



## The Evolving Role of Geoscientists

September 2020 [Barry Friedman, Explorer Correspondent](#)

“The public view of the oil industry and geoscience in general is on the low at the moment.”

That’s according to Mukul R. Bhatia, executive professor and director of the Berg-Hughes Center for Petroleum and Sedimentary Systems, who said that even some who want to enter the industry have this view.



Mukul R. Bhatia

“Enrollment in the geosciences and petroleum engineering courses has declined in most education institutes. The oil and gas development industry is seen as shrinking rather than growing,” he said.

Bhatia, a Dan A. Hughes '51 chair at Texas A&M University, said the challenge of attracting students back to the geosciences is compounded by the challenge of attracting them to the industry's new frontier, both internally and externally.

“It is well accepted that oil and gas will be needed for several decades to come,” Bhatia said, “both as a primary source of energy and as the building block for essential items required to sustain economic growth and enhance living standards. We also see a human resource and talent gap in the near future as a result of the older generation of geoscientists and engineers retiring and no one to replace them, as happened in the 1990s.”

## **The Vital Role of Geoscientists**

Additionally, those now entering the industry want a more holistic approach to the profession, one in which “the bottom line” isn't the only goal.

“In addition, younger professional geoscientists working in the oil and gas sector want to help in environment and sustainability, in addition to doing their job as exploration and production geoscientists,” said Bhatia.

Bhatia, a member of both AAPG and the Petroleum Exploration Society of Austria, said that shift in their thinking should be understood in order to appeal to these new students.

“To attract students back to geoscience, we need to change and evolve our geoscience delivery and education to equip students to face the multiple challenges of sustainability, growth, better living standards and preserving the environment,” he explained.

To that end, the Berg-Hughes Center for Petroleum and Sedimentary Systems was formed by endowments by the Dan and Dudley Hughes family with the mission to integrate geosciences, engineering and other disciplines to collaborate with industry and others to advance research and education in petroleum studies.

Bhatia said the center addresses the nation's energy needs, provides an innovative multidisciplinary education in petroleum and sedimentary systems, and contributes to the career development of geoscience and engineering students.

The new focus has to deal with the old perception.

“Fossil energy is deemed largely responsible for the current state of environmental degradation,” he said. On the other hand, he knows that geoscientists and their skillsets in subsurface are a vital part of the solution and of sustainability, not just the cause of the environmental damage.

“The subsurface skills and expertise that are used in the development of fossil energy are also essential for the decarbonization solutions, such as carbon utilization and storage, enhanced oil recovery, geothermal energy, water management, nuclear waste disposal and the safe extraction of metals and mineral resources, so are essential for renewables,” he said.

Further, he believes, as do many, that geoscientists have a vital role to play – the vital role, perhaps – in energy transition.

“The fundamental geosciences along with the broader appreciation of principles of rigorous subsurface (geological and engineering) characterization, fluid flow behavior and environmental science can be best learned while working in integrated and multi-disciplinary teams,” he said.

## **The Post-Pandemic Industry**

No discussion of the future of the oil and gas sector, or any field for that matter, can be had these days, without mentioning the pall of the current pandemic.

“Yes, COVID -19 has changed the game. Obviously, the economy is impacted immensely. Oil demand will remain low at least till 2022-23,” he said, pointing out the industry will spend less on oil and gas in the next two to three years, thus impacting the job opportunities in the exploration and production sector.

He said, however, there may be an opportunity in the new reality.

“All over the world, the public wants more to be done by governments and the private industry to tackle sustainability, environment and meet climate goals,” he said.

Bhatia believes this could result in increased investment in technology to enhance energy efficiency, water management and carbon issues. Geoscience is fundamental in carbon capture, utilization and storage. The techniques and workflow used in petroleum development are applicable in subsurface studies of carbon utilization and storage.

“So, going forward the focus will be on specializing in the subsurface geoscience and engineering techniques, which are applicable in oil and gas recovery as well as in carbon utilization and storage, hydrogen energy and geothermal energy,” he said.

## **Society’s Shifting Demands**

And here he talks about what he calls, “the lifecycle problems and the value change.”

“Oil and gas is a cyclical business, hence the need to be prepared for the ups and downs,” said Bhatia.

Education and research organizations need to consider the long-term picture of the industry and how we meet the needs of the society. This has to be an organic approach.

“We need to look at holistic, integrated and life-cycle projects, as industry’s needs and problems change over time. Our students get the best perspective of understanding the various facets and complexity of industry and society while working in multi-disciplinary teams in industry-sponsored projects,” he said.

The life-cycle problems in resource development are essential.

“New sets of problems and uncertainties develop over time even at the field level. Education and research institutions, should be prepared to help solve the current problems and also look for potential long term solutions,” Bhatia explained.

It will require, he said, a physics-based approach, good availability of data and communication with the operating teams of the industry, and access to the latest technology.

“A key element is the ability to work with various disciplines (engineering, mathematics, chemistry and data analytics) so that each discipline can contribute to solving the larger problem in the shortest period of time while preserving capital and value,” he said.

While it is imperative to keep a good grounding of fundamental geology, Bhatia said geoscientists need to broaden their skill sets and enhance their problem-solving abilities by understanding engineering and economic principles in order to survive.

In the future there will need to be rigorous learning of petroleum-related subsurface skill sets for their direct application in solving mineral and oil and gas development, sustainability and carbon management issues, which are essential to reaching the climate targets in an economically prosperous world.

“The geoscience profession,” Bhatia believes, “has an influential role in societal issues impacting economic growth, environmental and climate change.”