

Skills for a future in Geothermal Energy

Dr. Natalie Kruse

Overview

- Engineering Skills and Training Gaps;
- Skills in the Energy-Sector;
- Geothermal Energy—how does it fit in?
- Conclusions.



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World-class ambition
The hunt for graduates
to make Britain great

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An idea that clicked
Computer giant contract
on the back of a cold call

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The Daily Telegraph Edited by Richard Tyler

Thursday, April

Grand ideas to 'sex up' engineering

Sir James Dyson plans to set up an academy to re-establish Britain's design prowess

By Richard Tyler

LEADING entrepreneur Sir James Dyson has likened the emergence of new "green" technologies to the industrial revolution and believes they could provide the catalyst to re-awaken a critical love affair with science and engineering.

mathematical skills are not just important for our aerospace, defence, pharmaceutical and other high value manufacturing sectors, they also underpin our financial and business services," he argues.

Sir James says Britain needs to produce more engineers to maintain its share of world exports, and design and



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Scientists in demand

An industry set for rapid expansion is being undermined by a lack of skilled staff, says SIAN GRIFFITHS

Julie Tate's new work up the scale of the energy industry is the start of 2008. It's becoming clear that it's also becoming short of the skilled, trained scientists and engineers it needs if it is to carry on growing.

The main problem is that the number of students going on to do science at A-level and, later, science degrees in the UK is dropping like a stone. Over the last 20 years the number of people taking Physics A-level has fallen by almost 40% and between 1994 and 2004 more than 50% of Physics departments in British universities closed. It's a similar story in maths and chemistry, although a new national GCSE curriculum helped to restore the subject a little last year.

For Julie, it's a very different picture from when she got the news from her 10 years ago. In 1991, physics was the most popular subject to study at A-level. It was the most popular subject to study at A-level. It was the most popular subject to study at A-level. It was the most popular subject to study at A-level.



Nuclear option

MAX CROOKSON is an actor of 26 to become a mechanical engineering scientist at the Sellafield nuclear reprocessing plant. Twelve years later, he's on a salary of about £50,000 and enjoying the role of chief engineer at the Calder site. Along the way his employer sponsored him to undertake a foundation degree in mechanical engineering followed by a Leeds Metropolitan University degree in asset management. Crookson, 26, who got 10 GCSEs, recalls that his early wages were about £70 a week for a teenager being of some use to parents. It was good money, "I said, 'mum, I'm rich'." he says. His A-levels included learning how to do maths - from the safety of a training school before going for the job.

Was he worried about working at a nuclear plant? "Because I grew up in Calder, with the facility on our doorstep, I grew up adjusted about the noise and hazards."

His father, he says, holds slight, especially with the growth of the nuclear industry and the jobs that will spring from Calder re-opening the Calder. Calder in 2013. "There are lots of jobs for people with engineering backgrounds."

from energy sector



After a career break, Julie Tate took a masters-degree in chemistry for work.

Julie's story illustrates, there is also a pathway for 16-year-olds, with apprenticeship schemes spreading fast across the sector. Over the next three years the government is introducing 17 new diploma-style qualifications or awards including engineering and reprocessing technology as an example. A route to college is an option for 14 to 16-year-olds. More will be linked to nuclear site training.

Crucial, one of the first sector skills councils that cover the energy industry, is using training centres to set up a national skills academy, which will develop apprenticeships with companies as well as help equip existing employees with the new skills they will need.

The academy aims to develop skills apprenticeships and retain a 10% emphasis for existing skills. The government recently announced a package aimed at making a sector in health care, power, water and other sectors to take up to 10-year courses over the next decade - will now be set up for existing workers.

But right now recruitment is fraught with difficulty. Tate, the state school energy programme, has both government and school leaders to do

workforce, with graduates joining a two-year programme and spending a three-year one. There are 100 vacancies on the apprenticeship programme, says Tate, who leads Newcast's learning and development for generation and reprocessing, and 10 vacancies apply for each plant. But although applicants need low-level GCSEs, including maths, science and English, it is difficult to find the necessary and matching with the company who are difficult.

Fortunately, says Tate, although the government hopes that expanding apprenticeships and the new diploma will only fill the skills gap, some companies are now enthusiastic. To date, apprenticeships have not been "a happy time here". An apprentice, Julie Tate says, has a good record for training programme, many programmes have high dropout rates and low-quality training. And there is a concern about the new diploma qualifications. Tate's needs for those who he says that if employers can't immediately see how the new diploma has proved it through its results and English skills are, it will make the search for young science even more difficult.

"We are one of the few companies in the UK sector industry that has invested in the ability to provide what

used to be given before the energy industry was privatised - high-quality education and training for workers who want a long-term career," says Tate.

While Newcast's training programme is growing, it will not fill all the jobs. "We wanted to recruit 10 graduates this year to our programme - we took 41," says Tate. "Even though 10-15 applicants apply for each job, many do not get on to work and some turn up late."

"Even when they are trained they can be poached by one of the start players in the field, so happened recently to one of Newcast's young graduates. Having finished the training programme at Newcast he was offered a salary in the mid-£40,000s to take a job with another company. "It used to be that if you were offered to join you would be in the £30,000s," says Tate. "People are now starting to offer £40,000 plus for graduates a few years out of university."

The oil industry used to pay the top rates. Now the utility companies are looking to plug the gap. "It was a good, job-compatible time, those people will leave and not just within the UK," says Tate.

The message? If you want a career with prospects, it's time for the post-16 years, along for the energy industry.



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Half of companies struggle to recruit staff with science skills

By David Turner, Education Correspondent

Published: April 18 2008 03:00 | Last updated: April 18 2008 03:00

Almost half of companies across all sectors are having difficulty recruiting staff skilled in science subjects, says the first ever survey of Britain's skills by the CBI employer's organisation.

The finding underlines the desperate shortage of graduates in Stem (science, technology, engineering and maths) subjects. Yesterday's survey found more than nine in 10 employers were seeking Stem graduates.

Susan Anderson, CBI director of human resources policy, said it was a myth Stem graduates were only needed for industries such as engineering, construction and manufacturing. Employers "need numerate people on all sides", including sales and marketing, finance, and even human resources departments, she said.

The survey noted a 15 per cent fall in engineering and technology graduates over the past 10 years. It found "employers are acting rationally by looking abroad to hire Stem graduates", with more than one in three larger companies recruiting them from India, and a quarter from China.

The CBI also highlighted the gulf in information technology skills between the "Facebook generation" of new graduates, who have grown up using computers to



Pulled in every direction...

- Competition for personnel is growing;
- Companies turn to poaching engineers from other firms with ever rising salaries;
- Everyone wants Science, Technology, Engineering and Maths graduates, even non-technical fields like finance;
- What will new graduates choose?

Who is the Competition for People?

- Traditional Power Production;
- Other Renewable Energy;
- Processing Industry;
- Oil and Gas;
- Manufacturing;
- Finance, Business, Insurance, etc.
- Among many others...

**Skills for a Low Carbon London:
Summary Report and Recommendations on the Skills Gaps in
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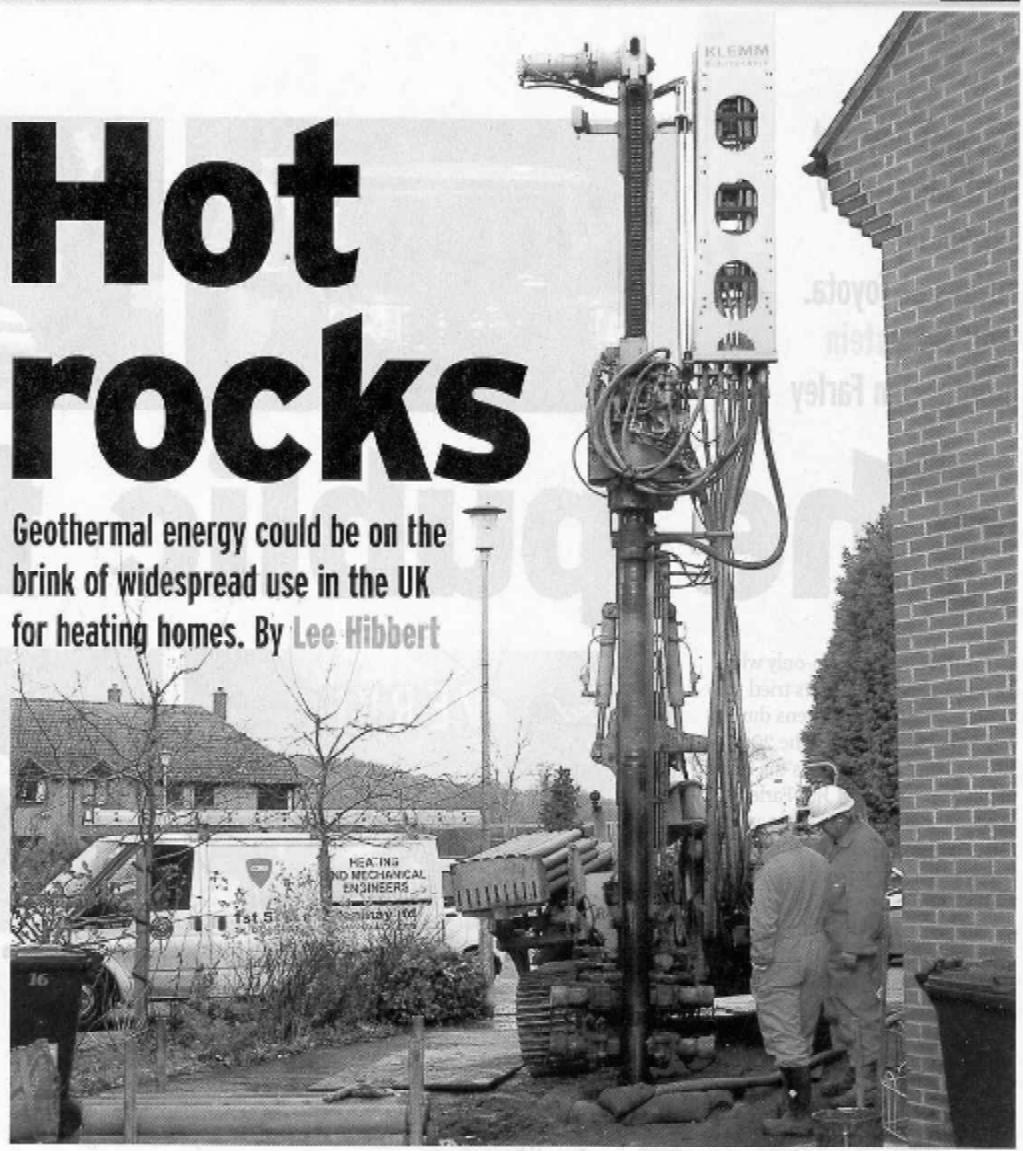
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Hot rocks

Geothermal energy could be on the brink of widespread use in the UK for heating homes. By Lee Hibbert



Going down well: Earth Energy is so certain its workload is about to expand that it has ordered four new drilling rigs

What Challenges Face Geothermal Energy?

- Experience in a new technology;
- Communication along the entire design/installation chain;
- Buildings engineers and geologists who can communicate to each other and with the installers;
- Understanding of heat pumps;
- Enough of each of these to fill demand.

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15 April 2008

Talent Shortage Threatens Renewables Growth

London, UK [RenewableEnergyWorld.com]

A shortage of human capital, especially experienced business leaders, is presenting an obstacle to further growth of the growing clean energy industry, a new study finds. According to a joint report by New Energy Finance and recruitment firm Heidrick & Struggles that looks into top-level recruitment in the clean energy sector, the issue is rising up the agenda in sectors such as wind and solar energy and biofuels, as investment in specialist businesses climbs.

The central finding of the research is that business leaders regard the recruitment issue facing the sector as a serious challenge. Some 37% of respondents said they saw the recruitment challenge as "very serious," and

"There is strong momentum behind the growth of clean energy worldwide, with new investment up nearly fivefold



How do we fill the void?

- Training and retraining of engineers, hydrologists, geologists and drillers;
- A single national or international standard for qualification to install or design geothermal heating systems;
- Inclusion of heat pump technology in buildings engineering courses;
- Education of geologists about heat.

Foreign Work?

- Significant Dutch and Swedish expertise in Geothermal Energy, although with different geology;
- **IS THIS THE RIGHT SOLUTION?**

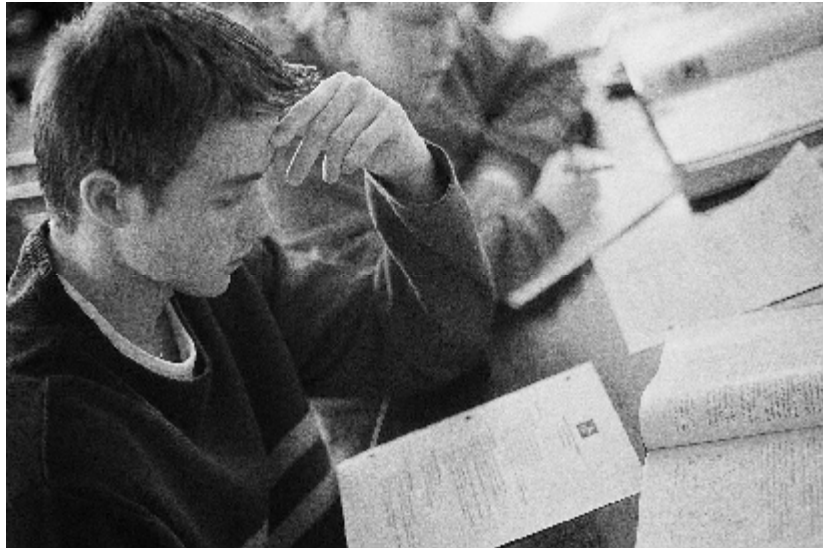


Retraining?

- Industrial and Engineering workforces are ageing;
- Government wants employer input into training, especially to achieve functional numeracy and literacy;
- New drilling and engineering firms breaking into the market—need training to at least a basic level.



New Blood?



- Fewer young people are undertaking Science, Technology, Engineering and Maths (STEM) subjects;
- Huge competition in the job market;
- Must improve perception of engineering and technology.

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Conclusions

- The government is driving a skills development agenda;
- With a growing industry will come growing personnel demands;
- We must make changes NOW to fill the future demands for geothermal energy;
- Training today will fill job vacancies in several years time.