
PEOPLE
ARE THE KEY TO
EVERYTHING

With a new name and its guiding vision to “see things differently”, Viridien (formerly CGG) focuses on human ingenuity to usher in a bright future across multiple sectors.

The oil and gas industry has seen rapidly changing trends over the last decade, driven as ever by the latest developments in technology and tapping into artificial intelligence (AI) and high-performance computing (HPC) to become more efficient. Energy technology companies are at the forefront of these innovations, but the skills and tools they have developed to serve their core clients are proving to have applications in a range of industries.

One such technology company, CGG, became Viridien this year, a new brand that builds upon a 90+ year legacy of innovation in geoscience to support oil and gas discovery and development. Although its focus remains primarily on exploration and production, the company recently started bringing the benefits of geoscience and data science to other industries. Peter Whiting, EVP Geoscience, talks about Viridien’s history and future, the decision to change its name, and the importance of developing people, who are at the heart of its success.

“The geoscience business is exciting and varied, covering a wide range of data, from seismic, satellite imagery, geology and geophysics to engineering, drilling and production. Enriching this data through our sophisticated algorithms allows clients to solve their challenges and work in an efficient, safe and successful manner,” he says. “This is true for the oil and gas, energy transition, and other science-reliant markets that we work with.”

Expanding the reach of geoscience and data science

Peter explains that the company had been thinking for some time about rebranding, particularly after it left the seismic acquisition market in 2018, which was quite a focus change that differentiated it from other geophysical companies. While the core of the business is still the oil and gas sector, the company has been moving into other areas, like mineral exploration and carbon storage as part of its commitment to support the energy transition, as well as addressing client challenges in HPC, data transformation, and infrastructure monitoring. To reflect this repositioning, it was decided a new name was needed.

"It's more about evolution than change," Peter explains. "Obviously, we are all very proud of the CGG name, and the legacy of 90 years of service and innovation behind that. We are not changing our strategy towards oil and gas and are as fully committed as ever to research and development for that sector. In fact, our expertise and capabilities are more needed now than ever for oil and gas as the industry actively supports and successfully adapts to the energy transition. However, we are also keen to build on our skills to expand the company in other ways, while not detracting from our core business. The new name is about looking forward, with pride in where we have come from. The word Viridien is based on Latin, meaning 'green and drawn from its roots';

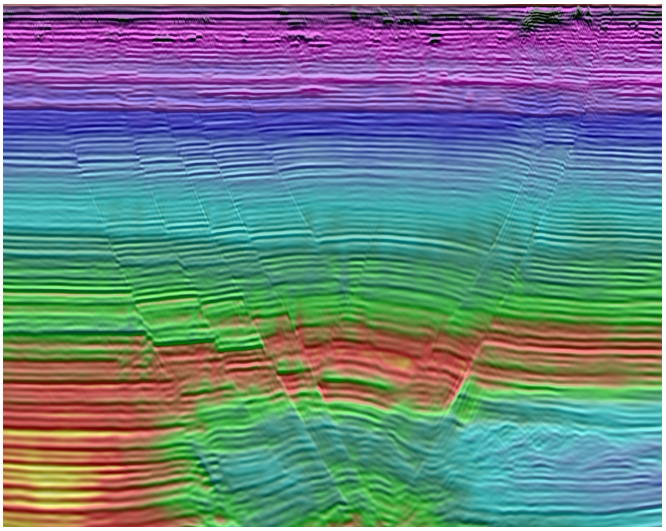

Figure 1. *FWI imaging (here shown co-rendered with velocity model) provides vital subsurface detail for better assessment of carbon storage risks. Image source: Viridien Earth Data.*

Figure 2. *Designed with efficiency and sustainability in mind, Viridien's new UK HPC Hub sets new standards for computational power. Image source: Viridien.*

looking ahead to future developments while still drawing on our long history.

"We see this name as a way to demonstrate our new direction and differentiate the company while stressing we are committed to oil and gas, which still makes up about 90% of our business. We're the same company, but definitely adding to what we are."

Delivering customer-focused solutions from people-driven technology

Peter believes it is important to understand customers and their needs in order to discover what technologies will be most useful to them. "You can't innovate and create new technology without the right people, and you also can't understand clients or deliver excellent service without them. You have to really get to know the client and work out exactly what their problems are; then you need people who can solve these problems. In technology, it's relatively simple to get a prototype, or 80% solution, but few people can fine-tune that to create a high-end commercial product. In addition, you need to provide an excellent service, which is delivered on time and without mistakes," he explains.

Having people with the right focus and attitude is vital, as is developing a culture that allows them to thrive. Peter admits it is sometimes challenging to find such employees and explains how Viridien strives to build ever stronger teams, with staff encouraged to recommend new people to join the company. "It's not just intelligence we're looking for," he continues. "We need people with a real passion and ability to work together for the technology and service we're developing. We must manage them well and give them a good culture to work in, help them develop their talents, and offer them good career opportunities. It's important to get the best people possible and keep improving their skillsets."

Remaining at the forefront of technology with a diverse portfolio of offerings

"Staying at the edge of technical advancements really goes back to people," says Peter. "People who are open and curious and then can solve real problems leading to positive business outcomes, while having the freedom to think broadly." To this end, Viridien has semi-independent R&D groups located throughout the world, making up about 10% of its total employees. Each location researches a range of local problems and ideas, but they know what is going on elsewhere in the world. When working on a new product, these groups work closely with the production teams, to ensure they understand client needs.

Peter stresses the importance of recognising far-reaching technical innovation. "If a team comes up with a good idea and product, we make sure we recognise this, which could include presenting them with an award," he adds. "The outcome must be a product that not only solves a problem for a particular client but can be sold to multiple customers. This can mean that, rather than improving the standard approach to something, we find a completely new process that is more beneficial. Our tag line is 'See Things Differently', and that resonates within the company, as we try to develop new ways of doing things."

Technology, innovation and differentiation are the main thrusts of Viridien's vision. A vital component of this is the company's own HPC capabilities, giving scientists and technologists the freedom to test new ideas and hypotheses at no extra cost. "The misleading idea that cloud computing is cheaper and more expandable has taken over – but you have to pay every time you want to run an idea," Peter explains. "Not being able to try out ideas and new technology on different data can impinge on innovation. By having our own supercomputing systems, we can achieve more.

"We've always designed our own HPC to our advantage. Our systems use only what is needed to get the job done. That might sound cheap,

but it's actually being efficient. We customise hardware to do each job in the most cost-effective way, while software writers work with hardware experts to ensure an algorithm operates efficiently on a given machine. We like to use new technologies and options in software to minimise our overall costs.

"AI and machine learning (ML) are now coming into the picture and are other ways to increase efficiency by reducing either people hours or computer time," he adds. "We're using it in many different areas; a good example is our new Data Hub digital transformation business." Many companies have vast volumes of geoscience data saved in variable formats and stored in many types of databases. Using Data Hub, these data can be ingested, curated, contextualised and enriched, with AI and ML being used extensively in this process. Clients can get the most from their updated legacy data to gain new insights for ongoing and planned geoscientific investigations.

Dual-use technology for energy transition and environmental initiatives

Peter explains that, while many of their technologies were initially developed for the oil and gas sector, they are easily transferred into other parts of the energy business. The majority of Data Hub clients, for example, are in oil and gas, but the team has recently undertaken a successful project with a mining company. "We also have a satellite mapping group and a multiphysics imaging group, both of which work with mining and geothermal companies as well as oil and gas.

Figure 3. *Geoscientists and data scientists explore geologic sources, sharing insights essential for Data Hub digital transformation solutions. Image source: Viridien.*

Figure 4. *Viridien HPC & Cloud Solutions drives scientific discovery, advanced simulations and transformative insights across life sciences. Image source: Viridien .*

"We are also actively involved in carbon storage, not just with oil companies but with other industrial players," he adds. "The value we can offer in this area is in seismic imaging and monitoring; the subsurface must be well imaged and understood to minimise risks like compromised seal integrity and hazardous injection strategies. If we can give companies actionable information to help them plan and execute their project, they will have to drill less and there will be a lower chance of failure. It's the same in oil and gas; more and better information means less drilling, and that means a lower carbon footprint. We believe if we can provide really good information, the world can do what it needs to do to provide energy with less negative impact."

As a company, Viridien puts a lot of effort into reducing its own emissions. For example, its very large data centres in both the UK and the US run on fully renewable green energy. "We want to help the world get the energy it needs at a reasonable price, and with the least amount of environmental impact."

Looking forward to the future

"I think we have a really good base with the type of company we are, the people we hire and how we organise and develop them, so we'll continue with that as the years go on," he says. "There is still a lot of technical innovation work to do in the oil and gas domain. The subsurface images that are being created now are phenomenal, you would not have believed them possible ten years ago – but there is still plenty of scope for improvement. We also continue to research advancements in what might be called 'normal' processing, like de-ghosting, de-multiple and de-noise where much progress is being made."

Within Viridien's core subsurface imaging business, Peter believes full-waveform inversion (FWI) has an exciting future. "The data is so much more accurate than it was in the past. Within a few years, we will be extracting detailed subsurface information directly from the data itself, so oil companies will be able to get data-driven analysis of reservoir potential, size and volumes automatically using AI," he explains. "That's not going to put people out of jobs; we need new experts to run and monitor the automated algorithms, and AI is just a tool that helps the interpreter do a better job. FWI outputs are also being used for rock property and fluid definition, so companies will be able to predict what is in the reservoir with greater precision before they drill."

As Peter has explained, Viridien is now moving into other industries alongside oil and gas. He admits it is challenging to enter new business areas – but he finds it very exciting. "These new relationships take time; you have to listen to and understand a new customer so you can find beneficial ways to assist them and develop something that will be really impactful."

"Another new sector involving the sensing and monitoring equipment part of our company is infrastructure monitoring, in which we put sensors on bridges and railways and other structures and earthworks to monitor stability," he continues. "This is starting to grow, with contracts in Saudi Arabia, the US and France, and we are doing trials and building up trust."

In addition to carbon storage and mining, Viridien has been developing alliances with other scientific industries including biotech, image rendering and materials science. Peter believes that the company's HPC expertise and supercomputing power will be useful in these sectors to maximise business efficiency and support environmental and sustainability goals.

"The most exciting thing about Viridien is its strong technological base, coupled with the people and culture that we have. It's a really good springboard for the future and that is what we will build on to serve our clients across a growing range of industries," he concludes.