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Skills needs in the energy industry

**A report on the initial findings of three surveys conducted by
the Energy Institute, Deloitte and Norman Broadbent**

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As the leading professional and scientific body for the energy industry, the Energy Institute (EI) works to attract the next generation of energy professionals into the industry and help develop their skills and capabilities to meet the challenges of the future.

Since 2005, it has teamed up with Deloitte, the leading management consultancy particularly active in the energy sector, and Norman Broadbent, an organisation dedicated to the search for executive talent in the energy industry, to review the skills issues affecting the sector.

This is a report on research conducted between 2005 and 2007.

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Executive summary

Background

For some years, the energy industry has registered a steady decline in the numbers of new recruits entering the sector, with science, engineering and technical (SET) skills particularly affected. Many parts of the industry have been undergoing slower growth rates than in the 1970s, but until relatively recently, the situation had been manageable. However, over the last decade, the risk of future serious shortages in SET skills has emerged, exacerbated by increasing global demand, large scale downsizing leading to lack of recruitment into the energy sector during the 1980s, and a large section of the industry's workforce rapidly approaching retirement. Such shortages would be felt at all professional levels, from technical specialists and operators to leaders and senior managers.

The Energy Institute (EI), Norman Broadbent and Deloitte undertook the research to establish the scope of the problem and the level of awareness among energy companies of this potential threat to their business activities.

Objective

The research was based on the premise that, with recent decline in the birth rate of western nations, together with the large scale downsizing and lack of recruitment to the energy industry during the 1980s and beyond, the industry has an ageing workforce rapidly approaching retirement. This is causing shortages that will be felt at all levels from technical specialists and operators to leaders and senior managers. The purpose of the research was to establish the scale of the likely problem direct from a large sector of the current workforce (by surveying over 1000 employees) and to establish the level of awareness of this potential problem amongst energy companies.

Methodology

This research was conducted in three separate segments:

- a survey sent to 300 energy companies on their recruitment policies;
- a survey sent to 2,400 individuals employed in the energy industry on their short and long term employment expectations;
- interviews with HR personnel at 10 EI Partner and other key company contacts on their changing employment needs and recruitment practices and development policies.

Over 1300 responses were received in total. The questionnaires were compiled jointly by the three partners involved in the research and the first two were conducted electronically by Deloitte on behalf of the EI which collected and collated the responses. See appendices for copies of the questionnaire to companies and individuals.

Questionnaires were sent to over 2,400 individuals. A total response rate of 56% was achieved, with additional responses in the nature of comments also being returned. The company questionnaire was emailed to over 300 company representatives (with recruitment and/or HR responsibility). The rate of response for this was 12% but with a further 5% making some separate response. The third survey was conducted by the EI via telephone/personal interview.

Findings

The findings are segmented by the survey target audiences: companies, individuals and HR professionals.

Companies

- Over 70% of the energy companies surveyed believed they would not have sufficient leadership talent to meet the industry's future challenges.
- Poaching competitors' employees was expected to be an issue, with most companies perceiving themselves as potential victims rather than perpetrators.
- Internal training and development programmes are delivering insufficient numbers of trained personnel to develop into senior roles.

Individuals

- Energy professionals have traditionally been very loyal to their employers, leading the industry to expect stability among its workforce (90% of under 35s expect to stay in the energy industry for more than five years). However, with the general trend in working life moving towards greater mobility, will the energy sector be able to adapt to increased staff turnover?
- Two thirds of the individuals polled declared a high degree of job satisfaction and even more would recommend a career in the industry to a new graduate.
- A fulfilling and challenging job together with a good work-life balance has superseded salary as the overriding reason to choose a career in the energy industry.
- The average age of the workforce in the sample was 45. 50% of respondents expected to leave the industry in the next decade, mostly through retirement.

HR departments

- The main shortage area was for technical specialists, in particular engineers. The level of specialisation required in many cases led to recruitment being mostly from within the industry.
- They perceived a lack of interest in the industry as a bigger barrier than lack of skills in recruiting outside of the industry.
- Competition from non-technical commercial sectors for the graduate pool was an issue – attracting even technically qualified people.
- In order to find the right levels of skills, most companies still predominantly and actively seek more experienced workers.

Recruitment strategy for a sustainable future

Recommendations for the energy industry:

- Raise the profile of the energy industry as one of the most exciting to work in to combat increasing competition from other industries for these shortage skills – the sector needs to be well presented to young people as a prime career choice.
- Re-skill and cross-train existing or new staff to combat the decline in scientific, engineering and technical (SET) skills – support for training organisations, particularly universities, is critical if those organisations are to meet industry needs on high level skills.
- Get the rewards right for engineers and technical specialists in order to combat decreasing numbers of SET graduates choosing to enter a SET career – SET careers need to be seen as attractive and financially rewarding to compete with 'high flying' roles in finance, management and law.
- Develop new and potential graduates at an early stage to combat lack of experienced hires for key roles in an expanding industry – employers need to be more innovative in their methods of training and development, looking for efficient and effective ways of benchmarking employees' competence and giving them the experience and support to develop those skills.

Recommendations for individual energy companies:

- Treat skills shortages and leadership development as strategic boardroom issues that need long-term planning.
- Invest in in-house training and development programmes to upgrade skills of existing and future workforce.
- Develop strategies to manage retention of experience – even beyond retirement - and transfer of knowledge - make a more creative use of your experienced workforce and prospective returners to combat the rapid strides towards larger scale retirement year on year.
- Engage with universities to offer technical support, student placements and allow recruits to return to university to promote the industry to future graduates.
- Make it clear to potential recruits that the energy industry as a whole offers a worthwhile and fulfilling long-term career.

Recommendations for academia:

- Engage closely with industry to develop and deliver qualifications that meet business needs.
- Demonstrate the 'can do' skills of your students to employers when seeking to secure work placements.
- Liaise with professional membership bodies to provide students with a head start towards professional recognition and use such bodies as sources of useful information and contacts.

Key commitments by the partners to this research:

- Promote the industry as a whole and SET in particular as a valuable and rewarding career path to present an accurate image of the industry to attract more entrants and encourage the take up of SET careers.
- Liaise with relevant stakeholders to promote and implement workforce development initiatives and leadership skills programmes – providing relevant and high standard training courses as well as professional recognition and chartered status.
- Help enable transfer of knowledge from retiring workforce to new entrants – for example, through mentoring programmes.
- Act as a bridge between industry and academia through the accreditation of courses, support of students' placements, mentoring programmes and the provision of networking opportunities.

This first phase research report forms part of a wider research project, the second phase of which will look at the supply side of the skills issue for the energy industry. The second phase will be reported on in 2008 and will include research on universities, consultants and training providers.

Sarah Beacock
Professional Affairs Director
Energy Institute

January 2008

1 Analysis of responses

i Questionnaire to companies

Awareness of potential shortage

When asked whether the industry would have sufficient leadership talent to meet the challenges faced by the industry in the future, over 70% believed they would not. However they were slightly more optimistic about their own company where just over half felt that they would suffer a shortage of leadership skills, suggesting that some companies either believed they could compete well for those skills in short supply or that they had already begun to address the problem.

When asked how long they had been aware of the shortage in the industry and in their own company, over 90% of respondents had known about industry shortages for some time but just two thirds were similarly aware of shortages in their own company. This would suggest the companies surveyed were generally better prepared than the majority of industry participants.

Reasons for talent shortages

Respondents were asked to rate five possible reasons for talent shortages as high, medium or low. The results were as follows:

Reason	% rated as high
Fewer qualified engineers	68
High requirement for scarce technical and commercial skills	54
Unattractiveness of the industry	46
Demographic changes	35
Increased energy demand	18

Comment from respondent:

“The industry has, for many years, utilised contract personnel. This applies as much to client companies, i.e. oil and gas producers, as it does to contractors and consultants. Future staffing at any level is only going to become ever more difficult due to the lack of qualified and experienced engineers available. In turn the lack of such engineers and technicians is due to the fact that they are ‘not made’ anymore, at least not in the UK!”

How to resolve the skills shortages

Respondents were asked to rate five possible resolutions to the shortage of talent facing both their company and the wider industry.

Resolution	Company (%)	Industry (%)
External recruitment from competitors/other industries	68	64
Internal cross skilling and leadership programmes	61	57
Greater use of remote and virtual working	50	29
Increased use of technology	46	46
External recruitment from suppliers/customers	32	57

In both cases the top two company solutions and industry solutions were the same – external recruitment from obvious sources and internal development. Interestingly, where the figures diverged between what the companies themselves would do and what the industry as a whole would do was in the recruitment from customers or suppliers, with fewer companies likely to do this but over half believing the industry would. Companies would not consider poaching staff from others, or would be loathe to admit to it, but they do expect to be the victims of it, which suggests that they know it goes on.

More companies thought remote working would work better for them than it would for the industry as a whole. The impact of technology was felt to be similar for both individual companies and the wider industry.

Shortage skills areas

Five skills areas, which respondents were asked to rate, were listed – technical, management, financial, marketing and leadership. Almost 4 out of 5 said that technical skills were a key shortage area, against half stating that management skills were a shortage area. At the bottom of the list were financial skills which 40% listed as a shortage area. Interestingly, both marketing and leadership skills were rated equally in short supply – just under half of the respondents citing this problem.

Specific shortages in each area were noted as follows:

Technical

Engineers:

Chemical, electrical power, drilling, operations, petroleum, reservoir, production, mechanical, pipeline, structural - especially those with practice expertise, report writing and consultancy skills.

General technical:

Alternative/renewable energies, fire safety, drilling and well site supervisors, IT, “hands on” skills, pressure vessel designers, metallurgists, industrial energy efficiency - especially problem solving and R&D skills.

Scientific:

Geologists/geophysicists, microbiologists, chemists.

Management

Project management:

Experienced project managers for both large and small scale projects (cited by almost 15% of respondents), risk management, technical management skills, additional practical as opposed to theoretical skills, contract skills, MBAs, enhanced industry awareness of grass roots problems, experienced engineers with additional management skills, integration work in a global environment.

People skills:

Line management skills, “managing managers”, department managers. A common theme here was that these management skills in short supply were often best resourced internally.

Financial/commercial/business skills

Energy trading, international finance, overseas finance management, economists, reporting skills.

Marketing

Sales and marketing managers, selling the “added value” of the company, marketing profile skills, closing sales, understanding of world markets, dealing with clients, marketing of technical skills, managers with wider experience of commercial technology, commercial skills to develop new markets.

Leadership

People that can “lead, not follow”, ability to work individually and head up a team, industry engagement in key initiatives, ability to develop technologists as leaders, greater all around rather than specific skills, understanding the interactions across a business, engineering plus MBA degree, project managers, more positive ‘can do’ attitude, self confidence and able to work with all levels.

Other skills and behaviours noted as being in short supply were:

Ability to observe and learn, good logical thought and ability to instruct others, willingness to travel extensively, ability to change course quickly as circumstances demand, languages, initiative, motivational skills, maturity when dealing with the industry cycles caused by energy price fluctuations and geopolitical changes.

Comment from respondent:

“The focus on technical training in both industry and academia in Asia combined with a willing and hard working labour pool suggests that UK engineering companies will have a tough job competing in the future.”

Usual methods of recruitment

Not surprisingly 60% of respondents recruited graduates direct from university, but more surprisingly almost a quarter recruited experienced hires in this way – possibly reflecting a greater supply of mature students? Fewer than 20% used the milk round for graduate entry and just three respondents used it for experienced hires.

Over half used recruitment agencies for experienced hires but less than a fifth of respondents recruited graduates in this way. The most popular method was indirect advertising/personal contacts, which was used by over three quarters of respondents for experienced hires, and by over a quarter for graduate entrants. This was more popular than direct advertising, which was used by almost two thirds for experienced hires.

Only one in 10 respondents said they would fill vacant posts through internal promotion of their graduate entrants. However half would fill such positions from their experienced staff. Internal training schemes similarly fared relatively poorly with only one in 10 graduates being recruited to posts via such training schemes. This seems to belie a surprising lack of faith in internal training schemes.

Change in workforce size

Just over 50% of respondents noted that their company’s workforce had grown in the last five years. 10% had reduced with the remainder staying about the same size. The rates of change varied from 15% to 1000% increase with the average being a staggering 218% growth. Even excluding the two largest respondents in this question, the average remains 118% growth. The companies experiencing a reduction in staff sizes had seen between a 5% and 50% reduction, with the average being 22.5%.

These levels of growth suggest that companies foresee a positive future which is translating into the recruitment of staff.

Turnover of staff

Over two thirds of the companies expected fewer than 10 people to retire in the next five years - these representing an average of 12% of their current full-time workforce. All the companies that expected to lose larger numbers of staff also expected to take on at least as many new staff with, in many cases, at least double or treble the number of new recruits replacing retirees. Only four companies (12%) expected to lose more than 25% of their workforce but this was mainly in companies of fewer than 60 full-time staff.

Just under half our respondents expected to recruit fewer than 10 new staff, but for most this represents less than 10% of their full-time workforce.

This suggests that demand for new staff will remain high at a time when companies expect to lose only relatively few staff to retirement. Later we will see how the survey of individuals suggests that those staff approaching retirement may have a different view.

Average age of workforce

The average age of the workforce in our sample varied substantially, from 29 to 72 - with the median being 45. Interestingly, those companies with an average age for their employees of 40 or lower had an average of 180 full-time staff. Those companies where the average age for their employees was above 40 had an average full-time staff of 482. This would appear to suggest that the larger the company, the bigger the potential problem with prospective retirees and their ability to recruit younger people. Alternatively it might indicate that larger companies require more experienced hires than graduate recruits.

Given that larger companies generally have more formal graduate training schemes this seems unlikely to be the case, but it may also be down to the perception that graduate recruits have about the industry. Perhaps the view is that training will be more varied and more thorough with smaller companies?

Comment from respondent:

“The average age of our workforce is 39. However 44% are 49 and over and the remaining 56% are 30 and under. We have NO staff aged between 31 and 48 so we have a severe demographic issue.”

Number of full-time staff

More than half our respondents were small companies of fewer than 50 full-time staff. However a comparison would be useful with the number employing part-time or contract staff. We know this to be a very small overall proportion of people engaged in the energy industry but it is undoubtedly increasingly used as at least a short-term solution and it would be worth analysing if there has been any change in this trend over recent years.

ii Questionnaire to individuals

Age of respondents

Just over 10% of our sample was under 35 with almost a quarter being 35-44 and over one third being 45-54. Over a quarter were aged 55-64 and only 1% were over 65. However these figures may reflect the fact that members of professional membership bodies (where many of the respondents were drawn from) tend to be older than the workforce as a whole. The EI's membership has an average age of 50, which is relatively low for a professional membership body, but possibly higher than some other bodies in the energy sector that tend to carry a higher proportion of students than the EI does (approximately 10%) and therefore artificially mask the true age of the working population in the industry.

Our findings suggest that either recruitment in the past 20 years has not been as vigorous as previously or that the industry does not appeal to the younger generation as much as it once did. However the value of older employees should never be overlooked, particularly those who may have left the sector at some point but can return with new skills.

Comment from respondent:

"I have been trying to return to the UK/EU energy sector at a time when the industry has been desperately short of competent people. I have been told by consultants that at 50 I would never work for an energy corporation again."

Time with company and in the industry

The largest proportion of our respondents – almost one third – had worked for their company for between one and five years. 20% of the sample had been with the company for 5-10 years and another 20% for 10-20 years. However, almost as many had been with their company for over 20 years.

In addition, over half our sample had been employed in the energy industry as a whole for over 20 years, with only 20% having been in the industry for less than 10 years.

Whilst the loyalty of older staff – both to their company and the industry – is perhaps of no surprise, it is noticeable that the trend is towards shorter spells with the same company. Retention of staff therefore becomes more critical for companies as an issue in the future.

Comment from respondent:

"I think that part of the problem is that the oil and gas sector is perceived as being a dying industry with no long term prospects. I got into this field by accident in 1981 and had that view. 25 years later I am looking forward to another 25 years."

Career mobility

A massive 40% of our sample had not moved jobs within their company compared to almost one in five that have not moved in the industry. The next largest sample – over one third – had made one to three moves in their company compared to almost 40% making one to three moves in the industry. Over a quarter had made four to six moves in the industry and almost 15% had made seven or more moves in the industry.

Although at first sight this appears to demonstrate a relatively immobile and possibly more unfulfilled career path for many, more have made more than four moves within the industry, suggesting that there is scope for career progression and satisfaction throughout the industry.

Comment from respondent:

“It may be that my future networking effort leads me towards employment within another area of the energy sector. The feedback I have received on my CV so far from local business professionals is quite encouraging, drawing comment in particular about the breadth and depth of transferable skills acquired within the oil industry.”

Future plans within/outside the industry

50% of our respondents expected to leave the industry in the next decade. Approximately one in three expected to leave their company in the next one to five years. Fewer than 3% expected to leave the industry within one year but 10% expected to leave their company in that time. However over half do not expect to leave their company for more than five years.

Over one third expected to retire from their company, and one third of these (over 10% of our total sample) expected to do so within the next five years.

Looking at the future plans of our sample from an age perspective, however, is more promising – almost 90% of our under 35s expected to remain in the energy industry for more than five years and over 40% hoped to be with the same company.

Generally this picture suggests that the individuals in the industry may have slightly different retirement plans compared with the expectations of their companies. This is something that companies will need to guard against so as not to suffer sudden unexpected losses. They may also wish to look carefully at past resources to solve current problems.

Comment from respondent:

“The reason for working for myself is that it is more satisfying financially and mentally, so I imagine people who had reasonably senior management positions are now outside the bigger companies because:

- 1 you don't have a manager to answer to*
- 2 you can earn more money*
- 3 you can enjoy yourself more.”*

Career enjoyment

Almost three quarters of respondents have enjoyed their career in the energy industry ‘very much’ with almost as many enjoying their career with their present company. The level of dissatisfaction was very low with the ratings of ‘not bad’ and ‘not that much’ totalling fewer than 7% for their time with their company and fewer than 4% not enjoying their career in the industry as a whole.

Asked to rate how strongly they would recommend a career in energy to a colleague or new graduate, almost 80% said ‘quite strongly’ or ‘very strongly’.

This bodes well for the internal perception of the industry to those currently in it. There is clearly, though, some way to go in order to entice new recruits into the industry in sufficient numbers as required by the companies responding to our survey.

Comment from respondent:

“My view of the energy industry is totally positive. I think the industry is very professional, is safety and environmentally aware and recognises the importance of setting targets and monitoring performance against those targets.”

Future replacement

When asked how their employer would fill their post should they leave, almost 15% believed that their post would not be filled. Over a third believed their role would be filled by an internal replacement, whilst almost a third believed they would be replaced by an external resource. Fewer than one in 10 believed their role would either be outsourced or consolidated into other roles.

This suggests that individuals may not be aware of companies' expansion plans generally, and the need to keep on as many skilled and experienced staff as possible. It may also suggest that individuals do not rate their own positions/expertise etc all that highly.

Comment from respondent:

"I took early retirement from my job as an energy engineer and agreed to support my previous company for 6-12 months whilst the job was absorbed by existing staff. Two and a half years later I am still supporting them with no sign of a long term replacement."

iii Interviews with HR personnel

Ten key energy companies contributed to this part of the research, responding to questions around their general recruitment trends, skills shortages, barriers to recruitment, drivers affecting recruitment levels and possible problems in meeting future skills gaps, particularly around leadership issues.

In early informal telephone discussions with the senior HR personnel at EI Partner companies and others, we set out a few basic questions on skills shortages generally in the industry as well as questions around the potential shortage of leadership skills. In addition we have been able to speak to other companies in the energy industry, together with discussions with recruitment agencies. The findings are set out below.

What is the general recruitment trend within your organisation?

Those companies in the E&P sector advise that recruitment is increasing, in some cases for the first time since 1999. After the latest round of UKCS licensing there is some increasing recruitment activity of asset management personnel and those in similar lines. Downstream there is less recruitment activity, at least externally, with some companies saying that their recruitment levels remain largely unchanged. These areas are seeing more cost cutting measures, which has been the main factor preventing recruitment.

Three companies reported being net recruiters and stated their success at maintaining low turnover rates. One reported having doubled their intake of graduates recently. Another trend appears to be the increased use of contracted staff with one organisation stating that contracted staff tended to be happier to work that way.

What sorts of skills are you looking for currently?

The main requirement with all organisations spoken to was for technical specialists. The highest demand was for engineers (mainly petroleum, process and chemical engineers) and other technical staff. Geophysicists and geotechnical personnel were also needed. Seismic processing and data management skills were identified as being in short supply. Because of the level of specialisation required in many instances, recruitment tends to be from within the industry.

In most cases this represented an ongoing shortage of people with these skills, but in one or two it was because of increased activity recently which has led to an immediate need for more skilled personnel. Legal and financial skills were also identified as additional needs.

What level of person are you seeking?

Although some organisations had a graduate recruitment policy, most were actively seeking more experienced personnel. With some organisations the need for graduates was primarily for the upstream areas of the business whilst downstream was more reliant on experienced personnel. Where companies were recruiting graduates, these tended to come direct from the major known universities or from the 'milk round'. One company suggested that even for senior management positions, technical skills were a prerequisite.

Senior recruits often required a global search for the right person whilst graduates tended to be recruited locally (particularly in overseas posts). One organisation reported that the balance of staff tended to be "heavy on top, ok around the middle level and very slack at the bottom" suggesting that this bulge would create some future problems in maintaining skill levels across the organisation. This has clear implications for industry's long-term leadership requirements to be met from within.

What barriers do you encounter in recruiting the right people?

One organisation suggested that lack of skills was less of a problem as they had the capability to train in-house, but a lack of interest in the industry, together with an unwillingness to relocate to relatively remote exploration and refinery sites, was a barrier.

Another barrier was the perceived competition from commercial sectors competing for the graduate pool (including technically qualified people being attracted to non-technical careers). One organisation pointed to the difficulty in retaining younger staff once they had completed their initial training period within the company. Mobility of younger staff acted against such companies and it was felt that older people were easier to retain.

In a number of cases the main reason for recruiting difficulties was simply the lack of sufficiently skilled people in the market, with one organisation commenting that it was a buyer's market and that the market was 'tight'. Almost all organisations surveyed use agencies to recruit their senior staff. In addition, a number increasingly have contacts with specific universities and/or degree programmes.

Some organisations appeared to have little desire to recruit internationally, although two were actively looking to recruit from a wider pool and had invested in skills training to make best use of such opportunities. Another had targeted specific European universities as potential recruiting grounds.

Another area beginning to be exploited is that of former employees. At least one organisation has reviewed its rehire policies, but others have not cited this source as a potential market for key skills. Another company however did report looking at ways of extending a person's time with the company.

What drivers affect recruitment levels?

The main factors quoted by all organisations were the needs of the business and the level of activity. Here the increase in E&P activity had led to a direct effect on recruitment activity. In one case it had been noticed that there was a demographic 'time bomb' within their organisation, with a preponderance of required skills amongst senior personnel who were close to reaching retirement age. They then had a reasonable pool of middle level staff but a considerable lack of new, younger recruits. However in order to get the right levels of experience, most respondents still predominantly recruit older workers.

What has been the effect of mergers, downsizing and general shedding of staff over recent years?

Almost none said that this had been a major factor influencing their business. There had been no perceived loss of skills because, in at least one case, that factor had been taken into account when staff were being laid off.

One organisation mentioned the effect on graduate training schemes at times of merger, downsizing and low recruitment levels. This had seen a reduction in the number of schemes offered within companies. However this trend was now reversing, with a number reinstating their former provision.

Such low recruitment levels had also led to a perception that the industry lacked any apparent career progression paths, which served to put off potential recruits.

One organisation felt that mergers and acquisitions had served the useful purpose of retaining sufficient high quality leaders for the future.

What problems, if any, do you perceive around a lack of future leadership skills?

Almost all respondents here said they had relatively few concerns, as leadership posts tended to be filled internally, sometimes from other parts of the business. Therefore, mobility and flexibility are key. Most claimed to have either succession plans or internal promotion policies which would meet their needs, particularly for core management groups. One or two had begun work on the leadership competences that would be required for their business so that future leaders could be 'home grown' within the organisation.

Another organisation mentioned that they tended to recruit with the longer term potential in mind rather than just for a particular job. A number were looking to recruit those who could offer a combination of technical expertise with generic financial/commercial/IT skills.

One reported that leaders were recruited largely from within the organisation but core technical skills were necessary in order to progress. At least two organisations were actively developing leaders amongst their technical experts.

Other sources and research relating to the skills debate

The issue of shortage of key skills is common not only to other industry sectors but also to other parts of the world. Although the key focus of this report has been around the UK, a number of the respondents have interests/activities in remote locations around the world and responses do vary widely. Most developed economies are experiencing similar shortages but trends and methods of tackling the shortages vary widely.

2 Putting the findings into context

It might be worth considering some further studies on skills issues for the energy industry and the international dimension in putting the findings of this research into context. A number of other organisations have undertaken research into this area, including the specific issues around leadership skills.

Recruitment

In May 2006, the UK Offshore Operators Association (UKOOA) announced that the number of jobs in the UK sustained by the oil and gas industry rose by over 7% in 2005 with a further forecast rise of around 4% expected in 2006 – around 40,000 jobs in just two years. It is likely that around 10% of these jobs will be directly related to the E&P industry.¹ In the US, a predicted increase of 30% over the next 10-20 years is thought likely.⁶

A study by Working Smart in July 2006 identified an undoubted gap at the younger end of the workforce in the oil and gas sector. Previous downturns in the industry have meant not only lay offs of experienced staff but the slowing of recruitment programmes that will replace them and a freezing of graduate training programmes which are then difficult to restart.²

An increase in the number of vacancies currently is leading to an increase in the amount of inter-company 'poaching'. However this does not solve the long-term shortage of skills and people. Offering more money is equally not a long-term solution as it leads to a spiral of escalating costs. Similarly at a joint conference of the Society of Petroleum Engineers (SPE) and International Association of Drilling Contractors (IADC) in February 2006, it was suggested that 7700 new recruits would be needed by 2008. This, they agreed, would only be achieved via 'cultural change' rather than poaching.³

In January 2005, Shell announced its intention to recruit 1,000 engineers, which represents 1/12 of the total UK university output of engineers who actually go into engineering (just under half the total of engineering graduates).^{4,5} However, in tackling this problem Shell understand the need to look more widely than their traditional recruiting grounds. David Pappie, Global Attraction and Recruitment Manager for Shell International Ltd, has highlighted the importance of local and international talent in seeking to fulfil their technical skills requirements, particularly in remote locations. Thus India, China, Russia and Malaysia are all seen as likely sources of future engineers.⁶

Ray Bignell, Director of Strategic Planning at Foster Wheeler and writing in *Hydrocarbon Engineering* in May 2006, identified their key pressures on recruitment as being the shortage of engineering graduates wanting to go into engineering and the pressure from other industries for the same skillset (and sometimes in the same locations - e.g. the Middle East, where construction engineers are highly sought after)⁵. Similarly in the nuclear industry, a shortage of local labour and construction sub-contractors in Finland has delayed expansion plans.⁷ In December 2005 a survey by Engineers Australia of 33 Australian engineering organisations found almost one vacancy per five employed engineers, with the majority of employers having experienced skills shortages for over 12 months.⁸

Retention/retirement

Retention strategies are more likely to be successful in meeting short and longer-term needs. In order to make this a success however companies need to focus on catering to the individual preferences of employees, offering more comprehensive career development support and offering appropriate rewards and recognition.

There are many varied reports on the impact of retirement on the industry in the next few years. For example, in July 2006 the Working Smart survey estimated that 50% of the oil and gas workforce would be eligible to retire within the next 13 years². Is this statistic so surprising however? Most employees are aged between 25 and 60 - i.e. a working lifespan of 35 years. If the age profile was flat you would expect 50% to be retiring in 17.5 years, so 13 years is not such a major distortion. What could distort it further, however, is early retirement or more industry leavers.

Another study cites the statistic that the average age of the industry is 49, with 33% expected to retire by 2012⁵. Whilst another in July 2006 states that 50% of E&P staff are aged between 40 and 50, and 50% of the workforce will retire within ten years.⁶ The nuclear industry in the UK, which has had an uncertain future since the 1990s, has one of the highest average age of engineers at over 50 and retirement will hit this sector hard.¹⁹

A further survey by Plimsoll Publishing of directors of oil and gas companies found that, by the end of 2006, 16% of consultancy directors will be over 60 (with 35% being aged 51-60 and 37% aged 41-50). However the same report goes on to say that of 131 companies in the study, 25% are not making a profit and 19% are in 'clear financial difficulties'. This, they suggest, points to strong evidence that directors will need to stay on well into retirement.⁹

Retaining knowledge within the industry is seen as critical. In particular it encourages the development of transferable skills, allows best use of mentors and re-hires and sees the increasing use of consultants. 94% of oil companies use consultants and 77% of service companies do so.²

The API undertook a survey in 2004 which found that the biggest impact on the industry from retirees would be in five to 10 years' time, giving companies some time to adapt. The greatest areas of need they identified for future recruitment were engineering, geosciences (both of which would require a further 38% of the current workforce) and operations, maintenance, instrumentation and electrical skills where a further 28% of the current workforce would be required.¹⁰

David Pappie notes that retirement and natural wastage are areas that need to be tackled by employers. He recommends more flexible retirement solutions, together with enabling employees to have challenging and satisfying careers whilst giving them a reasonable work-life balance, will help to retain staff. A recent survey of SPE members showed that only 2% of respondents wished to remain with their present employer until retirement.⁶

Universities

In February 2006 Working Smart researched 12 leading UK universities with earth science degrees. Overall it was found that only 24% of recent graduates were working in the oil and gas industry, whilst just over half had gone to work in other industries including environmental and engineering related fields. Arguments against working in the oil and gas industry include environmental concerns, low pay, job insecurity and the likelihood of working in unappealing locations. Low graduate (first degree) recruitment by the industry was also a factor and lack of access (financially) to further study was another off-putting factor.

In order to encourage further study of petroleum engineering, geosciences etc, universities need the following:

- information on skills requirements;
- access to up to date technologies especially IT
- interaction with companies.

Universities in the Working Smart study reported that half get input from the industry in course development but almost a quarter of them get no such input. Universities identified a need to work more closely with professional bodies as well as employers. They would particularly like to see industrial placements for their students, sponsorship of students, access to industry-standard hardware and software plus more training and relevant materials for lecturers.²

The SPE/IADC conference in February 2006 found that there were just 2,000 students currently studying petroleum engineering in the US compared to over 12,000 at its peak in 1983. They noted that pay rates had ceased to be the major motivator for choosing to study this subject. Rather, graduates were looking for careers that would offer them early levels of responsibility.³

In its 2005 report on the Role of Physics in Renewable R&D, the Institute of Physics noted that the UK lacks both general and specialist skills in renewable energy technologies. The report highlighted a lack of

postgraduate opportunities in the development of renewable energy technologies and fuel cells. Funding for such research is also difficult to obtain.¹¹ Previously the Sector Skills Council for the renewables industry, Energy and Utility Skills, had identified a potential growth in demand for R&D expertise in a number of renewable technologies.¹²

Solutions

Foster Wheeler's future strategy was focused on five key areas: returnees, especially project managers and senior managers; recruitment from overlapping industries; international recruitment; promotion of the industry and engineering in particular; and encouraging companies to work together more in assuring recruits of the industry's commitment to investing in its people.⁵

Coaching and mentoring are considered a solution for a number of organisations but require commitment from companies and strong links with universities.

Training and development are important with a number of key issues to be considered:

- individuals need to take ownership of their skills development and personal development plans;
- companies need to allow flexibility in using newly developed skills;
- a skills audit of the existing workforce is required;
- training should be provided in-house, via private training companies or through universities.

The API determined that their main focus for solutions would be on:

- youth for future recruitment;
- attempts to improve the industry's image;
- efforts to enhance technician level skills.¹⁰

Youth is a key target identified by Deloitte, in particular those born between 1982 and 1993 – known as Generation Y – who need to be wooed into the industry with more attractive and flexible working practices, promises of long-term career development and the support of mentors and training and development programmes that enhance their skills over time. Such changes may mean a re-think on company development policy for some employers.¹³

Within Shell, Chief Executive Jerome van der Veer, in a presentation to the World Petroleum Congress in September 2005, identified the need to invest in the training and development of all Shell's technical teams in order to retain the specialist level of technology and engineering skills required for future development and sustainability of the industry.¹⁴

Cogent, one of the UK's Sector Skills Councils, has undertaken a skills needs assessment of the petroleum industry. The emerging issues where the industry needs to take action included:

- innovation – predominantly around alternative fuels;
- management and leadership – particularly around change management, business management, SHE management and business improvement techniques;
- the skills gap – across the whole of Cogent's sector (not just petroleum but also oil and gas and nuclear), the assessment shows a bigger skills gap than other industry sectors, particularly at NVQ3 level job types, where 30% of jobs require such a qualification compared to only 20% of the workforce having them;
- workforce demand and industry attraction – the sector requires a new influx of chemical, process and energy engineers – approximately 6,000 SET professionals and 5,000 associate professionals across the Cogent sector.

Diversity of recruitment is seen as the key to tackling these issues.¹⁵

3 Conclusions

The shortage of key talent within the energy industry, and particularly within the oil and gas industry, is a topic that has reached a critical level of awareness such that in the US almost half of the boards of companies surveyed by Deloitte in 2005 have discussed the issue.¹⁷ As Deidre O'Donnell has observed, this is a long-term industry which needs long-term decision-makers who understand the implications of their decisions.² It cannot behave like a boom and bust industry but must invest in its people if it is going to keep up in the technology stakes.

A number of key issues around future skills provision need to be addressed, not only at the level of leadership skills, which will suffer depletion as the age profile of the workforce rises, but also around the immediate need for technical skills at all levels and in all sectors of the energy industry, and which will eventually feed through into the leaders of the future.

Due to the nature of the respondents to the survey, this research is heavily biased towards the oil and gas industry, which is seeing an exacerbated response to that experienced by most engineering and technology based industries. However the general outcomes and conclusions are common to other parts of the industry and the renewables industry for example is expected to see a high level of growth in jobs to 2020.¹⁸

These key findings are:

- a steadily decreasing pool of new entrants to the labour market;
- an accompanying decline in scientific, engineering and technical (SET) skills possessed by these new entrants;
- increasing competition from other industries for these shortage skills;
- decreasing numbers of SET graduates choosing to enter a SET career;
- rapid strides towards larger scale retirement year on year;
- lack of experienced hires for key roles in an expanding industry.

The majority of companies responding to our survey saw quite substantial growth in staff size. They also reported a wide variety of skills as being in short supply. This would seem to indicate a need for wider scale recruitment across the skill pool and range of company activities. However companies are also keen to plan ahead and recruit staff that will be flexible and capable of developing with the needs of the business. It is this combination of specialist technical skills with broader management/leadership skills that will mark out the future employee in the energy industry.

Our survey also found that companies expected to rely more on external experienced hires than in development and promotion/redeployment of existing staff. This may of course be a reflection on the ageing profile of employees after long periods of low recruitment but it may also suggest that some companies could expand their training/development schemes. Most companies suggested a need for a level of expertise that would deter them from recruiting many inexperienced graduates. However we know from our work with universities that, during their study, students would appreciate a placement with such companies. The benefit is that the company gets an enthusiastic and often fresh look at an area of their business at low cost whilst the student gains practical experience together with useful contacts.

With regard to age profile, our survey found that the average age was close to that for the industry – 45 – but also that the average age in smaller companies was lower than that for large companies. On the turnover issue however, most companies expected to see quite low levels of retirement in the next five years, particularly when compared with the industry predictions discussed earlier in this section. This is in contrast that with the response from individuals, where one in three expect to leave their company in the next five years. This may be an element of 'wishful thinking' or the normal desire to move on to 'pastures new' on the part of the individuals concerned, particularly when you consider the fact that almost 40% of respondents had been with their companies for more than years.

One of the more promising findings of our survey (and indeed others) is that the majority of individuals (almost 75%) employed in energy have enjoyed their career and would recommend it to others. Younger respondents expected to remain in the industry and even the same company for five years or more. For those who prefer more movement in their career however, our results suggest that the industry is flexible enough to cope with regular 'career changers' with almost 40% having had four or more moves in the industry.

4 Recommendations

Taking each of the key reasons for difficulties experienced by the industry currently, this report seeks to make some recommendations for action in order to halt or reverse the decline in available talent for the energy industry. They are:

- **better attraction of the industry as an employer to combat a steadily decreasing pool of new entrants to the labour market** – partly a demographic problem which the industry has limited opportunity to influence. It does however require a re-think by companies on their employment policies for the future. This may require consideration of a wider range of potential employees than their traditional market, including more diversification of the workforce. This is also likely to require attracting those considering a return to the industry, making better use of those about to leave or those who have recently left the industry and recruitment from countries where SET skills are in greater supply;
- **re-skilling and cross-training to combat the accompanying decline in scientific, engineering and technical (SET) skills possessed by these new entrants** – re-skilling or cross-training of existing or new staff is necessary, particularly in parts of the industry that have rapidly changing technology requirements. Support for training organisations, particularly universities, is critical if those organisations are to meet industry needs on high level skills. This may be in the form of practical help such as sharing of cutting edge technology and IT solutions or in building relationships and supporting the development of potential future employees;
- **higher profile for the industry as one of the most exciting to work in to combat increasing competition from other industries for these shortage skills** – the energy industry is an exciting career option for young people and offers some of the biggest challenges – to individuals and the world – that lead to a valuable and worthwhile job offering real responsibility to young engineers and others. The industry needs to be well presented to young people as a prime career choice;
- **getting the rewards right for engineers and technical specialists in order to combat decreasing numbers of SET graduates choosing to enter a SET career** – SET careers need to be seen as attractive and financially rewarding in order to compete with careers for high flying SET graduates in finance, management and law. During their studies students need to be presented with positive role models and have the opportunity for practical experience of what a future SET career might entail. Role models, placements, job finding services, training and development opportunities can all assist in enhancing the profile of such careers but employers also have a commitment to recognising energy professionals, offering suitable development opportunities and rewarding technical specialists in line with management staff;
- **more creative use by employers of the experienced workforce and prospective returners to combat the rapid strides towards larger scale retirement year on year** – employers need to be aware of the potential for major loss of staff, not just from retirement, which is largely predictable, but also from loss of younger staff to competitors and other industries, particularly as SET specialists become more marketable and can command ever-higher salaries. Where loss of experienced staff to retirement is inevitable, employers need to manage their exit in order to consolidate their skills and value to the business and invest them in new and existing staff. This may involve the use of mentoring schemes, use of 'garden leave' or part-time re-hire options or continuation of their employment on a consultancy basis;
- **greater involvement by the industry in developing its new and potential graduates at an early stage to combat lack of experienced hires for key roles in an expanding industry** – there is no magic formula for turning a fresh graduate into a skilled technician with ten years' experience. Such development requires time, investment and ability to retain them once trained to that level. This will require employers to be more innovative in their methods of training and development, looking for efficient and effective ways of benchmarking employees' competence

and giving them the experiences and support to develop those skills. It will also require closer cooperation between industry and academia to develop such skills during their early training.

The next phase of this piece of research needs to consider some of the specific areas that will have an impact on how the industry deals with the skills shortage in the next few years. In particular we need to monitor take up of energy related university courses and the numbers of graduates going into energy-related roles. It would also be useful to look at the role of the consultancy profession as this currently forms a large part of the industry and is likely to grow in the future.

However it is possible to propose some immediate actions for the industry from this piece of work. The industry itself needs to take action in order to:

- upgrade skills of existing and future workforce including investment in in-house training and development programmes;
- consider alternative sources of employment including overseas workers, returners, women, consultants and the retaining of 'retired' staff;
- engage with universities to offer technical support, student placements and allow recruits to return to university to promote the industry to future graduates;
- overhaul the appearance of the industry to potential recruits making it clear that the energy industry as a whole offers a worthwhile and fulfilling long-term career.

Universities also have a role to play:

- liaison with companies on student placements and course development;
- promotion of the industry as a whole and of SET as a valuable and rewarding career;
- liaison with professional membership bodies to assist students in getting a head start towards their recognition as an energy professional and use of such bodies as sources of useful information and contacts.

Finally the energy profession itself has a role to play in developing younger members of the workforce and supporting the future skills growth of the next generation. The partners in this piece of research propose a number of developments that will be of assistance in achieving this aim:

Promotion of the industry as a career option – there is much positive information on the industry but it is hard to find. The EI is currently developing a web portal that will assist in focusing all this relevant content and will have sections that serve different needs of the energy industry: the 'beginner' who wants some basic information, the student/graduate just beginning their career and the career professional. Energy companies will have a chance to support this development, as well as contribute their own materials to it. By presenting an accurate image of the industry we can attract more new entrants, encourage the take up of SET careers and compete effectively with other industry sectors for those with the necessary skills.

Workforce development – whilst companies undoubtedly have a key role to play here, there are other sources of effective competence development that can be used. The EI already provides a range of training courses to various sectors of the industry but increasingly we are working in partnership with other organisations to provide high quality specialist training including technical training. In addition we are focusing much of our current membership service development at the graduate level with graduate members having access to a wider range of more specialist information appropriate for their early career development. Accreditation of in-company training and development programmes means that we can advise on development of the workforce, particularly with a view to professional recognition and registration as Chartered Engineers and Chartered Scientists.

Outflow of skilled experienced staff – natural wastage of staff is an issue that will never be fully overcome but managing the existing situation will assist in retaining those essential skills. It requires the implementation of mentoring programmes and this is again something that the EI is developing in the future to assist companies with.

Leadership skills – here the industry needs to work on developing its own long-term succession plans and the best companies already recruit with a view not only to current staff needs but also future development planning. The EI has joined with a training company, Lane4, to develop a course specifically geared to developing leadership skills and high performance.

Liaison between industry, universities and the profession – the better the links between industry and universities, as discussed earlier, the better for the future of the industry as a whole. The EI can assist in achieving this relationship through accreditation of university courses, involvement for students and academics with local EI branches and a new service to help link universities looking for placements with those companies willing to offer them. In addition our Awards and Prizes system is currently undergoing redevelopment with a view to offering more support to students whilst studying.

The EI is keen to continue this research to identify the supply issues around skills shortages and to propose more long-term measures to help combat those shortages. We will work with as many of our industry and academic partners as possible to put these findings and recommendations into effect and help provide the industry with the future skills and talent it needs.

For information on ways you or your organisation can become involved please contact:

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January 2008

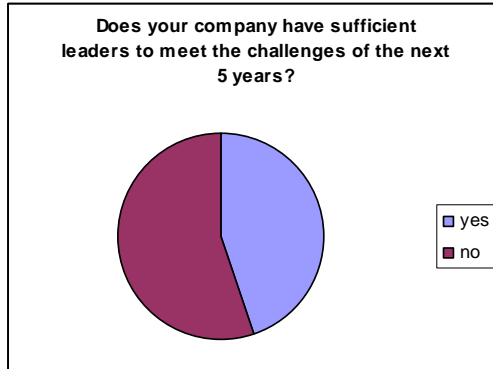
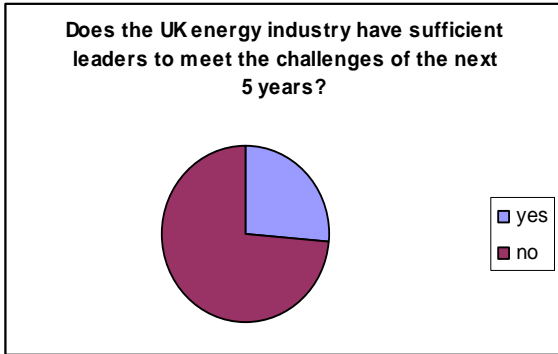


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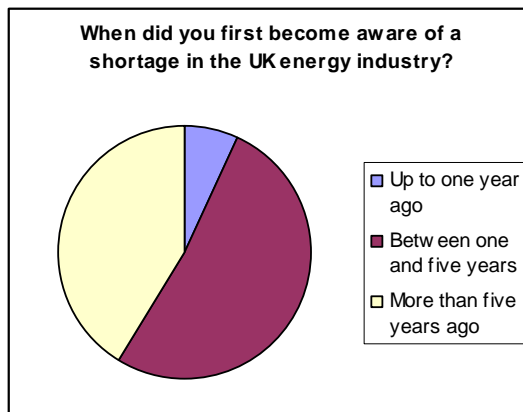
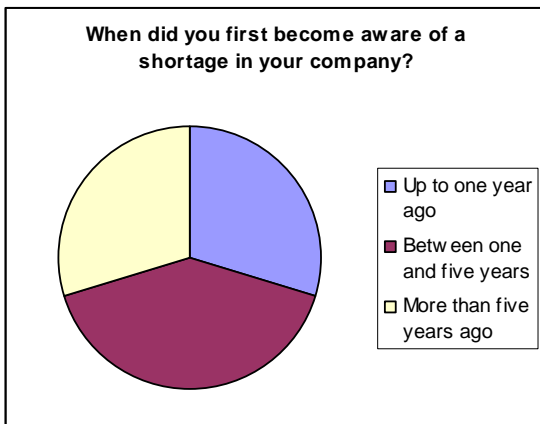
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Appendix 1 - QUESTIONNAIRE FOR COMPANIES

1. Do you believe that (a) the UK energy industry and (b) your company have enough existing and potential critical talent and leaders to meet the challenges faced by the industry and by your company in the next 5 years?

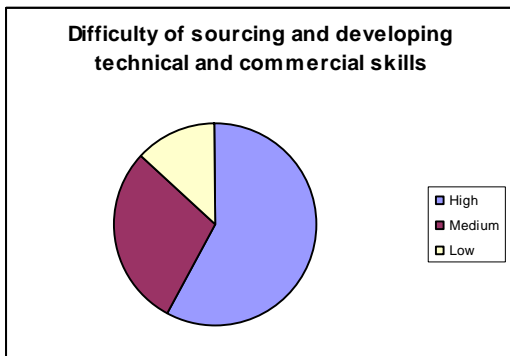
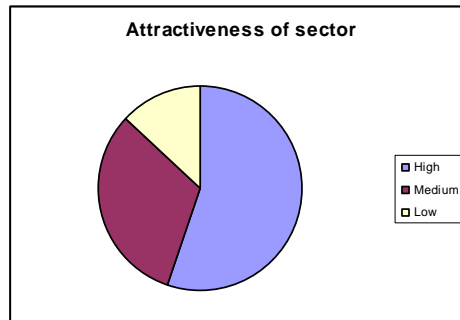
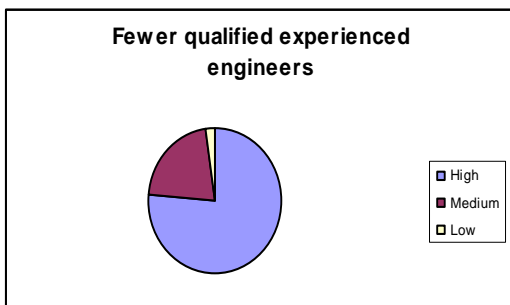
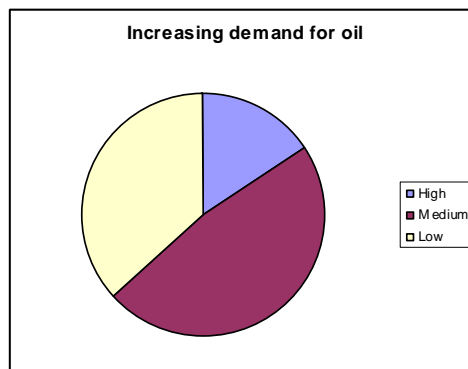
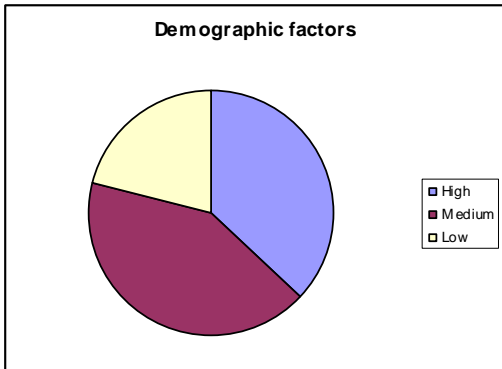


2. If no, when did you first become aware of a shortage of critical talent and leaders in (a) your company and (b) the UK energy industry ?



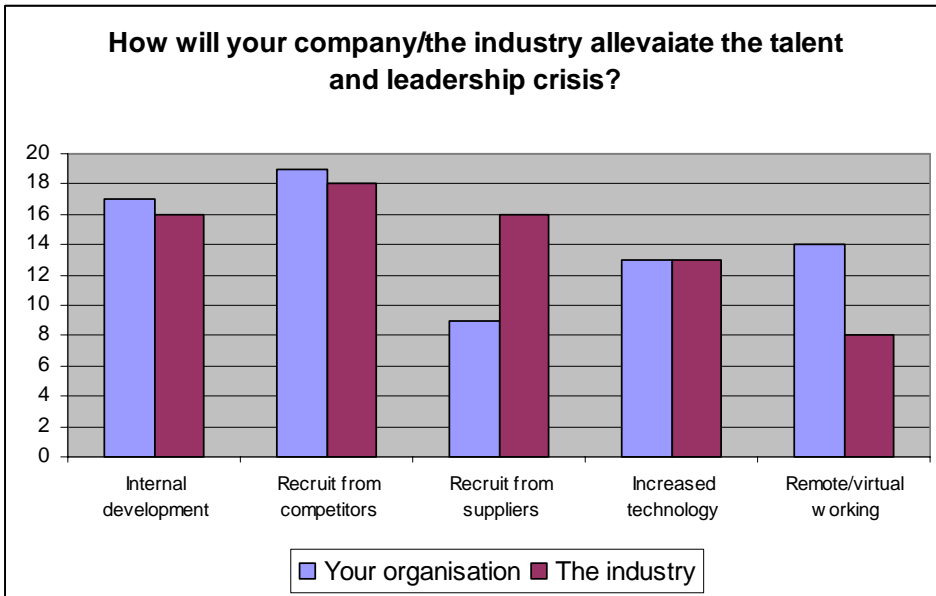
3. Rate the factors below in respect of their significance in respect of the influence they have on the critical talent and leadership crisis (high, medium or low)?

- Demographic changes resulting in fewer numbers of 16-29 years and ageing workforce
- Increasing demand for oil
- Fewer qualified engineers with right skills and experience
- Attractiveness of sector has declined reducing supply of the best talent
- Industry requires technical and commercial skills which are difficult to source and develop



4. How will (a) your company and (b) the industry alleviate the critical talent and leadership crisis?

- Through internal cross skilling and leadership development programmes
- Through external recruitment from competing companies or other industries
- Through external recruitment from customers or suppliers
- Through increased use of technology
- Through greater use of remote and virtual working

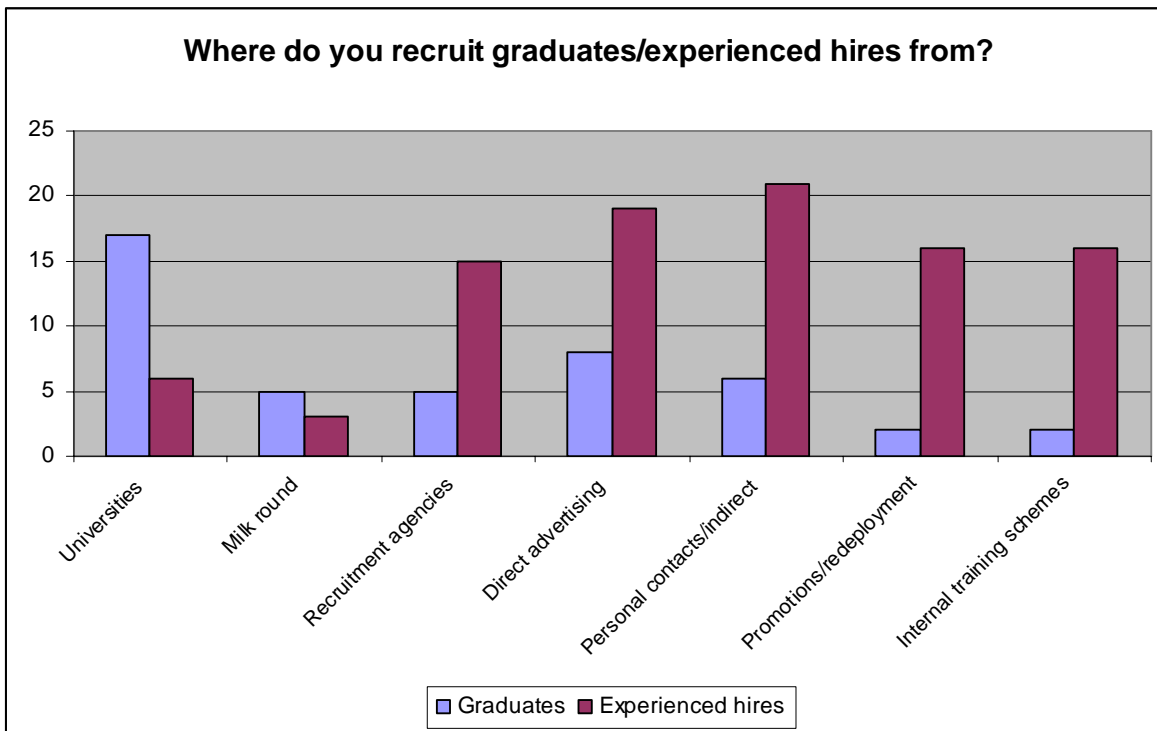


5. What disciplines, skills and competences do you anticipate your company will need over the next five years that you do not already possess or have sufficient supply of?

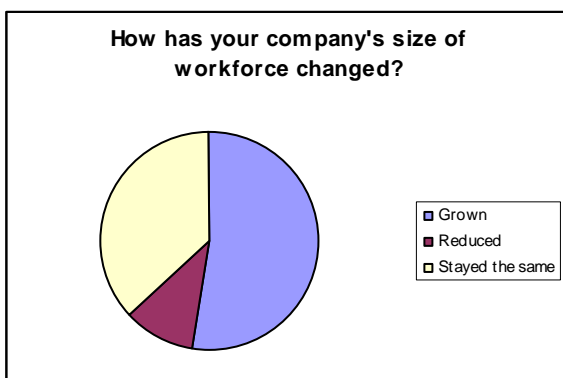


6. Where currently or in the past have you recruited graduate and experienced hires?

- Direct from universities
- Via milk round
- Via search/ recruitment agencies
- Direct advertising
- Indirect advertising/personal contacts
- Internal promotions and redeployment
- Internal training schemes



7. Over the past 5 years how has your company's size of workforce changed?



If your company has grown/reduced in size, please indicate the percentage change in workforce size.

8. Over the next 5 years what further changes in workforce size do you anticipate?

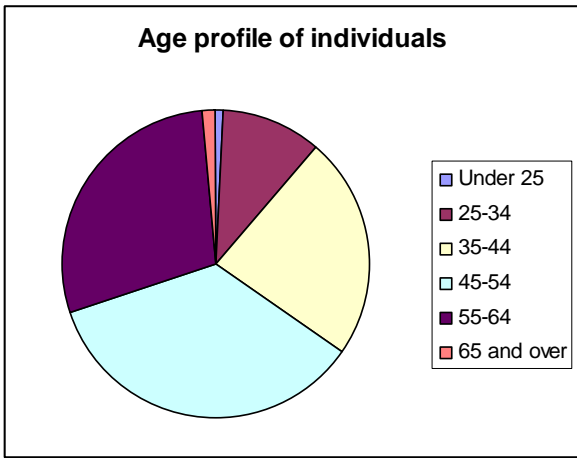
- Number of existing staff expected to retire
- Number of new staff expected to be recruited

9. What is the average age of your company's workforce?

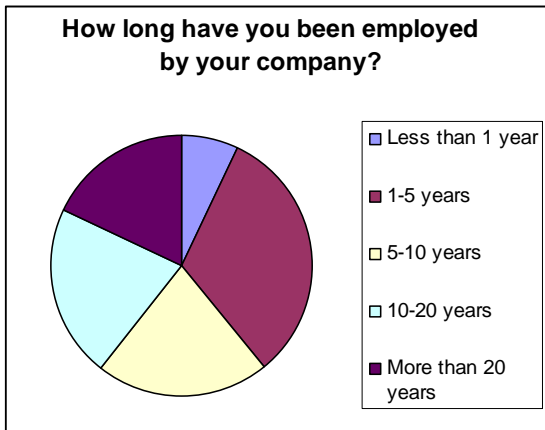
10. How many full-time staff does your company employ?

Appendix 2 - QUESTIONNAIRE FOR INDIVIDUALS

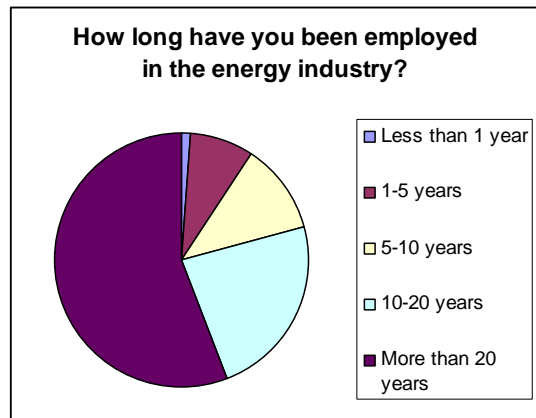
1. What is your age?



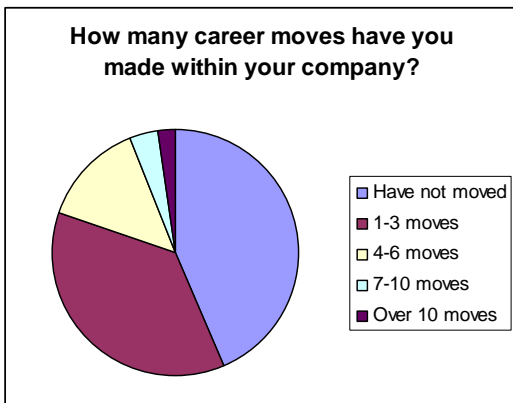
2a. How long have you been employed by your company?



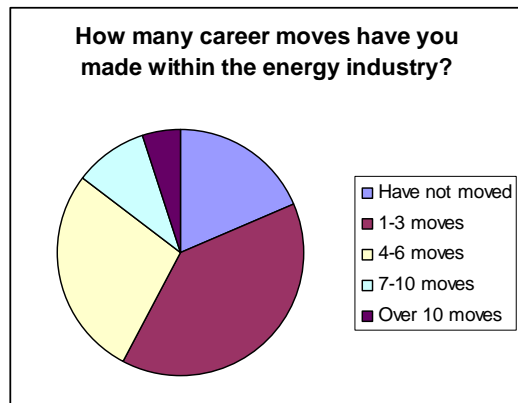
2b. How long have you been employed in the energy industry?



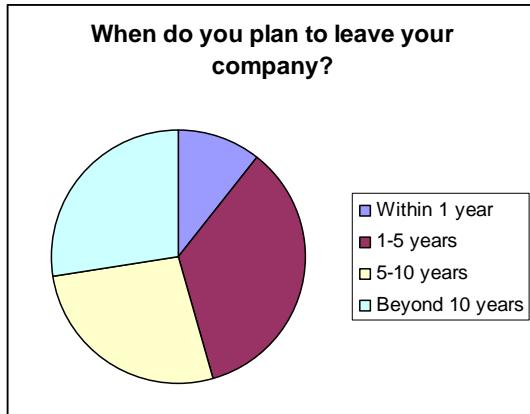
3a. How many career moves have you made within your company?



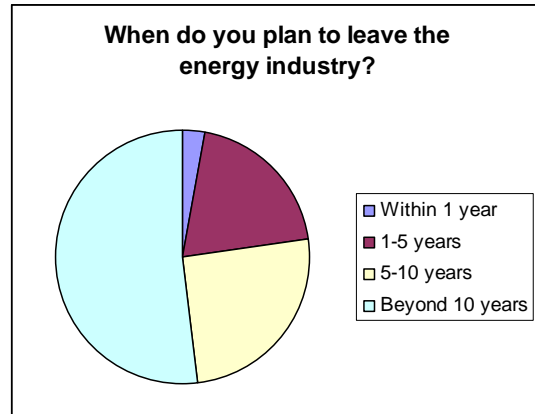
3b. How many career moves have you made within the energy industry?



4a. In the absence of unforeseen circumstances, when would you plan to leave your company?



4b. In the absence of unforeseen circumstances, when would you plan to leave the energy industry?



5. If you leave your company what will you do?

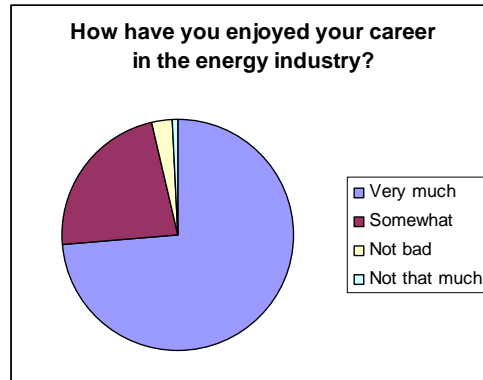
- Retire
- Work full time for a competitor, customer or supplier of my present company in the energy industry
- Work part-time for a competitor, customer or supplier of my present company in the energy industry
- Work outside the industry in an area where I could deploy my existing skills
- Work outside the energy industry where my existing skills are not relevant – try something different



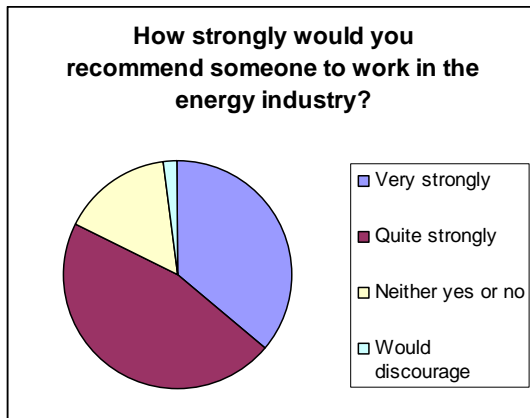
6a. How much have you enjoyed your career to date within your company?



6b. How much have you enjoyed your career to date within the energy industry?

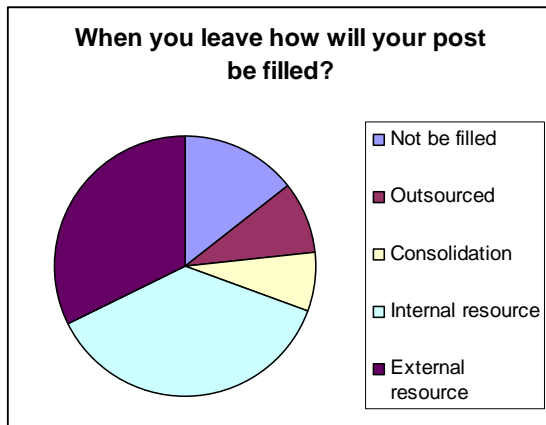


7. When you leave, how strongly would you recommend a colleague or new graduate to join the energy industry?



8. When you leave, how do you think that your vacancy will be filled by the company?

- Will not be filled
- Will be outsourced
- Other jobs will be consolidated to fill my role
- Will be replaced by internal resource
- It will be replaced by external resource



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