

Christine Ehlig-Economides

Christine Ehlig-Economides is a professor of petroleum engineering at Texas A&M University and holds the Albert B. Stevens endowed chair. She founded the Center for Energy, Environment, and Transportation Innovation, and is currently working to develop an academic program in energy engineering. Ehlig-Economides worked for Schlumberger for 20 years in a global capacity. She has published more than 50 papers and has authored two patents, and has lectured or consulted in numerous countries. She has received numerous awards from SPE and was elected to the US National Academy of Engineering in 2003. She is currently a member of the Committee on America's Energy Future sponsored by the US National Academy of Sciences.



What motivated you to join the E&P industry?

My first job involved groundwater flow modeling. The articles I read in *SPE Journal* at that

time acquainted me with SPE. My mentor persuaded me to consider doing a PhD, and I decided that since I liked modeling flow through porous media, it should be even more interesting to model three-phase flow. Then, while working on my MSc in chemical engineering, I applied to Stanford University for the PhD program in petroleum engineering.

How has your view of the oil industry changed through the years?

It has become ever more international. Our industry has always been technically driven and I was always fortunate to be working on cutting-edge technology.

What do you enjoy most about your job?

I really liked working all over the world. I have worked in at least 40 countries, and I have only one continent left—Antarctica—that I have not yet visited. I enjoy

enormously different cultures, and our industry is as international as you can get.

What advice would you give to young professionals who are in the early stages of their E&P careers and are seeking a technical path?

I would advise them to make sure they can see the big picture. Make sure they understand the value to the company of what they are doing. If they are not bringing value, then they should seek change and move to a company where their work does bring value.

Your career has shifted between academia and the private sector.

What motivated these changes and what are the main lessons from these experiences?

It is great to bring industry experience to the academic sector. Academics without industry experience can be off target and may lack vital industry contacts. This is less likely in petroleum engineering departments, but it can happen.

I was motivated to leave Alaska because I saw that I was starting my academic career putting out fires instead of doing original research, and my teaching lacked depth that one can

acquire through industry experience. I never thought I would spend so many rewarding years with one company, but Schlumberger turned out to be a great choice for me. Finally, when I had an opportunity to return to academia, I took it. I am far too busy these days. The private sector is like an ongoing vacation compared to working as a professor. This is because I have too many options that I am free to pursue in academia, and I have a bad habit of taking them all.

Do academia and the private sector offer different types of opportunities?

I think the main difference is that as an academic you have more freedom. However, it is hard work to establish academic credentials and the deals that count to academia are unlikely to be made on a golf course.

It seems that many young professionals, almost two-thirds, are hoping for a career in management. What would be your advice to these young professionals?

When they become managers, do a better job of stimulating their technical contributors. I think that managers should deliberately involve technical people in



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Andrew's, just 2 hours away), this appears to be right. However, pub crawling along Union Street has by far more supporters during the busy weekend nights. Entertainment is well compacted within the city center, where everything is just a walk away. Along Union Street and its surroundings you find His Majesty's Theater, the Music Hall, the

Maritime Museum with a great display on the North Sea oil industry, a wide variety of great restaurants, shopping centers, and pubs.

From Aberdeen you can also travel quite easily to the whisky-making countryside. Follow one of the castle and/or whisky trails and learn how the determination of the Scottish people always gave a good

fight and created the best liquor of all.

There is enough said and written on Aberdeen's weather. So, if you want an objective point of view, find a job, grab your stuff, and experience the great quality of life that Aberdeen has to offer... along with its sun-less summer and wet winter. **TWA**



strategic planning so the technical people appreciate the value of their technology to the company. Also, the technical ladder must reward technical people sufficiently so that they wish to continue their technical work.

Do you think the industry, as a whole, values technical roles as much as managerial roles?

I do not. The industry shuns petroleum engineers because they need to pay more for them than other industries, and because the majority of engineers in our industry are not trained petroleum engineers. They do not even know what they do not know.

It was frustrating at times to see that, within our own industry, technical careers in the service sector were compensated less. To me, the frustration was partly that the compensation was less, but perhaps more importantly, the poorer compensation was an indication that managers valued technical work less than other ways—mainly sales—to generate value for the company. In our industry, one day your technical work can be featured in conferences and internal training courses, and the next day the technology is merged into another business line in order to eliminate it.

Has there been a managing dimension to the technical positions that you have held?

I managed the reservoir modeling group when I was in Venezuela, and returned to a job linked with sales in the US before finally leaving Schlumberger to return to academia. Before that, I worked in R&D for the first 9 years of my time with Schlumberger. While I was in Venezuela from 1997 to 2000, we went through the dip in oil price, but I managed to build a new team, and most of the people I hired are still in Schlumberger doing well.

Do you think that any experienced person in the industry, even people with a technical profile, will have to assume a management role sooner or later?

No, not all the career paths finish in a managerial position. Experienced people also make great mentors, and managers could leverage this potential.

What are your recommendations to young professionals regarding whether they should undertake a technical or managerial career?

Always understand the big picture. Learn how to make value for the company. If technical work stimulates you, be sure you understand how to sell it to management. If you want to be a manager, learn the job your future reports will be doing.

What is the academic sector doing to help the industry develop its pool of talent?

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We offer distance-learning courses at Texas A&M. Previously, when at the University of Houston, I directed the MSc degree program in petroleum engineering. There, evening courses are offered to make them accessible to working professionals. Academics also offer short courses in collaboration with major oil companies or smaller consulting groups. But I think degree programs are better because they require admission so that students in the courses are eligible and suitably prepared, and because they require a commitment from the students. Too many students in short courses are assembled by training managers whose only job is to populate the course.

Few companies reward employees for completing advanced degrees. As a result, completion of an advanced degree is often a mechanism to achieve promotion by changing jobs. In this way, corporate managers are working against what academics offer to their employees. The assumption that corporate training

programs are better than an MS in petroleum engineering is probably not true.

What are the key technology challenges and advances you see for the E&P industry now and in the next 10 years? What can young E&P professionals do to help?

I strongly object to oil companies calling themselves energy companies and then speaking only of their petroleum business concerns. I also strongly object to oil companies claiming they are beyond petroleum when this is clearly a miniscule part of their bottom line. E&P is still big business and there are many challenges. It has been quite exciting to see significant US gas production develop from formations like coal beds and shales that, when I was educated as a petroleum engineer, would not have been called reservoirs. Besides that, we produce gas from micro-darcy sandstone.

I am quite stimulated by the potential for designer-well technologies like instrumented multibranch wells, and I wonder when we will start to see enough sensors to automate production management. Both of these arenas bring new opportunities for well monitoring and reservoir characterization concepts that I continue to stay interested in.

Young professionals with petroleum engineering education can bring a lot. They should know enough to appreciate what is new and may be more inclined to try new technologies than their more senior colleagues. For a few years, I was involved in training young professionals in Russia. I was quite pleased to attend a session at SPE's first Russian Oil and Gas Conference and Exhibition in Moscow that consisted almost exclusively of young professionals presenting and questioning the presenters. They were presenting their experiences on new Russian fields and explaining their aggressive use of new technologies. It was a wonderful session.

How has R&D been affected by the cyclic nature of the oil prices in our industry? Are we doing enough to conquer the technical challenges of the future?

If concern about anthropogenic climate

change leads to carbon-constraint regulations, the oil industry may be confronted with new realities. In any case, it would be better if societies were less dependent on oil for transportation. Fluctuations in oil price affect more than just our own R&D. Perhaps the most important challenge for the future is to conquer these fluctuations, and I think that transforming transportation to be less reliant on the monopolistic grasp of oil could be the mechanism.

Information technologies (IT) have had a great impact on the development of the E&P industry. What is your view on the performance of young professionals with their dominion of the newest IT developments?

We are only beginning to use what IT can bring. Technology transfer is incredible today. Information is literally at our fingertips. IT makes things happen faster. If you are standing still, you are losing ground.

Education should change to emphasize technology first, in order to motivate science second, and mathematics last (not arithmetic, this can be done on any calculator). We probably hold back young people by forcing them to learn the way we did.

You recently participated in an event at Rice University on energy engineering. What is energy engineering? How do you relate petroleum engineering with this new discipline?

Energy is to energy engineering as chemistry is to chemical engineering. Petroleum engineering is one facet of a much greater potential discipline that can promote appreciation for energy resources, how they are used, and how they impact society.

You have recently been appointed director of the Center for Energy, Environment, and Transportation Innovation (CEETI) in the Crisman Institute. Can you describe the role of CEETI and its most ambitious projects?

CEETI's vision is to become the recognized center of gravity for the electrified transportation architecture; an innovative R&D center dedicated

to accelerating the use of electrified transportation in the United States and around the globe. If transportation was both automated and electrified, we would eliminate reliance on foreign oil because our use of oil would be a choice among other choices. We could eliminate emissions from ground transportation, we could greatly reduce traffic congestion, and we would be safer.

What are your views on the options to reduce the environmental impact of the E&P industry?

I think most of this rhetoric is misplaced. There is enormous misunderstanding of our industry. Most of the environmental impacts of our industry are in oil transport and refining, not in the E&P industry.

What issues do you care most about in your work and your life? With these in mind, what advice would you give young E&P professionals?

I am quite glad that I have a son, and he

might have been happier if we had two children. There is more to life than your job. Do not slight the most important things in life.

How should young E&P professionals prepare for the way ahead?

Always be aware of the options that new constraints may bring. Be innovative.

Finally, if you had to give a brief speech to young E&P professionals about the attractions of the industry, and specifically the technical challenges, what would be your main focus?

I have had a wonderful rewarding career. I liked working all over the world on high-profile projects with major technical challenges. The challenges found me as much as I found them. Today, because of my interest in the potential for energy engineering as a new discipline, I would like to let people know why this attracts me today more than the many traditional challenges I still work on. **TWA**

QUICK TAKE

Describe SPE in a single phrase.

Most prominent and visible professional society for the petroleum E&P industry

The technology that has had the most impact in your career?

Pressure transient testing

Technical or managerial career?

Mainly technical

What is your favorite SPE paper?

Of those I wrote, probably Ehlig-Economides, C.A., Joseph, J.A., Ambrose, R.W., and Norwood, C. 1990. A Modern Approach to Reservoir Test Interpretation *JPT* 42 (12). Overall, I really like 18172 by Cinco-Ley and Meng, but this is really a very big question.

Most admired technical person in the E&P industry?

Henry Ramey, a longtime professor and researcher at Stanford University.

Favorite gadget?

Car navigation

A must have for young professionals to succeed?

Keep an eye on the big picture

Favorite oil city?

Houston

The game-changing technology for the next 20 years?

Batteries

The most important achievement of your life and career?

Wonderful husband and son