Technologies & Solutions
Providing unique perspectives on our planet

April 2023
A global technology and HPC leader

Providing a comprehensive range of data, products, services and solutions for complex digital, energy transition, natural resource, environmental and infrastructure challenges

SEE THINGS DIFFERENTLY

INNOVATION
PEOPLE
QUALITY
SOCIAL RESPONSIBILITY
HSE EXCELLENCE
Our values

We are problem solvers
Curious and passionate about constantly advancing science and technology to discover new insights, innovations and solutions for all our stakeholders

We are open
Always inclusive and believing good ideas can come from anyone, anywhere

We are responsible
Caring deeply about the Earth and doing the right thing, always acting safely and with integrity

We are driven to go beyond expectations
Continuously delivering outstanding service for our clients
Our ESG commitments

OUR CARBON NEUTRALITY STATEMENT

CGG will achieve net zero by 2050
Aligned with our longstanding commitment to act responsibly and minimize the impact of our activities on the environment, in every sector of our business, we pledge to reach net zero emissions by 2050 in scopes 1 & 2 of the greenhouse gas (GHG) protocol.

<table>
<thead>
<tr>
<th>GHG emissions Scope 1+2 (K tons CO₂ eq)</th>
<th>2020: 53 Kt</th>
<th>2021: 45 Kt</th>
<th>2022: 41 Kt</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Low emissions energy mix (total kwh consumption Scope 2)</td>
<td>2020: 31%</td>
<td>2021: 36%</td>
<td>2022: 51%</td>
</tr>
<tr>
<td>Power usage efficiency (3 main centers)</td>
<td>2020: 1.33</td>
<td>2021: 1.35</td>
<td>2022: 1.42</td>
</tr>
</tbody>
</table>

50% reduction by 2030
90% by 2050
50% in 2030
90% in 2050 or sooner depending on availability and prices

<= 1.2 by 2030

OUR SUSTAINABILITY CONTRIBUTION

Energy companies’ CO₂ footprint reduction: more accurate drilling locations to avoid hazards and optimally target reservoirs

Energy companies’ internal efficiency: expertise & HPC resources & digital platform to optimize decision process

Energy transition: supporting the transition to a lower carbon future

Environmental science: improving awareness of local and global environmental changes

OUR ESG RATINGS

MSCI ESG RATINGS

Sustainalytics

RATED

17.9

Updated May 13, 2022

#2 among the Energy Services

#1-3 in Oilfield Services
Our leadership

Sophie Zurquiyah  
CEO

Peter Whiting  
Geoscience

Dechun Lin  
Earth Data

Emmanuelle Dubu  
Sensing and Monitoring

Agnès Boudot  
HPC and Cloud Solutions

Jérôme Serve  
Finance

Eduardo Coutinho  
Group General Counsel

Jérôme Denigot  
Human Resources

Hovey Cox  
Marketing, Sales and Communications

Emmanuel Odin  
Sustainability
Revenue
$928 m
UP 3%* Y-O-Y

Adjusted
EBITDAs
$395 m
a 43% margin

Liquidity
$398 m

Financial overview: 2022 full year

Revenue Breakdown

- Sensing & Monitoring
  $269 m
  29%

- Earth Data
  $375 m
  40%

- Geoscience
  $284 m
  31%
Global services & expertise

25 Locations Globally
70% post graduate degrees
27% PhDs

Geoscience center
Sensing & Monitoring
Regional hub

Staff allocation by activity
- Operations
- Support
- R&D
- Sales

Staff allocation by Division
- Sensing & Mon.
- Geoscience
- HPC & Cloud
- Earth Data
- Support

Geoscience
- Sensing & Monitoring
- Regional hub

25 Locations Globally
70% post graduate degrees
27% PhDs
Geoscience global footprint

- **25 Locations Globally**
  - 16 Subsurface Imaging open centres
  - 7 Subsurface Imaging dedicated centres

**Technical Staff**
- 70% Post graduate degrees
- 27% PhD

**Geoscience Staff allocation**
- EHEM Operations: 51%
- WHEM Operations: 12%
- TECH+: 8%
- InCube: 9%
- Support: 9%
Our perimeter

OUR STRENGTHS

**Remarkable data & technology**
Unique Earth data library, imaging, geoscience and digital technologies

**Outstanding people & performance**
Ingenuity, diversity and expertise driving innovation and exceeding expectations

**Exceptional ESG commitments**
Enabling CGG and our clients to be more efficient, effective, responsible and sustainable

OUR CORE BUSINESSES

**Geoscience**
Established leader in subsurface imaging, geology and geoscience services

**Earth Data**
The industry’s most technically advanced seismic data and geologic studies in the world’s key locations

**HPC & Cloud Solutions**
70 years of pioneering computing technology for high-end Earth science, data science and digital solutions

**Sensing & Monitoring**
Established leader in seismic equipment, downhole gauges and innovative structural monitoring solutions
2022 new businesses: Key achievements

**Digital**
- HPC and Cloud Solutions pilots, building opportunities for 2023/24
- Launch of construction of a new UK HPC center
- Partnership with 2CRSI for joint business development and sales
- Several data transformation pilots and full-scale project with bp

**Energy Transition**
- Several screening/characterization projects for mineral exploration
- First multi-client project in North America for mining industry
- Integrated CCUS data packages in North Sea and US GoM
- ~ 20M$ sales of data for CCUS applications – North Sea and Australia

**Infrastructure Monitoring**
- 3 monitoring projects in France, including a stadium
- 1 pilot monitoring of a cable-stayed bridge in Houston with TX DOT
- Acquisition of Geocomp – a US expert in geotechnical engineering and infrastructure monitoring
HPC and Cloud Solutions

HPC

- Supporting CGG’s global Subsurface Imaging services
- Providing access to highly-optimized HPC resources and digital platform, and consulting services
- Construction of new UK data center in 2023

Cloud Services

- Secure and efficient access to our exceptional HPC resources on the secure CGG Cloud

3 compute hubs
- UK, Houston, Singapore

1 development lab
- Massy
Geoscience Ecosystem

Subsurface Imaging
Unmatched expertise, advanced geoscience & digital algorithms and excellent service in every image

Geology & Engineering
Leading geological and reservoir services and consultancy for natural resource development

Energy Transition
Applying our geoscience and digital expertise to geothermal, CCUS, critical mineral and environmental analysis and monitoring

Multiphysics
Expert analysis and interpretation of multi-domain geophysical data for natural resources and environmental applications

Earth Observation
Intelligence from imagery for energy, mining, engineering, environment and defense

Data Hub
Maximizing the value of data to improve business decisions with expert data transformation services and technology

GeoTraining
Bringing together the full breadth of CGG’s capabilities to provide comprehensive learning path programs

Energy Transition
Applying our geoscience and digital expertise to geothermal, CCUS, critical mineral and environmental analysis and monitoring

Data Hub
Maximizing the value of data to improve business decisions with expert data transformation services and technology

GeoTraining
Bringing together the full breadth of CGG’s capabilities to provide comprehensive learning path programs
Geoscience continues to advance FWI technology

**Best-in-class** results around the world for reservoir imaging and characterization

- Most advanced seismic imaging with pioneering FWI technology
- More accurate physics for better focusing and higher signal-to-noise ratio
- Time-lapse FWI helping to delineate reservoir compartmentalization based on accurate velocity change detection over time with full wavefield data

4D 20Hz FWI suggesting compartmentalization in a depleted North Sea reservoir
Earth Data

The most recent and advanced data in the world’s key basins and frontiers

- The highest quality seismic data library
- GeoVerse analytics-ready Earth data
- Versal unified seismic data ecosystem

TLFWI reimagining highlights pre-salt reservoirs, Santos Basin, Brazil

The right data, in the right place at the right time
An evolving suite of Earth Data products

Core Basins
- Gulf of Mexico, Brazil pre-salt, North Sea
- High-end 3D seismic, OBN and reimaging for near-field exploration, reservoir development and production

Developing
- Australia, Africa, Equatorial Brazil, Northwest Europe and Barents Sea
- 3D seismic and integrated geoscience studies

Energy Transition & Mining Studies
- CO2 storage studies, GOM and North Sea
- Southeast Arizona mineral exploration integrated database
- Global geothermal resource assessments
- Paleo-salar Lithium study, South America

An expanding suite of regional and global GeoVerse datasets and studies for energy transition and minerals
Digital solutions enrich Earth Data offering

Versal
Unified seismic data ecosystem offering the vast majority of the world’s multi-client seismic data
CGG | TGS | PGS | SLB

GeoVerse
A global integrated geological database ready for licensing

GeoWells
Advanced multi-discipline well data available in GOM (Mexico), Brazil pre-salt basins and Norway

BUILDING AN ECOSYSTEM AND GLOBAL DIGITAL DATABASE FOR A NEW GENERATION OF MULTI-CLIENT PRODUCTS AND SERVICES
Sercel designs and manufactures high-tech solutions for subsurface exploration. Capitalizing on its world-leading position in the seismic acquisition industry, Sercel also provides innovative solutions for structural and earthworks monitoring, defense and energy transition.

- Full range of onshore, offshore and downhole products
- Industry benchmark and market leader
- Unequalled product reliability and customer support

ANYWHERE. ANYTIME. EVERYTIME.
A diversified Sercel scope

**Natural Resources**
Seismic solutions for imaging and monitoring the subsurface and production monitoring gauges

**Energy Transition**
Seismic solutions for subsurface imaging and monitoring of geothermal, CCS, critical minerals and offshore wind

**Structural Monitoring**
Sensors and monitoring solutions for infrastructure

**Earth Monitoring**
Microseismic earthquake monitoring solutions

**Defense**
Custom-engineered marine acoustics and cable solutions
Sensing & monitoring Update

**Land**
- Strong deliveries in North America and North Africa
- Deliveries of WiNG wireless node with QuietSeis™ sensor

**Marine**
- Finalized delivery of a major GPR300 OBN order
- Streamer business still relying on section replacements and repairs

**Downhole tools**
- Artificial lift gauges very active in the North American market
- Memory gauges activity steady

**Beyond the Core**
- Structural health monitoring: First commercial projects secured on several structures in the USA
- Acquisition of Geocomp, a US expert in geotechnical engineering and infrastructure monitoring
New differentiated offerings in rapidly growing markets

**DIGITAL**

- **HPC & Cloud Solutions**
  70 years of pioneering computing technology for high-end Earth science, data science and digital solutions.

- **Data Hub**
  Creating curated decision-ready data for improved business decision quality with advanced data transformation workflows.

**MONITORING & OBSERVATION**

- **Environmental Science**
  Monitoring of local and global environmental changes using geoscience data, technology and analytics.

- **Infrastructure Monitoring**
  Detailed and continuous situational awareness to predict failures, respond to hazards and optimize preventative maintenance of structures and earthworks.

**ENERGY TRANSITION**

- **CCUS**
  Expertise for screening, evaluating and monitoring sub-surface storage and risks.

- **Minerals & Mining**
  Services for exploration and monitoring of mine tailings, increasing awareness at all stages of the mining lifecycle.

- **Geothermal**
  Evaluation of resource potential, optimization and monitoring of geothermal developments with greater subsurface insight.

**EARTH DATA**

- **Multi-Client Earth Data Library**
  Portfolio of digital products for natural resource and energy transition applications, with over 55 petabytes of data, backed by a unique taxonomy and data ecosystem.
Data Hub expert data transformation services and technology

Team
- Subject matter experts
- Data scientists and engineers
- Machine learning engineers
- System developers and Cloud architects

Technology
- Dynamic pipeline of data transformation and latest-generation Machine Learning technologies (driven by HPC and Cloud)
- OSDU roadmap

Taxonomy
- > 50 years of subsurface knowledge
- >700 distinct data types
- Millions of processed files
- 250,000 entities of subsurface terminology

Digitalization services
- Geoscience
- Engineering
- Mining
- Geothermal
- Environmental
- CCUS

DaaS products built by Data Hub
- GeoVerse global geology & geoscience
- GeoWells regional data
Data Hub workflow

**Input data**
Ingest structured and unstructured data

**Extraction**
Extract value from data sources into one consistent data model

**Curated data**
Consistent evergreen database accessible to SME’s through UI’s and connectors to discipline-specific software

**Classification**
Classify data on a sub-document level to prioritize extraction & integration

**Enrichment & Integration**
Integrate data across disciplines and generate new information from geoscience and engineering images
Minerals & Mining

Mineral Exploration
Predict, target and estimate mineral resource in different environments and at increasing depth

Production & Closure
Baseline and monitor mine site & tailings activity, performance, safety and risk

Strategic intelligence
Provision of unique third-party intelligence for exploration, mine site activity, environmental risk management and insurance

Data Management & Analysis
Enabling better management and analytics of data

Leveraging expertise across equipment, Earth data and geoscience
Critical insight for mine waste management

- Aging tailings storage facilities (TSFs) represent an ongoing liability for mine operators
- Recent high-profile failures and new global regulations emphasize the need for TSF monitoring
- Landmark project for a global mining company using airborne electromagnetic 3D imaging over 45 TSFs in Brazil
- Significant global potential for TSF monitoring services, with other pilot projects underway using a variety of integrated techniques

TailingsPulse™ service launched 2021

Apparent Resistivity from an airborne EM survey delineates the structure of dams and ponds. Parsons et al., SBGI 2021
Carbon Storage

Expertise spanning the Carbon Storage project lifecycle including participation in landmark CCS projects around the world such as Sleipner, In Salah and Gorgon

Leveraging experience across our different disciplines to provide solutions for:

- Regional screening
- Seismic site characterization
- Monitoring planning
- Operational monitoring

15 years of delivering impactful results in Carbon Storage
Geothermal

• **Independent** guidance to assess geothermal projects at a range of scales

• Exploring the ‘**Geothermal Value Chain**’

• Evaluating the **scale** of global geothermal energy potential and providing insight for electrical power and heating

• Leveraging CGG experience and advanced **data analytics** in sedimentary basins and volcanic regions

• Dedicated **multi-disciplinary** team to guide and advise on global to prospect investment de-risking

---

**Worldwide Experience**

With over 150 geothermal projects and 2 global resource assessments

---

**Supporting the transition to a lower carbon future**
Climate Change Analysis
Integration of our environmental and data sciences to understand climate risk, resilience and carbon offset challenges

Intelligence
Environmental data analytics workflows for climate, biodiversity, marine ecosystems, natural capital, geodiversity and nature-based solutions

Monitoring
Monitoring the impact of infrastructure or specific human activity on the environment

Climate Change Analysis
Integration of our environmental and data sciences to understand climate risk, resilience and carbon offset challenges

Leveraging Environmental Science expertise with HPC, AI and remote sensing capabilities to provide data analytics-driven intelligence
Expanding Environmental Sciences portfolio

Natural Insights data platform
- Enabling detailed geospatial analysis of environmental analytics and climate change risk factors
- Site suitability surveys for renewables and carbon-offsetting
- Natural capital assessments
- Asset monitoring

SeaScope: Clean sea monitoring
- Sea surface slick intelligence to strengthen situational awareness and mitigate risk
- Deliver value to environmental, operations, crisis response, legal and corporate teams
- Detection and classification of marine and coastal pollution using our unique satellite, ML and data expertise
Infrastructure monitoring: Structural health & earthworks

- Solutions for monitoring critical infrastructure, earthworks and near-surface conditions
- Providing detailed and continuous situational awareness to respond to hazards and optimize preventative maintenance
- Advanced ultra-sensitive QuietSeis™ MEMS and DAS sensor technology
- Patented passive seismic imaging technology maps near-surface anomalies and changes
- Industry leading Earth observation data provision and interpretation
- Autonomous systems with minimal footprint with no impact on operations
- Real-time cloud delivery of results and analysis
Structural health monitoring: Successful bridge test in the US

Market
- Structural health monitoring market estimated ~2B$
- Leveraging high-quality wireless sensors and imaging expertise to deliver solutions for critical infrastructures

Cable-stayed bridge test in Southern US
- Instrumented cable-stayed bridge with S-Lynks sensor solution for a major infrastructure operator
- System measured vibration modes and cables tension, and will allow more relevant and targeted maintenance
Earth Data platform & services

**Data as a Service**
DaaS Portal with interactive applications for clients to access and use CGG Earth Data

**Versal**
Unified seismic data ecosystem offering 70% of the world’s multi-client seismic data
CGG | TGS | PGS | SLB

**Management & Analytics**
Simplified management, hosting and streaming of CGG and client data, plus analytics layer

Data ecosystem enabling access, visualization, procurement, management and data mining
A growing and diverse Earth Data Library

- Applying our expertise to develop new multi-client products for the energy transition
- Carbon storage
  - Applying a unique play-scale screening methodology to identify and de-risk carbon storage potential in the GoM and North Sea
- Mineral exploration data
  - New cross-discipline, multi-client project launched in SE Arizona to support mining industry
- Lithium studies
  - Global Li brine screening study leveraging geochemical data
  - Paleo-salar Li study for South America combining satellite and topographic modelling and ground truthing