An Assessment of Skill Needs in the Gas, Water and Electricity Industries

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Business Strategies is one of the UK's leading economic consultancies, with particular strength in analysing labour market and skills issues. We have a track record of working with all the established players - local LSCs, NTOs, RDAs, the devolved administrations, government departments, local authorities and private sector employers.

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Contents

Foreword

As the representative National Training Organisations (NTOs) for the gas, water and electricity industries (in shorthand the 'Utilities'), we welcomed the recommendations from the National Skills Task Force to set up a programme of Skills Dialogues. This Gas, Water and Electricity Skills Dialogue collates valuable Labour Market Information (LMI) and presents new insights on skills to partner organisations planning education and training programmes and initiatives.

The Gas, Water and Electricity Skills Dialogue has been developed with the cooperation and shared knowledge of the NTOs, employers and government and has also involved some of the funding and planning bodies that will draw on this information.

Since the Dialogues were originally conceived in 1998, there have been changes to the skills and training infrastructure. The NTO network is now being phased out, and their task of supporting industry labour markets and skills development will be taken over by Sector Skills Councils. At the time of writing, the new form of representation for the gas, water and electricity sectors is undecided.

However, despite the period of transition we are currently in, we believe strongly that this document is of great relevance for all those who seek to understand the skills needs and challenges of the gas, water and electricity industries. Though new Sector Skills Councils will be representing the skills needs of our industries in the future, the labour market needs of gas, water and electricity will not differ from those outlined in this report.

The 'Key Messages' drawn from the report and consultation are highlighted overleaf and outline the challenges facing the gas, water and electricity industries in sustaining the supply of suitably trained and experienced staff into the Utilities sector. We also recommend that you read the 'Conclusion and recommendations' chapter, which reviews the findings of the partnership workshop that was held as part of this Dialogue process, and which summarises the partnership actions needed to secure skills sustainability and competitiveness in the Utilities.

This report has been though an extensive programme of consultation and we are confident that it reflects the views of the industries accurately. We hope that by working effectively with partner organisations in the skills and training process, we will succeed in meeting the skills needs of the industry and help it to compete successfully in the global market place.

Yours Sincerely

Tim Balcon
Chief Executive
Gas, Water Industry
National Training Organisation

Denis Hird
Chief Executive
National Electrotechnical Training

Bill Fenton
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Key messages

Dialogue Scope

- The Gas, Water and Electricity Dialogue incorporates the onshore UK gas industry from the transportation of gas to the installation of gas in the home; the water industry covering the management of water resources, supply, treatment and distribution together with the treatment and disposal of sewage and industrial effluent; the electricity industry including the generation of electricity and the installation and repair of electrical networks and instrumentation; and also telecom cable-laying.
- As a consequence of privatisation, together with other common drivers of change, there is shared ground across the Utilities in the area of *Network Construction* (the process of laying pipes and cables, servicing the networks and maintaining strictly regulated levels of health and safety) - this work is typically contracted out to 3rd party companies who work across the Utilities.
- The Utilities are represented by the following National Training Organisations (NTOs):
  - Gas and Water Industry NTO (GWINTO)
  - Electricity Training Association (ETA)
  - National Electrotechnical Training (NET)
  - British Plumbers Employers Council (BPEC).

Industry Drivers

Skills needs in the Utilities are being driven by the broad business drivers - increased competitiveness, globalisation and technological innovation - as are all industrial sectors. However, regulatory requirements are also creating cycles of skills needs and specific demand requirements for labour.

- In the water industry, the role of the regulator in price setting and arbitrating infrastructure investment dominates the industry. The regulator operates on a five-yearly cycle of rulings, setting prices and the extent of health and safety and regulation-driven investment required from each company. The response of the water companies - the large regional companies and also the small and medium sized contractor companies - to the demands of the regulator has been a cycle of bidding and contracting that fosters short-termism.
- The cycles and lack of long-term resource planning inhibits skills investment and planning, which will have a negative impact on the sustainability and competitiveness of UK water companies.
- EU rulings on drinking water quality and waste water mean additional demand pressures for the industry - by 2007, more than 3,500 km of new piping will need to be laid.
- Office of Gas and Electricity Markets (OFGEM) and the gas industry are now operating to a 30-year programme of investment and the industry is now able to plan for skills needs over the long term.
- The metallic mains replacement programme - driven by health and safety concerns - is pushing up the demand for contract workers in the gas industry, while the government's scheme to put gas central heating in all homes is contributing to an urgent need for gas installers.

- In the electricity industry, the UK commitment to the terms of the Kyoto protocol may lead to a decrease in electricity generation and a rise in nuclear generation to meet the emissions targets. No official pronouncements have been made, but if this is the case, the subsequent restructuring in the industry will have implications for skills needs.
- The regulator across the Utilities has kept prices in check and competitive edge has had to come through cost cutting and greater operational efficiencies - with a negative impact on training investment. For the long term health of the industries, the regulator must factor skills investment into the pricing equation.
- In their bids to be cost competitive, the contracting companies that are taking on the non-core activities hived off by Utilities companies are not investing in skills to the extent of the pre-liberalised Utilities, and the sustainability of the industries is threatened.

Industry activity

- The trend is towards multi-utility companies operating across water, gas and electricity, creating synergies of skills needs. (However, where the electricity companies have diversified across the Utilities, their involvement is rarely on the functional operations of the water or gas business and therefore there is not an associated demand for water and gas specific skills).
- Utilities are diversifying into other activities such as retailing and financial services to build market share.
- There is a significant amount of takeover and merger and acquisition activity, with a number of gas, water and electricity companies now in foreign ownership. Consolidation in the industries is expected to continue.

Demand for Skills

Employment

- Official statistics and NTO estimates of the size of their industries vary enormously - official figures put the size of the Utilities at 140,000 whereas other estimates put the figure at over 500,000.
  - The growth of outsourcing and contract workers means that official numbers underestimate employment in the Utilities supply chain. For example, in 1999, following the announcement of the periodic review, 11,000 lost their jobs in the water industry. However, 4,000 were re-hired as contract staff, suggesting an under-count of around one-third.[1]
  - On the assumption that the same proportions hold across the Utilities, this would provide a ballpark figure of 47,000 (i.e. one-third of 140,000) for the Utilities contracting sector.
  - This number is a rough estimate only. We suspect that many contracting companies providing services to the gas, water and electricity industries will be included in official data within the construction industry.
  - Official numbers do not include in a satisfactory way the downstream areas of the Utilities - gas installation and maintenance, electrical installation and maintenance, and plumbing - where NTO and Business Strategies estimates are around 98,000,[2] 159,800[3] and 106,270[4] respectively.

1 British Water, consultation communication.
2 CORGI registered gas installers.
3 Estimates for the size of the Electrotechnical sector are put at 350,000 in NET's LMI however Business Strategies has been unable to find statistical data that supports this estimate and in section 2.2.2 we arrive at an estimate of approximately 159,800 for the number of electricians (please note that on the SIC categories that NET draws on around 28,900 related workers are employed in the 'manufacture of electrical motors and associated products' that we have not counted in our estimate).
4 CITB Employment and Training Forecast for 1999, reported in BPEC Workforce Development Plan (no date). Please note that the CITB numbers will double count many reported in the CORGI registration figures and given here as an indication of those employed in gas installation.

- Together, these estimates suggest that downstream (beyond the meter) employment in the Utilities is circa 364,100.
- Combining the adjusted official statistics for the upstream, the rough estimate for the contracting sector and the estimates for the downstream suggest a workforce count of 554,470.

- Given such disparity and the rapidly changing face of the Utilities, there is a need for modelling work to produce more accurate estimates of employment numbers, drawing on a variety of statistical and survey data. This will need to be a priority of the Sector Skills Council(s).
- A more accurate sizing and remit of the contractor market is needed together with an audit of cross-Utilities working.
- Despite divergence in employment numbers, the overall trend is downwards as the Utilities continue to rationalise, restructure and upskill their remaining workforce.
  - Official statistics, capturing the upstream Utilities companies, show a significant decline in employment - a fall of 205,000 between 1971 and 2000 - driven by privatisation, restructuring and cost competition.
- However, the rate of decline is moderating as employment levels in the industries bottom out.
  - Official statistics show the decline in employment will continue, albeit at a slower rate. A fall to a level of 108,000 employees by 2010 is forecast.

Specific demand requirements

To better understand the employment needs of their industries, GWINTO, representing the Gas and Water industries, has undertaken its own demand side modelling to measure the extent of demand for labour, factoring in its aging workforce and two programmes of work: the replacement of old metallic mains within 30 metres of domestic property and the government's scheme to deal with fuel poverty.

- Modelling shows that the metallic mains replacement programme will require around 2,350 new contract workers to enter the industry by 2007.
- Seasonal modelling of the demand for gas installers indicates that there will be, on average, a shortage of at least 24,600 gas installers in 2004. The shortage will be most severe in the winter.

Replacement and occupational-specific demand

Because the Utilities have been retrenching their labour forces, insufficient attention has been paid to recruitment and succession planning. Some Utilities companies are only now recognising that throughout the period of employment restructuring and suspended recruitment, their remaining workforce has been steadily moving towards retirement. This pool of skilled and industry-knowledgeable workers will soon be lost to the Utilities, with no stream of young people to take their place.

- The age profile of workers throughout the Utilities and in the contracting industry is a major cause for concern, particularly as the industry is finding it difficult even now - a time when there is little recruitment occurring - to attract adequately skilled applicants.
- Demand across the occupations is principally driven by replacement demand - that is the demand for new entrants into the industries to take over from older workers retiring or people leaving the industry.

- The most urgent replacement demand is for administrative workers and skilled craft workers across the Utilities. In the case of administration, skills are not sector-specific and the Utilities will be competing with other industrial sectors.
- The electricity generation industry, based on findings from ETA, also faces difficulties finding replacements for engineering, technical and craft roles. The problems are even more acute for highly specialised engineering and scientific jobs (although the numbers are small).
- The demand for network operatives and gas installers is in large part due to the exit of older workers from the job (as well as the demands of new programmes of capital investment).
- There are concerns about succession planning within the Utilities as older senior managers leave, taking with them a wealth of industry-specific experience.
    - In the water industry, there are concerns about replacing the few highly skilled process managers who keep the logistics of the water companies running smoothly. Their exit will threaten the UK water industry's competitiveness.
    - Amongst gas transporting companies, there are concerns that as gas engineer managers retire (the age profile of membership of the Institute of British Gas Engineers is overwhelmingly over 50 years) and as business graduates are recruited into management roles in the sector, vital industry knowledge will be lost at senior levels.[5]

Skill needs

Across all occupations, there is a demand for the following:

- multiskilling (across utilities and across installation and maintenance);
- upskilling (driven by technical advances and more stringent regulation);
- customer service and business awareness skills (driven by growing customer expectations and competition);
- new types of skills such as asset management, supply chain management and contractor management as Utilities companies change their business models;
- technicians (i.e. the team leader role) to manage teams of crafts workers, driven by the cutbacks of managerial employees.

Supply of Skills

Recruitment

- There is difficulty across the gas, water and electricity sectors in attracting young people into the industry to replace the aging workforce. While the upstream industries are only recruiting in small numbers at present, the fact that they find it hard to attract graduate and apprentice applicants is causing anxiety. ETA is currently addressing this problem through better marketing of careers in the sector.
- The gas and water industries are already beginning to target alternative labour pools - unemployed, lone parents, women and ethnic minorities - through New Deal schemes to widen the pool of potential labour as the supply of young people dries up.
- The industry needs to overcome its poor image and employers need to build strong brands if they are to attract people to the industry. The public is deterred by perceptions of insecure employment and unclear career paths.
- Graduates are deterred by the industries' image and a commonly held view that pay is low.

5 This is also a concern for the wider gas industry, although the majority of gas engineers are employed in the gas transportation side of the industry.

Qualifications

A Utilities qualification - with core modules applicable to all Utilities and separate modules to meet the unique training needs of the gas, water and electricity industries - would benefit the industries by:

- promoting transparent competition between contractors and Utility companies in different regions;
- enabling the free movement of labour across the Utilities and across the regions;
- providing a broader range of career opportunities across the Utilities for new entrants, thereby encouraging supply.

The occupational structure has been transformed, with first line supervisory/technical roles growing in importance. An NVQ Level 4 qualification has been developed to meet this need.

- Electricity, for example, has recently developed an NVQ Level 4 qualification in Engineering Technology Management.
- Gas and water have had the development of an NVQ Level 4 qualification approved by the Qualifications and Curriculum Authority and supported by the Health and Safety Executive. It is intended that this will be available from September 2002.

Training

- Regulations mean health and safety are key issues for training across all occupations.
- The short-term regulatory framework of investment and contracting in the gas and water industries acts as a disincentive to invest in skills and training (although this is changing in the gas industry where the industry is now planning 30 years in advance and is predicting significant workforce challenges).
- Within the upstream electricity industry, the view is that the industry has invested substantially in managing the process of restructuring and downsizing by multiskilling its workforce. Training investment has been in IT, customer service, management development, health and safety and regulation.
- The onus is now on sub-contractors to meet training needs to secure contracts with the main players. However, long time delays in awarding contracts and the prevalence of short term contracts mean many sub-contractors are reluctant to invest in building a workforce and there is anecdotal evidence that some are choosing to stay as small operations rather than support larger workforces in anticipation of large contract spends.
- Concerns about poaching are a disincentive to investment in training, particularly where the employer bears the total training costs - a major issue for contractor companies and also in the Electrotechnical sector.
- Health and safety issues dominate training due to the need to meet regulatory requirements, and there is a need for training in communication and customer service skills across all occupational levels - e.g. technicians and skilled crafts persons now represent the face of the company and are expected to be responsive to customer needs.

- Cranfield University, which runs the postgraduate Process Management degree for the water industry, has found that despite significant industry demand for their graduates, employers are reluctant to fund places. The result is that few take the course (wages in the water industry are inadequate to warrant an individual's investment in the training).
- Sponsorship is required for succession to be secured in the industry.

Skills Shortages and Gaps

Skills shortages

- Anecdotal evidence from the water industry suggests that there is a shortage of engineers where industries, such as petrochemicals, in the vicinity use similar engineering skills to the Utilities and offer higher wages.
- Shortages of call centre staff in the South and South East have been noted by the electricity industry.
- Many workers with upstream and downstream electrical training concentrate on instrumentation and then shift into the IT sector, which is more lucrative, contributing to shortages of electricians and approved electricians.
- Anecdotal evidence suggests that the Scottish water industry faces difficulties attracting staff to work in more remote areas. London and the South East and, to a lesser extent, other regions, face a tough challenge to attract sufficient numbers into gas installation to meet the needs of the Affordable Warmth scheme, and for contractors to meet the demands of the metallic mains replacement programme.
- There are shortages of contracting staff.

Skills gaps

Skills gaps - that is, where workers in the industry do not have the right level of skills to meet the demands of their job - are a particular issue in the following areas:

- at the supervisory level, where individuals are required to have technical abilities but have inadequate communication, customer care and people management skills;
- when health and safety regulation is constantly being overhauled and when new legislation comes into play, there is often a temporary skills gap;
- business and financial understanding together with sales and marketing awareness is needed across all occupations in the Utilities;
- stakeholders in the industries point to skills gaps within the contracting businesses supplying the Utilities.

1. Sector overview

1.1 Introduction

The Gas, Water and Electricity Skills Dialogue has been prepared by Business Strategies, on behalf of the associated National Training Organisations (NTOs) and the Department for Education and Skills (DfES). Skills Dialogues make up a rolling programme of biennial skills assessments that provide information on skills demand and supply trends across 16 broad economic groupings.

This report provides a comprehensive and well-evidenced skills assessment to inform Local Learning and Skills Councils (LLSCs), Regional Development Agencies (RDAs) and the devolved administrations about the skills and labour market needs of the Utilities industries. It is also intended to underpin careers guidance and advice.

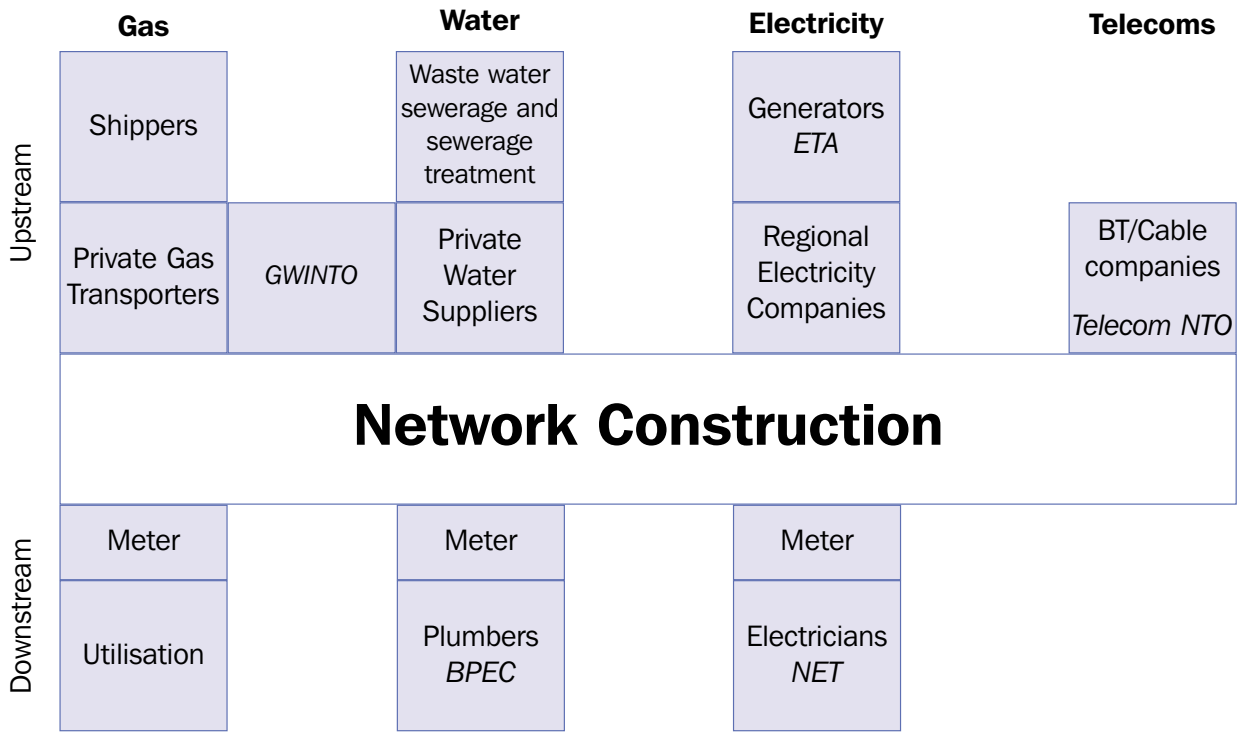
1.2 Scope

The Utilities industries are essential to many of our daily activities. Without them, we would be unable to switch on a light, boil the kettle, turn on the oven or make a phone call. The health and well-being of the UK population is dependent on the provision of water for washing, and electricity and gas for lighting and heating. Equally, commercial businesses - manufacturing and services - depend on these companies for their power and water supply. The Utilities, in short, underpin the smooth running of UK Plc.

Coverage of the Dialogue

This Dialogue incorporates the gas, water and electricity industries, together with telecom cable-laying. The coverage of the Dialogue is illustrated in figure 1.1.

Figure 1.1: Coverage of the Skills Dialogue



As is clear from the diagram, network construction links the gas, water, electricity and telecom industries. This is a consequence of privatisation and other common business drivers (see section 1.5.1). Network construction is the process of laying pipes and cables, servicing the networks and maintaining strictly regulated levels of health and safety.

Since the privatisation of the Utilities, such as British Gas and National Power, contractor companies such as Morrison Utility Services, McNicol Construction Services Ltd and AMEC Construction Services now carry out the majority of network construction. These contractors typically work across the Utilities although they may specialise. Equally, the large Utilities companies are multi-utility, operating across power, water and cable sectors. There are consequently significant synergies in skills needs across these industries.

There is an industry distinction between upstream and downstream, as shown in figure 1.1. Upstream reflects the industries' activities up to the meter (i.e. the supply of energy and water), while the downstream represents everything from the meter onwards (i.e. the activities facilitating and servicing domestic and business utilitisation of power and water).

This distinction is reflected in the coverage of NTOs that look after the energy and water industries, and in some areas of this report reference is made to upstream and downstream. The downstream part of the industries - gas installers, plumbers and electricians - is also discussed in the Construction Industry Skills Dialogue.

National Training Organisations

The Dialogue covers the activities of numerous NTOs - GWINTO, BPEC, ETA and NET. The telecom industry was represented by NTO telecom, however, they have now merged with the e-skills NTO and so at present, the service network operations of telecom are not adequately represented. The coverage of the Skills Dialogue NTOs is summarised in table 1.1.

Table 1.1: Coverage of the Skills Dialogue

National Training Organisation	Industry coverage
GWINTO (Gas & Water Industry NTO)[6]	The upstream and downstream on-shore gas industry from beach terminal to appliance burner; and the water industry extending from source to meter and also including sewage treatment
BPEC (British Plumbers Employers' Council)	The plumbing industry
ETA (Electricity Training Association)	The upstream electricity industry - businesses involved in the generation, transmission, distribution and supply of electricity. Also nuclear decommissioning companies at the operative level

6 Note: GINTO (Gas NTO) and BETWI (Water NTO) merged in 2001 to form GWINTO.

NET (National Electrotechnical Training)	The downstream electricity industry - covering the installation, assembling and maintenance of electrical systems and equipment from small domestic installation projects to commercial complexes

During 2002, Sector Skills Councils (SSCs) will take on the mantle of raising competitiveness and productivity, when they replace the NTOs. The NTOs as they now stand will therefore take on a different form following the dissemination of this Dialogue. At present, we do not know the form the SSCs for the Utilities will take.

1.3 Skills Evidence

This report draws on forecast material provided by the Institute of Employment Studies (IES), evidence from the Employer Skills Survey (ESS) and the associated NTOs' survey material, Skill Foresights and Workforce Development Plans are incorporated, together with consultation with stakeholders in the industries.

Painting an accurate picture of the Utilities on the basis of these diverse sources of information has proved a challenge. Liberalisation in the gas, water and electricity industries mean that official classifications mask rather than reveal some acute skills needs within the sectors.[7] Official occupational classifications also fail to capture the occupational detail of the industries because the occupations are in rapid flux given the huge transformations the Utilities have gone through. To add greater accuracy and colour to our analysis, we therefore draw on demand side modelling that has been carried out by GWINTO to more accurately capture the demand for labour in their industries.

Utilities coverage in the ESS is poor, with only 58 Utilities establishments surveyed.

- As the prime tool for benchmarking skills needs in the UK, the Utilities industries would like to see this number of responses supplemented in future runs of the survey.

The small sample size means that the responses should be regarded with caution, as in our view they are not statistically robust. We have presented the findings as raw counts in order not to overstate the results. In respect of skills gaps, the sample size falls to a fifth of the total sample size, below the minimum base of 30 responses recommended for reporting. However, given the lack of alternate data sources we have chosen to present the raw counts of the data to promote debate within the industries concerned and their partner organisations.

It should also be noted that reporting unweighted counts tends to bias the results in favour of larger establishments. Typically, as larger firms undertake more training than smaller establishments, the survey may well over-represent the extent of training being undertaken by the industries, while under-representing the skills shortages and gaps that are faced by smaller establishments.[8]

7 The forecast evidence supporting this report was only available at the 2-digit SIC (Standard Industrial Classification) level that is imperfect in capturing the essence of the industries' coverage.
8 The distribution of Utilities establishments surveyed in the Employer Skills Survey by size is as follows: 3 establishments (1-4 employees); 12 (5-24); 9 (25-49); 19 (50-199); 14 (200+).

We supplement the ESS findings with survey evidence of skills shortages and gaps from the NTOs' own research. The research in existence on the water industry is rather out of date and relates to the large water companies rather than the water industry as a whole.

- Detailed research needs to be undertaken on the wider water industry, and a robust and up-to-date survey of skills needs and gaps is required.

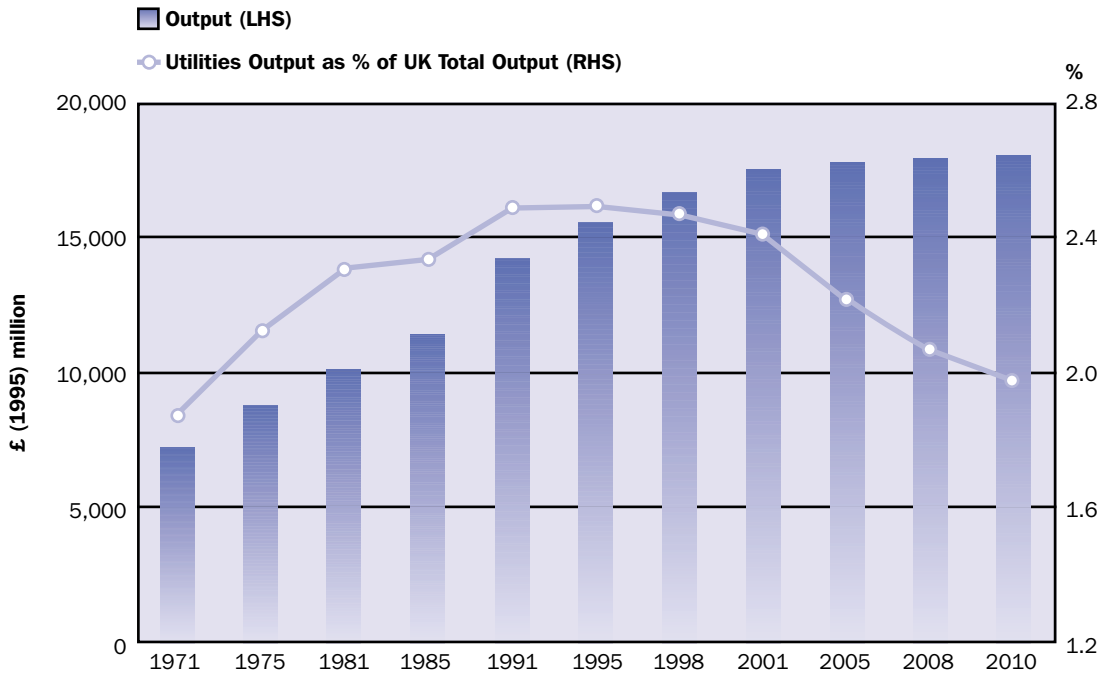
There are synergies across the Utilities industries but they are also distinctive in some respects - for example, their need for industry-specific technical skills - and so where appropriate we refer to the gas, electricity and water industry in detail in the text. More detailed overviews of the industries can be obtained from the NTOs themselves. Contact details are provided in Annex 1.

1.4 Contribution to the UK Economy

As figure 1.2 shows, Utilities output amounted to £17.5 billion in 2001, set to rise to £18 billion in 2010. Official data captures the activities of the utility companies but fails to count the broader industry and so this is an underestimate of the actual contribution to output.[9]

- Output has followed an upward trend since the early 1970s, leading to an increasing share of UK output for the industry between 1971 and 1995.
- In addition to underpinning the smooth operations of all other sectors of the economy, in 2001 the Utilities contributed directly to 2.4 per cent of the UK's total output.
- However, the share of Utilities output is forecast to decrease as the rate of increase in output moderates.

Figure 1.2: Utilities output



Source: Cambridge Econometrics, July 2000 (supplied by IER)

9 GWINTO's bid for SSC status for example, puts the output of the industry at £27 billion.

1.5 Business and Industry-Specific Drivers

1.5.1 Business drivers

Privatisation

The gas industry underwent privatisation in 1986, and from 1991 liberalisation has transformed the industry. The role of major players has fragmented and transformed as a result, making it difficult to paint a clear picture of the industry. Indeed, the industry lacks a clear identity, certainly in the public's mind. Privatisation took the form of an unbundling of British Gas's assets and operations (to create Centrica and The Lattice Group).

The water industry was privatised in 1989 and hand in hand with this came regulation. In response to the level of regulation, some water companies have developed non-regulated businesses that act as service companies to the regulated part of the company and also compete externally for wider business.

In December 1990, the 12 regional electricity companies responsible for the distribution and supply of electricity in England and Wales were privatised, while the generator companies faced this change even earlier. It has had a huge impact on the structure, operating regime and culture of the electricity industry.

Mergers and acquisition

There has been diversification across the gas, water and electricity industries as the common skills of the business encourage single utilities to become multi-utilities. Merger and acquisition activities within the sector reflect the business and skills synergies. In the electricity sector, many companies have also expanded their interests, blurring past divisions between generation, distribution and supply.

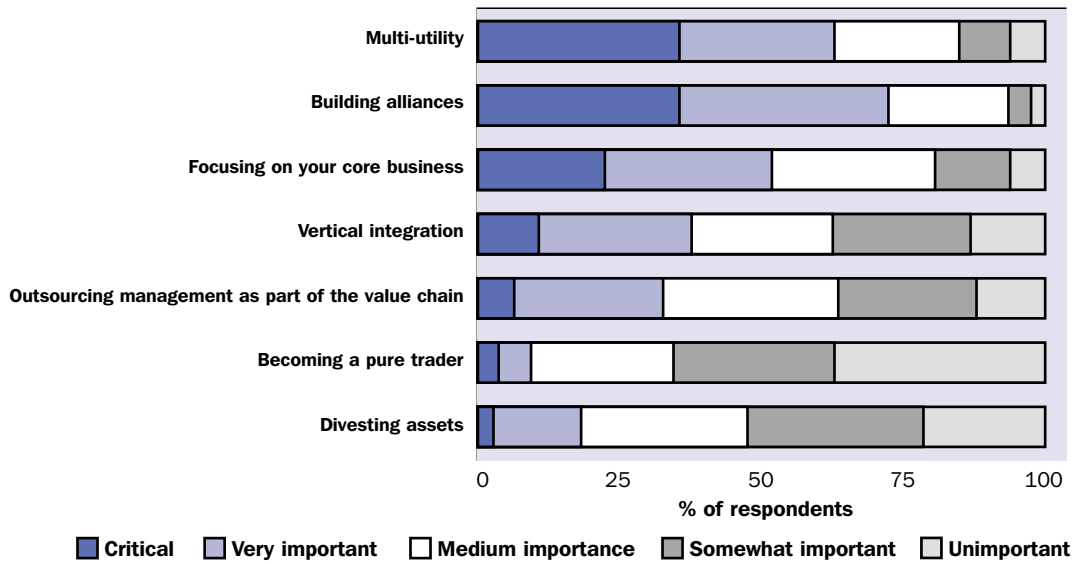
The significant level of consolidation within the industry has led to the emergence of the 'multi- utility', supplying electricity, water and gas to customers. This has created difficulties in determining employment numbers as the boundaries between the industries have blurred.

Water is the only one of Britain's privatised utilities in which mergers between companies operating in the same market are automatically referred to the competition authorities. There is evidence of consolidation in the sector, for example Anglian Water's takeover of Hartley Pool, and also a rise in foreign ownership.

In the electricity sector, many companies are now owned by overseas businesses, some in the US while one is French owned. PricewaterhouseCoopers's Survey of European Electricity Utilities[10] interviewed Utilities companies about the importance of strategies given the current climate. The results, illustrated in figure 1.3, suggest that the strategy of forming multi-utilities and alliances will continue at the forefront of business activities, indicating further consolidation and rationalisation in the sector.

10 Source: Electricité Sans Frontières, PricewaterhouseCoopers, 2001.

Figure 1.3: Assess the importance of the following business strategies in the competitive environment



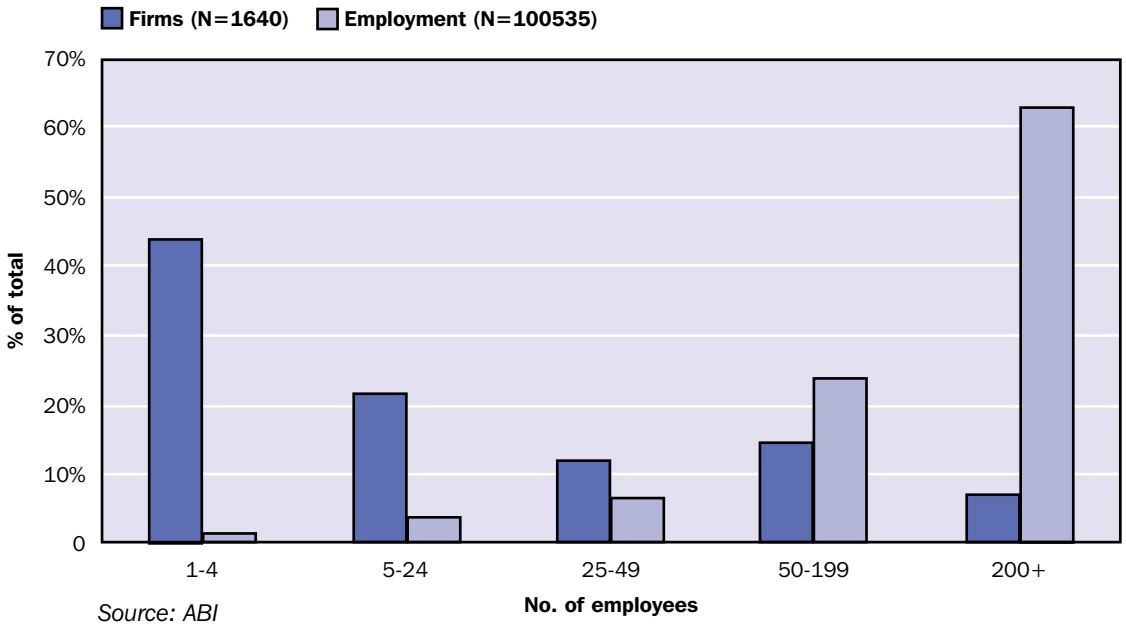
Source: PricewaterhouseCoopers Survey of European Electricity Utilities, 2001

As well as becoming multi-utilities, some businesses are diversifying beyond their boundaries to increase market share and grow the market. One example is the 'gas' company, Centrica, which is moving towards a multi-utility product home service offering, including credit card, car breakdown, insurance, plumbing and central heating services, as well as utility retailing.

Business and organisational structure

As figure 1.4 shows, 45 per cent of the firms in the sector employ between one and four people, reflecting the large number of sole traders and small businesses. However, in terms of employment, these companies account for just 1 per cent of total employment. 63 per cent of employment is within firms that employ over 200 people, reflecting the dominance of the large companies in the Utilities.

Figure 1.4: Number of Firms & Employment in Utilities, 2000 (by establishment size)



Source: ABI

Within the large businesses, restructuring and de-layering has taken place to cut costs, increase responsiveness and develop customer-focused businesses. The most obvious effect across the Utilities had been a dramatic decrease in employment, a process that is now slowing but is still a trend. Though dramatic, as employment in the large companies has fallen, smaller contracting companies have proliferated, typically hiring workers made redundant from the large companies.

Within the organisation, the shift has been from command and control structures to de-layered businesses where individuals throughout the organisation have greater autonomy and decision-making opportunities. A considerable cultural shift has occurred as public companies have developed into commercial businesses and in all occupational roles business awareness and an understanding of the cost implications of activities is expected.

Competition

The process of privatisation was designed to stimulate competitiveness in monopoly utility companies that were growing stagnant, while the 1990 Competition Act furthered this aim. There is now fierce competition between Utilities companies for business and also for workers. Cost efficiencies have been achieved but there have been negative consequences. Many of the Utilities businesses have not shifted from a situation of competition to co-optition i.e. cooperative competition through the sharing of resources and information to the gain of all. The emphasis is still on winning business from a competitor rather than cooperating to grow the market or develop overseas markets. There are also few signs of jointly funded research and development projects. Competition has put the customer central in the Utilities, a rather new position. In some cases this means companies, in particular their customer service staff, having to reconcile contradictory aims. Providing excellent quality customer service and meeting environmental obligations by advising the customer on energy conservation, while at the same time trying to maximise profits for the business, is one example.

There is equally strong competition for skilled workers, with businesses poaching rather than working cooperatively to train and develop a pool of suitable workers. The poaching strategy has worked thus far, because of the pool of skilled labour that remained post privatisation, but this pool is nearing retirement. Individual Utility companies will need to come together to fund and share training resources if the industries as a whole are to succeed. Cooperation with contracting companies is also a priority need in order that training investment is compatible with strategic thinking. Furthermore, as the larger contracting companies operate across the gas, water and electricity sectors, there is a need for cross-Utilities cooperation to address skills issues.

Regulation

The Utilities industries are central to everyday domestic and industrial existence and failure in any aspect of their supply and delivery can have catastrophic consequences. The gas, water and electricity industries are heavily regulated in order to enforce health and safety considerations and also to ensure that prices remain fair.

The Health and Safety Executive and OFGEM regulate the gas and electricity industries while the Drinking Water Inspectorate, the Environment Agencies and Office of Water Services (OFWAT) regulate the water industry. The Health and Safety Executive, the Drinking Water Inspectorate and the Environment agency all ensure that broad social and environmental concerns are adhered to, while OFGEM and OFWAT promote competition and price control in what are semi-monopolistic markets.

All core Utilities activities are subject to the industries' regulators and distrust and animosity between regulatory bodies and post-privatised Utilities in the past has not been to the benefit of either the industries or the consumer. There is now a more productive dialogue going on between the sectors and regulators and this is vital if the industries are to develop in the long term and compete without their hands being tied, in an international marketplace. The skills needs of the industries need to be considered by the regulator in future decisions on investment and pricing. As it is presently structured, the regulatory decision making process is resulting in short-term cycles of investment, which is proving detrimental to the skills base of the industries and exacerbating the flow of talent from the sectors.

Contracting

Post privatisation there has been a growing trend towards the outsourcing of activities in order to achieve benefits in terms of cost efficiencies and flexibility. This follows the trend across all industries. Small contractor companies often provide specialised services to the Utilities - for example, some engineering companies that are peopled by former in-house engineers. The larger contracting companies tend to operate across the sectors.

Contractors often lack a strategic overview of the industry. British Gas was the UK gas industry and therefore it is no surprise that it had a comprehensive view of skills needs and trends, but for contractors this is not the case. Strategic partnerships between gas transporters and contractors are urgently needed and Transco[11] is currently working to develop this relationship through GWINTO.

The Labour Market Survey for BETWI, conducted in 1999, found that 18 out of 21 water companies or utilities surveyed outsourced some or all of their operations. ETA estimates 15,000 contract staff are employed in the electricity industry at any one time. Across the Utilities there is also outsourcing of activities like billing, servicing and sales through call centres.

Summary

Since the advent of privatisation and regulation across all three industries, the picture is one of increasing complexity. In their nationalised guises, the gas, water and electricity companies were widely recognised by the general public, and a full range of industry activities were carried out within these monolithic companies. Since the late 80s and privatisation, the gas, water and electricity companies have been disaggregated, with many in-house functions shifting outside the newly privatised companies. This has had significant implications for sizing the industries and for the level of training carried out within the industries.

11 Transco manages the operations side of gas transportation and was created by the unbundling of British Gas operations from its assets.

1.5.2 Summaries of the gas, water and electricity sectors

Summaries of the industries covered in this report are given in this section. The purpose of this section is to pick out developments that are more specific to the sectors than those discussed in section 1.5.1. It should be noted that this section is not intended to provide an in-depth analysis of the industry and should the reader wish to do so, we direct them to the relevant NTOs and their Skills Foresight and Workforce Development Plans.

Gas (upstream and downstream)

- The upstream gas industry consists of the public gas transporters, metering, and contracting & maintenance (Transco is the major player).
- The downstream industry consists of gas suppliers, manufacturers & retailers and gas installers.

Industry characteristics

- Following privatisation and the de-merger of British Gas, the Lattice Group and Centrica were formed. Between them, they employ more than 30,000 people and dominate the industry[12].
- There are also a number of large companies employing around 1,000 in the industry and these are typically the principal contracting companies.
- There are many small and medium sized companies including public gas transporters, licensed gas shippers, suppliers and equipment and service providers.
- There are approximately 43,000 Corgi registered companies in the gas installation and maintenance sectors, of which 86 per cent are sole traders.

Drivers

- The Transco Affordable Warmth Scheme, Energy Action Grant Agency (EAGA) and Warm Zone initiatives are intended to bring central heating to more than one million homes in the next five years. This will place significant demand on the number of gas installers needed in the industry.
- Project Aurora - Transco's Mains Replacement policy - means that the industry will have to replace all ductile/cast metallic mains within 30 metres of property over a period of 30 years.

Water (upstream)

The upstream water industry is made up of companies managing and supplying water resources, and processing and treating sewerage.

Industry characteristics

The sector is dominated by around 30 large companies, which employ approximately 45,000 people in total (BETWI LMI 1999), and are primarily engaged in service delivery.

12 Data supplied by GWINTO and based on company records for The Lattice Group and Centrica - 13,000 (Lattice), 10,900 (British Gas Services) and 10,100 (British Gas Trading).

Other companies in the water industry include:

- contracting companies;
- specialist water/flood resources consultants;
- manufacturers and suppliers.

Large and medium sized firms in the water industry are losing out to small firms that are more flexible and adaptive to changing industry trends. The impact of this trend on overall employment in the industry is unclear at present.

In Scotland, the three water authorities are currently in the process of being consolidated into one authority. The authority will subsequently be under the same pressures as the English companies to obtain income through consumer tariffs.

Drivers

- The collection, distribution and treatment of water has a considerable impact on the environment, which has led to environmental legislation and policing of that legislation.
- The 1999 Periodic Review of Prices was the second review of prices since the privatisation of the water industry in England and Wales in 1989. The regulatory review is now set at five years with the next review in 2004. The review process requires the water companies to submit detailed plans of their programmes of work necessary to meet the requirements of European Directives, environmental improvements and asset maintenance.
- The government has recently put forward proposals to open up water supply to competition. Under the scheme new entrant water companies will be allowed to pump water into the existing pipe network.

Water (downstream)

Industry characteristics

- The downstream of the meter, plumbing sector is characterised by self employed, micro-businesses (60 per cent).
- According to CITB figures, the mainstream plumbing and heating industry employed 106,300 workers in 1999[13].

Drivers

- The industry is very competitive but highly fragmented and disparate.
- The work is labour intensive and requires skilled craft and technicians.
- The industry is being driven by increased regulation and rapid technological change.
- There is currently a problem of unskilled or semi-skilled workers pricing themselves below businesses that are investing in skills or workforce. These workers have few overheads and often lack business experience. In addition, they do not recognise the necessity for qualifications and standards.

13 Source: BPEC Workforce Development Plan.

Electricity (upstream)

The electricity sector is made up of those companies concerned with the generation, transmission, distribution and supply of electricity.

Industry characteristics

- According to the Electricity Training Association (ETA), there are 22 large companies in the sector. However, there are a growing number of smaller electricity producers and auto-generators producing electricity for own use.
- The nuclear decommissioning part of the electricity sector employs an estimated 12,000 people.
- The downstream electrical installation and maintenance industry is dominated by micro businesses.

Drivers

- The industry has experienced a high level of acquisition, merger and takeover activity. In addition, new players have entered the market from the UK, US and Europe.
- Intensifying competition, greater focus on the bottom line and a drive to reduce costs and increase efficiency, drives the industry.
- Legislation and regulation such as separation of supply and distribution businesses, price controls, safety requirements and social responsibilities.
- Diversification into new business activities such as gas supply and telecommunications.
- Increasingly blurred divisions between generation, distribution and supply.
- Regulatory controls have led to significant price reductions in an industry that is only experiencing slight growth in consumer demand - creating downward cost pressures. Prices are determined by a price control review carried out by OFGEM every five years.
- There has been a strong trend towards the use of contracting companies. According to ETA[14], the most common form of activities that require contract workers are non-core areas such as cleaning, catering and security, IT and some clerical/administrative support. In addition, contractors are also used in craft areas such as plant maintenance and cable laying.

14 Employment and Skills Survey Report 2001.

Electrotechnical (electricity downstream)

The electricity sector is made up of those companies that are concerned with the generation, transmission, distribution and supply of electricity.

Industry characteristics

- 90 per cent of businesses in the electrotechnical sector are Small and Medium Enterprises (SMEs) with nearly 45 per cent in the category of 'micro' firms (less than 10 staff)[15]. The self-employed also account for a significant proportion of employment in the sector [see section 2.2.2].
- The majority of the workforce (47 per cent) is comprised of qualified electricians and a further 13 per cent are apprentices. Therefore, for the purpose of this report, we will concentrate on skill issues of electricians and apprentices.

Drivers

- The Electricity at Work Regulations 1989 provide the overriding legal framework.
- The sector operates under the Institute of Electrical Engineers Wiring Regulations (currently the 16th edition), which was adopted as the British Standard 7671 in 1992.
- New manslaughter legislation will increase the burden on employers for audited, documented risk assessment measures.

1.6 The Future

The future of the utilities is uncertain; while the same can be said of any industry, the Utilities are highly subject to external drivers that are beyond their ability to control (although they can of course lobby and influence). The future of the industry will be shaped as much by the regulator as by its own actions. Regulatory influences that are driven by health & safety concerns, such as the metallic mains replacement programme, are having a dramatic impact on the demand for skills in the industry. Environmental legislation such as the Kyoto protocol and European Union rulings on water quality and waste management have had, and will continue to have, an impact on the industry. Furthermore, concerns over flooding, inspired by recent weather conditions, now mean that developers have to assess flood risk within their planning applications and this is stimulating more work for specialist water and flood expert professionals.

The insecurity felt by the water and gas utilities over the actions of the regulator encourages them to operate across a time frame of five years or less. Long-term planning is difficult and the vision of the industry is therefore on the medium term rather than on positioning for the long term. This has a knock-on effect on competitiveness and most particularly for planning of skills needs and training. It has also led to the industry being reactive rather than proactive, which also inhibits predicting and planning for future skills needs.

15 NET (2001) Labour Market Information Survey.

2. Demand for skills

Key messages

- The Utilities have experienced a significant fall in employment over the past 20 years.
- Employment will continue to fall over the next decade, but at a much slower rate.
- There is still a significant demand for labour that is masked by official statistics and hidden by the use of contracted labour to carry our network construction activities.
- Replacement demand, particularly due to the aging of the workforce, is the primary driver of demand across almost all occupations.
- There is an urgent need for contract workers at operative, supervisory and managerial level as a result of Transco metallic mains replacement programme.
- A significant demand for gas installers as a result of the Affordable Warmth Scheme.
- In the water industry, there is a need for process managers for the UK Utilities to compete effectively as global players.
- Across all occupations, there is a demand for **multiskilling, multidiscipline skilling** and **upskilling**.

2.1 Demand Overview

The demand for skills in an industry is fuelled by any/all of the following factors:

- a change in employment [2.2];
- a transformation in the types of skills required by an industry (occupational shifts) [2.4];
- people leaving the industry and therefore requiring replacement (replacement demand) [2.5];
- an increase in the level of skills required of individuals working in the industry [2.6].

In the following sections, we will examine the demand for skills in the Utilities and the factors that underpin that demand, by looking at historical trends and future projections of employment in the industries, together with survey evidence on recent employment patterns taken from the ESS. We will also look at the way the occupational composition of the Utilities has changed and analyse the impact this is having on skills needs.

2.2 Employment

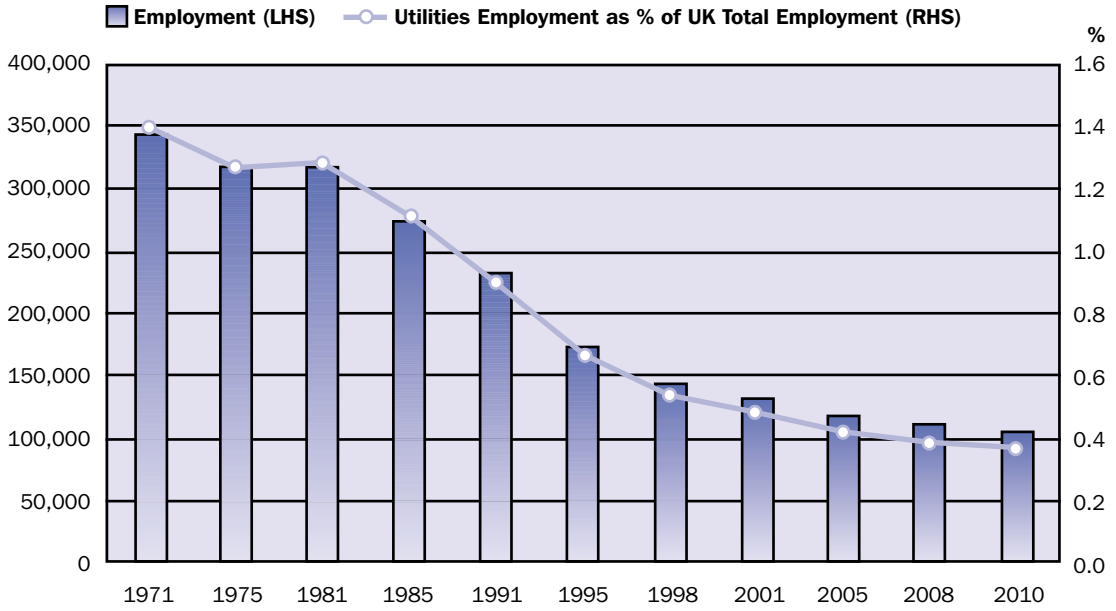
Before attempting to draw any conclusions regarding employment trends in Utilities, it should be noted that the following analysis applies to the upstream gas, water and electricity companies but does not adequately cover the downstream (e.g. gas installers, electricians, plumbers) and contractors. We have used alternative sources of information, discussed in section 2.2.2, to get the full picture regarding the number of people employed in the wider Utilities.

With this caveat in mind, according to official data, employment across the Utilities has fallen dramatically and is expected to continue falling through to 2010, albeit at a far slower rate.

As figure 2.1 shows:

- employment in Utilities fell by 205,000 between 1971 and 2000 - driven by privatisation, radical restructuring and competition;
- this led to the share of UK employment decreasing from 1.4 per cent to 0.5 per cent over the same period;
- in 2001, employment in the sector was an estimated 135,000;
- the fall in employment is forecast to continue and employment will equal 108,000 in 2010.

Figure 2.1: Trends in Utilities Employment



Source: Cambridge Econometrics, July 2000 (supplied by IER)

Table 2.1 shows the split of Utilities employment:

- in 2000, electricity accounted for 50 per cent of employment, a share that has not changed significantly since 1980;
- there has been a slight increase in the share of water supply employment, at the expense of employment in gas supply.

Table 2.1: Utilities sector employment

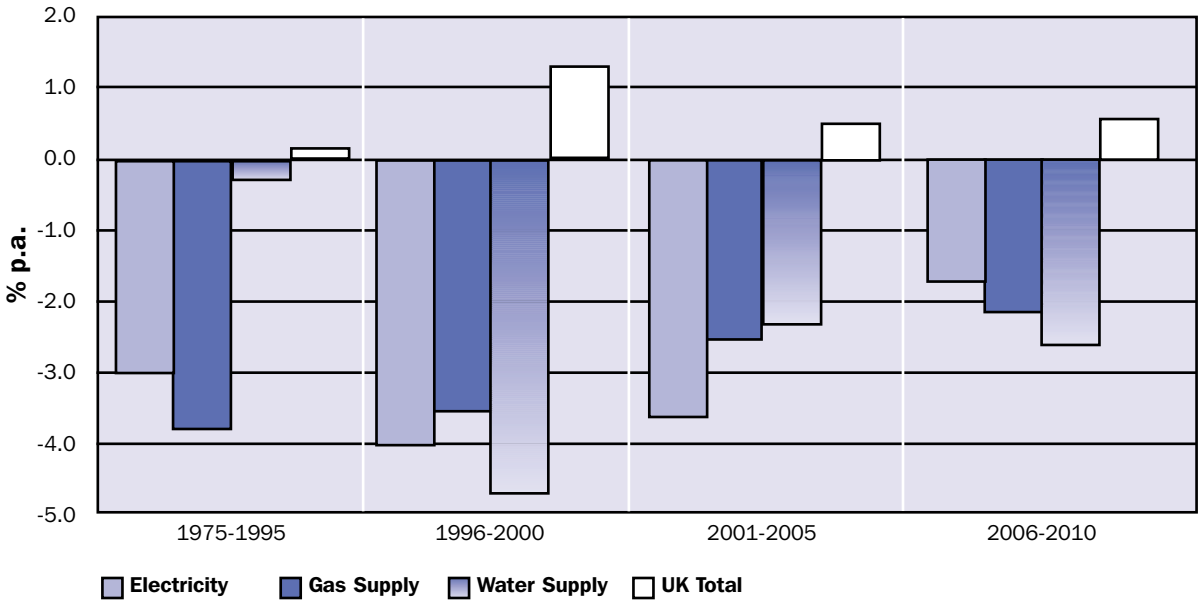
	1980		1990		2000		2010	
	Employment	% of total	Employment	% of total	Employment	% of total	Employment	% of total
Electricity	159,000	49	125,000	51	70,000	50	53,000	49
Gas	95,000	30	68,000	27	34,000	24	27,000	25
Water	68,000	21	54,000	22	36,000	26	28,000	26
Total	**322,000**		**247,000**		**140,000**		**108,000**	

Source: Cambridge Econometrics, July 2000 (supplied by IER)

The overwhelming trend is the large contraction of employment within all three sectors. As figure 2.2 shows:

- in comparison to UK total employment, electricity, gas and water supply have all experienced a sharp contraction in employment levels;
- between 1996 and 2000, employment in water supply fell by an average of 4.7 per cent per year, compared to overall UK employment increasing by 1.3 per cent per year over the same period;
- the rate of employment contraction is forecast to moderate over the next decade.

Figure 2.2: Employment Growth in Utilities



Source: Cambridge Econometrics, July 2000 (supplied by IER)

2.2.1 Survey evidence

While forecasts show a downward trend in employment, survey evidence shows a less clear picture. Some Utility establishments are experiencing growth in employment whilst others are reducing their workforce. The 2001 Employer Skills Survey for the Utilities (see table 2.2) shows:

- an even distribution of establishments experiencing an increase or a decrease in employment - 23 and 24 businesses respectively;
- of the 24 business units reporting a decrease in employment, the majority of these were in the West Midlands (5) and in establishments employing 100 to 199 employees (9), reflecting the wider economic decline of the engineering industry;
- only ten establishments felt that employment in their company stayed the same.

Table 2.2: Trends in employment at establishment over the past twelve months

	Unweighted Count
Increased	23
Stayed the same	10
Decreased	24
Total	**57**

Source: Employers Skills Survey 2001/IER

Of the establishments that experienced an increase in employment, the majority attributed this to an increase in turnover or budget (8 out of 23 businesses). Other reasons for an increase in employment include a move into or withdrawal from a new business area and company restructuring. The main reason cited for a decrease in employment was company restructuring (13 out of 24 businesses).

2.2.2 Further evidence

The employment forecasts discussed above refer to the regulated elements of the gas, water and electricity industries and therefore significantly underestimate the numbers working in the wider Utilities industries. As a result, official data is masking the immediate skills needs and shortages in the industry for downstream occupations such as gas installers and contractor operatives.

In this section, we use information from associated NTOs and stakeholders to provide a clearer picture of employment in Utilities.

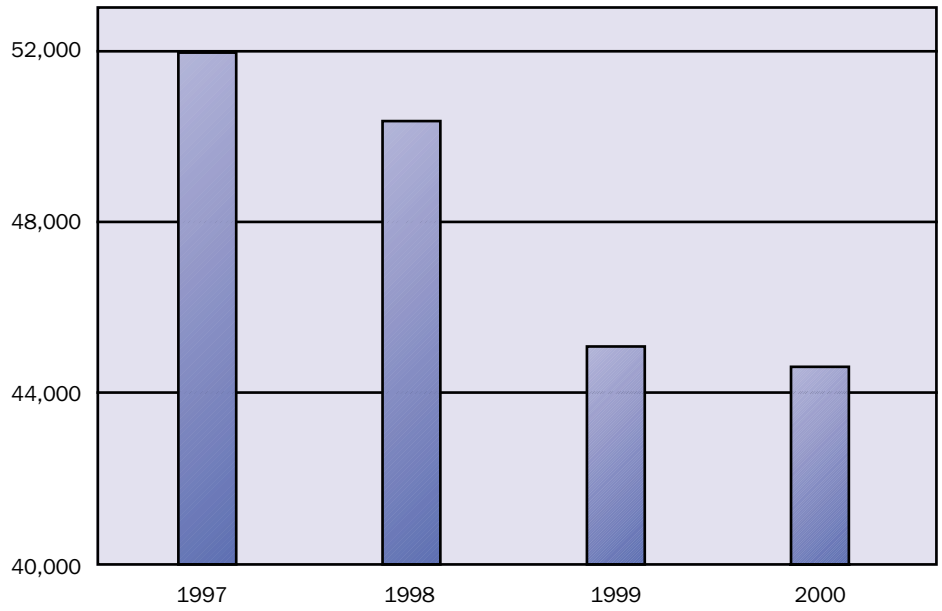
Gas

The following employment figures are taken from the GINTO Workforce Development Plan 2001 and the CORGI Annual Report 2001.

Gas installation and maintenance:

- the number of CORGI registered installers in 1997 was 52,000;
- as figure 2.3 shows, at the end of 2000, the number of CORGI registered installers had fallen to 44,200, employing 98,300 gas fitting operatives.

Figure 2.3: Number of CORGI Registered Installers



Source: CORGI Annual Report

Network construction and maintenance:

- there are approximately 6,000 CITB registered operatives (40 per cent are over 50 years old, 6 per cent are under 30 years old).

Chartered gas engineers:

- there are approximately 2,175 chartered engineers currently working (32 per cent are over 50 years old, 3.5 per cent are under 30 years old).

Water

- In 1999, the BETWI Labour Market Investigation and Skills Foresight report calculated that there were approximately 47,000 people in the water industry.
- Recent research conducted for GWINTO estimates that there were some 60,000 people employed in 2001[17]. With the inclusion of outsourcing companies, this suggests that there are about 100,000 people employed in or associated with the industry.
- According to CITB figures, the mainstream plumbing and heating industry employed 106,300 workers in 1999[18]. The forecast for employment in the sector is an increase to 113,850 by 2005. However, the CITB expressed caution when interpreting these estimates, as the large number of small businesses and self-employed in the sector means that employment could be significantly underestimated.

17 GWINTO (January 2002) *Water Industry Overview & Relationships.*
18 Source: BPEC Workforce Development Plan.

Electricity

- According to the ETA, the industry employed approximately 62,400 people in the UK in 2001[19].
- A further 12,000 workers in the industry are contract staff, and there are 14,300 overseas staff.
- An estimated 12,000 staff are also employed in the nuclear decommissioning sector.

Over the last ten years, the number of people employed in the electricity industry has declined by 59 per cent. In addition, according to the ETA Employment and Skills Survey Report 2001, the number employed in the electricity industry is likely to fall slightly over the next three years.

- 8 of the 13 employers surveyed indicated that their total number of employees would fall.
- Half of these companies believed that the decrease would partly be offset by an increase in the number of contractors employed.
- The main reason given for the decreases by employers in the survey was continuing efforts to streamline business and reduce costs in response to competition in the market and regulatory pressures.

Electrotechnical

The definition of the electrotechnical industry, according to NET, is electrical installation companies (SIC 45.31) and business involved in the manufacture of electric motors and associated products (SIC 31.1). However, for the purposes of the Utilities Dialogue we have focused solely on those working in electrical installation.

Data from the Annual Employment Survey states that there were 132,100 people employed in electrical installation in 2000 (and a further 28,900 were employed in the manufacture of electric motors and associated products). However, when assessing the level of employment in the electrotechnical sector, it is important to note that the Annual Employment Survey does not include self-employed and proprietors of small businesses who do not draw a salary.

To give an indication of the difference this group of workers makes to the overall employment estimate, the Labour Force Survey states that there were 247,400 electricians in the Spring 2001 survey, of which the self-employed accounted for 21 per cent.

The majority of the respondents in the 2001 NET LMI Survey stated that workforce numbers in 2002 would remain the same.

19 Source: ETA Employment and Skills Study 2001.

Summary

The purpose of section 2.2 is to give details of the level of employment in the industry. However, what has become clear is how estimates of employment in Utilities differ. The industry view of the number of people that work in the industry is much broader than the official definitions. Table 2.3 summarises employment levels taken from both the official figures, Business Strategies estimates and the NTOs' own calculations, in order for a clear comparison to be made.

Table 2.3: Summary of employment in Utilities

	Source	Year	Employment estimate
SIC definition			
Electricity (SIC 40.1)	IER	2000	70,000
Gas (SIC 40.2)	IER	2000	34,000
Water (SIC 41)	IER	2000	36,000
NTO figures			
Gas	GWINTO & CORGI	2000	141,500
Water (upstream)	BETWI LMI[20]	1999	47,000
Water (downstream)	CITB WDP 2001	1999	106,300
Electricity (upstream)	ETA LMI 2001	2001	62,400
Electrotechnical	Business Strategies estimates[21]	2001	159,800

Official statistics estimate Utilities employment to total 140,000 persons. The historical pattern of outsourcing in the water industry suggests that contract work equated to one-third of the in-house labour force. Applying the same proportions to official statistics for the Utilities suggests a rough estimate of 47,000 as the size of the contractor workforce.

Unofficial estimates put the total of the Utilities workforce at more than half a million[22]. There is no doubt that unofficial estimates involve double counting, but the disparity between the two is extreme.

For the Utilities industries to fully understand and address their skills needs, and in order that the new Sector Skills Council(s) can develop strategies to address skills challenges facing the industries we recommend:

- a detailed mapping to determine synergies in activities across the Utilities;
- a review of the size of the contractor market and an audit of the extent of cross-Utility working by contractors;
- econometric modelling to obtain employment numbers that are statistically robust and properly evidenced.

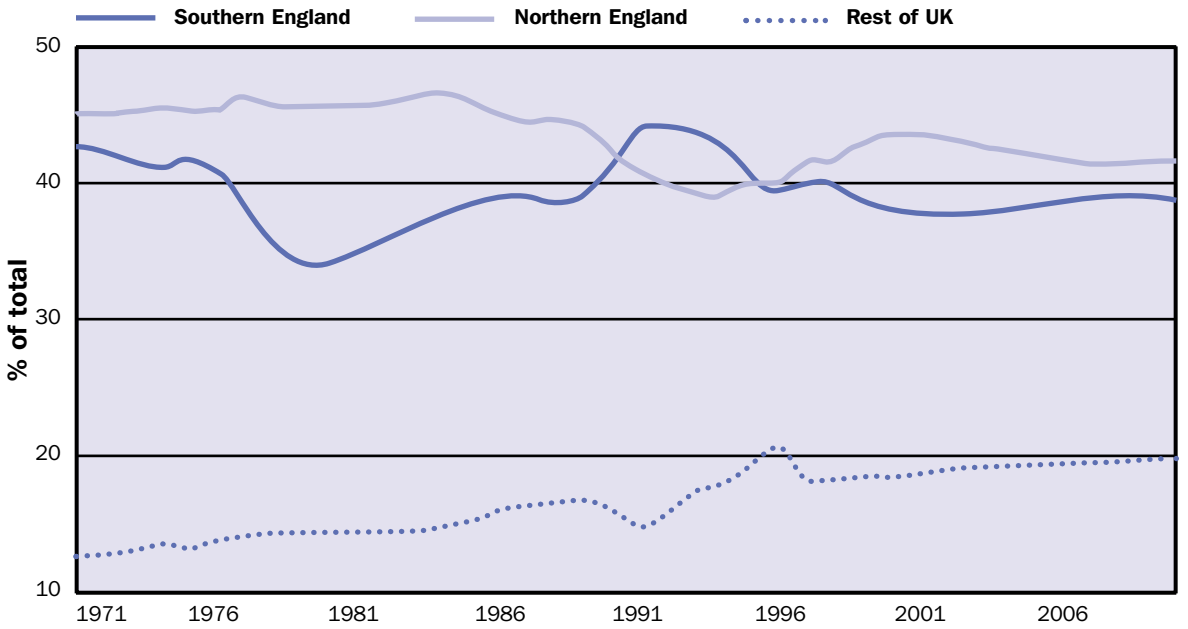
20 NB this figure does not take account of the wider water industry which research carried out for GWINTO has estimated adds a further 40,000 employed (i.e. they estimate 60,000 to be employed by the water companies and 100,000 in total).
21 Calculated on the basis that AES numbers show 132,100 employees work in 'Electrical installation'. However, these numbers do not include the self-employed and those below the VAT threshold - according to the Spring 2001 LFS - 21 per cent of those employed as electricians. We have therefore increased the AES 'Electrical installation numbers by 21 per cent to arrive at an estimate of total employment.
22 This does not incorporate our ballpark estimates for contracting as some NTO numbers include 'guesstimates' of contractors in their employment numbers.

2.2.3 Regional picture

In this section we draw on both the Institute of Employment Research (IER) industry forecasts as well as more bespoke research to build up a regional picture of the Utilities industries. The very nature of the Utilities industry means that businesses are concentrated in pockets across the UK. As figure 2.4 shows, England accounts for the largest share of UK Utilities employment.

- In 1971, Southern England[23] accounted for 43 per cent, Northern England[24] 45 per cent and rest of UK[25] 13 per cent.
- However, in 2000, Southern England's share of UK employment in the industry fell to 38 per cent, Northern England's share fell to 44 per cent, whilst the rest of the UK increased its share to 18 per cent.
- This trend is forecast to continue over the next decade, as the rest of the UK increases its employment share to 20 per cent by 2010.

Figure 2.4: Regional Employment in Utilities



Source: Cambridge Econometrics, July 2000 (supplied by IER)

Analysing regional distribution by Southern England, Northern England and Rest of UK categories provides a general picture but it does mask the trends within these regions. As table 2.4 shows, there have been some marked shifts in the rankings of the regions.

- In 1980, the North West had the largest proportion of Utilities employment (19 per cent), whilst Northern Ireland accounted for the least (3 per cent).
- However, by 2000 there had been a shift towards a more even regional distribution of employment, whilst only Wales and London reduced their share.
- London experienced the largest impact between 1980 and 2000; total employment fell from 49,000 to 8,000 during this period.
- In 2010 Scotland is forecast to possess the highest employment levels in the industry.

23 Southern England is defined as the South East, South West, Greater London and the Eastern region.
24 Northern England is defined as the West Midlands, East Midlands, Yorkshire & the Humber, North East and North West.
25 The rest of the UK is Scotland, Wales and Northern Ireland.

Table 2.4: Regional employment in Utilities

1980		2000		2010	
Region	% of UK	Region	% of UK	Region	% of UK
North West	18.7	South East	13.1	Scotland	14.2
London	15.2	Scotland	12.6	West Midlands	12.6
South East	11.0	West Midlands	12.0	South East	12.1
West Midlands	9.5	North West	10.8	East of England	11.6
Yorks & the Humber	7.7	South West	9.9	North West	10.3
Scotland	7.6	East of England	9.4	South West	10.3
East of England	7.0	Yorks & the Humber	9.3	East Midlands	6.9
South West	6.7	East Midlands	6.5	Yorks & the Humber	6.4
East Midlands	6.1	London	5.6	North East	5.4
Wales	4.0	North East	5.1	London	4.8
North East	3.7	N Ireland	2.9	Wales	3.1
N Ireland	2.7	Wales	2.8	N Ireland	2.5
UK	100	UK	100	UK	100

Source: Cambridge Econometrics, July 2000 (supplied by IER)

Water

We also have some detailed numbers for the regional employment distributions of plumbers taken from the CITB's 2001 WDP. The regional distribution of those employed in the plumbing and heating industry is outlined in table 2.5. Data from the CITB Employment and Training Forecast shows that in 1999, employees were concentrated in the South East and Greater London. In addition, the West Midlands accounted for a significant proportion of employment (10.5 per cent) and Scotland accounted for 10 per cent.

In 2005, the South East and Greater London are forecast to maintain their ranking as the main regions for employment. Regions that will increase the proportion of employment are Eastern, Scotland and the South West.

Table 2.5: Regional employment for the plumbing and heating industry

Region (ranked according to 2005 employment share)	1999		2005	
	Employment	%	Employment	%
South East	15,570	14.7	18,120	15.9
Greater London	13,400	12.6	13,820	12.1
Eastern	10,300	9.7	11,870	10.4
Scotland	10,410	10.0	11,670	10.3
South West	10,310	9.7	11,340	10.0
West Midlands	11,130	10.5	11,080	9.7
East Midlands	7,960	7.5	8,440	7.4
North West	8,710	8.2	9,040	7.9
Yorkshire & Humberside	8,450	8.0	8,940	7.9
North East	4,610	4.3	4,670	4.1
Wales	5,420	5.1	4,860	4.3
Total	**106,270**	**100**	**113,850**	**100**

Source: CITB Employment & Training Forecast

Electricity

Statistics from the ETA, taken from their Employment and Skills Study, show that of the 62,400 workers employed directly by electricity firms, 78 per cent work in England. A further 12 per cent are employed in Scotland.

Table 2.6: Number of employees in the Electricity sector, by UK region

	No. of employees	% of total
England	48,900	78
Scotland	7,500	12
Wales	3,900	6
Northern Ireland	2,100	3
Total	**62,400**	**100**

Source: ETA ESS 2001

ETA have recognised the need for greater regional research to be carried out in their sector and this will be undertaken in the near future.

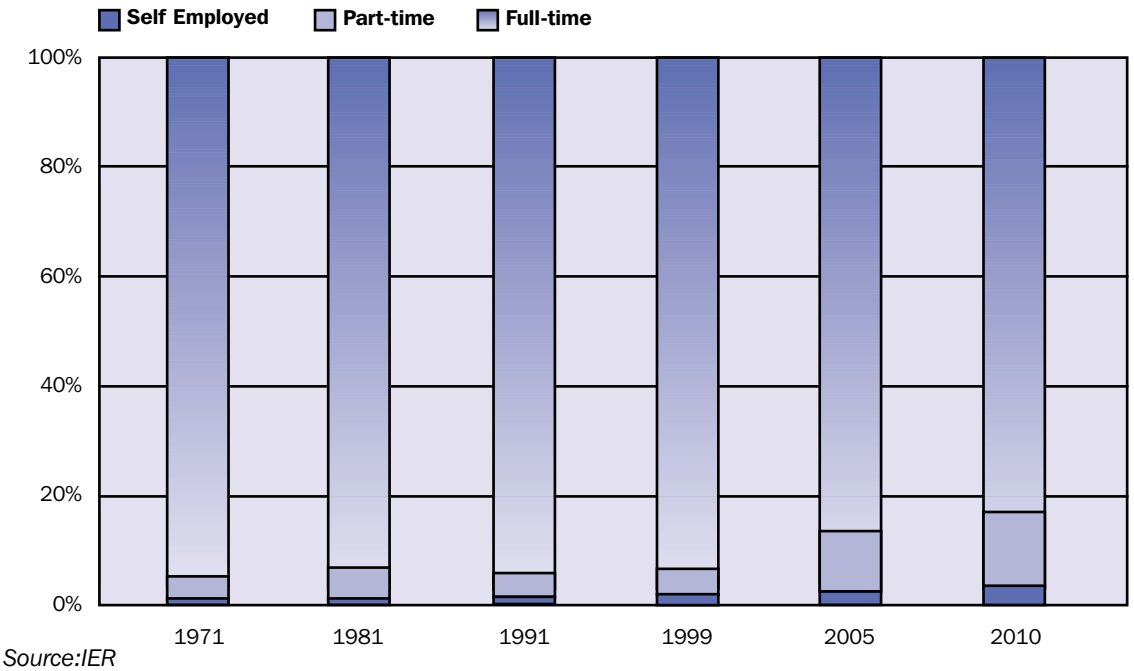
2.2.4 Workforce characteristics

Status

Employment within the sector is predominantly full time - in 1999, 91 per cent of employees worked full time. However, as figure 2.5 shows, there are some noticeable trends.

- The proportion of full-time employees has decreased considerably since 1971.
- The number of self-employed is increasing - in 1971, self-employed workers in the industry only accounted for 1 per cent of the total employment but this is forecast to increase to almost 4 per cent in 2010.
- More part-timers are now employed in the Utilities - they accounted for just 3 per cent of employment in 1971, but this will increase to 11 per cent in 2010 mirroring trends in the wider economy and also explained by the growing diversity of the workforce.
- The cause for the shift in the make-up of Utilities employment is that the fall in overall employment illustrated in figure 2.5 has disproportionately been full-time employees (a fall from 331,000 in 1971 to 92,000 in 2010).

Figure 2.5: Make-up of Utilities Employment



Source:IER

The dominance of full-time working and the age structure of the workforce has contributed to a working culture in the Utilities that is predominantly white and male. As we have already argued, this structure is a ticking time bomb that the Utilities companies have to address to meet their workforce needs for the future. Encouraging diversity by attracting women and ethnic minorities into the industries is essential for survival and future competitiveness. To achieve diversity, the Utilities need to:

- encourage women and ethnic minority workers to apply for jobs in the industry and to see a future for themselves in these sectors;
- work with managers within the industries to foster positive perceptions of their industries amongst prospective and new recruits and to ensure internal barriers to diverse recruitment do not exist.

ETA held a 'Diversity & Equal Opportunity' forum in December 2001 to debate the industry's record, discuss equal opportunities issues (e.g. attracting applicants from diverse groupings) and identify and share best practice.

The growth in part-time employment, together with NTO's workforce development initiatives to promote the industries to women and ethnic minority groups, will go some way to helping to promote diversity in the industry but a concerted and coordinated campaign to change attitudes and ideas would be cost effective and beneficial to all.

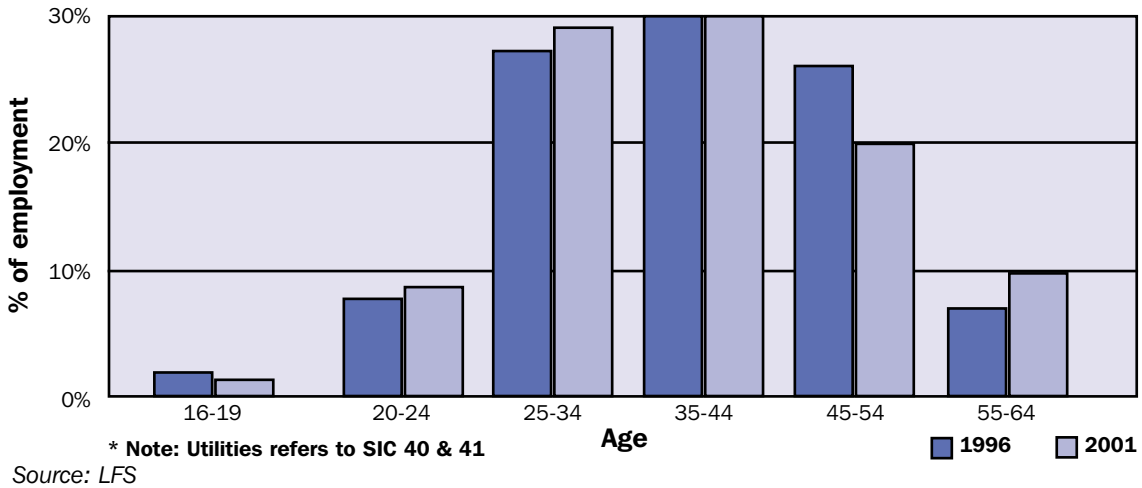
Age

The age profile of the Utilities is one of the most urgent labour force issues that the industry faces - it is a time bomb waiting to go off. The majority of workers across the Utilities are older and in the next decade will reach retirement age. However, for the most part the Utilities have been retrenching their workforces and have failed to recognise and address what this may mean for their futures. New blood has not been recruited into the industry and when the old guard retires, there are no younger workers skilled and available to take their places. While not facing a problem of recruitment to meet expansion, the industries nevertheless face an urgent need to recruit to meet replacement demand [see section 2.5].

As figure 2.6 shows:

- employment in Utilities is skewed towards older workers: 30 per cent of those employed in the industry are aged 35 to 44, and a further 30 per cent are aged over 45;
- in contrast, only 10 per cent of workers in the sector are aged between 16 and 24.

Figure 2.6: Employment in Utilities*, by Age



Source: LFS

This trend is evident across the Utilities not covered by SIC 40 and 41. As table 2.7 shows, the age profile of registered gas installers is skewed towards retirement age, and the fact that installers typically retire earlier than the statutory age of 65 further exacerbates this problem.

Table 2.7: Age Profile of Registered Installers

	Employment	%
15-19	300	0.3
20-24	3500	3.6
25-34	20,400	20.8
35-44	31,600	32.1
45-54	30,300	30.8
55-64	11,600	11.8
65+	500	0.5
Total	**98,300**	

Source: CORGI

The extra demand for gas installers caused by regulatory requirements will also cause problems. The Utilities will need to meet this demand by fighting to attract young people and also by hiring from alternative pools of labour, for example women and ethnic minorities.

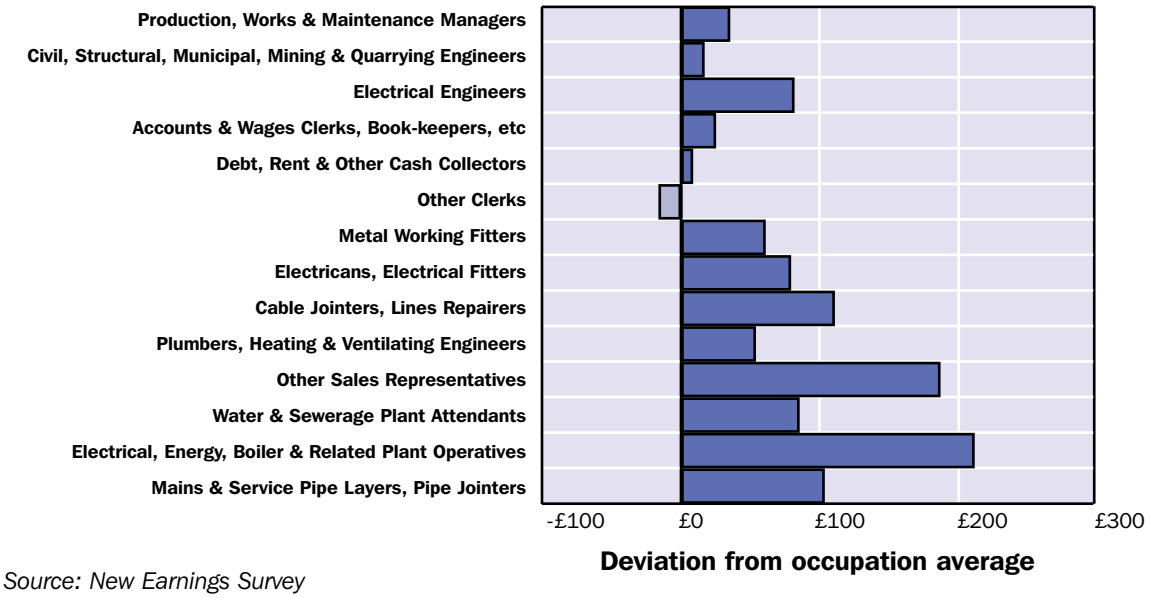
2.3 Pay and Conditions

A study of pay levels in an industry provides a further component to our analysis of its labour market. A higher wage rate may be a reflection of the skills and expertise required to carry out a job [see section 2.6.2]. It may also reflect the scarcity of workers in the industry [section 4.2].

As figure 2.7 shows, weekly pay across most occupations in Utilities is above the UK average for similar occupations. Wages for operative workers are generally further above the occupational average than those of managers and professionals. Our earnings include overtime payments that will boost the wages of operatives, while the majority of managers do not receive payment for overtime working. Overtime payments will also reflect the unsociable hours worked by many operatives in the Utilities.

- Production, works and maintenance managers earn only £35 more per week than the all-industries average for managers and administrators.
- Civil engineers, around one-fifth of which work in the water industry, earn a meagre £18 more per week than the all-industries average for professional workers. Electrical engineers fare slightly better, with weekly pay £84 above the occupational average.
- Manual workers in the sector - water and sewerage plant attendants; electrical, energy, boiler & related operatives; mains & service pipe layers; pipe jointers - earn above the all-industries average for manual workers (£327 per week).
- Significantly, manual workers in the Utilities earn wages that are above the average take-home pay for all UK occupations (£367 per week). Electrical, energy, boiler and related operatives typically earn £540 per week while mains & service pipe layers, pipe jointers earn on average £430 per week.

Figure 2.7: Pay Comparisons (including Overtime) of Key Occupations in Utilities, 2001



Source: New Earnings Survey

It seems likely that pay levels in the Utilities reflect both scarcity and skills. Plumbers, gas installers and electricians are skilled workers, many of whom are members of trade bodies undertaking work that has significant health and safety implications if not carried out properly. Equally, there is a shortage of skilled workers that has been flagged up in the Construction Industry Skills Dialogue. As a result, such workers are able to charge a premium. As figure 2.7 shows, wages for plumbers and heating engineers are £57 above the weekly average for all craft occupations. Anecdotal evidence suggests that, as a result of acute shortages, some of the more astute operators in the plumbing industry have annual earnings that are the envy of many professional knowledge workers.

The above average pay earned by manual workers in the Utilities is also likely to reflect scarcity, together with a premium for unsociable working conditions. Transco, as the primary contractor of labour to meet the regulatory requirements for the metallic mains replacement scheme, is already concerned that if more workers cannot be attracted into the area, then wages will rise considerably. This will create enormous cost implications for the programme and Transco's ability to meet the regulator's demands. Manual operatives in the Utilities need to be sufficiently trained to meet health and safety requirements and therefore, despite not being highly skilled, will have to be trained before being able to undertake manual work in the sector. If this scarcity is to be addressed, the industries (and its contractors) may benefit from recruiting and training from amongst the pool of migrants into the UK. This will require 'English as a second language' initiatives in addition to industry-specific training.

Above average wages, particularly for craft and manual occupations, should help to attract workers into the industries, and publicity to this effect should be undertaken so the market adjustments occur. It is unlikely, however, that pay offerings for managers and professionals in the Utilities related occupations are sufficient to alleviate the shortage of talented managers and engineers. The numbers suggest that the monetary offering will need to be improved, or benefits paid in kind, possibly through a commitment to invest in individuals' training and development to encourage graduates into the industries.

Further research is needed into the pay and conditions on offer within the industries to determine its influence in addressing recruitment. The New Earnings Survey data we have discussed tells us little about the variation in offering across Utilities companies. Representatives of the industries suggest that the pay and conditions packages in the major Utilities companies are attractive, but that there is a problem in the wider supply chain.

2.4 Occupational Change

The occupational trends in the Utilities industry, mirroring trends in the economy as a whole, are shifting away from manual occupations towards service and knowledge jobs. The Utilities are experiencing a growth in white-collar professional, associate professional and technical and administrative occupations and a decline in blue-collar skilled crafts occupations, operative and elementary occupations.

As well as an occupational shift, the Utilities industries are increasingly contracting out non-core activities. Typically, network construction is now sub-contracted, which explains the fall in manual occupations in the regulated Utilities but also represents a sectoral shift in activity that is not picked up in the forecasts based on official statistics.

The distribution of Utilities employment is shown in table 2.8. The transformations in the employment distribution are as follows.

- Historically, the number of managers has been rising, but between 1999-2010 they are forecast to fall from 9.0 to 8.6 per cent, reflecting further downsizing in the Utilities coupled with flatter management structures.
- Professional occupations have been rising since 1971 and are forecast to grow to 12.6 per cent of total employment by 2010 - driven by the demand for science and technology professionals as technology transforms the industries into increasingly hi-tech operations.
- Associate professional and technical occupations will continue to increase as a share of employment, stimulated by stringent UK health and safety and European Union regulations (particularly on water quality and waste management).
- Administrative and secretarial occupations are forecast to grow to comprise the majority of employment at 23 per cent in 2010. This reflects the increased emphasis that employers are placing on customer service to compete.
- Skilled trades workers, or craftsmen - once the cornerstone of the Utilities, comprising 33.9 per cent of employment in 1971 - are a declining share of employment but nevertheless are forecast to account for 21.5 per cent of the workforce in 2010.
- Operatives (including process, plant and machine operatives and elementary occupations) are declining moderately as a share of total employment as a result of service network operations being sub-contracted out.

Table 2.8: Occupational distribution of Utilities employment

	1971		1999		2010	
	Employment	% of total	Employment	% of total	Employment	% of total
Managers & Senior Officials	22,000	6.5	13,000	9.0	9,000	8.6
Professional Occupations (including engineering professionals)	30,000	8.7	17,000	11.9	14,000	12.6
Associate Professional & Technical Occupations (including science and engineering technicians)	23,000	6.6	11,000	7.6	9,000	8.4
Administrative & Secretarial Occupations	62,000	18.0	29,000	20.0	25,000	23.0
Skilled Trades Occupations (including electricians, lines repairers and cable jointers, plumbers, heating and ventilating engineers)	117,000	33.9	38,000	26.0	23,000	21.5
Personal Service Occupations	4,000	1.1	3,000	1.8	3,000	2.7
Sales & Customer Service Occupations (including call centre agents and operators)	12,000	3.4	6,000	3.9	5,000	4.7
Process, Plant & Machine Operatives (including plant and construction operatives)	40,000	11.5	15,000	10.3	10,000	9.0
Elementary Occupations	35,000	10.3	14,000	9.6	10,000	9.5
Total	**345,000**	**100**	**146,000**	**100**	**108,000**	**100**

Source: IER

2.4.1 Survey evidence

Water

BETWI's Skills Foresight from January 2000 for the water industry suggested that occupational shifts within the water industry were likely but that inadequate company information on trends made it difficult to predict how things would change. The report suggests a rise in call centre and customer service operatives is likely.

Electricity

The ETA Employment and Skills Survey report 2001, which surveyed 13 companies in the electricity industry, asked respondents about the changing occupational structure specifically within the electricity industry. Results show that:

- since 1999, managers and professional/technical staff represent a declining proportion of total staff employed;
- the proportion of the workforce made up of commercial/administrative staff has increased;
- the above results show that the electricity sector is experiencing an occupational shift that is similar to the other Utilities.

The ETA survey also asked respondents which occupations would experience an increase in employment and which would experience a decrease.

- With most employers forecasting a decrease in employment over the next three years, the decreases are expected across all occupational areas.
- The survey suggests that recruitment of craft apprenticeships and graduate trainees is likely to increase as part of the industries drive to attract more young people.

2.5 Replacement Demand

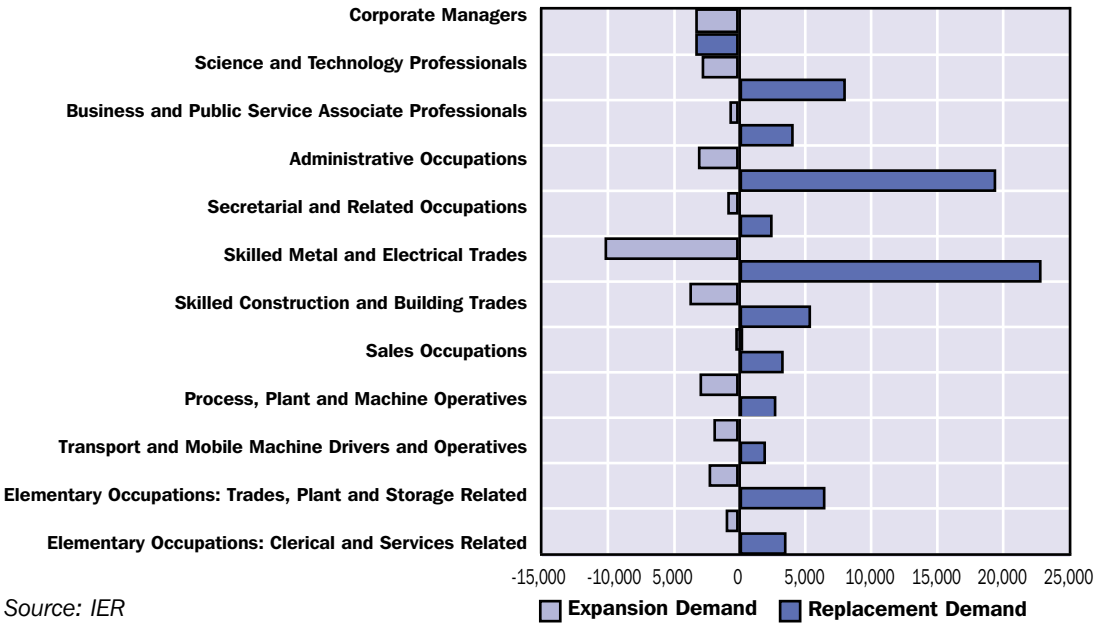
The demand for skills in an industry is directly related to levels of employment. Employment levels change both as a result of expansion (or contraction) of the industry and because workers leave the labour market through retirement, sickness or moving to other sectors. As a result, the net requirement for labour is the sum of expansion (or contraction) demand and replacement demand.

Forecasts for net requirement in the Utilities over the next decade are shown in figure 2.8. The grey shaded bars illustrate the demand for labour as a result of expansion and clearly show that the contraction in the industry will cause negative demand for labour. Across the Utilities, there is no demand for skills as a result of expansion.

Demand for labour in the Utilities is entirely the result of needing to fill jobs left by those retiring or leaving the industries through sickness or choice. Replacement demand (black shaded bars) is positive for nearly every occupation in Utilities, reflecting the significant replacement demand that the industry is facing.

- The highest replacement demand is for skilled metal and electrical trades (22,700), resulting in a net requirement of 12,300 workers in the occupation. Given the age profile of the existing workers, there is an urgent need for skilled crafts people to meet this substantial replacement demand.
- Administrative occupations will also require a significant number of individuals entering the occupation; replacement demand is forecast to equal 19,400 between 1999 and 2010.
- There is also, but less so, replacement demand for science and technology professionals (7,900), elementary trade, plant and storage related occupations (6,300) and skilled construction and building trades (5,300).

Figure 2.8: Replacement Demand & Net Requirements for Selected Occupations in Utilities, 1999-2010



Source: IER

2.5.1 Gas

Data available for the gas industry shows the net requirement for workers over the period 1999-2010 to be:

- 4,400 administrative occupations;
- 4,100 skilled metal and electrical trades;
- 900 science and technology professionals;
- 850 elementary clerical and service occupations;
- 750 sales occupations.

As discussed previously, these statistics only cover the regulated elements of the gas, water and electricity industries. GWINTO is currently in the process of developing a manpower demand-led forecasting model for the purpose of assessing labour demand outside the traditional SIC and SOC categories. This model covers both the upstream and downstream parts of the industry.

Upstream

GWINTO has forecast the demand for workers in the upstream part of the industry. A significant component of the demand for contract workers is driven by Health and Safety and OFGEM requirements. The requirement is to replace all old mains with steel mains within 30 metres of domestic property. GWINTO estimates a significant demand for contract staff over the next five years to meet the needs of this 30-year programme, including:

- reinstatement operatives;
- support operatives;
- first line supervisors;
- managers.

The GWINTO demand model covers the five-year ramp up period associated with this programme[26]. It is assumed that there will be a need for entry-level workers (NVQ level 1) but also a need for workers to be upskilled to NVQ level 2. The results are outlined in table 2.9. Over the period 2002-2007, it is estimated that an additional 1,215 people qualified to NVQ Level 1 will be needed, and 1,093 people qualified to NVQ Level 2.

Table 2.9: Needs analysis of the upstream Gas industry

	2002-2007 Cumulative N/SVQ level 1 required	2002-2007 Cumulative N/SVQ level 2 required
East Anglia	24	24
East Midlands	61	61
North London	89	89
North	135	135
North West	242	186
Scotland	113	93
South East	177	177
South	135	53
The West	22	22
Wales	39	39
West Midlands	189	189
Yorkshire	25	25
Total	**1,251**	**1,093**

Source: GWINTO

Downstream

The downstream part of the gas industry, covering registered gas installers, is also part of the GWINTO demand model. Assumptions have been made regarding productivity levels, the proportion of time spent on gas-specific work, sickness and travel time. Bearing these assumptions in mind, the number of Full-Time Equivalents (FTEs) required
in the industry has been calculated using the following methodology:

1. No. of appliances sold **X** installation time
→ Total job hours

2. Total job hours
→ Hours per day **X** days per year

→ FTEs required

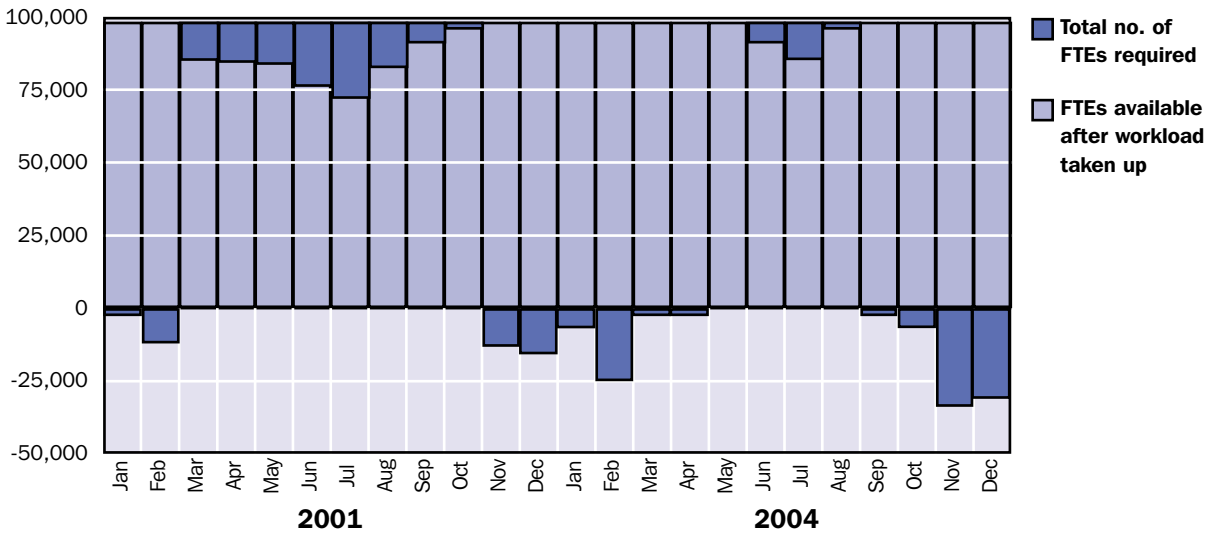
26 The ramp up period is the time allowed to meet the labour and equipment needs of the 30 year programme.

Figure 2.9 illustrates the results of the model that have been calculated on the basis of relatively conservative assumptions i.e. they are more likely to understate rather than overstate the problem. The positive grey bars reflect a surplus of gas operatives whilst the negative grey bars show where there is a shortage. The results clearly show the seasonal nature of the industry, as there are obvious months of surplus and shortage.

In 2001, the industry suffered shortages in the winter months (November to February). On average, this translates to a demand for an additional 10,670 workers in a month.

In 2004, assuming that the government's anti-fuel-poverty scheme requires a further 200,000 appliances per year, shortages of gas installers will become more severe. In the winter months (November to February), the shortage will average at least 24,600 workers a month.

Figure 2.9: Demand for CORGI Registered Operatives



Source: GWINTO

2.5.2 Water

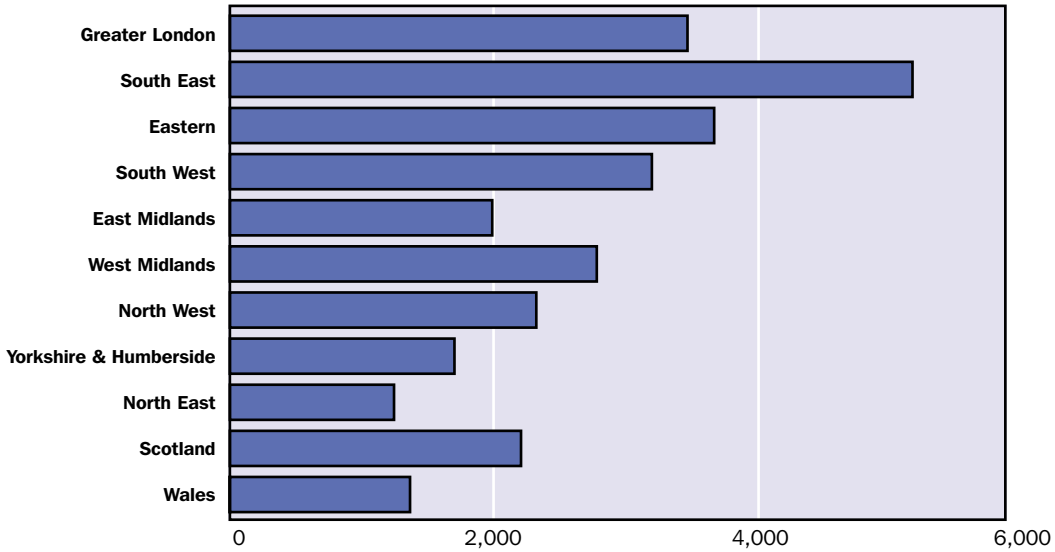
Data available for the water industry shows the net requirement for workers over the period 1999-2010 to be:

- 4,400 administrative occupations;
- 1,500 skilled metal and electrical trades;
- 1,300 elementary trade, plant and storage related occupations;
- 1,200 science and technology professionals;
- 950 secretarial and related occupations;
- 900 business and public service associate professionals.

There are likely to be additional employment demands created by the EU drinking water quality directive. This will exacerbate the shortage of labour to carry out the metallic mains replacement programme in the gas industry.

The CITB has also calculated the number of additional workers required in the heating and plumbing sector[27]. As illustrated in figure 2.10, across the UK the industry will need to recruit 28,900 individuals by 2005. The highest proportion of these will need to be in the South East (18 per cent) and the Eastern region will also need to employ a significant number of new recruits.

Figure 2.10: Additional Requirement of Employees in the Plumbing and Heating Sector (1999-2005)



Source: CITB Employment & Training Forecast

2.5.3 Electricity

Forecast evidence for the electricity industry shows the net requirement for workers over the period 1999-2010 to be:

- 7,300 administrative occupations;
- 6,800 skilled metal and electrical trades;
- 2,800 science and technology professionals;
- 2,000 sales occupations;
- 2,000 elementary trade, plant and storage related occupations;
- 1,500 business and public service associate professionals.

Results from the ETA Employment and Skills Survey Report 2001 suggest that the current level of recruitment in the industry will fall short of future demands. ETA concludes that between 2001 and 2011 the workforce will decline by an estimated 25 per cent, given the age profile of the workforce and current rates of recruitment.

For example, for science and technical professionals, the industry is currently recruiting around 150 per year. Assuming the same rate of recruitment year on year, this would result in 1,500 new science and technical professionals over the next decade, fewer than the 2,800 forecasts suggest will be needed. The discrepancies (also apparent in other occupations), coupled with industry attitudes to recruiting, point to an urgent need for the electricity sector to begin thinking more long-term about its labour force, skills needs and recruitment practices.

27 Source: BPEC Workforce Development Plan.

2.6 Skills Needs

In addition to the demand to replace people leaving the industries, there is a demand for increased skills levels from people currently active in the industry. In the sections that follow, we outline trends in skills needs.

2.6.1 Multiskilling and upskilling

Across the gas, water and electricity industries, the two key words in relation to skills are **multiskilling** and **upskilling**. Restructuring and cost rationalisation have resulted in fewer people managing larger workloads and as a consequence job boundaries have widened and work roles - across all occupations - now involve greater autonomy and responsibility.

Each individual working in the Utilities now needs to be able to draw on a wider armoury of skills.

When employers in the Utilities talk about their desire for employees to be multiskilled they mean two things:

- the need for individuals to have technical skills yet also be able to offer soft skills;
- and the need for individuals to be multi-disciplined, that is, to be able to work across different specialist areas.

In order to survive, Utilities businesses have become far more customer and business focused and this has driven a demand for soft skills - communication, interpersonal, people management skills - amongst workers who were previously valued for their technical and engineering skills. This is a significant cultural shift to which workers have had to adapt, and a new requirement for recruitment into the industries.

Multidisciplinary working - registered gas engineers who are also skilled plumbers, or qualified electricians able to work across mechanical, electrical and instrumentation functions - is also what Utilities businesses mean when they talk of multiskilled. There are now fewer employees, and hiring one person who can operate across several disciplines is more cost effective than hiring several individuals to work one discipline each. For sole traders/small businesses working in the gas installation, plumbing and electrotechnical businesses, being able to carry out multiple functions gives a competitive edge.

Upskilling is about developing new skills, but also about enhancing the level of skills already present in the workforce to support business strategy. In the upstream water industry, meeting European Union directives for water quality has necessitated significant investment in waste management. Once a physical, mechanical process, it is now a complex chemical and biological process requiring strict monitoring of technical data. This in turn has transformed and upgraded the skills required of those working in what used to be a ‘sludge management process’.

2.6.2 Skills Trends

The most important anticipated skills need within the Utilities industry is information technology skills. These include basic computer literacy skills and advanced IT and software skills. Other cited needs include other technical and practical skills, communication skills and team working skills.

Table 2.11: Anticipated future skills needs over the next 2/3 years

	Unweighted Count
Advanced IT/software skills	28
Basic computer literacy skills	20
Other technical and practical skills	10
Communication skills	9
Customer handling skills	7
Team working skills	6
Management skills	4
Industry specific skills	3
Problem solving skills	2
Adaptability and flexibility skills	2
Numeracy skills	1
Sales and marketing skills	1
Don't know/not sure	5
Base	57

Source: ESS 2001/IER

IT skills

With the onset of privatisation in the utilities, considerable investments were made in IT and in the computerisation and instrumentation of many processes. Processes that were largely mechanical have become electronic, requiring different skills sets. For example, control and instrumentation engineering skills sets are now in demand in the electricity industry, rather than mechanical engineering skills.

Encouragingly, the ETA Employment and Skills Survey Report 2001 suggested that young people have a good standard of IT skills. 8 of the 12 companies responding thought that young people show significant strengths in IT and computing. The raising of IT skills is largely an issue for more long-standing employees in the industries, rather than new recruits.

Numeracy and literacy

While literacy was not asked about directly in the ESS and few employers appear concerned about numeracy, according to ESS results, the electricity industry in particular has highlighted these skills needs. Young people entering the electricity industry lack numeracy, a basic building block for training in the sector. In addition to maths, the industry needs more young people with an understanding of physics. Given the association between numerical ability and logical thinking, there may be knock-on impacts for diagnostic and problem solving skills.

Diagnostic and problem solving

New technology has transformed systems from mechanical to electronic and dealing with breakdowns is now dependent on an individual or team having a comprehensive understanding of a system rather than its parts. Diagnostic skills are particularly important for the maintenance and repair side of the Utilities industries.

Business awareness

Business awareness is a growing need for people working in the Utilities. Whilst traditionally the preserve of managers, the intense cost cutting and competitive environment means that throughout the industry, individuals need to understand the potential impact of their actions and behaviours on the wider business. Skilled craft workers, for example, need to work with an understanding that their choice of materials, project management and time allocation have cost implications.

The customer is king and, in the new competitive energy and water industries, is free to go elsewhere if the service is unsatisfactory. Consequently, all employees now need to have a strong customer service orientation in their working activities. Customer service is not the preserve of call centre staff. The gas installer, electrotechnical engineer and plumber represents the face of his/her company when they carry out work for a domestic or business customer.

In many instances there may be an inherent tension in the objectives of providing the best possible customer service and simultaneously promoting business objectives - the provision for advice on energy saving is one area where individuals will need to manage the tension between the demands of profit and the need to promote customer satisfaction.

Interpersonal skills: team working and communication

Teams are geared around the task in hand and may be comprised of contractors, specialists and employees from the business concerned. The growth of third party contracting is a major driver of teamwork, but also within organisations, the fluid creation and dissolution of teams is becoming a common pattern of work.

The pace of change in today's economic climate is rapid and often dramatic. The Utilities have experienced prolific partnership, merger and acquisition activity, which has created a working climate that is uncertain and where organisational culture can transform overnight. Furthermore, some 'UK' Utilities are now foreign owned while others are making forays into the international market, which creates its own adaptive challenges.

All this means is that managers and individuals need to become experts at change management. For contractors and other businesses in the Utilities supply chain, managers and employees need to be adept in operating within cycles of business activity where workloads may be significant at some periods of the year and low at others. Work cycles are linked to the seasons, the demands of the regulator and broader economic cycles affecting energy consumption and construction.

Greater awareness of environmental issues will be required from all employees, to match consumer sensibilities and regulatory demands.

Multiskilling of technical/craft workers is becoming more important with pressure to work across traditional craft boundaries. There are clear advantages and disadvantages to this. Individuals who are able to work across specialisms - for example, an electrical engineer who also has mechanical, and control and instrumentation skills - are more versatile and cost effective on a project team than those who have just one area of skills. It means hiring one person rather than three.

However, our consultation process has raised scepticism in some quarters about the extent to which multiskilling will really occur, given the current framework of health and safety legislation and training programmes. Therefore, while multi-skilled individuals will be highly prized in the labour market, in the immediate and medium term, it is likely that multiskilling will be in the form of project teams, where it is the team that is able to offer 'multi-skills'. The emphasis will therefore be upon building and coordinating teams comprised of individuals with specialised craft skills. This is driving the demand for project management skills.

Management skills needs

Project & contract management: Project management skills are of growing importance across all industries. As part of the drive towards efficiency and cost competitiveness, project management has been identified as a necessary competence for effective delivery. Failure to deliver according to time and budget schedules may incur significant penalties for contractor companies. Transco, for example, has to meet its statutory obligations set by the regulator in terms of the extent and speed of the metallic mains replacement programme. Project management is fast becoming a highly sought after and specialised skill, and given the trend towards outsourcing, will continue to be a key skills need in the future.

General management: General management skills are prerequisites but since downsizing, there are fewer managers and they are required to operate across functional boundaries. Managers are now expected to have business and financial, sales and marketing, and contract management skills, to be effective in the new business climate. Furthermore management styles are now changing and there is a need for softer skills: communication, negotiation, people management, coaching and mentoring.

Asset management & supply chain management: many Utility companies have split the assets and service functions of their businesses and there is accordingly a growing need for asset management skills. The separation of different components of the business also requires supply chain management skills to bridge integral but separate business parts together. Asset management and supply chain management skills are highly sought after and the Utilities have to compete in a sector-wide labour market for the skills they need.

First line supervisory/management: these skills have been highlighted across the Utilities as an area requiring attention. With a flattening and shrinking of the management structures post privatisation, many technical/craft skilled workers moved to take up junior management roles without the requisite managerial skills. These people need upskilling to develop leadership, project and team management skills.

3. Supply of skills

Key messages

- Difficulty attracting young people into the industry to replace aging workforce.
- Recruitment difficulties across a range of engineering, craft and technical skills.
- Image, lack of company name recognition, lack of security, and lack of career paths are key disincentives to entry. There is also intensive competition for qualified engineering graduates from outside the Utilities.
- Craft skills are not sufficiently valued nor are craft occupations seen as attractive career options.
- Alternative labour pools are being targeted by the gas and water industries through New Deal schemes - unemployed, lone parents, women and ethnic minorities - to widen the pool of potential labour.
- Regulations mean health and safety are key issues for training across all occupations.
- Employer desire, predominantly in the water and gas industry, for a Utilities qualification with core modules applicable to all and separate modules to meet the unique training (particularly health and safety) needs of the gas, water and electricity industries.
- This would promote free movement of labour across the Utilities and across the regions and also provide a broader range of careers for entrants (thereby encouraging supply).
- Water industry S/NVQs require updating to reflect the recent changes and new skills demands of the sector.
- There are concerns that the training infrastructure is not capable of meeting the demands of the industries for skilled personnel.

3.1 Supply Overview

In the following sections, we will examine the supply of skills in the Utilities and the factors that underpin that supply, by looking at historical trends and future projections of qualifications and training, taken from both official data and survey evidence from the ESS and NTO surveys. We also look at the culture of training within the Utilities.

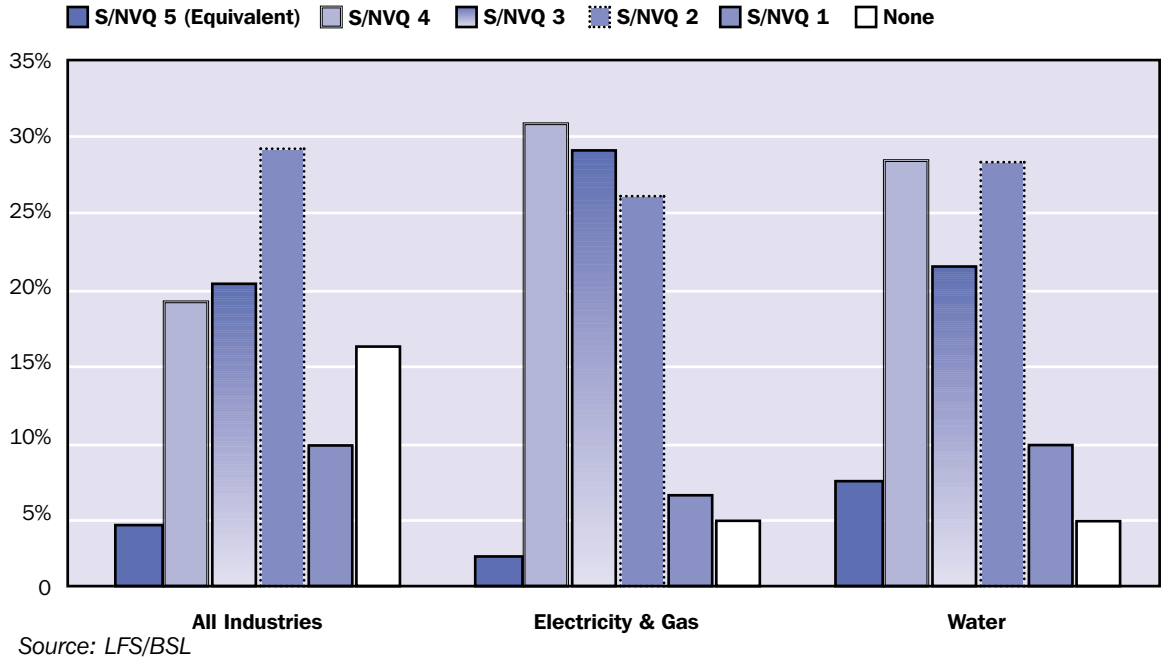
3.2 Qualifications

Across the Utilities, there is a wide range of relevant qualifications available (see annex 2 for further details). Indeed, the breadth of coverage suggests some room for rationalisation across the Utilities qualification framework. In this section, we focus on the S/NVQs that are most important to the sectors and also discuss graduate level qualifications.

Based on Labour Force Survey data, the average level of qualifications held by the Utilities workforce is shown in figure 3.1.

- 62 per cent of employees in electricity and gas are qualified to S/NVQ level 3 or above and equivalent and 57 per cent in the water industry.
- This compares favourably with the average across all industries, where just 44 per cent of employees are qualified to this level.
- To further put this in context, the CBI asserts that to work effectively in the current economic environment, all workers should be qualified to a minimum of S/NVQ level 3 and equivalent.

Figure 3.1: Qualifications within Electricity, Gas & Water, Spring 2001



Source: LFS/BSL

The *Training in Britain Conference* held in November 2001 raised some pertinent points regarding S/NVQ qualifications, which are particularly relevant to the Utilities industries. Firstly, many employers, particularly since the privatisation and streamlining of the Utilities industries, do not offer a broad enough range of activities to meet the demands of the S/NVQ. This results in individuals leaving their jobs without meeting the obligations of the qualification, despite attaining the requisite standard in many areas. A modular system of S/NVQs would be a solution to this, whereby individuals can, if necessary, meet the standards of an S/NVQ by drawing on a series of job roles to build up their portfolio of experience.

Gas

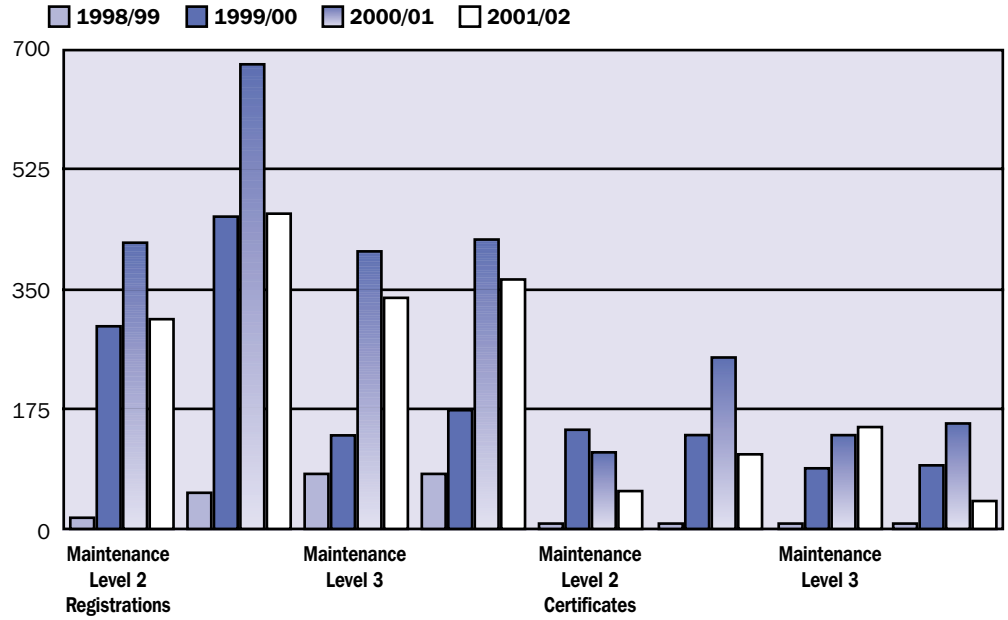
To meet the needs for a contractor qualification, British Gas and CITB introduced the Gas Distribution S/NVQ in the 1970s. It has remained largely unchanged since that time, but in 2002 it will be replaced by the Gas Network Operative (GNO) qualification, a Gas Network Engineering (GNE) qualification (developed by Transco) and a Public Utilities Distribution (PUD) qualification for the water industry.

This new set of qualifications has been developed to meet the needs of the Health and Safety Executive and OFGEM in their mains laying programme, which requires a skilled contractor labour force. Transco are also keen to introduce the qualification before work by their contractors begins.

NVQ data for the period 1998 to 2002 is illustrated in figure 3.2. Although no detailed conclusions can be drawn as we have information for only four years, some points worth noting include:

- level 2 NVQs have a slightly higher take-up than level 3 awards;
- the number of Gas Maintenance NVQ level 2 certificates awarded in 1999/00 was 147 - this fell to 113 certificates in 2001/02;
- 253 Gas Installation NVQ level 2 certificates were awarded in 2000/01, falling to 110 in the following year;
- the number of certificates awarded, as a percentage of the number of registrations to each NVQ, is relatively low.

Figure 3.2: NVQ Registrations and Certificates



Source: City and Guilds

Only those gas installers registered with CORGI are legally able to carry out installation and maintenance work. To become registered, an individual must first gain a certificate of competence and then demonstrate that their business is able to undertake safe and competent gas work. However, the industry still faces a problem of non-registered installers. Recent CORGI figures show that there is an 81 per cent higher risk of a serious gas safety defect being found on work where a non-registered installer is used.

In 1998, a new certificate of competence for gas installers was introduced to replace the number of different schemes present at that time. The Nationally Accredited Certification Scheme for Individual Gas Fitting Operatives (ACS) means that all operatives are now assessed by a national standard[28].

The certificate is valid for five years after which the gas installer is required to retake the assessment. According to CORGI, 18,200 candidates completed the ACS qualification in 2001, which makes a total, to date, of 32,900[29]. CORGI is currently in the process of introducing an ACS certification for field staff.

28 The pass mark is stringent - 100 per cent - and according to CORGI the pass rate is in excess of 96 per cent. However, individuals are allowed numerous attempts.
29 Source: CORGI Annual Report and Accounts 2001.

Previously, the S/NVQ system and the ACS certification were not in alignment. This meant that individuals were not qualified to practise without the ACS, despite gaining S/NVQs, and they could not officially work. This misnomer is now being rectified and it is hoped that this will encourage individuals to take, and companies to support, the S/NVQ.

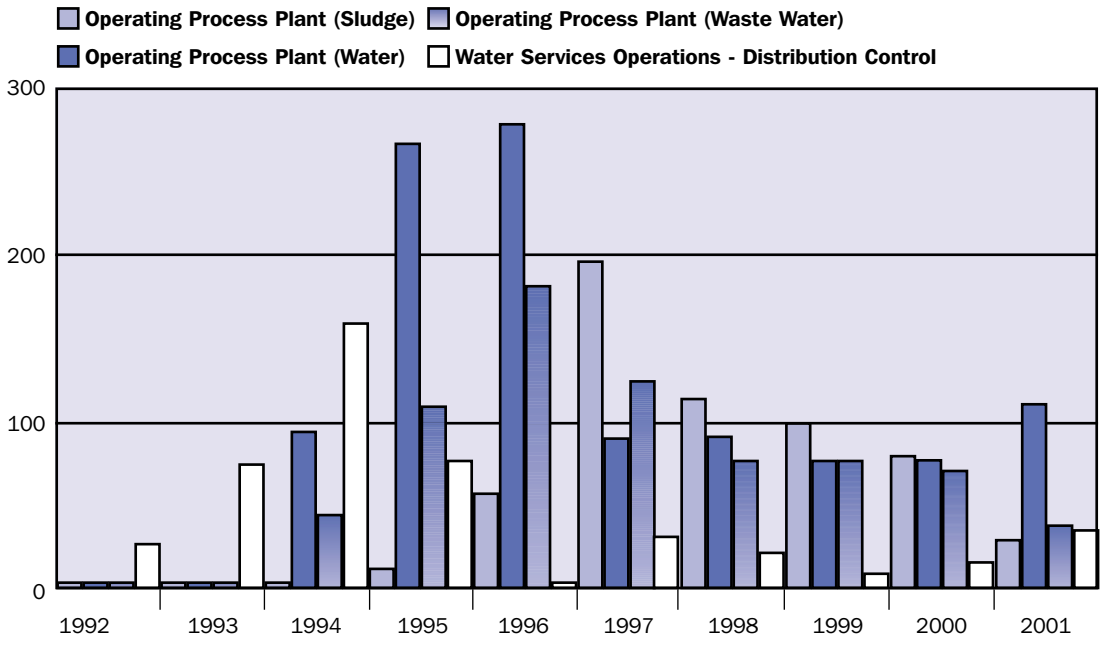
Water

CABWI is the awarding body for national vocational qualifications in the water, waste and Utilities industry. Formally, the water industry only contracts work to companies employing those with the requisite level of skills. People working in the water industry are required to be skilled to S/NVQ level 2 in water operations, but in practise, many are not. This is caused partly by the shortage of skilled contracting labour to meet workloads, which means that those without qualifications are employed to fill the gaps.

As the requisite level of education to work in the water industry is S/NVQ level 2, figure 3.3 illustrates the number of certificates awarded at this level for the most common NVQ titles.

- The peak for the number of NVQ level 2 certificates awarded was in the mid 1990s.
- In 1995, 264 certificates were awarded for Operating Process Plant (waste water) NVQ and a further 276 were awarded in 1996.
- Following this peak, there has been a notable downward trend in the number of NVQs awarded in the water industry.
- The decline in the number of NVQs may be due to external pressures leading to a cutback in training budgets, or the fact that the current suite of qualifications (developed 4-5 years ago) does not meet the modern demands of the industry.

Figure 3.3: Selected Level 2 NVQ Certificate Awards



Source: QCA

A more detailed analysis of the S/NVQ awards available in the water industry is included in annex 2. It is worth noting that there are a large number of S/NVQs available in the water industry, but a significant number of these have very small take-ups and therefore a low number of certificates awarded to individuals. It is important for stakeholders in the industry, such as GWINTO and the awarding bodies, to ensure that each qualification is relevant and there is no repetition between the S/NVQs. There appears to be room for consolidation of the S/NVQ system in the industry, provided health and safety demands can be met through the technical certification scheme.

Electricity

ETA is launching a Register of Electricity Sector Engineers (RESET) to provide a standard method of safety and quality accreditation and monitoring. This has been introduced as a reflection of the changing nature of the industry. Individuals can move relatively freely between employers and contractors are increasingly carrying out work in the sector. This is attracting individuals into the industry who are not necessarily skilled to the required level. RESET is a method to help control the level of quality and safety in the industry.

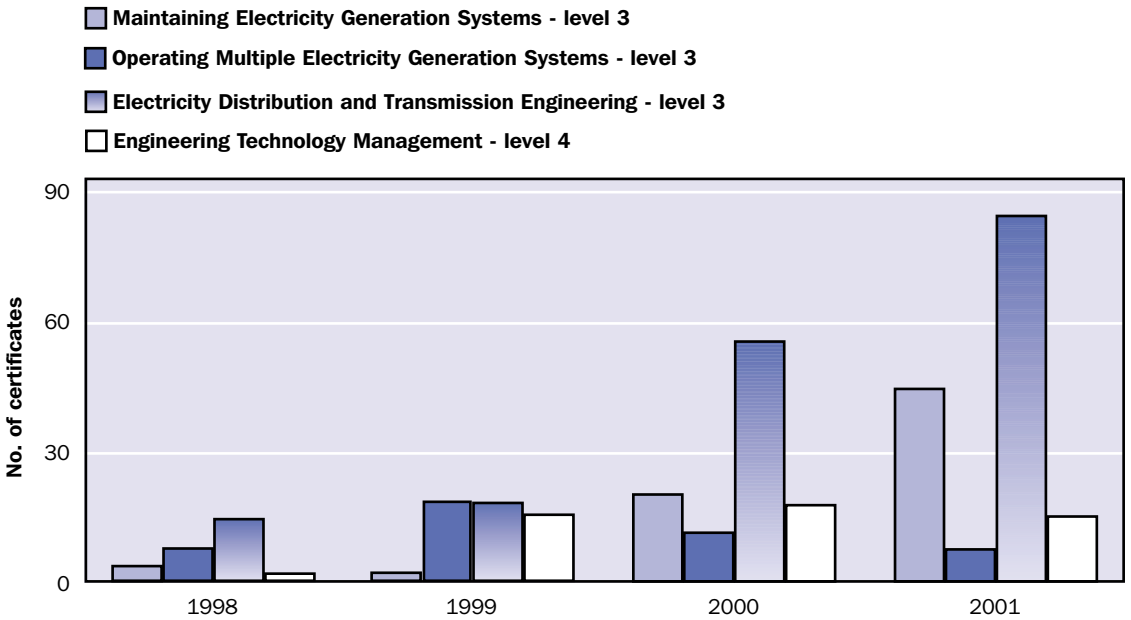
The S/NVQ titles available to individuals wishing to study within the electricity sector are detailed in annex 2. Of these titles, data from the Qualifications and Curriculum Authority[30] suggest that the level 3 and 4 certificates have the highest uptake. A selection of these titles is illustrated in figure 3.4.

Although there is just four years of data with which we can assess the Electricity NVQ awards, there does appear to be an upward trend in the number of NVQ certificates awarded.

- The recently developed NVQ level 4 qualification in Engineering Technology Management reflects the emphasis placed on first line supervisory/technical roles but only a few individuals have passed the qualification so far.
- The NVQ level 3 in Electricity Distribution and Transmission Engineering has experienced a rapid increase in the number of certificates awarded. In 1998, 15 certificates were awarded but in 2001 this had increased to 85.
- The NVQ level 3 in Maintaining Electricity Generating Systems has also experienced a surge in the number of certificates awarded, from four in 1998 to 45 in 2001.

30 Corresponding data for the Scottish equivalent SVQ is detailed in annex 2.

Figure 3.4: Selected level 3 & 4 NVQ Certificate Awards



Source: QCA

Electrotechnical

The Electrotechnical Certification Scheme (ECS Card) is the standard by which a qualified operative is recognised. The minimum registration requirement is a relevant Electrotechnical S/NVQ level 3 qualification (outlined in annex 2).

According to NET, in their 2001 Labour Market Investigation, 36 per cent of the workforce were educated to GCE A level or equivalent. A further 11 per cent had a degree or an equivalent qualification.

Table 3.1: Highest qualification amongst the Electrotechnical workforce

	% of the workforce
Degree or equivalent	11.4
Higher education	9.6
GCE A Level or equivalent	35.6
GCSE grades A-C or equivalent	17.1
Other qualifications	11.1
No qualification	13.5

Source: NET LMI, 2001

3.2.1 Supply of graduates

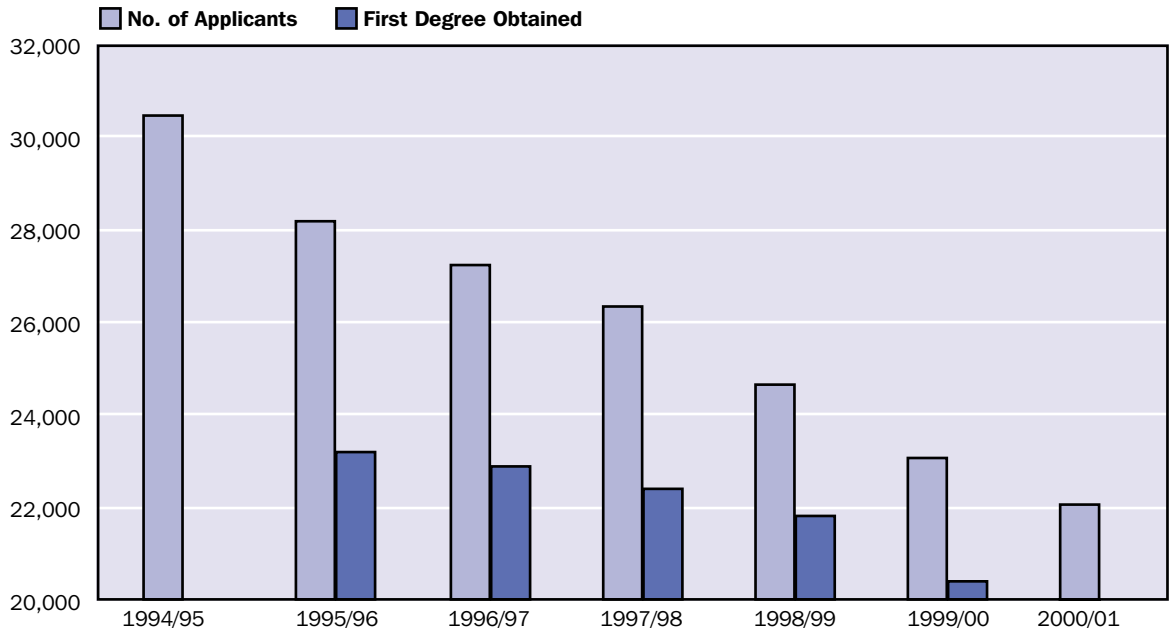
Graduates from all disciplines are taken on in gas, water and electricity to meet the needs of a broad range of professional and managerial occupations. However, engineering graduates are vital to the utilities.

The supply of engineering graduates is addressed in the Engineering Skills Dialogue, which reviews the labour market for engineers across all industries. Forecasts (based on official statistics) indicate that the Utilities sector employs 2 per cent of all UK engineers. Anecdotal evidence suggests around one-fifth of civil engineers are employed in the water industry.

Of particular concern to the Utilities is the significant fall in the number of applicants to study engineering and technology degrees at university. According to the Higher Education Statistical Agency, since 1995 the number of students qualifying with an electrical engineering degree has fallen by 18 per cent.

As figure 3.5 shows, the number of applicants for engineering and technical degrees has fallen from 30,600 in 1994 to 22,200 in 2000. This has filtered through to a fall in the absolute number of students obtaining degrees in engineering and technology, although the number of individuals obtaining a first degree as a proportion of the number of applicants is increasing.

Figure 3.5: Students on Engineering & Technical Courses



Note: Data on degree obtained not available for 1994/95 and 2000/01

Source: UCAS / Higher Education Statistical Agency

The proportion of UK and overseas students in engineering and technology subjects further exacerbates this problem. The IES Annual Graduate Review shows that 24 per cent of undergraduates and 52 per cent of postgraduates, in engineering and technology subjects, are from the EU and other overseas countries. The average for all subjects is 10 per cent of graduates and 38 per cent of postgraduates are non-EU. As stated by the IES,

"the importance of these high representations is that many non-EU nationals will not be able to work in the UK labour market."

The Institute of Civil Engineering is currently running a campaign to promote the profession. This will have knock-on benefits for the water industry but there is an urgent need for more to be done to promote engineering. This will need to be done at an early age, with industries like the Utilities offering student placements for young people, so they can get a sense of what working in the industries is like. Only by reaching children while still at school age will the overall level of applicants to engineering degrees increase. Equally, there is a need to encourage engineering graduates to enter employment in a subject-related role rather than to diversify.

Across the Utilities, whilst engineering graduates would previously have worked their way up to the top management positions, there are now signs that new recruits hold business rather than engineering qualifications. In the upstream gas industry, for instance, Chartered Gas Engineers used to hold the top management positions but this is changing with newer management recruits coming from business backgrounds. This reflects the way the industry has transformed, but also the fact that the membership of the Institute of Gas Engineers is largely made up of older people - more than 60 per cent of membership is over 50 years and less than 16 per cent are under 40. Succession planning is a major issue for the industry[31].

It is reasonable to assume that the supply of future senior managers is equally an issue in the water and electricity industries. Stakeholders in the water industry have flagged up process engineers as a major issue, as the old guard leaves, holding inside information about the working of the industry, without passing on their knowledge to a younger generation.

In the electricity sector, there is evidence of a fall-off in the number of graduates taking options that directly relate to the electricity industry. Since 1995, there has been an 18 per cent fall-off in the number of students qualifying with an electrical engineering degree, while fewer students appear to be selecting the relevant 'power' options as part of their studies. While the number of applicants for electrical engineering courses is up by 10 per cent over the same period, fewer students are being offered places (suggesting weaker quality applicants) and fewer are accepting places (suggesting the courses/industry is insufficiently attractive)[32].

Furthermore, if the Utilities industries are to secure a sufficient supply of business graduates, a considerable amount of work will need to be done to attract the best into these sectors, as they compete among higher paying and 'sexier' sectors for talent.

31 GINTO (February 2000) Labour Market Investigation and Skills Foresight Report for the Onshore Gas Industry.
32 ETA (Draft 2002) ESS Report 2001.

Examples of best practice

The Institute of Civil Engineers hosts a 'School Zone' on its website where children can find out about the civil engineering profession in a way that is fun, accessible and colourful - http://www.ice.org.uk/schoolzone

The Campaign to Promote Engineering - www.cpe.or.uk - does exactly what its name suggests through:

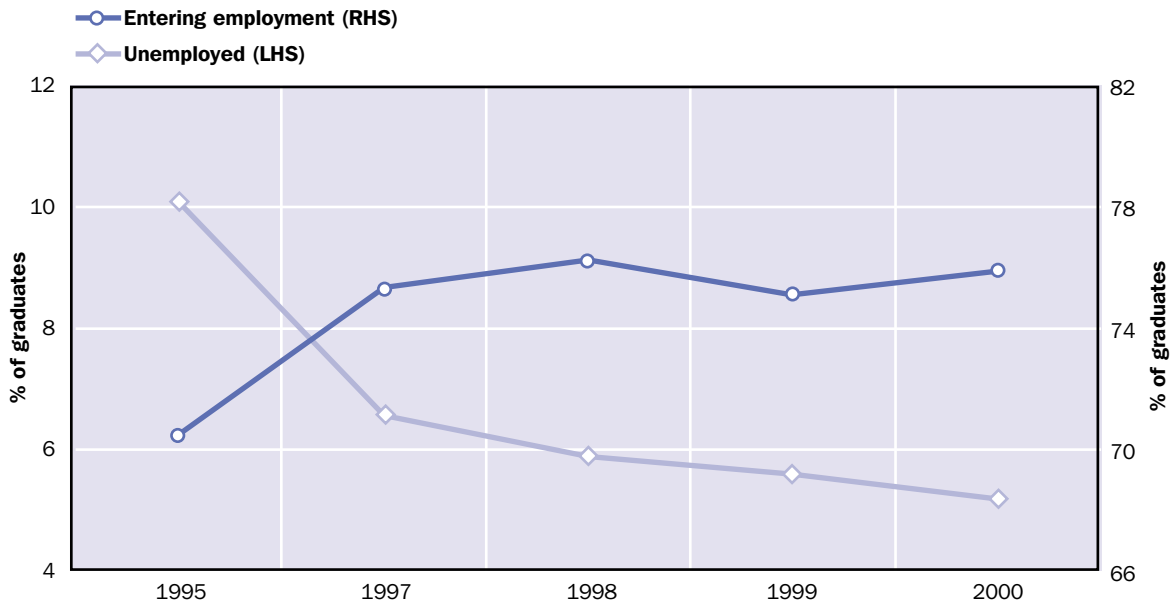
- graduate recruitment fairs and exhibitions;
- business-school partnerships at primary and secondary school level;
- engineering competitions;
- company open days;
- events for school teachers and careers advisers;
- raising awareness of skills shortages and promoting engineering to parents and young people through a national newspaper campaign, sponsored by employers.

The organisation has strong backing from engineering employers through secondments, sponsorship and hosting of events. Patrons from the Utilities industries are Innogy (formerly National Power Plc), Lattice Group Plc, London Electricity Plc, National Grid Company Plc and Yorkshire Electricity.

3.2.2 Utilities as a career

There is concern that the industry is not being promoted to young people and graduates as an attractive career proposition. It is important that young people appreciate the relatively good prospects they face after graduation. As figure 3.6 shows, the number of engineering and building graduates entering employment has been increasing significantly, whilst the number of students left unemployed after graduation has been falling.

Figure 3.6: What do Engineering & Building Management Graduates Do?



Source: Prospects Graduate Careers Service

More specifically, the industries within Utilities are facing their own particular problems. These are outlined below.

Gas

- Previously, a graduate could join British Gas and have a career path moving from one sector to another, whilst developing the skills needed in the process.
- British Gas offered the assurance of a well-known, well-established company offering a high degree of job security and career development opportunities.
- The fragmentation of the sector has led to an image problem, and the industry is not sending a coherent message to young people.

Water

- The increasing number of young people who are being encouraged to continue into higher education rather than entering a skilled trade is intensifying the shortfall in the number of plumbers.
- This problem is further exacerbated by the low wages that plumbing apprentices receive. The industry rate for apprentices starts at £3.55 an hour[33].
- However, the pay levels become an advantage once an individual is qualified. A trained plumber can earn £25,000 or more a year outside London and around £50,000 in London[34].

Electricity

- Lack of recognition of new brand names for the electricity companies is deterring young people from entering the industry.
- ETA is working to introduce a branded electricity apprenticeship that is offered under the same name by all electricity companies to raise the take-up of apprenticeships.
- Insufficient university students opt for the 'power' option in engineering courses, meaning few graduates with relevant training are available to the industry.

Electrotechnical

There are a number of career paths that individuals can take in the electrotechnical sector. These are outlined in table 3.2. As the routes into the industry are clearly defined, there should be sufficient knowledge for those influencing career choices to advise. It is important that such clear and concise information is available to potential recruits to the industry.

33 Hourly wages are below the adult minimum wage because workers are under 18.
34 No one to fix the taps, The Times, 12th February 2002.

Table 3.2: Career paths in the Electrotechnical sector

Start with	Goal 1	Goal 2	Goal 3	Goal 4
School leaver with no qualifications				
No qualifications	Labouring (only if over 18)	National traineeship NVQ level 2	Modern apprenticeship OR NVQ level 3	Electrician
School leaver with GCSEs				
GCSE e.g. Maths, English, DT, Science	Modern apprenticeship	NVQ level 3	Electrician	Further career development
School leaver with an advanced GNVQ or A levels				
A levels e.g. Physics (others are acceptable) OR	Modern apprenticeship OR HND OR	NVQ level 3	Electrician	Further career development
GNVQ Built Environment, Science, Business	Degree	Engineer traineeship	Project or Design Engineer	Further career development

Source: NET

However, as expressed in the NET Workforce Development Plan, there is some concern that routes into the industry are not attractive or apparent to young people, particularly for those with IT skills. In addition, electricians can move into the instrumentation discipline and then leave the electrotechnical sector relatively easily to work in the IT sector.

3.3 Company Training Provision

The Utilities, for very obvious reasons, are subject to extensive health and safety regimes. Training levels on the whole seem to be above the all-industries average, and the main area of training activity is geared to meeting health and safety requirements. At present, developmental training does not appear to be a major element of training activity, and certainly, the cost cutting nature of the business and the trend towards outsourcing is likely to work against investment in developmental training in future.

Much of the training in the gas industry used to be provided in-house by British Gas, and little use was therefore made of external training provision in the gas industry. In addition, problems with the quality of training provided by colleges has led to a decrease in the number of institutions offering specialist gas training.

In the electricity industry, companies have invested substantially to multiskill and upskill their managers and wider workforce, training in the softer skills in addition to technical and health and safety related areas. The challenge is not so much getting businesses to train, the problem is coping with the extent of the cultural change, and the loss of staff. It is an almost impossible task for the training infrastructure - in-house and wider - to keep up with transformations in the industry. In the gas industry, there are also concerns about the ability of the training and assessment infrastructure to keep pace if firms provide more training. Trainers and assessors are more mature industry members who went into training following downsizing. Who will train the trainers is a matter of concern for the sector.

As contractors carry out more work across the Utilities sector, the responsibility for training is also being transferred to them. However, contracting companies compete primarily on cost and are less likely to invest in training and development for their employees, beyond meeting legal requirements. This culture is slowly beginning to change. As a result of finding it difficult to recruit, Clancy Dokwa, a large contracting company, increased its investment in training in a bid to attract people. Contractors are also recognising the need to demonstrate competence in bidding for contracts, and a clear way of doing this is through qualifications achieved against national standards.

There is a significant problem of unskilled or semi-skilled workers pricing themselves below businesses that are investing in the skills of the workforce. These workers have few overheads and a lack of business experience, and they do not recognise the necessity for qualifications and standards.

3.3.1 Training provision

Drawing on the ESS, we can examine the extent of training provided by businesses in the Utilities. Training can take the form of on-the-job or off-the-job.

- Off-the-job training includes courses, evening and weekend study, e-learning and block study.
- On-the-job training includes mentoring, job shadowing and learning through doing.

The ESS only asks about on-the-job training and we remind readers that the sample size is low. Where possible, we supplement this with survey evidence available from the NTOs.

In terms of employers' attitudes to training, table 3.3 indicates that there is a relatively positive attitude to training. Fifty establishments fund or arrange off-the-job training for their employees.

Table 3.3: Whether funded or arranged off-the-job training for employees

	Unweighted	
No. of employees	**Yes**	**No**
	Count	**Count**
1 to 4	1	2
5 to 24	9	3
25 to 49	9	-
50-199	17	2
200+	14	-
Base	50	7

Source: ESS 2001/IER

The numbers are too small to be conclusive, but the results in table 3.3 suggest that micro and small firms (1 - 4 and 5 - 24 employees) are the least likely to support off-the-job training. This should be of particular concern to the industry, as 67 per cent of firms in the sector are small businesses employing between 1 and 24 people (see figure 1.4).

The relationship between size of firm and training is a well-established one[35]. Small firms face greater challenges freeing up the time and money for training and also require courses to be delivered in a more flexible and 'bite-sized' way. GWINTO aims to identify the role and needs of SMEs in the gas and water industry in future work, helping to target their needs more effectively.

3.3.2 Training coverage

Respondents to the ESS were also asked about the proportion of staff that received off-the-job training (see table 3.4). This provides us with an indication of the extent of off-the-job training coverage within an establishment (rather than simply whether they offer off-the-job training or not).

- Of the 57 business units surveyed, 23 reported that more than half their staff participated in off-the-job training. However, of some concern is the finding that 17 reported that no employees took part in off-the-job training.

Table 3.4: Proportion of employees participating in off-the-job training

	Unweighted
	Count
0-49%	17
50-100%	23
None or don't know	17
Base	57

Source: ESS 2001/IER

35 SFEDI (2002) Small Business Skills Assessment 2002. (Draft version)

3.3.3 Types of training

Evidence from the ESS, coupled with anecdotal evidence, suggests that levels of training in the Utilities industries are generally good. However, we suspect that on the whole the training is aimed at meeting urgent skills requirements and gaps, together with health and safety training to meet regulatory demands, rather than developmental training i.e. training associated with developing the abilities of the individual and linked to future business objectives and the changing culture of the organisation.

Evidence from the ESS supports these conclusions. Respondents were asked about the nature of off-the-job training that they supported. As table 3.5 shows:

- health and safety is the most common form of off-the-job training on offer, followed closely by job-specific training;
- training in new technologies, induction, management, soft and generic skills and supervisory skills are other areas where off-the-job training is offered by a number of establishments.

Table 3.5: Types of off-the-job training (funded or arranged)

	Unweighted
	Count
Health and safety	47
Job specific	46
Training in new technologies	39
Induction	36
Management	34
Soft and generic skills	33
Supervisory	28
Training in foreign languages	9
None of these	-
Don't know	-
Base	50

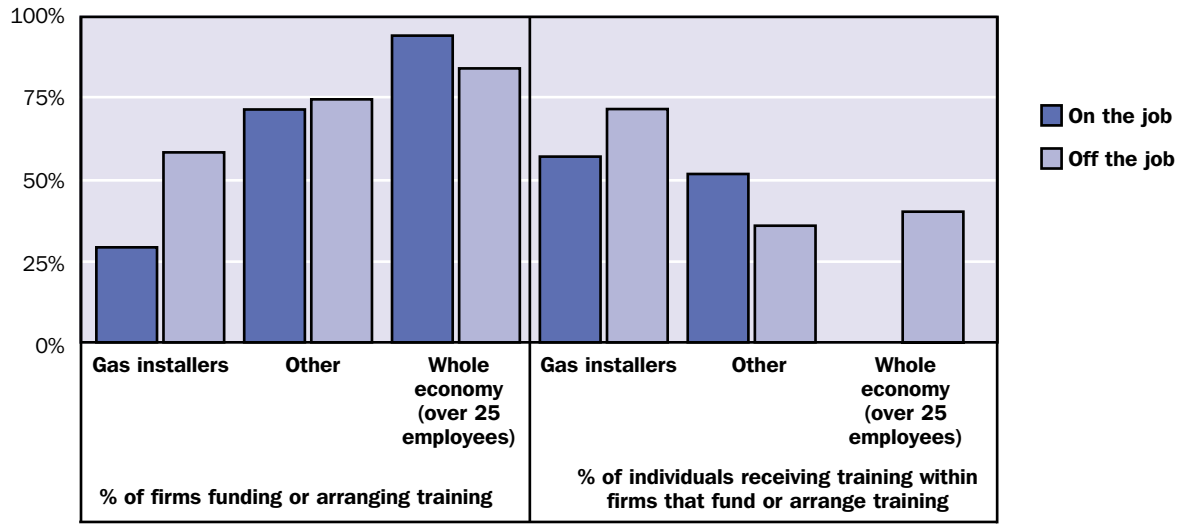
Source: ESS 2001/IER

3.3.4 Further evidence

Gas

According to the 1999 ESS for the gas industry, only 20 per cent of gas installers had a training plan compared to 57 per cent of the non-installers part of the industry. As figure 3.7 shows, 29 per cent of gas installers said they had arranged on-the-job training and 59 per cent off-the-job. This compares unfavourably to the non-installer part of the industry but reflects the fact that small businesses (the majority of gas installers are sole traders) have poor training records because of time and money constraints.

Figure 3.7: Training in the Gas Industry



Source: Employers Survey, BMG, 1999: IFF Research, 1998

Water

Evidence from BETWI's Skills Foresight, which focuses on the main water companies, showed that the majority had dedicated training staff with a range of training facilities and materials on offer. This is not a surprise given the industries strong reliance on in-house training provision. There is suggestion from more recent discussions with the industry that some are now realising that there are economies of scale to be made by using external training providers, particularly as the size of the in-house workforce has decreased.

Virtually all water companies had a formal planning process for training through the internal training function and line managers. However, there was also the view that training could be ad hoc and dependent on an individual requesting it or as the need arose, rather than being delivered in a comprehensive and strategic way.

Barriers to training included first and foremost the difficulty of releasing employees from their jobs. Budget constraints were also an issue. Some reported a lack of sufficient skills internally to deliver training, possibly suggesting a need for quality external provision.

Training priorities were overwhelmingly linked to regulations (supporting the findings of the ESS) and also IT related.

Electricity

Conclusions drawn from the ETA Employment and Skills Study 2001, in terms of training in the electricity industry, are:

- 48 per cent of the workforce is covered by Investors in People recognition
- the number of training days delivered is above the national average
- a high proportion of staff receive training
- a variety of training opportunities are offered by companies
- the majority of training, particularly technical training, is delivered in-house using internal training expertise
- companies did not report any significant difficulties in sourcing external expertise when necessary.

Electrotechnical

There is little evidence available as to the extent of training that takes place in the electrotechnical sector. Survey results available in NET's 1999 LMI report show that half the companies that responded in a postal survey had arranged for one or more staff to participate in training during the year[36].

3.3.5 Modern apprenticeships

Apprenticeships are the traditional route to a career as a technician/craftsperson. Unfortunately the format in which data is collected for Modern Apprenticeships means that we cannot determine failure rates for those embarking on the training programme or establish meaningful trends in take-up of courses. In the period 1999 to 2000, 936 individuals undertook the plumbing Foundation Modern Apprenticeship and 16 undertook the relevant water scheme.

Table 3.6: Foundation Modern Apprenticeship Starts, England & Wales

	1997-98	1998-99	1999-00	Estimated 2000-01
Plumbing		249	936	921
Heating & Ventilation		62	-	220
Water		4	16	1
Not stated	60	1,955	3,564	591

Source: DfES FMA Trainee Database

According to official data, 2,600 individuals began their Advanced Modern Apprenticeship in the period 1999 to 2000. This is a significantly lower number than the industry recruited in 1996 (8,700), but no conclusive trends can be drawn from this data.

Table 3.7: Advanced Modern Apprenticeship Starts, England & Wales

	1994 - 95	1995 - 96	1996 - 97	1997 - 98	1998 - 99	1999 - 00	Estimated 2000-01
Electrotechnical	144	2,008	2,455	2,881	3,518	3,492	3,307
Electricity Supply	1	66	77	90	156	102	58
Plumbing	24	486	1,020	1,083	1,186	50	1,107
Heating, Ventilation & Air Conditioning	2	8	402	428	689	715	528
Gas	-	19	12	52	172	212	289
Water	-	-	-	-	-	1	2
Not stated	903	6,699	8,682	6,711	3,573	2,637	5,070

Source: DfES AMA Trainee Database

36 We do not have information as to how many establishments were surveyed or any indication on data reliability. Nor do we have any information as to what constitutes training in the survey.

There is very little supply-side information on the success or otherwise of Modern Apprenticeships from the NTOs. The electrotechnical sector has a significant number of apprentices, suggesting that the Modern Apprenticeship scheme dovetails successfully with the traditional apprenticeship route to become an electrician. In the gas industry, evidence suggests that gas installer businesses are reluctant to train apprentices because without the ACS qualification they are not allowed to carry out installations and therefore are not in a position to contribute to overheads.

Certainly it seems that reasons for the poor take-up and failure levels across the Utilities requires greater research. However, anecdotal evidence points to a number of contributory factors:

- the poor calibre of applicants for the Modern Apprentice scheme;
- in the gas industry, employers consider apprentices a waste of money since they are training people whom they cannot fully use for two to three years.

In the case of the gas industry, apprentices may leave once they have obtained their ACS competency. The gas industry survey revealed that, for technical occupations, only 14 per cent of gas installer companies employed modern apprentices in 1999, and only 3 per cent employed national trainees[37].

The electricity industry used to have thousands of apprentices. Now, the number is estimated to be down to 58 in 2001, mainly because the industry is not seeking to recruit. The quality of training is generally very high and companies are supportive of the scheme, but they are finding it difficult to recruit young people to fill vacancies for Modern Apprenticeship programmes. Lack of brand awareness is a major deterrent, as well as perceptions of insecure employment in the industry. ETA is working to address this by branding the Modern Apprenticeship scheme in electricity so it is nationally recognised and advertised, whereas at present companies advertise the apprenticeships with their own company name.

The Modern Apprenticeship scheme was introduced into the electrotechnical sector in 1996. According to NET, 17,000 individuals have been registered onto the framework since its introduction, which makes the Electrotechnical Modern Apprenticeship one of the highest intakes nationally.

Changes in the government's education policy and attitudes in society mean that even fewer young people will leave school at sixteen. The industry will need to cater for more adult entrants rather than focus on apprentices and the funding regime needs to be made available for all ages rather than solely young people, to encourage a broader intake into the Utilities industries.

37 Source: GINTO Labour Market Investigation and Skills Foresight Report, February 2000.

4 Recruitment & skills challenges: the supply-demand mismatch

Key messages

- The majority of Utilities companies are experiencing skills shortages, with the most sought after skills being job-specific and technical.
- This is despite the fact that few Utilities are recruiting at present (employment is still in decline) - should they wish to expand, or face specific demand requirements (for example, through regulatory rulings) the situation will be dire.
- Specific demand requirements have occurred in the gas industry and there is an urgent shortage of gas installers and network construction operatives, which will also impact on the water and electricity industries.
- The prevalence of hard-to-fill vacancies indicates that there are problems recruiting adequately skilled people into the industries. With the exception of gas installers and network construction operatives, the industries are not recruiting large numbers, yet still vacancies cannot be filled.
- There are too few people wanting to enter the industry or that have the requisite skills needed to fill vacancies. This needs to be tackled at an early age to improve the uptake of maths and physics and raise numeracy in schools, and to increase the supply of graduate engineers.
- There are skills gaps in management and in the soft skills.
- The findings of the ESS indicate that training priorities are driven by health and safety regulations and do not appear to be addressing (with some honourable exceptions) the cultural shift that the Utilities have been through.
- Electricity companies have provided training to raise technical, soft and management skills but the training infrastructure cannot keep up with the extent of change. In the gas and water industries, there are also concerns that the assessment and training infrastructure is inadequate to cope with an upsurge in demand for training.
- Management skills may be improved by the industry trend of recruiting business graduates. But without training, these graduates will have an inadequate grasp of the technical realities of the Utilities.
- NTO research and industry voices suggest that employers invested in training to upskill and multiskill and multi-discipline skills as a means of achieving employment reductions and reducing costs. The industry needs to continue to invest in skills development to ensure ongoing competitiveness and to militate against the effects of skills shortages.
- The same skills shortages and gaps facing the large utilities are also facing contractors. There is growing awareness that the skills needs of the industries can most successfully be addressed by partnerships between the Utilities companies and their contractors.
- Contractor skills shortages and gaps need to be quantified in order that a strategy for tackling the issues can be implemented. Funding and the development of a partnership approach will be challenging but vital.

4.1 Introduction

In this chapter, we present the evidence relating to skills gaps and shortages in the gas, water and electricity industries, drawing on statistics for vacancies and recruitment difficulties. In addition, we use data on business's views of the proficiency of their workforce taken from NTO surveys and supplemented by qualitative information.

4.2 Skills Shortages

Skills shortages occur when the labour market fails to deliver the type of people and skills required by the industry. The existence of skills shortages is often revealed when employers are unable to fill vacancies with recruits that are suitable for the job. With this in mind, this section will discuss the evidence available on the level and duration of vacancies in the sector. In addition, the ESS asked employers their views on the extent of skills shortages.

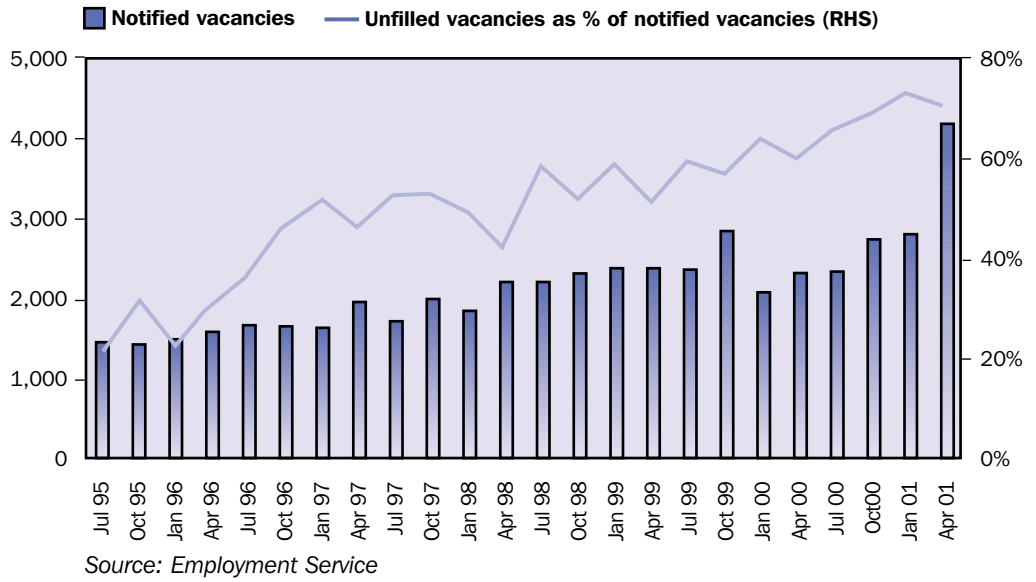
4.2.1 Vacancies

One indicator of the state of the industry's labour market is the number of vacancies that employers have at any one point in time.

A source of statistical information on vacancies is the Employment Service, which collates data from job centres. Figure 4.1 (left axis) illustrates the number of reported vacancies in electricity, gas and water supply. The trend is notably upwards, although the number of notified vacancies is concentrated in the electricity and gas sector, rather than in water.

Of particular interest is the number of vacancies reported as hard-to-fill, which is used as a proxy for skills shortages. The level of hard-to-fill vacancies can be inferred by calculating the proportion of notified vacancies that are left unfilled (see figure 4.1, right axis). The trend here is notably upwards, suggesting that vacancies are becoming increasingly hard to fill in the Utilities sector.

Figure 4.1: Hard to Fill Vacancies in Electricity, Gas & Water Supply



Source: Employment Service

However, using vacancies - more specifically hard-to-fill vacancies - as a proxy for skills shortages poses some problems. Vacancies can reflect cyclical trends in the labour market and are therefore not an exact measure of the demand-supply mismatch. In addition, an inability to obtain the right kind of people can be down to a number of reasons that are not necessarily indicative of a problem in the market place such as:

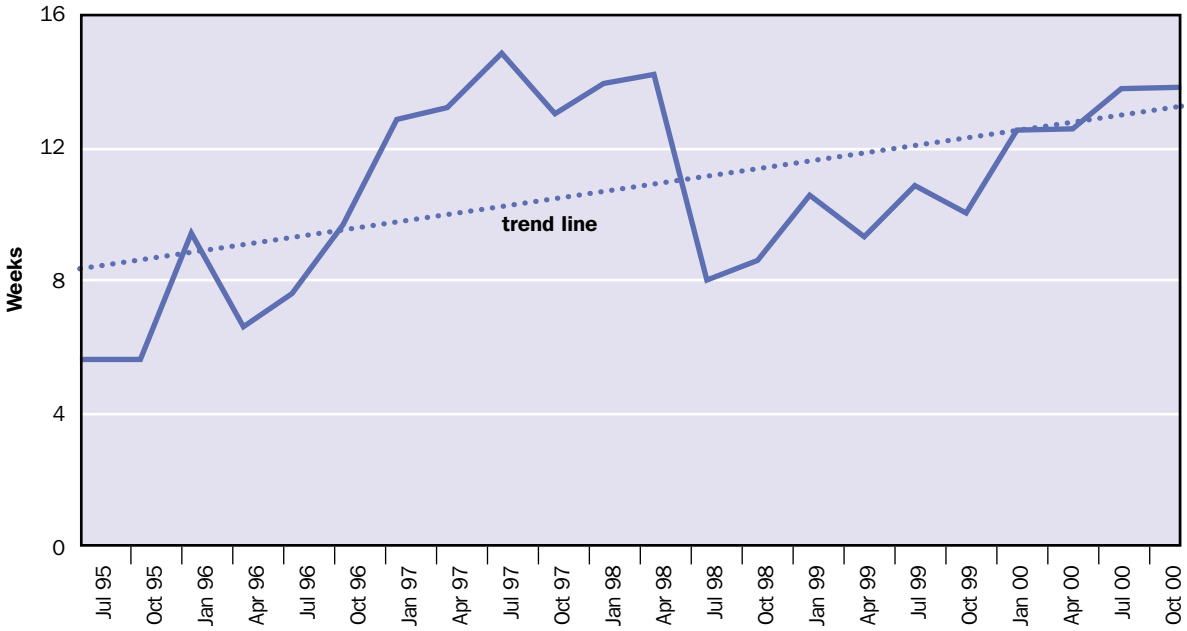
- geographical location;
- ineffective recruitment practices;
- cyclical factors;
- unwillingness to pay the going rate.

4.2.2 Duration of unfilled vacancies

Additional analysis of the duration of hard-to-fill vacancies indicates the extent of any skills shortages in the industry. A vacancy that is lengthy in duration indicates a more severe problem than vacancies that are filled in a relatively short period.

As figure 4.2 illustrates, the duration of vacancies left unfilled in the sector has been increasing quite significantly. Although seasonality should be taken into account in this analysis, an unfilled vacancy lasted nearly six weeks in July 1995. In October 2000, this had increased to nearly 14 weeks.

Figure 4.2: Mean Duration of Unfilled Vacancies in Electricity, Gas & Water Supply



Source: Employment Service

In summary, the overall trend in the duration of vacancies across the industries is steadily upwards, reflecting the difficulties the gas, water and electricity sectors face in attracting sufficiently skilled personnel.

4.2.3 Skills shortages - survey evidence

The ESS recorded vacancies, by occupation, in the Utilities sector. Of the 57 companies surveyed, 48 reported hard-to-fill vacancies. This is in line with the official data from the Employment Service, described above, although caution should be taken when drawing any conclusions using this data because of small sample numbers.

It is useful to understand the type of skills that employers are looking for that are contributing to such hard-to-fill vacancies. As table 4.1 shows, when asked what skills were lacking:

- 25 establishments stated that company or job-specific skills were lacking and a further 19 establishments cited other technical and practical skills, not including IT skills.

Table 4.1: Skills sought in relation to hard-to-fill vacancies

	Unweighted
	Count
Company or job specific skills	25
Other technical/practical skills	19
Experience	11
Team working skills	10
Problem solving skills	10
Numeracy skills	10
Literacy skills	10
Management skills	2
Advanced IT or software skills	1
Personal attributes	1
Driving	1
Don't know/not sure	2
Base	48

Source: ESS 2001/IER

4.2.4 Causes of skills shortages

In order for the Utilities to tackle skill shortages, it is important to understand the reasons why skills shortages exist. Table 4.2 outlines some of the possible reasons given by respondents in the ESS.

- The overwhelming cause of skills-related hard-to-fill vacancies is the low number of applicants with skills (46 out of 48 companies).
- Additionally, 18 establishments stated that applicants lacked qualifications.
- Other cited reasons were not enough people interested and applicants with a lack of work experience.

Table 4.2: Causes of skill related hard-to-fill vacancies

	Unweighted
	Count
Low number of applicants with skills	46
Lack of qualifications	18
Not enough people interested	3
Lack of work experience	2
Base	48

Source: ESS 2001/IER

Some tentative conclusions can be drawn from these results. The existence of hard-to-fill vacancies is not solely the result of a lack of applicants, but also of a lack of applicants with the required skills. This suggests that potential recruits to the industry are not being suitably equipped with the skills that employers are looking for.

4.2.5 Consequences of skills shortages

The existence of skills-related hard-to-fill vacancies has certain implications for the companies surveyed:

- 28 of the 48 establishments stating they had hard-to-fill vacancies believe that they will experience difficulties in meeting customer service objectives. This is a particular concern to the industry, as customer service is increasingly becoming the differentiator in the face of competition;
- 13 establishments think they will have difficulties in meeting required quality standards, introducing technological change and introducing new work practices. As firms are subject to strict compliance and health and safety standards, the existence of skills shortages will continue to cause problems.

Table 4.3: Implications of skills related hard-to-fill vacancies

	Unweighted
	Count
Difficulties meeting customer service objectives	28
Difficulties in meeting required quality standards	13
Difficulties in introducing technological change	13
Difficulties in introducing new work practices	13
Increased operating costs	11
Loss of business/orders	2
Delay in developing new products	1
Withdrawal of products/services	1
Don't know/not sure	7
Base	48

Source: ESS 2001/IER

4.2.6 response to skills shortages

The adverse impact of skills shortages on businesses is captured in table 4.4.

- The response within the industry to the existence of hard-to-fill vacancies is centred on increasing advertising and recruitment spending.
- Virtually all (47 out of 48) companies experiencing hard-to-fill vacancies have had to expand their recruitment channels.

Table 4.4: Response to skill related hard-to-fill vacancies

	Unweighted
	Count
Increased advertising/recruitment spending	48
Expanded recruitment channels	47
Redefined existing jobs	15
Increased/expanded trainee programmes	14
Increased training given to existing workforce	13
Increased salaries	11
Substituted labour for technology	9
Base	48

Source: ESS 2001/IER

However, these responses do not appear to be tackling the root of the problem. As table 4.2 shows, the main cause of skill related hard-to-fill vacancies are a lack of applicants with the required skills and a lack of qualifications. This suggests that the problems stem from the quality of education and the level of industry-specific training that an applicant has received.

Increasing advertising and recruitment spending provides a solution to recruitment problems in the short-term, but will not resolve the situation over the longer term. Inevitably, this will lead to poaching and competition within the industry for a small number of suitable candidates and will push up the going rate. The low number of employers that stated they have increased or expanded trainee programmes and training of the existing workforce is a cause for concern. That said, consultation showed that there were problems recruiting modern and graduate apprentices to the Utilities, so even if firms did respond by expanding trainee programmes, this may not solve difficulties merely highlight them.

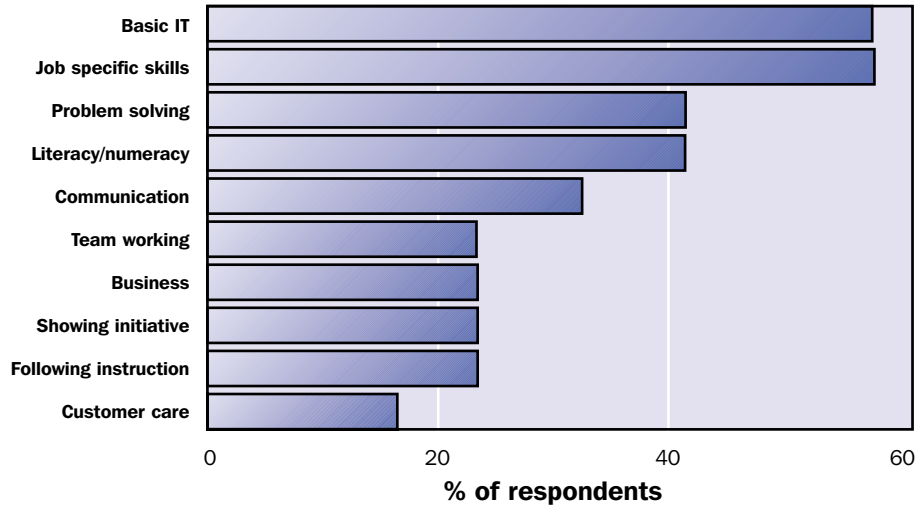
Part of the problem is that the newly privatised industries have typically relied on the ready-trained pool of labour created when the public utilities disbanded. These people are now reaching the end of their working life. Yet new training programmes have not been funded either through public or private money to replenish the stock of skilled labour.

4.2.7 Further evidence

Gas

The ESS for the gas industry asked its respondents where they considered skill shortages to exist in their business. 52 per cent cited that basic IT skills and job-specific skills were missing. A further 42 per cent of firms believed problem solving, literacy and numeracy skills were missing from potential recruits.

Figure 4.3: Top 10 Skill Shortages in the Gas Sector (excluding installers)



Source: Employers Survey, BMG, November 1999

For gas installers, severe shortages are predicted as a result of a fall in the number of registered installers. GWINTO calculates that the number of registered gas installers will fall from 98,300 in 1999 to 66,000 in 2004.

GWINTO has reacted to the conclusions drawn in the 1999 ESS with a number of initiatives aimed at rectifying the industry's skills shortages. Three of these are outlined below.

Edinburgh Adult Gas Learning Exercise (EAGLE)

In response to the findings of the 2000 Labour Market Investigation and Skills Foresight Report, GWINTO introduced a programme in North Edinburgh to expand the number of gas installers to meet shortages. The EAGLE programme enables 24 people who have been long-term unemployed to train on a 16 week Gas Distribution Course (SVQ level 1 equivalent) and then to start a guaranteed job with Kennedy Utility Management.

Energy Action Grant Agency (EAGA)

To tackle the government's fuel poverty programme, EAGA provides funding to recruit and train new entrants to the gas industry. This GWINTO-managed project is for people to begin a NVQ level 2 course. The course takes up to 32 weeks, which includes classroom-based technical and non-technical training, and six weeks on-the-job technical training. Recruits are then able to take up full-time employment with EAGA-registered gas installers.

Welfare to work

GWINTO has piloted a 28 week programme to enable individuals to train as specialist central heating installers. The programme aims to give both technical and life skills training, through training and mentoring. It is a modular programme that focuses solely on training people to become central heating installers (rather than gas installers, which takes three years of training).

Water

There are indications from British Water that a shortage of process managers is having a limiting effect on business growth. Process managers manage the logistics of the water supply chain. Shortages therefore impact on the ability of the business to manage overseas operations and to expand the business in other directions. Process expertise tends to be located in the hands of relatively few within the business and when these leave, water companies can be left with huge gaps in their skills base. Innovations in the supply chain across all industries mean that to attract people with process management skills, the water industry must compete with the rest of the economy.

Also in the water industry, the CITB estimates a shortfall of 29,000 plumbers over the period 2000 to 2005. During the 1990s, the number of recruits fell by two thirds. The challenge is summed up by Andy Watts, Chief Executive of the Institute of Plumbing:

"There is a crisis in the industry. Industry is not attractive to youngsters. They are encouraged to go to university whether they are academic or not, and computers and IT courses are far more glamourous to them than standing in a drain. The problem is image. It is infra dig to do things with your hands in this country, and vocational skills are no longer pushed in schools."

The extent of skills shortages in plumbing is described in the BPEC Workforce Development Plan, outlined in table 4.5. 73 per cent of respondents in the South East stated they were experiencing skills shortages and a further 63 per cent in the Eastern region.

Table 4.5: Skill shortages in plumbing by region

	Base	% citing skill shortages
South East	26	73
Eastern	35	63
West Midlands	45	60
Greater London	22	59
East Midlands	55	58
Yorkshire & Humberside	52	56
North West	56	55
Wales	30	53
North East	47	51
South West	35	49
Scottish Enterprise	88	42
Highlands & Islands	38	29

Source: BPEC Workforce Development Plan

Electricity

The ETA Employment and Skills Survey Report 2001 for the electricity sector found that shortages in technical skills are becoming more widespread.

"Many skilled craftsmen and engineers have left the industry over the last 10 years. At the same time, trained younger staff are not available to fill vacant posts and recruitment of such specialist skills is difficult. Many employers are also experiencing poaching, especially by the newer energy companies."

The occupations that are experiencing hard-to-fill vacancies in the electricity sector, according to the ETA ESS Report 2001, are:

- managers;
- skilled engineers/technicians/craftsmen;
- call centre staff;
- market analysts and traders;
- graduates - in particular power engineering graduates but also other scientific disciplines;
- craft apprenticeships.

More specifically, employers in the ETA survey were asked their opinion on the skills of young people entering the industry. Seven companies thought there were weaknesses in both oral and written communication and five companies thought there were weaknesses in team working ability and numeracy.

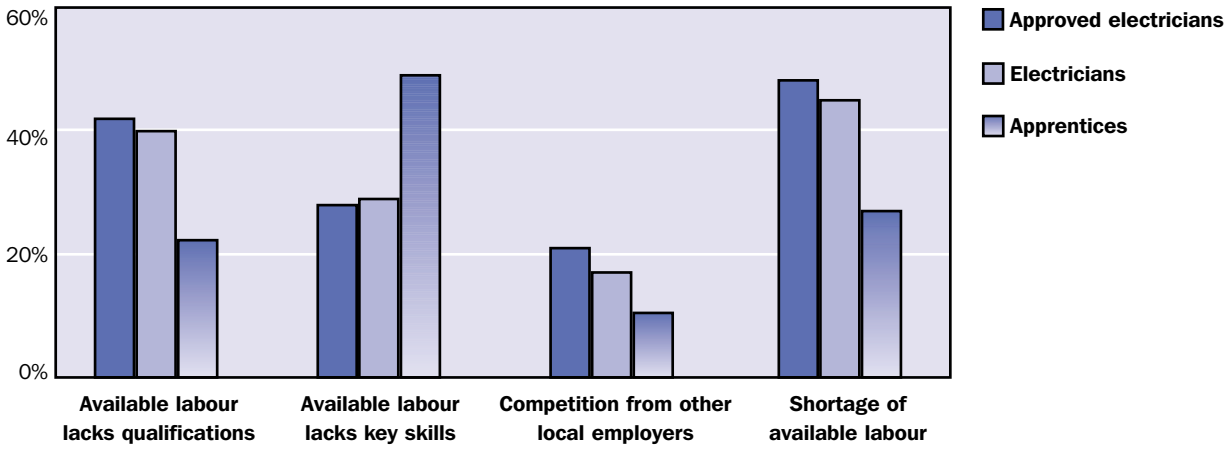
Employers in the electricity sector were asked why the industry was experiencing recruitment difficulties[38]. The replies included:

- a lack of adequately skilled and qualified applicants when recruiting skilled technical staff and graduate trainees;
- competition for skills from other employers e.g. for call centre staff;
- the poor image of engineering industries and the unattractiveness of craft roles;
- a general lack of awareness and knowledge amongst career advisers and some confusion owing to the extent of change in the industry;
- encouragement given to young people to stay on in education rather than opting for vocational, work-based training.

Electrotechnical

Within the electrotechnical sector, respondents of the 1998 NET Postal Survey suggested that recruitment difficulties were caused by a shortage of available labour, and a lack of key skills among the labour that was available. The results are illustrated in figure 4.4.

Figure 4.4 Reported Reasons for Recruitment Difficulties



Source: NET Postal Survey 1998

An example of an initiative that NET is undertaking to boost the number of electricians and combat the shortage of available labour in the industry is outlined below.

Co-operation in Construction

NET has established a network of centres in the North West to offer individuals the opportunity to gain an NVQ level 3 qualification. As discussed in section 3.2, the minimum requirement for gaining an ECS card to be a qualified electrician is a relevant NVQ 3.

38 Source: ETA Employment and Skills Survey Report 2001.

4.3 Skills Gaps

Defined by the Skills Task Force as the difference between a firm's current skills level and the level required to meet the firm's business objectives, a skills gap is an internal problem. Skills gaps are said to exist when employees do not have the requisite level and/or type of skill to meet what is required of them in their jobs.

A total of 12 companies in the ESS stated that they had skills gaps. The survey sample is small - guidance suggests that less than 30 responses to a question should not be cited. However, given little alternative data on skills gaps, we show the results here to stimulate debate. While the counts are not robust, the story told by the ESS numbers is backed by the industry (although the scale of the problem cannot be determined).

The dominant skills gap across the Utilities is for management skills. NTO information suggests that better quality management skills are required of managers and other workers, particularly supervisors. Seven establishments felt that their staff lacked management skills (see table 4.6), whilst four establishments felt that there was a lack of communication skills within their workforce.

Table 4.6: Skills lacking

	Unweighted
	Count
Management skills	7
Communication skills	4
Advanced IT or software skills	3
Experience	3
Other technical/practical skills	2
Team working skills	2
Foreign language skills	1
Problem solving skills	1
Numeracy skills	1
Personal attributes	1
Don't know/not sure	4
Base	12

Source: ESS 2001/IER

The above analysis covers all occupations, but evidence suggests that certain occupations are more likely to experience skills gaps than others. Of the 12 companies in the ESS that stated there were skills gaps within their company, eight said that these were in managerial roles, and a further four said there were skills gaps in clerical roles. This is illustrated in table 4.7.

Table 4.7: Substantial* skills gaps by occupation

	Unweighted
	Count
Managerial	8
Professional	2
Associate professionals	3
Clerical	4
Skilled and related	-
Personal and protective services	1
Sales	1
Plant and machine operatives	2
Other	-
Base	12
*over half or fewer staff fully proficient	

Source: ESS 2001/IER

4.3.1 Causes of skills gaps

It is very difficult to draw conclusions from the above analysis, as the sample size is very small. Table 4.8 shows the results from the ESS.

The primary reasons given for the skills gaps are:

- failure of the company to train and develop staff;
- recruitment problems;
- inability of workforce to keep up with change;
- lack of experience or still training.

Table 4.8: Reasons for lack of proficiency

	Unweighted
	Count
Failure to train and develop staff	3
Recruitment problems	3
Inability of workforce to keep up with change	3
Lack of experience/still training	3
High workload/no time	2
High staff turnover	1
Age/too young/too old	1
Don't know	1
Base	12

Source: ESS 2001/IER

Although skills gaps are an internal problem, they can be linked to shortages in the labour market. Insufficient and poor quality applicants are likely to result in some businesses hiring people who are inadequately skilled for the role, out of necessity. Without investing in their training and development within the company, skills gaps are inevitable. Yet, even with training, the pace of change in the industries is so fast that it is difficult for businesses and individuals to keep pace. Training is necessary just to keep standing still in the market.

Table 4.9 shows some of the barriers that establishments face in trying to train and maintain proficiency amongst their workforce. 26 of the 57 companies in the survey stated that there was a lack of time for training, whilst 19 companies believe they lack cover for training. These difficulties will be even more acute for small businesses.

There are some indications that the training infrastructure may not be in place to meet training needs. Just under one-fifth of establishments surveyed said that there were a lack of suitably targeted courses for staff and slightly fewer felt that suitable courses were not available in their locality.

The majority of establishments surveyed - two-thirds - felt that there were no barriers to maintaining proficiency. It suggests some naivety on the part of employers or that the crisis of aging skilled workers leaving the industry has yet to hit home. But is not just the responsibility of employers to maintain proficiency through training - staff need to be willing to undertake training. As we have already discussed, the Utilities have experienced a significant cultural shift in the way they do business and no doubt some employees have yet to recognise the realities of the new organisational environment.

Table 4.9: Barriers to maintaining a fully proficient workforce

	Unweighted
	Count
No barriers	38
Lack of time for training	26
Lack of cover for training	19
Lack of suitable courses relevant to this grade of staff	10
Unwillingness of staff to undertake training	10
Lack of suitable courses in area or locality	9
Lack of funding for training	8
High labour turnover	3
Recruitment difficulties	3
Low pay across their sector	1
Competition from other employees	1
Don't know	2
Base	57

Source: ESS 2001/IER

4.3.2 Implications of skills gaps

The number of companies stating that skills gaps exist in their workforce is small and therefore we should be cautious in inferring too much. However, some of the implications of skills gaps include:

- difficulties introducing technological change;
- difficulties introducing new working practices;
- difficulties meeting customer service objectives;
- difficulties meeting requisite standards;
- increased operating costs.

For three companies, skills gaps resulted in no particular problems.

Table 4.10: Implications of lack of proficiency

	Unweighted
	Count
Difficulties in introducing technological change	4
Difficulties meeting customer service objectives	3
Difficulties in meeting required quality standards	3
Increased operating costs	3
Difficulties in introducing new work practices	3
No particular problems	3
Loss of business/orders	2
Delay in developing new products	2
Withdrawal of products/services	1
Don't know/not sure	-
Base	12

Source: ESS 2001/IER

4.3.3 Response to skills gaps

Given the negative impact of skills gaps that we have just outlined, businesses are tackling gaps through a variety of different approaches shown in table 4.11.

Table 4.11: Response to skills gaps

	Unweighted
	Count
Provided further training	10
Expand trainee programmes	7
Changed working practices	6
Relocated work within the company	4
Increased recruitment	2
Expand recruitment channels	2
No particular action	1
Don't know	1
Base	12

Source: ESS 2001/IER

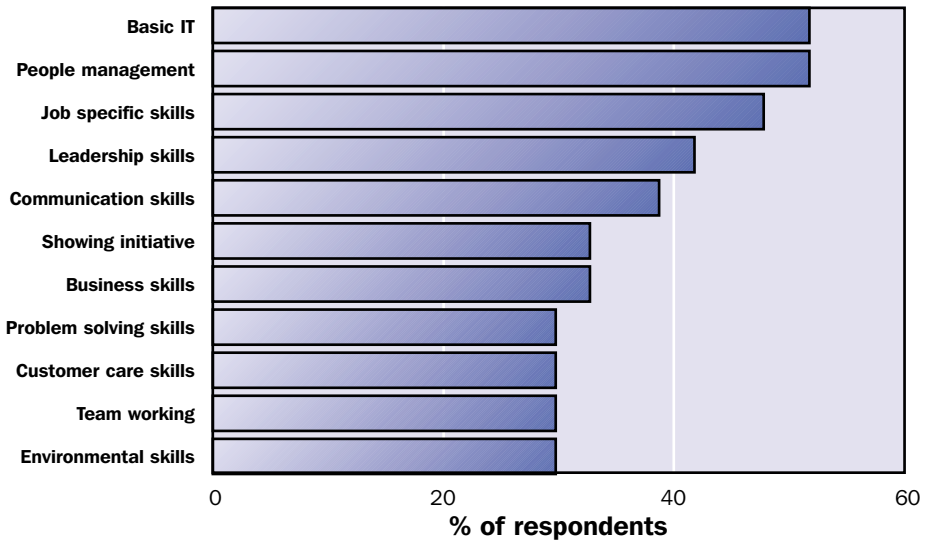
A positive sign is that the overwhelming response to skills gaps is to provide further training (10 out of 12 companies). This can largely be explained by the very stringent health and safety requirements of the industry and the role of the regulator in enforcing standards. Other reactions included changing working practices and expanding the trainee programmes.

4.3.4 Further evidence

Gas

Around a quarter of respondents to the Gas ESS believed skills gaps existed in their workforce (see figure 4.5). Of these, 52 per cent believed gaps existed in basic IT and project management skills. 48 per cent cited that their workforce has gaps in their job-specific skills.

Figure 4.5: Top 10 Skills Gaps in the Gas Sector (excluding installers)



Source: Employers Survey, BMG, November 1999

Electricity

Results from the 2001 Electricity Employment and Skills Study are small in number but they do cover the major companies within the sector (of which there are 22). Employers in the sector believe that their workforce has gaps in their specialist engineering skills (6 out of 11 respondents) and engineering/technology skills (5 respondents).

Table 4.12: Skills gaps in the Electricity industry

	Employers reporting gap (base=11)	Employers reporting significant impact on business (base=6)
Management and leadership skills	3	0
Technical skills		
Engineering support (below craft)	0	0
Skilled craft	4	3
Multi-skilled craft	3	3
Technician skills	4	3
Engineering/technology skills	5	3
Specialist engineering skills	6	3
Commercial skills	4	2
Admin/clerical	2	0
Key skills		
Computers and IT	3	1
Communication skills	3	0
Literacy and numeracy skills	1	0
Team working skills	3	0
Problem solving skills	0	0
Self-development	2	0
Languages	2	0

Source: ETA ESS 2001

5. Conclusion & recommendations

Conclusion

The picture of the Utilities emerging from the evidence of the forecasts, ESS and consultation, is of some industries coping with the current demand for skills but others failing to cope in the very near future. Substantial work needs to be done to build partnerships that will support the supply of adequately skilled people to meet skills needs in the medium to long term (and for the gas industry in the short term). The gas, water and electricity industries need engineers and business graduates; asset, supply chain and contract managers; skilled craft people; team leaders; and operatives skilled to a minimum of S/NVQ level 2. Skilled personnel will not develop overnight, yet there are vacancies now that companies cannot fill because of a lack of suitable applicants. Success and survival depends on growing talent to take over from the aging workforce that characterises the gas, water and electricity industries.

The age profiles of the Utilities suggest that over the next decade, the industries may lose around 25-50 per cent of their workforce. Even though the industries are not expected to expand over the next decade, there is a significant need for people to replace those leaving the industry and those who are retiring. Attempts are being made by the NTOs to improve the supply of young people (of which there are few) and to attract others into the pool - ethnic minority groups and women (currently under-represented), and the unemployed. However, the industries require a coordinated effort and the support of partner organisations for their labour to bear fruit.

Already there are hard-to-fill vacancies being reported by Utilities businesses, and evidence that the duration of vacancies is getting longer, both of which point to problems in the labour market. A shortage of graduate apprentices and modern apprentices has also been reported suggesting the skilled workers of the future will not be forthcoming. The industries face significant challenges attracting people to their business and without remedial action this situation will worsen. In the gas industry, the problem is very immediate - there is an acute shortage of gas installers and a shortfall of contracting operatives to meet the demands of the Project Aurora metallic mains replacement programme.

- In 2002, Transco needs to recruit 1,000 operatives who are qualified to NVQ level 2 in order to meet the regulatory requirements of the metallic mains replacement programme. It will take a minimum of six months to train and get operatives into the field, and we are already half-way through the year.
- Centrica is exporting qualified gas installers from Wales to install gas boilers in London. The cost of this supply-demand mismatch will be felt in the pocket of the consumer, as well as threaten the government objective for every home to have heating.

The gas, water and electricity industries have relied heavily on the store of skills left over from historic investments in training. As this pool of skills dries up, new skills and personnel are required. But the industries have been subject to enormous structural changes, and the responsibility for training has become blurred. Contractors are now a major component of the Utilities industries yet they have been reluctant to invest in training because of the insecurity of contract work and fear of poaching. Meanwhile, some large companies are guilty of contracting out skills shortages and gaps along with work. The culture is changing: because of health and safety considerations, the larger companies are beginning to appreciate the need for cooperation - with their contractor companies, partnership organisations and the regulator - to ensure skills levels are met and regulatory standards adhered to. Some large contractors are also realising that training can be a powerful recruitment tool.

Even if the combined efforts of employers and partner organisations can promote the industries successfully to new entrants, there are also doubts over whether the training infrastructure will be able to cope. Both quantity and quality of provision are in question. The history of in-house company training, which prevailed pre-liberalisation, means that there is an inadequate infrastructure in place to train via third party training providers. Many of the current trainers are older, and came through the nationalised companies, which invested comprehensively in training. It is not clear where the next generation of trainers will come from.

Cyclical patterns in the industries are exacerbating skills needs. Much can be done through more efficient management systems to balance cycles of work - for example, easing the shortage of gas installers during the Winter by encouraging customers to have routine maintenance carried out in the Summer. In the water industry, there are hopes that the regulator and water companies can work in close cooperation to smooth the five-yearly cycle of infrastructure investment.

Recommendations: for employers and partnership organisations

The following text summarises the broad sweep of the discussions from the Gas, Water and Electricity Skills Dialogue Workshop held on 24 April 2002. Present at the meeting were representatives of the industries including contractors, the NTOs, training providers, LSCs, S/QCA and DfES.

The Dialogue event proved very positive with acknowledgement of responsibility for training and skills issues by the partner organisations present. There is clearly a solid platform on which partnerships can build in the future to promote skills in the industries.

The gas, water and electricity industries have served the public and businesses well, delivering high quality services at competitive prices. Vital for the future is how to maintain this quality and competitive service delivery in a way that is sustainable. Addressing industry concerns about how to recruit, retain and train workers is central to the sustainability of the gas, water and electricity industries.

The consensus of the Dialogue process was that, at present, the system is only just delivering in some sectors, but there was significant evidence that this was not sustainable. Contracting companies are suffering unduly, insufficient recruitment is occurring to meet the labour demands of the medium and long term, and the framework of shared responsibility (and funding) for training is unclear and needs to be negotiated and clarified.

It was recognised that the gas, water and electricity industries have been through a significant period of cultural change. This process is set to continue. Merger and acquisition activities suggest there will be ongoing flux within the gas, water and electricity companies. Nevertheless, despite the significant change and cycles of uncertainty, the demand for gas, water and electricity services is relatively stable compared with many other industries. It has been challenging for those working within and managing businesses to adapt to the extent of the cultural shift that has occurred. As a whole, the industries are in the early stages of making the shift to flexible business models and a competitive climate.

Given the relatively recent period of change, those present at the Dialogue event recognised that the old style training arrangements are not working and need to be renegotiated. Training providers from the water industry suggested that there were shortages of trainers and also expressed concerns that the cyclical demand for training linked to contract awards made it difficult to invest in training the trainers.

Contracting out is a core characteristic of the modern liberalised gas, water and electricity industries. Outsourcing of work has resulted in an outsourcing of the responsibility for training. However, as representatives of the contracting companies made clear, margins are slim and the contracting business is so precarious that there is little spare cash for training. Costs continue to be pushed out from the large companies to their contractors but the operating margins of the contractors have not increased commensurately. There is certainly a strong need for realistic contract pricing, to ensure that margins are sufficient to allow investment in training and recruitment. Without this, contractors will leave the market and the large gas, water and electricity companies will have nobody to contract out to. Some contractors are beginning to raise prices to reflect the costs of recruitment.

It was agreed by representatives from the industries, public sector agencies, the regulator, and qualification and training bodies that the long term sustainability and health of the industries will be best achieved through partnerships. These will involve employers, contractors, government, regional and local organisations, learning and training providers, regulators and the new SSCs.
This will necessitate:

- The availability of high quality information about labour and skills supply and demand and the effective sharing of this information between industries and partner organisations. In the gas industry, OFGEM, the Health and Safety Executive and Transco have successfully worked together to draw up the 30 year metallic mains replacement policy.
- Long-term planning is required on the part of the industries, and the large companies in particular need to share this information to enable contractors to plan their labour resources adequately.
- This will require a shift in the psychology of the industries, but there are signs that it can be effective, as shown by Transco and their contractors.

- Training needs to be recognised as a universal responsibility across all parts of the supply chain. Contract pricing at present does not support skills development and this situation is storing up problems for the future.
- Evidence from the dialogue suggested that businesses accepted this need, but that this has not translated into practical actions, with a few exceptions.
- Both the size and the working of the contractor market are insufficiently understood, and more research is needed.
- In light of the cross-utility working of many companies, dialogue and information sharing should also occur across the gas, water and electricity industries. This will require labour and skills demands to be addressed in a coherent rather than fragmented way across the Utilities, and ensure that the developing SSCs have sufficient influence and power to meet the growing regulatory and commercial demands across the traditional Utilities.
- In order to attract quality entrants into the gas, water and electricity industries, the importance of 'parity of esteem' between academic and vocational training is fully supported.
- Gas, water and electricity businesses are seeking recruits from other industry sectors, women, older people and ethnic minority groups to alleviate their skills needs and recognise that more needs to be done to market the industries as offering clean (and often hi-tech) jobs.
- Partnership with schools and colleges will be important in promoting the realities of working in the industries and attracting young people to take Graduate and Modern Apprenticeships. However, there are fewer young people available to the industry and other labour pools must be targeted with appropriate training schemes.
- Their recent history of restructuring and downsizing means that the industries are unaccustomed to recruiting in the current labour market, where individuals seek job experience and learning opportunities rather than a job for life. Businesses in the sectors need to adapt to the new labour market and promote skills, training and employment opportunities in light of this.
- A fair system of funding training needs to be negotiated to accommodate a Utilities market where employment and business contracts are short term and flexible. This is at the heart of meeting the future skills challenges of the gas, water and electricity companies.

Annex 1 Contact details

Gas and Water Industry National Training Organisation (GWINTO)

The Business Centre
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Worcestershire B97 6HR

www.GWINTO.co.uk
Contact: Tim Balcon, Chief Executive

National Electrical Training (NET)

ESCA House
34 Palace Court
London W2 4HY

www.net-works.org.uk
Contact: Dennis Hird, Chief Executive

Electricity Training Association (ETA)

30 Millbank
London SW1P 4RD

www.ETA.org.uk
Contact: Kate Moore

British Plumbers Employment Council (BPEC)

2 Walker Street
Edinburgh EH3 7LB

www.bpec.org.uk

Department for Education and Skills (DfES)

Room E4d
Moorfoot
Sheffield S1 4PQ

www.dfes.gov.uk
Contact: Ben Cowdell

Annex 2 S/NVQ qualifications

NVQ DEFINITIONS[39] AND EQUIVALENTS

Level 1

Competences that involve the application of knowledge and skills in the performance of a range of varied work activities, most of which may be routine and predictable.

Level 1 equivalent

NVQ level 1 or equivalent

GNVQ,GSVQ foundation level

CSE below grade1,GCSE below grade C

BTEC,SCOTVEC first/general certificate

SCOTVEC modules

RSA other

City & Guilds other

YT,YTP certificate

Level 2

Competences which involve the application of knowledge and skills in a significant range of varied work activities, performed in a variety of contexts. At this level, there must be activities that are complex or non-routine and some individual responsibility and autonomy. Collaboration with others, perhaps through membership of a work group or team, may often be a requirement.

Level 2 equivalent

NVQ level 2 or equivalent

GNVQ intermediate

RSA diploma

City & Guilds craft

BTEC,SCOTVEC first/general diploma etc

O level, GCSE grade A-C or equivalent

39 Source: CABWI.

Level 3

Competences that involve the application of knowledge and skills in a broad range of varied work activities performed in a wide variety of contexts, most of which are complex and non-routine. There is considerable responsibility and autonomy and control or guidance of others is often required.

Level 3 equivalent

NVQ level 3

GNVQ advanced

A level or equivalent

RSA advanced diploma

OND,ONC,BTEC etc, national

City & Guilds advanced craft

Scottish CSYS

SCE higher or equivalent

A,S level or equivalent

Trade apprenticeship

Level 4

Competences which involve the application of knowledge and skills in a broad range of complex, technical or professional work activities performed in a wide variety of contexts and with a substantial degree of personal responsibility and autonomy. Responsibility for the work of others and the allocation of resources is often present.

Level 4 equivalent

First degree

Other degree

NVQ level 4

Diploma in higher education

HNC,HND,BTEC etc higher

Teaching, further education

Teaching, secondary education

Teaching, primary education

Teaching, level not stated

Nursing etc

RSA higher diploma

Other higher education below degree

Level 5

Competences that involve the application of skills, and a significant range of fundamental principles, across a wide and often unpredictable variety of contexts. Very substantial personal autonomy and often significant responsibility for the work of others and for the allocation of substantial resources feature strongly, as do personal accountabilities for analysis and diagnosis, design, planning, execution and evaluation.

Level 5 equivalent

Higher degree

NVQ level 5

Utilities NVQ titles

The following summary tables show the number of certificates (and registrations) for NVQ qualifications in the Utilities. The summaries are as detailed as possible, but some gaps exist in the data which reflects the low numbers that some of the NVQs attract.

Gas

NVQ titles in the Gas industry

		1998-99	1999-00	2000-01	2001-02
Registrations					
Level 2	Maintenance	21	298	417	308
	Installation	56	455	677	460
Level 3	Maintenance	82	138	406	338
	Installation	83	174	423	366
Certificates					
Level 2	Maintenance	-	147	113	57
	Installation	-	139	253	110
Level 3	Maintenance	-	90	138	152
	Installation	-	95	157	43

Source: City and Guilds

Water

NVQ certificates awarded in the Water industry

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Level 1										
Laboratory Operations (water)				7	2	5	1	2	2	
Level 2										
Operating Process Plant (water)			45	109	180	124	77	77	72	39
Operating Process Plant (waste water)			95	264	276	90	91	77	78	111
Operating Process Plant (sludge)			1	14	58	195	114	100	81	31
Laboratory Operations (water)				6	8	10	1	4	0	13
Monitoring the Water Environment								13	19	12
Distribution Control	28	75	158	77	0	32	23	11	18	36
Public Utilities Distribution						2	67	297	98	82
Sewerage Maintenance				1	8	19	26	32	17	8
Leakage Control										
Utilities Metering Operation										
Customer Service										
Level 3										
Controlling Water Operations (process)					1	-	-	5	3	1
Laboratory Operations (water)					1	1	1	1	2	-
Leakage Control										
Customer Service										

Source: QCA

SVQ certificates awarded in the Water industry

	Level	94/95	95/96	96/97	97/98	98/99	99/00	00/01
Laboratory Operations: Water	1							1
Operating Process Plant: Water	2		21	14	3	4	54	138
Operating Process Plant: Waste Water	2		36	20	20	7	20	79
Operating Process Plant: Sludge	2		4	13				
Public Utilities Distribution	2			16	4	13	12	
Landfill Operations: Inert Waste	3			1	3			
Landfill Operations: Inert Waste	3				6	5	18	21
Managing Transfer Operations: Special Waste	4			1	4	4		
Managing Incineration Operations: Special Waste	4				3			
Managing Landfill Operations: Biodegradable Waste	4		1	1	3	13	15	21
Managing Landfill Operations: Special Waste	4					22	23	25
Managing Treatment Operations: Clinical or Special Waste	4					21	15	20
Managing Transfer Operations: Clinical or Special Waste	4					24	56	38
Managing Incinerator Operations: Special Waste	4					1	3	
Managing Treatment Operations: Biodegradable Waste	4					18	11	11
Managing Transfer Operations: Biodegradable Waste	4					18	56	32

Source: SQA

Electricity

NVQ certificates awarded in the Electricity industry

	1997	1998	1999	2000	2001
Level 1					
Engineering Technology Operation Foundation					
Level 2					
Maintaining Electricity Generations Systems				1	
Operating Single Electricity Generation Systems	3	2	-	2	1
Operating Hydro Generation Systems (SVQ)					
Electricity Distribution and Transmission Engineering Support			18	42	11
Nuclear Decommission	2	18	16	17	13
Engineering Technology Operation Support					
Level 3					
Maintaining Electricity Generations Systems	1	4	3	21	45
Operating Multiple Electricity Generation Systems		8	19	12	8
Electricity Distribution and Transmission Engineering		15	19	56	85
Engineering Technology Operation					
Level 4					
Engineering Technology Management		2	16	18	16

Source: QCA

SVQ certificates awarded in the Electricity industry

	Level	94/95	95/96	96/97	97/98	98/99	99/00	00/01
Operating Single Electricity Generation Systems	2						1	
Electricity Distribution and Transmission Engineering Support	2					11	7	
Operating and Controlling Power Station Systems (Fossil-Fired): Unit Operation	3			2				
Maintaining Electricity Generation Systems (Electrical)	3			1		6	4	1
Electricity Distribution and Transmission Engineering Support	3							1

Source: SQA

Electrotechnical

NVQ certificates awarded in the Electrotechnical industry

	2000	2001
Level 2		
Installing Electrotechnical Systems and Equipment	1,287	337
Level 3		
Installing and Commissioning Electrotechnical Systems and Equipment (Electrotechnical Services)	61	411

Source: QCA

SVQ certificates awarded in the Electricity industry

	Level	98/99	99/00	00/01
Installing and Commissioning Electrical Systems and Equipment	3	227	283	516
Installing and Commissioning Electrotechnical Systems: Electrician	3			27

Source: SQA

Currently in development

Electrotechnical Panel Building - level 3

Electrotechnical Machine Repair and Rewind - level 3

Annex 3 Gas industry

The Structure of the Gas Industry

The upstream industry

Public Gas Transporters

Metering

- Installation
- Maintenance
- Reading
- Technology

Contracting/Maintenance

- Contractors
- Transco (operations)
- Self-lay Contractors
- Gas equipment manufacturers (associated with pipe laying and pressure reducing equipment)

The downstream industry

Gas suppliers

- Shippers
- Suppliers
- Traders

Manufacturing/Retailing

- Manufacturers
- Retailers

Gas Installers

- Installers/repairs/maintenance
- Industrial/commercial
- Local authorities

Annex 4 Consultation

Consultation Process

Consultation for the Utilities Skills Dialogue has taken place via:

- A virtual industry panel
- A Steering Group
- Face-to-face and executive telephone interviews
- Skills Dialogue Seminar

We are very grateful to the following organisations for their contribution to this Skills Dialogue:

Gas and Water National Training Organisation (GWINTO)

National Electrotechnical Training (NET)

Electricity Training Association (ETA)

British Plumbers Employers' Council (BPEC)

E-Skills National Training Organisation

Mid Kent Water

Scottish Power

South East Water

British Telecom

Southern Water

Transco

Total Fina Elf

Society of British Gas Engineers

GMB (General Workers' Union)

Society of British Water industries

CORGI

British Water

Nottinghamshire Learning and Skills Council

Office of Water Services (OFWAT)

Morrison Utility Services

Business Strategies Ltd

South East England RDA (SEEDA)

London West Learning and Skills Council

Penon Group Plc

Department For Education and Skills (DfES)

Schofield Associates

British Gas Services

Qualifications Curriculum Authority

Scottish Qualifications Authority

London West Learning and Skills Council

WTI Training Group

Department of Trade and Industry (DTI)

CABWI Awarding Body

London Electricity

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