

The **employment impact** of the opening of electricity and gas markets



The impact of the opening of electricity and gas markets on employment in the EU-27, and of key EU directives in the field of energy

Summary report

C3126 / March 2007

ECOTEC Research & Consulting

Anne-Mari Nevala and Professor Peter Lloyd

Priestley House
12-26 Albert Street
Birmingham B4 7UD
United Kingdom

T +44 (0)121 616 3600

F +44 (0)121 616 3699

www.ecotec.com

CONTENT

PAGE

Introduction.....	3
The limitations of the within-sector approach	4
Job losses and the impact on energy sector workers	4
Liberalisation in the wider restructuring process	6
Electricity sector.....	9
Gas sector	13
Identifying the groups most affected by restructuring	15
The locus of the new jobs	16
Effective but responsible restructuring strategies.....	17
Influence of other energy Directives.....	19
Recommendations.....	19

Introduction

The internal market in electricity and gas was the subject of Council Directives 96/92/EC and 98/30/EC respectively, representing an important step towards the creation of an internal market in these sectors. These Directives came into force in February 1999 for electricity and August 2000 for gas. In 2003, two Directives were adopted setting deadlines for the full opening of the EU energy market; 1 July 2004 for business customers and 1 July 2007 for households.

The Directives were adopted with the explicit aim of benefiting customers through lower prices generated by greater competition. It was also expected that a lowering of energy prices would lead to the preservation and further creation of employment in sectors heavily dependent on energy use for production, though there was at the same time a concern that greater competition would lead to job losses and poorer working conditions in energy businesses.

The first study into the effects of liberalisation on employment in gas and electricity industries was carried out by ECOTEC Research and Consulting Ltd on behalf of the European Commission in 2000/01. The study confirmed the concerns of trade unions and estimated that over 250,000 jobs were lost in the sector between 1990 and 1998 and significant further reductions were expected with the on-going liberalisation process.

This study into employment effects of opening of gas and electricity markets (2006/2007) has sought to expand on those findings by covering the enlarged EU-27 and Turkey, and by taking into account recent key legislative acts related to the energy sector¹. The study has also sought to capture examples of good practice of the process by which restructuring has been achieved and managed by different energy companies.

This summary report should be read in conjunction with the main analysis report, the separate country chapters that analyse the effects of the deregulation process on employment at a Member State level and case study reports. These case studies provide a more detailed assessment of the net employment outcomes of the on-going restructuring in ten EU Member States, and also include descriptions of how 12 energy utilities have managed the restructuring process. The cases deal with Denmark (DONG), Estonia (Eesti Energia), France (EDF), Italy (ENEL), the Netherlands (Gasunie and Intergas), Poland

¹ Directive on the promotion of cogeneration based on a useful heat demand in the internal energy market (2004/8/EC); Directive establishing a scheme for greenhouse gas emission allowance trading within the Community (2003/87/EC); Directive on the limitation of emission of certain pollutants into the air from large combustion plants (2001/80/EC); Directive on the promotion of electricity produced from renewable energy sources in the internal electricity market (2001/77/EC); Proposal for a Directive on energy end-use efficiency and energy services (COM(2003)739 final)

(Electrabel Polaniec), Slovenia (Elektro Ljubljana and Elektro-Slovenija), Spain (Iberdrola), Sweden (Vattenfall) and the United Kingdom (Centrica).

The limitations of the within-sector approach

This study provides clear evidence that liberalisation has shaped the workforce of gas and electricity utilities in both quantitative and qualitative terms. However, before these employment effects can be explored, there are two vital contextual and methodological issues that need to be taken on board.

First, this study - as well as research from the Member States - has indicated that attempting to abstract and then quantify the privatisation and liberalisation effects on employment from a *within-sector* perspective alone is both **conceptually and statistically risky**. The processes of energy privatisation and liberalisation have not taken place in a vacuum. Any erosion of the within-sector employment base and parallel shifts in the composition of the workforce have to be understood against a whole host of other social, economic, historical, political and technological issues. Taking the wider view would undoubtedly colour overall judgements about employment impacts. In carrying out this exercise we have been fully aware that “disconnecting” the sector from its wider context in this way can lead to partial and even dangerous generalisation and we have been at pains to qualify our findings to minimise the risk as far as possible.

Second, it is an established feature of work on industrial and sectoral restructuring that the downside effects are generally much easier to see and document than the upside ones. We have been faced with this throughout the study. The negative effects of privatisation and liberalisation in the energy sector have been more publicly visible and higher profile than the benefits. These processes are most often seen through the lens of job losses - while estimating the wider net effects of the process to take account of job creation elsewhere is a vastly more challenging exercise.

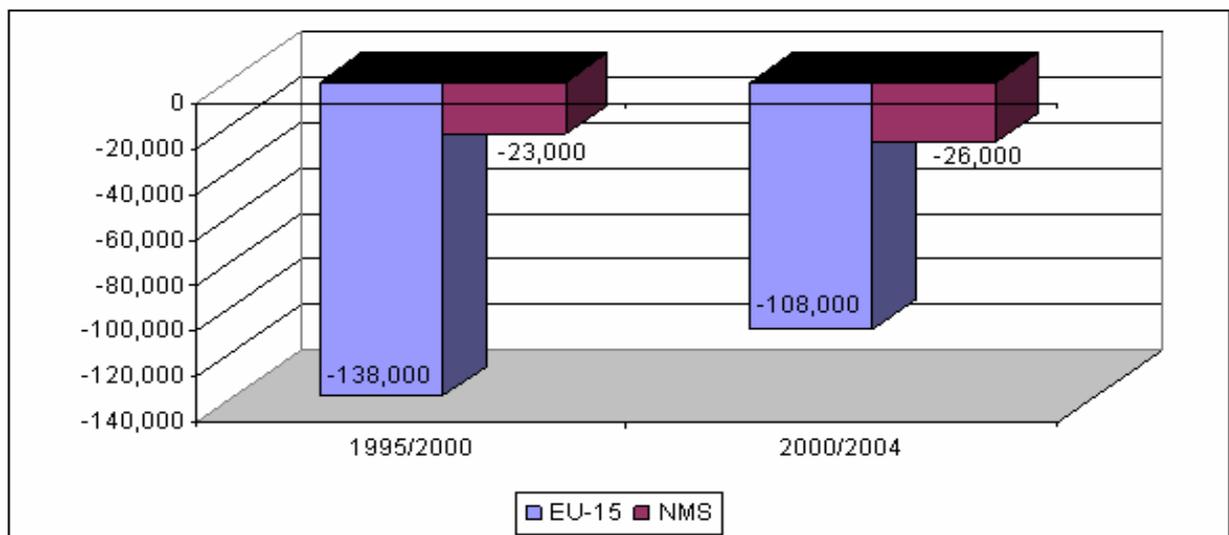
Job losses and the impact on energy sector workers

Bearing these caveats in mind, this study can conclude that the process of privatisation/liberalisation has had the **effect of significantly reducing employment** in the energy sector itself. But we cannot say how far these losses have found compensation across the wider economy and the labour market. This does not mean, of course, that the within-sector losses are not a matter for serious concern – especially for the workers subject to them – and that there is no case for policy intervention to ameliorate the downside effects. Indeed, precisely the opposite is the case. It is a legitimate policy proposition - four-square with EU philosophy - that, subject to the need to promote and

support competitiveness and innovation, the rights of workers need to be protected and every opportunity should be sought both to **ameliorate the negative effects** of job losses and to prepare those subject to them for successful re-entry to good quality jobs.

From a predominantly within-sector perspective, we have witnessed **radical shifts in employment**. The evidence we have gathered shows that **electricity** utilities in the EU-15 have lost nearly a **quarter of a million** jobs over the past decade, from 854,000 in 1995 down to 608,000 in 2004. This represented over a quarter of the total workforce in the sector. For the 12 new Member States, around **50,000** jobs were lost in the sector during the same period, representing around a sixth of the workforce.

Figure 1; Job losses in the electricity sector: EU-15 and 12 NMS



Sources: See Figure 4.1 from the main report for detailed information on data sources & coverage for all 27 countries.

Employment in the **gas** sector is more marginal than in the electricity industry due to the fact that most natural gas continues to be supplied from outside the European Union. Employment loss in the gas sector has been less severe but still substantial. Our best estimate shows employment losses of around 12-13% across the board in the gas sector over the past five years. Employment declined from around 174,000 in 2001 to 151,000 in 2004. It must however be taken into consideration that no reliable employment data was available for Belgium, Bulgaria, Luxembourg, the Netherlands and Poland. There is no significant gas distribution in Cyprus and Malta.

Further job losses are foreseen in both sectors at European level.

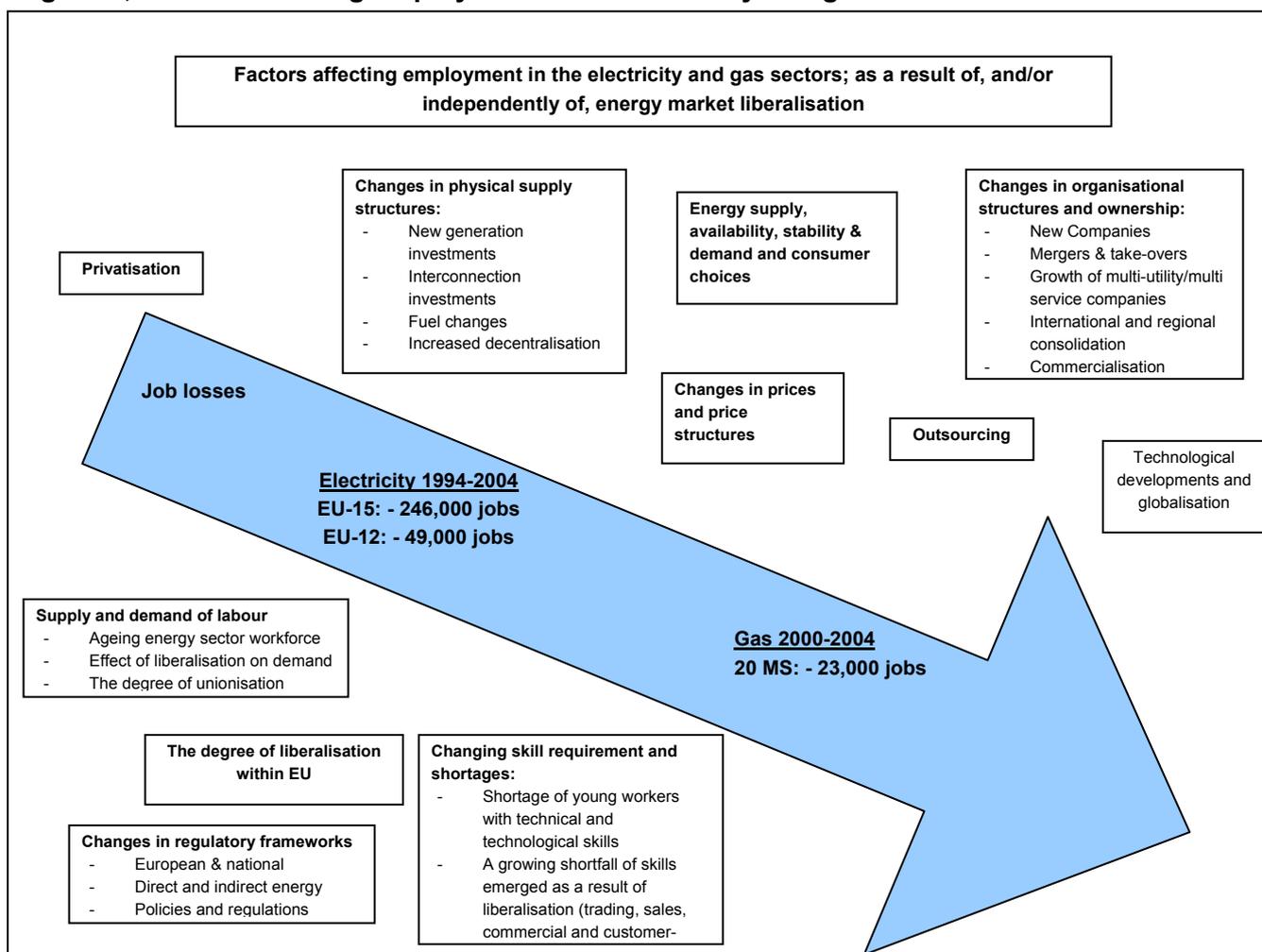
Liberalisation in the wider restructuring process

The influence of liberalisation on driving these trends varies, of course, from sector to sector and country to country and is once again hard to isolate. The study indicates that the Member States with mature competitive structures in the electricity and/or gas industries have seen some of the **greatest losses in employment** and in these countries the stakeholders almost universally regard **the regulatory reform as being a key causal factor**. The evidence also suggests that the employment effects have been more dramatic in cases where liberalisation within the sector also involved **privatisation**. Indeed, in some countries privatisation has been seen as a bigger threat for the industry from the employment perspective than actual market opening. Some of the most extensive energy sector privatisation programmes have taken place in the UK, Portugal, Hungary, the Czech Republic and Slovakia.

The fundamental difference between the Member States of the EU-15 and the new Member States in this respect is that the latter are for the most part still dealing with the broad **transition from a planned economy to a market-driven one**. This has consequences for employment of a much more comprehensive kind - regardless of sector. Liberalisation in the specific case of energy is in its early stages in many of the new Member States but we can show that the process is already having a profound impact on employment. Two linked processes stand out – the role of liberalisation in intensifying the pace of change in the sector and, in parallel, its effect in opening the door more widely to foreign take-over activity.

Liberalisation, however, has by no means been the only cause for drastic reductions in employment (see figure 2). **Technological change** has had a very significant impact. This can be illustrated, for example, through changes in generation technology (handling gas – CCGT power stations - has proved significantly less labour intensive than handling coal), customer billing systems and meter reading services. With or without liberalisation, the energy market has also been changing in response to shifts in **supply and demand**. From a Europe-wide view, the **structure of the market** has changed in at least two significant ways. On the one hand there has been a growing importance of few international market leaders due to an expanding presence outside their home country and on the other there has been a consolidation among the smaller municipal utilities.

Figure 2; Factors affecting employment in the electricity and gas sectors



Source: ECOTEC Research & Consulting, 2006

Note: Gas sector statistics refer to AT, CZ, DK, DE, GR, SP, FR, IE, IT, LV, LT, HU, PT, SL, SK, FI, SW and UK. There is no significant gas distribution in CY and MT.

Market trends such as privatisation, commercialisation and outsourcing can be seen as consequences of liberalisation, but they also occur regardless. Outsourcing has become a key business strategy for energy utilities to reduce overheads and create greater flexibility and it can today be seen as an established feature of the sector nearly universally across the EU-27¹. Indeed, a substantial increase in **outsourcing** over the past 10-15 years has delivered a reduction of within-sector employment, which does not translate into a commensurate loss of real overall employment from the wider perspective as some of the losses only mean a shift of employment from the energy sector to other related sectors (e.g. services or construction). Job loss is to be expected, however, as is far-reaching change in the composition of employment and working conditions. The study demonstrated that the estimated effect of outsourcing on employment levels varied from

¹ Anecdotal evidence suggested that outsourcing is only marginal in Bulgaria, Cyprus and Luxembourg.

6% up to 35% across the Member States. It affects 6-8% of the workforce in the Nordic States (FI, SW), in the region of 15% of employees in Germany and has been responsible for up to 30-35% reduction in within-sector employment in countries such as the Czech Republic, Italy, the Netherlands and Slovenia. Clearly, this strongly affects any judgements we can make about real absolute levels of job loss as a result of the liberalisation of the electricity and gas sectors.

Most of the outsourced functions in the energy sector are carried out by service providers within the country, but limited evidence implies that offshoring of activities to other EU countries is also on the increase, though still marginal in relative terms. Some of the British energy companies have started to contract-out back-office functions to India. Outsourcing affects employees in non-core, low-skill activities such as catering, security and cleaning as well as employees in energy sector specific activities, mainly maintenance and construction of distribution networks.

Commercialisation of former public sector departments providing energy services has often coincided with downturn trends in employment when newly-established companies work to streamline their services according to commercial principles.

The **wider political and regulative agendas**, in European¹ and in global and national terms, influence employment in electricity and gas markets strongly. Even if the industry is transforming from a centrally planned industry to one in which commercial criteria hold a much stronger position, regulation remains strong and governments still use the energy industry as a device to further wider policy objectives such as environmental and macro-economic aims. The market opening in a number of Member States like the UK, Sweden and Finland was a national policy decision, rather than a result of EU Directives. General labour market policies have also contributed to employment trends in the energy industry, especially when it comes to the promotion of employment of older workers and regulations on working time.

While shifts in markets can be a product of increased liberalisation, they also take place as a product of normal competitive processes in the face of fast changing technology. Once again, it is difficult to extract the **liberalisation effect** and this inevitably opens the door to the wide variety of views on causality among employers, government representatives and trade unions reported in the study. Due to these complexities only a handful of countries have monitored employment impact at a Member State level in a systematic manner². In

¹ Chapters 10 and 11 examine more closely the employment impact of the wider European energy policy and regulatory framework and in particular the employment effect of policies to boost generation from renewable sources.

² Studies into social or employment impact of energy liberalisation were only found in Austria, the Netherlands, Sweden and UK and only one study (NL) attempted to build a more detailed statistical analysis and therefore forecast the employment effect of electricity market opening.

the following sections we briefly touch upon the influence of liberalisation at a Member State level for both electricity and gas industries, although readers are recommended to examine the main report and the country reports for further information.

Electricity sector

By September 2005 the electricity market liberalisation was legally completed in ten Member States. It is most advanced in **Austria, Finland, Germany, Sweden** and the **United Kingdom** where the regulatory reform in the electricity market took place in the 1990s (apart from Austria where it took place in 2001). Statistics indicate that the employment trend of the past decade in these five countries is that of strong decline, far greater than the average decline in the EU-27. Key energy sector players (employers, trade unions and government representatives) regard liberalisation as one of the key reasons for job losses in these five countries, though has not caused all the 'casualties'. All these countries had experienced a longer-term decline in employment that preceded the market opening. This, on one hand, indicates that energy companies undertake significant levels of preparatory activities for the market opening by increasing their competitive position, but on the other hand demonstrates that employment in the sector has been witnessing a longer-term decline due to a variety of technical and market forces (as explained earlier).

From a comparative perspective the German electricity sector lost both the largest number of employees (96,000) and the largest share of the workforce (-34%) in the ten years between 1995 and 2004 (see Figure 3).¹ In relative terms, Germany is followed by Sweden (-33%), Finland (-29%), the UK (-28%) and Austria (-24%).

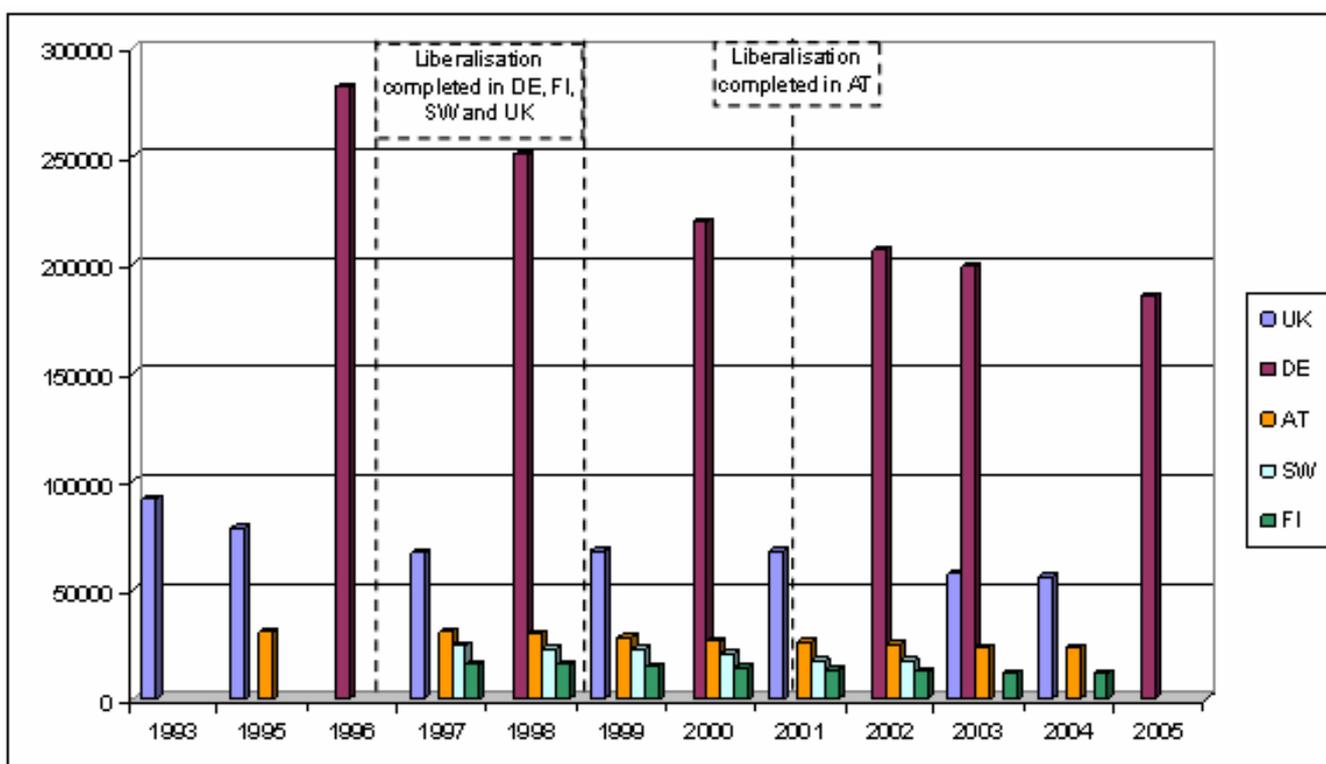
The level of job losses in Germany and Austria was greater at the end of the 1990s than during the early years of the current decade, but the opposite situation occurred in countries like the UK and Sweden where the liberalisation took place earlier. These countries had already seen more substantial drops in employment in the early 1990s; in Sweden during the commercialisation of Vattenfall and in the UK the incumbents have suffered the most significant job losses during the heaviest period of restructuring and privatisation (1989-1993), more so under liberalisation than privatisation. This derives from the fact that while liberalisation has resulted in a legally unbundled market, the regulator has treated different players in the market in different ways; the incumbents have been subject to tighter controls than new entrants, as one of the regulator's roles is to promote effective competition, which in effect takes market share from the former incumbents - with

¹ Because of the size of the country and its electricity sector, it is not surprising that the German electricity sector has lost the largest *number* of employees.

detrimental effects on the workforce. But the sector's employment base continues to evolve even today because of the on-going restructuring, the development of the dual fuel provider market, offshoring and the pressure to improve price competitiveness and market share through mergers and acquisitions.

The workforce in the German electricity industry had started to decline already much before liberalisation, but job losses have continued to occur since. Although outsourcing has become more widespread in recent years (affecting 15% of workers), evidence suggests that the majority of job losses experienced in the electricity utilities have arisen from competitive pressures to bring down costs, from restrictions to generation capacity, and from municipal companies having to build strategic alliances with other municipalities or larger players - with consequences on the workforce. In Austria, the extent of job losses in energy companies was partly determined by "benchmarking activities" against energy companies operating in liberalised markets.

Figure 3; Employment trends in advanced open electricity markets (DE, FI, SW, UK and AT)



Sources: Eurostat SBS for production and distribution of electricity (AT), national statistics office (FI, UK), and a combination of Eurostat data and information from stakeholders at national level (DE, SW). Note: the data sources for Germany and Austria have data gaps (1996 for AT, and 1997, 1999, 2001 and 2004 for DE).

The legal electricity market liberalisation has recently been completed also in **Denmark, the Netherlands, Portugal, Spain and Ireland**. However, no real competition exists yet for residential customers in Ireland, Portugal and Spain.

Largely speaking, employment trends in these five countries have followed similar trends to those countries where liberalisation is more advanced. The rate of decline from the past decade greatly exceeds the EU average rate, with the Dutch electricity sector having witnessed a 39% fall in employment, followed by Spain (-34%). The decline in the Danish electricity sector stands at around 30% and the development was predicted by the Danish administration for Competition before the liberalisation was initiated. In the Netherlands the most evident impact has been an erosion of employment in distribution/sales, network management and among employees with low educational attainment. The strong fall in employment in the Spanish electricity market was a response of the companies on a national energy policy, which failed to encourage energy companies to adapt to a new competitive framework and instead allowed them to get rid of expensive older employees (at very high cost) and incorporate cheaper labour into their workforce. The situation has now alleviated as a consequence of a fairly dramatic increase in energy demand and increase in the number of temporary contracts.

Recent downsizing efforts in Portugal, Energias de Portugal in particular, have been implemented with a view to adjusting to the new liberalised market. The reduction from the past decade reaches 26%. The Irish statistics imply a much more established employment situation (-5%), however company specific statistics (Electricity Supply Board of Ireland) point towards stronger decline (-27%).

The **remaining countries** are still undergoing reform to fully liberalise (legally) their electricity markets; deregulation is expected to be complete in most of them by July 2007. Preparation for market opening is already affecting employment in all of the study countries in both quantitative and qualitative terms, though the extent of its influence varies from country to country (see table 1). Job reductions schemes are already being implemented and clear shifts in the occupational profile and educational level of the workforce are discernible. For example in Italy, the first quantitative employment effects were already visible in 1997 and during the past decade the Italian electricity industry has shrunk by around 40% - according to both employers and unions, as a result of liberalisation. On the other hand, the smallest Member States (Cyprus, Malta and Luxembourg) are yet to see any substantial quantitative employment effects. Even though there has been a steer towards lower employment rates in Slovenia and Estonia in order to achieve more efficient economic operations - after the shift towards market economy - liberalisation is yet to effect employment rates in terms of redundancies. In Slovenia this development is expected to 'hit' the sector in the next few years, when much of the production capacity (and possibly also distribution) is likely to be privatised. Statistics from Bulgaria indicate a stable employment situation but many of the largest distribution businesses have cut their workforce by 20-30% in just one year since the publication of latest statistics.

Those countries that have witnessed substantial job losses (e.g. the Czech Republic, Slovakia and Hungary) have seen a shift from a mostly state-owned sector to one with more widespread private ownership – usually with detrimental implications for the size of the workforce and working conditions. In these countries the linkages between privatisation and liberalisation are debated. Some see privatisation as a first step towards competitive market place whilst others see it just being linked to the general trend of privatisation. The longer-term employment decline in most of the Eastern European Member States is also to a certain extent attributable to the effects of the regime change as the new economic model places greater emphasis on labour efficiency.

Table 1; Employment trends in countries with an on-going electricity market liberalisation

	Jobs lost/created 1995-2004	%Δ 1995-2004	Jobs lost/created 1995-2000	%Δ 1995-2000	Jobs lost/created 2000-04	%Δ 2000-04
EU-15						
BE	-4,647	-22%	-2,729	-13%	-1,918	-11%
IT	-51,400	-40%	-27,800	-22%	-23,600	-23%
FR	-8,362	-7%	-692	-1%	-7,670	-7%
GR	-6,662	-19%	-3,036	-9%	-3,626	-11%
LU	61	9%	256	37%	-195	-21%
New Member States and Turkey						
CY	205	11%	67	4%	138	7%
CZ	-10,265	-31%	-7,129	-22%	-3,136	-12%
EE	-3,400	-22%	-700	-5%	-2,700	-18%
HU	-22,145	-51%	-12,203	-28%	-9,942	-32%
LV	-1,613	-21%	-954	-12%	-659	-10%
LT	n.a.	n.a.	n.a.	n.a.	-2,957	-20%
MT	n.a.	n.a.	n.a.	n.a.	-108	-5%
PL	-9,348	-9%	-2,739	-3%	-6,609	-6%
SL	-485	-7%	-365	-5%	-120	-2%
SK	-4,100	-20%	700	3%	-4,800	-23%
BG	1,776	6%	605	2%	1,171	4%
RO	n.a.	n.a.	n.a.	n.a.	3,793	6%
TK	n.a.	n.a.	-5,973	-11%	n.a.	n.a.

Sources: Eurostat SBS for production and distribution of electricity (BE, BG, CZ, LT, LX, PL, RO), key company/incumbent (CY, FR, GR, LV, MT), national statistics office (EE, IT, SL, TK), Hungarian Energy Office, combination of Eurostat data and information from trade unions at national level (SK).

Note: The 1995 figures for LV, PL and BG are from 1996. The Romanian figures only refer to 2002-04. The 2000 figure for Malta is from 2001. The Estonian data refers to electricity, gas and water.

Gas sector

The study findings convey that employment trends in the gas sector vary fairly strongly from country to country. In general terms the liberalisation of the European gas industry is somewhat behind the liberalisation of the electricity sector, hence also the overall employment effect seems less radical. On the other hand, countries with open gas markets have seen some of the greatest cutbacks in employment.

A full gas market opening has been legally declared by Denmark, Germany, Spain, Italy, the Netherlands, Austria and the United Kingdom. The UK was the first country in the EU to introduce competition to the gas industry and is today the only country with a significant degree of switching among households. Significant supplier switching among large industrial and medium industrial / commercial consumers has taken place in Belgium, Denmark, France, Spain and Ireland¹. In Italy this has been the case for large industrial consumers.

The **UK** - that features the only mature competitive market - has experienced similar employment losses in the gas sector as in the electricity sector. The UK Department of Trade and Industry undertook a study into social effects of energy liberalisation which reports that 30,000 jobs were lost in the gas sector between 1990 and 1997. Employment today is around 30% of the 1991 figure and just around 20% of the 1985/86 figure. During this time the structure of the British gas industry has changed significantly. The mergers and take-over activities together with the regulator's pressure towards more competition (hence the incumbent losing market share) have contributed to the dramatic employment reduction. Another reason for job loss has been an increase in the use of contractors particularly in relation to manual occupations, such as network construction and more recently IT, billing, and call centre services that also use offshoring companies in India. The UK energy sector is today dominated by dual energy providers, hence it is no longer obvious which employees are registered under electricity and which under gas industry.

The trends in the **Austrian** and **German** gas industries are largely speaking in line with average European trends and liberalisation has disproportionately affected blue rather than white collar workers. The German gas utilities have cut around 12% of their workforce since the market opening (1998-2003) and the employment reduction in Austrian gas sector amounted to 9% between 1995 and 2004. The **Italian** gas sector structure has seen changes with ex-municipal companies and ENEL strengthening their position in the gas market that has traditionally been dominated by ENI. Competition, together with other market forces, has had the consequence of reducing nearly a quarter of the total workforce

¹ Eurostat: European gas market indicators of the liberalisation process 2004 – 2005.

between 1997 and 2004. Since early 2000, ENI has undergone a complex development and transformation process characterised by a reduction of low profitable activities and divisional organisation focusing on the core business.

It would seem that liberalisation is yet to have any detrimental effect on the **Spanish** gas industry. The industry representatives however do argue that liberalisation has increased competition in the Spanish market already and at the same time decreased margins of gas utilities – leading to occasional job reductions at a company level. But these reductions remain fairly rare as the sector has been able to maintain employment levels of pre-liberalisation.

Even if competition in the **Danish** gas market is not functioning as well as in the electricity market, the unbundling has taken place and liberalisation has led to structural changes with regard to ownership, responsibility and strategic alliances – with obvious consequences on the sectoral workforce. The organisational restructuring at a company level is characterised by mergers that is integrating the electricity, gas and oil sector. The process is still on-going and has recently become much more international in its scope. The focus on efficiency, promoted through benchmarking and increased performance measuring, has increased. There has been a small decline in employment between 1997 and 2005 (-2%), although the number of workers has risen in recent years following an initial decline post-1997. The shift in employment has had a propensity towards a workforce with a higher average skill level.

The rest of the study countries are yet to legally open their gas markets to competition. According to the European Gas Directive, all consumers will be free to choose their gas supplier from July 2007 onwards. For industrial consumers the market has been open in most countries for several years.

Like in the case of the electricity sector, in relative terms the greatest employment losses have been witnessed in countries that feature a fairly high degree of privatisation (HU, CZ and SK), Hungary in particular. Employment in the Hungarian gas industry was growing up until the regime change and privatisation of the industry (1995/1996). In 2004 the sector employed just 47% in comparison to what it used to employ fifteen years ago and 57% in comparison to the situation just a decade ago. While employer and union representatives feel the liberalisation has been one of the key causes for the losses through privatisation and the drive towards greater profitability, it must be assumed that the privatisation of gas utilities could have gone ahead even without the upcoming liberalisation process and therefore the link between these two structural changes is not always straightforward. The decline from the past decade in the Czech Republic and Slovakia amounts to 24% and

29%, respectively. Companies in these countries regard the drive to reduce operating and capital expenditures and personnel costs as the main reason for the fall.

A number of EU countries have seen a growth in gas sector employment (e.g. Romania, Portugal, Greece and Finland) and these are generally speaking countries where the natural gas production and supply has been extremely marginal, if not non-existent, and new infrastructural and energy policy developments have functioned as a catalyst for growth. In France employment has remained stable.

Identifying the groups most affected by restructuring

The impact of liberalisation on employment in the energy sectors is better confirmed when it comes to identifying those groups of employees who have been most seriously affected by the opening-up of markets. We can point to a number of negative outcomes that have had differential impacts across skills, occupation, activity, gender and age.. The study makes the following observations in this respect:

- The liberalised energy market tends to demand more educated and highly skilled personnel. As a result job losses have occurred overwhelmingly at the expense of **lower skilled personnel**. More specifically the occupational groups involved have been among maintenance personnel, followed by customer service and administrative staff, lower skilled technicians in power plants and distribution companies, and workers in elementary occupations.
- By activity, the **distribution sector** has been heavily affected by the liberalisation process and by outsourcing - with workforce reductions reaching as much as 45% in some countries. The **production sector** has also witnessed considerable losses. Often, however, these have been a product of technological change along with the cost pressures arising from competitive markets. By contrast, employment in the **transmission** field has remained stable, whilst **trading** has in many cases experienced a short-term growth around the period of market opening.
- **Male workers** have been affected by restructuring more than female workers. This is a result of their propensity to work in those occupations which have been adversely affected by restructuring (e.g. maintenance), by their overall representation in energy businesses and also from the tendency of the emerging new occupational profiles to be more attractive to female employees than to men from more traditional 'technical' backgrounds.

- Finally, liberalisation has contributed to negative outcomes for two specific worker **age groups**. Many countries have seen large proportions of their older energy sector workforce retire early in response to corporate strategies seeking reductions in staff through early retirement. This process has usually taken place without a wider assessment of skill supply and demand - with *age* functioning as the main decision parameter. Young workers and graduates from technical fields have also suffered as new employment and training opportunities in the sector have declined in the context of restructuring and cost-cutting.

From a company perspective it has been the more **traditional smaller companies**, usually municipally owned, that have found it particularly hard to remain competitive in a liberalised market. These have tended either to seek out alliances with other municipal companies or to have succumbed to take-over activities by larger domestic or international companies. The process of consolidation among small distributors and network managers has been strongly driven by the need to achieve economies of scale, and sometimes the result has been as much as 50% reduction in employment.

At the same time disintegration of former monopolies has meant that **incumbents** in many countries have lost by far the greatest number of jobs, though it must be taken into consideration that sometimes the decline can be explained by transfers of employees to newly established, unbundled companies. This can be seen as a development linked to the promotion of competition.

The locus of the new jobs

As a result of liberalisation **new jobs** in the energy sectors have tended to be created in business development and marketing functions, project management (combining technical skills with financial and management capabilities), brokerage and trading functions and product development. Demand has also grown for highly educated and experienced technicians and legal experts. Employment has also tended to grow in the field of renewable energy as a consequence of the EU Directive on the promotion of renewable energy¹. The new skills required by energy sector employers appear mainly to demand flexibility and adaptability and tend to be dedicated to customer-focussed 'sales' skills, regulatory and legal expertise, new management methods and knowledge of foreign languages. However, it is our view that, in general terms, employment growth in all these areas has been relatively insignificant by comparison with the scale of within-sector job losses.

¹ International studies have forecast that if the EU pursues a target of 20% renewable energy by 2020 more jobs will be created in the renewable energy sector than are lost in the traditional generation sector.

Some of these new jobs sources have emerged from the influence of the free market on internal, company based restructuring and others from the re-organisation of the sector as a whole. Indeed, many energy companies have seen a radical transformation from essentially "civil service" departments providing energy supply services to the public into State - and possible later on privately - owned companies that function as profit driven businesses in a liberalised market place (albeit in some countries this process is only just under way). Perhaps paradoxically, another consequence of liberalisation has been the proliferation of new, smaller players in the market; operating alongside and servicing the large companies that dominate the sector. Liberalisation has for example introduced the concept of "traders" who sell electricity/gas directly to the consumers.

The changed regulatory climate and the disintegration of former monopolies have undoubtedly presented enormous challenges for human resource management everywhere as the shift has taken place from single fuel providers to multi-utility, international energy giants who are not only major employers in the European energy industry but in Europe as a whole. This has put a recruitment premium on those personnel with an understanding of those complex legal, regulatory and functional requirements needed to implement change management across both sectors.

To add to the complexity, some companies have diversified into non-energy sectors as a way of expanding their potential revenue streams. These companies are offering other services and utilities than gas and electricity, such as water, telephone or insurance. They are often entirely service-based companies, which do not have the same demand for engineers and other skills traditionally required in the sector, focussing rather on customer-faced activities.

Effective but responsible restructuring strategies

Much of the public concern and policy discussion on liberalisation and restructuring in the energy sectors relates to what has just been discussed - its effects on the size and character of the overall workforce and its impact on particular groups. The study has shown that these concerns are well-founded. In addition to these more macro-scale effects, anecdotal evidence from the study suggests that work intensification is also on the increase as a result of liberalisation - with rising numbers working at higher speed and to tighter deadlines. Concerns have also risen from the effect of outsourcing on working conditions, health & safety in particular. Restructuring, the pace of change and privatisation have also generated legitimate concerns over stress levels of employees and the security of employment. At the same time, of course, employers are looking for more flexible labour inputs, contractual arrangements and working conditions. This makes it clear that the current EU debate on "flexicurity" has a profound relevance in setting the

right overall conditions for issues of job security to be brought into a common framework with demands for adaptability and flexible working.

However, negative implications can not be regarded as fully universal across energy companies and many energy utilities have made significant financial investment to look after employees affected by restructuring. Furthermore, in some companies liberalisation has resulted in greater investment in staff training and indeed in many countries the workforce of the sector is emerging as more diverse than before, for example, with women constituting a greater share of total employment.

Modernisation of work organisation, including flexible working arrangements, have been in the agendas of European energy businesses as a way of improving productivity and enabling adjustment to structural and market forces. Part-time employment is on the increase in many of the liberalised markets, which can *under right circumstances* also offer employees the chance of a better balance between working life and family life (or other commitments like studying), or make it easier to enter the labour market.

While these broader debates, for example on flexicurity, are still underway, it is important - in the overall interests of the energy companies themselves as well as of their workers - to undertake **socially responsible restructuring strategies**. These should go together with supportive actions at regional and national level under the aegis of the Lisbon strategy and under the Regulation for the Structural Funds where these are appropriate.

This study offers some examples where such a responsible and holistic approach to managing restructuring has been successfully undertaken in the interests of all parties. These are ones that;

- i) **anticipate** workforce changes and their implications;
- ii) embrace a thorough **consideration of alternatives to redundancies** and
- iii) seek sustainable and responsible solutions for these challenges through **constructive dialogue between employees, management, trade unions and other appropriate partners**.

The main report and case studies illustrate examples of good practice in corporate restructuring, including:

- Examples of energy companies that have adopted a holistic approach to managing consequences of restructuring and have made significant financial investment to **look after employees affected by restructuring** (e.g. Vattenfall). This has included, for example, extensive re-training provisions, financial support for further education and assistance in finding new employment or setting up new business.

- Examples of energy companies that have early on **prepared for market opening** from the perspective of human resource management in order to minimise the negative impact on employees. This includes, for example, taking steps to ensure the right intellectual capacity to handle the change by utilising new recruitment strategies and seeking inspiration from innovative approaches to managing restructuring from companies in liberalised markets (e.g. Eesti Energia and Elektro-Slovenija) or other liberalised sectors such as telecoms (e.g. EDF and Vattenfall).
- Examples of social partners that have actively **monitored and researched the implications** of electricity market liberalisation on the quantity and quality of employment (e.g. the Netherlands).
- Examples of companies that have used **social dialogue** and consultation of management & employees as a basis for designing approaches to restructuring (e.g. Electricity Supply Board of Ireland).
- Examples of companies that have sought appropriate **external partnerships** to ameliorate effects on employees who have lost their job in the restructuring process (e.g. Electrabel Polaniec) or created **internal organisations** to handle large-scale restructuring (e.g. EDF and Vattenfall).
- Examples of companies that have promoted **redeployment through re-training**. This includes, for example, carrying out a detailed stock-take of existing and anticipating skills' needs (e.g. EDF), setting up relevant training programmes to offer existing employees the skills that will be in demand in the near future (e.g. ENEL) and offering incentives for company managers to hire from within the company (e.g. Vattenfall).

In a global economy experiencing rapid technological transformation, restructuring has to be considered both inevitable and necessary. What will make both for the good society and for competitive success is the willingness to manage the process efficiently – but holistically and through constructive social dialogue.

Influence of other energy Directives

Prepared by COWI, Denmark

Although the core subject of this study is the employment impact of the opening of the EU electricity and gas markets, it is important to see the impact of liberalisation together with other EU energy policies since each Directive presents their own push and pull factors to employment trends. These Directives include;

- Directive 2001/77/EC on the promotion of electricity produced from renewable energy sources in the internal electricity market;

- Directive 2001/80/EC on the limitation of emissions of certain pollutants into the air from large combustion plants;
- Directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading within the Community;
- Directive 2004/8/EC on the promotion of cogeneration based on a useful heat demand in the internal energy market;
- Directive 2006/32/EC on energy end-use-efficiency and energy services.

Whereas the implementation of the electricity and gas market directives in particular cause a restructuring (e.g. unbundling) in the sectors and thereby mainly lead to organisational changes, some of the other directives may also lead to physical changes, e.g. in the form of a shift in fuel and production technologies from large coal and lignite fired power plants to renewable sources and increased CHP generation. Generally the CHP and the RES Directives lead to a shift to more decentralised production structures.

The **Renewable Energy Directive** causes a shift from conventional coal, oil and gas fired technologies to renewable technologies. This moves jobs from the traditional fuel sectors, oil, gas and coal to the renewable fuel sectors, biomass and waste. Additionally, it implies a change from fuel costs to investment costs e.g. investments in wind turbines. Indeed, the analysis shows that if the EU pursues a target of 20% renewable energy by 2020, there will be a job gain - i.e. more new jobs in the renewable sector than jobs lost in the traditional sector. The job gain is due to the large manufacturing and installation of new renewable energy plants, while the staff needed for operation and maintenance is lower.

Many of the new jobs created require high skills. In particular, they include engineering and technical skills, particularly civil, mechanical and electrical/electronic engineering. Project development and management skills are also paramount to an industry that is developing rapidly and which needs to focus on exploiting new business opportunities and technology application. An apparent worry is of course that the many skills required cannot be accommodated. Several countries are experiencing a falling number of physics graduates.

The Directives influencing the electricity production structure and the requirements in respect of increased efficiency and reduction of environmental impacts increase investments in new plants and technologies as well as investments in rehabilitation of inefficient equipment. Typically, there can be expected a reduction of jobs related to operation and an increase in jobs related to installations and equipment.

The last mentioned Directive, the end-use-efficiency Directive, might possibly decrease the number of jobs in the fuel and electricity supply sectors due to a lower electricity demand, though this effect might not be dominating.

The impact of some of the directives may draw in opposite directions, whereas the impact of other directives may draw in the same direction and thereby reinforce each others. When monitoring the development it is not possible to single out the impacts of the individual directives as the development reflects the impact of the combined set of measures taken to ensure development in accordance with the strategic goals.

All together, **the net effect of each individual directive, in particular in quantitative terms, is difficult to evaluate**. Furthermore, there is an important but very uncertain time dimension to this discussion, which is hard to determine in precise figures.

Common for most of the Directives is that they may lead to **higher electricity prices**. For instance, the large combustion plant Directive will lead to some additional costs for establishing environmental facilities at power plants, and the greenhouse gas emission Directive will lead to a price of emitting CO₂, which can be seen as an extra variable cost in power generation. These higher electricity costs (which will be allocated to the electricity price) will, all others things being equal, reduce the competitiveness of the energy intensive industry in EU and thereby reduce the number of jobs in this sector.

Possible developments of energy prices and their effects on competitiveness and jobs in energy intensive industries are assessed in this study. The **combined** effect on energy prices of market opening **with a number of other measures**, notably emissions trading, is ambiguous. Therefore it is investigated how sensitive the competitiveness of the energy intensive industries are from to changes of the energy price. In this context, the following issues were covered:

- Differences in sensitivity between similar energy intensive industries in different countries;
- Differences in sensitivity between countries due to different industrial structures

Competitiveness and thereby also the number of jobs in energy-intensive industries is dependent on energy prices. The industries are in a particularly vulnerable position in relation to increased electricity prices if similar price increases do not take place in competing economies such as the United States, Australia and the developing countries.

In any case, a change in energy prices - whether it is upwardly or downwardly - will affect the energy-intensive industries in the EU Member States differently. The energy content of the iron and steel industry e.g. ranges from 1.9% of the production value in Finland to 12.0% in Greece; and for other non-metallic mineral products it ranges from 1.2% in

Norway to 9.1% in the Czech Republic and Greece. An increase in energy prices - of same magnitude in all countries - will thus not be neutral regarding the competitiveness for these energy intensive industries in the different countries. In particular, the competitiveness of the new Member States appears to be more sensitive to energy price changes.

Recommendations

Policy at European level

- The European Commission should continue to carry out research on the impact (positive and negative) of liberalisation in the gas and electricity industries and to use the information gathered in this study to encourage Member States (under the Open Method of Coordination) to identify and disseminate good practice in holistic approaches to restructuring that are both efficient and socially responsible.
- It is recommended that this dissemination of good practice should be most actively pursued on behalf of those Member States where the regulatory reforms are, as yet, in its early stages – particularly in the new Member States where this forms part of the general process of transition to the market economy.
- The European Commission should use its influence to promote constructive social dialogue at both European and national levels amongst the players involved in energy sector restructuring and its implications for workers and the efficient management of change in the labour market.
- The report should be used to assist in the evaluation of the employment implications of liberalisation and the preparation of the national social action plans in the countries of the (South East European) Energy Community.

Policy at National level

- National social partners and other stakeholders should take active steps systematically to monitor and consult over the way of dealing with the effects of market opening in their energy sectors on employment¹. In particular the following issues require close examination:
 - ▶ The impact of sectoral and territorial change in employment as the sector goes through such a fast-moving transformation;

¹ This assessment should also take into consideration interaction between different energy directives.

- ▶ The potential effects of outsourcing for the quality and security of employment - particularly in relation to working conditions, health & safety and skills development;
- ▶ The potential risk posed by emerging skills deficits in technical fields;
- ▶ The level of need for enhanced training opportunities for young technical graduates;
- ▶ The effects of restructuring on available skills and the age mix of the workforce;
- ▶ The importance of establishing transferable systems for re-training designed both to ensure effective redeployment and to give proper weight to the validation of prior learning / work experience.