

The Geoscience Workforce of the Future: A 2020 Vision

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I annotated my notes for this session with the title "A 2020 vision". Later I realised the incongruity of me needing my reading glasses to describe that 2020 vision! That's the aging work-force for you. However after Prof. Bruce Rubridge's lunch-time lecture on South Africa's fossil record, I feel rather less of an old life form.

I would like to paint a personal picture of my vision for the geoscience workforce a decade or so from now. You may find it provocative in places. I believe part of this vision is already becoming reality. The rest can happen if we choose to make it happen.

My thinking on this subject is a response to three trends which concern our industry:

- Portfolio: the conventional prospect and field portfolio is becoming deeper, tighter, and lies in more challenging physical environments. All this means it is more costly. The other part of the portfolio, which has seen dramatic growth, addresses Unconventional oil and gas resources. Here the challenge is finding the productive sweet-spots. In either case, we need to pick the winners even more effectively, and exploit them more efficiently.
- Declining numbers of students studying the geosciences^{1 2}, and indeed science in general, at least in the western world, with a growing gap between supply (western university's enrolments) and demand³.
- Demographics of our industry: you have all seen the bar charts with a skew towards people of my generation. In some more hopeful cases, like my own organisation, we see a bi-modal age distribution with an increasing part of our business being delivered by people with less than 10 years experience⁴.

My co-chair and I agreed that we did not want this panel to simply admire, or lament, the demographic problem of the great crew change. Rather, we would like to recognise the progress being made by those who are leading the way in terms of solutions.

I think the future workforce can be described using 6 phrases as headers. I elected not to use any slides. Instead I've adopted a more dangerous strategy for an after-lunch speech, and invite you to close your eyes and picture in your minds how these thoughts could apply to your own organisation. I can see that some of the audience are already trying it!

- 1. Technically excellent** – though the geoscientist will use an increasingly sophisticated array of tools, a good grasp of the fundamentals of geology and geophysics, and its creative application, will be paramount. The ability to generate good prospects starts with the capability to describe the petroleum system at the basin and play scales. I believe we have emerged from the era in which 3D seismic was believed to hold all the answers.
- 2. Knowledgeable & networked** – individual experience will be substantially augmented by capturing organisational experience. Knowledge bases initially fed by experienced senior professionals and mentors will grow organically with the contributions of the younger professionals. Experience is vital in our industry, but through proper use of knowledge bases and personal networks, we will accelerate the pace with which our people build and apply their experience. Those networks will extend beyond company boundaries into research institutes and academia.
- 3. Integrated & cross-disciplinary** – we will still need specialists, but there will be no place for unconnected isolated specialities: they will be closely integrated into the technical and business work-flows. Successful companies will be those that retain for themselves the core capability of integrated geoscience evaluation. Technical outputs will feed seamlessly into

¹ AGI: 35,000 geo students in 1980, 10,000 in 2000

² AGI: from 1996 to 2000, the number of geo's entering the EP industry declined from 50% to 30%

³ PetroStrategies Inc: based on a 2000 projection, 2008 needs 8000, supply is 4000; 2020 needs 7000, supply is 3500.

⁴ EPX: peaks at 33 and 49; AAPG members: main peak at 48, minor peaks at 28 and 73

business decision-making and operational execution, with a feedback into technical evaluation again through collected learnings. Geoscientists will stick to what they are good at, and enjoy doing, whilst working in teams with the capacity to integrate across sub-surface and surface disciplines, from exploration and appraisal through development engineering to production. Geoscience leaders will re-define the hydrocarbon life-cycle to include the disposal of the by-products of oil and gas use – such as sulphur, acid gas and most importantly CO₂.

- 4. Technologically adept** – geophysical, geological, petrophysical, geochemical and engineering technologies will each play a role in mitigating technical risk, delivering successful wells, controlling costs and improving personal productivity. Information technologies will be a huge enabler. However, technology will complement fundamental geoscience skills, but not replace them -- not least because even as new technologies emerge, the plays and prospects are getting more challenging. New technology applications will help define productive sweet spots and generate new opportunity classes such as subtle traps. We can expect a new suite of tools to come to the fore. Some, like electromagnetics and space-borne sensing, are already making an impact. There will be many others, but no silver bullet.
- 5. Diverse in demography and geography** – the age profile of our industry will start to resemble that of a technology industry⁵, with a large number of young technical professionals and a more linear age distribution. Not only will it look different, the companies will feel different⁶! Our staff will be ethnically diverse, increasingly coming from locations outside of Western Europe and North America. Some will be based in our present, centralised locations, others will be employed in new technology centres in the Middle East and Asia, such as Shell's technology centre in Bangalore, for example. Yet others may work remotely in virtual teams, capitalising on the bandwidth that our IT networks offer.
- 6. Demanding & valued** – by 2020, our industry will be offering a prime value proposition to (geo)scientists. But beware, good people are mobile and will select only those companies offering the best. The best working environments and tools. The best development opportunities and job challenges. The best leaders: people with not only business savvy and intellect, but with the emotional intelligence to connect with their people, to engage and to motivate. Geoscientists will command high salaries. In recent weeks, bankers have been toppled from their pedestals of privilege. Geoscientists can take their place, but they will be admired and appreciated by a populace that understands their role in socially responsible creation of global wealth.

Looking into the auditorium, it is hard with this lighting to gauge your response: are you in enthusiastic agreement, sceptical or doubtful, or do you plainly dis-agree? Some of the approaches I have described are working and already happening. I admit that I don't yet know how to achieve all these lofty goals. But I believe that the dialogue with my fellow panellists and this audience will advance our industry on our collective journey. And I believe our industry cannot afford to ignore these challenges.

⁵ OGI study: in the EP industry, 75% of staff are older than 40 (50% older than 45); in a typical technology company, 70% are younger than 40 (50% younger than 35)

⁶ EPX: based on current recruitment, retirement & attrition trends, by 2011, 35% of the work force will have <10 yrs experience