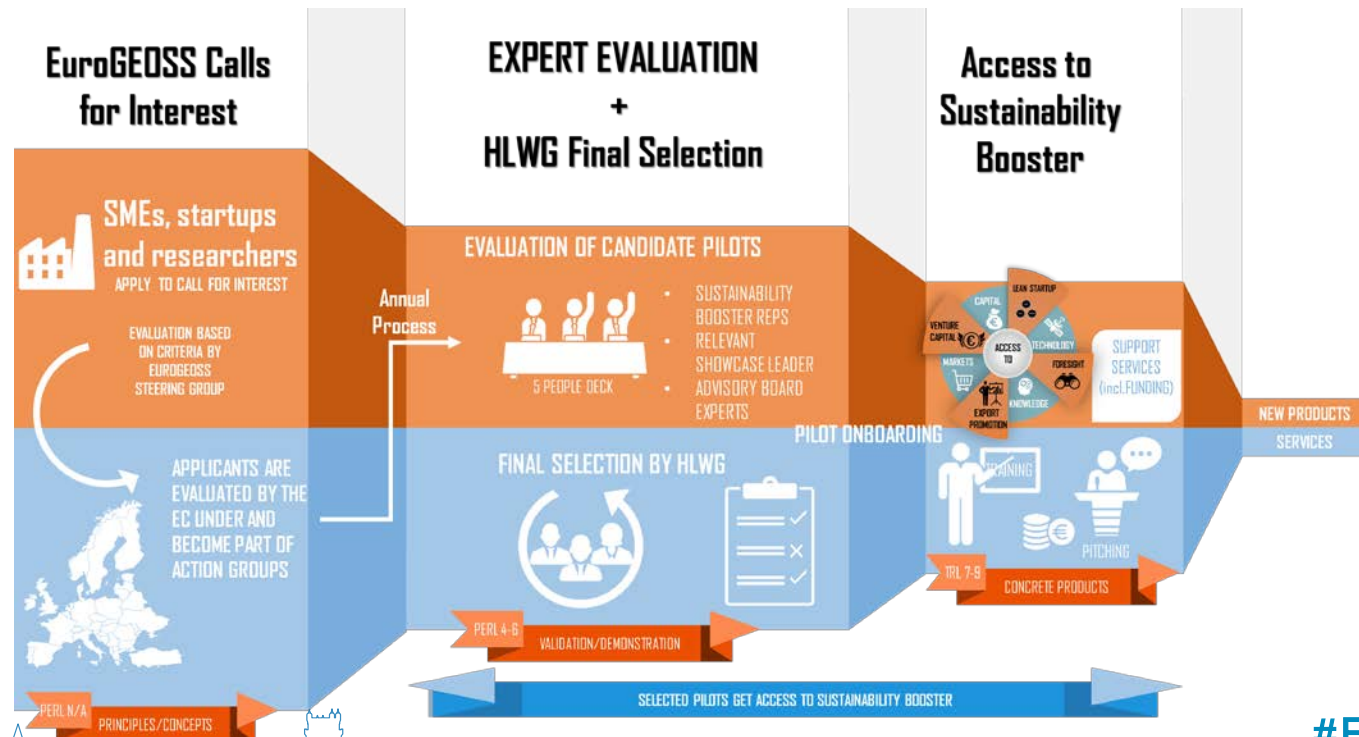
# e-shape's tools to support EuroGEOSS

## Supporting the sustainability



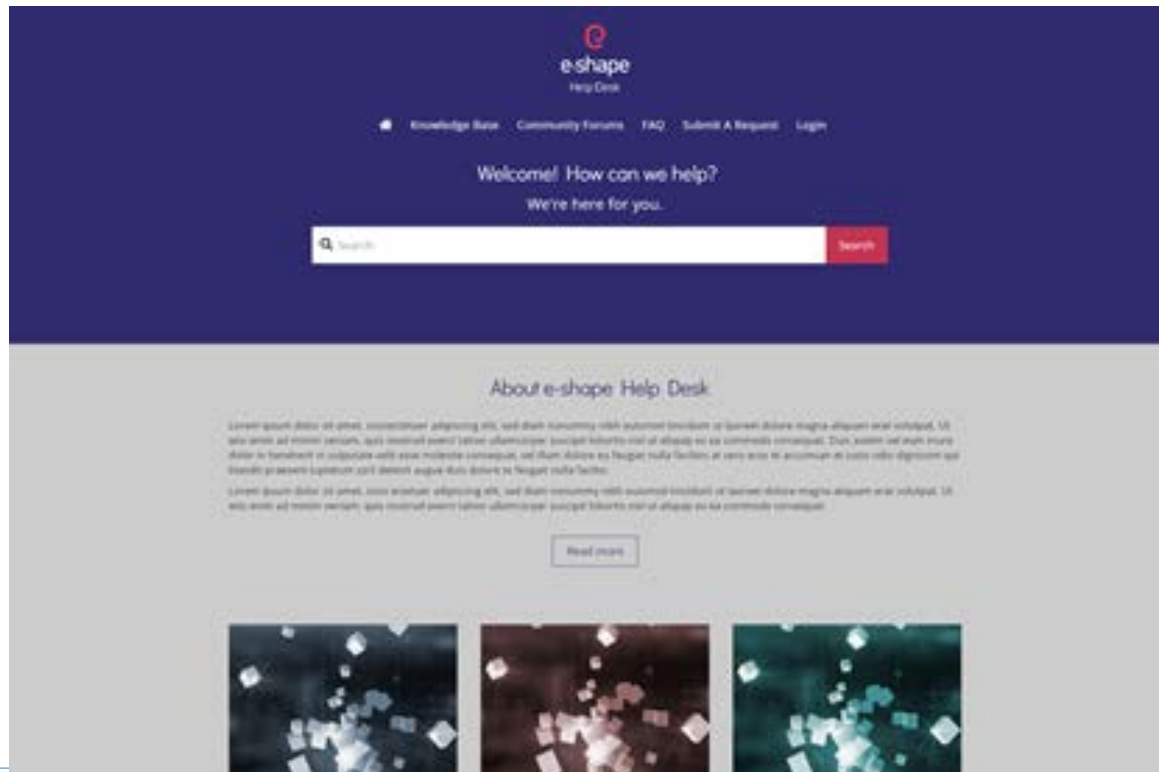
# e-shape's tools to support EuroGEOSS

## On-boarding process



# e-shape's tools to support EuroGEOSS

## Communication, Dissemination, Help Desk










The screenshot displays the e-shape Help Desk website. At the top, the e-shape logo is centered, with the text "e-shape Help Desk" below it. A navigation menu includes links for "Knowledge Base", "Community Forums", "FAQ", "Submit A Request", and "Login". The main heading reads "Welcome! How can we help? We're here for you." Below this is a search bar with a magnifying glass icon and a red "Search" button. The section titled "About e-shape Help Desk" contains two paragraphs of placeholder text and a "Read more" button. At the bottom, there are three decorative images showing abstract, glowing geometric shapes.

## e-shape supports EuroGEOSS

- co-designs and co-creates with end-users of EO based services.
- leverages existing distributed assets (DIAS, GEOSS Platform, NextGEOSS platform, EOSC, ..) for developing the pilots AND respects the Data Management Principles of GEOSS and GEO Standards & Interoperability Forum (SIF) recommendations on **interoperability** and being in compliance with the INSPIRE Directive.
- promote services in European and global markets through eMall acting as a **“window to the market”** for providers
- delivers a boost to the European EO sector acting as a **sustainability booster for market penetration support**.
- On-boards **new pilots** and offers them the support of our strategic activities



Thursday 04 July 2019					
	Library		Auditorium		Clocks Meeting room
9:00 - 10:30	Disaster Resilience		Agriculture/Food		Land Use/Land coverage
10:30 - 11:15	Coffee Break				
11:15 - 12:45	Platform and Data cube		Biodiversity & Ecosystems		Urban
11:45 - 14:00	Lunch Break				
14:00 - 15:30	Climate & Atmosphere		Best practices on how to involve users		Citizens Observatories
15:30 - 16:15	Coffee Break				
16:15 - 17:45	Posters session		Energy		Citizens Observatories
17:45 - 18:15	Posters session				
18:15 - 18:45	Feedback from the sessions				
20:00 - 21:30	Reception				





# EuroGEOSS Showcases: Applications Powered by Europe



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