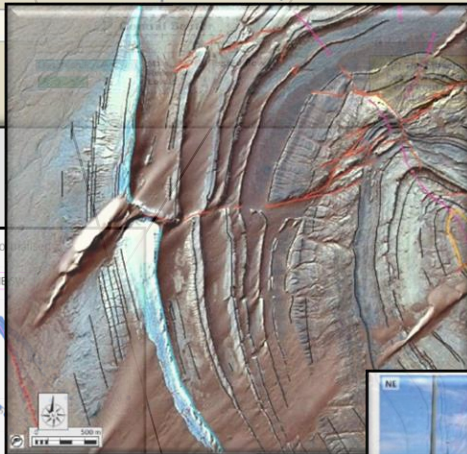
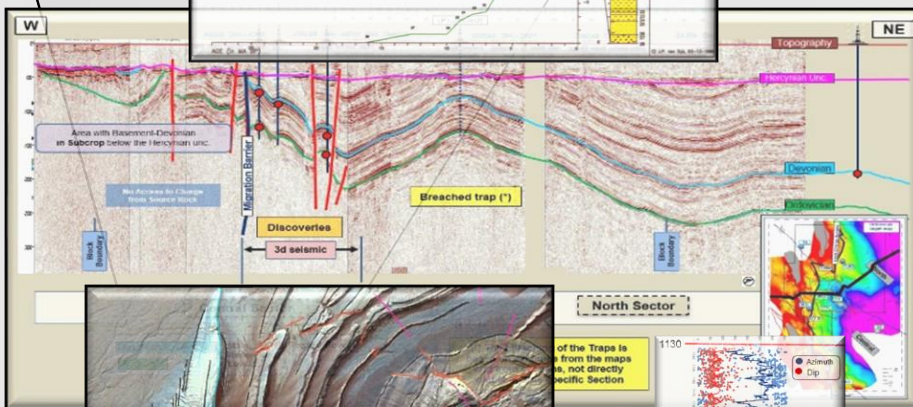
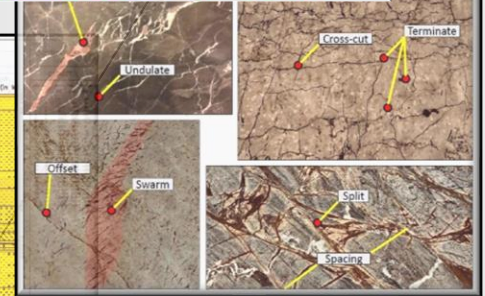
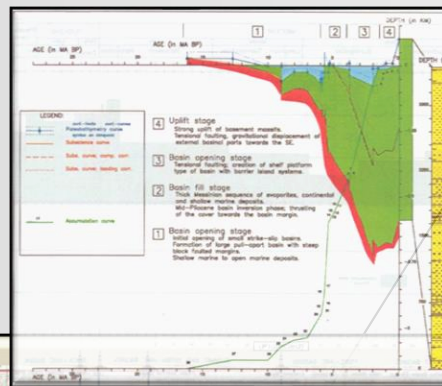
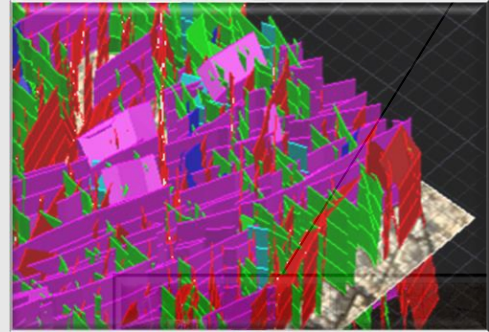


**Game Changing  
Cost Effective  
High Quality  
Tailor Made  
Efficient  
Unique**

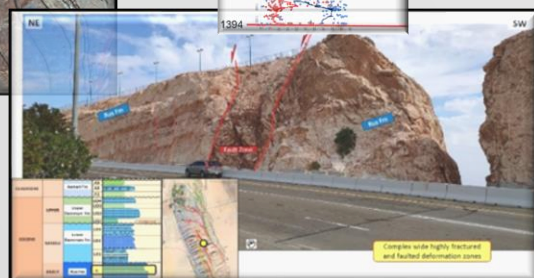
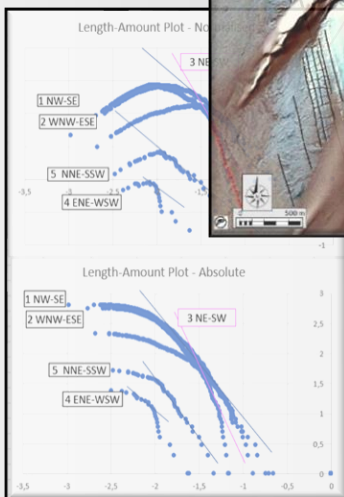
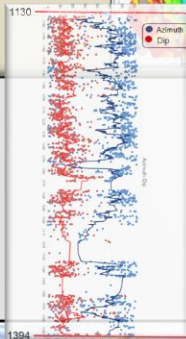


**OCRE**

**OGS - OCRE Geoscience Services**



of the Traps is from the maps, not directly specific Section



**OCRE**

**Contact**

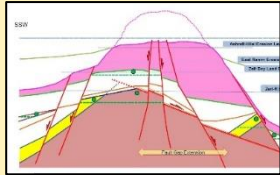
## What We Do

# Unique, Cost Effective and Best in Class Services in Geology, Engineering, and Geophysics

List

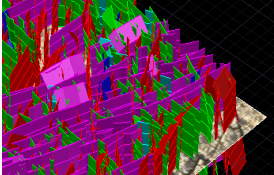
READ  
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Value



***CPR, Asset Portfolio & Opportunities  
evaluation, Geological Studies , Risk  
Management, CCS***

Technology



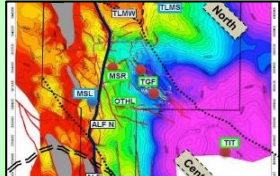
***Analyses and Modeling of Fractured and  
Faulted Reservoirs deploying unique new  
AI Tools (FMX<sup>SM</sup> -DMX<sup>SM</sup> Protocols)***

Efficiency




***Data Base and Library Management  
Applying Straight-forward Desk-top  
Based Principles***

Reliability




***Seismic Interpretation and Mapping,  
Well Logs Evaluation, Prospect  
Generation, Risking and Ranking***

Science



***Real or Virtual Geological Fieldtrips  
Including Unforgettable In-depth  
Learning Experiences***

Team Work



***Training Courses, Team Building and  
Incentives, for Starter or Advanced Level,  
Online, On Site or in the Classroom***

OCRE strongly believes in the application of Best Practicing in Geological, Geophysical and Engineering studies and operational activities. The following is a list of 30 Typical Projects Categories, and a summary of the different Tasks and Activities involved in these projects (next page), extracted from the OCRE Best Practice Management System (BPMS) which our World-wide experts Excellency Network applies, and which specifications are continuously being updated and enhanced following new

**Geology:**

- Territorial Management – Geographic Information Systems (GIS)
- Drone Site Surveys (UAV; Unmanned Aerial Vehicles) – 3dmodeling
- Micro seismicity studies and monitoring
- Earthquake analyses and Modelling
- Remote Sensing Acquisition, Elaboration and Interpretations including InSAR
- Terrain Subsidence-Uplift Studies
- Analyses and Modelling of Faulted and Fractured Rocks
- Geological Field Work s.l.
- Core Studies, Conventional and Special, Geomechanics
- Seismic Interpretation, Mapping, and 3d Structure Modelling

**Geophysics:**

- Offshore High-Resolution Geophysical site-surveys
- Magnetotelluric (MT) studies
- Seismic Acquisition, Planning, and (re)Processing
- Well Bore Seismics
- Grav-Mag Acquisition and Modelling

**Portfolio Management:**

- HC and Mining - Prospect Generation, Risking and Ranking
- Asset Evaluation, Peer Reviews, Economics, QC, Competent Person's Reporting

**Engineering:**

- Well Drilling, Logging, Completion and Work-over
- Log interpretation, Petrophysics, and Modelling
- Reservoir Modelling, Production Planning
- Facilities Planning and Management
- Civil Engineering Planning, Construction and Management

**IT:**

- Data management, Library and archiving, data conversion
- Cloud, Big Data, AI, ML, Coding and Development
- 3d Computer Modelling, 3d scanning and printing, CAD-CAM & Digital Twins

**HR:**

- Organisation Analyses
- Job Description, Gap Analyses
- Training
- Incentives – Team Building
- PR, Promotion, Image Building

[READ  
MORE](#)



## Section A – Information, Data Management, Projects

### Task A.1 Information

#### Activity A.1.1 Data Management and Storage

Geophysical, Geological and subsurface information  
Vintage, Industrial, and Scientific Information  
Small Data and Big data

### Task A.2 Projects

#### Activity A2.1 Project Set-Up

Seismic Interpretation Environments (SIE)  
Geographic Information Systems (GIS)  
Dynamic Simulation Systems  
Special Tasks Systems

## Section B – Geological & Geophysical and Other Technical Studies

### Task B.1 Geological Model

Activity B.1.1 Data Collection and Regional framework  
Activity B.1.2 Reconstruction of the Plate Tectonic Setting  
Activity B.1.3 Reconstruction of the Stratigraphic Framework  
Activity B.1.4 Structural Modelling  
Activity B.1.5 Description of the Basin Evolution  
Activity B.1.6 Definition of the Petroleum System & Play Concepts  
Activity B.1.7 Reconstruction of the E&P Activity and Hydrocarbon Potential  
Activity B.1.8 Field Geological Studies

### Task B.2 Remote Sensing & Surface Studies

Activity B.2.1 Geological Interpretation on Satellite Photography  
Activity B.2.2 Field Geology Studies

### Task B.3 Grav/Mag Interpretation

Activity B.3.1 Grav/Mag Interpretation

### Task B.4 Seismic Studies

Activity B.4.1 Seismic to Well Tie  
Activity B.4.2 Seismic Interpretation  
Activity B.4.3 Velocity Modelling

### Task B.5 Well Data Studies

Activity B.5.1 Vintage Wells  
Activity B.5.2 Log Correlation  
Activity B.5.3 Cores & Cuttings  
Activity B.5.4 Special Core Analyses  
Activity B.5.5 Petrophysical Studies  
Activity B.5.6 Well Test & Fluid Analyses  
Activity B.5.7 Subsurface Conditions

### Task B.6 Shared Earth Model (SEM)

Activity B.6.1 Seismic Mapping  
Activity B.6.2 3d Modelling

### Task B.7 Post well evaluation

Activity B.7.1 Post Well Evaluation

## Section C. Operations

### Task C.1 Grav/Mag Acquisition & Processing

Survey design  
Acquisition & In Field Processing

### Task C.2 Seismic Acquisition & Processing

2d & 3d Seismic Survey Design  
Seismic Acquisition Execution Phase  
Seismic (Re)Processing

### Task C.3 Well Drilling, Completion & Production

Well Planning – Well Initiation Document (WID)  
Well Delivery  
Execution phase (Monitoring, Steering)

### Task C.4 Field Geological Studies

## Section D. Models (Leads, Prospects, Reservoirs; Volumes, Risks, Models)

### Task D.1 Prospect Generation & Evaluation

Activity D.1.1 Prospect Definition  
Activity D.1.2 Prospect Volumetric Calculation  
Activity D.1.3 Prospect Risking and Ranking

### Task D.2 Reservoir Modelling

Activity D.2.1 Static Modelling  
Activity D.2.2 Dynamic Modelling

### Task D.3 Asset Evaluation - CPR

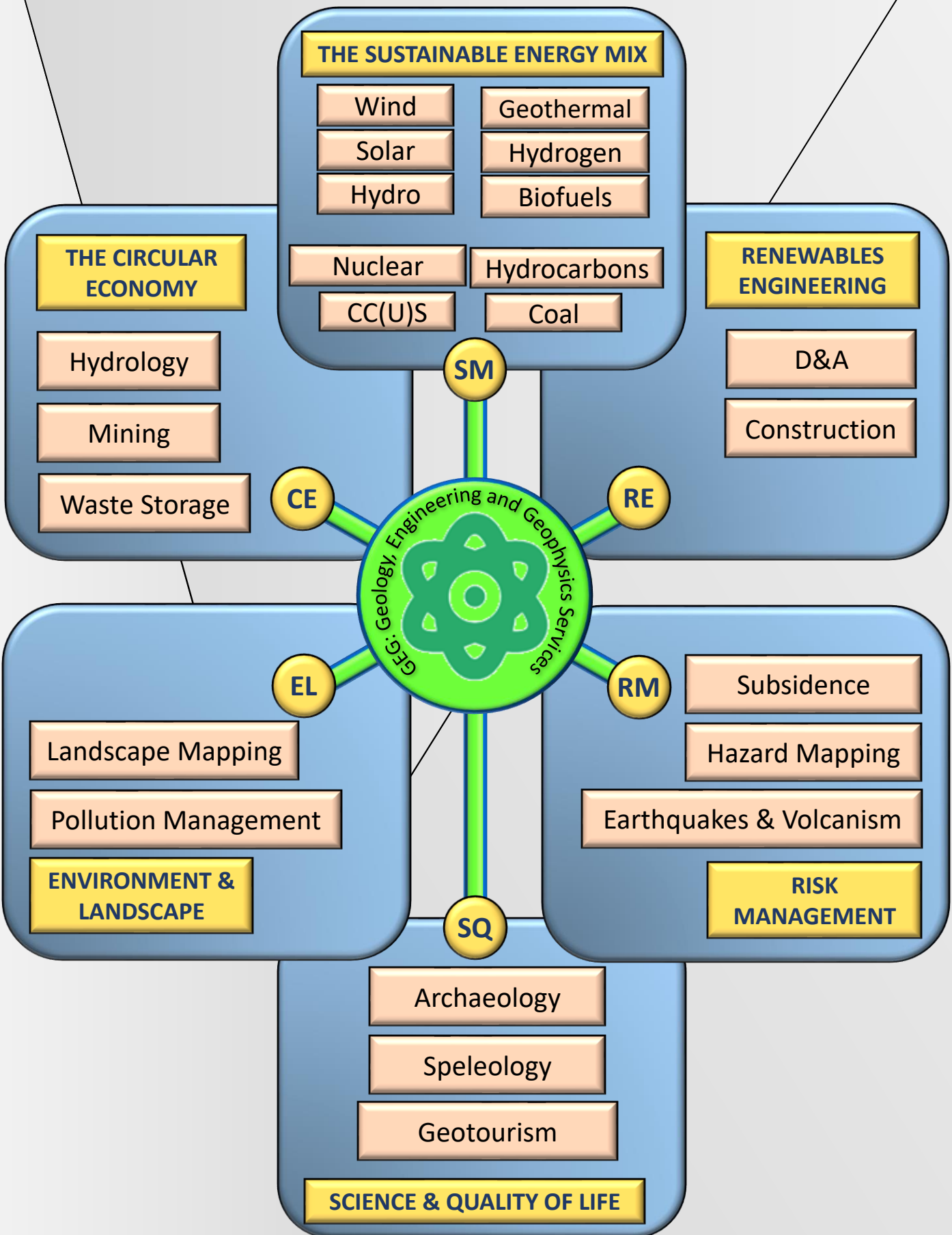
Activity D.3.1 Asset Description  
Activity D.3.2 Asset Economic Evaluation

**READ  
MORE**

## **Where the Services are Applied**

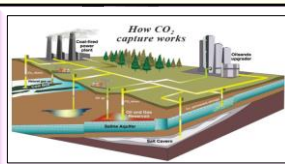
# Realms and Sectors

## The Geoscience Landscape of the Transition Era

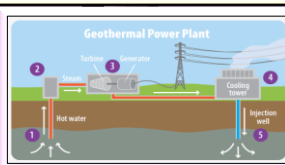


**SM**

## THE SUSTAINABLE ENERGY MIX



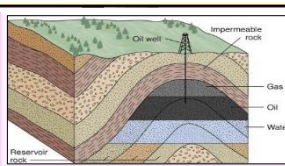
### ***SM.1 - CCS Carbon Capture and Storage (Aquifer, Cushion Gas, EOR, EGR)***



### ***SM.2 - Geothermal Energy Generation (volcanic areas, mines, aquifers)***



### ***SM.3 - Hydrogen Generation and Storage***



### ***SM.4 - Hydrocarbon Exploration and Production***

#### ***Realm SM - THE SUSTAINABLE ENERGY MIX***

The key word of the recent Yesterday, and of the New Normal of Today: A Sustainable Energy Mix to support our society, our industry, transport and households, (lighting, heating, cooking, air conditioning, machinery, locomotion, etc. etc.). How to conduct this Decarbonisation to arrive at “Net Zero” and how this Mix should look like and what it will be composed of is subject of a lively debate: Three renewable sources are already in place: HydroEnergy, Geothermal sources, and Solar Energy. Using Hydrogen is still under development, although only the black version which uses Oil or Natural Gas to produce Hydrogen is well on the way. In the meantime, the other, conventional and non-renewable sources, such as Nuclear Power, Hydrocarbons, and various types of Coal are still providing the main part of our electricity. But these generate waste such as CO2 and nuclear waste, that needs to be disposed of.

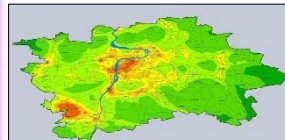
To examine all the Tasks involved in this Sector, the [OCRE Geoscience Services GEG List](#) can be consulted.



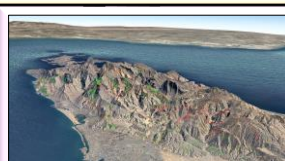
# The Geoscience Landscape of the Transition Era

[Intro](#)[Services](#)[Sectors](#)**EL**

## ENVIRONMENT AND LANDSCAPE



### ***EL.1 - Environmental Pollution Control***



### ***EL.2 - Landscape and Territorial Mapping (Planning, Authorities Management)***

#### ***Realm EL - ENVIRONMENT AND LANDSCAPE***

Our vulnerable, but in the same time also resilient Planet Earth is subject to a number of changes due to an interplay of factors related to Natural occurring secular and periodic changes, and Human Induced modifications. The monitoring of the landscape on all scales and its critical hazards is one of the most important tasks of the geoscientific community, and the development of related engineering solutions has become a technological challenge for the decades to come.

OCRE identifies a series of specific Sectors where the geoscientific and engineering community will be able to offer fundamental support, which are focussing on pollution control and landscape mapping. The other services directly related to the Risk Management such as seismicity, landslides, volcanism, are discussed on the relative Page.

To examine all the Tasks involved in this Sector, the [OCRE Geoscience Services GEG List](#) can be consulted.

# The Geoscience Landscape of the Transition Era

[Intro](#)[Services](#)[Sectors](#)**CE**

## THE CIRCULAR ECONOMY



### ***CE.1 - Underground Water Management; Hydrology***



### ***CE.2 - Mineral Resources - Mining; Landscape Management***



### ***CE.3 - Waste Disposal (Nuclear & Chemical Waste)***

#### ***Realm CE – THE CIRCULAR ECONOMY***

The Circular Economy as a concept calls for recycling as much as possible materials that we extract from Mother Earth such as through mining, extracting of geofluids and gases such as water and hydrocarbons, for our energy generations, transport devices, products manufacturing, agriculture, just to name a few. This calls for the deployment of all necessary new technology especially in Chemistry, with, alongside, a conscious meticulous management of the waste products, from small scale in our households up to the large scale in industry and agriculture.

New processes need to be put in place to convert already used and previously processed materials back into usable crude substances, which in many cases shows the need of introducing other specific chemical substances and especially large amounts of energy. Verifying whether or not these processes are both sustainable and low-carbon is one of the main difficult tasks for the near future.

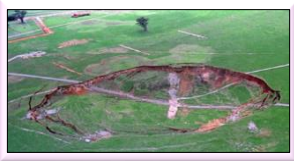
Geosciences, Engineering and Geophysics all play fundamental roles in making the Circular Economy principle a success, and our Global Experts Network is implied in various projects regarding many sectors that are involved.

To examine all the Tasks involved in this Sector, the [OCRE Geoscience Services GEG List](#) can be consulted.

# The Geoscience Landscape of the Transition Era

[Intro](#)[Services](#)[Sectors](#)**RM**

## RISK MANAGEMENT



***RM.1 - Subsidence Monitoring  
(Natural, Fracking, CCS, HC Production)***



***RM.2 - Landscape Hazard Mapping  
(Floods, Landslides, Tsunami)***



***RM.3 - Seismic Hazard Mapping  
(Earthquakes, Volcanic Activity)***

### ***Realm RM – RISK MANAGEMENT***

Managing the natural risks related to the environment we are living has since always been one of the focus points of Human Society. These can be related to atmospheric conditions, flora and fauna, and the landscape itself, all obviously strongly related, and they can be connected to our housing, energy and food supply, and any other condition that affects the quality of lives. A challenge is to identify, manage, and mitigate the influence of human activities on these natural causes and events, and Geoscientist, and Engineers are the focus points when it comes to the risk management related to the landscape, which may involve direct hazards such as earthquakes, volcanism, landslides, and floods, or indirect risks due to the impact of atmospheric and biological factors on agriculture and other activities.

To examine all the Tasks involved in this Sector, the [OCRE Geoscience Services GEG List](#) can be consulted.

# The Geoscience Landscape of the Transition Era

[Intro](#)[Services](#)[Sectors](#)**RE**

## RENEWABLES ENGINEERING



### ***RE.1 - Civil Engineering: Onshore and Offshore Construction***



### ***RE.2 - Decommissioning and Abandonment; Industrial Archaeology***

#### ***Realm RE – RENEWABLES ENGINEERING***

Entering in the New Transitional Area of a Sustainable Energy Mix, applying all our resilience capacities, New Technology deployment in Engineering is clearly accelerating. In this case we are of course thinking about Robotics and Machine Learning, Artificial Intelligence, new Material Science applications, etc. in order to manage time, budget and HSSE constraints in the building of Geothermal, Hydro Power, Wind Power, and Solar Power Plants, both onshore and offshore. But not only. The applications of CCUS (Carbon Capture, Usage and Storage), storage of other Waste products, and, most important, the reconversion or dismantling of old Industrial Facilities will play a major role.

And Earth Sciences, be it Geology or Geophysics, is, as usual, heavily involved in all these activities, and the experts of OCRE's Global Excellency Network are working in numerous projects that regard Renewables and Industrial Conversion.

To examine all the Tasks involved in this Sector, the [OCRE Geoscience Services GEG List](#) can be consulted.



# The Geoscience Landscape of the Transition Era

[Intro](#)[Services](#)[Sectors](#)**SQ**

## SCIENCE – QUALITY OF LIFE



***SQ.1 - Archaeology, History,  
Architecture, Museology***



***SQ.2 - Speleology***



***SQ.3 - Geotourism - Education -  
Incentives - Geosites – Stakeholders***

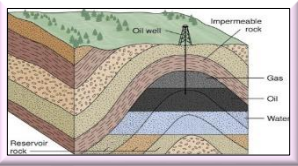
### ***Realm SQ – SCIENCE and the QUALITY OF LIFE***

Science and the Quality of Life. We in OCRE believe that should actually be a slogan of the New Normal: From Science to Technology to the Wellbeing for All. The ongoing interaction between Science, Technology and Society can be translated in our case into Geoscience, Engineering and Business drivers. And where it comes to Science, geologists and geophysicists working in the Energy and Resources Sector have always been highly involved in projects that transfer knowledge from research institutes to industry and visa-versa. Because the main stake-holder of all activities is located inside the community itself.

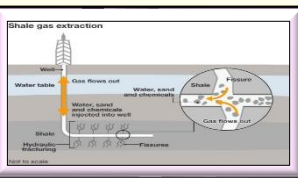
To examine all the Tasks involved in this Sector, the [OCRE Geoscience Services GEG List](#) can be consulted.

**HQ**

## HYDROCARBONS – CONVENTIONAL AND UNCONVENTIONAL



### ***HQ.1 - Oil and Gas E&P New Ventures, Exploration, Production***



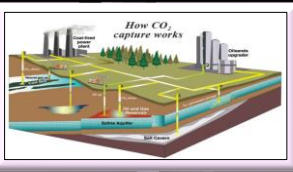
### ***HQ.2 – Unconventionals - Shale Gas Fracking, Microseismicity, Subsidence Analyses and Modeling***



### ***HQ.3 - Oil & Bitumen Surface Mining and Tunnelling***



### ***HQ.4 - Hydrates To Methane***



## Sector SM.1 - Carbon Capture Usage and Storage

### Sector SM.1 - Carbon Capture (Usage) and Storage (Aquifer, Cushion Gas, EOR, EGR)

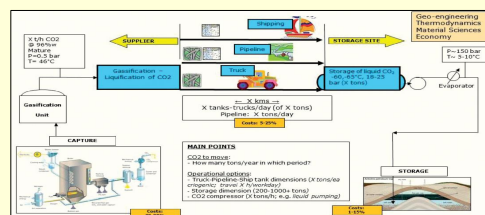
It is now established that one of the options to mitigate for Climate Change and enter into the New Era of Sustainable Energy Mix is the Capture of Carbon of CO<sub>2</sub> at the source, and the successive underground Storage in depleted Oil and Gas Reservoirs, in saline Aquifers, or in Coal layers that were previously mined. Several experiments have already been conducted in the past with variable success. The CCUS, instead, Carbon Capture, Usage and Storage, has been applied since decades in the United States in EOR (Enhanced Oil Recovery) projects, where the CO<sub>2</sub> is used to boost up the production in older Oil and Gas reservoirs, as an alternative to water or steam injection.

First of all, we need to understand where the CO<sub>2</sub> comes from and how it can be captured, using various filters. At present, CO<sub>2</sub> is generated through the burning of conventional sources such as Coal, Oil and Gas, for electricity generation, heating, and transport in the Public sector, and mostly in Refineries and in the Steel and Cement Industry in the Private sector. The CO<sub>2</sub> can be captured with special filters and needs to be purified before transporting it for underground storage. Obviously in the evaluation of transport what needs to be considered is the distance between the source and the site where storage can be conducted, and the type of transport needed (pipelines, rail, shipping, trucking, etc.). This obviously calls for enormous steps in the development of technology, logistics, engineering and legislation. But the involved costs can be leveraged by using the CO<sub>2</sub> as Cushion Gas for Gas storage fields, or for Enhanced Oil or Gas recovery from brown fields (EOR/EGR).

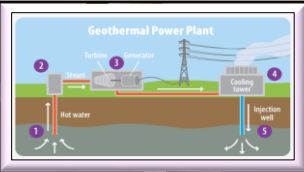
Another solution which is being studied, revolutionary as it may sound, is Direct Air Capture (DAC) of CO<sub>2</sub> using special membranes (a process now still involving considerable energy consumption), which would avoid the transport problems, but would not mitigate directly for the CO<sub>2</sub> producing facilities.

Studying the geo-sites for storage potential evaluation, and their additional potential for applying Cushion Gas or EOR/EGR, is the among the main CCS task OCRE believes Geoscientists needs to be massively involved in, to evaluate all the options applying decades of G&G experience in the field of analysing and modelling subsurface reservoirs of all types, and our worldwide experts Network of Excellency is already working on various options and projects.

To examine all the Tasks involved in this Sector, the [OCRE Geoscience Services GEG List](#) can be consulted.



The complete Carbon Capture and Storage Flow Chart. From: [van Dijk \(2012\)](#).



## Sector SM.2 - Geothermal Energy (volcanic areas, mines, aquifers)

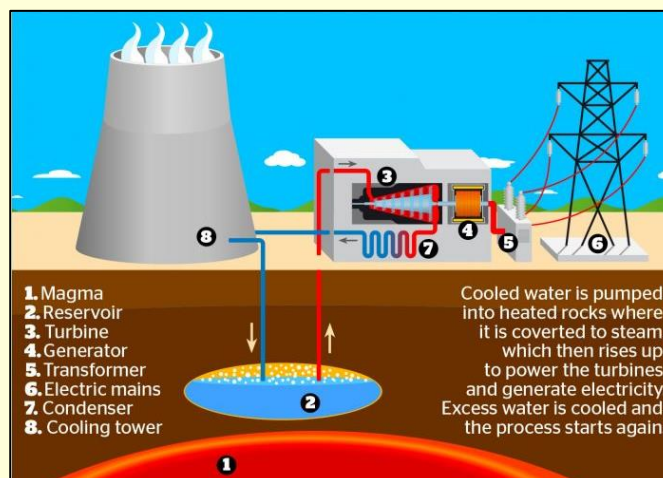
### Sector SM.2 - Geothermal Energy Generation (volcanic areas, mines, acquirers)

The generation of Geothermal Energy is one of the key options in the application of Renewable Resources to be applied in the New Era of Sustainable Energy Mix. For the moment, main efforts have been focussing on the areas with high natural geothermal gradients (mainly volcanic areas). Some of these are already producing energy such as in Italy (Monte Amiata, Larderello / Travale / Radicondoli, Grosseto, Pisa and Siena). One of the major issues with these volcanic sites in other countries is that they are often remote, and the transport of the produced electricity or the heat itself can be subject to large losses. Studies should focus on the inventory of geothermal springs, regional heat flow mapping, Gas geochemistry of thermal springs, heat flow modelling, etc.

Another option is the usage of old mines (e.g. coals mines), which possess networks of deep shafts which are often filled with warm water and could be converted to geothermal energy generating sites refurbishing the old engineering networks.

Studying potential sites and mapping regions for possible applications, are among the main tasks OCRE believes Geoscientists needs to be massively involved in, to evaluate all the options, applying decades of G&G experience in the field of analysing and modelling subsurface reservoirs of all types, and evaluating territories, and our worldwide experts Network of Excellency is already working on various options and projects.

To examine all the Tasks involved in this Sector, the [OCRE Geoscience Services GEG List](#) can be consulted.



Geothermal Energy Generation. From: [Steve McClure \(2019\)](#)





## Sector SM.3 - Hydrogen Generation and Storage

### Sector SM.3 - Hydrogen Generation and Storage

The generation of Hydrogen to successively use as a source for electricity is one of the key options in the application of Renewable Resources to be applied in the New Era of Sustainable Energy Mix.

Hydrogen can be generated in the following ways:

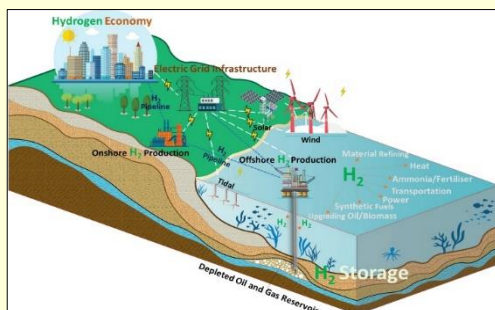
- 1) Green Hydrogen, generated through the electrolyse of water, using renewable power (Wind Power, Hydro-Power, Solar Energy);
- 2) Hydrogen generated through the transformation of Oil, Natural Gas (Methane), or Coal which therefore generates CO<sub>2</sub>, and therefore has 2 options:
  - 2a) Blue Hydrogen, which involves CCS, and
  - 2b) Grey/Black Hydrogen without CCS.

Only the latter option is at the moment conducted, the other options are part of studies and projects.

An important option under investigation is the storage of Hydrogen that can be generated by installations applying other sources of renewable energy such as Hydro-Power or Wind Power in underground reservoirs. This can be depleted Oil and Gas fields, onshore or offshore. What needs to be considered is the transport route between the generation of the hydrogen and the storage facility, costs and engineering technologies involved.

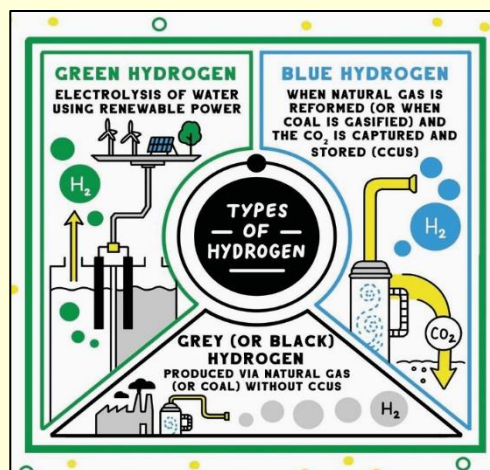
Studying the potential geo-sites for the Hydrogen storage is among the main tasks OCRE believes Geoscientists needs to be massively involved in, to evaluate all the options, applying decades of G&G experience in the field of analysing and modelling subsurface reservoirs of all types, and our large network of Excellency is readily available for all Hydrogen Storage projects.

To examine all the Tasks involved in this Sector, the [OCRE Geoscience Services GEG List](#) can be consulted.

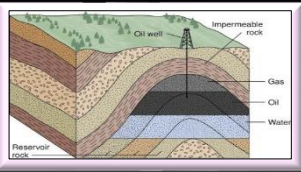


*The Hydrogen Economy.*

From: [Haasanpouryouzband et al. \(2021\)](#).



*Types of Hydrogen usage for Electricity Generation. From: BP, in [Underhill \(2021\)](#).*



## Sector SM.4 - Hydrocarbon Exploration and Production

### Sector SM.4 - Conventional and Unconventional Hydrocarbon Exploration and Production

As is evident during the New Era of Sustainable Energy Mix the involvement of Hydrocarbons is for variable reasons, especially during the transition period, of crucial importance. The tendency to apply more and more Natural Gas instead of various types of Crude Oil is already on its way since a decade, as can be appreciated from the massive developments in the fields of LNG generation and transport. Obviously, the application of hydrocarbons in Transport, Heating and Electricity generation involves the generation of CO<sub>2</sub> for which the main solution foreseen is the Capture and Storage in underground saline aquifers or depleted fields, or the application in EOR/EGR or cushion Gas. Furthermore, hydrocarbons are continuously foreseen to play a role in the generation of materials of the industrial processes to create batteries, or other primary materials needed for the construction of renewable energy generation devices (plastics, paints, etc.), which implies a massive effort in sustainable geochemistry and down- to midstream engineering.

Therefore, new developments work in the direction of Clean Hydrocarbons (for which different chemical frameworks are under development), together with resource renewal which implies regeneration of the resource pools, to reduce extraction, consumption, and pollutants, which needs changing and transforming the material supply chains with an enormous economic impact.

OCRE strongly believes in the continuous need for expert Geoscientists, Engineers and operational staff, and the application of decades of experience in the field of analysing and modelling reservoirs, Geophysical Operations, and Well Site operations. Our large world-wide network of Excellency is readily available for all New Venture, Exploration, Appraisal and Production Projects, both in specialised studies as well as in the issue of Competent Persons Reports for the evaluation of Assets, Peer Reviews, and Due Diligence.

We foresee 4 specific SubSectors of application in the Sector of Hydrocarbon Exploration and Production (see our dedicated Page):

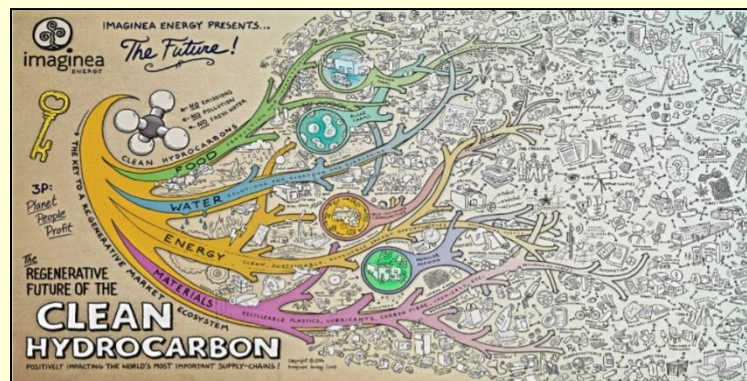
HQ.1 - Oil and Gas: E&P; New Ventures, Exploration, Production

HQ.2 - Unconventionals: Shale Gas; Fracking, Microseismicity, Subsidence Analyses and Modelling

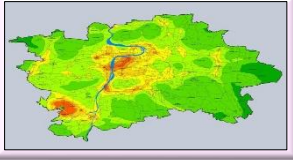
HQ.3 - Bitumen: Surface Mining and Tunnelling of Bitumen

HQ.4 - Hydrates: From Hydrates To Methane

To examine all the Tasks involved in this Sector, the [OCRE Geoscience Services GEG List](#) can be consulted.



The concept of Clean Hydrocarbon. From: [Imaginea \(2017\)](#)



## Sector EL.1 - Environmental Pollution Control

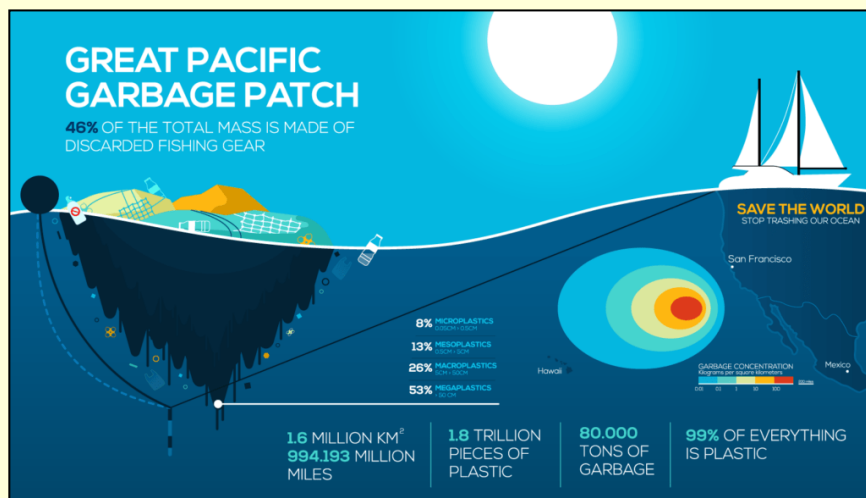
### EL.1 - Environmental Pollution Control

Industrial activity, whether renewable, sustainable, resilient, conventional or unconventional, the risk of environmental pollution is a reality that Mankind has been facing since the advents of the Industrial Revolution. Not only concentrated in industrial sites, but in many cases distributed over larger, onshore and offshore territories.

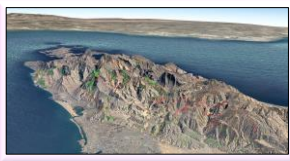
Why not take the [Great Pacific Garbage Patch \(GPGP\)](#) as a typical example of an anonymous, large scale environmental risk where complex solutions with international and financial repercussions need to be proposed and new technologies applied to arrive at a reversal of the situation back to normal.

OCRE strongly believes that applying the Geoscience experience accumulated over decades in various industrial sectors, can make a huge difference and provide fundamental insight needed to understand the processes and cycles governing the Earth System, necessary to perform a controllable recovery from environmental pollution, and our worldwide experts Network of Excellency is already working on various options and projects.

To examine all the Tasks involved in this Sector, the [OCRE Geoscience Services GEG List](#) can be consulted.



The Great Pacific Garbage Patch as an example of Environmental Pollution. From: [GTS \(2018\)](#).



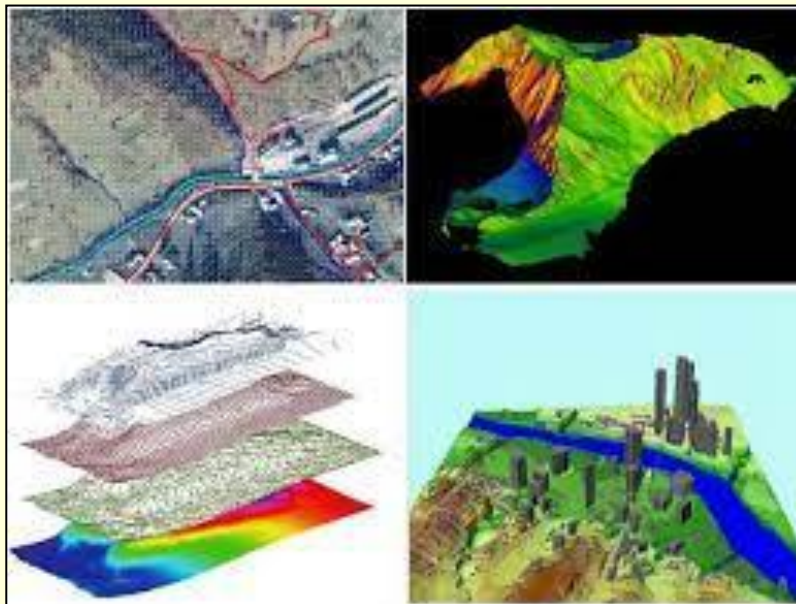
## Sector EL.2 - Landscape and Territorial Mapping

### ***EL.2 - Landscape and Territorial Mapping (Planning, Authorities Management)***

Geoscience and Geographics go hand in hand in the complex projects that regard all the aspects of how we manage our territory and landscape. From urban planning to engineering and industrial projects, from Natural Reserves to the management of transport routes, from restructuring old mining sites to the building of offshore islands; It's all about GIS, Remote Sensing, drone scanning, 3d modelling and geological bedrock mapping, geochemistry of soils, tracing of underground and surface water reserves, slope stability and land-slides mapping, and therefore, above all, multidisciplinary thinking and technology cross-over.

OCRE strongly believes that applying the Geoscience experience accumulated over decades in various industrial sectors, can make a huge difference and provide fundamental insight needed to perform a sustainable territorial mapping and planning, and our worldwide experts Network of Excellency is already working on various options and projects.

To examine all the Tasks involved in this Sector, the [OCRE Geoscience Services GEG List](#) can be consulted.



*Environment and Territory Mapping. From [EC \(2021\)](#)*





## Sector CE.1 - Underground Water Management; Hydrology

### CE.1 - Underground Water Management – Hydrology

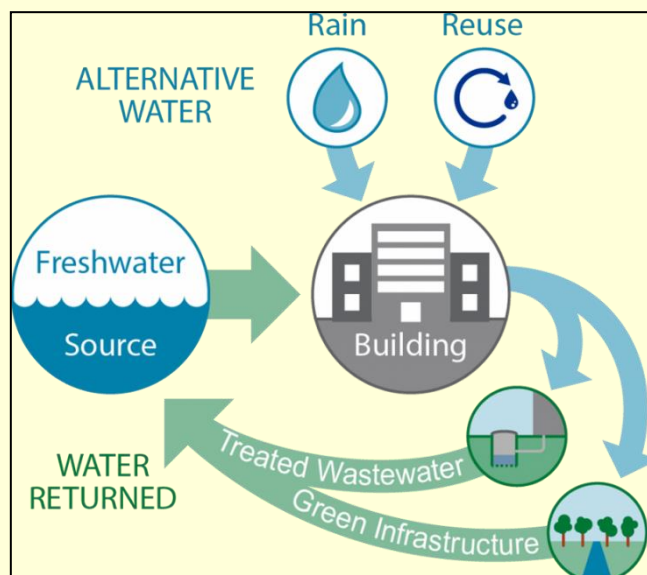
If we are talking about the New Normal, Resilience, and the New Era of Sustainable Energy Mix, the management of our groundwater resources is already recognised as one of the key issues that will start to play a major role in Regional and Global politics.

The key slogan here is **Net Zero Water Solution**; the optimisation of the usage and recycling of fresh water resources in both households and industry.

Geoscientists are already used to speaking about “Geofluids” in studies regarding geological subsurface conditions such as porosity (capacity to store) and permeability (capacity to transport), and the technologies available and developed in the hydrocarbon exploration and production Industry are now readily applied in the analyses and modelling of groundwater resources.

Therefore, OCRE strongly advocates the applications of this application of transversal technology and her global expert network of Excellence is already applied in studies relative to groundwater management on various scales.

To examine all the Tasks involved in this Sector, the [OCRE Geoscience Services GEG List](#) can be consulted.



The Net Zero Water solution. From: [EERE \(2021\)](#).



## Sector CE.2 - Mineral Resources - Mining; Landscape Management

### CE.2 - Mineral Resources: Onshore-Offshore Mining; Landscape Management

In the New Era of Sustainable Energy Mix one of the key issues that needs to be tackled is the availability of natural mineral resources that should satisfy the demand related to the construction of the devices that are implicated in the transformation process.

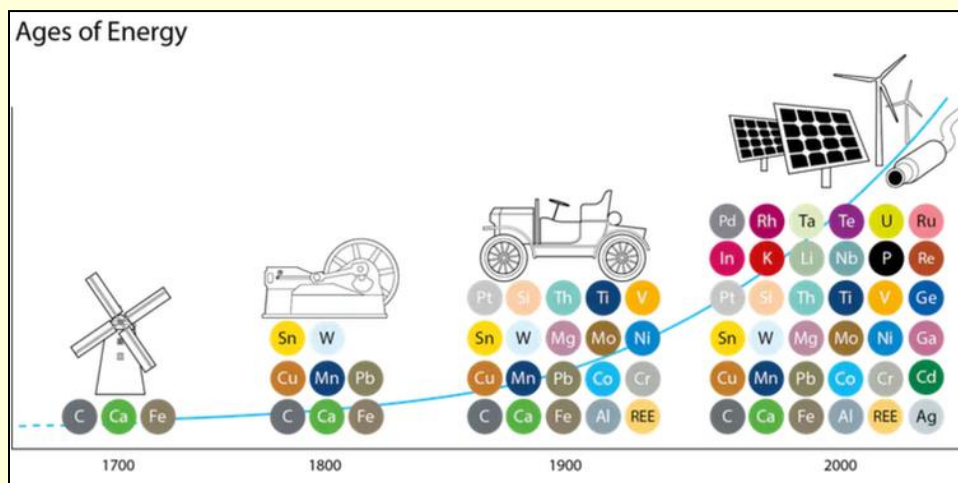
Hybrid and battery powered locomotion, as an alternative to petrol and diesel vehicles, is already on its way on a large, global scale. This leads to an impressive increase in demand for a suite of raw materials (e.g. minerals and rare earth elements) for the batteries to store the energy and for the construction of the vehicles themselves (for which also products derived from hydrocarbon are still heavily involved).

A similar need can be identified in the construction of the solar panels and wind turbines in power generation, and still more is required for the continuous increase in smartphones production and other applications.

This increase in demand cannot be met by recycling and therefore there is a need to identify new sources of the critical elements, be it metals or specific minerals. An example is the need for lithium which will show a five- to ten-fold increase during the next decades.

Identification of new sites, the implementation of sustainable mining, landscape management, transport issues, political and legal frameworks, are all involved in the near future developments which are also in need of the application of new technologies. It is our strong believe that Geoscientists needs to be massively involved in evaluation of all the options, applying decades of G&G experience in the field of mining, surface engineering, and territorial investigation such as remote sensing studies, and fault and fracture modelling.

To examine all the Tasks involved in this Sector, the [OCRE Geoscience Services GEG List](#) can be consulted.



Elements used in the application of different energy sources through time. From: [The Conversation \(2018\)](#).



## ***Sector CE.3 - Waste Disposal (Nuclear & Chemical Waste)***

### ***CE.3 - Underground Waste Disposal***

We may safely state that even if the Circular Economy will be fully implemented in the future, there is still a certain amount of material being generated that in some way cannot be used nor directly re-inserted in the Natural environment. At Present, regrettably, there are still large amounts of materials that need to be safely stored in a geologically stable situation.

At the moment the most important waste disposal SubSectors are:

CE.3.1- Nuclear Waste Disposal

CE.3.2-Chemical Waste Disposal

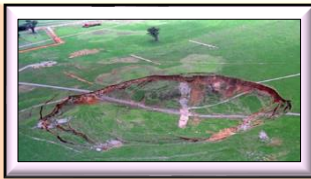
We regard the Carbon Capture and Storage also part of Waste Disposal, and it is described as the Sector [SE1-CCS](#) of the [Sustainable Energy Mix Realm](#).

Geoscience is a key element in the identification of these sites, and OCRE believes that many of the specific capacities and technologies available in specific Industries, should be and can be applied in this delicate exercise.

To examine all the Tasks involved in this Sector, the [OCRE Geoscience Services GEG List](#) can be consulted.



*Yucca Mountain Waste deposit site. From: [Bechtel \(2020\)](#).*



## Sector RM.1 - Subsidence Monitoring (Natural, Fracking, CCS, HC Production)

### RM.1 - Subsidence and Seismicity Monitoring (Natural, Fracking, CCS, HC Production)

Several types of industrial activity which are being undertaken as part of the New Sustainable Energy Mix landscape are accompanied with specific risk factors which need to be mapped applying targeted technologies. One of these risk factors is now well known and has a considerable impact on stakeholders and the population: It is the increase in subsidence or micro-seismic activity of the geological substratum related to the following processes:

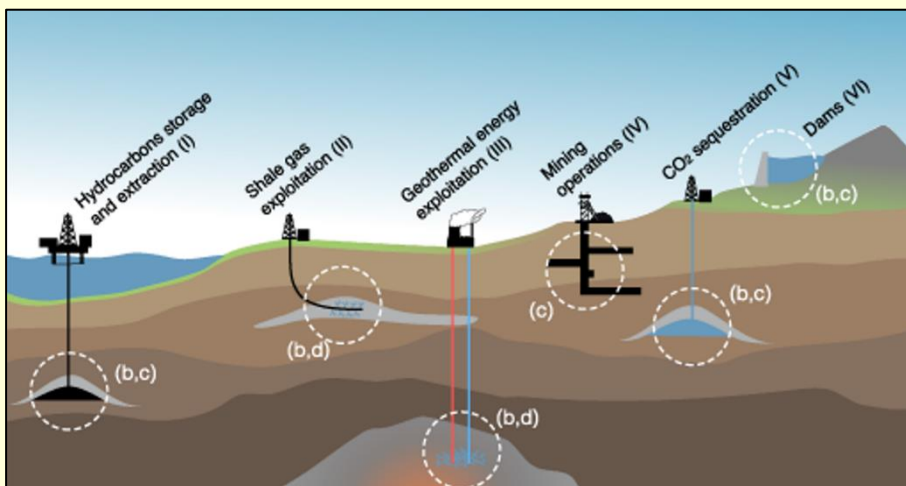
- Extraction of hydrocarbons from subsurface reservoirs,
- The enhancement of the productivity of hydrocarbons (fluid of gaseous) by fracking of the subsurface rocks,
- The storage of specific gases in the subsurface such as CO<sub>2</sub> for Enhanced Oil/Gas recovery (EOR, OGR, HER)

Each of these processes has, obviously, a number of characteristics: timeframe of the activity, depth at which the activity is undertaken (hundreds up to kilometres below the subsurface), type of methodologies applied (chemical, mechanical), economic gain, environmental impact.

A lively debate whether these activities should or should not be undertaken in certain highly sensible territories is on its way, and time will tell where economic drivers, social responsibility and future planning of the Energy landscape will find a sustainable and balanced equilibrium.

Geologists and Geophysicists are since long strongly involved in the projects, and OCRE's worldwide experts' Network of Excellency is already working on various options and projects.

To examine all the Tasks involved in this Sector, the [OCRE Geoscience Services GEG List](#) can be consulted.



Different Activities that may induce or trigger (micro-)seismic activity. From: [Grigoli \(2017\)](#).





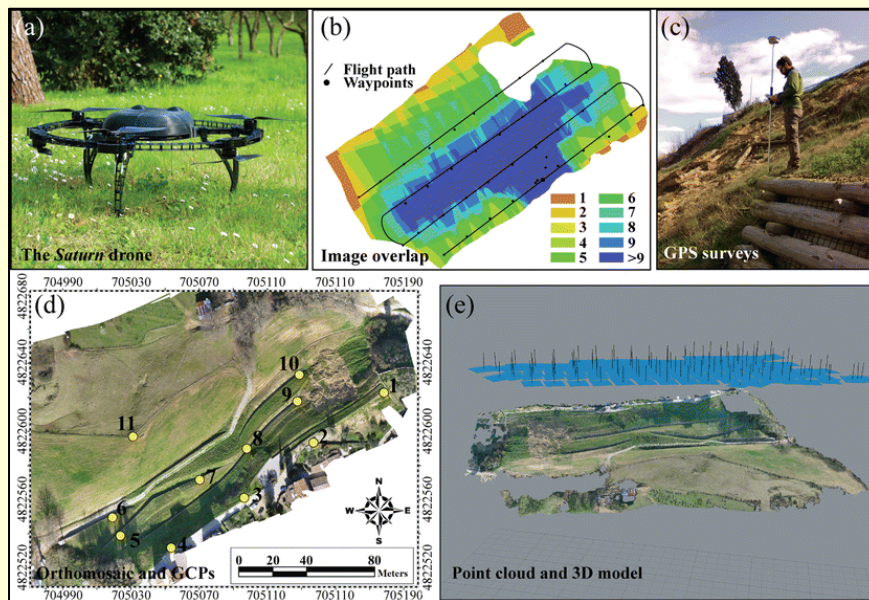
## Sector RM.2 - Landscape Hazard Mapping (Floods, Landslides, Tsunami)

### RM.2 - Landscape Hazard Mapping (Floods, Landslides)

Part of a sustainable landscape management is the monitoring of specific risks related to the stability of the areas that are subject of human activity; this involves factors related directly to the activity due to human interference, or to slopes and areas related to the natural environment and its characteristic dynamics over centuries of time.

Geologists and Geophysicists are since long strongly involved in the projects, and OCRE's worldwide experts' Network of Excellency is already working on various options and projects.

To examine all the Tasks involved in this Sector, the [OCRE Geoscience Services GEG List](#) can be consulted.



Mapping of Landslides in the Village of Ricasoli (Tuscany). From [Rossi et al. \(2018\)](#)





## ***Sector RM.3 - Seismic Hazard Mapping (Earthquakes, Volcanic Activity)***

### **RM.3 - Seismic Hazard Mapping (Earthquakes, Volcanic Activity, Tsunami)**

One of the main risks which Mankind faces since ever is the frequent occurrence of earthquakes and volcanic activity. Can we predict their frequency, the timeframes involved and the level of damage they may incur in order to mitigate the damage? One of the approaches is the territorial risk mapping and application of related regulatory measurements for industrial and urban activity, the another is the scientific analyses of their historical occurrence, and the application of new technological advancements in observations and analyses of related phenomena.

All these activities heavily involve the knowledge Earth Scientists have been gathering and are collecting daily through seismicity network monitoring, analyses of earthquakes, geological mapping, the mapping of the faults and fractures structures that are activated, the mapping of volcanic areas, and many other data analyses methodologies.

Geologists and Geophysicists are since long strongly involved in the projects, and OCRE's worldwide experts' Network of Excellency is already working on various options and projects.

To examine all the Tasks involved in this Sector, the [OCRE Geoscience Services GEG List](#) can be consulted.



*Eruption of Mount Soputan (Indonesia). From: [BNPP Indonesia \(2018\)](#)*



## ***Sector RE.1 - Civil Engineering: Onshore and Offshore Construction***

### **RE.1 - Civil Engineering: Onshore and Offshore Construction**

If we think of modern technologies in onshore and offshore engineering and new developments, key concepts like Robotics, Sustainable Development, Resilience, and HSE Compliance come into our minds.

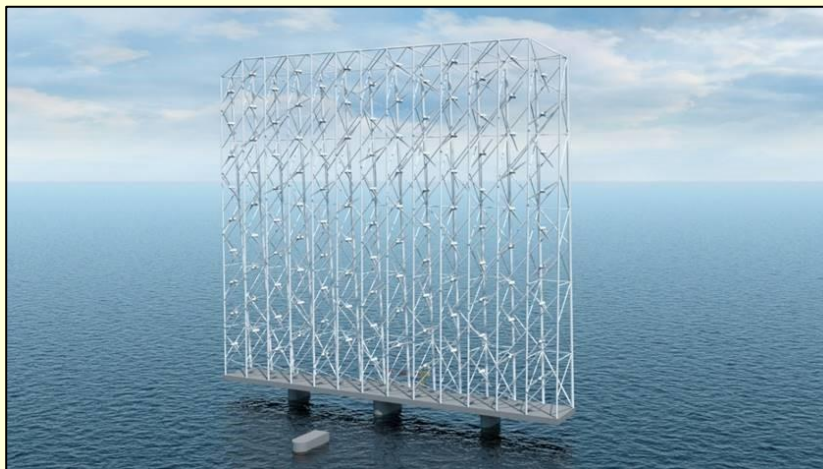
Especially in the development of Offshore Windfarms, the conversion of depleted Oil and Gas Field Platforms into Carbon Storage Sites, the construction of Solar Energy fields, the building of Geothermal Installations, the approach to the geological subsurface becomes essential.

But what about Oceanographic Surveys, large Ocean Cleaning Projects, Deep Oceanic Piston Coring and Drilling, Polar Ice Coring projects, and many more initiatives to observe and manage our delicate Planets H<sub>2</sub>O cycle to protect it against damages caused by unsustainable human activities.

Furthermore, the harvesting of offshore mineral deposits, possible developments to produce Methane from Hydrates on the continental shelf, and even the building of large Artificial Islands to host the immense servers needed for the Global Network Trafficking and Digital Trading, it all comes to where and how these projects will be positioned, their sustainability, their effectiveness.

OCRE strongly believes in an integrated approach in this New Era of Renewables Engineering Technology between Engineering and all aspects of Geology and Geophysics. Therefore, we introduce the concept of GEG; Geology, Engineering, Geophysics.

To examine all the Tasks involved in this Sector, the [OCRE Geoscience Services GEG List](#) can be consulted.



*Offshore Wind Catching Systems. From [Bulijan \(2021\)](#).*



## ***RE.2 - Decommissioning and Abandonment; Industrial Archaeology***

### **RE.2 - Decommissioning and Abandonment (D&A); Industrial Archaeology**

The relics we sometimes treasure of our past Industrial Development are the testimonies of what we now all “Decommissioning and Abandonment”; The dismantlement of to be abandoned Industrial facilities, the removal of waste material, and the reconstruction of the Landscape.

Whether onshore or offshore, there are strict regulations and protocols involved in this activity, which obviously vary from country to country, but they have one thing in common: the protection of our environment through a sustainable and HSE compliant industrial lifecycle, be it of a non-renewable or renewable kind.

It is OCRE’s strong believe that the involvement of all professional sides of Geology and Geophysics as a support to the Engineering activities for Decommissioning and Abandonment as well as in the emerging field of Industrial Archaeology is fundamental. The professionals in our Excellency Network have already shown considerable expertise in these fields and are readily available to support upcoming projects.

To examine all the Tasks involved in this Sector, the [OCRE Geoscience Services GEG List](#) can be consulted.



*An example of Industrial Archaeology and Decommissioning and Abandonment: The Decauville Railway of the bitumen mining companies in Central Italy, in 1903, now partly converted into a bicycle track.*

*From: [van Dijk \(2019\)](#).*



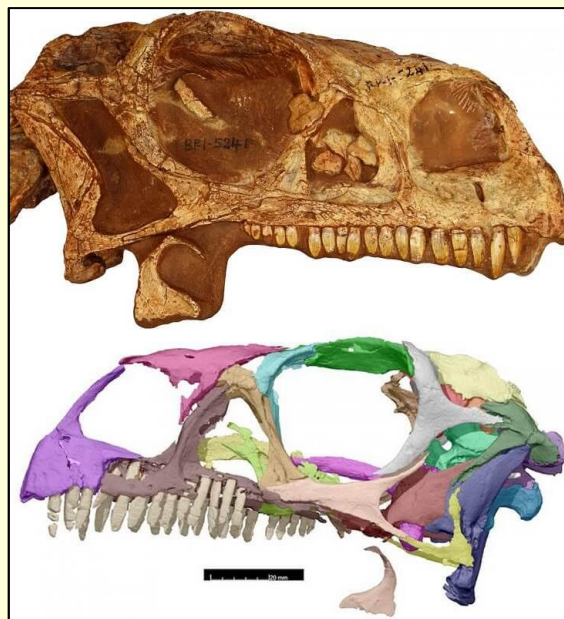
## ***Sector SQ.1 - Archaeology, History, Architecture, Museology***

### **SQ.1 - Archaeology, History, Architecture, Museology**

How many times did we visit a museum becoming fascinated about the history of Planet Earth, its life forms, and its beautiful landscapes of the past and Present? As part of our general education we all know about the Dinosaurs' extinction, evolution of species, continental drift and ice ages. The evolution of Mankind, from stone age cave men to the rise and fall of ancient civilisations, Archaeologists, Biologists, Geologists and Palaeontologists and many other scientists they all work together to unravel the torn-apart book of Ages, in the frame of "The Past is the Key to the Present and the Future".

The large experience of our Worldwide network of Geoscience and Engineers Experts has been involved numerous times in projects that regard Archaeological and Historical investigations, and we strongly believe that Technologies developed in Industrial activities will add significant value to these most important activities.

To examine all the Tasks involved in this Sector, the [OCRE Geoscience Services GEG List](#) can be consulted.



*3d Reconstruction through Laser Scan and 3d Printing: The Hadrosaur. From: [Gaget \(2019\)](#).*





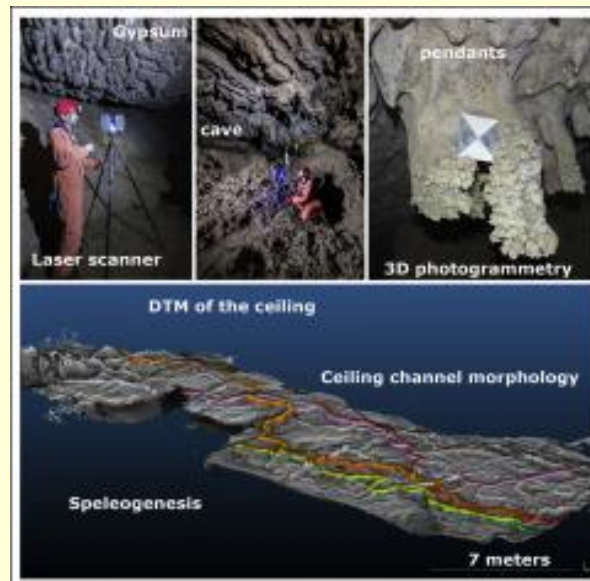
## Sector SQ.2 - Speleology

### SQ.2 – Speleology

Although Speleology is regarded as one of the most dangerous sports activities undertaken, and the visit of underground caves one of the most fascinating attractions the landscape has to offer, there is a most fundamental aspect related to this exploration and mapping of underground cavities and tunnels: The investigation of underground water reserves, their storage capacity, conductivity and development. The correct balance between the maintenance of the beautiful underground sceneries, subsurface water management and sustainable tourism can be found applying a multidisciplinary approach which involves various disciplines in Earth Sciences, Biology, and Engineering.

The large experience of our Worldwide network of Geoscience and Engineers Experts has been deployed numerous times in speleological investigations, and Technologies previously developed in Industrial activities such as 3d laser scanning are already adding significant value to these most important activities.

To examine all the Tasks involved in this Sector, the [OCRE Geoscience Services GEG List](#) can be consulted.



3d Mapping of a Gypsum Cave in Emilia Romagna (Italy). From: [De Waele et al. \(2018\)](#).



## **Sector SQ.3 - Geotourism - Education - Incentives - Geosites – Stakeholders**

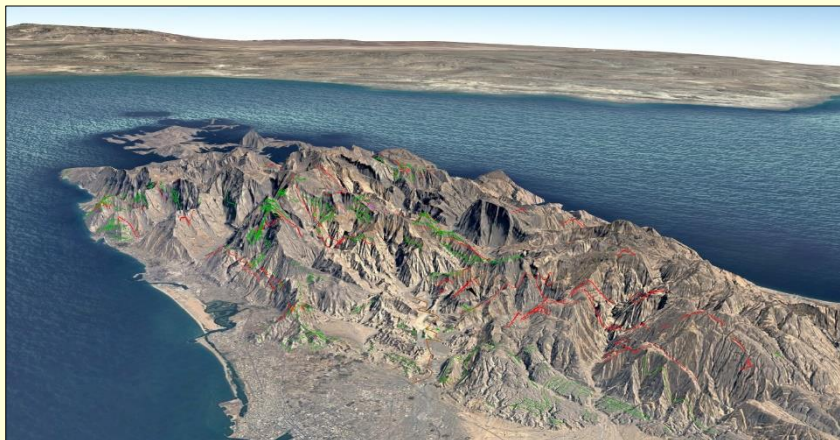
### **SQ.3 - Geotourism - Education - Incentives - Geosites – Stakeholders**

Creating awareness of how precious the relicts of the evolution of the Planet Earth are, is part of the capacities Geoscientists have always been equipped with. Obviously, it is more easy to gather people around a rocky cliff when it is situated along a tropical beach or nearby a great place to dine, but the installation of so-called “geosites”, locations which uniqueness should be recognised and protected, is slowly obtaining consensus and in numerous countries they have now been officially recognised and sponsored.

Strongly linked to this is the sector of training, incentives and Team building. It is our experience that the strong message that can be transmitted through a guided visit to specific geologically significant localities has an enormous effect on triggering multidisciplinary team spirit, and out of the box thinking in project management.

The expertise of Geologists and Geophysicists obtained throughout the Industry is fundamental to apply in these activities and the OCRE’s worldwide network of experts has already been involved in numerous projects over the years.

To examine all the Tasks involved in this Sector, the [OCRE Geoscience Services GEG List](#) can be consulted.



*Fascinating history and sceneries: Geology, Tourism and Geotourism: The Musandam Pensinsula, Oman and United Arab Emirates. [From: van Dijk \(2020\).](#)*



# Who We Are

The present list of services is set up and managed by our [Excellency Team](#) with a cumulative experience of over 300 years in Geosciences, Geophysics, and Engineering. These are the fields in which OCRE Geoscience Services is Worldwide Best in Class, which we believe can really make a difference in your Projects and Organisation.

- All [Services](#) are divided in 6 [Realms](#), 23 [Sectors](#), and 30 Project [Categories](#).
- Any tailor made solution can be proposed.
- Everything is illustrated with examples [published](#) over the years (hyperlinks to our free downloadable papers).
- A [map](#) is provided of the previous applications of the services.
- Unique software solutions and specific procedures developed by us are deployed which we am happy to disclose (labelled with ★)
- Work can be performed remote, with possible office visits, or completely integrated in your Team.
- Training on the job with your employees is certainly part of that.
- Full collaboration and intense communication is crucial.
- Short term or Long term Services are possible:
  - Quick Technical Job
  - Integration in your Team
  - Advice on Projects
  - **Competent Person's Report (CPR)**

***There is a cost effective and competitive solution  
for any of your needs.***

Experts can be involved from our vast network of over 150 screened professionals that can collaborate and take care of any specific aspect of your project.

**Feel free to contact us for a preliminary exchange of ideas:**

[michi.vandeursen@ocre.nl](mailto:michi.vandeursen@ocre.nl)

[janpieter.vandijk@ocre.nl](mailto:janpieter.vandijk@ocre.nl)

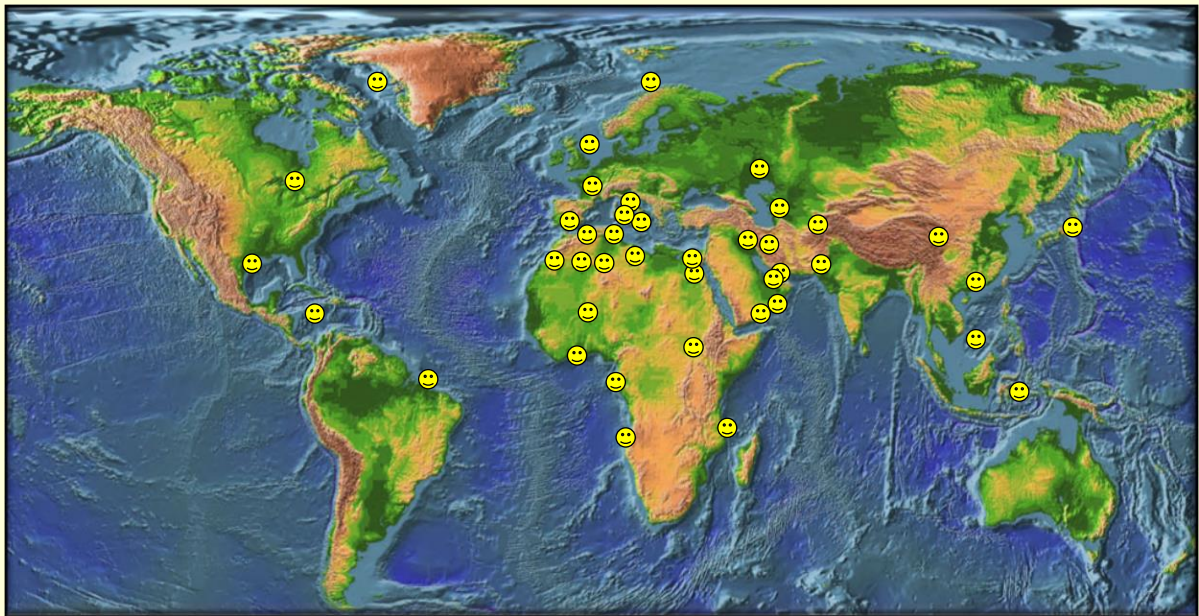
[mark.okkes@ocre.nl](mailto:mark.okkes@ocre.nl)

<https://ocre-geoscience.com/>

## Experiences

The proposed services have been applied already in previous Projects over a timespan of 28 years, indicated in the map. These are:

- Operated and non-operated JV
- New Venture, Exploration and Reservoir Development
- Bid Rounds, Data Rooms
- Research and Technology, Training
- Conventional and Unconventional settings
- Carbon Capture and Storage (CCS)
- Gas Storage, EOR/EGR, water/gas injection
- Green and Brown Fields



-- Collaboration is the Key to Unlock Success--

The Auditing and Certification of Resources (Prospective or Contingent) (Exploring or Appraising) or Reserves (ready for, or already in Production) that are in the Companies' Portfolio is performed through an independent Audit and the drafting of what is called a CPR: A Competent Person's Report. This Report is required for the Company as one of the components of a Prospectus or Admission documentation as part of regulatory filings in the following cases: If there are Initial Public Offerings (IPO), in case of a merger/acquisition/takeover or to support any other fund-raising initiatives towards Financial Institutes or Banks. This to comply to stock exchange rules, or to justify a Production Plan (Preliminary, Initial, or Final, or Extensions) towards stakeholders, or, in some cases, for QMS, Auditing, and internal decision-making processes for the sake of Investment Protection and Due Diligence.

For specifications regarding the CPR we refer to the following reference documentation:

The ESMA (European Securities and Markets Authority) Update of the CESR (Committee of European Securities Regulators) Recommendations regarding the consistent implementation of Commission Regulation (EC) No. 809/2004 implementing the Prospectus Directive, (March 20, 2013): (ESMA/2013/319) Which can be downloaded using the following links:

<https://www.esma.europa.eu/document/consistent-implementation-commission-regulation-ec-no-8092004-implementing-prospectus> [https://www.esma.europa.eu/sites/default/files/library/2015/11/11\\_81.pdf](https://www.esma.europa.eu/sites/default/files/library/2015/11/11_81.pdf)  
<https://www.esma.europa.eu/sites/default/files/library/2015/11/2013-319.pdf>

The Experts that are qualified and officially allowed to issue such a CPR need to satisfy a series of conditions:

- (1) Professionally qualified and a Good Standing possibly with an affiliation to reputed International Associations (SPE, AAPG, EAGE),
- (2) A minimum of 5 to 10 but preferably 20+ years' experience,
- (3) Independent of the Company and of any interested Stakeholder of the Company,
- (4) Remunerated by Fee, not on success of the qualification, and
- (5) Engaged by the Company, but with the care of the investors and stakeholders.

The CPR should contain a minimum amount of information which is in many cases dictated by regulators: Legal overview (licences, expiry dates, obligations), geological overview, Resources and Reserves estimates, evaluation of reserves (optional), environmental and facilities description, history of production/expenditures (minimum 3 years), infrastructure (power, water, supply, HSE), maps, plans, diagrams, and special factors. The reporting standards to follow are the SPE PRMS, COGEH (Canadian), Norwegian (NPD) system, depending on the necessities and requirements. Reserves estimates should be supported by economic evaluation, including factors such as Post Tax Net Present Value (NPV) using costs, prices, effective dates, FOREX, and sensitivity analyses on these factors. In some cases, site visits are necessary to evaluate the surface situation.

In the geological overview a multidisciplinary approach is needed of Geology, Geophysics, Petrophysics, Reservoir Engineering, Production Engineering, Facility Engineering and O&G Economy.

Details of the procedures for Auditing, Certification, Portfolio ranking, risking, and all other activities involved can be found in various handbooks, manuals and guides and are all integrated in the OCRE Geoscience Services Best Practice Management System.

The Leadership staff of OCRE Geoscience Services (OGS) is competent and qualified to issue CPR's which are officially accepted by banks and financial institutes, and has, during its 25-40 years of O&G activity, managed projects in numerous occasions where this was required, the necessary studies and evaluations were conducted, and the CPR's were issued.

They have been part of working groups of SPE that establish the PRMS regulations and have collaborated with the different larger International Firms that provide the CPR's since decades.

The staff of OCRE is also Editor of the Best Practices Management System (BPMS) that established the numerical criteria to arrive at a correct portfolio evaluation and certification.

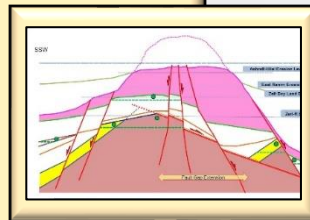


# **Catalogue of our G&G Services**



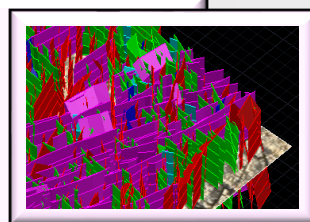
## G&G Studies

- [ST1](#) – CPR; Best Practise, QC/Integrity, Peer Review, Due Diligence ★
- [ST2](#) – Literature Study ★
- [ST3](#) – Geological Model Building – Petroleum System
- [ST4](#) – Opportunity Evaluation – Data rooming
- [ST5](#) – Field Geology Studies ★
- [ST6](#) – Carbon Capture and Storage (CCS)
- [ST7](#) – Operations, Facilities, Engineering, Trading, Mid-Downstream



## Faulted and Fractured Reservoirs ★

- [FR1](#) – Fractures and Faults; Data Acquisition
- [FR2](#) – Fractures and Faults; Data Analyses
- [FR3](#) – Fractures and Faults; 2d and 3d Modelling
- [FR4](#) – Fractured Reservoir Mapping (FPDM)

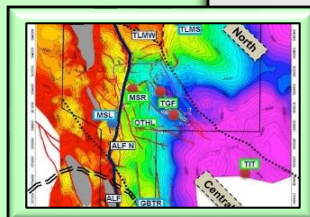


## Small and Big Data Management

- [DM1](#) – Database Organisation ★
- [DM2](#) – Bibliography – Library Setup
- [DM3](#) – Vintage Dipmeter Log Digitisation ★
- [DM4](#) – Digitalisation of Field Geology Data

## Seismic Mapping and Prospect Generation

- [GG1](#) – Seismic Interpretation and Mapping
- [GG2](#) – Prospect Evaluation and Ranking
- [GG3](#) – Remote Sensing GIS Interpretation ★



## Field Trips ★

- [FT1](#) – Field Trip Central Italy
- [FT2](#) – Field Trip UAE
- [FT3](#) – Field Trip Neoproterozoic Oman



## Training Courses ★

- [TC1](#) – Introduction in the Oil and Gas
- [TC2](#) – Analyses & Modelling of Fractured & Faulted Reservoirs
- [TC3](#) – Geology and Geophysics







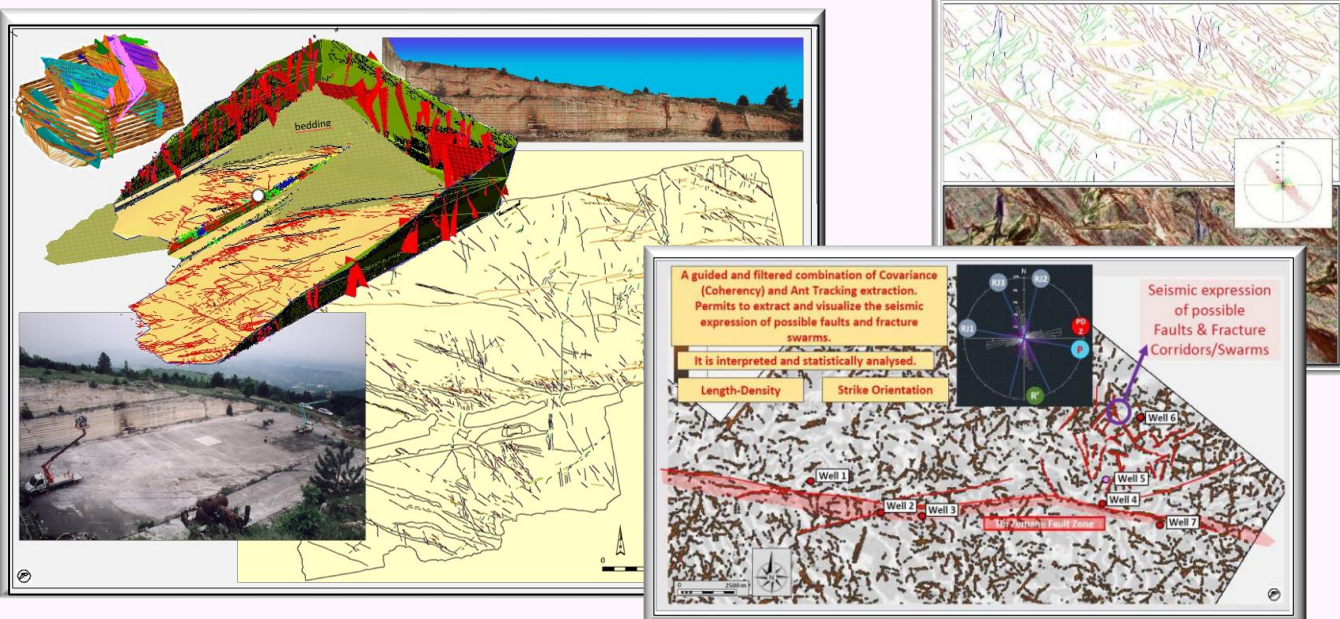
## Short Description

**OCRE**

This activity comprises the acquisition through observation and processing on Cores, Logs, Seismic, Outcrop and Remote Sensing data, in order to provide a dataset of observed faults and fractures.

Additional a geological description and interpretation is provided.

It involves a special designed working environment (FMX<sup>SM</sup>).



## Input

Core (physical, or photographs)

Seismic (3d volume, time/depth slices)

Outcrop (physical survey or photographs)

## Used in:

- Exploration well planning
- Well testing
- Static reservoir modelling
- Dynamic flow modelling
- Ground water flow
- Civil engineering risk analyses
- Carbon Capture and Storage

## Deliverables

Acquired data & geological interpretation

Organised data files (Ascii, Excel)

Report (.pdf)

Photographic survey

Presentation (.ppt)

## Connected Service Packs:

[FR2](#) – Fault and Fracture Data Analyses

[FR3](#) – Fault and Fracture Modelling

[FR4](#) – Fractured Reservoir Mapping

[ST5](#) – Field Geology Studies

[TC2](#) – Training: Analyses & Modelling of Fractured & Faulted Reservoirs

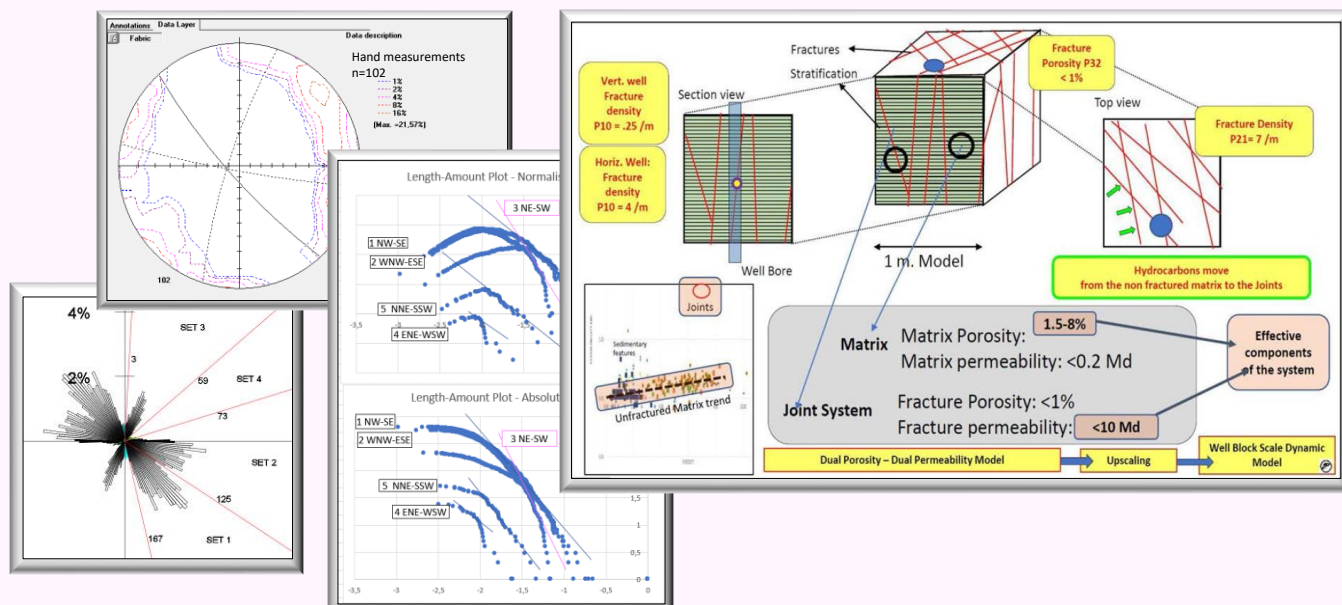


## Short Description

**OCRE**

This activity comprises the technical analyses of data regarding faults and fractures from Cores, Logs, Seismic, Outcrop and Remote Sensing data, using special tools (e.g. FMX<sup>SM</sup>), in order to provide an accurate description of the mathematical properties of the systems.

Additional a conceptual model, geological description and interpretation is provided.



## Input

Core (physical, or photographs)  
Seismic (3d volume, time/depth slices)  
Outcrop (physical survey or photographs)

## Deliverables

Mathematical description, conceptual model, and geological interpretation  
Processed files (Ascii, Excel)  
Report (.pdf)  
Presentation (.ppt)

### Used in:

- Geothermal Energy
- Carbon Capture and Storage
- Well planning & testing
- Well testing
- Static reservoir modelling
- Dynamic flow modelling
- Ground water flow

### Connected Service Packs:

[FR1](#) – Fault and Fracture Data Acquisition  
[FR3](#) – Fault and Fracture Modelling  
[FR4](#) – Fractured Reservoir Mapping  
[TC2](#) – Training: Analyses & Modelling of Fractured & Faulted Reservoirs

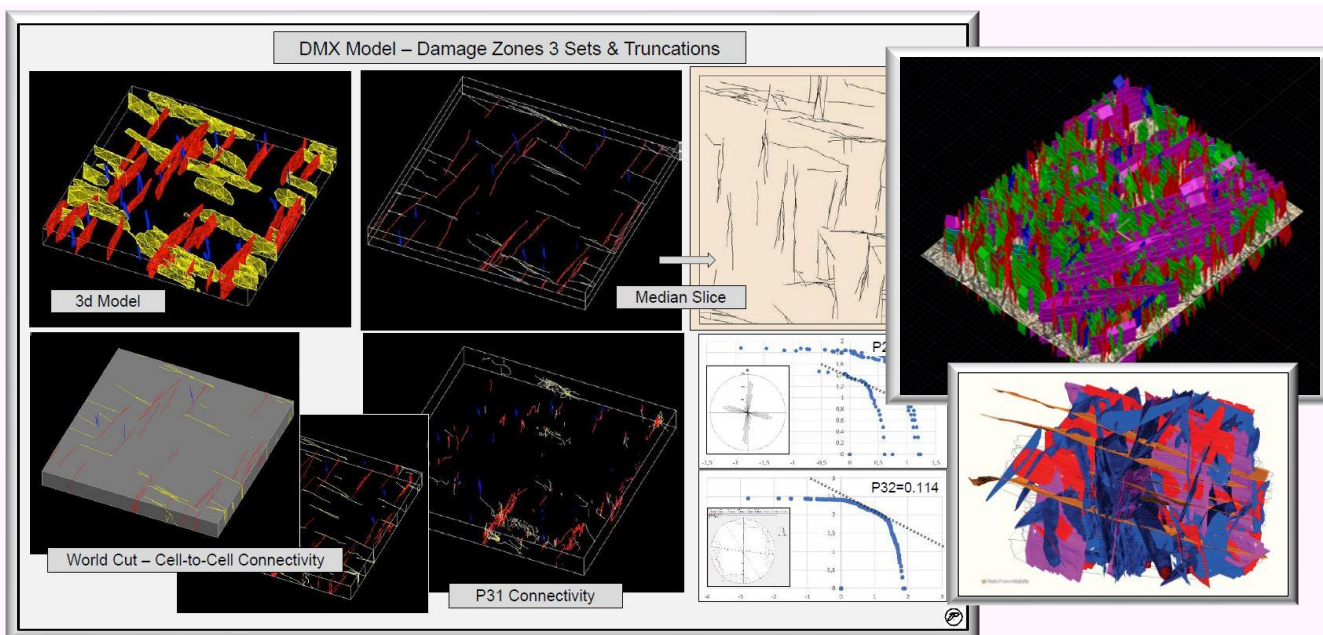


## Short Description

**OCRE**

This activity comprises the 2d and 3d geological modelling of fault and fracture networks, so-called DFN, using the unique DMX<sup>SM</sup> protocol.

The models and maps can be used in planning of deviated wells, well test and fracking design, extraction of parameters for dynamic reservoir modelling (history matching), and discrete flow analyses.



## Input

Core (physical, or photographs)  
Seismic (3d volume, time/depth slices)  
Outcrop (physical survey or photographs)

### Used in:

- Geothermal Energy
- Carbon Capture and Storage
- Well planning & testing
- Well testing
- Static reservoir modelling
- Dynamic flow modelling
- Ground water flow
- Civil engineering risk analyses

## Deliverables

3d Model & Model parameters  
(ready for use in Reservoir simulator)  
Processed files (Ascii, Excel)  
Report (.pdf)  
Presentation (.ppt)

### Connected Service Packs:

[FR1](#) – Fault and Fracture Data Acquisition  
[FR2](#) – Fault and Fracture Data Analyses  
[FR4](#) – Fractured Reservoir Mapping  
[TC2](#) – Training: Analyses & Modelling of Fractured & Faulted Reservoirs





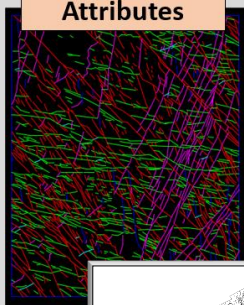
## Short Description

**OCRE**

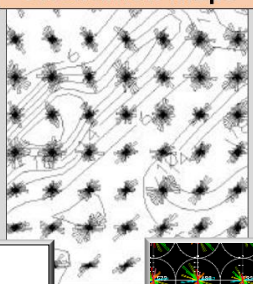
This activity comprises the building of a Fracture Potential and Domain map, in 2 or 3d, of a Reservoir, using the well established FPDM Technology (used Worldwide since 1995).

The models and maps can be used in planning of deviated wells, well test and fracking design, extraction of parameters for dynamic reservoir modelling (history matching), and discrete flow analyses.

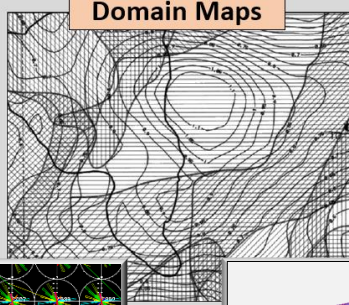
Seismic  
Attributes



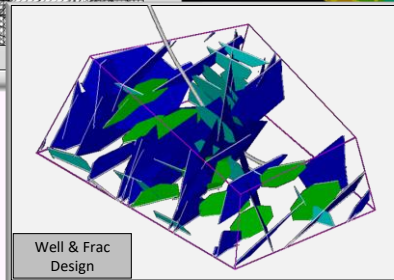
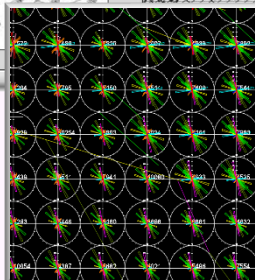
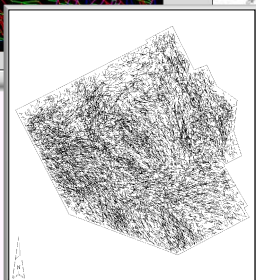
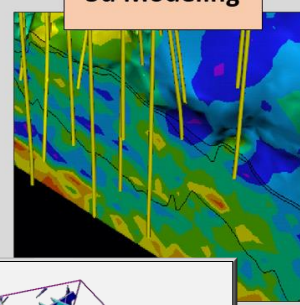
Density &  
Orientation Maps



Fracture  
Domain Maps



3d Modeling



## Input

Seismic (3d volume, time/depth slices)  
attribute slices or other fracture/fault  
maps  
Optional; available well data

## Used in:

- Geothermal Energy
- Carbon Capture and Storage
- Exploration well planning
- Well planning, testing
- Static reservoir modelling
- Dynamic flow modelling
- Ground water flow

## Deliverables

3d Maps and Model with density and  
domain maps  
(ready for use in Reservoir simulator)  
Processed files (Ascii, Excel)  
Report (.pdf)  
Presentation (.ppt)

## Connected Service Packs:

[FR1](#) – Fault and Fracture Data Acquisition  
[FR2](#) – Fault and Fracture Data Analyses  
[FR3](#) – Fault and Fracture Modelling  
[TC2](#) – Training: Analyses & Modelling of  
Fractured & Faulted Reservoirs



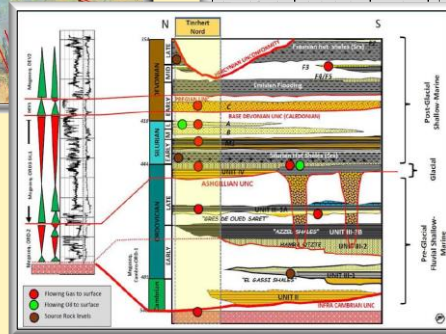
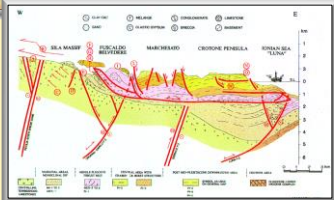
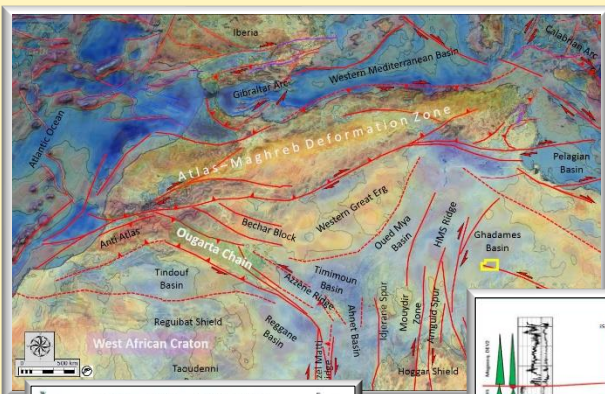


## Short Description

**OCRE**

This activity comprises the analyses of available literature (published and non-published) regarding a any specific geoscientific topic. This can be a basin, an area, an epoch, a phenomena, etc.

A report is provided on the topic and a bibliographic database is delivered.



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## Input

Any available published and unpublished material (digital or analogue): Seismic, Logs, Cores, GravMag, Maps, Geology, etc.

## Used in:

- New Ventures
- Exploration
- Reservoir Development
- Unconventionals
- Carbon Capture and Storage

## Deliverables

Description of the results of the study within the objectives set.

Report (.pdf)  
Presentation (.ppt)

## Connected Service Packs:

[DM2](#) – Bibliography – Library Setup  
[ST3](#) – Geological Model Building – Petroleum System

**OCRE**

Additionally, Structural Balancing and Geohistory can be provided.



**Used in:**

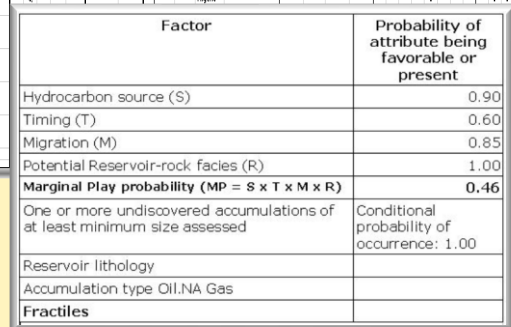
- New Ventures
- Exploration
- Reservoir Development
- Unconventionals

Report (.pdf)  
Presentation (.ppt)

## DM2 – Bibliography – Library Setup

**OCRE**

It can be combined with a separate independent Seismic Mapping and Prospect Generation activity.



**Used in:**

- New Ventures
- Exploration
- Unconventionals

### Connected Service Packs:

**GG1** – Seismic Interpretation and Mapping  
**ST1** – Best Practise, QC/Integrity, Peer Review, Due Diligence

Processed files (Ascii, Excel)  
Report (.pdf)  
Presentation (.ppt)

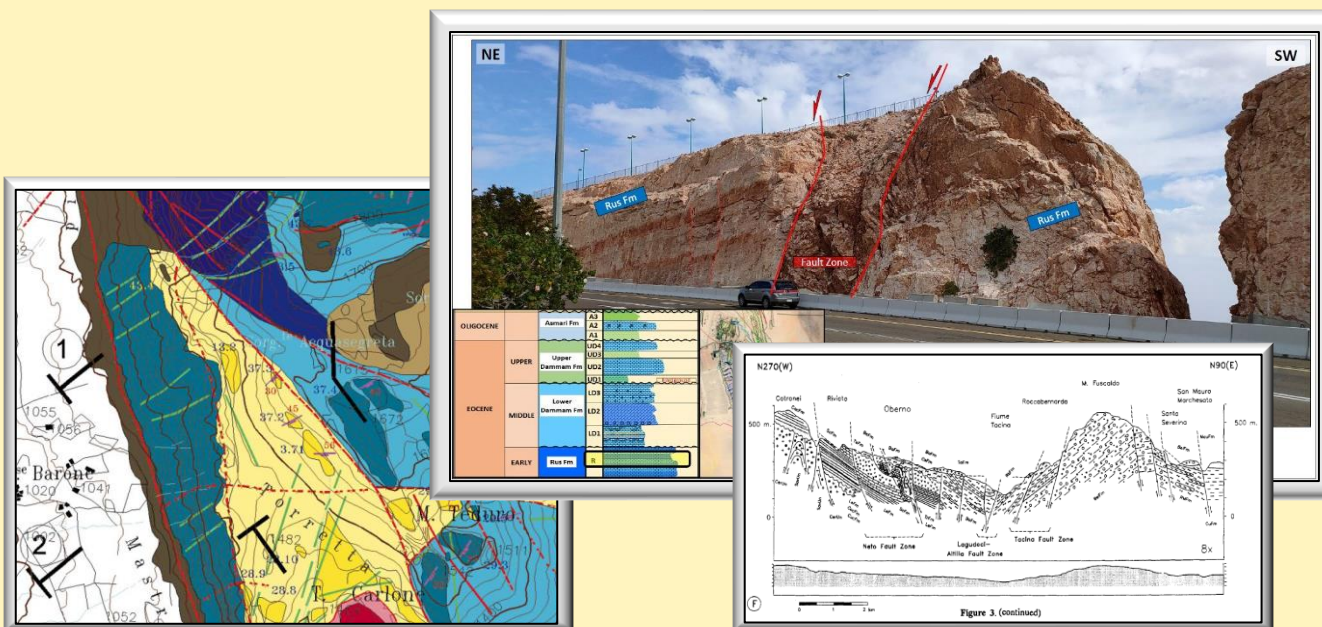


## Short Description

**OCRE**

The activity comprises geological field studies that can range from the evaluation of outcrops as analogues, field geology mapping of an area, structural geological analyses of fractures and faults, to facies mapping and sedimentological evaluation and sampling.

OCRE has developed a unique completely digital data workflow which only deploys commonly available systems such as Google Earth, Excel, and ArcGIS.



## Input

Definition of the area, and definition of objectives

## Used in:

- Well planning
- Environmental studies
- Seismic Acquisition
- New Ventures
- Ground water flow
- Civil engineering risk analyses
- Carbon Capture and Storage

## Deliverables

Geological map, outcrop descriptions, logs, and measurements database. In GIS environment.

GIS Project  
Report (.pdf)  
Presentation (.ppt)

## Connected Service Packs:

- [FR1](#) – Fractures and Faults; Data Acquisition  
[GG3](#) – Remote Sensing GIS Interpretation  
[DM4](#) – Digitalisation of Field Geology Data



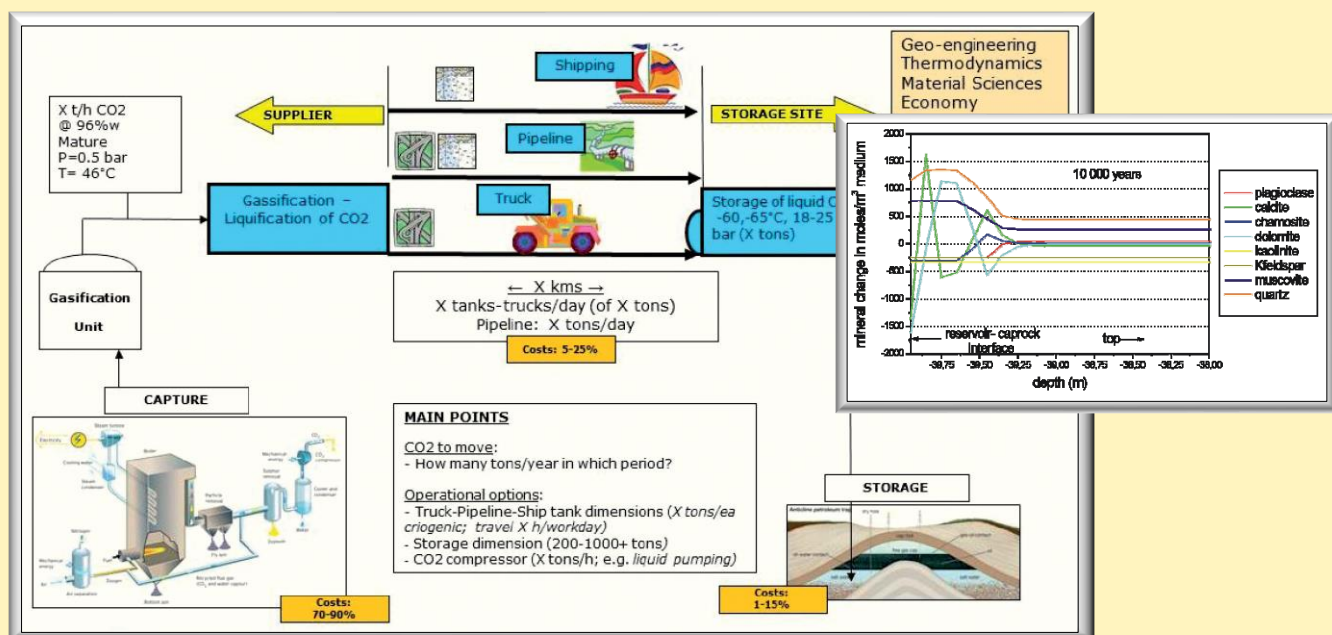
## Short Description

**OCRE**

This activity comprises assistance in the set up of a Carbon Capture and Storage (CCS) Project.

It foresees the analyses of opportunities, capture, transport and storage routs, the set up of a road map, based on available technical and economic parameters.

The objective is to find feasible and sustainable solutions for CCS in Production, EOR, EGR, and pure Storage projects.



## Input

All available information on surface and subsurface conditions, and objectives in terms of availability and timing.

## Used in:

- Reservoir Management
- Territorial Management
- Carbon Capture and Storage
- EOR EGR

## Deliverables

Report on the CCS project.

Report (.pdf)  
Presentation (.ppt)

## Connected Service Packs:

[DM1](#) – Database Organisation  
[ST2](#) – Literature Study  
[GG1](#) – Seismic Interpretation and Mapping



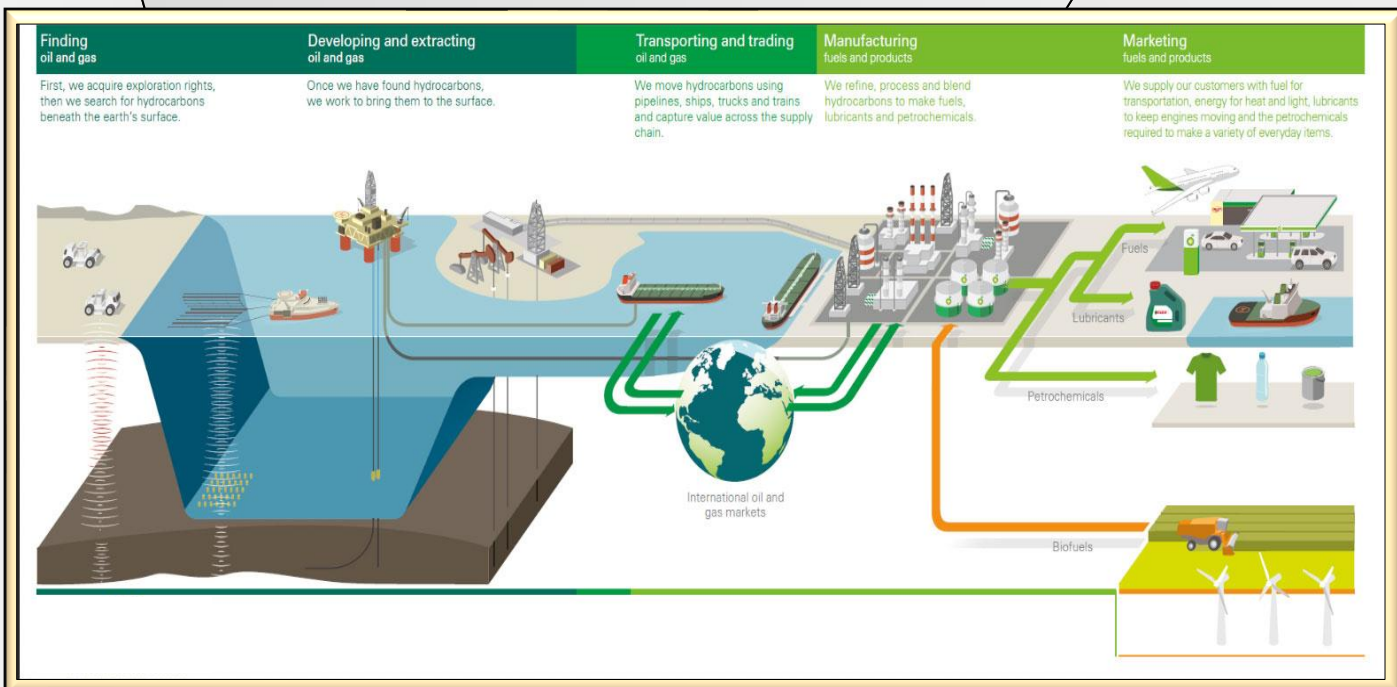


## Short Description

**OCRE**

This services is related to operations (drilling, seismic acquisition, etc.), facilities management, trading, and mid- downstream business.

It foresees service trough the analyses of business opportunities, market analyses, engineering planning, based on available technical and economic parameters, objectives, and specific requests.



## Input

All available information on planned operations, facilities management, project planning, Trading objectives, and mid- to downstream business plans.

## Deliverables

Services related to the business development and trading, operational planning, cost management.

Reports (.pdf)  
Presentations (.ppt)

## Used in:

- Reservoir Management
- Territorial Management
- Carbon Capture and Storage
- EOR EGR
- Trading
- Mid- Downstream Biusiness
- Engineering

## Connected Service Packs:

[DM1](#) – Database Organisation

[ST2](#) – Literature Study

[GG1](#) – Seismic Interpretation and Mapping

**OCRE**

Logic organisation is proposed of Administration, Asset G&G Data, Libraries, and Digital projects. Clear separation of data from presentations and projects is foreseen. No specific data management software is involved.

[illegible]

**Used in:**

- New Ventures – Data-rooms
- Exploration
- Reservoir Management
- Civil Engineering
- Territorial Management
- Unconventionals
- Carbon Capture and Storage

### Connected Service Packs:

**DM2** – Bibliography – Library Setup  
**ST2** – Literature Study



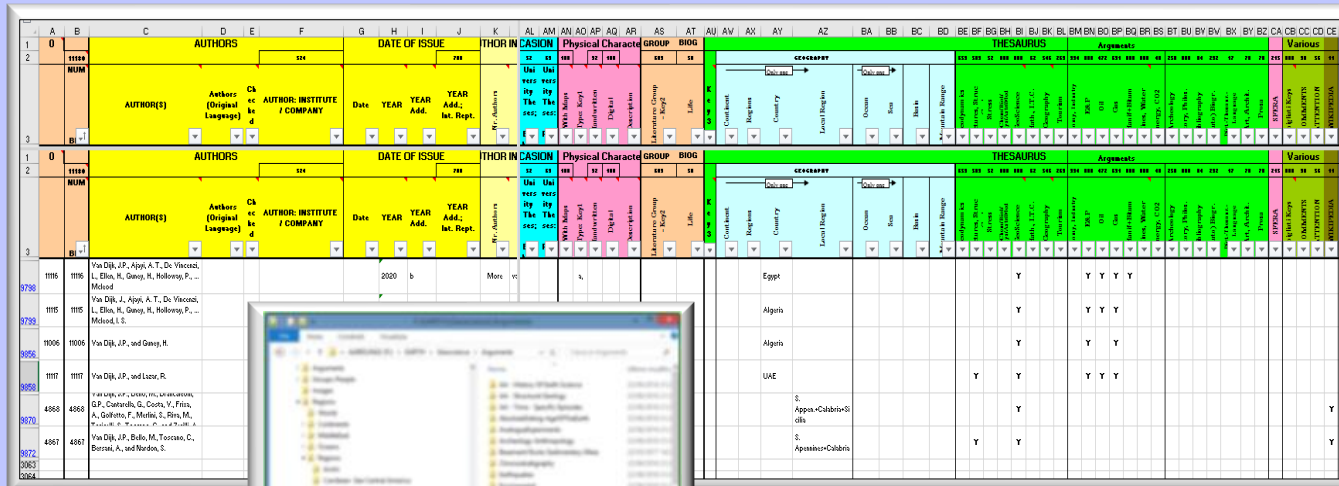
## Short Description

The activity comprises the logical set up of published and non-published reports and publications. It foresees:

- Organisation of folders and file locations.
- Storage in a personalised indexed LIB Excel environment of all files.

It is tailor made to specific business needs.

No specific specialised software involved, a unique indexed Excel file is provided.



The screenshot displays a complex Excel spreadsheet with multiple tabs. The visible tabs include: AUTHORS, DATE OF ISSUE, THOR IN, CASION, Physical Character, GROUP, BIOG, CCEABAPT, THESAURUS, and Various. The spreadsheet contains various data fields such as Author(s), Date, Year, Add., Int. Rept., and various classification codes. A smaller window is overlaid on the spreadsheet, showing a list of authors and their corresponding works.

## Input

Files and folders

## Used in:

- New Ventures – Data-rooms
- Exploration
- Reservoir Management
- Civil Engineering
- Territorial Management
- CCS

## Deliverables

Organised Files and folders

Indexed LIB file (Excel)  
Report (.pdf)  
Presentation (.ppt)

## Connected Service Packs:

[DM1](#) – Database Organisation  
[ST2](#) – Literature Study

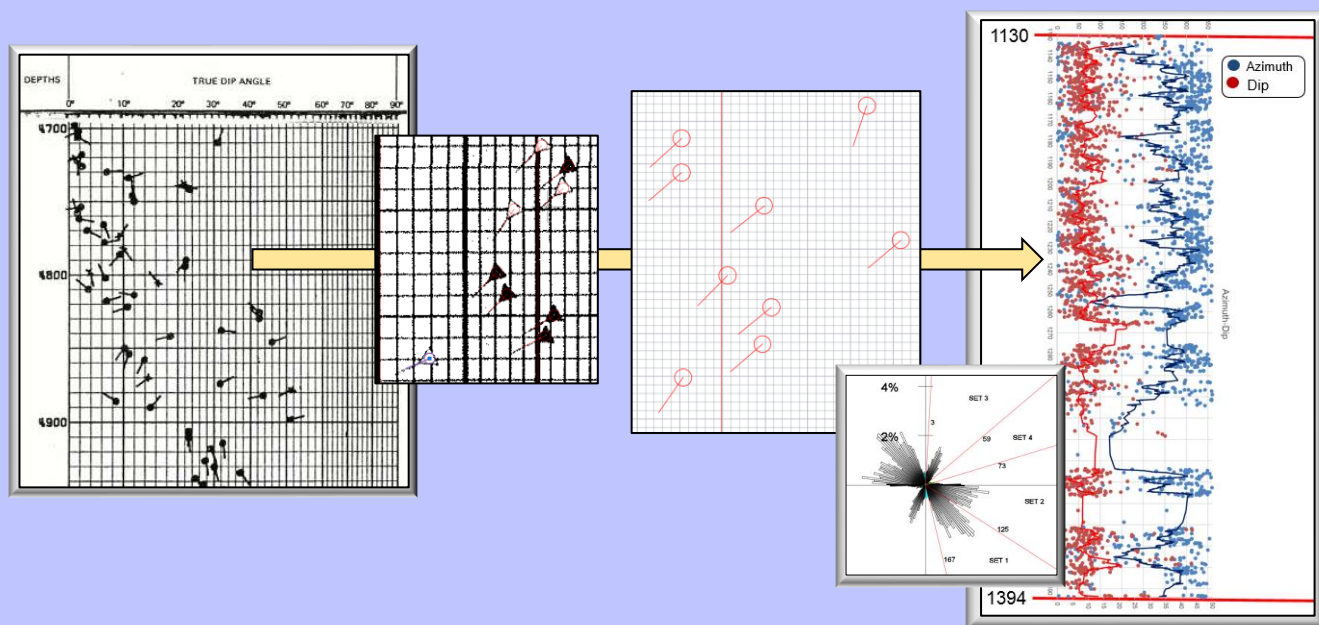


## Short Description

The activity comprises the digitisation of vintage dipmeter logs which are often part of G&G data sets.

This involves a specific new developed software which can handle different scales and formats, and provides direct input for seismic interpretation and 3d modelling environments.

Report of the structural-geological analyses can be provided separately.



## Input

HR digital images of vintage dipmeter Logs, or paper versions.

## Used in:

- New Ventures – Data-rooms
- Exploration
- Reservoir Management

## Deliverables

Digital dipmeter data package with interpretation

Data files (Ascii)  
Report (.pdf)  
Presentation (.ppt)

## Connected Service Packs:

[FR1](#) – Fractures and Faults; Data Acquisition  
[FR2](#) – Fractures and Faults; Data Analyses  
[GG1](#) – Seismic Interpretation and Mapping

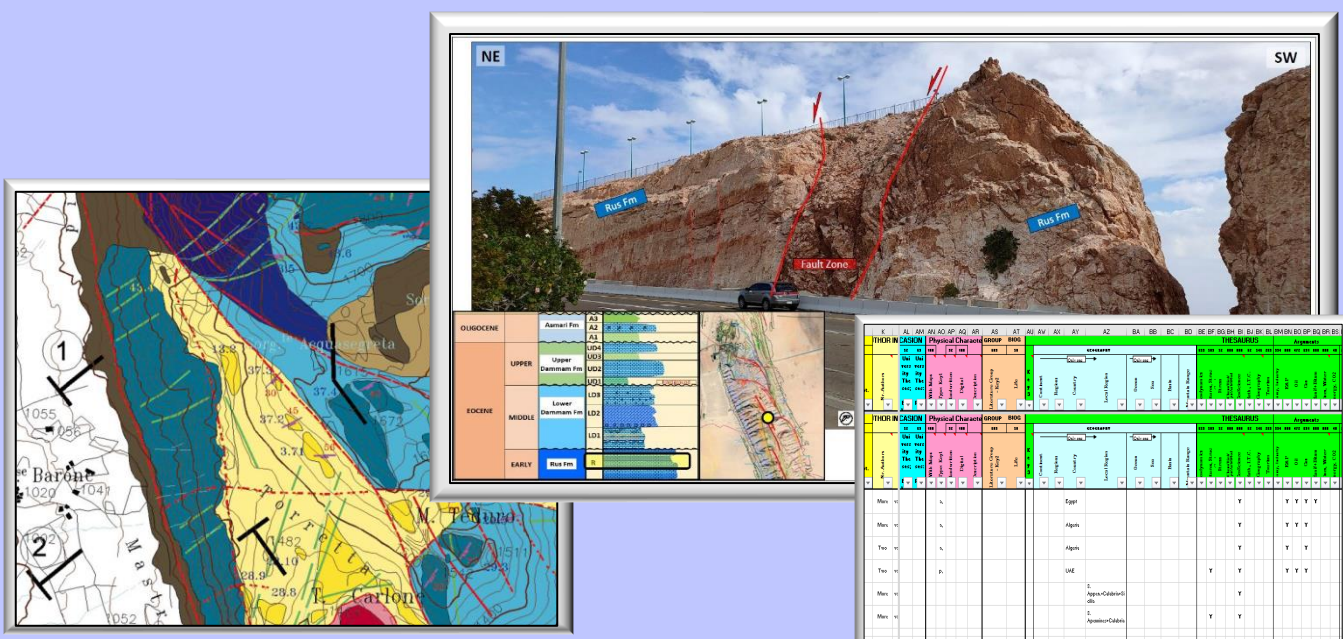


## Short Description

**OCRE**

The activity comprises the digitalisation of field geology studies which are available in written reports and published studies, to transfer them to a user friendly environment deploying only commonly available systems such as Google Earth, Excel, and ArcGIS, but unique and special designed templates.

Precious geological information such as sedimentary logs, maps, analogue studies, will be integrated in the company database and unified with subsurface information.



## Input

Reports, publications, field logs, geological maps.

## Used in:

- Well planning
- Environmental studies
- Seismic Acquisition
- New Ventures
- Ground water flow
- Civil engineering risk analyses
- Carbon Capture and Storage

## Deliverables

Digital database in Google Earth and GIS environment.

GIS Project, Excel Workmap  
Google Earth Project  
Report (.pdf)  
Presentation (.ppt)

## Connected Service Packs:

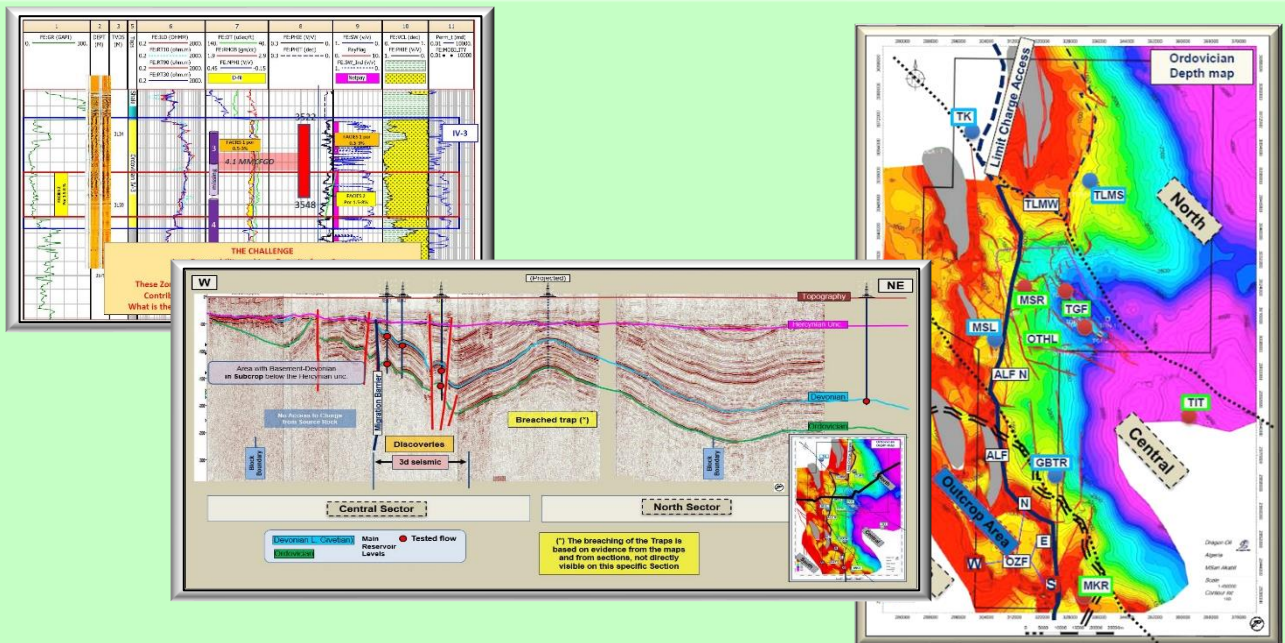
**DM1** – Database Organisation  
**DM2** – Bibliography – Library Setup  
**ST5** – Field Geology Studies  
**GG3** – Remote Sensing GIS Interpretation



## Short Description

The activity comprises the interpretation of 2d and 3d seismic data in a 3d environment (Petrel, Kingdom, etc.). Mapping in time/depth, seismic to well tie, log correlation, depth conversion, seismic attribute analyses, 3d modelling, fault modelling, facies recognition, DGI, etc.

It foresees the identification of Leads and Prospects, structural closures, fault gap analyses.



## Input

Seismic project (seismic and well data),  
Choice of working environment, loading  
of data if necessary.

## Used in:

- New Ventures – Data-rooms
- Exploration
- Reservoir Management
- Civil Engineering
- Territorial Management
- Carbon Capture and Storage
- EOR EGR

## Deliverables

Organised Interpretation Project

Project files (chosen environment)  
Report (.pdf)  
Presentation (.ppt)

## Connected Service Packs:

[GG2](#) – Prospect Evaluation and Ranking  
[ST4](#) – Opportunity Evaluation – Data  
rooming

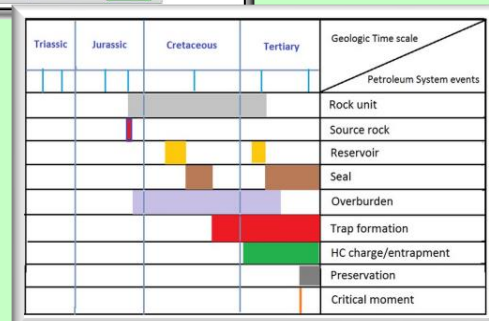
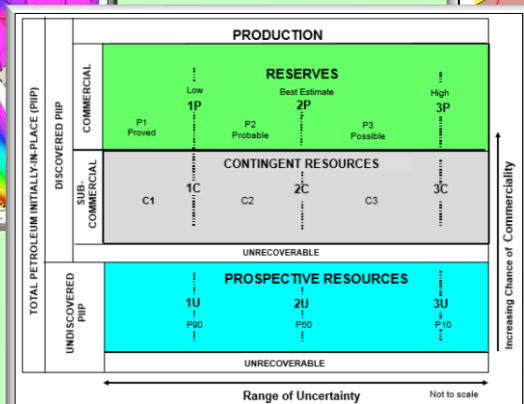
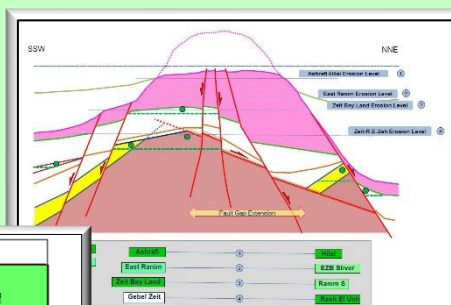
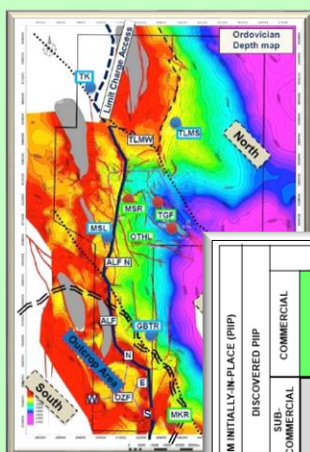
## Short Description

**OCRE**

This activity comprises the evaluation of Prospect portfolio in terms of Volumetrics, and HC content, according to the SPE PRSM system.

It foresees the evaluation of risking (PoS) using Petroleum System definition and elements, and Fairway&CRS Mapping.

It contains the building up Creaming curves for Basin and Play concepts and the application to the elements of risking in the portfolio.



## Input

Maps of Prospects and Leads in Seismic interpretation environment.

## Used in:

- New Ventures – Data-rooms
- Exploration
- Reservoir Management

## Deliverables

Prospect portfolio evaluation with risking and ranking.

Data files (.xls)  
Report (.pdf)  
Presentation (.ppt)

## Connected Service Packs:

- [GG1](#) – Seismic Interpretation and Mapping
- [ST4](#) – Opportunity Evaluation – Data rooming
- [ST3](#) – Geological Model Building – Petroleum System



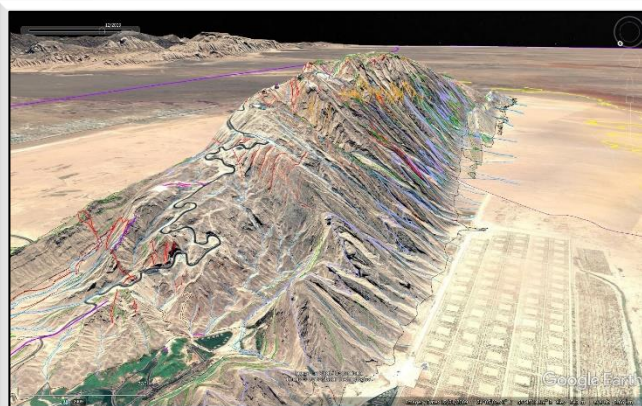
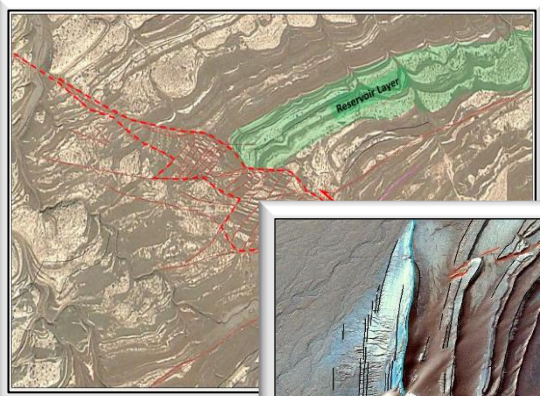
## Short Description

**OCRE**

This activity comprises the interpretation on Remote Sensing data sets (imagery) of geologic, geomorphologic and geographic features.

It foresees integration with available reports and publications, geological interpretation, and delivery of measurements and analyses.

Unique procedures are applied to perform numerical analyses and transfer of the data to a seismic interpretation environment.



## Input

Available Remote Sensing Imagery.  
This can be provided on request.

### Used in:

- New Ventures
- Exploration
- Reservoir Management
- Unconventionals
- Territorial Management
- CCS

## Deliverables

The interpreted geological, geomorphological and geographical features.

GIS Data files  
Report (.pdf)  
Presentation (.ppt)

### Connected Service Packs:

[GG1](#) – Seismic Interpretation and Mapping  
[ST5](#) – Field Geology Studies  
[FR1](#) – Fractures and Faults; Data Acquisition



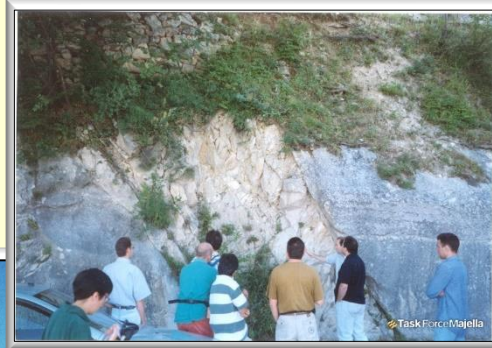


## Short Description

**OCRE**

This Field Trip focusses on the area of Central Italy where an important analogue of a fractured and faulted carbonate reservoir is outcropping: The Majella Mountain. The area has been subject of important international research projects such as the TFM.

Examples will be visited of platform to basinal settings, fault zones and fracture systems, oil seepages and asphalt mining.



## Input

Amount and background of participants.  
Length of the desired program and arguments to focus.

### Used in:

- New Ventures
- Exploration
- Reservoir Management
- Unconventionals
- Territorial Management
- Carbon Capture and Storage

## Deliverables

Real or Virtual Field trip of 3 to 10 days.

Field Trip guide book (.pdf)  
Presentations (.ppt)  
Support material

### Connected Service Packs:

[ST5](#) – Field Geology Studies  
[FR1](#) – Fractures and Faults; Data Acquisition

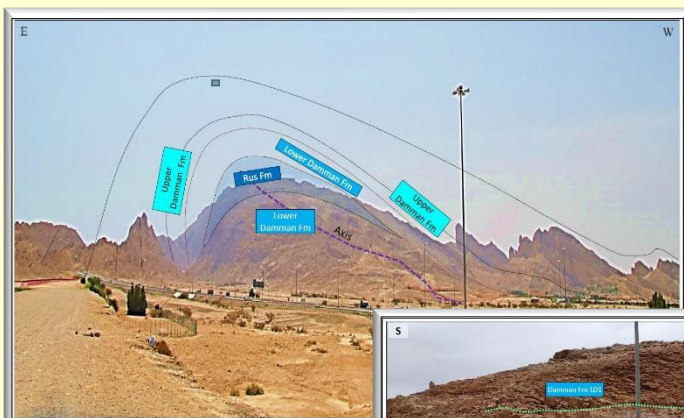


## Short Description

**OCRE**

This Field Trip focusses on the area of Al Ain (Abu Dhabi, UAE), where an important analogue of a fractured and faulted carbonate reservoir is outcropping: The Jebel Hafit. The area has been subject of important international research projects.

Examples will be visited of Eocene to Oligocene platform to basinal settings, with various types of facies, fault zones and fracture systems.



## Input

Amount and background of participants.  
Length of the desired program and arguments to focus.

### Used in:

- New Ventures
- Exploration
- Reservoir Management
- Unconventionals
- Territorial Management
- Carbon Capture and Storage

## Deliverables

Real or Virtual Field trip of 1 to 4 days.

Field Trip guide book (.pdf)  
Presentations (.ppt)  
Support material

### Connected Service Packs:

[ST5](#) – Field Geology Studies  
[FR1](#) – Fractures and Faults; Data Acquisition

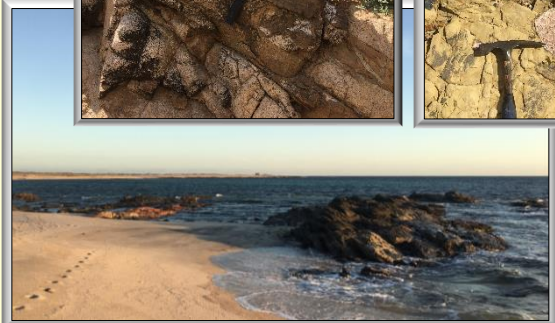




## Short Description

**OCRE**

This Field Trip focusses on the area of Mirbat (Southern Oman), where an important analogue of Neoproterozoic glacial clastic series are outcropping. The area has been subject of important international research projects. Examples will be visited of the syn-glacial clastic deposits, with the possibility of inserting various stops in the Cretaceous fractured carbonates sequence.



## Input

Amount and background of participants.  
Length of the desired program and arguments to focus.

### Used in:

- New Ventures
- Exploration
- Reservoir Management
- Unconventionals
- Territorial Management
- Carbon Capture and Storage

## Deliverables

Real or Virtual Field trip of 2 to 5 days.

Field Trip guide book (.pdf)  
Presentations (.ppt)  
Support material

### Connected Service Packs:

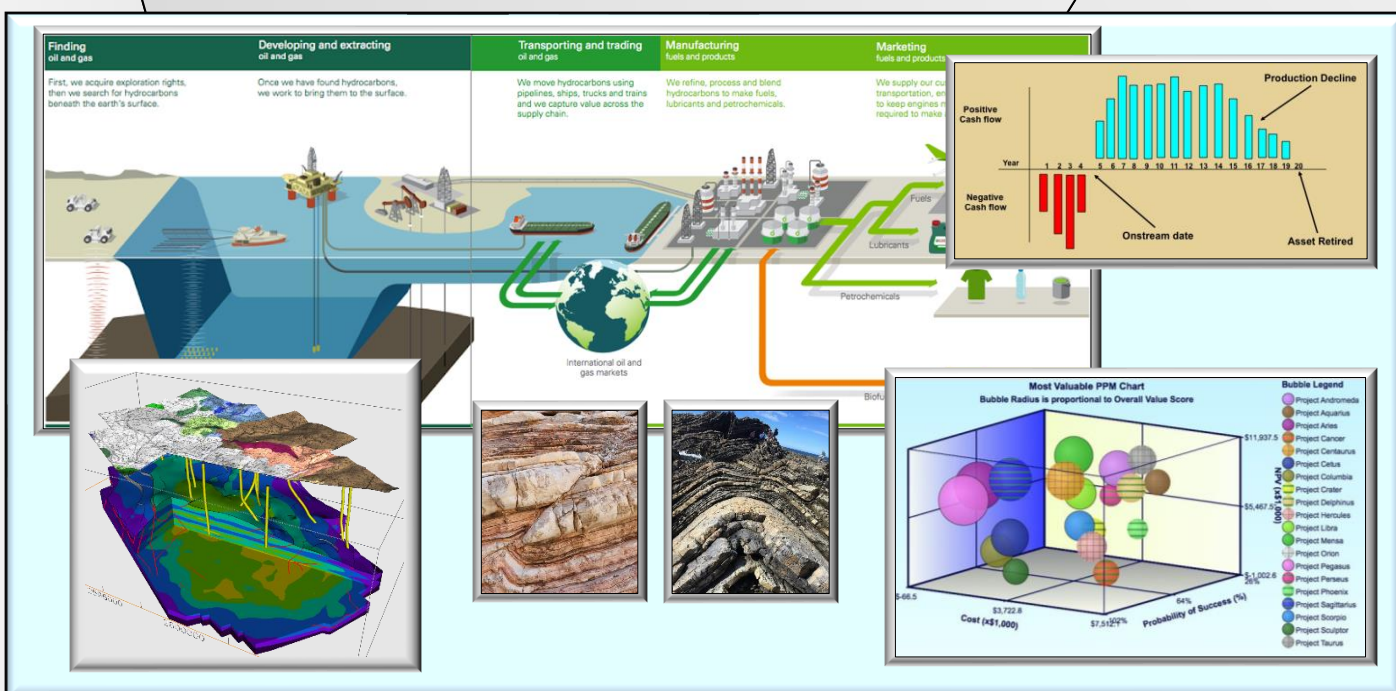
[ST5](#) – Field Geology Studies  
[FR1](#) – Fractures and Faults; Data Acquisition



## Short Description

**OCRE**

This Training Course is designed to provide an introduction of the O&G Value Chain. This is especially adapted for staff members which do not have a specific G&G background (Admin, HR, Finance, HSE, Legal, Management, etc.). The participants are introduced in Geology, Petroleum Geology, NV, Exploration, Reservoir Management, Drilling, and Facilities, Projects, and perform various practical exercises during the program.



## Input

Amount and background of participants.  
Length of the desired program and arguments to focus.

## Used in:

- New Ventures
- Exploration
- Reservoir Management
- Unconventionals
- Territorial Management
- Carbon Capture and Storage

## Deliverables

Course of 2 to 5 days.

Training Course book (.pdf)  
Presentations (.ppt)  
Support material

## Connected Service Packs:

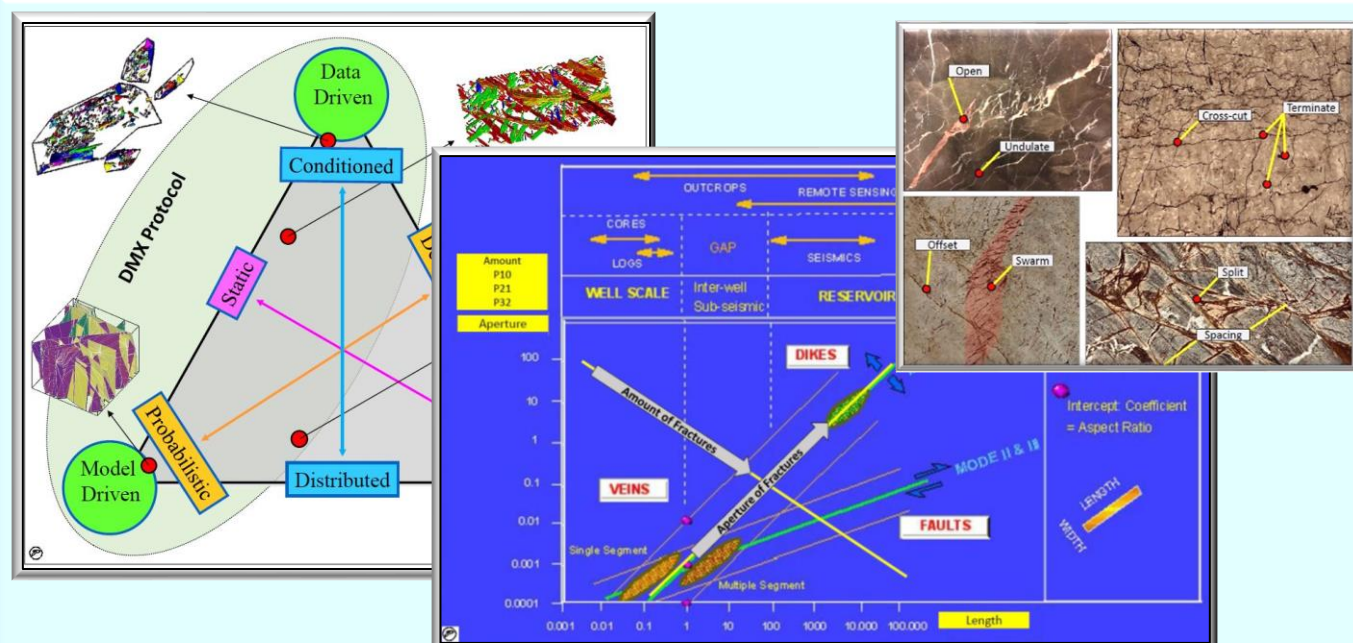
[TC2](#) – Training: Analyses & Modelling of Fractured & Faulted Reservoirs  
[TC3](#) – Geology and Geophysics  
[ST1](#) – Best Practise, QC/Integrity, Peer Review, Due Diligence

## Short Description

OCRE

This Training Course is designed to provide an overview of the Analyses and Modeling Fractured and Faulted Reservoirs.

The participants are introduced in fracture data acquisition, analyses, and modeling technologies, multiscale analyses, upscaling, and reservoir modeling parameters. Various exercises are performed on real cases and applications in Exploration and Reservoir Management are provided.



## Input

Amount and background of participants.  
Length of the desired program and arguments to focus.

## Used in:

- New Ventures
- Exploration
- Reservoir Management
- Unconventionals
- Territorial Management
- Carbon Capture and Storage

## Deliverables

Course of 1 to 5 days.

Training Course book (.pdf)  
Presentations (.ppt)  
Support material

## Connected Service Packs:

[TC1](#) – Training: Introduction in the Oil and Gas  
[FR1](#) – Fractures and Faults; Data Acquisition  
[FR2](#) – Fractures and Faults; Data Analyses  
[FR3](#) – Fractures and Faults; 2d and 3d Modelling

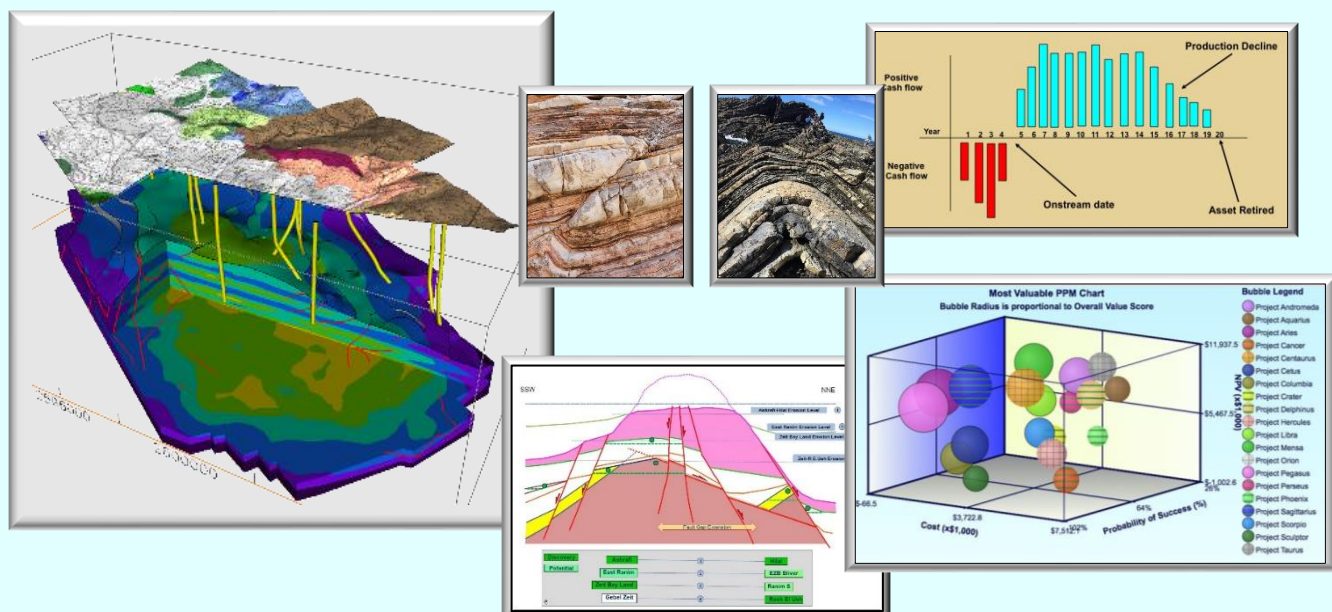




## Short Description

**OCRE**

This Training Course is designed to provide an overview of Geology and Geophysics in O&G. The participants are introduced in practical and theoretical Geology and Geophysics, Petroleum Geology, Remote Sensing, Seismic Interpretation, Log analyses, Prospect Generation, Risking and Ranking, Reservoir Modeling and Operations. Various exercises are performed on real cases and applications in E&P are provided.



## Input

Amount and background of participants.  
Length of the desired program and arguments to focus.

## Used in:

- New Ventures
- Exploration
- Reservoir Management
- Unconventionals
- Territorial Management
- Carbon Capture and Storage

## Deliverables

Course of 1 to 5 days.

Training Course book (.pdf)  
Presentations (.ppt)  
Support material

## Connected Service Packs:

[TC1](#) – Training: Introduction in the Oil and Gas  
[TC2](#) – Training: Analyses & Modelling of Fractured & Faulted Reservoirs



This document is illustrated with images originating from published work which can be consulted online using the hyperlinks inserted on each of them.

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