WP23_25: GEO Vision for Energy

1250,168

Basic Information

Full title of the Initiative

GEO Vision for Energy

Short Title or Acronym

GEO VENER

Current category in the 2020-2022 GWP

GEO Initiative

Proposed category in the 2023-2025 GWP

GEO Initiative

Points of Contact

First Name	Last/Family Name	Email
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Purpose

Objective

to ensure a more efficient link between the renewable energy community and the GEO Community and to stress the benefits of Earth Observation (EO) data for decision-making in the development of renewable energies (RE).

Please provide a short description of the Initiative

The initiative aims at developping and promoting the use of EO to serve the development, the operation and the maintenance of RE systems. GEO-VENER built on the community portal Webservice-energy.org, to serve the development of RE by providing an easy interoperable and GEOSS compliant access to documented, precise, trustable (or bankable) data, observation, information, knowledge and services related to RE.

Why is this Initiative needed?

Development of RE is key for fighting against the global warning and to ensure the Transition towards an energetic system more sustainable and with less impact on the Earth system

What evidence is there to support this need?

Keeping the global temperature rise below 2 degrees Celsius (°C) is technically feasible and GEO-VENER will contribute to the 2015 Paris Agreement on Climate Change objectives. However, the global energy system must undergo a profound transformation, replacing the present system that is largely based on fossil-

fuels. The total share of RE must rise from around 18% of total final energy consumption (in 2015) to around two-thirds by 2050. Over the same period, the share of renewables in the power sector would increase from around one-quarter to 85%, mostly through growth in solar and wind power generation.

Is this Initiative open to participation by representatives of any GEO Member, Participating Organization, and GEO Associate?

Yes

Are you aware of other projects or initiatives at a global or regional scale (both in GEO and externally) that provide similar products or services?

No

Please identify the most important actual and/or intended outputs (products, services, etc.) produced by the Initiative, along with their intended and/or actual users. This list does not need to be comprehensive but should identify the outputs which are most used and are expected to have the greatest potential impact.

Output	Status	Users	Additional info
Copernicus Atmosphere Monitoring Service for Solar Radiation	Regularly updated	Commercial users, citizens, decision makers	http://macc.copernicus-atmosphere.eu/catalogue/#list?st=Solar%20radiation
compilation of resources in the catalogue of the energy community portal http://www.webservice-energy.org.	Regularly updated	Commercial users, citizens, decision makers	http://www.webservice-energy.org
Copernicus Climate Change Service for Energy	Regularly updated	Commercial users, citizens, decision makers	https://climate.copernicus.eu/operational-service-energy-sector
New European Wind Atlas" (NEWA)	Regularly updated	Commercial users, citizens, decision makers	http://euwindatlas.eu/
Series of tools and Applications dedicated to RE	Regularly updated	Commercial users, citizens, decision makers	http://www.webservice-energy.org/web-gis-client
series of RE pilots in the e-shape project	Regularly updated	Commercial users, citizens, decision makers	https://www.e-shape.eu/index.php/showcases/pilot3-2-high-photovoltaic-penetration-at-urban-scale
FlexiGIS	Regularly updated	decision makers for energy systems	Open source GIS-based platform for the optimisation of flexibility options in urban areas

If needed, please provide additional comments or explanation to accompany the outputs table

The genericity of the outputs provided by the initiative opens the floor to unknown use of the achievements of the initiative. As an example, improving the spectral description of the solar ressource (in Copernicus Atmosphere Monitoring Service) can lead to important information and services related to Photosynthetically Active Radiation (PAR) that are of great interest for Agriculture. This spectral description can also support activity related to health by providing information related to UVA and UVB that impacts on skin cancers, ...

What kinds of decisions are the outputs of this Initiative primarily intended to support?

Investment in RE systems, installation of RE systems, operation of RE systems, support to scenarios development of nergy system taking into account carbon neutrality

How will these decisions benefit from the outputs of this Initiative?

The initiative provides key knowledge on renewable resources, on prevision at different temporal (historical, short-term and climatological) and spatial resolutions for different energies (solar, wind, ocean, ...), on services related to renewable energies usages. From these sets of information the different users are able to take decisions on onvestment, scenarios of energy deployment, ...

What kinds of impacts (for example, reduced loss of life, monetary savings, conservation of biodiversity, etc.) are anticipated as a result of the use of the outputs of this Initiative?

Decrease of carbon in atmosphere with all its consequences. Reduction of fossils energies uses ie reduction of air pollution, reduction of loss of lifes, reduction of impacts on biodiversity, support to SDG7 objectives, contribution to the PAris Agreement, contribution to the development of resilient cities

Has this Initiative been asked to provide specific information (for example, reports, data, services) on an ongoing basis to an international convention, organization, or other multilateral body?

Yes

Please identify the requesting organization.

International Renewable Energy Agency (IRENA), International Energy Agency (IEA)

Describe the nature of the request.

IRENA: support to the Global Atlas for Renewable energies, IEA: Participation to the IEA Task 16 PVPS

Please provide supporting documentation of the request.

- no supporting documents provided -

Technical Synopsis

Please provide a brief description of the methods used by the Initiative to produce its (actual or planned) outputs.

Development of modeling of renewable energies resources (solar, wind, ocean, ...) based on EO data (including new sensors, new ioT, ...)
Development of renewable energies predictions models (solar and wind)
Development of shading modelling for solar energy in urban area
Development of renewable energy systems production for Climate change applications
Development of services related to renewable energies (see as example the showcase on renewable energy in e-shape)

If you would like to provide further details on the technical methods, you may upload one or more documents here.

- no supporting documents provided -

Are there any significant scientific or technical challenges that need to be resolved by the Initiative during the 2023-2025 period?

Yes

Please describe these challenges and the steps being taken to solve them.

Given access to all in-situ measurements (including Internet of Things and citizen observatories) related to renewable energies. This will require to disseminate standards and good practices in a large community and to increase the quality check of the measurements. The user needs should be also better taken into account. The co-design methodology developed in the e-shape project will support this challenge. Tackling the huge amount of data delivered through all EO (current and new) will be also a challenge. The Cloud-based approaches will help to tackle this one.

Does the Initiative expect to complete any key new outputs, improvements to existing outputs, or improvements to the methods of producing outputs, in the 2023-2025 period?

Yes

Please describe these new outputs or improvements.

P1. Development of a platform to access to In-situ solar networks - Time-series measurements 2. Development of services related to solar energy in urban areas 3. Development of services for solar and wind energy 4. Preparation of the use of new meteorological satellites (such as Meteosat Third Generation) for solar energy resources evaluation

Please identify the key tasks that must be implemented to ensure delivery of these changes, with target dates for completion.

Task	Task description	Expected completion (month/year)
Platform for solar in-situ measurements	Development of a platform dedicated to solar in-situ measurement and population of the database	12/2023
Services for solar energy in urban areas	development of dedicated services related to the use of soalr energy in urban areas	05/2023
Services for solar and wind energy	see description of the different services in https://www.e-shape.eu/index.php/all-pilots	05/2023

Resources

Have all resources required to implement the Initiative's planned work in the 2023-2025 period been secured?

- Gap in financial resources
- Gap in human resources

What is the estimated funding gap for the 2023-2025 period?

300 000 to 1 000 000 €

What are the essential skill sets needed by the Initiative but are not currently resourced?

May be some skills around resources mobilization (to fund dedicated activities in the intiative) and capacity

building and dissemination/communication

What actions is the Initiative taking to obtain the required resources?

Preparation of EU funded projects to support the activities and thematic supported by GEO VENER. Difficult to evaluate a funding gaps which is also depending of the gaps in human resources

Please list all financial and non-financial contributions to the Initiative (other than in-kind, voluntary participation by individual contributors) having a value of more than USD 50,000.

Contributing Organization	GEO Status	Type of Resource	Value	Currency
H2020 e-shape showcase on renewable energy	European Commission	Financial	900000	euros

Lessons from the 2020-2022 Period

Were all planned activities for the 2020-2022 period implemented as expected?

Yes

Were there any key challenges faced by the Initiative in the 2020-2022 period?

Yes

Please describe.

The governance issue was the key challenges for the initiative. One a the co-lead resigned and a lot it still to do about governance and animation of the initiative. A challenge for the coming period

Were there any impacts or changes to operations due to COVID-19?

No

Please describe the key changes proposed for the 2023-2025 period, for example, new projects, new areas of focus, or adjustments to the activity governance.

Re-organize the governance and animation of the initiative. Expand the geographical representation of the GEO members in the initiative

Does the Initiative have outputs (products, services, etc.) available to users now, even if only on a pilot or testing basis?

Yes

Please provide any available information describing this usage (for example, user statistics, results of user testing) and/or feedback from users (for example, user comments, evaluations).

Examples of applications/services can be found in http://www.webservice-energy.org/ and in the ID card of the pilots developped in the framework of e-shape https://www.e-shape.eu/index.php/showcases/pilot3-1-next sense-solar-energy-nowcasting-and-short-term-forecasting-system

Please provide supporting documentation if available.

- no supporting documents provided -

Do you have evidence of any impacts that have occurred in part as a result of using the outputs of the Initiative (for example, policy decisions taken, behaviour changes by users, risks mitigated)?

Yes

Please provide examples, with evidence where available.

As an example: All new development of solar farms in Europe are funded after a bankability analysis achieved by investors. These analyses and the due diligence achieved by bankers are done using solar radiation data derived from EO such as the one provided by solar service in CAMS.

Please provide supporting documentation if available.

- no supporting documents provided -

Have there been any internal or external reviews or evaluations of the Initiative since 2019?

No

Please indicate any GEO Work Programme activities with which you have ongoing collaboration.

- AFRIGEO - African Group on Earth Observations
- AMERIGEO - Americas Group on Earth Observations
- AOGEO - Asia-Oceania Group on Earth Observations
- CAMS - Copernicus Atmosphere Monitoring Service
- C3S - Copernicus Climate Change Service
- EO4MIN - Earth Observations for Managing Mineral and Non-Renewable Energy Resources
- EUROGEO - European Group on Earth Observations
- GEO-CRADLE - GEO Capacity Building in North Africa, Middle East, Balkans and Black Sea Region
- GEO-EV - GEO Essential Variables
- GEO Secretariat Operations - GEO Secretariat Operations
- GEO-VENER - GEO Vision for Energy
- GEOSS Data, Information and Knowledge Resources - GEOSS Data, Information and Knowledge Resources
- GEOSS Infrastructure Development - GEOSS Infrastructure Development
- NEXT-EOS - Next Generation Earth Observation Services
- GEO-VALUE - Understanding the Impacts and Value of Earth Observations

Please indicate any additional GEO Work Programme activities with which you would like to establish new collaborations.

- DE-AFRICA - Digital Earth Africa
- GUOI - Global Urban Observation and Information
- BLUE-PLANET - Oceans and Society: Blue Planet
- SCO - Space Climate Observatory

Stakeholder Engagement and Capacity Building

Are there specific countries or organizations that your Initiative would like to engage?

No

Does your Initiative engage users in the work of the Initiative (for example, consultation, testing, co-design)?

Yes

Please briefly describe the Initiative’s approach to engaging users.

During the development of services through co-design activities, in testing products and services

Does the Initiative have a user engagement strategy or similar kind of document?

No

Are there categories of users that are not represented at this time, but you would like to engage?

No

Does the Initiative have a documented capacity development strategy?

No

Please describe the approach to capacity development that is being implemented by the Initiative?

- no answer given -

Are there any commercial sector organizations participating in this Initiative?

Yes

Please list the commercial sector organizations.

Organization name	GEO Member/PO/...	Country in which the organization is based	City in which the organization is based
SMME in the energy domain	European Commission	Europe	
TotalEnergies	France	France	Paris

Are there opportunities for commercial sector uptake of the outputs of the Initiative?

Yes

Please describe these opportunities.

Some of the pilots and development are close to the market. The valorisation of these activities can be achieved through industrial collaboration.

Is there already commercial uptake occurring?

Yes

Please describe the nature of this uptake and the relevant commercial sector organizations.

As an examples solar radiation for users: see www.soda-pro.com

Are there opportunities for further commercial sector participation in the Initiative?

Yes

Please describe these opportunities.

GEO VENER is developping services and applications for renewable energies. Some of them can be further sell to companies and customers. Specific discussion should be conducted on the development of this

activities by the development team and the commercial sectors

Does the Initiative have a plan for commercial sector engagement?

Yes

Please describe this plan or upload the relevant document.

Activities in GEO VENER are focused on exploitation of EO data for Renewable energies. Since its inception, the initiative involved industrials users in its activities. This focus is still in the scope. This can be done through co-design of services with the commercial sector, through participation to industrial for

- no supporting documents provided -

Governance

Please describe the roles of each of the key leadership positions, as well as any team structures involved in day-to-day management.

This is the most important challenge for the initiative. Currently the lead is taking care of anything. Should be reorganized

Is there a steering committee or other governance bodies that advise the Initiative but are not involved in day-to-day management?

No

What methods does the Initiative use to communicate with its participants?

- Email / e-newsletters
- Other

Please describe.

irregular meetings

Please describe the key risks that could delay or obstruct the completion of the planned activities and outputs of the Initiative, along with any actions taken to mitigate these risks.

- no answer given -

What methods are used by the Initiative to monitor its effectiveness?

- Informal discussions with users / beneficiaries
- User or beneficiary surveys

Would the Initiative be interested in assistance from the GEO Secretariat for developing an impact plan?

Yes

How are the results of the monitoring and evaluation activities shared with participants and the wider GEO community?

Through the different GEO events during the year

Are any monitoring or evaluation activities required by funders/contributors?

Yes

Please describe and provide reports if available.

- no answer given -

- no supporting documents provided -

Participants

Please list the active individual participants in the Initiative

First name	Last name	Email address	Member	Org
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Other information

Please provide any other comments or information that was not included in the previous sections, but you would like to appear in the Implementation Plan.

- no answer given -

- no supporting documents provided -

Co-Editor Management

List of co-editors for this initiative

- no answer given -