

Meeting the Education and Training Needs of the Industry

a report by

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World consumption of energy derived from fossil fuels is at an all-time high and continues to increase, albeit at a slower rate than in previous years. The future supply of energy is critical for worldwide economic vitality and security. To ensure that future energy supply will be sufficient to meet the needs of the increasingly industrialised world, more well-educated and trained geologists, geophysicists and engineers are needed.

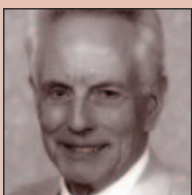
The US Department of Labor estimates that over half of the US technical workforce will retire in the next 15 years – a critical loss. Currently, a significant shortage of petroleum geoscientists exists in North America and western Europe, but shortages have also been reported in India and South-East Asia.

Enrolment in geosciences and petroleum engineering education is increasing; for example, the number of undergraduate students studying petroleum engineering at Texas A&M University, one of the largest petroleum engineering universities in the US, has increased from 191 in 2001 to 507 in 2006, including a new satellite campus in Qatar. However, will the current increase in enrolment be enough to supply the accelerating workforce needs stimulated by the increasing demand for energy and the looming wave of retirements?

What Is the American Association of Petroleum Geologists Currently Doing to Attract, Assist and Encourage Students in Geosciences?

The American Association of Petroleum Engineers (AAPG), through its local affiliated societies, encourages students in elementary through to high schools to take scientific and technical classes. It is important to interest young students in geoscience before they enter college or university.

Many local societies participate in the Earth Science Week programme, developed by the American Geological Institute (AGI). This year, the West Texas Geological Society, my home society, will send volunteers into 50 elementary schools to give geoscience talks to fourth- to sixth-grade students.



Willard 'Will' R Green, a certified independent geologist and Head of Green Energy Resources in Midland, Texas, is President of the American Association of Petroleum Geologists (AAPG), a professional association with over 31,000 members in 115 countries. He began his career with Shell Oil, working as a geologist in Denver, Roswell, Midland and Houston. In 1976 he joined GeoQuest International as Senior Geologist in Houston, and in 1977 joined BHP Petroleum (Americas) as

Division Exploration Manager in Midland. He joined Forest Oil in Midland in 1986, and in 1989 formed Green Energy Resources. Mr Green, a native of San Angelo, Texas, holds a BSc in geological engineering and petroleum engineering from Texas A&M University and an MSc in geology from the University of Texas at Austin.

The AAPG Sections, with partial funding from the AAPG Foundation, offer elementary- and middle-school science teachers training in geology with applications to the petroleum industry. This is accomplished through the seminar 'Rocks In Your Head'. The programme is usually offered in conjunction with the Section conventions.

The AAPG Foundation has a Grants-in-Aid programme, which was created to foster research in the geosciences by providing support to graduate students in the earth sciences whose research has application to the search for and development of petroleum and energy minerals resources, or to related environmental geology issues.

A comprehensive and rigorous application and review process identifies the most deserving applicants, who are eligible for a maximum grant of US\$2,000. The 2006 application class completed the 50th year of the AAPG Grants-in-Aid programme. In that time, over US\$2.5 million has been granted to 2,265 high-quality MSc and PhD student research projects throughout the world.

AAPG also sponsors student chapters in 160 universities throughout the world and endeavours to increase that number. The newest chapter is in Ecuador, and its addition to the group brings the total number to 80 international and 80 US-based chapters. Student chapter membership totals over 5,000. Student membership fees (US\$10 per year) are generously sponsored by Chevron. The student chapter programme was highlighted by several events at this year's AAPG annual convention in Long Beach, California, where students participated in oral presentation and poster competitions. Thirty-five students also participated in a three-day post-convention field trip in southern California.

This year, AAPG began sponsorship of the Imperial Barrel Award (IBA) contest, a programme that originated at Imperial College London. The IBA programme provides a real-world learning experience for college- and graduate-level students that integrates their academic training with a team exploration project format. The students are given a seismic and well data set to interpret, and then use their interpretation to predict exploration potential in a designated basin.

Seven student teams presented their results and interpretations to a panel of judges at our annual meeting. The winner was the team from the University of Aberdeen, Scotland; the University received a gift of US\$20,000 from AAPG. Thanks to the huge success of the 2007 IBA, the programme will be expanded to include worldwide Section and Region competitions, with 12–14 school teams competing for the awards at next April's AAPG annual convention in San Antonio.

The AAPG Visiting Geoscientist Programme plays an important role in guiding students into earth science careers through direct student contact during college and university visits by active professional geoscientists.

The volunteer AAPG members may provide a technical presentation on a variety of subjects or discuss career opportunities with the students, or may offer advice and counselling on career paths based on the presenter's own experiences. Interaction with faculty and administrators also provides guidance regarding the courses and field experience needed by students if they are to become effective geoscientists.

During the autumn of 2006 and then again this spring, the AAPG and the Society of Exploration Geophysicists (SEG) sponsored four successful student-recruiting events across the US at the University of Wyoming in Laramie, the University of Oklahoma in Norman, the AAPG Eastern Section meeting in Buffalo, NY and Rice University in Houston.

Approximately 400 students participated in the four expos, the purpose of which was to connect geoscience students with potential employers. The students learned by presenting their work, networking and interviewing with multiple

employers at a central location; companies benefited from cost-efficient recruiting from a large and diverse group of motivated students.

The 2007–2008 expo schedule has been expanded to five and begins with a new event in Wichita, Kansas, then continues with expos at the University of Wyoming, Rice University, the Eastern Section meeting in Lexington and the University of Oklahoma.

What New Programmes Is the American Association of Petroleum Geologists Planning to Help Increase the Energy Workforce?

AAPG, through its Corporate Advisory Board, has proposed a new programme called the Petroleum Education and Research Consortium. The purpose of the programme, currently in the planning stage, is to have a long-lasting impact on petroleum-related teaching and research.

The consortium would help provide significant research grants to both graduate students and professors.

AAPG will continue to do its best to make a difference in the supply of energy professionals for the future. ■

Exploration and Production at the IFP – 50 Years of Research and Development and International Partnerships with Industry

a report by
IFP

IFP has built up a network of partnerships – bilateral research and development (R&D) partnerships, joint industry-funded projects (JIPs) and granting of licences for process, equipment and software – with oil, gas and related industries around the globe. It regularly works with more than 100 partners from the upstream oil sector in some 20 countries.

It provides these partners with the services of its multidisciplinary R&D teams, which incorporate more than 300 exploration and production engineers, the majority of whom hold PhDs, and highly specialised technicians, along with unique and high-performance equipment and testing facilities.

IFP is a leader in the field of basin modelling. The latest developments concern basin modelling in complex structural settings, such as thrust belts and salt diapirs (Temisflow). These developments are supported by new software providing 3D capabilities for palaeogeographic reconstructions (Kine3D) and sedimentological modelling (Dionisos).

IFP proposes innovative techniques for enhanced data integration, from seismic to production data, implementing and analysing 4D seismic data, stratigraphic inversion, innovative enhanced oil recovery (EOR) processes and propagation along the whole workflow.

IFP is developing solutions to optimise oil and gas flows from the reservoir to the process facilities in production networks, with a new generation of flow assurance simulation tools. To improve the exploitation of ultra-deepwater fields and heavy crudes, IFP is focusing on several areas, such as riser systems, flexible pipes and reeled pipelines.

IFP is developing processes for CO₂ capture, transport and underground storage in order to prevent its release into the atmosphere. As an international research and training centre, IFP is developing the transport energies of the 21st century. ■