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ECOWREX 2

Implementing a complete Spatial Data Infrastructure and improved Renewable Energy resources maps for supporting sustainable energy development

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Ecowrex2 SDI

Perspectives of new maps of energy consumption / potential of green energy production

Plan

1) Ecowrex2 SDI

- Introduction to SDI: Benefits of Implementation
- Ecowrex2 map viewer: demonstration of tools and functionality

2) Perspectives of new maps of energy demand / green energy production potential

2.1 - List of produced maps
2.2 - Discussion of the process and methodology
2.3 - Benefits of maps / demonstration of maps usability
2.4 - Future perspectives

1) Ecowrex2 SDI

Introduction to Spatial Data Infrastructure (SDI): benefits of Implementation

Data are the fuel for scientific analysis and decision-making

Data are the fuel to make scientific analysis and to support decision making process.
More that 50% of the time of scientists and decisions-makers is spent in searching data and information.
This is a waste of time, impending them to concentrate on analyzing data and taking good informed decisions.

There are a lot of geospatial data repositories.

However, they are heterogeneous, disconnected, hidden to users, and accessing them is often difficult.

The are stored in electronic silos of data and are not used efficiently.

Geospatial data are difficult to integrate

incompatibilities
(formats, models, ...)

missing documentation
(metadata)

data fragmentation
data replication

data policies

Spatial Data Infrastructure (SDI)

"an umbrella of policies, standards and procedures under which organizations and technologies interact to foster more efficient use, management and production of geospatial data"

- Policies & Institutional Arrangements (governance, data privacy & security, data sharing, cost recovery)
- People (training, professional development, cooperation, outreach)
- Data (digital base map, thematic, statistical, standards, place names)
- Technology (hardware, software, networks, databases, geospatial portals, technical implementation plans

An Spatial Data Infrastructure **(SDI)** can be seen as enabling environment that supports an easy access to and utilization of geospatial data.

SDIs are more than just data repositories.

They allow to discover, visualize, evaluate, and access geospatial data and information.

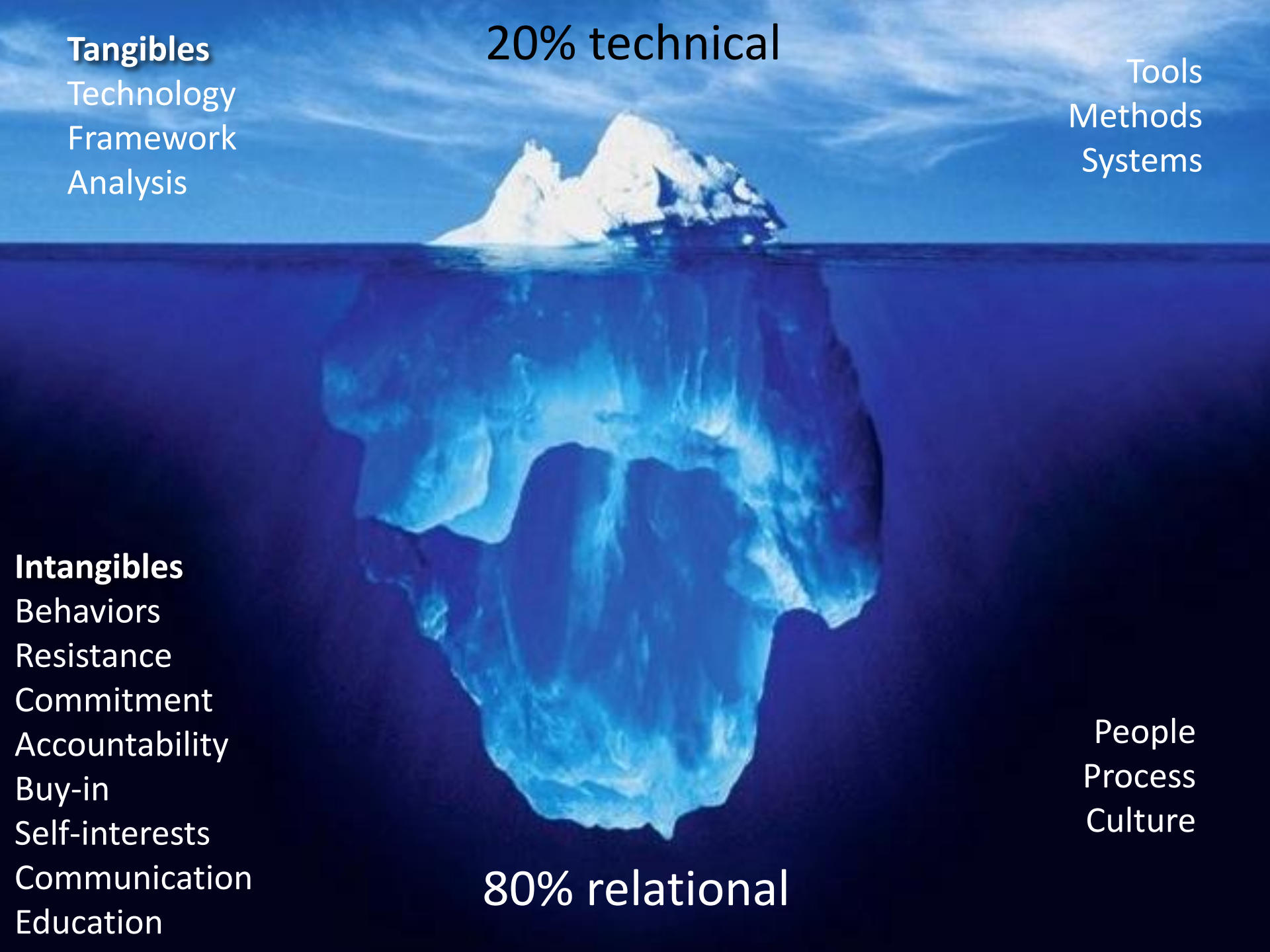
This is an environment where users can interact continuously with data. The objective is to bring data as close as possible of the users and answe to their needs.

“SDIs can be thought as social networks of people and organizations supported by data and technology”

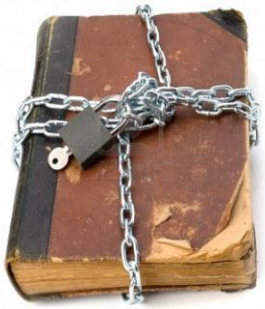
“Technology is cheap, data is expensive, but social relations are invaluable”

Craglia et al. (2009)

collaboration, cooperation, social relations


20% technical
Tangibles
Technology
Framework
Analysis
Tools
Methods
Systems
Intangibles
Behaviors
Resistance
Commitment
Accountability
Buy-in
Self-interests
Communication
Education
People
Process
Culture
80% relational

Unlock the power of data, information, and services



Data can be a shared resource

Through an SDI, data can be seen as a shared resource that can be exchanged with other domains and communities.

They are like pieces of a puzzle who will fit together and can be useful to different categories of users.

INFRASTRUCT.

We need to make resources coming from different platforms interoperable like to pieces of puzzle who can fit together.

“Interoperability is the ability of two or more systems or components to exchange information and to use the information that has been exchanged.
Interoperability facilitate the integration of data”.

INFRASTRUCT.

Interoperability

Standards, Standards, Standards, Standards, ...

To facilitate interoperability, several factors come into play.
But the most important is the STANDARD.

Standards are reference documents defining specifications and providing technical features to ensure interoperability between different components.

ISO International Organization for Standardization

CERTIFIED OGC® COMPLIANT

INFRASTRUCT.

OGC Making location count.

http://www.opengeospatial.org/

Web services available on Ecowrex2 viewer

Data

WMS 1.3.0

Web Mapping Service (WMS)

HTTP protocol for publishing a collection of layers as a map (PNG, JPEG)

WFS 1.1.0

Web Feature Service (WFS)

HTTP protocol for publishing feature collections that may be queried and updated by clients (features published as GML,…)

WCS 1.0

Web Coverage Service (WCS)

HTTP protocol for publishing "coverages" (multi-band raster data) that can be accessed by clients (GeoTiff, HDF)

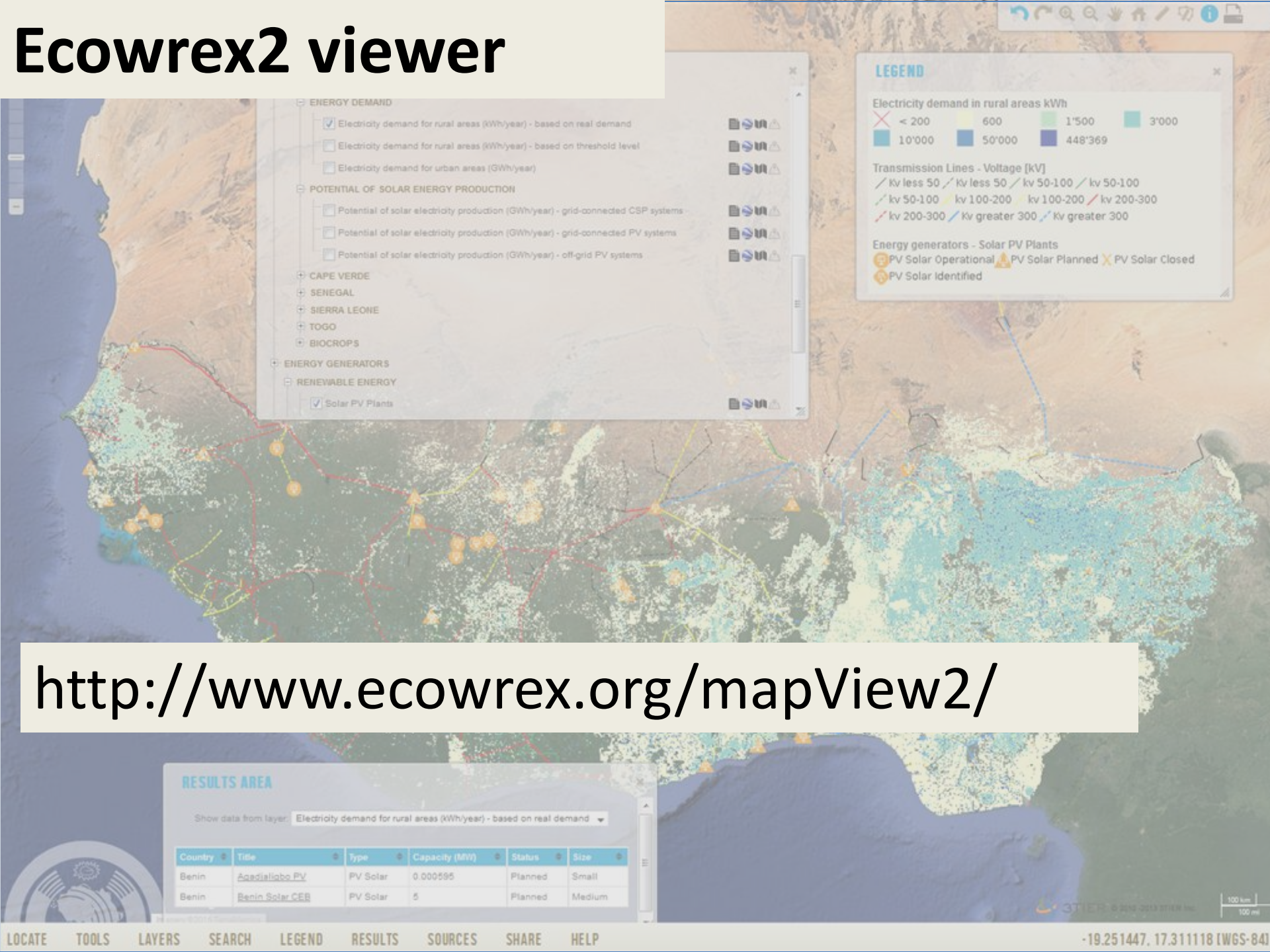
Metadata

CSW 2.0.1

Catalog Services for the Web (CS-W)

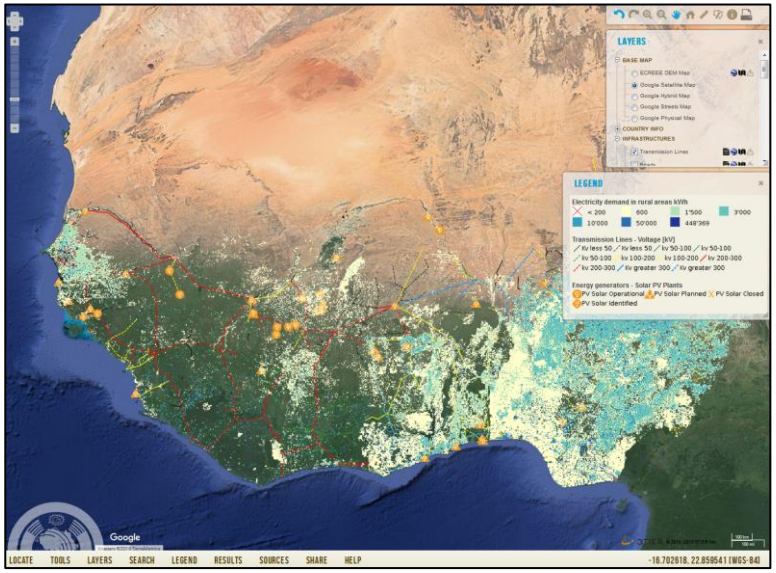
Defines several web interfaces for data discovery

Ecowrex2 viewer



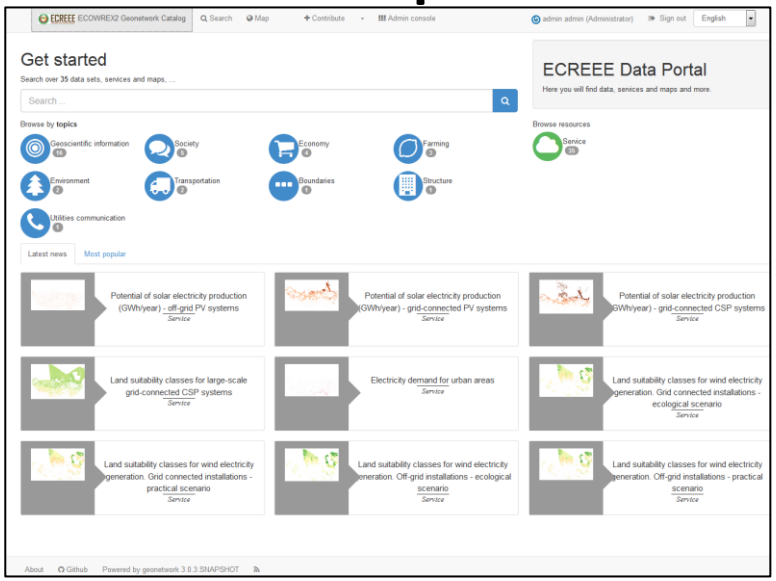
http://www.ecowrex.org/mapView2/

Viewer component

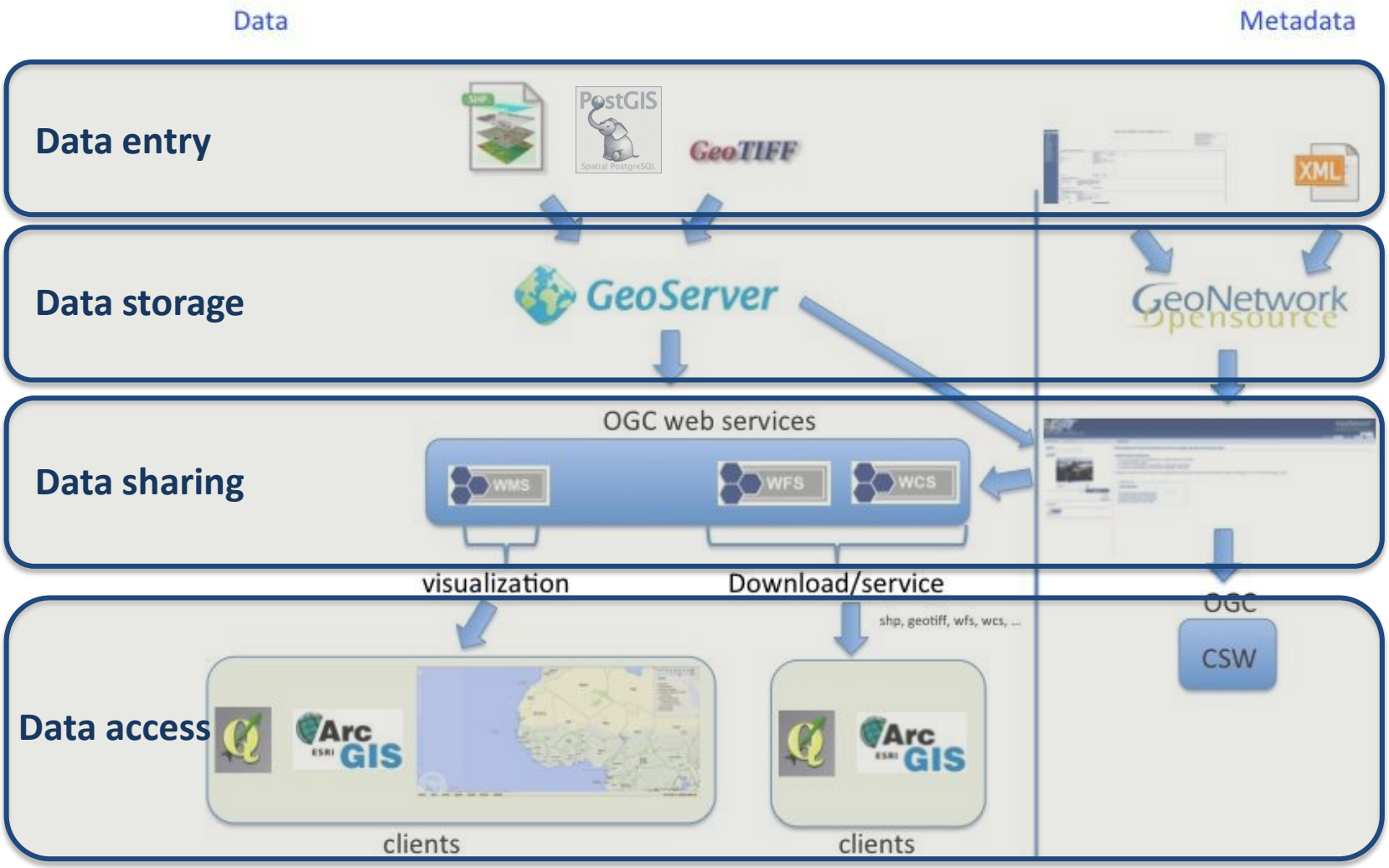


- Data visualization
- Data query
- Data download

Metadata component



- Advanced data search
- Data detailed information (metadata)
- Data visualization



From GeoServer, the data becomes available either for visualization (through WMS) in any client supporting the WMS standard, or for download (through WFS for vector files or WCS for raster files). In parallel, the GeoNetwork metadata catalogue is used for storing metadata for each layer

benefits of Implementation

- Support end-users
- Facilitate discovery and access of existing data
- Create and make available new data sets
- Contribute to data sharing initiatives like GEOSS

https://www.earthobservations.org/geoss_en_ph.shtml

GROUP ON EARTH OBSERVATIONS

Home > GEOSS > Strategic Targets > Energy > Progress and Highlights

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GEO Portal

Browse Earth observation data and services

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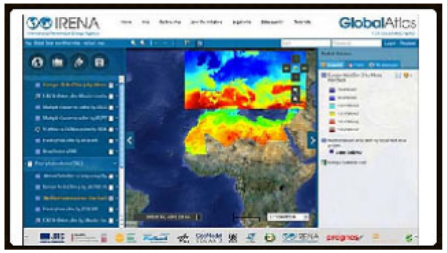
Energy: Progress & Highlights

Introduction | Energy Resources | Energy Access | Energy Efficiency | Data Access | Users

Renewable Energy

Renewable Energy activities of the GEO Energy Team include a wide range of renewable energy technologies from wind and solar to hydropower and bioenergy and both offshore and onshore. The products and tools developed facilitate evidence-based decision both of private and public sector.

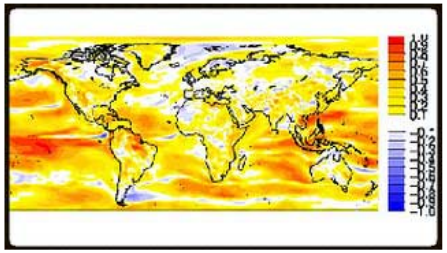


IRENA Global Solar and Wind Atlas

Global to National / Wind and Solar

The GEO Energy Team contributes to the development of the Global Renewable Energy Atlases for the International Renewable Energy Agency (IRENA) and more specifically the development, compilation and provision of data through web-portal and mapping tools (the catalogue service for the Web (CSW).

http://geocatalog.webservice-energy.org/geonetwork/srv/eng/main.home



Forecast of Wind Speed

Global to National - Private Sector / Wind

Global and country level forecast skill maps (Fig.3) to show the regions where there is potential to predict wind and solar resources over future timescales (e.g. monthly, seasonal, annual, multi-annual or decadal). The regions with high forecast skills also show where the risk of resource variability can be managed most effectively. [IC3]

http://www.ic3.cat/

Impact Assessment of Offshore energy

North Europe to National - Private Sector / Marine Energy

A portfolio of environmental performance maps enabling "geo-localized life cycle assessment" of offshore wind farms for different configurations provided via a Web Map Service (WMS). Currently, the application is online for the installation and operation of offshore wind farm in Northern Europe. Innovation: The user can choose the impact type (i.e. human health, climate change, ecosystem, resources), system lifetime

Spending more time in doing energy planning

... and less in searching data!