WAGEINDICATOR SUPPORT FOR BARGAINING IN THE UTILITIES SECTOR (WISUTIL)

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WISUTIL:
FINAL PROJECT REPORT

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Table of contents

Introduction

Energy, water and waste: dynamics and competition

The energy, water and waste sectors are highly dynamic, as across Europe almost every day can be learned from the newspapers. Market regulation, internationalization of utilities companies, technological changes and pressures for energy efficiency and conservation are expected to continue and even to intensify. These dynamics also continue to form common pressures on trade unions organizing workers in these sectors throughout the European Union, united in the European Federation of Public Services Unions (EPSU). The growing awareness of this communality has led to discussions about the coordination of collective bargaining in the utilities sector within the EPSU. This report aims to contribute to the debate about the strategies for collective bargaining at national and European levels in view of market liberalisation, privatisation, cross-border mergers and acquisitions, and technological change. It investigates the effects of these changes on wages, working conditions, occupational structures and skills, as measured through the answers of workers in this sector on the *WageIndicator* web-survey.

In this report, the energy, water and waste sub-sectors are defined as the production, transmission and distribution of *energy*, including electricity and gas; the collection, treatment and supply of *water*, including sewerage, and the collection, treatment and recovery of *waste*. Table 0.1 shows how these industries have been clustered into three sub-sectors: energy, water and waste. It shows also the so-called NACE industry codes.

Table 0.1 Division of the utilities sector in sub-sectors, using the NACE 2.0 industry coding

NACE 2.0 Industry	sub-sector
3511 Production of electricity	Energy
3512 Transmission of electricity	Energy
3513 Distribution and trade of electricity	Energy
3521 Manufacture of gas	Energy
3522 Distribution and trade of gaseous fuels through mains	Energy
3530 Steam and air conditioning supply	Water
3600 Water collection, treatment and supply	Water
3700 Sewerage	Water
3811 Collection of non-hazardous waste	Waste
3812 Collection of hazardous waste	Waste
3821 Treatment and disposal of non-hazardous waste	Waste
3822 Treatment and disposal of hazardous waste	Waste
3832 Recovery of sorted materials	Waste
3900 Remediation activities and other waste management services	Waste

In four ways this report aims to add value and innovativeness for the discussion in the European trade union movement:

1) to contribute to better insights in the trade union movement on the implications of market liberalisation, privatisation and technological change for wages, working conditions, occupational structures, skills, and workers' representation, and thus for the modernisation of labour markets;
2) to fuel the debate in the trade union movement on the anticipation and management of change related to liberalisation, privatisation and technological change;
3) to contribute to better insights in the effectiveness of collective bargaining, in particular contributing to growing debate in the European trade union movement on balancing the viewpoints and resources at national and European levels;

4) to respond to the growing demand in the European trade union movement for *WageIndicator*-based analyses concerning wages, working conditions, occupational structures and skills, and workers' representation throughout the EU.

The WISUTIL project

The impact of market liberalisation, privatisation, cross-border mergers and acquisitions, and technological change in the utilities sector calls for further study. For this reason, the EPSU, the University of Amsterdam/AIAS, the independent research institute FORBA, and the WageIndicator Foundation joined forces. They submitted a project proposal for funding through the EU Industrial Relations and Social Dialogue Program. In autumn 2010 this so-called WISUTIL project, was financially supported by the European Commission (nr VS/2010/0382). The project was coordinated by the University of Amsterdam/AIAS. See for information about the project the EPSU website (http://www.epsu.org/r/561) and the *WageIndicator* website (http://www.wageindicator.org/main/projects/wisutil).[2]

The WISUTIL project ran from 1 November 2010 until 31 October 2011. Within this period, two meetings of EPSU/AIAS/FORBA have been held to discuss the outline of the project (December 2010) and its progress (May 2011). The draft project results have been presented at a conference in Vienna on 26-27 September 2011. There, they were discussed by an audience of trade union officials and researchers, in particular as for their implications for collective bargaining. These discussions have been used in writing this final report.

Core of the WISUTIL project are the analyses of the data of the continuous *WageIndicator* web-survey on work and wages. This web-survey was posted on the national websites of the WageIndicator Foundation in 21 EU countries. On these websites a teaser was posted, inviting individuals working in energy, water or waste to complete the survey. From the very start of the project, EPSU and its affiliates undertook great efforts to invite workers to complete the survey. During the project three Newsletters have been published with preliminary findings from the web-survey; these were also posted on the national websites.

The project team would like to thank all respondents who completed the survey. They would like to thank EPSU, in particular Jan-Willem Goudriaan, Richard Pond and Jerry van den Berge, for guiding the project. They also would like to thank all EPSU affiliates for their continuous efforts to encourage members and non-members to complete the web-survey, as well as the conference participants for their input in the discussions. The authors are grateful to Melanie Hughie-Williams of the University of Amsterdam/AIAS for her continuous contributions to the project, and the web-survey in particular. Finally, they would like to thank Christine Wagner of FORBA for her efforts in the organisation of the Vienna conference.

The four partners in the WISUTIL project

AIAS: The Amsterdam Institute for Advanced Labour Studies (AIAS) is an institute for multidisciplinary research and teaching at the University of Amsterdam in the Netherlands. Founded in 1998, it brings together the University's expertise in labour studies from the Faculties of Law, Social and Behavioural Sciences, Economics and Econometrics, and Medicine. Combining law, economics, sociology, psychology and occupational health studies, AIAS seeks to foster not only the results of their combined effect, but also to add value to the individual disciplines. Multidisciplinarity is strengthened by AIAS fellows: colleagues in and outside of the University of Amsterdam who are associated with AIAS to contribute to teaching or research at the Institute.

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EPSU: The European Federation of Public Services Unions (EPSU) in Brussels, Belgium, is the largest federation of the ETUC and comprises 8 million public service workers from over 250 trade unions; EPSU organises workers in the energy, water and waste sectors, health and social services and local and national administration, in all European countries including in the EU's Eastern Neighborhood. EPSU is the recognized regional organization of Public Services International (PSI).

FORBA: The Forschungs- und Beratungsstelle Arbeitswelt (FORBA) in Vienna, Austria, is an independent research institute specialising in social science research on work and employment. The institute is interdisciplinary and international in character, looking back on long-term cooperation with researchers in the EU and overseas. In terms of their training and background, FORBA's academic staff covers sociology, political science, business administration and computer science, with research activities at the institute centering on both basic and applied research in these areas. Knowledge transfer aimed at translating research findings into social practice forms an integral part of the institute's activities. FORBA wants to add to the knowledge available on work and employment and to provide policy advice with the aim of contributing to better working conditions. FORBA has participated in the WISUTIL project in particular because of the institute's previous research on privatisation of public services.

WIF: The WageIndicator Foundation owns the *WageIndicator* concept. It is a non-profit organization, dedicated to labor market transparency by providing accurate wage and wage related information, located in Amsterdam in the Netherlands. Its mission statement reads: "Share and compare wage information. Contribute to a transparent labour market. Provide free, accurate wage data through salary checks on national websites. Collect wage data through web surveys." Thus, the public at large contributes to scientific information gathering, and scientists in return provide information free of charge to the public. The WageIndicator Foundation was established on 17 September 2003 under Dutch law. It is a joint initiative of FNV (Dutch Confederation of Trade Unions), the University of Amsterdam/AIAS and career website Monster, which also make up WIF's board of supervisors.

The sources used in this report

For this report, several sources have been used:

1) data from the worldwide *WageIndicator* web-survey on work and wages, selection WageIndicator data November 2010 – July 2011 workers in energy, water and waste in 21 EU countries plus *WageIndicator* data before the WISUTIL project started from January 2007 - November 2010. Table 1.1 shows the number of respondents in the web-survey (for more information about the web-survey see Tijdens *et al* 2010);
2) the AIAS/MNE database, an already existing database that was extended for multinational companies active in energy, water and waste;
3) an update of the findings of the PIQUE project (2006-2009, co-ordinated by FORBA: Flecker *et al* 2009) aiming to investigate the relationship between employment, productivity and the quality of public services in the process of liberalisation and privatization;
4) issues of the monthly *AIAS-ETUI Collective Bargaining Newsletter* and the bi-weekly *EPSU Collective Bargaining Newsletter*, covering the period 2008-current;
5) other publications and reports, like those of the Public Services International Research Unit (PSIRU) of the University of Greenwich, London: see reference list.

The WageIndicator web-survey

Concerning the *WageIndicator* survey, one should note that this information is derived from a volunteer survey; therefore, it is not representative for the labour force at large in a country, or

for all workers in the energy, water and waste sectors in the European countries.[3] One should also note that the *WageIndicator* web-survey has a substantial drop-out during survey completion, which is common for all web-surveys. Therefore, the number of observations is lower for questions that are asked to the end of the questionnaire. Basically the minimum number of observations per cell is around 10, so the reader should be very careful with drawing conclusions from cells with less than 10 observations! For more information about the WageIndicator web-survey, see the codebook at www.wageindicator/main/publications/2010.

At the start of the WISUTIL project, 14 of the 21 countries in the project had already a *WageIndicator* web-survey. During the project in seven countries new websites were started, namely in Austria, Bulgaria, Ireland, Luxembourg, Portugal, Romania, and Slovenia. In spite of the attempts of the EPSU affiliates to complete the survey, the number of respondents in these countries turned out to be too low to be included in the analysis. In total, 10,013 workers from all 21 countries started the questionnaire, as Table 1.2 shows. The number of respondents (the 'N' in the graphs and tables in this chapter) that gave complete details about their information is 5,430, which is 54%. This drop in response is mostly due to workers who quit the survey halfway and to a lesser extent to the fact that the reported wages were outside the range of valid answers. In this report, no information will be given about countries with less than 50 observations with valid wage data. Unfortunately, this is the case for eight of 21 countries, namely Austria, Bulgaria, Ireland, Luxembourg, Portugal, Romania, Slovakia and Slovenia. In seven of these countries the web-survey did not start until November 2010, which left obviously a too short period in time as to collect sufficient data. The remaining 13 countries are included in the analyses of the wages, namely Belgium, Czech Republic, Denmark, Finland, France, Germany, Hungary, Italy, the Netherlands, Poland, Spain, Sweden, and the United Kingdom. Per country the number of observations with valid wage data ranges from 66 to 1,155. The total number of observations in these 13 countries used in the wage analyses is 5,361: see Table 0.2.

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[3] *From a scientific perspective, concerns have been raised in relation to the quality and reliability of web-survey data. The problem of sample bias arises when those not covered, not recruited, and/or not surveyed are different from those who are covered, are recruited and have responded. In the case of the volunteer WageIndicator web-survey, the most serious question is to what extent the results are representative for the general population. To deal with this problem, different weighting techniques have been proposed to adjust a biased web sample to the population under consideration. For the WageIndicator data the efficiency of different weights in adjusting biases regarding the wage variable has been considered (Steinmetz and Tijdens 2009). Specifically, un-weighted and weighted results of these data from the year 2006 for selected countries (Germany, Netherlands, Spain, United States, Argentina, and Brazil) have been compared using representative reference surveys for the same year. Similar to findings from previous studies, the results showed that all web samples deviated from the reference samples with regard to the common variables age, gender and education. This argument is supported by a detailed comparison of the WageIndicator data to representative surveys, such as the Labour Force Survey or the World Values Survey using the distributions over 36 categories (2genders*2workinghours*3agegroups*3 education groups). As shown in the analysis, for most of these categories it would be exaggerated to speak of a fundamental selection bias in the volunteer data set. The mean wages did not largely deviate from the representative data and, moreover, the impact of the applied weights on the wages seemed to be very limited. It seems worthwhile to emphasize the argument made by Couper and Miller (2008) that it is better not to treat survey quality as an absolute, but to evaluate quality relative to other features of the research design and the stated goals of the survey.*

Table 0.2 Number of observations in the web-survey and number of observations with valid wages data in 21 countries

	No of observations	Col %	WI website start - month	No of obs. with valid wage data	Col %	% of obs. with valid wage data	Included in analyses
Austria	42	.4	Nov-10	18	.3	42.9%	no
Belgium	1274	12.7	Nov-04	662	12.2	52.0%	yes
Bulgaria	12	.1	Nov-10	3	.1	25.0%	no
Czech Republic	486	4.9	Feb-09	317	5.8	65.2%	yes
Denmark	137	1.4	Dec-04	66	1.2	48.2%	yes
Finland	807	8.1	Apr-05	461	8.5	57.1%	yes
France	131	1.3	Apr-08	66	1.2	50.4%	yes
Germany	2071	20.7	Oct-04	1155	21.3	55.8%	yes
Hungary	215	2.1	Jun-06	116	2.1	54.0%	yes
Ireland	7	.1	Nov-10	1	.0	14.3%	no
Italy	165	1.6	Apr-05	98	1.8	59.4%	yes
Luxembourg	28	.3	Nov-10	8	.1	28.6%	no
Netherlands	2114	21.1	Apr-00	1046	19.3	49.5%	yes
Poland	307	3.1	Nov-04	204	3.8	66.4%	yes
Portugal	32	.3	Nov-10	16	.3	50.0%	no
Romania	34	.3	Nov-10	15	.3	44.1%	no
Slovakia	25	.2	Jan-09	7	.1	28.0%	no
Slovenia	7	.1	Nov-10	1	.0	14.3%	no
Spain	1079	10.8	Nov-04	579	10.7	53.7%	yes
Sweden	216	2.2	May-08	165	3.0	76.4%	yes
UnitedKingdom	824	8.2	Nov-04	426	7.8	51.7%	yes
Total (N)	10013	100%		5430	100%	54.2%	-

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers in energy, water and waste in 13 EU countries with valid wage information.

In the Chapters 2, 3 and 4 we will present the empirical results of the *WageIndicator* web-survey for the 13 countries, through graphs. Appendix 2 contains tables with the corresponding figures; the numbering of these tables corresponds with that of the graphs. Appendix 1 includes a list of all occupational titles with 4 or more observations and their grouping into these three major groups.

Chapter 1 Markets, employment and skills

In this Chapter we present information on the utilities sector in the EU that is essential for an understanding and interpretation of the empirical outcomes that we will present in the Chapters 2, 3 and 4, on a number of issues: on market structures and market trends; on technology and (re)organization; on employment; on skills, efficiency and service quality, and on collective bargaining. Wherever possible we focus on information about the 21 member states included in the WISUTIL project. We aim at clarifying the development of legal frameworks and economic and social conditions influencing ownership relations, and indeed liberalization and privatization are central themes here. In doing so, we split up the sector at large in four sub-sectors: electricity, gas, water, and waste. This is in contrast with the next chapters, where 'electricity' and 'gas' have been treated jointly as 'energy', but the reader will note that in particular market conditions and trends vary substantially between the two sub-sectors 'electricity' and 'gas'.

1.1. Market structures and trends

1.1.1 Electricity

In the UK, privatisation of the electricity sub-sector took place prior to the process of liberalisation, while in the other EU member states the process went in reverse order. While the privatisation of the UK's previously fully publicly owned electricity industry was well under way in the mid-1990s and markets were fully opened by 1999, in the majority of member states liberalisation only took off in the late 1990s, after the adoption of the 1996 EC Electricity Directive in 1999. On the one hand, the directive called for a gradual opening-up of retail markets for the largest customers (40 GW/year starting from 1999; 20 GW/year starting from 2000 and 9 GW/year starting from 2003). On the other hand, it imposed the requirement to legally separate network maintenance from other activities, or at least to establish separate accounting systems in order to permit equal network access to competing providers. This was followed by the Second Electricity Directive in 2003, which imposed the creation of fully liberalised markets for commercial users by 2004 and for residential consumers by 2007. It also included a number of additional unbundling requirements and the establishment of national electricity regulators. Unbundling, consequently, led to a splitting-up of existing providers. Some companies used the disintegration to establish formally independent subsidiaries and employ workers outside the relatively generous electricity sector collective agreements. As described further below, this resulted in a considerable fragmentation and deterioration of electricity sector employment and working conditions.

Far from creating highly competitive electricity markets, liberalisation has triggered a process of concentration with the result that public monopolies have been replaced by private oligopolies (Hermann and Verhoest 2009; Hermann and Pond, forthcoming). Currently five major multinational companies dominate the European market, complemented by two somewhat smaller corporations that have major assets in more than one country. Steve Thomas (2003) has coined them the "Seven Brothers", as an analogy to the "Seven Sisters", the large multinational oil companies that dominate the world oil market. Both in 2008 and 2010, together GDF Suez and EDF (France), EON and RWE (Germany), ENEL (Italy), Iberdrola (Spain) and Vattenfall (Sweden) achieved over three times more turnover than the following 12 companies, largely operating nationally and with rather limited interests abroad[4]: see Table 1.1.

[4] *Although some of these firms are rapidly expanding internationally. For example CEZ expanded the last few years solely in power production beyond the Czech Republic and Slovakia to Germany, Austria Poland, Romania, and Bulgaria (CEZ Annual Report 2010, company website).*

Though the packages of activities of the respective firms are hard to compare, it remains remarkable that turnover per employee is lower for the "Seven Brothers" taken together than for the next 12 firms as a whole: in 2010 € 607,938 versus € 730,015. Moreover, from the table it can be derived that in 2008-2010 the joint turnover of the "Seven Brothers" increased by 10.1%, but the joint turnover of the next 12 firms by 12.2%. Total employment in the large seven multinationals fell slightly, whereas joint employment in the 12 firms grew by just over 4%. This comparison indicates that on average efficiency and productivity of the seven internationalized firms are not higher than those of the next 12 companies.

Table 1.1 The 'Seven Brothers' and national energy companies, turnover and workforce, 2008 and 2010

	Turnover (billion €)		Worldwide workforce	
	2008	**2010**	**2008**	**2010**
GDF SUEZ (FR)	67.9	84.5	234,653	236,116
EON (GE)	86.8	92.9	93,538	85,105
EDF Group (FR)	64.3	65.2	160,913	158,842
ENEL (IT)	61.2	73.4	75,981	77,704
RWE (GE)	48.9	53.3	65,908	70,865
Iberdrola (SP)	25.2	30.4	32,993	29,641
Vattenfall (SW)	15.0	23.7	32,801	38,179
'Seven Brothers'	**384.5**	**423.4**	**696,787**	**696,452**
Centrica (UK)	23.0	26.0	32,187	27,298
Scottish & Southern (UK)	21.0	25.0	18,500	18,196*)
National Grid (UK)	16.9	16.6**)	27,886	28,000
EDP (SP/PT)	13.9	14.2	12,245	12,100
Gas Natural Fenosa (SP)	13.5	19.6	6,842	18,780
DONG Energy (DK)	8.2	7.3	5,347	5,847
CEZ Group (CZ)	6.9	8.1	27,232	32,627
PPC (GR)	5.8	5.8	23,611	21,845
Fortum (FI)	5.6	6.3	14,077	10,585
Verbund (AT)	3.7	3.3	2,541	3,015
Statkraft (NO)	2.8	3.8	2,633	3,300
EVN (AT)	2.4	2.8	9,342	8,540
National companies	**123.7**	**138.8**	**182,447**	**190,133**

Source: Thomas 2009: 6-7; company annual reports 2010

**) 2009*

***) 2010-2011*

Four specific developments deserve to be mentioned, all of relevance for trade unions operating in utilities. First, with the splitting-up of existing providers, large network companies have emerged which have no interest in buying or selling energy. Besides National Grid (partly owned by the UK government, partly by energy companies, partly by other investors), already included in Table 1, the most important are TenneT (publicly owned, Netherlands) and REE (private, Spain). Especially TenneT has grown rapidly, particularly by its 2009 take-over of part of the German transmission network from EON (Thomas 2009: 4, 31).[5] Second, a large number of specialist and outsourced companies has been created in the energy market, often quite small in size, leading to a (at least from the outside) fragmented and complicated market landscape.

[5] *These network providers can be extremely capital intensive. For instance, in 2010 TenneT reached sales of €7.3 billion with a workforce of only 1,879 (Annual Report 2010).*

Between 2000 and 2006, according to Eurostat the number of enterprises in the energy sector of the EU27 grew by no less than 52%, from 14,605 to 22,200. The highest increase took place in Spain, Portugal and Hungary, followed by Austria, Bulgaria and Romania (Stawinska 2009: 5-6).

A third important development is that, under pressure of the European Commission's Directives and the large volumes of investment in the construction of new and heavily capital-intensive capacity generating projects, the largest energy firms growingly form consortia, in which they respectively take part with minority shares (Thomas 2009). Moreover, in and between major firms, continuous benchmarking operations have been developed, and various firms and associations offer services here (like the Electric Utility Benchmarking Association, EUBA). As in other industries, benchmarking may have major spill-overs for industrial relations: it may drive 'coercive comparisons' of labour costs, working practices and performance, and exert downward pressure on Human Resources Management (HRM) practices and working conditions (Cf. Van Klaveren and Tijdens 2008: 2-3). Fourth and finally, within the EU regional energy markets are developing, with specific coordination institutions in place: cooperation between governments, regulators, companies and others in regional mini-fora. A concrete manifestation is the CASC-CWE (Capacity Allocation Service Company-Central West Europe) in which TSOs (Transmission System Operators) from several countries work together and hold joint shares (internal note EPSU).

The high degree of market concentration in the European electricity and gas markets is the result of a sustained wave of mergers and acquisitions within EU member states and across borders, in some cases also involving acquisitions outside Europe. All "Seven Brothers" were heavily involved in mergers and acquisitions: see the box below. In-depth research on company restructuring in the electricity sub-sector, carried out as part of the PIQUE project,[6] confirmed this trend. In four out of the six PIQUE cases ownership has changed in the last ten years and in two cases ownership changes involved a shift from a fully publicly to fully privately owned enterprise. As a result, five out of these six companies are predominantly or fully foreign-owned (Hermann and Pond, forthcoming). Others have already earlier argued that the combination of market liberalization and concentration in saturated markets impacts directly on the reduction of employment, and that the strongest reductions take place in liberalized markets. The negative employment effects of outsourcing by utilities companies may well top this trend. Outsourcing may partly cover core areas, like maintenance and the construction of network grids, and partly non-core areas, where it especially may affect the low-skilled (Nevala 2007).

CHARACTERISTICS OF THE "SEVEN BROTHERS"

GDF SUEZ. This company was formed in 2008-09 through the merger of the partly privatised French gas company Gaz de France (GdF) and the French-owned but Belgian-based energy company SUEZ. GdF already had significant assets in Germany, Hungary, Slovakia, Portugal, Romania and Belgium; SUEZ controlled the dominant electricity and gas companies in Belgium, Netherlands, France, Italy, Hungary and Poland. Recently GDF SUEZ expanded largely in the UK, taking a 70% controlling share over the major British utility firm International Power. In 2010, 63% of the revenues of GDF SUEZ were gained outside France, whereas that share was still

6 *Privatisation of Public Services and the Impact on Quality, Employment and Productivity (PIQUE) was a research projected funded by the European Commission's Sixth Framework Programme, coordinated by FORBA. It lasted from 2006 to 2009 and covered six countries (Austria, Belgium, Germany, Poland, Sweden, and the UK) and four public service sectors (electricity, postal services, local public transport, health care/hospitals). Among other things, the project carried out a series of company case studies on restructuring and the impact on quality, efficiency and employment and working conditions. More information in Flecker* et al *2009 and at:* www.pique.at.

69% in 2008: expansion in France remains stronger. Turnover growth in 2008-2010 reached 24.4%, against an increase in employment of only 1,500 (0.7%).

EON. This is one of the two major German electricity and gas companies. In 2008, it acquired some of ENEL/Endesa's assets in Spain, Italy and France. It already had major market positions in the UK, Sweden, Czech Republic, Netherlands and significant stakes in Romania, Hungary and Bulgaria. In 2010, 59% of the EON staff was employed outside Germany. In 2008-2010, EON showed a 7% growth in turnover while employment diminished by 8,400 or 9%.

EDF Group. The former Electricité de France is the main French energy company, which was partly privatised in 2005 but remains 84.5% owned by the French government. In 2009, it took over the British nuclear generation company, British Energy, as well as Segebel (Luminus), the second-largest player in the Belgian energy market. It already had major market positions in the UK, Germany, Italy and smaller but significant assets in Poland, Spain, Netherlands, Switzerland and Hungary. Its expansion rests heavily on nuclear power. In 2010, 44% of the EDF Group turnover was gained outside France. Over 2008-2010, Group turnover grew by only 1.5%, while employment fell by 2,100 or 1.3%.

ENEL. This is the main Italian energy company, which in the past decade has been progressively privatised so that by 2009 only about 30% of the shares were in national ownership. In 2007, it completed the takeover of the largest Spanish energy company, Endesa. It also has major power plants and market positions in Romania and Slovakia. ENEL does not own transmission networks. Between 2008 and 2010, ENEL's turnover grew by exactly 20%, but its workforce by only 1,700 or 2.2%.

RWE. This is the other large German energy company. In the 2000s, it sold off its manifold non-energy activities, though some water activities remain. In 2009, RWE completed the takeover of the Dutch energy company, Essent. It already had strong market positions in the UK, the Czech Republic, Poland and Hungary. Currently, RWE advertises to be the no. 1 power producer in Germany, and the no. 3 in the UK and the Netherlands. In 2008-2010, RWE's revenue grew by 9% and employment by 7.5%.

Iberdrola. This is the remaining large Spanish company (apart from ENEL/Endesa). It has a major market position in the UK, through the acquisition of Scottish Power in 2007. It realized a rapid growth in the 2000s, especially through expansion in renewable energy like wind energy. In 2010, 60% of its workforce was employed outside Spain. Iberdrola does not own transmission networks, but is leading in renewable energy. In 2008-2010, Iberdrola's turnover grew by 20.5%, but at the same time its workforce fell by 10%. The company explains this fall by the sales of assets in the US and Latin America.

Vattenfall. This is the only international company still fully nationally owned i.e. by the Swedish government. In 2009, it gained control over the other large Dutch utilities company, Nuon, though this brought Vattenfall into serious financial problems. It already had a major market position in Germany and significant interests in Denmark, Finland and Poland. 2008-2010 witnessed strong growth, with Vattenfall's turnover increasing by 58%; in contrast, employment grew by only 16%.

Sources: Thomas 2009; Van den Heuvel et al *2010; EMCC 2008c, 2008d, 2008e; company annual reports and websites; various press messages*

In Table 1.2 we have mapped the interests of the "Seven Brothers" in the 21 countries involved in the WISUTIL project. We have only included substantial interests.[7] The table shows that by

[7] *For instance in case of retail activities, we have only mentioned these if the firm in question has a market share in the country at stake of at least 2%. Purely administrative or financial holdings have been*

September 2011 GDF SUEZ and EON are most internationalized, followed by EDF, RWE and, maybe surprisingly, Iberdrola. ENEL and Vattenfall close the ranks of the "Seven", albeit with interests in nine of 21 countries. As for countries, all companies have interests in France, while Germany, Italy, Poland, Slovakia, Spain and the UK follow with six of seven companies. Five companies have interests in both Belgium and the Netherlands. According to our information, only one major company deploys substantial activities in Slovenia.

Table 1.2 Division of activities of the 'Seven Brothers' by country, 1 September 2011

	GDF SUEZ	EON	EDF	ENEL	RWE	Iberdrola	Vattenfall	TOT comp.
Austria	x	x	x					3
Belgium	x	x	x		x		x	5
Bulgaria		x		x		x		3
Czech Republic	x	x						2
Denmark		x			x		x	3
Finland	x	x					x	3
France	**x**	x	**x**	x	x	x	x	7
Germany	x	**x**	x		**x**	x	x	6
Hungary	x	x	x		x			4
Ireland				x	x			2
Italy	x	x	x	**x**	x	x		6
Luxembourg	x							1
Netherlands	x	x	x		x		x	5
Poland	x	x	x		x	x	x	6
Portugal			x	x		x		3
Romania	x	x		x		x		4
Slovakia	x	x	x	x	x	x		6
Slovenia				x				1
Spain	x	x	x	x	x	**x**		6
Sweden	x	x				x	**x**	4
United Kingdom	x	x	x		x	x	x	6
TOTAL countries	16	17	12	9	12	11	9	

Sources: Company annual reports; various press messages

We could have produced nearly the same table more specifically for the energy activities of the seven companies. We have left that out, because we found just one difference: GDF SUEZ does not undertake energy activities but only waste / water activities in Finland, implying that in the energy sub-sector that firm is active in 15 of 21 countries.

Table 1.3 provides an overview of the ownership characteristics of the electricity sub-sector in the 21 countries involved in the WISUTIL project. It shows that in only seven of these countries ownership in the sub-sector is in majority public.

left out. However, the growing number of consortia with minority shares may have led to an underestimation of the interests of the largest energy companies.

Table 1.3 Ownership electricity sub-sector by country, situation 2009-2010

Austria	Mostly public
Belgium	Mostly private (share 78%)
Bulgaria	Mostly public
Czech Republic	Mostly private (share 74%)
Denmark	Mixed (share 47%)
Finland	Mixed (share 25%)
France	Mostly public (share 87%)
Germany	Mixed (share 26%)
Hungary	Mixed (share 43%)
Ireland	Mixed (share 37%)
Italy	Mixed (share 30%)
Luxembourg	Mixed
Netherlands	Mixed
Poland	Mostly public (share 18%)
Portugal	Mixed (share 52%)
Romania	Mostly public (share 29%)
Slovakia	Mixed (share 82%)
Slovenia	Mostly public (share 55%)
Spain	Mostly private (share 33%)
Sweden	Mostly public (share 44%)
UK	Mostly private (share 25%)

Sources: various EU documentation and press messages (departing from Pedersini 2005); shares: Eurostat (http://appsso.eurostat.ec.europa.eu/nui/print.do?print=-true)
Key: share = market share of the largest electricity generator in 2009

1.1.2 Gas

Liberalisation of the gas sub-sector in the EU followed a similar trajectory as in the electricity industry. The first EU Gas Directive was adopted in 1998. As in electricity, the gas directive imposed the requirement to 'unbundle' production from distribution in order to grant third parties access to the distribution network. At the same time the market was opened for customers consuming more than 25 million cubic metre gas per year from 2000 onwards. The threshold was reduced to 15 million cubic metre after 2003. The second Gas Directive from 2003 imposed fully liberalized markets for commercial users from 2004 onwards and for households from 2007 onwards. However, gas differs from electricity insofar as some member states have significant capacities in gas production, while others rely exclusively on the supply of gas from foreign countries, mostly outside the EU. This means that the number of workers employed in the gas sub-sector also varies substantially across member states. Major energy companies are currently involved in safeguarding a considerable part of their gas supply, through securing long-term contracts with in particular Russian Gazprom and through participation in pipelines transporting Russian gas (Nord Stream, Nabucco), but also through own stakes in gas winning. Already in the early 2000s, EON, GDF and Vattenfall articulated their ambition to get 15-20% of their gas from their own sources (Van den Heuvel *et al* 2010).

Still, there is a close link between electricity and gas as municipalities have often provided both, electricity and gas. The link between retailing electricity and gas has been strengthened through liberalization and privatization as many of the large electricity companies have also become active in gas markets. In Germany, for example, EON and RWE have both acquired significant market shares in the national gas markets – EON particularly through the takeover of Ruhrgas in 2002. Usually it is the larger electricity companies that expand into gas markets, though there are a number of cases in which expansion happened the other way round. The newly formed GDF

SUEZ, for instance, had a dominant position in the French gas market from which it expanded into electricity. Centrica, the retail arm of former British Gas, has also reinforced its gas market with a strong position in electricity in the UK market. Another example is Gas Natural of Spain, in 2009 taking over one of the major Spanish electricity companies, Union Fenosa (Thomas 2009: 5). In some countries, however, the gas sub-sector converged with the oil industry with large oil companies producing and importing natural gas: Italy's ENI is a major example here. In any case, the gas sub-sector also shows a strong tendency towards concentration.

1.1.3 Water

While the European Union has formally abolished energy monopolies, EU regulations in the water and waste management sectors are mostly technical (For an overview: Hall 2010a). However, in case the whole service or parts of it are provided by an external contractor, even if it is a public corporation, the awarding of the contract must confirm with the EU Public Procurement Directives.[8] In addition, municipalities are under considerable pressure to cut costs in order to reduce public deficits, vigorously monitored by the European Commission. In circles of policy makers, outsourcing and public-private partnerships (PPPs) are widely considered as cost-reducing measures. The European Commission is also very active in promoting PPPs as solution to the infrastructure crisis that has been caused by a lack of public investment; the European Bank for Reconstruction and Development (EBRD) is eager to provide financing – especially in the New Member States (NMS) (Hall and Lobina 2008a, 2010a).

In the long run municipalities may find out that private contractors are more expensive and provide inferior services. As a result, quite some municipalities, in particular in Germany and France, have re-integrated service provision in a process known as 're-municipalisation'. Perhaps the most spectacular case in this respect was the termination of the 25-year concessions held by Suez and Veolia for water supply in the city of Paris (Candeias *et al* 2008; Hall and Lobina 2010a). It has to be noted that in particular the privatization of water provision has met strong political resistance throughout Europe and elsewhere. Widespread opposition has also come from a range of civil society groups, including trade unions. Such resistance has been fuelled by the economic, social and even technical problems associated with the implementation process (Hall *et al* 2005; Hall and Lobina 2008a: 13-18). Proponents of liberalization have to admit that the results of political steps in this direction in water are at best mixed, and that there is no ideal liberalisation model that offers a way out **(**Peeroo and Ménard 2010).

As for the structure of competition: There are member states with largely privatized water systems such as France and the UK, and countries where water systems are still exclusively operated by public organisations, often on a local level. While across Europe water management is still mostly public and public finance continues to play a dominant role in funding, there is also a number of private water companies, often in the course of the 2000s separated from their earlier multinational 'mothers' that retreated from the water sub-sector. As we will discuss below, the largest of these new companies have internationalized and increased their market shares in recent years. Moreover, in various countries public water operations are commercialized, with for instance public water operators introducing 'demand driven' maintenance or engaging in commercial operations (Hall and Lobina 2008a, 2008b, 2010b). Table 1.4 presents an overview of the situation in 'our' 21 countries as of 2009-2010. It indicates that in 13 countries water facilities are mostly publicly owned.

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[8] *Yet, on 9 June 2009 the European Court of Justice decided that local authorities are allowed to cooperate using each other's resources without applying the EU Public Procurement Directives (Hall 2010a: 8).*

Table 1.4 Ownership water sub-sector by country, situation 2009-2010

Austria	Mostly public
Belgium	Mostly public
Bulgaria	Mostly public
Czech Republic	Mixed
Denmark	Mostly public
Finland	Mostly public
France	Mostly private (PPPs)
Germany	Mostly public
Hungary	Mostly public
Ireland	Mostly public
Italy	Mostly public
Luxembourg	Mostly public
Netherlands	Mostly public
Poland	Mixed
Portugal	Mixed
Romania	Mostly public
Slovakia	Mixed
Slovenia	Mixed
Spain	Mixed
Sweden	Mostly public
UK	Mostly private

Sources: Hall and Lobina 2010a; Dutch embassy Romania (for Romania and Bulgaria); various press messages

By the end of 2010, there were seven companies operating water services in more than one EU member state. The two most important and growingly dominating private water companies are SUEZ Environnement and Viola Environnement, both France-based and both with ties to the energy sector. Besides the internationalized companies mentioned below, there is a number of private water companies active on a national scale, especially in Spain (besides FCC/Aqualia and Sacyr Vallehermoso/Valoriza, also ACS-Dragados), Germany (besides Gelsenwasser, also RWE[9] and Berlinwasser), Austria (besides Energie AG, also EVN), UK (Biwater and United Utilities[10]) and Italy (Acea). These companies are often part of larger groups dominated by construction or electricity companies. Several of them are also active in waste management (Hall and Lobina 2010a).

CHARACTERISTICS OF SEVEN INTERNATIONALIZED WATER COMPANIES

SUEZ Environnement, consisting of the water and waste divisions of GDF SUEZ, was spun off as a separate company in 2008. It is 35.4% owned by GDF SUEZ, the company formed by the merger of Suez' energy division with GdF and currently one of the major players in the European energy sector (see above). In 2010 it had total sales of €13.9 billion, of which €7.4 billion (53%) was earned in the water sector (34% in France, 19% internationally), and 47% in waste management. By then, SUEZ Environnement had worldwide nearly 79,550 employees, a strong growth compared to 2009 (65,895 employees); 44% of them worked in France, 41% elsewhere in Europe. Besides being one of the two dominant water and waste companies in France, SUEZ takes strong positions in a number of other EU member states, in particular through its SITA subsidiary. In

[9] *RWE has been systematically withdrawing from the water sub-sector since 2004. It currently retains minority stakes in water in Germany (Berlinwasser), Hungary and Poland.*

[10] *In the course of 2010, both Biwater and United Utilities completed their withdrawal from international activities (Hall and Lobina 2010a).*

2009 it took control over AgBar, market leader in the Spanish water sub-sector. By September 2011, its European water subsidiaries were active in 11 of 'our' 21 countries.

Veolia Environnement encompasses energy (Dalkia, a 50-50 joint venture with EDF), water, waste, and public transport operations. In 2010 its total revenue was $34.8 billion, of which €12.1 billion, or 35%, in water (drinking water and wastewater treatment): relatively profitable, as these activities in that year contributed 48% to the company's operating income. Veolia is the only group stating that it plans to expand its water operations worldwide. Its activities in Europe have indeed increased significantly since it bought the European subsidiaries of United Utilities in Estonia, Bulgaria and Poland. In 2010, its workforce in water grew by 16,000 to 96,260, 30% of the group total. By September 2011, the European water subsidiaries of Veolia were active in 11 of 'our' 21 countries.

The French **Groupe SAUR** undertakes activities in the water sub-sector as well as in real estate, engineering, leisure and travel. By the end of 2010 SAUR had 13,000 employed; its 2010 sales were nearly €1.5 billion. In April 2007, SAUR was bought by a consortium led by the French state bank CDC, which currently holds 47%.

FCC is a Spanish construction, cement, and urban services group. Its environmental services division includes waste management and water, and **Aqualia** is its water company. In 2009 it set up a new subsidiary (50%), jointly with the EBRD, aiming at expansion in a number of new member states, Russia and Ukraine. Aqualia operates already, besides in Spain, in Portugal (waste management), the Czech Republic, and Italy. In 2010 it had 7,500 employed and €880 million sales.

Sacyr Vallehermoso/Valoriza: Sacyr Vallehermoso (SYV) is a Spanish construction, infrastructure and real estate group, which currently encounters serious problems due to the recession. Its 2010 sales were €4,820 million, against still €5,825 million in 2009. By the end of 2010, the Group had 21,380 employees. **Valoriza** is the services group of SYV, with stakes in water and waste management.

Gelsenwasser is one of the two public companies in this list: it is a water, gas and electricity distribution firm, 98.5% owned by the German cities Bochum and Dortmund, which bought the company from EON in 2003. Since then, Gelsenwasser retreated from Hungary, but it still has modest interests in the Czech Republic and Poland as well as in a small French water company. In 2010 it had 4,600 employed and total sales of €702 million.

Energie AG is also publicly owned: it originated as an energy company owned by the province (Land) of Upper Austria, which still owns 51%. In recent years it expanded into water and waste services, and invested in water activities in the Czech Republic and Slovenia. In 2009-10 Energie AG had 7,300 employed and its sales were €1,979 million, of which €118 million in water and €380 million in waste.

Sources: Hall and Lobina 2008a, 2010a; company annual reports and reference documents 2010; company websites

Table 1.5 provides an overview of the recent water activities of the seven internationalized companies in the 21 countries involved in the WISUTIL project. As for countries, most covered are the Czech Republic, France, Poland and Spain, all by four international water companies. According to our information, these companies did not deploy substantial activities in Denmark, Ireland, Luxembourg, the Netherlands, and Sweden.

Table 1.5 Water activities of seven internationalized companies by country, situation 31 December 2010)*

	SUEZ	Veolia	SAUR	FCC/	Sacyr	Gels	Energie	TOT comp.
Austria							**x**	1
Belgium	x							1
Bulgaria		x						1
Czech Republic	x	x		x			x	4
Denmark								0
Finland		x						1
France	**x**	**x**	**x**			x		4
Germany	x	x				**x**		3
Hungary	x	x				x		3
Ireland								0
Italy	x	x		x				3
Luxembourg								0
Netherlands								0
Poland	x	x	x			x		4
Portugal					x			1
Romania	x	x						2
Slovakia	x	x						2
Slovenia							x	1
Spain	x		x	**x**	**x**			4
Sweden								0
United Kingdom	x	x	x					3
TOTAL countries	11	11	4	3	2	4	3	

Sources: Hall and Lobina 2008b, 2010a; company annual reports; various press messages

**) SUEZ and Veolia: 1 September 2011*

Key: FCC/ = FCC/Aqualia (ES)

Sacyr = Sacyr Vallehermoso/Valoriza/AGS (ES)

Gels = Gelsenwasser (GE)

Since there are only a few large companies providing private water services, there is a considerable risk that they exert excessive and unjustified market power. However, water companies have faced a number of problems with regard to generating profits from their investments, also as water systems require extremely high levels of investment. As a result, several major companies have shifted their strategy: Instead of acquiring concessions and leases, involving long-term investments and commitments, they now focus on short-term management or advisory contracts, and treatment plants on a BOT (Build, Operate, Transfer) basis. While management contracts last between two and five years, BOT contracts for treatment plants last considerably longer, often between 20 and 30 years. Water companies, furthermore, increasingly rely on public support, especially from the EBRD which has invested almost €500 million in private water operation between 1991 and 2009, either as loans or private equity investments. On the other hand, as noted the sub-sector has also seen a number of cases of re-municipalisation (Hall and Lobina 2010a).

1.1.4 Waste

The competitive situation in waste management is rather similar to that in the water sub-sector. The two France-based leading water companies are also Europe's two largest companies in waste management. Yet privatization has gone further in waste management than in the water sub-sector. According to a sector expert, already in 2001 private companies in the EU captured approximately 35% of refuse collection, the rest still being handled by public organizations, often municipalities (Davies 2003: 13). Currently for example in Denmark 80% of garbage collection is handled by private contractors (Sørensen and Hasle 2011). In other countries, such as Austria, waste management is still predominantly in public hands, but municipalities here have created

independent subsidiaries, some of which have started to operate abroad (Holtgrewe and Sardadvar 2011). In Italy, the large cities run their own waste companies while smaller municipalities often rely on private firms (Ferraris *et al* 2011).

As for the treatment of waste, Eurostat figures show that in 2009 38% of all municipal waste in the EU27 was landfilled, 20% incinerated, 24% recycled, and 18% composted. The 2000s witnessed major changes in this division: the 2000 shares were respectively 55%, 16%, 16% and 11%, indicating the gradual loss of the landfill share against the other three waste treatment forms; the absolute amount of municipal waste landfilled in the EU27 decreased as well, between 2000 and 2009 by about 30%, whereas at the same time the amount of waste recycled grew by nearly 60% (authors' calculations based on Blumenthal 2011). Some European Directives have contributed to this development, in particular Directive 1999/31/EC on the landfill of waste, requiring member states to reduce the amount of biodegradable municipal waste going to landfills gradually to 35% by 16 July 2016. Nevertheless, lack of further European interference in waste collection and management has helped to maintain considerable national differences in how (municipal) waste is treated as well as in how waste management systems are structured and how much competition is allowed. In 2009, across the EU27 the highest amounts of waste were landfilled in Bulgaria, Romania, Lithuania and Latvia (90% or more); whereas on the other hand Germany, the Netherlands, Sweden, Austria, Denmark and Belgium reported landfill rates below 5%. By then, with 49% and 48% respectively Sweden and Denmark had the highest incineration rates for municipal waste in the EU-27, Germany (48%), Sweden and Belgium (36%) the highest rates for recycling, while Austria (48%) and the Netherlands (36%) reported the largest shares of composting. These figures have to be regarded against the backdrop that the amount of waste generated varies enormously across countries: in 2009 the average municipal waste of 520 kg per person of the EU hides a variation from 316 kg in the Czech Republic to 831 kg in Denmark – a variation reflecting differences in consumption patterns and economic wealth, but also in the organisation of municipal waste collection and management (Blumenthal 2011). These differences have, of course, their effects on the input of labour in these activities in the respective countries.

Though the amount of municipal waste per capita in the EU at large is only slightly increasing since 2000 and in some countries even falling (Blumenthal 2011), political and societal pressures urge for more sophisticated forms of waste treatment. Waste collection and management activities in the 2000s have recorded high growth rates and are expected to increase further in the near future, making it a highly interesting sector for private investment. As mentioned before, municipalities are under considerable pressure to cut deficits and the privatization of municipal services such as waste management is widely advertised as highly effective cost-cutting measure. The withdrawal from Europe of two big US-based waste companies, Waste Management Inc and Allied Waste/BFI, between 1998 and 2002, following problems with the US competition authorities (Davies 2003: 5), triggered a wave of mergers and acquisitions in waste. Although this wave slowed down after 2007, there is still a tendency towards concentration, as in the other sub-sectors (Hall 2010b: 3). In 2008 the three largest waste companies – Veolia Environnement (through Veolia Propreté), SUEZ Environnement (mainly through SITA) and Remondis – together achieved a 50% higher turnover as the remaining 13 smaller companies – although the numbers for Remondis do not only include waste management. SUEZ is clearly the market leader, with in 2010 €9,312 million sales and 84,740 employed in waste (source: reference document).[11] For an overview, see Table 1.6.

[11] *For 2010, SUEZ Environnement and Remondis did not give breakdowns of sales and numbers employed in the sub-sectors water and waste.*

Table 1.6 Largest municipal waste management companies in Europe, 2008

Company	Parent	Parent country	Parent type	sales 2008 (€ mln.)	notes
Veolia Environnement	Veolia	France	S	7,668	a
SUEZ Environnement	GDF-SUEZ	France	S	5,770	a
Remondis	Rethmann	Germany	P	5,600	b
FCC	FCC	Spain	S	2,788	c
Alba	Alba	Germany	P	2,700	d
Urbaser	ACS	Spain	S	1,480	b
AVR/Van Gansewinkel	KKR/CVC	USA/UK	PE	1,197	d
Biffa	Montagu PE	UK	PE	788	e
Shanks	Shanks	UK	S	697	e
Séché-SAUR	Groupe Séché	France	S	695	f
Cespa	Ferrovial	Spain	S	606	d
Ragn-Sells	Ragn-Sells	Sweden	P	408	d
Delta	Delta	Netherlands	Mun	405	a
Energie AG	Energie AG	Austria	Mun	300	a
Lassila & Tikanoja	Lassila & Tikanoja	Finland	S	300	a
CNIM	CNIM	France	S	271	a

Source: Hall 2010b; Energie AG annual report 2008

Notes:
a. Waste management, Europe
b. Includes water
c. Environmental services, excluding water
d. Total company sales
e. Year to March 2009, total company sales
f. including waste business of SAUR
Key to parent indication:
P= private
PE= private equity
S= stock exchange listed
Mun= municipal/regional

David Hall distinguishes five main categories of waste management companies: the French listed companies Suez and Veolia, with major government shareholdings; the Spanish companies, all subsidiaries of major private listed construction groups FCC, ACS, and Ferrovial; 'traditional' private companies, led by Rethmann (whose waste and water division operates as Remondis) and the Alba Group; two companies still owned by private equity; and a last category consists of large municipally (and regionally) owned companies, including Delta from the Netherlands and Austria's Energie AG. In addition to these major companies, there are still many small publicly and privately owned waste operators in many European countries (Hall 2010b: 3-4). In terms of business strategies, the major companies continue to push for vertical integration and the creation of environmental service chains, from waste collection and sorting to more sophisticated treatment, including incineration and/or recycling. In this connection there will be growing pressure to create multinational companies offering wide ranges of services (Davies 2003: 15, 19). However, there is a counter-movement: like in the water sub-sector, municipalities recently have brought waste collection back 'in-house', again notably in France and Germany (Hall 2010a: 10).

1.2 Technology and (re)organisation

New technology plays a major role in utilities and has fuelled organisational change. In the electricity sub-sector the improvement of gas turbines led to shift from coal to gas based power plants. Growing environmental concerns have also led to investments in renewable energy, most

notably wind and water run turbines, as well as bio mass power plants. At the same time innovations in ICT made unbundling possible, without which liberalization in the electricity sector would arguably not have taken place. Within companies, new technology allowed for the automation of processes such as accounting, billing and 'smart' metering, while sparking the introduction of new forms of customer care, including, as most far-reaching change in work organisation, the establishment of customer care call centres (Flecker and Hermann 2011). In the waste sub-sector, the application of new technology is closely linked to the introduction of new sorting techniques which allow companies to sort out recyclable material. Waste collection continues to involve relatively large amounts of labour, though new low-floor vehicles and special waste bins can make the work less strenuous (Holtgrewe and Sardadvar 2011).

All four sub-sectors have undergone major trends in reorganization, including outsourcing, the creation of relatively independent subsidiaries and the formation of public-private partnerships (PPPs). These changes have had major impacts on employment and working conditions of those working in these industries. In the electricity sub-sector, reorganization was partly caused by unbundling and the employers' efforts to establish formally independent business entities. In countries with weak sector-wide bargaining structures this could imply that workers from the same company were from then on covered by different agreements. Another major trend in all sub-sectors is the establishment of separate retail entities, often involving the creation of call centres. Here companies deliberately pursue the strategy to 'flee' the relatively generous electricity sector agreement and employ its retail staff on regular private sector contracts. Quite some utilities companies have outsourced maintaining customer relations to external call centres. Yet, outsourcing processes have got a much wider scope: other major activities that have recently been outsourced include construction and repair work, maintenance, metering, and IT services. Table 1.7 shows major organisational changes that took place in electricity companies studied in the PIQUE project. In this sample there was even one company, a new retail firm on the Belgium electricity market, which had outsourced all activities except management and a core administrative unit.

Table 1.7 Major organisational changes in PIQUE case study companies, electricity

	Communal Power (AT)	National Power (BE)	Mutual Electricity (BE)	New Electricity (BE)	Eastern Electricity (PL)	Capital Power (UK)
Splitting-up of the company (as a result of unbundling)	X	X			X	X
Retail departments or subsidiaries	X	X	X	X	X	X
In-house call centres	X	X	X		X	X
External call centres				X		
Concentration	X	X	X	X	X	
Flatter hierarchies	X		X	X		X
Outsourcing		X	X	X		X
Insourcing	X					X

In recent years the most common form of reorganization in the water sub-sector has been the formation of PPPs: Rather than acquiring public water infrastructures, private companies sign contracts with public authorities according to which they receive the exclusive right to run the water systems at stake for 20 to 30 years. Usually the private partner agrees to make investments in infrastructure maintenance; in exchange that partner receives parts or all of the revenues generated by the service. In waste management, the whole service is outsourced to a private partner, often a multinational firm. The private contractor is paid for the service according to a

temporally limited contract. PPPs and outsourcing led to the close-down of those facilities which were previously responsible for providing the respective services. Sometimes the PPP arrangement involved the transfer of staff to the new private operator. While losing technical staff, public authorities have added capacities for contract negotiations and contract monitoring.

1.3 Employment

1.3.1 Employment in utilities

Recent figures for employment in utilities at large in the EU are rare. According to Eurostat, in 2006 throughout the EU27 the electricity, gas and water sub-sectors employed 1.7 million, employees as well as self-employed. Energy alone, covering electricity, gas and steam and hot water supply, each including branches of production or manufacturing, distribution and end (retail) sale, employed 1.3 million people, of which electricity and steam and hot water supply accounted for about 1,130,000 and gas alone for nearly 170,000. Water supply and sales added just over 400,000 employed (Manshanden *et al* 2009). Recent EU-wide employment figures precisely covering waste treatment do not seem to be available; an estimation of total jobs in 'pollution management' for 2006 came at 2.3 million (ECORYS 2008). More recently, for 2008, Eurostat (2011b) registered in the EU27 1.5 million employed persons in electricity, steam, gas and airconditioning supply, and 1.6 million employed in water supply, sewerage and waste management. According to these figures, the 21 EU member states covered by our project accounted in 2008 for 1,444,000 employed in electricity, steam, gas and airconditioning supply and 1,504,000 employed in water supply, sewerage and waste management, totaling nearly three million (2,948,000) employed.

The latest detailed employment figures by sub-sector and by country date from 2006: see Table 1.8. The table shows widely differing shares across countries of respectively electricity, gas, steam and warm water (NACE 40) and production of water (NACE 41) in total employment. Whereas the first sub-sector employed on average in the EU27 countries 0.59% of the workforce, this was more than double (1.20%) in the New Member States (NMS). The employment shares were highest in, in that order, Slovakia, Poland, the Czech Republic and Romania, and lowest in Spain, Portugal, Luxembourg, Belgium, and the UK. Water showed about the same picture, albeit at a lower level: employment shares of 0.18% in the EU27 respectively 0.48% in the NMS. Again, Slovakia had the highest share, followed by the Czech Republic, Hungary and Romania. At the bottom end, Sweden, the Netherlands, Belgium and the UK showed remarkable low numbers of employed in water production, all with less than 0.1% of national employment. It is also interesting to observe the share of the high educated, which has been used in this source (a report commissioned for the European Commission) as a measure for knowledge intensity. In the EU27 workforce of electricity, gas and water together, in 2006 26% was highly educated, against 19% in the NMS. With 48%, Spain showed the highest share of high educated workers, followed by Finland, Denmark and the UK.

Table 1.8 Employment) in electricity, gas, steam and warm water (NACE 40) and production of water (NACE 41), head-count, 2006, by country*

	NACE 40	NACE 41	TOTAL NACE 40 + 41	Of which high educated	NACE 40 in % of national employm.	NACE 41 in % of national employm.
Austria	30,236	3,170	33,406	19%	0.72%	0.07%
Belgium	15,419	7,293	22,712	?	0.36%	0.17%
Bulgaria	39,327	18,284	57,612	22%	0.89%	0.21%
Czech Republic	58,539	29,618	88,157	15%	1.15%	0.58%
Denmark	14,108	3,395	17,503	36%	0.50%	0.12%
Finland	12,365	2,567	14,932	42%	0.51%	0.11%
France	166,029	37,507	203,536	31%	0.66%	0.15%
Germany	249,452	44,122	293,574	31%	0.64%	0.11%
Hungary	32,259	20,333	52,592	17%	0.83%	0.52%
Ireland	10,581	-	10,581	33%	0.52%	-
Italy	92,238	25,609	117,847	15%	0.37%	0.10%
Luxembourg	767	75	842	16%	0.24%	0.02%
Netherlands	20,812	5,203	26,015	34%	0.25%	0.06%
Poland	178,104	52,618	230,722	20%	1.33%	0.39%
Portugal	10,588	12,469	23,057	12%	0.21%	0.24%
Romania	99,558	44,271	143,830	17%	1.08%	0.48%
Slovakia	38,905	18,653	57,558	15%	1.80%	0.86%
Slovenia	7,347	3,914	11,260	33%	0.79%	0.42%
Spain	36,911	32,705	69,616	48%	0.18%	0.16%
Sweden	31,518	1,197	32,715	29%	0.71%	0.03%
United Kingdom	107,549	26,407	133,956	36%	0.35%	0.09%
TOTAL EU 27	**1,297,075**	**401,714**	**1,698,789**	**26%**	**0.59%**	**0.18%**
Total 21 countries	**1,252,613**	**389,409**	**1,642,022**	**26%*)**	**0.67%**)**	**0.24**)**
NMS	**498,502**	**199,996**	**698,498**	**19%**	**1.20%**	**0.48%**

Source: *Manshanden* et al *2009*
*) *employees and self-employed*
**) *unweighed average*

We now go into employment trends and their causes as they can be traced in the sub-sectors.

1.3.2 Employment in electricity

In the electricity sub-sector the combination of liberalization, privatization and the introduction of new technology caused a substantial loss in jobs. Within the EU-15, 246,000 jobs disappeared between 1995 and 2004. In these years, the largest absolute decreases took place in Germany, Italy and the UK, and the largest relative decreases in Hungary (51% decrease), Italy (40%) and the Netherlands (39%), whereas most countries followed suit, with a fall of employment between 22 and 34% (ECOTEC 2007). More recently, Eurostat (SBS) data for 2005-2007 showed a continuous strong fall in Hungary, Austria and Italy, and a somewhat slower but persistent decrease in the other countries: see Table 1.9.

Another source, though not providing absolute figures over time, for 2000-2006 indicated a strong employment fall in particularly Hungary (on average 8% yearly), followed by Luxembourg and Portugal (over 6% yearly), Italy (nearly 6%) and Belgium (4.5%), while suggesting a slowing down of the decrease in Germany and a (temporary) increase in employment in electricity in the UK (Manshanden *et al* 2009). However, it should be noted that over a longer period of time the greatest job losses were recorded in the UK, where since the early 1980s almost half of the jobs disappeared. The meso-economic picture of job losses is largely confirmed by the company case studies carried out in the PIQUE project. However, the PIQUE

case studies also showed that employment cuts usually took place on a voluntary base through early retirement and 'golden handshakes' (Hermann and Pond, forthcoming).

Table 1.9 Employment changes in the electricity sector, various periods, selected countries

	1995-2004	1995-2004	2005-2007	2005-2007
Sources	ECOTEC		Eurostat SBS data	
Austria	-7,629	-24%	-2,632	-11%
Belgium	-4,647	-22%	-152	-1%
Czech Republic	-10,265	-31%	-2,552*)	-3%*)
Denmark	-3,503	-30%	-332	-3%
Finland	-4,863	- 29%	-117	-1%
France	-8,362	- 7%	-1,548	-1%
Germany	-96,000	- 34%	-3,693	-2%
Hungary	-22,145	-51%	-5,738	-26%
Italy	-51,400	-40%	-6,298	-11%
Netherlands	-12,500	-39%	?	?
Poland	-9,348	-9%	-2,763	-3%
Portugal	-3,900	-26%	-312*)	-3%*)
Slovakia	-4,100	-20%	?	?
Spain	-15,952	-34%	-1,584	-4%
Sweden	-8,107	- 33%	-751	-2%
UK	-22,178	-28%**)	?	?

Sources: ECOTEC 2007; Eurostat Structural Business Survey (SBS) Data.
**) 2005-2006*

1.3.3 Employment in gas

Employment in the gas sub-sector also fell significantly through Europe since the start of the liberalization and privatization process – although slightly less dramatic than in the electricity sector. ECOTEC (2007: 54) found employment cuts of between 12 and 13% for 12 member states in the five-year period from 2000 to 2005. In the UK more than a third of the jobs were lost since 1991 (ibid.: 56). Yet, the picture varied considerably across countries. The country figures of Manshanden *et al* (2009: 11) for gas covering 2000-2006 suggest a stronger fall than in electricity employment in Finland (minus 17% average yearly in gas), the UK (minus 4.5% yearly), Poland (minus 4%) and France (minus 2%), a similar decrease in Italy (a fall in both of nearly 6% yearly), and a slower decrease or even an increase in employment in gas for the other countries covered. In Austria, employment in the gas sub-sector fell by 12.5% between 2000 and 2003. The Austrian experiences showed that blue-collar workers took the brunt of that reduction: the number of blue-collar workers decreased by 22%, while those of white-collar workers fell only by 5% (Atzmüller and Hermann 2005: 27).

1.3.4 Employment in water

There is little information available on the long-term development of employment in the water sector in Europe. Given that water management has only limited possibilities to increase output and at the backdrop of the introduction of new technology and growing financial pressures one might expect a fall in employment numbers. Yet, the picture that emerges is diverse. Atzmüller and Hermann (2005: 105) report for Germany that employment in water management has decreased about 25% during the 1990s. Initially, privatisation in the UK also seems to have induced a decrease, but that ended in the 1990s: Whereas UK employment fell by 1.9% annually between 1985 and 1990, it increased by 2.8% between 1990 and 1999 (Hall 2008c: 101). In stark contrast to these findings, a study commissioned by the European Commission showed, based on Eurostat information, a 0.9% annual growth in employment in the water sector in Europe

between 2000 and 2006. Yet, this study also pointed at large differences in employment growth across countries. While in 2000-2006 employment in water in the EU15 increased by 1.5% yearly, the growth pace was only 0.2% in the NMS (Dijkgraaf *et al* 2009: 14). Also within these two country groups developments varied widely: for instance, a yearly growth of water employment in 2000-2006 in Italy of 7.2%, in Spain of 8.5% and in Austria of 7.3%, against a decrease in the UK of 4.1% and in the Netherlands of 5.1%; an increase in the Czech Republic of 4.6% and in Slovakia of 4.4%, against decreases in Hungary (2.5%), Romania (4.1%), and Slovenia (1.5%) (Manshanden *et al* 2009).

Detailed analysis learned that the wave of mergers and takeovers was the driving force behind the job cuts in the British water sector in the 1990s. The new owners were looking for opportunities to save costs, and cutting labour costs was on the top of their agenda. This logic was reinforced by the administrative demands of the regulator, who insisted on a significant level of reductions in operating costs as a condition for approving the mergers. Another reason for the job losses in the water sector was the widespread use of outsourcing. Work which was previously carried out by specialist water workers has been sub-contracted to workers of other companies, on different employment conditions, even where these subcontractors are subsidiaries of the same group (Hall and Lobina 2000).

1.3.5 Employment in waste

Waste differs from the electricity and water sub-sectors insofar as there is wide agreement that employment in waste management has increased significantly in the past decade, in line with growing waste volumes. Many experts expect that this trend will continue in the future. Yet, as we already noted the availability of detailed employment figures as a proof for these statements is limited. Here we have to rely partly on company figures, partly on indications from various countries. Employment in 10 companies with their main interests in waste grew by over 34,000, from 43,200 in 2004 to 77,300 in 2008 (authors' calculations based on Hall 2010b: 7, and company annual reports).[12] As for countries, in Denmark employment in waste management increased between 2000 and 2009 by about 30% (Sørensen and Hasle 2011); in Austria the increase was more than 50% over the same period (Holtgrewe and Sardadvar 2011). Figures from the Netherlands indicate that in 2006 there were already more people employed in waste management than in electricity and gas: 24,800 compared to 19,600. Similarly, in the UK 141,000 people worked in the waste sector in 2005, compared with about 100,000 in electricity and gas (Dijkgraaf *et al* 2009: 14).

1.4 Skills, efficiency and service quality

1.4.1 Skills

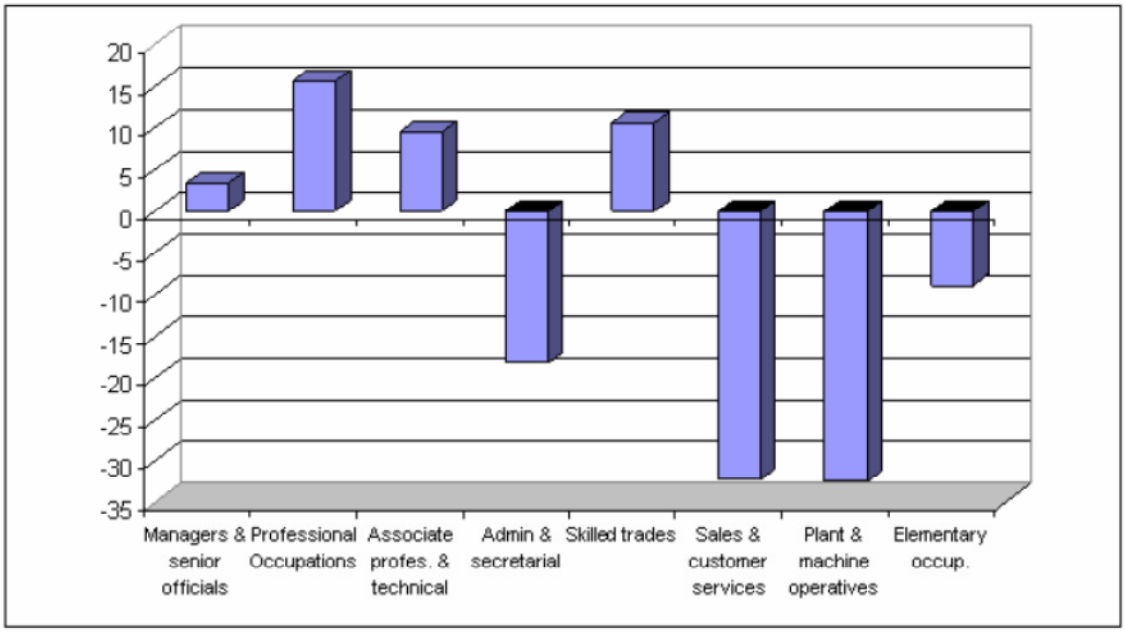
Changes in employment have been complemented by changes in skill structures. All four sub-sectors were important reservoirs for blue-collar employment where semi- or unskilled male workers could find a decent job. Accordingly, electricity, gas and waste management traditionally displayed a high proportion of male and full-time workers and a small proportion of women and part-time workers. However, the proportion of blue-collar jobs has decreased for a number of years, while the share of white-collar jobs is increasing. The combination of new technology and liberalization has resulted in a shift from technical skills (except IT skills) to commercial and costumer care skills, as companies have been establishing and expanding departments for sales and customer care (ECOTEC 2007: 107-8). According to an analysis for ECOTEC (ibid.: 90), covering occupational groups in the electricity, gas and water sectors in

[12] *These companies were Rethmann (2007 instead of 2008 figure), FCC, Alba (2007 instead of 2008 figure), Shanks, Séché-SAUR, Cespa, Ragn-Sells, Delta, Lassila & Tikanoja, and CNIM.*

seven member states in 1995-2005, professionals and technicians together with managers and skilled trades have increased their share in total employment, whereas customer service personnel, machine operators and administrative personnel have become less important: see Figure 1. Dijkgraaf *et al* (2009) present a similar picture. From their figures presented in Table 1.8 it could already be derived that in the EU27 workforce of electricity, gas and water in 2006 26% was highly educated. Between 2000 and 2006, this share had increased by 2%points. The group mid-educated increased somewhat faster, by 3%, to 63% of all employed. At the same time the share of the low-educated fell by 4% to 11%. Remarkably, the share of the low-educated in electricity, gas and water in 2006 was only 4% in the NMS, while it was still 17% in the EU-15 (Dijkgraaf *et al* 2009: 22). For the energy sub-sector, the EMCC mapping report suggested that a scenario is not unlikely in which the need for skilled labour will increase dramatically. It is suggested that the focus on innovation and renewable energy will improve the image of the energy sector, making it easier to attract a young and well-educated workforce (EMCC 2008a). The available figures indicate a more modest trend towards up-skilling.

Liberalization has also led to the creation of new job categories, such as that of electricity traders. In this connection established pay systems have been reformed to allow for substantial bonuses for electricity traders and sales staff. The transformation of customer care not only demanded for new skills, but also changed the composition of the workforce in other respects. In particular the establishment of call centres increased the proportion of part-time and female workers. Between 2000 and 2006, the share of women in the EU working in electricity, gas and water grew by 4%points to 27%; in the EU15 it grew by 2%points to 22%, while feminization went even quicker in the NMS: with 4%points to 35%. By contrast, in 2006 the share of full-timers was lower in the EU15 (93%) than in the NMS (99%) (According to this source, developments over time in full-/part-time work could not be traced: Dijkgraaf *et al* 2009: 22).

Graph 1.1 Occupational shares electricity, water and gas: changes (%) 1995-2005



Source: ECOTEC 2007: 90. Data covers Austria, Denmark, Ireland, Italy, the Netherlands, Portugal, Spain, UK.

Dijkgraaf *et al* (2009: 24) looked at occupational trends in the waste sub-sector. The time period covered by this study (2000 – 2006) may have been too short to trace significant trends. The only significant change these researchers traced was some increase in the share of technicians, indicating a growing degree of professionalisation: see Table 1.10.

Table 1.10 Occupational shares in waste in the EU, 2006 and 2000-2006

	EU-27 2006	Changes 2000-2006 (%points)
Managers	5%	0
Technicians	13%	2
Clerks	8%	-1
Skilled agricultural and fishery workers	1%	0
Craft and related trade workers	6%	0
Drivers & mobile plant operators	20%	-1
Other plant and machine operators	6%	-1
Domestic helpers, cleaners, launderers	3%	-1
Other elementary occupations	37%	1
	100%	

Source: Dijkgraaf et al 2009: 24

1.4.2 Efficiency and service quality

While the job cuts in the electricity sub-sector temporarily boosted efficiency, they often had a negative impact on service quality – especially since providers not only cut jobs to save costs, but also cut back investments in infrastructure renewal. Among the negative consequences are the closing down of walk-in centres where customers could talk face to face to a service agent. The advantage of the newly established customer care call centres is that they can be reached outside regular business hours, but for various reasons, including the fact that the agents may not be familiar with the local situation and sometimes not even with the product they are selling, they do not always provide the service quality expected by the customers. Another negative effect in the electricity sector is longer waiting time of power to be restored after major breakdowns following storms or other disasters, as has been reported in the PIQUE project (Flecker and Hermann 2011). David Hall and Emanuele Lobina (2008a) have argued that the job cuts in the water sector in the UK had only negative effects as they hardly boosted productivity. If anything productivity has decreased because of the reluctance of the new private owners to invest in infrastructure improvement.

In waste management and treatment it is difficult to measure and compare efficiency as a lot depends on local circumstances. From the angle of service quality, waste management privatization in the UK was negatively evaluated by both researchers and by a governmental audit committee (Davies 2003: 16-17). Rather than being more efficient, private waste firms seek to reduce costs by deteriorating employment and working conditions. As Ole Busck (2007: 388) has noted, "[q]uality is a word which often appears in the contract documents, but when specified it amounts to effectiveness or productivity measured in 'no-collects' or complaints. In other cases, it is spelled out as an award criterion, sometimes even compromising environmental or working environmental connotations. When it comes to the actual choice of contractor, however, no priority is given to quality." All that counts are costs. Waste management is not an exception: Especially in labour-intensive services, the widespread intensification of work and deterioration of employment conditions caused by liberalization and privatization has had a negative impact on service quality (Flecker and Hermann 2011). Trade unions in the waste sector have repeatedly linked the expected negative impact of privatization in the waste sector on pay and conditions with negative effects on environmental policies and the quality of service; an

example was the strike of the three Italian union confederations in November 2009 in response to government plans (*AIAS-ETUI Collective Bargaining Newsletter*, October and November 2009).

1.5 Collective bargaining

Industrial relations in public utilities, as in public services more generally, have been characterized by a high proportion of trade union membership and centralized bargaining structures. In some countries public sector unions lacked formal negotiations rights. In these cases bargaining took place informally between trade union leaders and representatives of the respective governments. In sum, the traditional public sector labour relations regime (Brandt and Schulten 2009; Brandt and Schulten, forthcoming) guaranteed relatively uniform employment and working conditions and a much smaller degree of wage dispersion than the private sector.

1.5.1 Electricity and gas

In most EU member states liberalization, privatization and marketization have profoundly changed the collective bargaining landscape. In the electricity sector, the introduction of competition and private ownership led to a decentralization and fragmentation of bargaining structures and, subsequently, to substantial differences between electricity sector employees. Electricity sector agreements had provided for comparable decent employment and working conditions. However, with liberalisation the new competitors in some countries are not covered by the same agreement which applies to the former monopolists. Generally company agreements have become more important. In Germany and Belgium, for example, new competitors are only covered by company agreements. Yet, company agreements have also become a major instrument for regulating employment and working conditions in former monopolists. Sometimes the disintegration of former monopolists resulted in the adoption of two different company agreements for the two separate entities. Decentralization went most far in the UK, where industry-wide agreements have been completely abandoned in favour of company and plant agreements. In some cases agreements are even negotiated on the departmental level (Hermann and Pond, forthcoming). Similar developments can be seen in the gas sub-sector (Atzmüller and Hermann 2005: 66). Differences are further accelerated through the growing use of atypical forms of employment, including, most notably, that of temporary agency workers, which in some countries, for example Belgium, make up for a significant share of total energy sub-sector employment (Hermann and Pond, forthcoming). Large energy firms also have been engaged in efforts to attract new entrants under collective agreements with less favourable terms than those for incumbent workers, like National Grid tried in December 2009 in the UK (*AIAS-ETUI Collective Bargaining Newsletter*, December 2009) and GDF SUEZ in spring 2011 in Germany (*AIAS-ETUI Collective Bargaining Newsletter*, April 2011).

In particular the creation of call centres and their subsequent outsourcing, operating in labour relations regimes with less regulatory constraints and outside existing collective bargaining schemes, has been cost-saving for employers. Notably in Germany and the Netherlands call centre work is characterized by a high incidence of low pay, also in energy, water and waste. In Germany low pay rates concentrate at outsourced call centres, but in the Netherlands low pay has also pervaded in-house utility call centres, especially through the use of temp agency workers working in low entry wage scales (Van Klaveren and Sprenger 2008; Lloyd *et al* 2010: 437-439).

Table 1.11 provides an overview that characterizes collective bargaining structures in the electricity sub-sector, unfortunately (as newer systematic data is lacking) based on the situation in 2005.

Table 1.11 Collective bargaining in the electricity sub-sector, by country (situation 2005)

Country	Collective bargaining structure	Bargaining coverage	Union density
Austria	Five collective agreements (two sectoral and three company deals). Some workers are not covered by formal agreements	95%	90%
Belgium	Sectoral and company	100%	High
Denmark	Sectoral framework (whole industry) and company	100%	98%
Finland	Either central or sectoral agreements supplemented by company deals	100%	High
France	Sectoral (since 2002) and company	93.5%	17%
Germany	Sectoral and company. Company agreements are acquiring increasing importance. Works agreements are also present	n.a.	35%
Hungary	Sectoral agreement extended by decree; company agreements at major firms	Multi-employer: 100%. Single-employer 92.9%	32%
Ireland	Sectoral and company	Nearly 100%	Very high
Italy	Sectoral and company	90%	74%
Poland	Sectoral and company	Nearly 100%	55% in generation. 37% in distribution
Slovakia	Sectoral agreement supplemented by company accords	85%	78%
Slovenia	National intersectoral agreement, supplemented by sectoral and company agreements. Some companies do not have a firm-level deal	100%	60%
Spain	Sectoral and company	>50%	Low
Sweden	Sectoral and company	Estimated at 100% at Vattenfall and >90% for smaller operators	Estimated at 100% at Vattenfall and >90% for smaller operators
UK	Company agreements. Most firms combine framework deals with decentralised agreements at divisional or profit-centre levels	68%	53%

Source: Pedersini 2005

The overview in Table 1.12 characterizes collective bargaining structures in the gas sub-sector, based on the situation for 2008.

Table 1.12 Collective bargaining in the gas sub-sector, by country (situation 2008)

Country	Collective bargaining coverage (CBC)	Proportion of multi-employer bargaining (MEB) as % of total CBC
Austria	100%	60%
Belgium	100%	100%
Bulgaria	30%	0%
Czech Rep.	100%	100%
Denmark	85%	100%
Finland	100%	100%
France	100%	83.6%
Germany	>90%	n.a.
Hungary	41%	50%
Ireland	83%	0%
Italy	100%	100%
Luxembourg	6.7%	0%
Netherlands	~ 92%	~ 94.5%
Poland	80%	0%
Portugal	11%	0%
Romania	80%–90%	100%
Slovakia	100%	100%
Slovenia	100%	MEB prevailing
UK	70%	SEB prevailing

Source: Traxler 2008

Key: MEB = Multi-employer bargaining; SEB = single-employer bargaining.

The outcomes of the PIQUE project point out that these trends result in growing differences among electricity and gas workers, differences that have been accelerated through outsourcing and the creation of independent subsidiaries. A major employer advantage of these subsidiaries is that they often no longer belong to the electricity sector and hence are covered by an agreement which provides lower wages and inferior working conditions. Thus, wages and working conditions increasingly depend on which part of the company one works for. In addition several former monopolists have introduced wage cuts for workers hired after a certain date in the liberalization and privatization processes. These cuts can amount to 35% of former wages. Thus, differences have emerged between 'old' and 'new' staff, between workers in core units and outsourced departments, and between workers employed by former monopolists and those working for the new competitors. However, while the differences in employment conditions increase, only few workers do not suffer from growing work intensification. Table 1.13 shows results of PIQUE case studies concerning wage differentials.

Table 1.13 Wage differentials in former electricity monopolists

Communal Power (AT)	National Power (BE)	Mutual Electricity (BE)	New Electricity (BE)	Eastern Electricity (PO)	Capital Power (UK)
Lower wages for employees hired after 2001 (minus 13 %)	Lower wages for employees hired after 2002 (between 22 and 34% less) Lower wages for call centre agents employed by an independent subsidiary	Lower wages for employees hired after 2002 (between 22 and 34% less) Lower wages for call centre agents employed by an independent subsidiary	Same wages but lower than those of the competitors Differences between employees and outsourced workers?	Higher wages for new employees	No or less generous company pension scheme for new employees

Source: PIQUE case studies

1.5.2. Water and waste

There is little systematic information gathered on collective bargaining throughout the EU in water and waste management. However, the experience in the electricity sector and other public services allows the following assumptions. Decentralization of bargaining and the private-public split likely occurs in similar ways in water and waste management. In the UK, given the absence of industry-wide agreements outside the public sector, workers employed by the privatized water companies are most likely covered by company agreement. In Austria, waste workers employed by a public organization are covered by a different collective agreement than those in private firms. However, the social partners are in the process of negotiating a new sector-wide agreement (Holtgrewe and Sardadvar 2011).

As in the energy sector, a lot depends on the national collective bargaining systems. In for example Germany collective bargaining rounds in waste have recently been put under pressure of efforts of the private employers' federation to introduce lower pay rates for new entrants, and so trying to create a two-tier pay system, also under the threat of individual employers to pull out of the industry agreement (*AIAS-ETUI Collective Bargaining Newsletter*, April, July-August and November 2010) – efforts that are growingly difficult to counteract for the trade union movement as collective bargaining coverage and union density are decreasing.[13] Generally, the Nordic countries have a better record in ensuring the same conditions and standards across the (sub-)sector. Yet, even if wages remain at the same level, due to outsourcing waste workers in private firms usually suffer from inferior working conditions (Busck 2007; Ferraris *et al* 2011). Moreover, the introduction of competitive tendering has often enlarged job insecurity. While in the first round of outsourcing the private contractors typically took over the staff from the public provider, in following rounds of tendering the winners can take over the workers from the competitor but are not entitled to. This, at least, is the Danish experience (Busck 2007; Sørensen

[13] *In January 2010, the position of many German waste workers was improved when after quite some union pressure the federal government declared the national agreement on waste treatment – including a sector-specific hourly minimum wage of Euro 8.02 -- generally binding, as it covered 50% of the (130,000) employees at national level (AIAS-ETUI Collective Bargaining Newsletter, November 2009; Bosch and Weinkopf 2010).*

and Hasle 2011).[14] Ole Busck (2007) also found for refuse collection services that outsourcing had a negative impact with regard to the observation of health and safety standards. He identified a causal relation with a combination of municipal cost-saving strategies, harsh market forces and cultural influences.

1.6 Summary and perspective

Public utilities, in sum, have undergone substantial changes since the mid 1990s. In particular in energy (electricity and gas), liberalisation and privatisation have unleashed simultaneous processes of concentration and decentralisation – concentration of market power in the hands of a small number of European-wide acting private companies, and organisational decentralisation of previously integrated public utilities enterprises. The latter was fuelled by unbundling requirements, outsourcing strategies and public-private partnerships. Even though public ownership still plays a major role in most countries, especially in the politically sensitive water sector, private ownership has clearly been on the rise. Growing competition and increasing private profit interests have encouraged providers to cut employment and increase pressure on wages. The electricity and gas sub-sectors, in a large majority of the countries involved, and in some countries also the water sub-sector, have seen substantial employment cuts since the mid 1990s, combined with a significant intensification of work. The resulting deterioration of employment and working conditions puts the quality of services at risk. Examples of such risks can in particular be seen in the electricity and waste sub-sectors. Stimulated by its promising commercial prospects, privatisation of waste management has gone further than in water. On the other hand, waste obviously was also the single sub-sector with employment growth in the 2000s.

Partly the changes in competitive structures have become possible through the introduction of new technology. Without ICT, for example, the unbundling of infrastructures would hardly have been possible and outsourcing would be much more difficult. However, new technology also promoted organisational change, e.g. through automation processes in offices and other workplaces and through the establishment of call centres. As a result, new technology not only led to cuts in employment numbers, but also to changes in skills requirements and composition of the workforce. Common trends in energy, water and waste are the gradual disappearance of blue-collar jobs and the increasing share of technicians. If there is a trend towards up-skilling, that is rather modest and slowly developing. Here, one should guard against too much optimism.

The changes in markets and employment have also affected collective bargaining, and will continue to do so. Industrial relations in public utilities were traditionally characterised by high trade union density and comprehensive bargaining structures. Since the mid-1990s it has become clear that liberalisation and privatisation have fuelled the fragmentation of existing bargaining structures, with in various countries company bargaining tending to replace sector agreements. As a result, differences in wages and working conditions may have widened: between workers employed by public and private entities, between former monopolists and new competitors, between core units, subsidiaries or subcontractors, et cetera. In most countries differences in these respects have accelerated through the increase of atypical forms of employment, such as the use of temporary and part-time workers. New low-pay areas seem to develop in utilities, notably call centres.

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[14] *In case of outsourcing in the own country, in a number of EU countries the outsourcer is put under the legal obligation of keeping pay and conditions of outsourced employees unchanged for mostly at least one year. This is the case in for example Belgium and the Netherlands.*

Chapter 2 Wages in energy, water and waste

2.1 Introducing the workers in the WageIndicator survey data

What do workers earn in energy, water and waste? For an answer to this question, the *WageIndicator* survey data has been used. This data is available for the period between January 2007 and July 2011, covering 13 EU member states, as explained in the Introducton. In total, 5,361 individuals in these 13 countries have completed the survey, including valid wage information. What kind of workers has responded to the survey? Table 2.1 shows that in the 13 countries the workers on average have been employed between 6 and 12 years with their employer. On average they are between 33 and 43 years of age in these countries, between 20 and 49% of them are females, and their education level is between 2.8 and 4.4 ISCED, measured on a scale from 1 (no education) to 6 (university education) of the international ISCED level. From the four countries with substantial numbers of respondents, Belgium and Spain have a relatively young, feminized and well-educated sample, whereas the profile of the German and Dutch samples is older, with less women and on average lower educated.

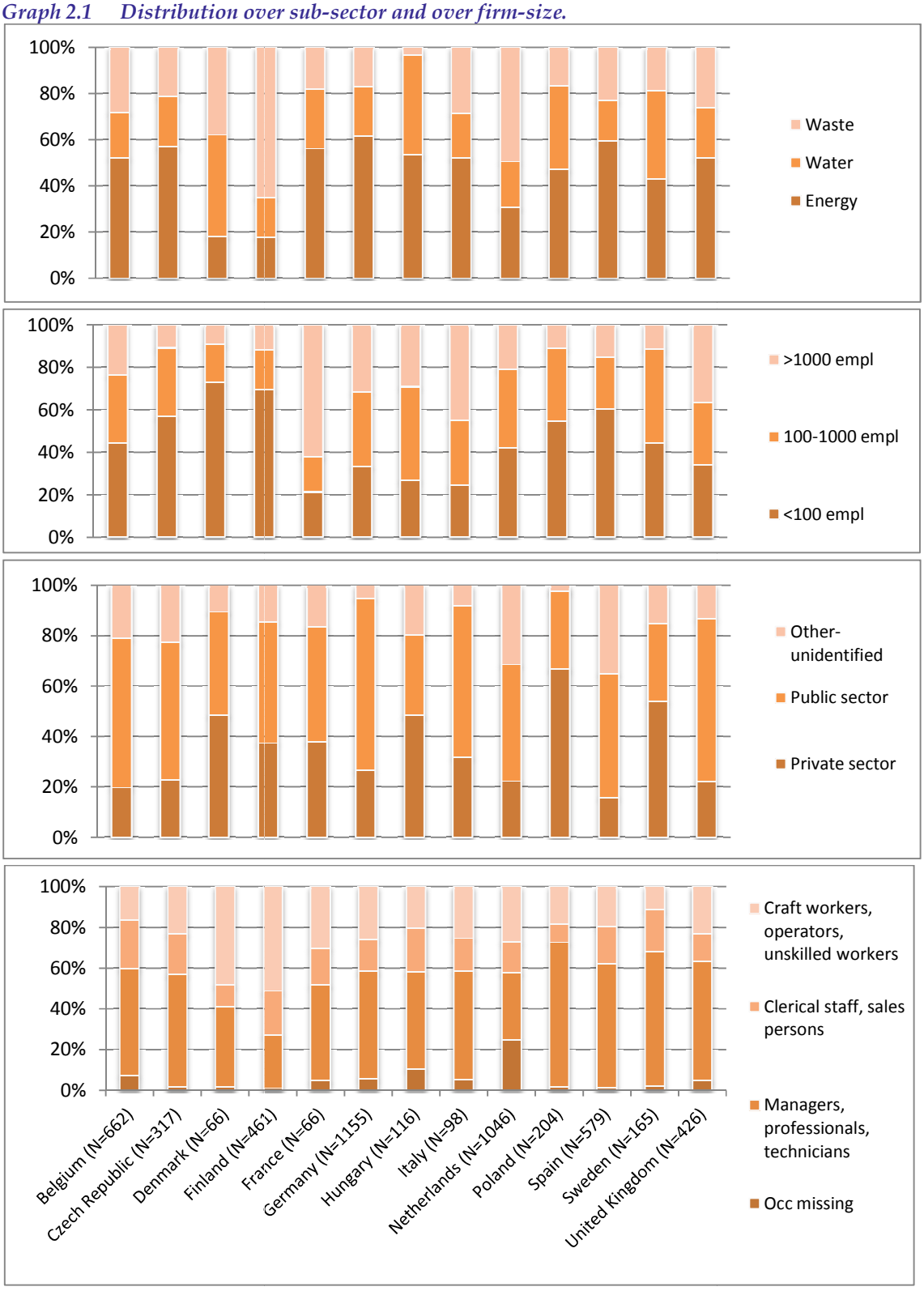
Table 2.1 Personal characteristics of the respondents in the dataset

	N	Col%	Av. years in company	Av. age	% female	education level (1-6)
Belgium	662	12.3	6.3	34.2	34%	4.4
Czech Republic	317	5.9	9.2	40.1	34%	3.9
Denmark	66	1.2	11.5	44.6	18%	2.8
Finland	461	8.6	7.3	37.5	49%	3.2
France	66	1.2	10.3	38.8	24%	4.2
Germany	1,155	21.5	10.7	41.1	20%	3.1
Hungary	116	2.2	15.7	41.3	39%	4.2
Italy	98	1.8	12.0	42.7	22%	3.8
Netherlands	1,046	19.5	7.1	38.2	21%	3.4
Poland	204	3.8	11.6	41.4	26%	4.2
Spain	579	10.8	6.0	33.7	30%	4.1
Sweden	165	3.1	6.3	43.1	47%	4.2
United Kingdom	426	7.9	8.3	37.9	29%	4.1
Total (N)	5,361	100.0	-	-	-	-

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. N= 5,361. NOTE: Av. = Average (Mean).

Our empirical reporting covers three sub-sectors, namely energy (electricity and gas), water and waste. Graph 2.1 shows per country how the 5,361 respondents are distributed over these three sub-sectors. In all but three countries (Denmark, Finland, the Netherlands), the majority of respondents work in the energy sub-sector. In Denmark, the largest group is employed in the water sub-sector, and in Finland and in the Netherlands the largest group is employed in the waste sub-sector. The distinction between public and private companies is a major feature of this report. The web-survey has a question about private and public ownership of the employees' companies, including an option 'other'. The latter is used when respondents ticked 'don't know', when the company is both public and privately owned, or when they have not ticked an answer to this question. Graph 2.1 shows that in most countries the majority of respondents is employed in the public sector. Yet, in Hungary, Poland, and Sweden this share is only three in ten and in Denmark it is four in ten. This is in particular remarkable for Sweden, as according to our Tables 1.3 and 1.4 ownership in the electricity and the water sub-sectors is largely public in that country. On the other hand, our UK respondents stem in majority from the public sector, in spite of the high degree of privatization of utilities at large in the UK.

Graph 2.1 Distribution over sub-sector and over firm-size.



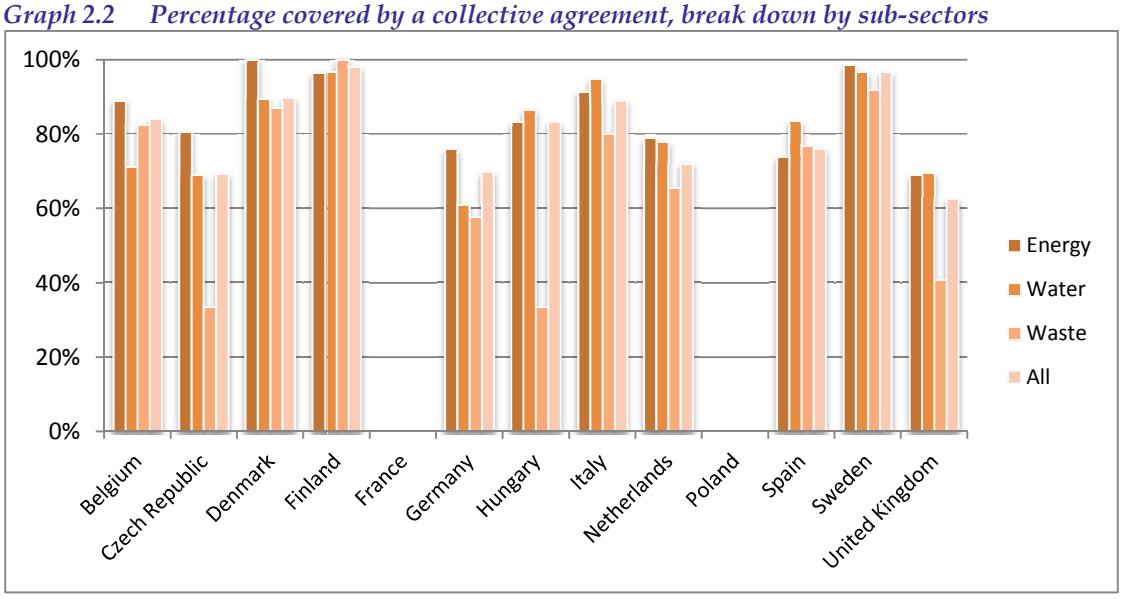
Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. N= 5,361.

The web-survey includes a question about the size of the establishment. In case the respondent's company has more than one establishment, the size of the company at national level is asked. Graph 2.1 reveals that in France six in ten workers are employed in a company with more than 1,000 employees, followed by Italy with four in ten workers. In contrast, in the Czech Republic, Denmark, Finland, Poland, and Sweden, only one in ten workers is employed in such a large company. In Denmark and Finland, even seven in ten workers are employed in a small company with 100 employees or less; by contrast, in France and Italy this holds for two in ten workers.

The web-survey also contains a question about the occupation of the respondent. On behalf of this report, occupations have been clustered into three groups: (1) managers, professionals and technicians; (2) clerical staff and sales persons; (3) craft workers, operators and unskilled workers. As said, Appendix 1 includes a list of all occupational titles with 4 or more observations and their grouping into these three major groups. Graph 2.1 reveals that group (1) covers 50% of all respondents, group (2) 19% and group (3) 31%. Large country differences can be noticed. In Poland, Spain, Sweden and the United Kingdom, group (1) covers 60-69% of respondents, in Finland it is below 30% and in Denmark little over 30%. Group (2) is the smallest group in all countries, ranging between 10 and 25% of the respondents. In contrast, group (3) is the largest group in Denmark, Finland, and the Netherlands (45-55%), whereas the smallest share is found in Sweden (slightly over 10%).

Before turning to our analyses of wages, we briefly summarize the outcomes concerning collective bargaining coverage. Graph 2.2 shows that, as expected, collective bargaining coverage is high in the energy sub-sector. Spain and the UK reveal the lowest coverage: here 'only' seven in ten workers is covered by a collective agreement. In contrast, in Denmark, Finland and Sweden the percentages reach almost to 100%. In the remaining countries, eight to nine in every ten workers are covered by an agreement. In the sub-sector water, coverage is slightly lower compared to energy. In Denmark, Finland, Hungary, Italy, and Sweden, nine in ten workers are covered. In contrast, in Germany only six in ten are covered. In the remaining countries, seven to eight in every ten workers are covered. In the waste sub-sector collective bargaining coverage is again slightly lower compared to water. In addition, coverage in waste varies much more than in energy and water. In the Czech Republic and Hungary, only three in ten waste workers are covered. In contrast, in Denmark, Finland and Sweden the percentages reach again almost to 100%.

Graph 2.2 Percentage covered by a collective agreement, break down by sub-sectors



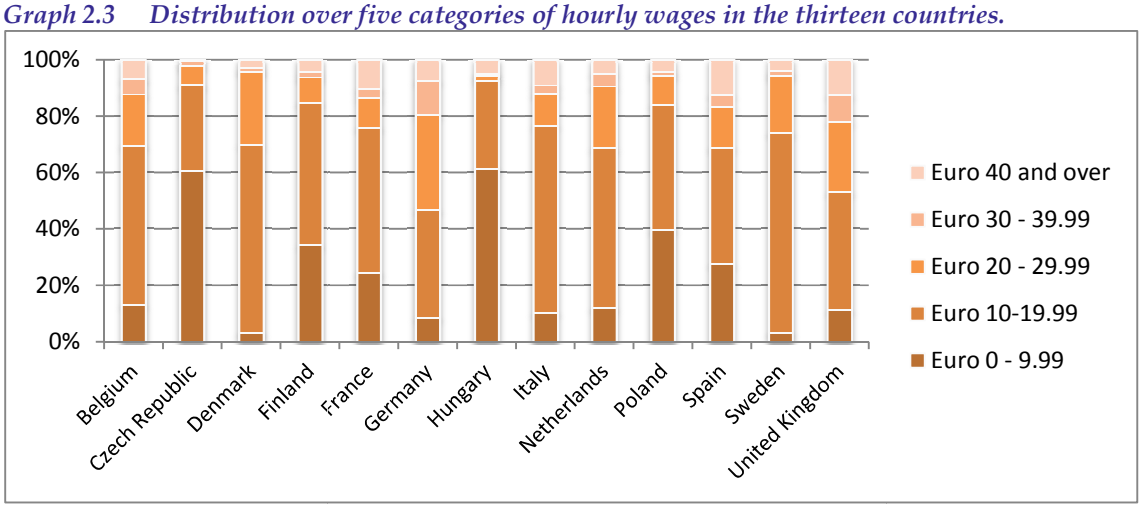
Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. Wages are expressed in Standardized German Euros level 2010. N= 3,918 - Note: the respondents with valid wage information but ticking the answers "don't know" and "not applicable" are excluded here. No data is available for France and Poland.

2.2 Introducing the wage analyses

What do workers earn in energy, water and waste? To provide an answer to this question, the *WageIndicator* survey has survey questions about wages in a similar way across countries. A three step procedure has been applied to harmonize this wage data across countries and across survey years. First, all wages are of course measured in the national currencies. Using the World Bank's purchasing power parity indexes, the wages in the database have been converted into standardized US dollars. In this step, the earnings data becomes comparable across countries. Second, to make these standardized wage data comparable over the years (remember that we have data between January 2007 and July 2011), all wages have been converted to the level of 2010, using the annual percentage change in wages of employees per hour, as available in the LABDEV Economic databases and indicators of the European Commission, DG Economic and Financial Affairs. Using the 2007 percentage change, the standardized US dollars wages collected in 2007 have been converted to the level of 2008. Similarly, the wages collected in 2008 and in 2009 have been converted to the levels of 2009 respectively 2010. The wages collected in 2011 have all been considered to be equal to the 2010 level, because at the time of reporting the LABDEV had not information available for the year 2011. This procedure results in wage information that allows for cross country comparisons, using wage data from several years. Third, to understand the wage information more easily for an European audience, the standardized US dollars wages level 2010 have been converted into standardized Euros for Germany level 2010, using the 2010 implied purchasing power parity conversion rate, converting the standardized US Dollars 2010 wages into standardized Euros for Germany 2010.

Graph 2.3 shows the distribution of the hourly wages over five categories.

Graph 2.3 Distribution over five categories of hourly wages in the thirteen countries.



Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. Wages are expressed in Standardized German Euros level 2010. N= 5,361.

The reader may also note that we use two yardsticks: median[15] and mean (average) wages. In all countries the mean wages are higher than the median wages. This implies that there is a relatively large group at the bottom of the wage distribution, and above the median a smaller number of respondents earning high(er) wages; the latter lifts the mean in most countries to some 20 to 40% above the median. This difference is much larger in three countries: the mean is nearly double the median in Italy, and about 1.5 times the median in Spain and the UK. These large differences point to a large spread (dispersion) in the range of the wages of the respondents from these countries, with relatively many in the higher end of the wage distribution.[16] We indicate the spread of wages by the statistical measure most used for this purpose, the standard deviation (Std. Dev. in the table). Indeed, standard deviations are largest for Italy, Spain and the UK. For Spain, with a substantial number of respondents, this outcome may be less accidental; it suggests a relatively large share of respondents with higher wages. To a somewhat lesser extent, this is also the case in Belgium, Germany and the Netherlands.

If we concentrate on the median wages measured in PPP, Graph 2.4 allows to distinguish four groups of countries: (a) in the USD 23-24 range: Germany and the United Kingdom; (b) in the USD 16-19 range: Belgium; Denmark; Italy; the Netherlands, and Sweden; (c) in the USD 12-15 range: Finland, France, and Spain; (d) in the USD 8-11 range: the Czech Republic, Hungary and Poland. For most countries this grouping reflects rather well their ranking in the general ranking of purchasing power levels across countries, as published by Eurostat. Finland and France show up as the main exceptions, with quite low medians in the utilities sector compared to that ranking. Obviously quite some low-paid respondents from Finland and France (compared with the over-all wage level in these two countries) filled out the *WageIndicator* survey, which *can* point to comparatively low wages in utilities.

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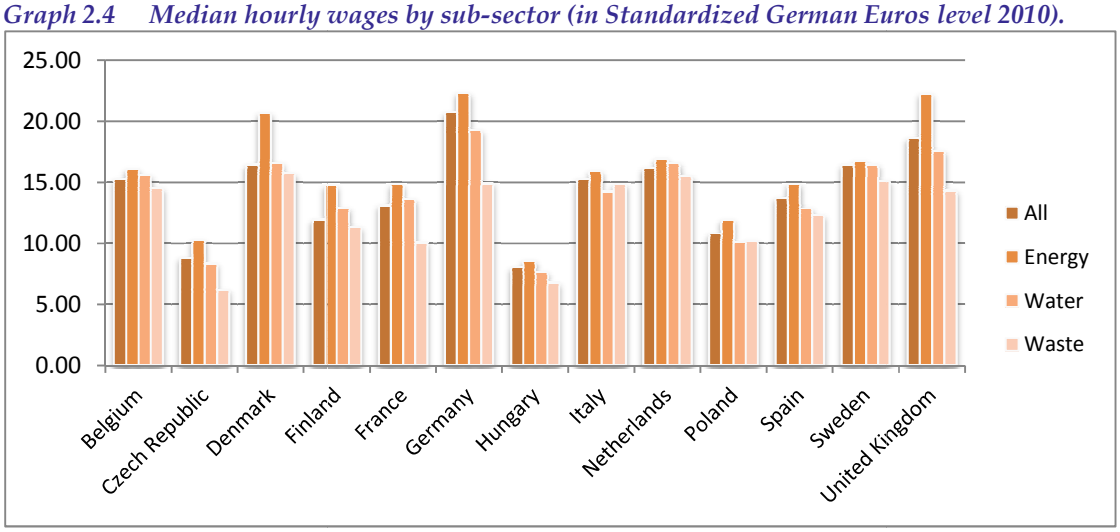
15 *The median value separates the higher half of a sample from the lower half. Thus, if there are nine different respondents with their wages ranked from high to low, the wage of the fifth respondent is the median.*

16 *Taking into account that we already have excluded those with hourly wages over USD 250 and those with hourly wages lower than USD 4 from our calculations.*

2.3 Wages by energy, water and waste

In the remaining of this report, the median wages of the relevant groups will be displayed. Graph 2.4 displays the median wages earned in the industry and in energy, water and waste. The graph clearly shows that in all countries the median wages are highest for energy, followed by water. In all countries these wages are lowest for waste. However, differences between the three sub-sectors vary largely by country. In the Czech Republic and in the UK, the median wages in waste are only 60% respectively 66% of the median wages in energy. By contrast, in Belgium, Italy, the Netherlands and Sweden, this is more than 90%. In all countries, the median wages in water are in between those of energy and waste. In the UK the difference is largest, with the water workers earning only 79% of the energy workers.

Graph 2.4 Median hourly wages by sub-sector (in Standardized German Euros level 2010).



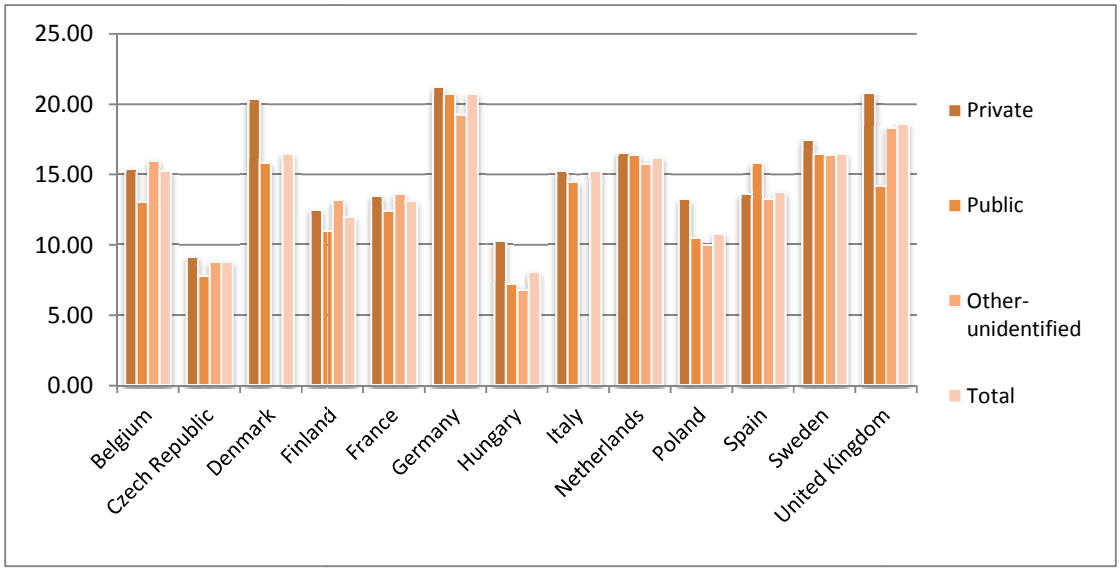
Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. N= 5,361.

2.4 Wages by public and private sector

Graph 2.5 displays the median wages earned in the industry at large with a breakdown in public, private and other sectors as explained earlier in this chapter. The graph shows that in all countries the median wages are higher in the private sector compared to the public sector, apart from Spain where median wages are 16% higher in the public compared to the private sector. However, the differences across the public and private sector vary largely by country. In Finland, France, Germany, Italy, the Netherlands, and Sweden it is 10% or less in favour of the private sector. In Belgium, the Czech Republic, Denmark, and Poland the differences are between 15 and 22%, whereas in Hungary and the UK the differences are largest: around 30%.

Is the wage distribution, as may be expected, more compressed (less dispersed) in the public sector compared to the private sector? Or, compared to the private sector, have the lowest wage groups higher earnings and have the highest wage groups lower earnings in the public sector? Yes, this is indeed the case in seven of 13 countries, namely in the Czech Republic, Denmark, Finland, Italy, the Netherlands, Poland, and the UK. However, it is not so in Belgium, France, Germany, Hungary, Spain, and Sweden, where the distribution is more compressed in the private sector than in the public sector.

Graph 2.5 Median hourly wages by private/public/other ownership (in Standardized German Euros level 2010).

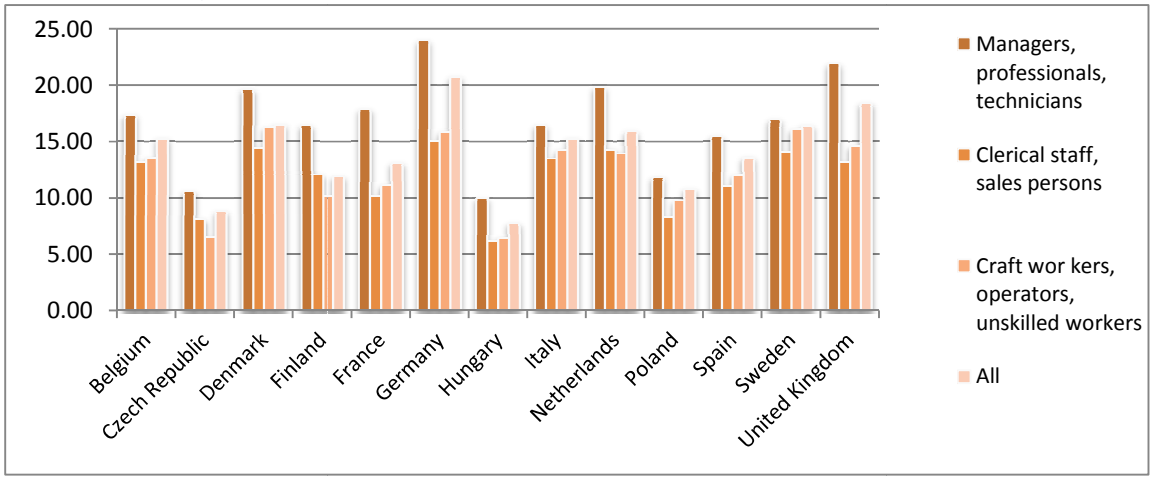


Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. N= 5,361

2.5 Wages by occupational groups

Graph 2.6 shows the median wages for the three occupational groups, as explained in the previous section. As was to be expected, in all 13 countries these medians are highest for group (1), the managers, professionals and technicians. Their wage levels are 5 to 40% above those of group (3), the craft workers, operators and unskilled workers. The largest differences are found for the Czech Republic, Finland, France, Germany, Hungary and the UK, and the smallest for Denmark, Italy, Poland and Sweden. When comparing group (1) to group (2), the clerical staff and sales persons, their wages are even 20-80% higher. Across most countries, the wages of group (2) are lower than those of group (3), in the range of 2-17%. The few exceptions are the Czech Republic, Finland and the Netherlands. In these three countries group (2) has higher earnings compared to group (3), in the range of 2-20%.

Graph 2.6 Median hourly wages by occupational group (in Standardized German Euros level 2010).

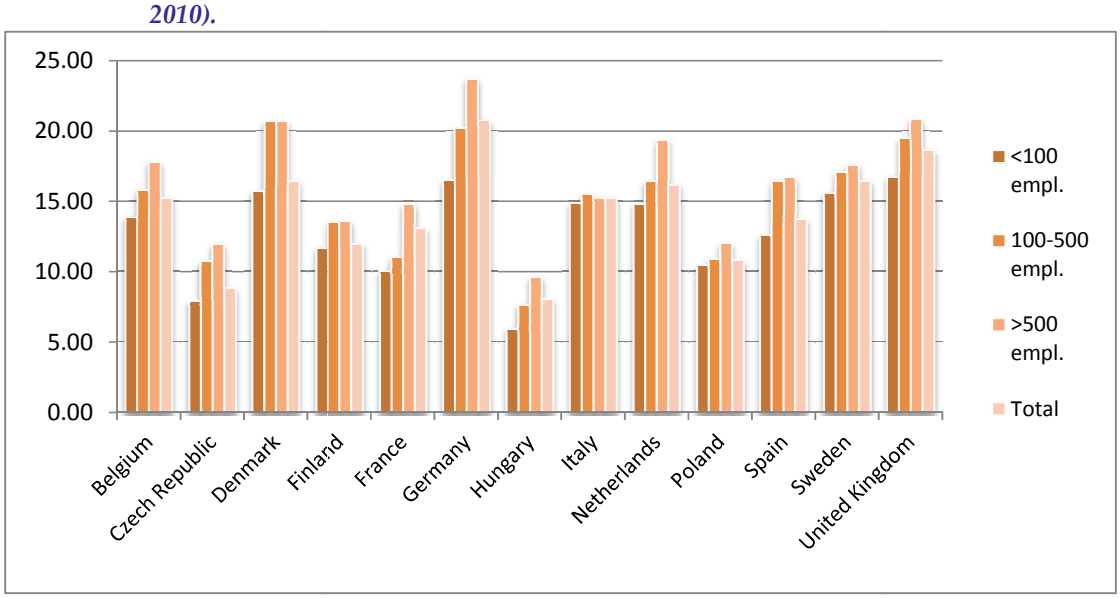


Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries.
N= 4,895 - Note: not all respondents with valid wage information have indicated their occupational group.

2.6 Wages by establishment size

Worldwide, any analyses of wage differentials conclude that on average wages are higher in large firms than in small firms. The main reason is that the group of high paid employees is both larger and has higher earnings in large firms than in small firms.[17] The same pattern is found in our analyses of the 13 countries. As Graph 2.7 shows, in all countries the median wages are highest in the largest establishments and lowest in the smallest establishments. In Hungary and the Czech Republic the differences between the large and small establishments are relatively high, with 61% respectively 51%. The smallest wage differentials across establishment sizes are found in Finland, Poland and Sweden, while in Italy hardly any differentials across establishment size exist.

Graph 2.7 Median hourly wages by establishment size (in Standardized German Euros level 2010).



Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries.
N= 5,204 - Note: not all respondents with valid wage information have indicated their establishment size

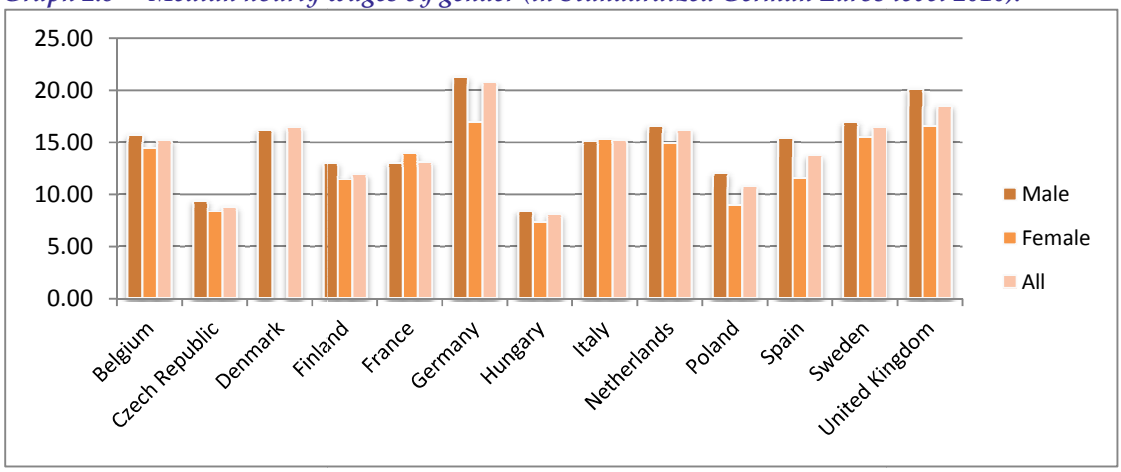
[17] *Many economists argue that larger firms have a productivity advantage over smaller firms, which would be at the basis of wage differences. Chapter 1 revealed that at least for the energy sector such a difference can be questioned; the "Seven Brothers" did not show higher productivity outcomes than the 12 large national firms.*

2.7 Wages by gender

In the 13 countries, two to three in ten employees in energy, water and waste are female. Finland and Sweden are the exceptions: Here, almost five in ten employees are females. However, the shares of females does not relate to the gender pay gap.

The gender pay gap in the industry is shown in Graph 2.8. The median wages of women are slightly higher than those of men in France and in Italy, with 7% respectively 1%. Most of these women are among the highly educated clerical staff, whereas men hold jobs along the full wage distribution. In contrast, in Poland and Spain women earn 25% less than men, and in Germany and the UK women earn 20% respectively 18% less than men. In the remaining countries the gender pay gap remains below 12%. Nevertheless, there seems ample room for the development of policies for equal opportunities and diversity in relation to changing employment patterns, as suggested by Fairbrother *et al* (2005) for the electricity industry.

Graph 2.8 Median hourly wages by gender (in Standardized German Euros level 2010).



Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries.
N= 5,204- Note: not all respondents with valid wage information have indicated their gender.

2.8 Benefits and allowances

In addition to basic wages, two types of fringe benefits are asked in the web-survey. The first one refers to benefits, such as holiday allowance, performance pay, year-end benefits and profit shares. The web-survey asks if these benefits were included in the last payment or if they were received in the last year. The second one refers to allowances for workers with specific working conditions, such as shift / unsocial hours / weekend allowances, overtime bonuses and premiums, and dirty / dangerous work / inconvenience / hardship allowances. The web-survey asks if these allowances were included in the last payment. In the survey a wide variety of terminology is used across countries as the benefits are called differently in the 13 countries. In the database, the data on benefits and allowances are set to minimum and maximum boundaries to identify out-of-range observations, similarly as has been applied to the observations of the wages.

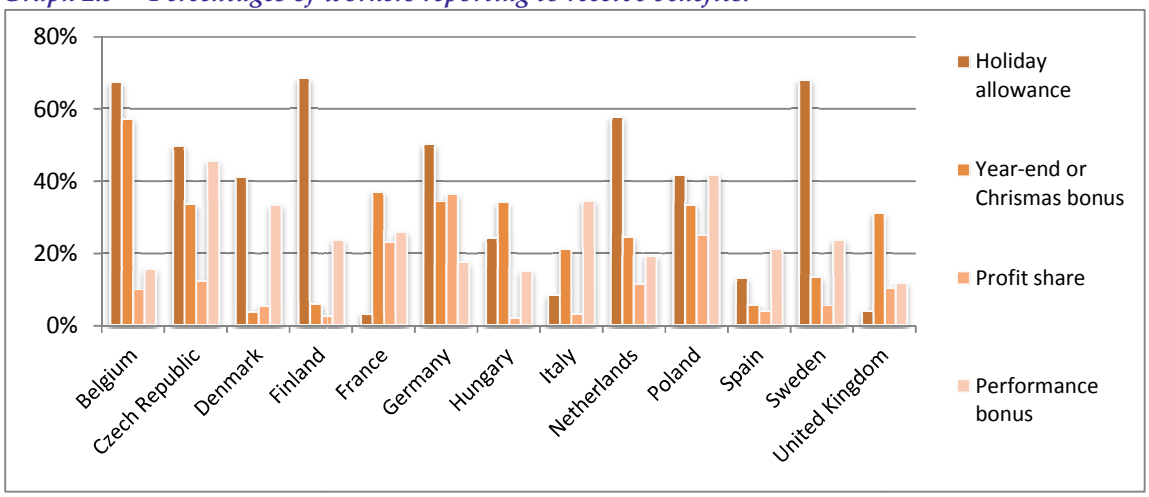
Graph 2.9 shows that holiday allowances are the most common benefit in energy, water and waste. They are particularly frequent in Belgium, Finland, the Netherlands, and Sweden. In these countries approximately seven in ten workers receive this allowance. In contrast, holiday allowances are hardly found in France, Italy, and the UK (less than 10%).

Year-end benefits include Christmas bonuses, 13th month payments and other end-of-year bonuses. These benefits are most frequently found in Belgium, with almost six in ten respondents reporting to receive such a bonus. In the Czech Republic, France, Germany, Hungary, Poland, and the UK approximately three in ten workers report such a bonus. In contrast, these benefits are hardly found in Denmark, Finland and Spain.

Profit shares are not very frequently found, although still three in ten workers in Germany and two in ten workers in France and Poland report to receive profit shares. In four countries approximately one in ten reports receiving profit shares, namely in Belgium, the Czech Republic, the Netherlands, and the UK. In the remaining countries only few percentages of workers report receiving profit shares.

Performance bonuses include a wide variety of bonuses related to the performance of individual workers or that of groups or departments, such as commission, group or departmental bonus, personal performance bonus, labour market supplements, personal allowance, seniority or managerial bonus, skill bonus, and tips. Performance bonuses are common in the Czech Republic, Denmark, Italy, and Poland, where three to four in every ten workers reports receiving such a bonus. In four countries, about one in ten respondents report to receive performance bonuses, namely in Belgium, Germany, Hungary, and the UK. In the remaining countries this holds for approximately two in every ten workers.

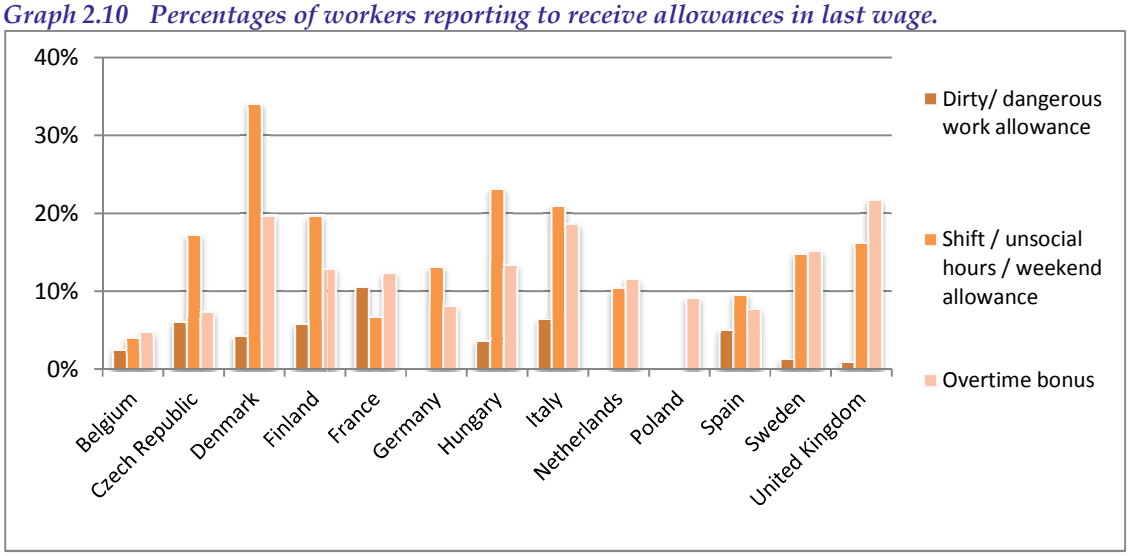
Graph 2.9 Percentages of workers reporting to receive benefits.



Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries.
N=4,514 (Holiday allowance), N=4,027 (Year-end or Christmas bonus), N=4,634 (Profit share), N=4,280(Performance bonus).
Note: not all respondents with valid wage information have indicated their bonuses.

Graph 2.10 presents the incidence of allowances for workers with specific working conditions. The dirty/ dangerous work allowance is rarely paid in the countries under study. Only in France one in ten workers reports receiving such an allowance. In all other countries this is less. In contrast, the shift / unsocial hours / weekend allowances are more frequently mentioned. In Denmark more than three in ten workers report having received such an allowance in their last payment, while in the Czech Republic, Finland, Hungary and Italy approximately two in ten workers report so. Overtime payments in the last wage are reported by every two in ten workers in Denmark, Italy, and the UK. In all other countries this share is approximately one in ten workers. In Belgium it is lowest, with only a few percent of workers reporting overtime payment.

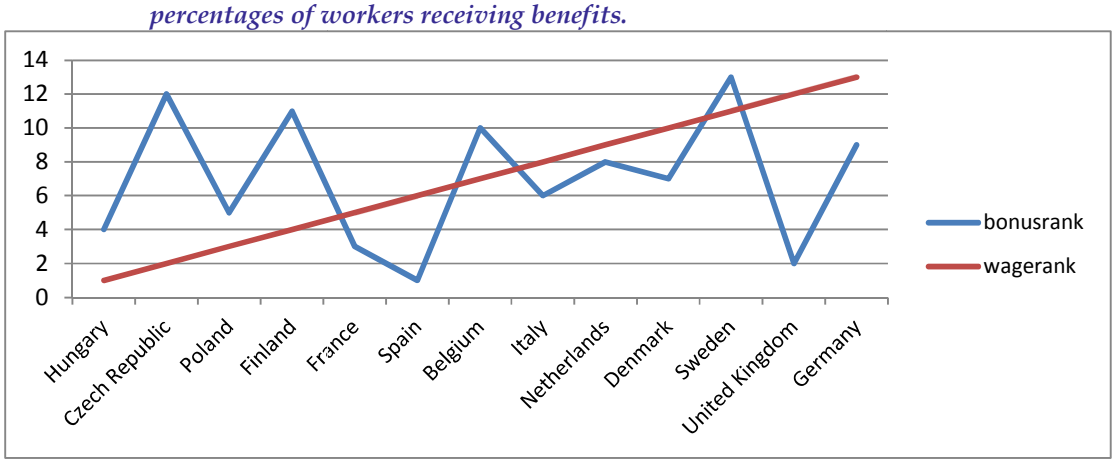
Graph 2.10 Percentages of workers reporting to receive allowances in last wage.



Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries.
N=1,916 (Dirty/dangerous work allowance in last wage), N=3,449 (Shift / unsocial hours / weekend allowance in last wage), N=3,110 (Overtime bonus in last wage)
Note: not all respondents with valid wage information have indicated their allowances.

How do wages relate to benefits? Are workers in countries with relative low wages receiving more often benefits, or vice versa? To answer this question the countries have been ranked from the lowest to the highest median wage levels and from the lowest to the highest percentages of workers reporting to receive at least one benefit or allowance. Graph 2.11 presents these two rankings. It shows clearly that there is no relationship between wages and benefits (r=0.08).

Graph 2.11 Thirteen country ranking (1=lowest - 13=highest) for median wage levels and for percentages of workers receiving benefits.



Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. Wages are expressed in Standardized German Euros level 2010.
N=5,361 (Wage rank), N= 4,975 (Bonus rank for respondents reporting at least one benefit or allowance)
Note: not all respondents with valid wage information have indicated their benefits or allowances.

2.9 Wages better understood

We have compared wages, taking into account sub-sectors, public versus private sectors, occupational groups, establishment size, and gender. However, to make a more 'honest' comparison it is important to take into account variations in the educational levels and tenure (years of work experience) of the workforce, since these two factors arguably exert the largest influence on wage levels. In order to undertake a comparison that includes the relevant factors, we carried out a regression analysis to control for the influence on wages of six factors: public/private, occupation, establishment size, gender, education and work experience. We did so for the whole utilities sector and for each sub-sector, thereby controlling for country, as shown in Table 2.2.

The results of our analysis confirm our initial findings with respect to the sub-sectors. In the 13 countries jointly, wages are higher in the energy sub-sector compared to the waste sub-sector. The wages in water and waste are not significantly different from each other (See column 'all' in the Table).

Regarding the public-private divide, however, the findings do not support the previous findings that wages in the private sector are higher. Here the results do not reveal significant differences, neither in the whole sector nor in any of the three sub-sectors.

When it comes to the three occupational groups, the regression findings confirm the previous results. In the whole sector as well as in energy and waste, group (1) of the managers, professionals, and technicians have substantially higher earnings than group (2) of the clerical staff and sales persons. Yet, this pattern is not confirmed for the water sector. The earnings in group (3) of the craft workers, operators and unskilled workers are lower than those of group (2) of the clerical staff and sales persons, though only in utilities as a whole and in the waste sub-sector.

Concerning firm size, the previous findings are confirmed by the regression analysis. Wages are on average slightly higher for workers in firms with over 500 employees, compared to those with 50-500 employees. However, this pattern is only found in the whole sector as well as in the energy and waste sub-sectors. Wages in firms smaller than 50 employees are slightly lower for workers in firms with 500 employees, compared to those with 50-500 employees. This pattern is found in the whole sector and in all sub-sectors.

Regarding gender, as expected females experience a substantial wage penalty, in the whole sector and in all three sub-sectors. The reader should note that this is most likely not due to unequal pay for equal work, but due to lower pay in female-dominated occupations.

Regarding education, as expected, the regression shows that higher educated workers have higher wages in the whole sector and in all three sub-sectors. Similarly, regarding work experience wages increase with years, though this is not unlimited, because after some time they do not increase and start to flatten.

Table 2.2 Factors determining wages for all, energy, water and waste

	all		energy		water		waste	
	B	sign.	B	sign.	B	sign.	B	sign.
Constant	2.368	***	2.378	***	2.344	***	2.432	***
Energy	.071	***	-		-		-	
Water	-.022		-		-		-	
Private sector	.021		.019		-.009		.039	
Public sector	-.030		-.044		-.047		-.016	
Managers; profess.; technicians	.159	***	.181	***	.030		.250	***
Craft w.; operators; unsk. workers	-.071	***	-.013		-.080		-.119	***
Firm size <50 empl.	-.088	***	-.077	**	-.096	**	-.096	***
Firm size >500 empl.	.058	***	.053	*	.050		.092	**
Female	-.139	***	-.130	***	-.139	***	-.152	***
Education level (1-6)	.093	***	.095	***	.110	***	.075	***
Work experience (0-50 years)	.025	***	.024	***	.027	***	.026	***
Work experience squared	.000	***	.000	***	.000	**	.000	***
Belgium	-.127	***	-.137	***	-.066		-.103	*
Denmark	.068		.181		.046		.072	
Finland	-.176	***	-.195	***	-.213	***	-.142	***
France	-.316	***	-.216	**	-.382	**	-.448	**
Germany	.080	***	.130	***	.156	**	-.086	
Hungary	-.886	***	-.903	***	-.874	***	-.450	
Italy	-.147	**	-.086		-.246	*	-.125	
Poland	-.551	***	-.451	***	-.633	***	-.533	***
Spain	-.124	***	-.109	**	-.080		-.149	**
Sweden	-.052		-.072		.070		-.110	
Czechrep	-.734	***	-.627	***	-.780	***	-.900	***
UK	.035		.085		.064		-.016	
N	5022		2361		1106		1555	
F	69.945	***	35.065	***	17.432	***	21.730	***
R	.501		.498		.511		.488	

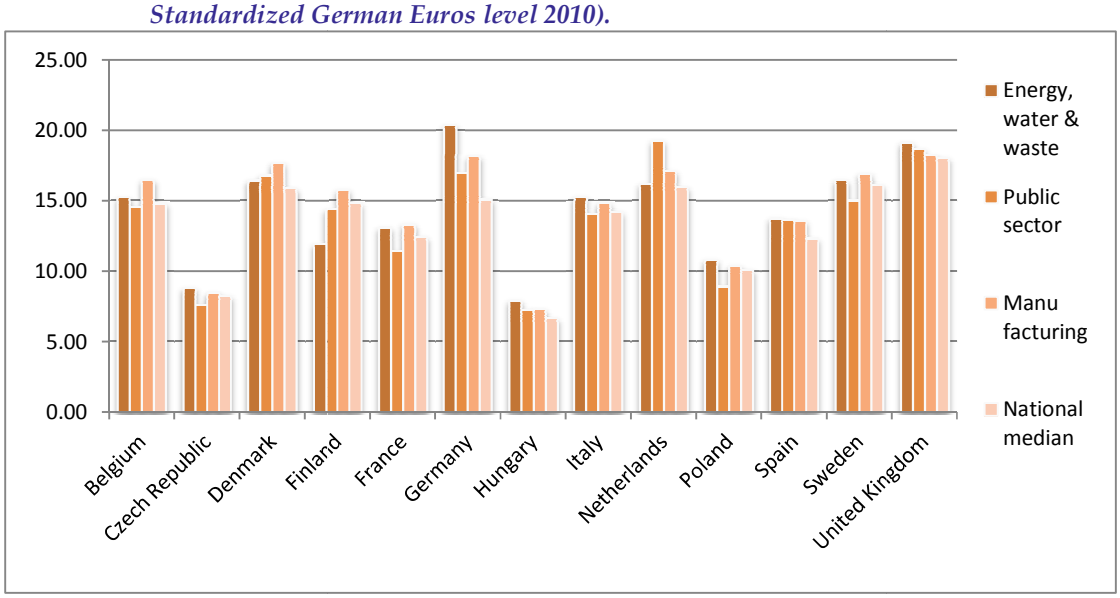
Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. Dependent variable logarithm of the Standardized German Euros level 2010 wages. N= 5,022 (*) significant at 10% (**) significant at 5% (***) significant at 1%
NOTE: Reference groups are 5- 9 yrs service, Clerical staff, sales persons, Firm size 50-500 empl., Waste, Netherlands.

2.10 Wages in utilities compared to national levels

This chapter concludes with a comparison of the wages in the utilities sector (energy, water and waste) with the median wages in manufacturing, in the public sector as a whole and in the country at stake. Note that a break-down of utilities by sector can be found in Graph 2.4. In this analysis, the manufacturing sector includes NACE category C 'Manufacturing' and the public sector includes NACE category O 'Public administration and defence; compulsory social security'. This latter category does not include education or health care.

Graph 2.12 shows that the median wages in utilities are higher than the national median in all countries, apart from Finland. Note that the utilities sector in Finland includes a large share of workers in waste, which is the lowest paid sub-sector. Yet, in earlier research, based on *WageIndicator* data for 2005-06 for the economy at large of nine EU member states, the Finnish utilities sector was also an outlier in this respect, with the highest position in a ranking of 13 industries according to the incidence of low pay; in the other countries utilities was consistently in the lower half (Van Klaveren and Tijdens 2008: 82-3). In our current outcomes the median wages in utilities are higher in all countries compared to the public sector, apart from Denmark, Finland, and the Netherlands. Compared to the manufacturing sector, the median wages in utilities are higher in seven countries; not in Belgium, Denmark, Finland, France, the Netherlands, and Sweden.

Graph 2.12 Median hourly wages in manufacturing, utilities, public sector and national (in Standardized German Euros level 2010).



Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries.
N=18,301 for public sector, N = 53,170 for Manufacturing, N = 5,361 for Utilities, N = 304,302 for all

Chapter 3 Working hours in energy, water and waste

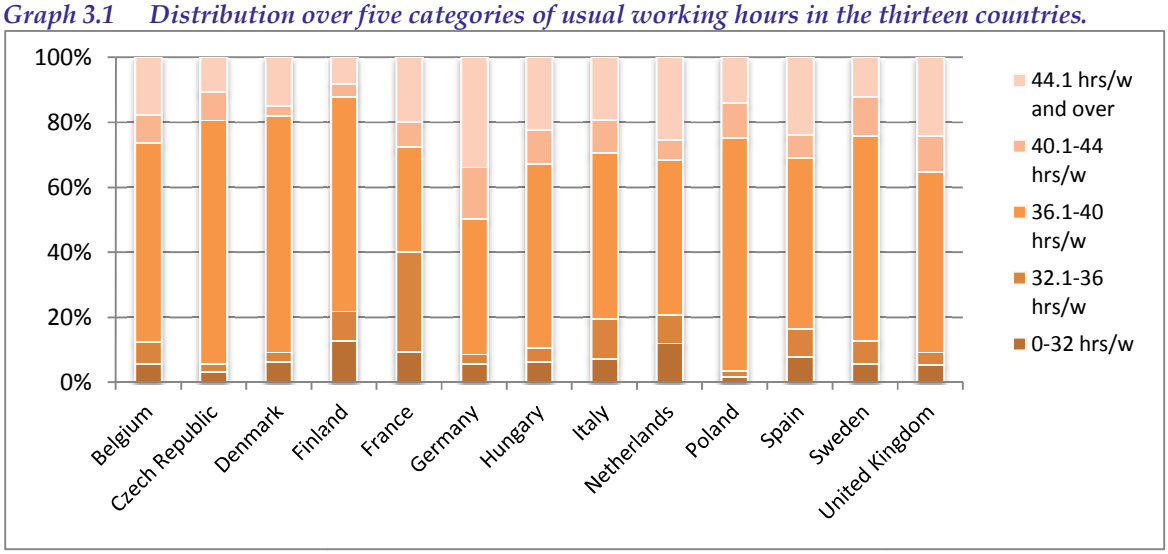
3.1 Introduction

In the web-survey, one question asks if the respondents have agreed their working hours with their employer, either in writing or verbally. If yes, they are asked how many hours per week they work under the terms of their contract. A next question asks "Do you usually work the number of hours laid down in your contract?" If no, the usual number of working hours is asked; if yes, the question is skipped. Respondents who do not have an employment contract or have no working hours agreed, are always asked about their usual working hours. Working hours are asked using drop-down selection lists with hours, ranging from 1 to 80. A final question asks respondents how many days a week they work. This question is used for checking the reliability of the reported hours.

3.2 Usual working hours

In this chapter about working hours, our first focus is on the length of the working week in utilities as a whole and in the energy, water and waste sub-sectors. Here we focus on the usual working hours. Graph 3.1 reveals that very few workers have working weeks of less than 32 hours, with some exception for Finland and the Netherlands, where one in ten workers has such a part-time job. Similarly, working weeks of 32.1-36 hours are not very common, with the exception of France, where three in ten workers reports to be working in this category: not surprising, given the 35-hours' law in France. In all other countries, less than one in ten workers is categorized here. Working 36.1-40 hours per week is the most common pattern in all countries. In the Czech Republic, Denmark, Finland and Poland, seven of ten workers are found in this category, compared to France with only three in ten and Germany with four in ten. When looking at the category 40.1-44 hours per week, Germany ranks highest with almost two in ten workers, followed by Belgium, the Czech Republic, Hungary, Italy, Poland, Sweden, and the UK with approximately one in ten workers. In the remaining countries, this category covers only few percentages of the workforce in energy, water and waste. Long working hours, that is 44.1 hours and more, are found in Germany, where more than one in three report to be working so many hours. In contrast, approximately one in ten workers reports to be working in this hours' category in the Czech Republic, Finland, Poland, and Sweden. In the remaining countries –Belgium, Denmark, France, Hungary, Italy, the Netherlands, Spain, and the UK-- the share with long working hours is about two in ten.

Graph 3.1 Distribution over five categories of usual working hours in the thirteen countries.

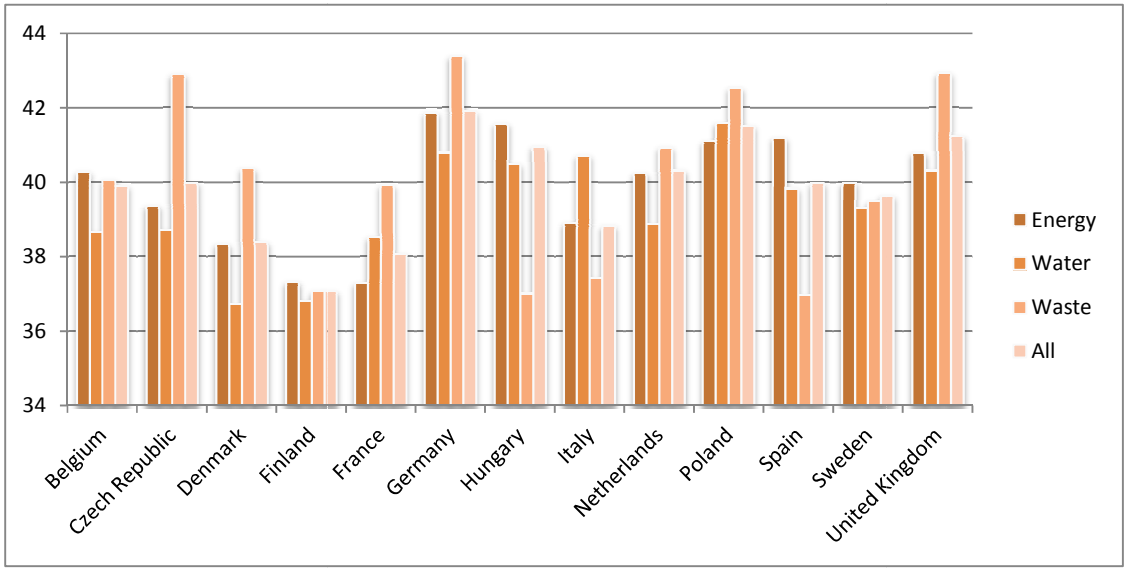


Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries.
N=5,357 - Note: 4 respondents have not indicated their working hours.

3.3 Usual working hours by sub-sector

What does a breakdown by sub-sectors reveal? Graph 3.2 shows clearly that the average usual working hours per week are longest in the waste sub-sector in all countries apart from France, Hungary, Italy and Spain. The average hours are shortest in the water sub-sector, again apart from France, Hungary, Italy and Spain. The working hours in energy are in between in six countries, but not in Belgium, Finland, France, Hungary, Poland, Spain, and Sweden.

Graph 3.2 Average usual working hours, breakdown by sub-sector (mean hours per week) by sub-sectors.

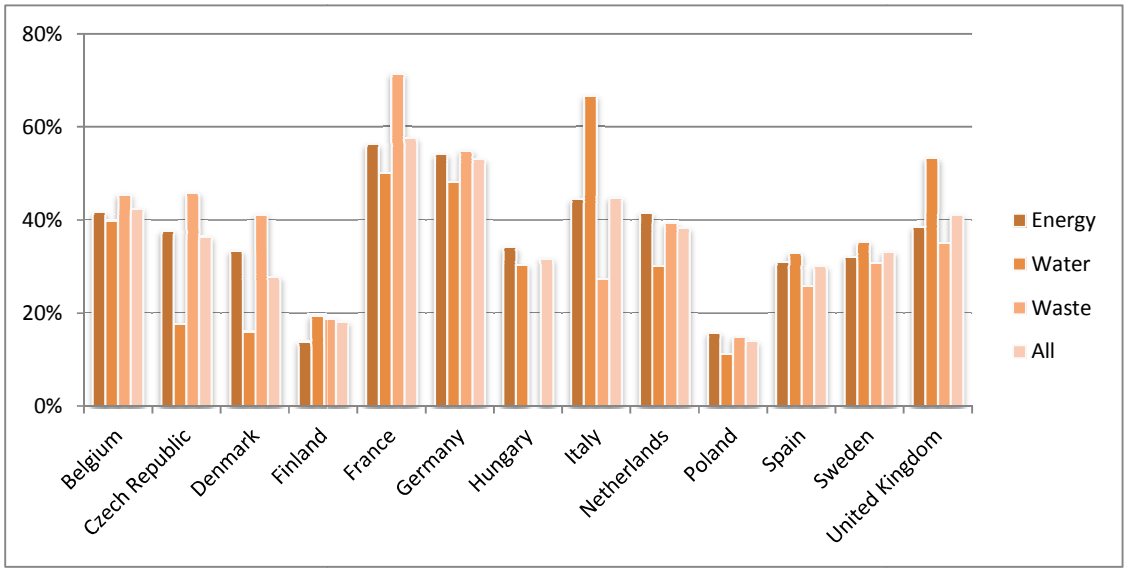


Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries.
N=5,357 - Note: Note: 4 respondents have not indicated their working hours.

3.4 Overtime hours by sub-sector

The web-survey has a question about contractual working hours and about usual working hours. Graph 3.3 reveals the percentages of workers reporting usually to be working more hours than agreed. Workers in France are on top, which might well be an effect of the 35 hours' law. In Germany, Italy, the Netherlands and the UK, the incidence of overtime is high too. There might be an effect of the (temporarily) strong recovery from the economic crisis in the course of 2010, having led to much overtime. In contrast, Finland and Poland show little overtime. When comparing the sub-sectors, in half of the countries overtime most frequently occurs in waste, whereas it occurs least frequently in water.

Graph 3.3 Percentages reporting usually working longer hours than agreed in their contract by sub-sectors.

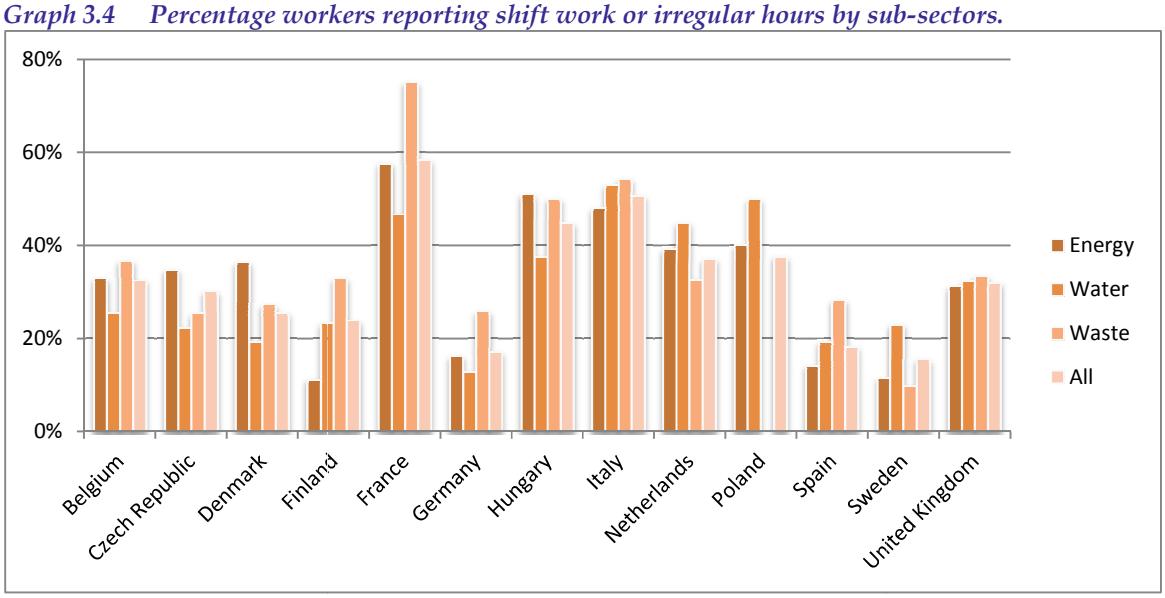


Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries.
N= 4,141 - Note: 1,220 respondents have not indicated if they work more hours.

3.5 Shifts or irregular hours

The web-survey includes a question asking if the respondent works shifts or irregular hours. Graph 3.4 shows how often the workers in energy, water and waste report to do so. In the waste sub-sector, the incidence of shift or irregular hours is highest in the majority of countries. While in France a high share of overtime workers report to be working irregular hours, this is not the case in Germany, where also many overtime hours have been reported.

Graph 3.4 Percentage workers reporting shift work or irregular hours by sub-sectors.



Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries.
N= 4,185 - Note: 1,176 respondents have not indicated if they work shifts.

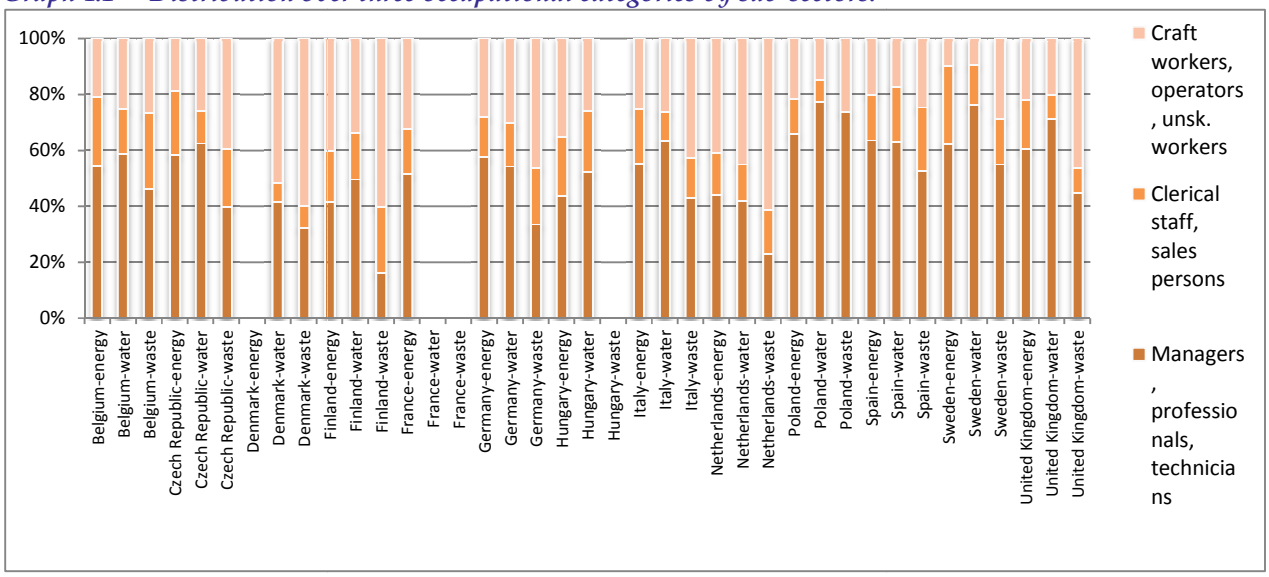
Chapter 4 Occupational structures and skills in energy, water and waste

4.1 The occupational groups in energy, water, and waste

In Chapter 2 the wages of three major occupational groups have been studied. These three are: (1) managers, professionals and technicians; (2) clerical staff and sales persons; (3) craft workers, operators and unskilled workers. Table A1 in the Appendix includes a list of occupational titles, grouped into these three groups. In this chapter, we will provide more details about the three occupational groups; thus, we will shift our focus from the three sub-sectors to the three occupational groups.

Graph 4.1 shows for each sub-sector in each country the distribution of the respondents over the three occupational categories. It shows that in most countries the shares of managers, professionals and technicians are lower in waste than in energy and water, whereas the percentages of craft workers, operators and unskilled workers are larger.

Graph 4.1 Distribution over three occupational categories by sub-sectors.



Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries.
N= 4, 895 - Note: not all respondents with valid wage information have indicated their occupation.

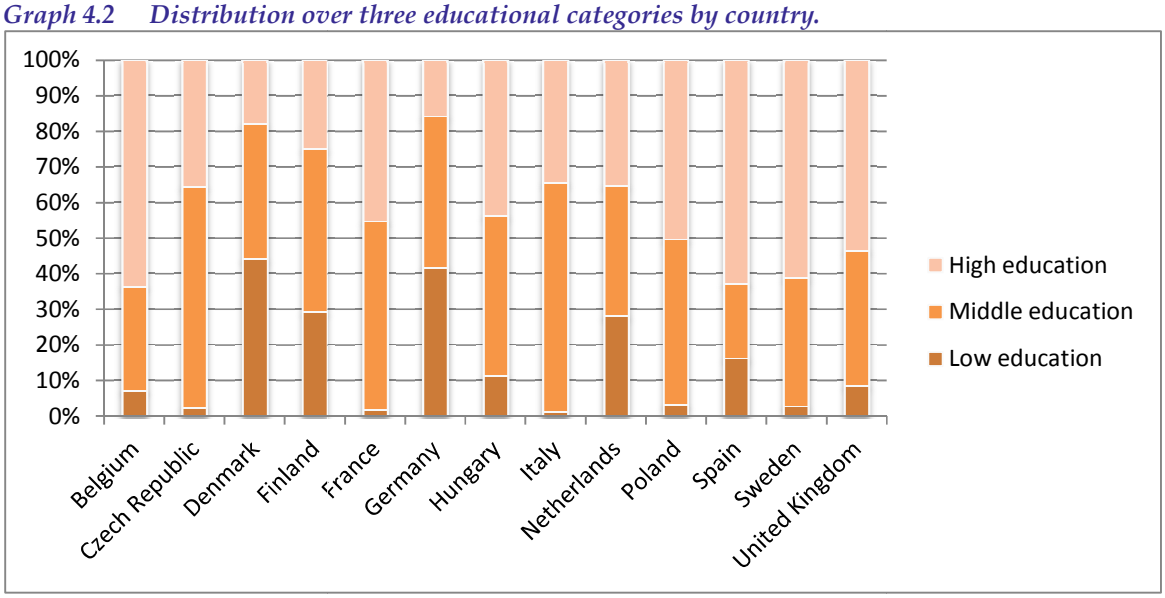
4.2 Educational levels

Occupations are closely related to educational levels. This section addresses the distribution over three educational categories: high, middle and low education, using the ISCED levels explained in the introduction of Chapter 2. Graph 4.2 provides a picture per country. We do not provide a breakdown into sub-sectors here, because the category 'low education' does not have sufficient observations to present reliable figures.

Graph 4.2 shows that five to six in ten workers are highly educated in Belgium, France, Poland, Spain, Sweden, and the UK. In the remaining countries this share is three to four in ten workers. The exceptions are Denmark, Finland and Germany, with only two in ten highly educated. In Denmark and Germany the share of low educated workers is with four in ten workers highest compared to other countries; the Netherlands and Finland follow with three in ten. In the

remaining countries the share is approximately one in ten, with some countries even far below that. However, note that the ISCED classification does not fully incorporate vocational training into its ranking. In other words, the workforces in notably Denmark and Germany are probably not as low educated as it seems, because of the substantial vocational training many may have received in these countries.

Graph 4.2 Distribution over three educational categories by country.

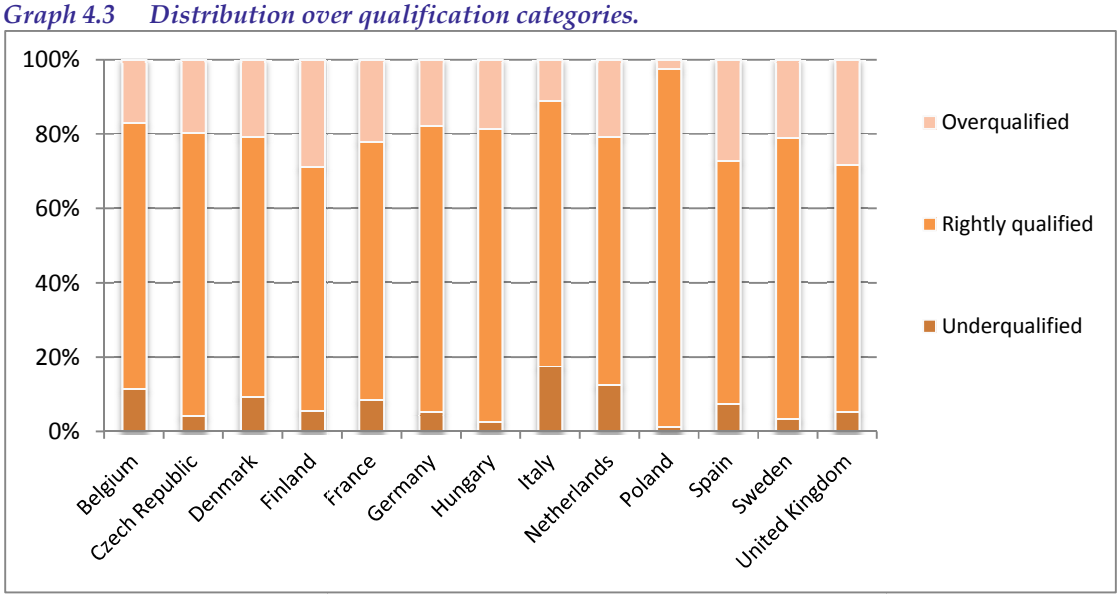


Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries.
N= 5,261- Note: not all respondents with valid wage information have indicated their education.

4.3 Skill levels

The *WageIndicator* web-survey includes a question "Do your qualifications match your job?" The three response options are "Yes", "No, I am overqualified for my job", and "No, I am underqualified for my job". Graph 4.3 shows that the vast majority of workers (seven to eight of every ten) perceives that they have the right skill level for their current job. Two in ten perceives to be overqualified. This is with three in ten workers higher in Finland, Spain, and the UK. In contrast, in Poland hardly any worker perceives to be overqualified. Underqualification is an even smaller problem in energy, water and waste: on average one in twenty workers perceives to be not sufficiently qualified, though in Belgium, Denmark, Italy and the Netherlands this share is one in ten workers.

Graph 4.3 Distribution over qualification categories.



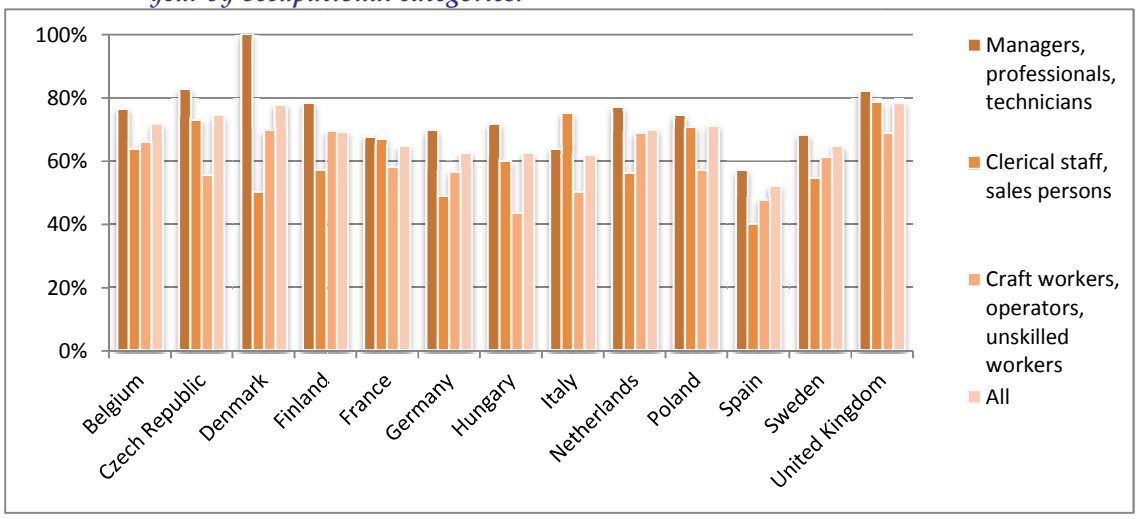
Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries.
N= 3,276 - Note: 2,085 respondents have not indicated their occupation or their qualification level.

4.4 Training

The web-survey has a question "How much training have you received, paid for or provided by your EMPLOYER, over the past year in order to improve your skills?" The possible answers are: None, 1 - 2 days , 3 - 6 days, 1 - 2 weeks, 3 - 4 weeks , 1 - 2 months, 2 months or more. For this report, we have rearranged the answers into two categories, indicating yes or no training received. Graph 4.4 reveals that training obviously is not a major problem in the sector at large. The majority of workers reports having received at least one day of training over the past year. Spain has the lowest percentage of workers reporting training, but even here still more than five in ten workers has received training. In Belgium, the Czech Republic, Denmark, Finland, the Netherlands, Poland and the UK, this percentage is even higher than seven in ten workers.

Details for the three occupational groups reveal that occupational group (1), Managers, professionals and technicians reports most frequently to receive training in all countries, apart from Italy. The shares of workers in this occupational group receiving training vary between six to eight in ten workers, with the Danish even reporting ten in ten. In occupational group (2), Clerical staff and sales persons, five to seven workers report having received training, apart from Spain with only four in ten and the UK with even eight in ten. In group (3), Craft workers, operators and unskilled workers, the percentages reporting having received training are about equal to those of occupational group (2). Five to seven workers report this, apart from Hungary where it is four in ten.

Graph 4.4 Percentages having received at least one day of employer-paid training in the last year by occupational categories.



Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries.
N= 4, 093 - Note: 1,268 respondents have not indicated their occupation or their training.

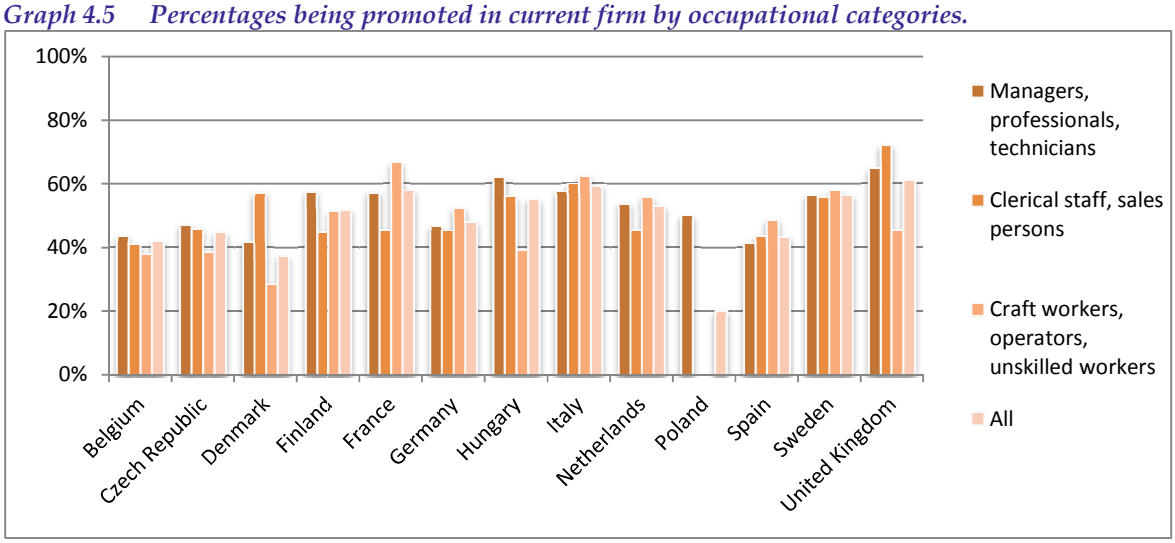
4.5 Careers

The web-survey contains a question asking if respondents have occupied more than one job with their current employer. In this report we define those who have had two or more jobs as being promoted, though we are aware that changes of job may also be due to reorganisations, mergers, the introduction of new technology or other reasons, and therefore may not necessarily be a promotion. However, the web-survey is not sufficiently detailed to address this difference.

Taken into account this definition of promotion, Graph 4.5 reports the percentages of workers reporting that they are being promoted. It shows that promotion is rather common practice: across countries, between four to six in ten workers reports to be promoted. These percentages slightly differ across the three occupational categories. Overall, occupational group (3) Craft workers, operators, unskilled workers, reports most frequently to be promoted, whereas occupational group (2) Clerical staff and sales persons reports least often to be promoted, with group (1) Managers, professionals and technicians in between. Across countries, however, this ranking varies slightly.

Promotion depends among others on the years of service in the firm. In a separate analysis (no table in the report) we found that promotion indeed is related to years of service. The longer the work experience, the higher the chance of being promoted. In small firms of 50 employees and less, the chance of promotion is smaller than in larger firms, but this will not come as a surprise neither. Controlling for these factors, women are less likely to be promoted than men. Finally, the public-private divide and the educational attainment do not affect the chance of being promoted.

Graph 4.5 Percentages being promoted in current firm by occupational categories.



Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries.
N= 3,704 - Note: 1,657 respondents have not indicated their occupation or their promotions.

Chapter 5 Working conditions in energy, water and waste

5.1 Introduction

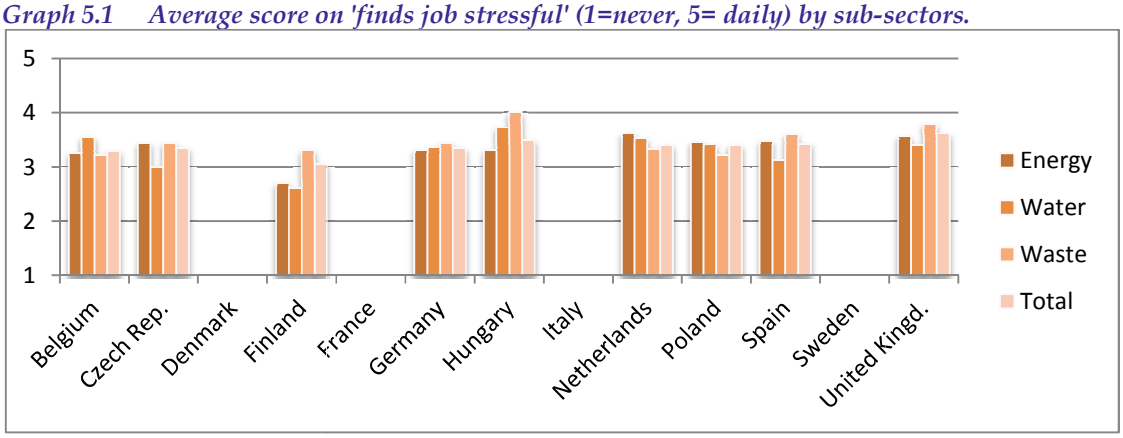
Treating working conditions in social research and surveys asks for some explanation. A wide variety of research approaches and yardsticks prevail in this field. Already for decades in various countries, most notably in the UK, Germany, the Scandinavian countries and the Netherlands, debates among researchers are going on how to capture and measure the quality of work. More recently these debates have also reached policy debates and regulation at the EU level (Cf. Van Klaveren and Tijdens 2008: 164-170). In the *WageIndicator* web-survey about 15 questions are asked in this field, covering as many yardsticks for work quality, wherever possible similar to questioning in the European Working Conditions Surveys (EWCS) of the Dublin Foundation. For the purpose of this reporting, we have selected eight yardsticks: four covering aspects of work-related stress (job stressful; boring; mentally exhausting; physically exhausting); dangerous work; the incidence and expectation of reorganisations, and job security. Because of data limitations we were only able to report on working conditions for eight or nine countries.

5.2 Job stressful

The web-survey contains a question about job stress, asking how often respondents find their job stressful. The answers range from never to daily on a 5-point scale, ranging from 'never stressful' (=1) to 'finds job daily stressful' (=5). Graph 5.1 presents the average score on the stress-level. Stress is highest in the UK (3.6), followed by Hungary (3.5), whereas it is lowest in Finland (3.0). In six of the nine countries reported stress levels are highest in the waste subsector.

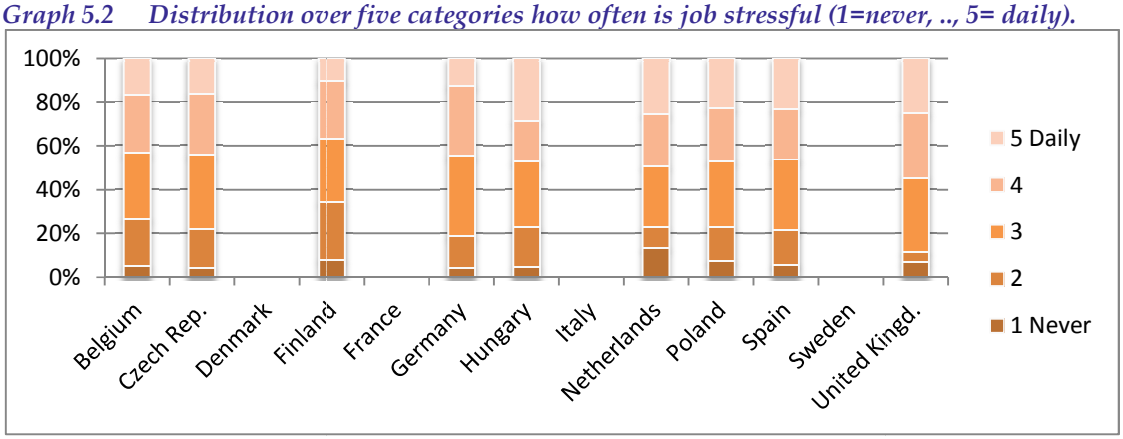
Graph 5.2 shows the distribution over the five 'stress' categories. In almost all countries, around two of ten workers never or hardly ever find their job stressful. On the other hand also in almost all countries around four of ten workers find their job daily or almost daily stressful. In the UK this last share is highest with almost six in ten workers, followed by the Netherlands. Across all countries about three in ten workers find their job moderately stressful.

Graph 5.1 Average score on 'finds job stressful' (1=never, 5= daily) by sub-sectors.



Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. N= 1,857 - No data is available for Denmark, France, Italy, and Sweden.

Graph 5.2 Distribution over five categories how often is job stressful (1=never, .., 5= daily).



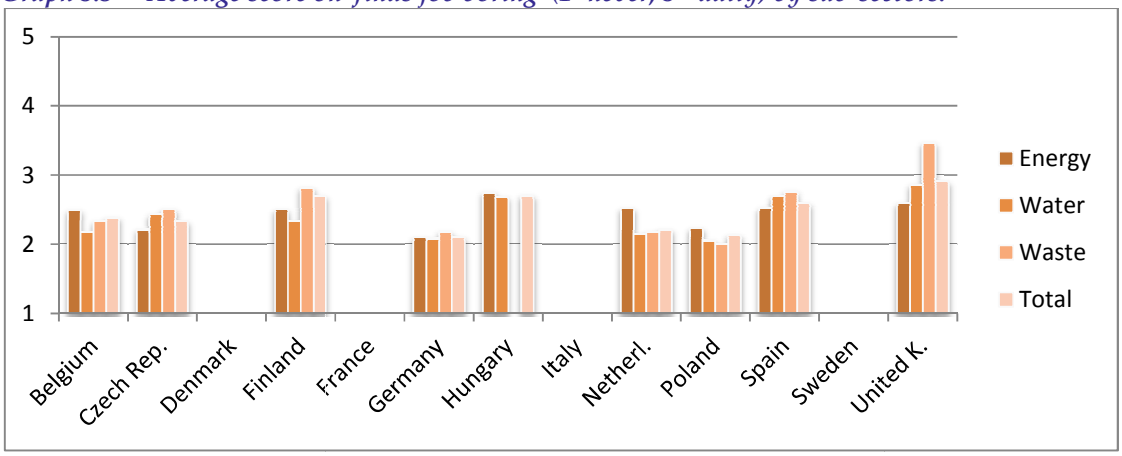
Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. N= 1,857 - No data is available for Denmark, France, Italy, and Sweden.

5.3 Boring job

The web-survey contains a question asking how often respondents find their job boring. The answers range from never to daily on a 5-point scale, ranging from 'never boring' (=1) to 'daily boring' (=5). Graph 5.3 presents the average scores on the boring-level. This level is highest in the UK (2.9), followed by Hungary and Finland (2.7), whereas it is lowest in Germany (2.1). In five of the nine countries, reported stress levels are highest in the waste subsector.

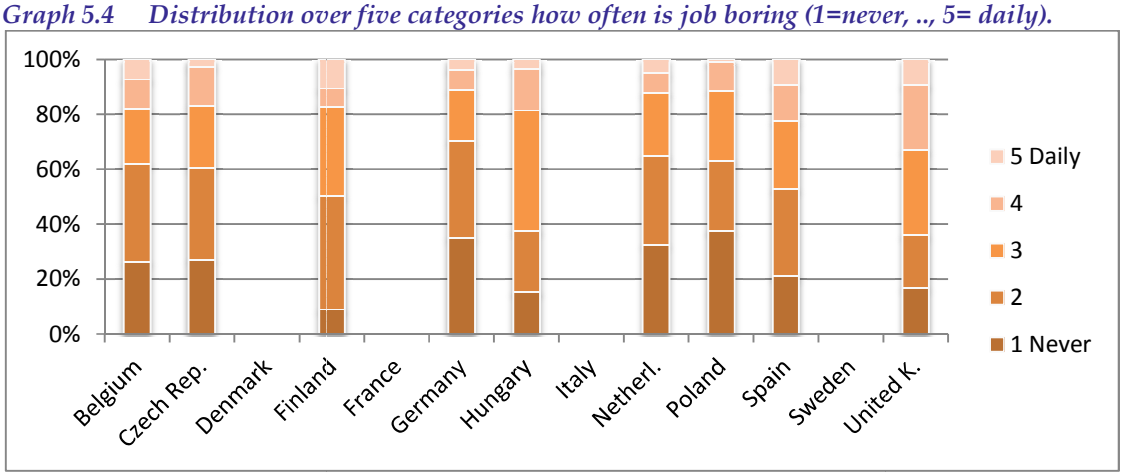
Graph 5.4 shows the distribution over the five 'boring' categories. In almost all countries, six of ten workers never or hardly ever find their job boring, but in two countries this is only four of ten workers. In almost all countries, slightly more than one of ten workers find their job daily or almost daily boring. In the UK this share is higher, namely three in ten workers, followed by Spain with two in ten.

Graph 5.3 Average score on 'finds job boring' (1=never, 5= daily) by sub-sectors.



Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. N= 1,939 - No data is available for Denmark, France, Italy, and Sweden.

Graph 5.4 Distribution over five categories how often is job boring (1=never, .., 5= daily).



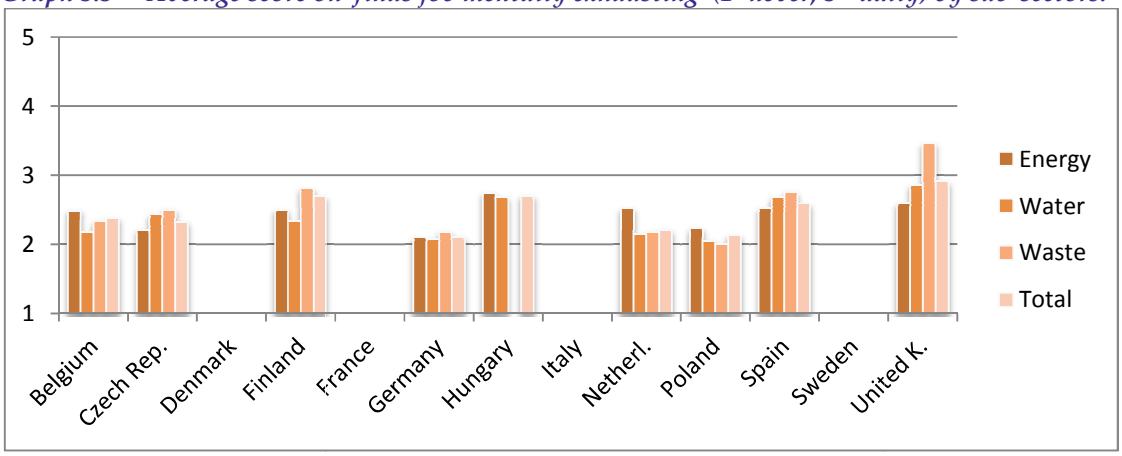
Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. N= 1,939 - No data is available for Denmark, France, Italy, and Sweden.

5.4 Job mentally exhausting

The web-survey contains a question asking how often respondents find their job mentally exhausting. The answers range from never to daily on a 5-point scale, ranging from 'never mentally exhausting' (=1) to 'daily mentally exhausting' (=5). Graph 5.5 presents the average scores on the exhausting-level. The share of mentally exhausting jobs is highest in Spain (3.7), followed by Hungary and the UK (3.5), whereas it is lowest in the Netherlands (2.9). In four of the nine countries the reported exhausting levels are highest in the energy subsector.

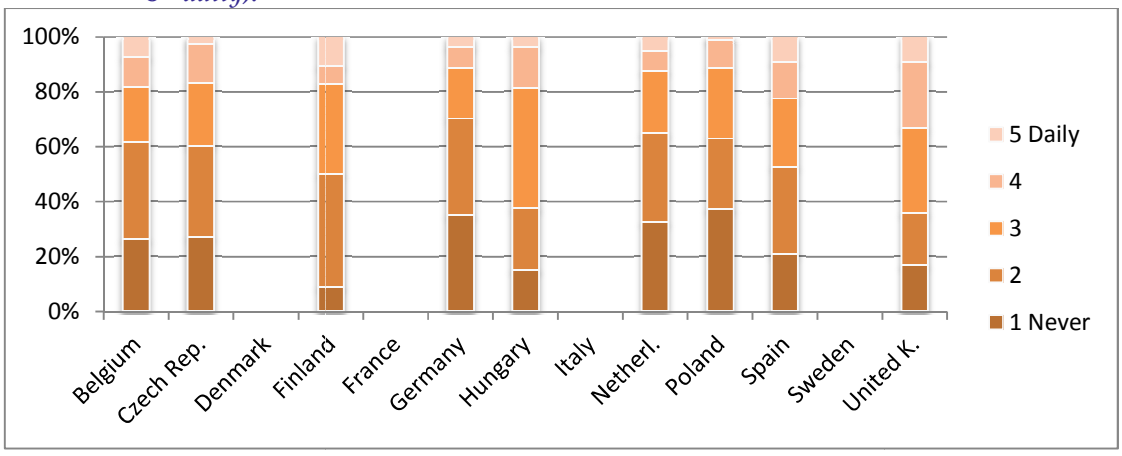
Graph 5.6 shows the distribution over the five 'exhausting' categories. In two countries, Finland and the Netherlands, more than three of ten workers never or hardly ever find their job mentally exhausting, but in Spain this is even less than two of ten workers. Across the nine countries at least three of ten workers find their job daily or almost daily mentally exhausting. In Poland, Spain and the UK the latter is higher, namely more than five in ten workers.

Graph 5.5 Average score on 'finds job mentally exhausting' (1=never, 5= daily) by sub-sectors.



Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. N= 1, 908 - No data is available for Denmark, France, Italy, and Sweden.

Graph 5.6 Distribution over five categories how often is job mentally exhausting (1=never, .., 5= daily).



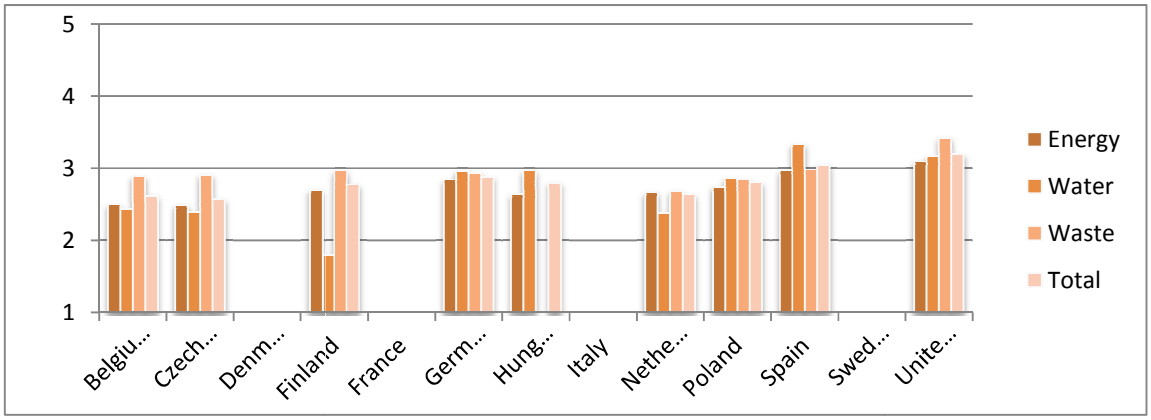
Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. N= 1, 908 - No data is available for Denmark, France, Italy, and Sweden.

5.5 Job physically exhausting

The web-survey contains a question asking how often respondents find their job physically exhausting. The answers range from never to daily on a 5-point scale, ranging from 'never physically exhausting' (=1) to 'daily physically exhausting' (=5). Graph 5.7 presents the average scores on the exhausting-level. The level of physically exhausting jobs is highest in the UK (3.2), followed by Spain (3.0), whereas it is lowest in Belgium, the Czech Republic, and the Netherlands (2.6). In four of the nine countries the reported exhausting levels are highest in the energy subsector.

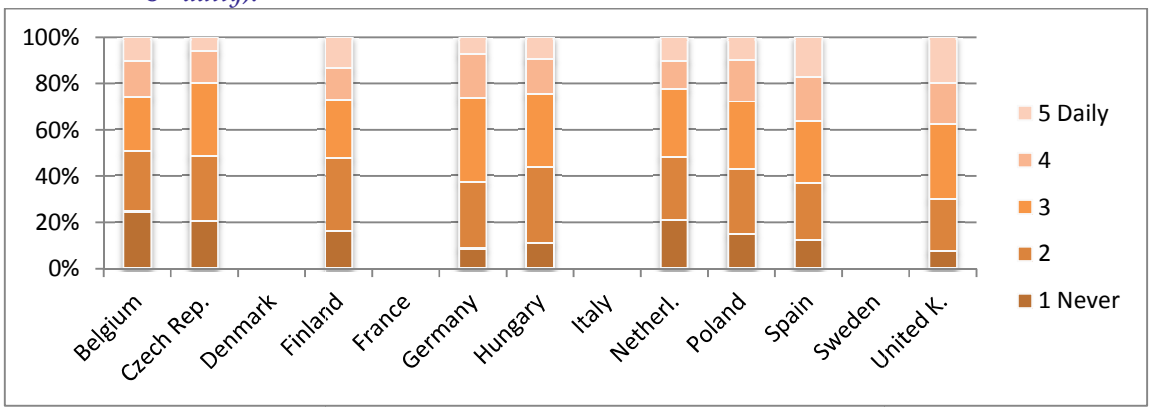
Graph 5.8 shows the distribution over the five 'exhausting' categories. In six countries between four and five of ten workers never or hardly ever find their job physically exhausting, but in three countries, Germany, Spain and the UK, this is slightly more than three of ten workers. In the nine countries, two to three of ten workers find their job daily or almost daily physically exhausting. In Spain and the UK this is slightly higher.

Graph 5.7 Average score on 'finds job physically exhausting' (1=never, 5= daily) by sub-sectors.



Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. N= 1, 985- No data is available for Denmark, France, Italy, and Sweden.

Graph 5.8 Distribution over five categories how often is job physically exhausting (1=never, .., 5= daily).



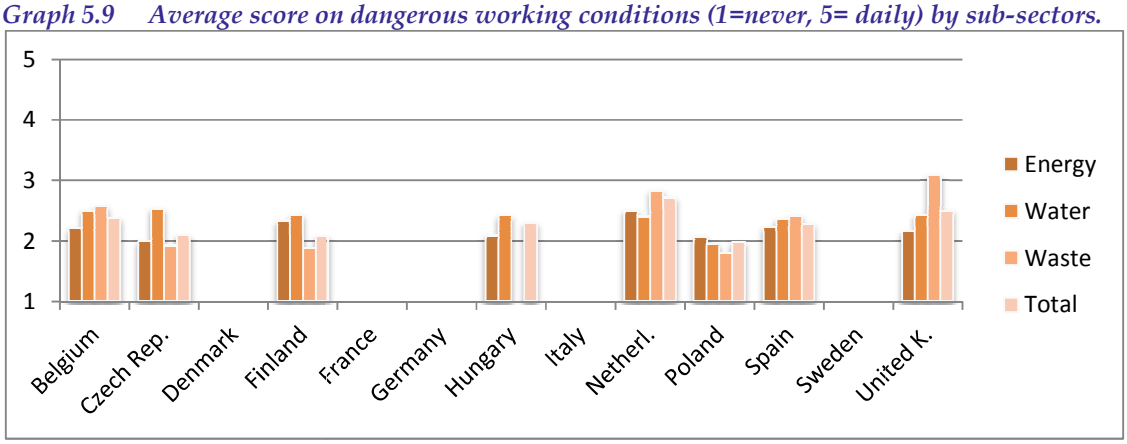
Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. N= 1, 985 - No data is available for Denmark, France, Italy, and Sweden.

5.6 Dangerous working conditions

The web-survey contains a question about working conditions, asking how often respondents work in dangerous conditions. The answers range from never to daily on a 5-point scale, ranging from 'never dangerous' (=1) to 'daily dangerous' (=5). Graph 5.9 presents the average scores. Dangerous working conditions are highest in the Netherlands (2.7), followed by the UK (2.5), whereas it is lowest in Poland (2.0). In four of the eight countries reported dangerous conditions are highest in the waste sub-sector.

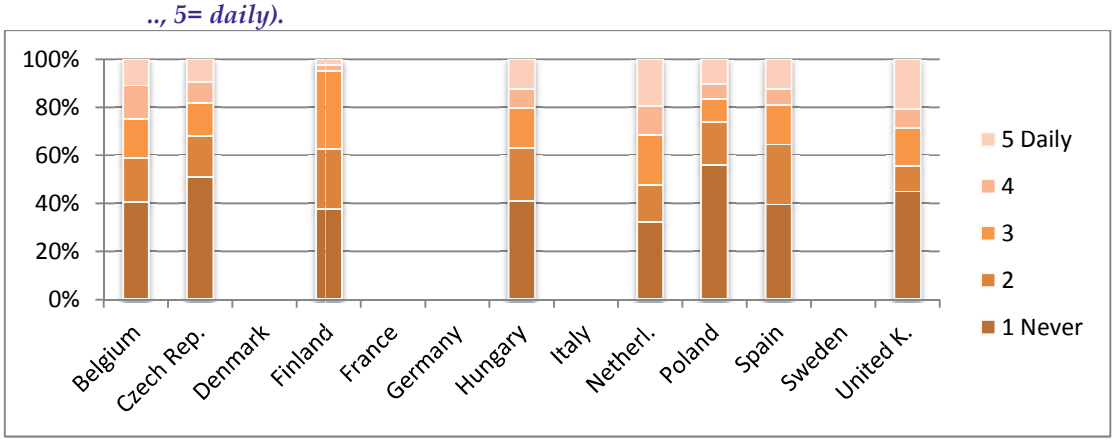
Graph 5.10 shows the distribution over the five 'dangerous conditions' categories. In almost all countries, between five to seven of ten workers never or hardly ever find they are working in dangerous conditions. On the other hand in almost all countries around two of ten workers find they are working in dangerous conditions daily or almost daily. In the Netherlands this last share is highest with more than three in ten workers, followed by the UK, whereas it is lowest in Poland with less than one in ten workers reporting so.

Graph 5.9 Average score on dangerous working conditions (1=never, 5= daily) by sub-sectors.



Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. N= 1,293 - No data is available for Denmark, France, Germany, Italy, and Sweden.

Graph 5.10 Distribution over five categories how often working dangerous conditions (1=never, .., 5= daily).



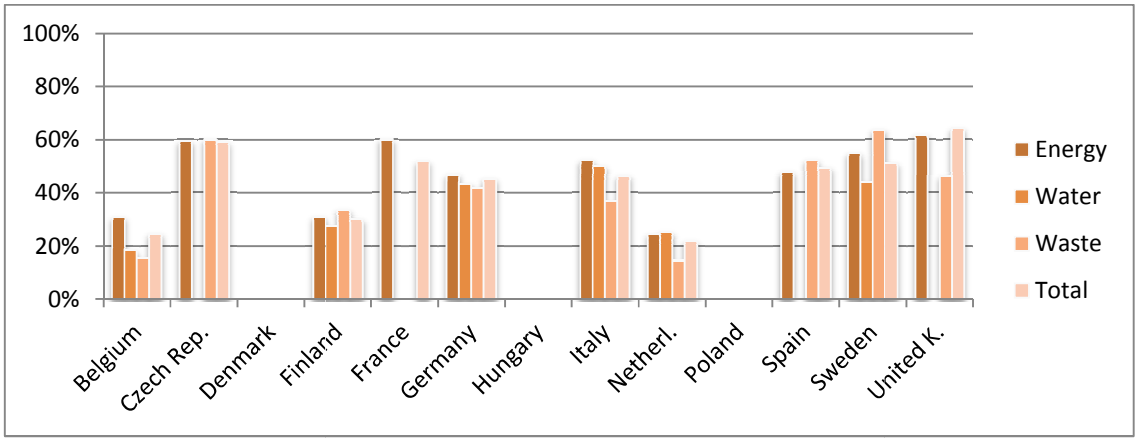
Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. N = 1,293 - No data is available for Denmark, France, Germany, Italy, and Sweden.

5.7 Reorganisations

The web-survey contains two questions about reorganisations, asking if reorganisations had affected workplaces in the respondents' organisation in the past 12 months and asking if reorganisations were expected in the next 12 months. The answers could be "Yes" or "No".

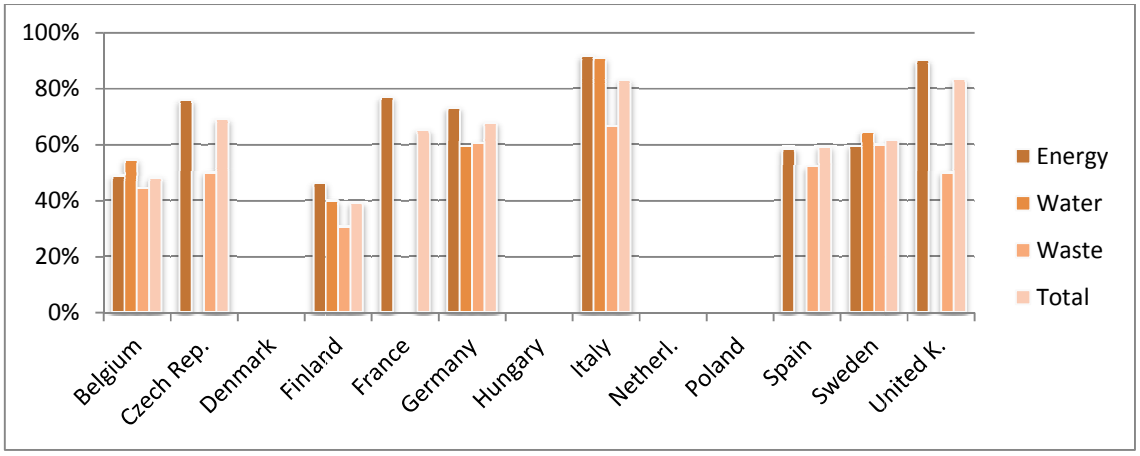
Graphs 5.11 and 5.12 show the percentages workers reporting about reorganisations affecting workplaces. Percentages vary largely across countries, but less so across the three subsectors. In the Czech Republic, France, Spain, Sweden and the UK more than five in ten workers reports about reorganisations in the past 12 months, whereas this is only two in ten in the Netherlands and Belgium. Overall, higher percentages of workers report to expect reorganisations. In Italy and the UK even more than eight in ten workers fills out to expects so, followed by the Czech Republic and Germany with seven in ten workers. Finland shows the lowest share, with four in ten workers expecting reorganisations.

Graph 5.11 Percentages workers reporting about reorganisations in the past 12 months by sub-sectors.



Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. N= 1,044. No data is available for Denmark, Hungary, and Poland.

Graph 5.12 Percentages workers reporting about reorganisations in the next 12 months by sub-sectors.



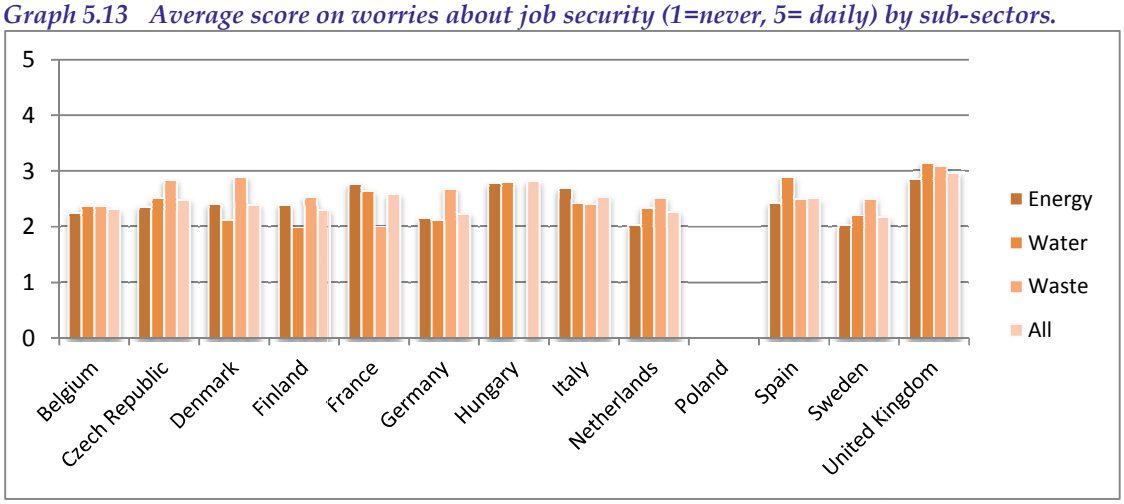
Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. N = 888. No data is available for Denmark, Hungary, Netherlands and Poland.

5.8 Job security

The web-survey contains a question about job security, asking how often respondents worry about the security of their job. The answers range from never to daily on a 5-point scale, ranging from 'worries never' (=1) to 'worries daily' (=5) about job security. Graph 5.13 presents the average score on the worries-level. It is highest in the UK (3.0), followed by Hungary (2.8), whereas it is lowest in Sweden and Germany (2.2).

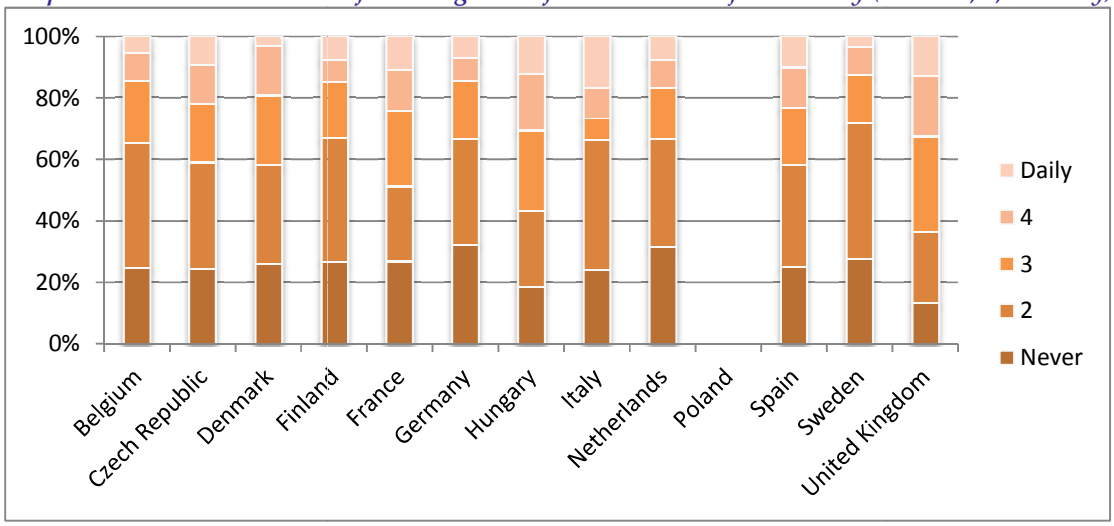
Graph 5.14 shows the distribution over the five 'worry' categories. In the majority of countries seven of ten workers never or hardly ever worry about their job security. In three countries this is six of ten, namely in the Czech Republic, Denmark, and Spain. In France, this is five in ten, whereas in Hungary and the UK it is four in ten. In the latter two countries the rather considerable share of nearly four in ten workers worry daily or almost daily about their job security, while in Italy this share is nearly three in ten. In Belgium, Finland and Sweden, this is only one in ten. Scores in the remaining countries are in between.

Graph 5.13 Average score on worries about job security (1=never, 5= daily) by sub-sectors.



Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. Wages are expressed in Standardized German Euros level 2010.
N= 2,741 - Note: not all respondents with valid wage information have indicated their occupation. No data is available for Poland.

Graph 5.14 Distribution over five categories of worries about job security (1=never, .., 5= daily).



Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries.
N= 2,741 - Note: not all respondents with valid wage information have indicated their occupation. No data is available for Poland.

Chapter 6 A closer look: Germany and the Netherlands

6.1 Introduction

For most countries, the data from the web-survey has not sufficient observations to provide further details for each of the three sub-sectors. Yet, for two countries, Germany and the Netherlands, the sample size allows for these details. This chapter therefore reports about the characteristics of workers in the energy, the water and the waste sub-sectors in these two countries. Table 6.1 shows the number of observations with valid wage data across countries and sub-sectors. The composition of respondents over sub-sectors clearly differs. It can be deived from the table that in Germany with 64% the energy sub-sector contributes by far the largest share of respondents, followed by water (21%) and waste (15%). By contrast, in the Netherlands with 50% waste has the largest share of respondents, followed by energy (30%) and water (20%).

Table 6.1 Number of observations with valid wages data in three sub-sectors, in Germany and the Netherlands

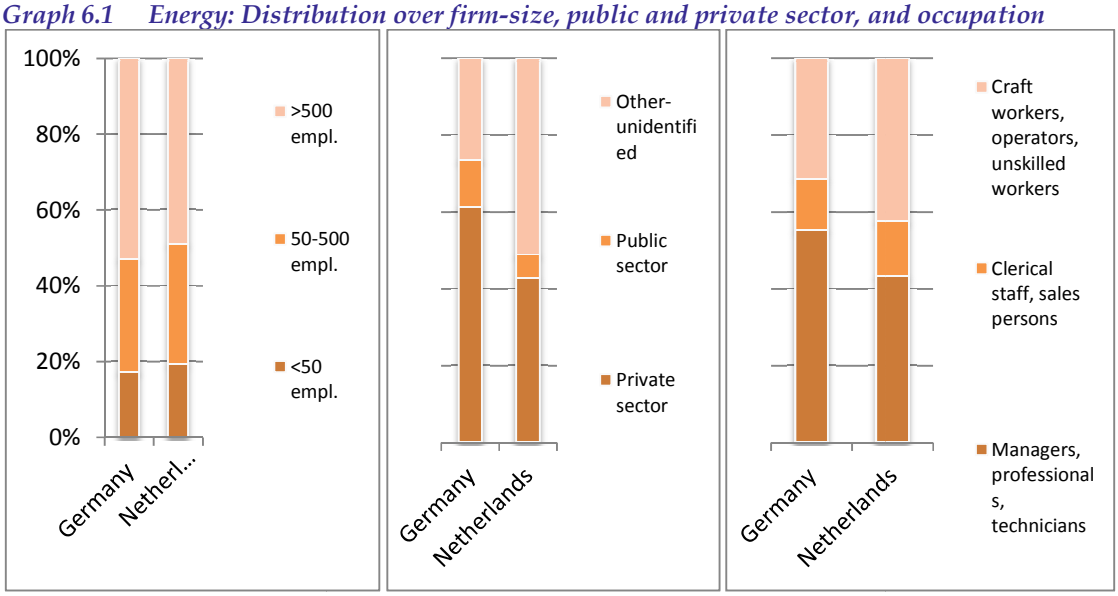
	Energy	% with valid wage	Water	% with valid wage	Waste	% with valid wage	Total	% with valid wage
Germany	1334	53%	416	59%	321	62%	2071	56%
Netherlands	628	51%	424	49%	1062	49%	2114	49%
Total	1962	53%	840	54%	1383	52%	4185	53%

6.2 Energy

Graph 6.1 shows the distribution of the energy sub-sector respondents in Germany and the Netherlands by firm size, by the public/private divide, and by the three occupational categories explained earlier.

The division over firm size categories hardly differs: nearly five in ten German respondents work in large firms, against slightly over five in ten of the Dutch. By contrast, six in ten German energy workers can be found in the private sector, against four in ten for the Netherlands. In Germany, nearly six of ten respondents are grouped in (1), the managers, professionals and technicians, whereas in the Netherlands this is just over four in ten. In the Netherlands occupational group (3), craft workers etc., is about the same size.

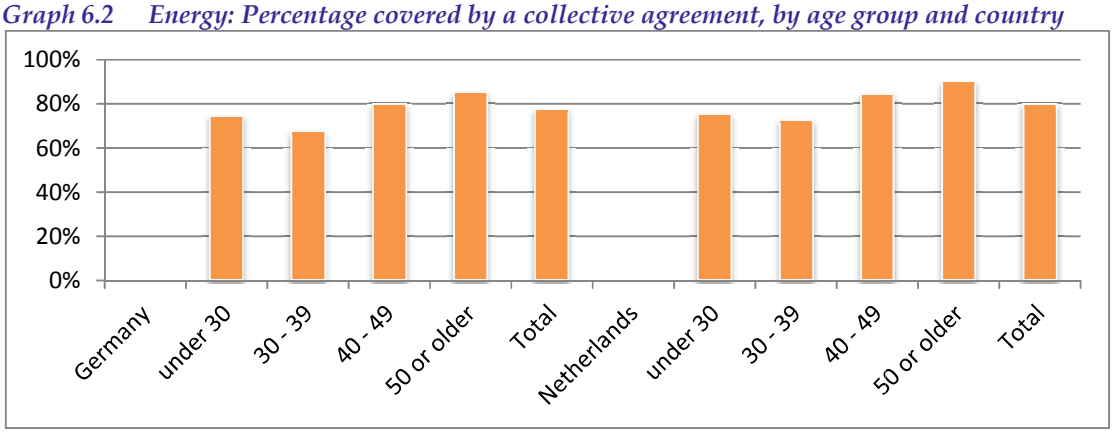
Graph 6.1 Energy: Distribution over firm-size, public and private sector, and occupation



Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers in energy in Germany and the Netherlands. N= 1,962.

Which share of workers in energy reports to be covered by a collective agreement? Graph 6.2 shows that in Germany and in the Netherlands on average eight in ten workers are covered. This graph also shows that in both countries older workers are more often covered compared to younger workers, but that this pattern does not apply to the youngest age group, the workers under 30 years of age: their coverage is close to the averages.

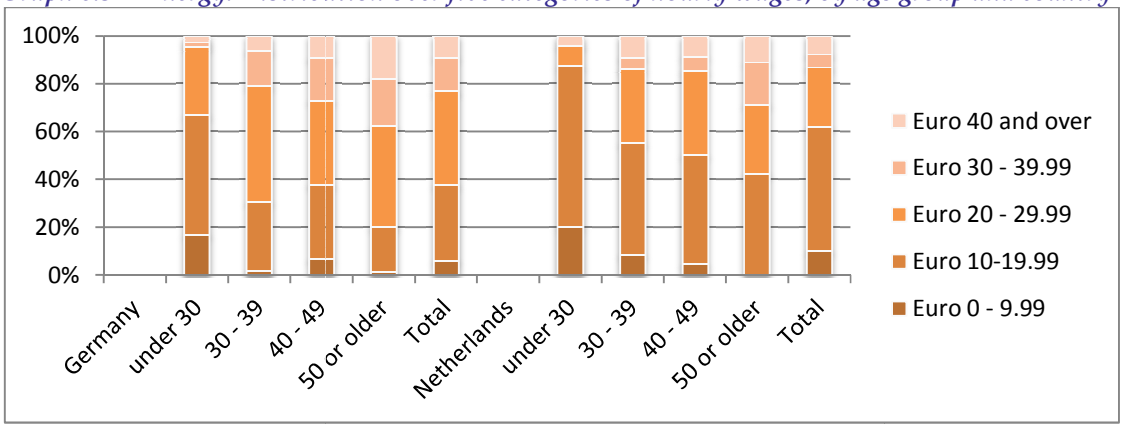
Graph 6.2 Energy: Percentage covered by a collective agreement, by age group and country



Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers in energy in Germany and the Netherlands. N= 1,962.

We go on in presenting a number of outcomes on wages. Graph 6.3 shows how the workers in energy are distributed over five categories of hourly wages. Not surprisingly, in both countries the youngest age group reveals the lowest earnings and the oldest groups shows the highest earnings. For this last age group, in Germany the bracket 20-29 euro is substantially larger compared to the Netherlands, where still a substantial group of older workers falls in the bracket 10-19 euro.

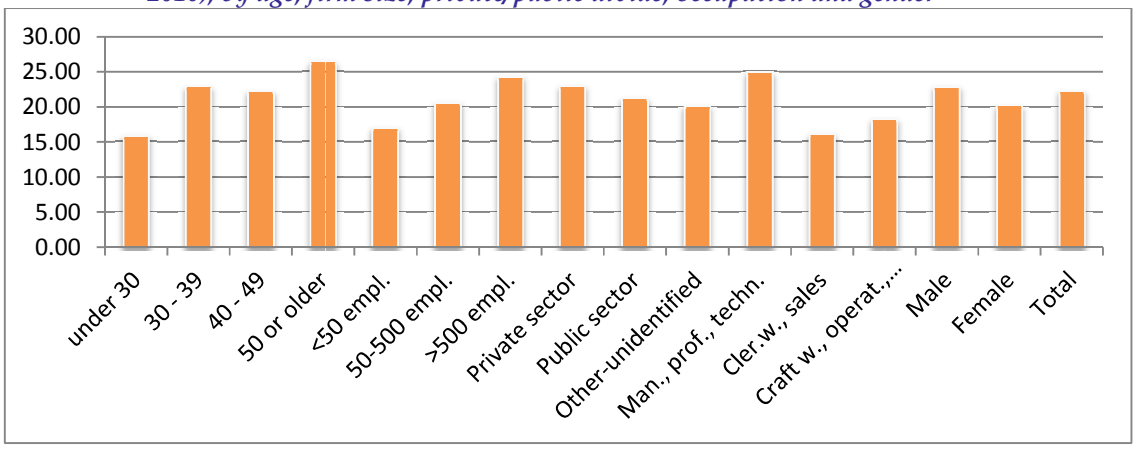
Graph 6.3 Energy: Distribution over five categories of hourly wages, by age group and country



Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers in energy in Germany and the Netherlands. N= 1,028.

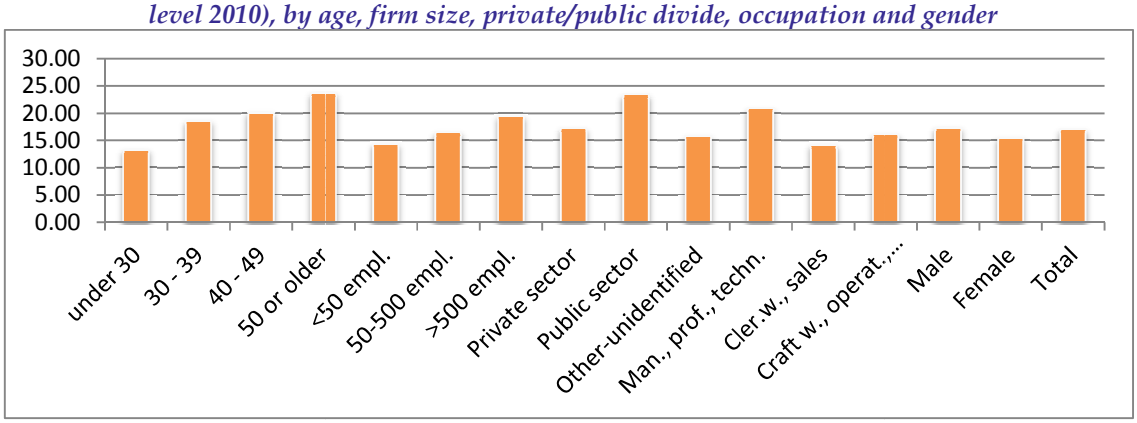
Graphs 6.4 and 6.5 reveal the median wages in energy for Germany and the Netherlands, broken down by age, firm size, private/public divide, occupation, and gender. It shows that in both countries the median wages are higher for the oldest age group compared to the youngest, that wages in small firms are lower than in large firms, that wages in the occupational group of managers and professionals, and technicians is higher compared to other groups, and that the male workers have higher earnings than the female workers. Yet, in one respect the countries differ: in Germany wages are higher in the private sector, whereas in the Netherlands they are higher in the public sector.

Graph 6.4 Energy in Germany: median hourly wages (in Standardized German Euros level 2010), by age, firm size, private/public divide, occupation and gender



Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers in energy in Germany. N= 711.

Graph 6.5 Energy in the Netherlands: median hourly wages (in Standardized German Euros level 2010), by age, firm size, private/public divide, occupation and gender



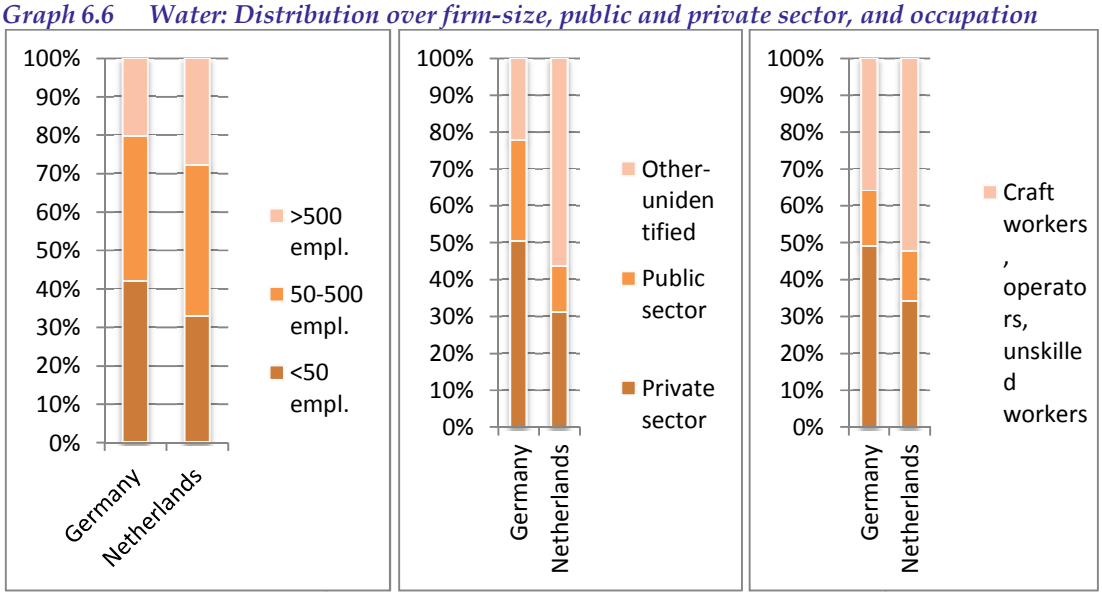
Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers in energy in Netherlands. N= 320.

6.3 Water

Graph 6.6 reveals the distribution of the respondents from the water sub-sector in Germany and the Netherlands by firm size, by the public/private divide, and by the three occupational categories explained earlier.

The division over firm size categories differs not that much: only two in ten German respondents from water work in large firms, against nearly two in ten of the Dutch; the other two size categories are about equal. Here too, like in energy, a larger share of German respondents can be found in the private sector: about half, against three in ten for the Netherlands. And again, in Germany a higher percentage can be grouped in (1), managers, professionals and technicians: nearly half, against one in three in the Netherlands. With over half of the respondents in water, in the Netherlands group (3), craft workers etc., is clearly largest.

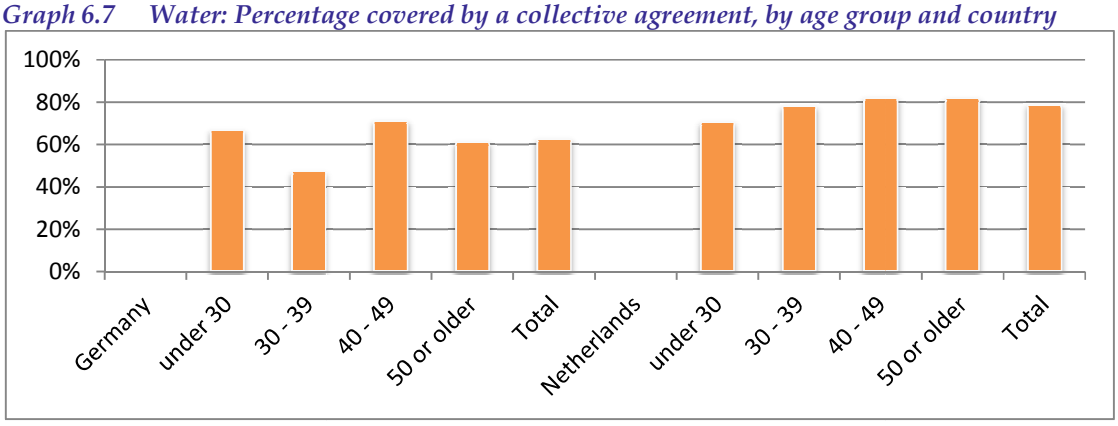
Graph 6.6 Water: Distribution over firm-size, public and private sector, and occupation



Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers in Water in Germany and the Netherlands. N= 840.

Which percentage of workers in water reports to be covered by a collective agreement? Graph 6.7 shows that in Germany six in ten workers and in the Netherlands even eight in ten workers are covered. The graph also shows that in both countries the age groups 40-49 have the highest coverage rate. In Germany the age group 30-39 has the lowest coverage rate, while in the Netherlands this is the case with the age group under 30 years of age.

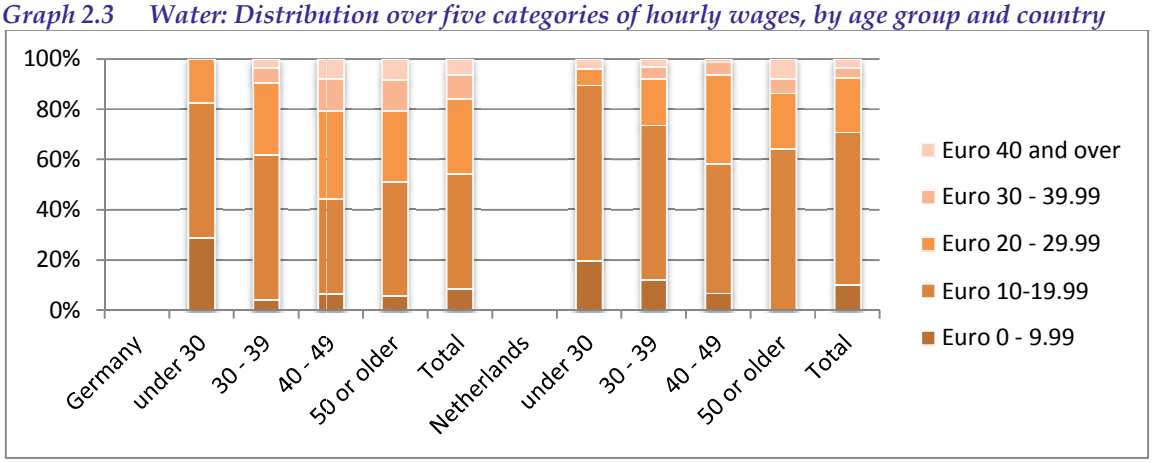
Graph 6.7 Water: Percentage covered by a collective agreement, by age group and country



Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers in Water in Germany and the Netherlands. N= 614.

Graph 6.8 shows how the workers in water are distributed over five categories of hourly wages. Not surprisingly, in both countries the youngest age group reveals the lowest earnings and the oldest groups shows the highest earnings. In Germany and in the Netherlands, the bracket 10-19 euro is the largest in all age groups. In Germany around five in ten workers earn between 10-19 euro, whereas this is around six in ten in the Netherlands.

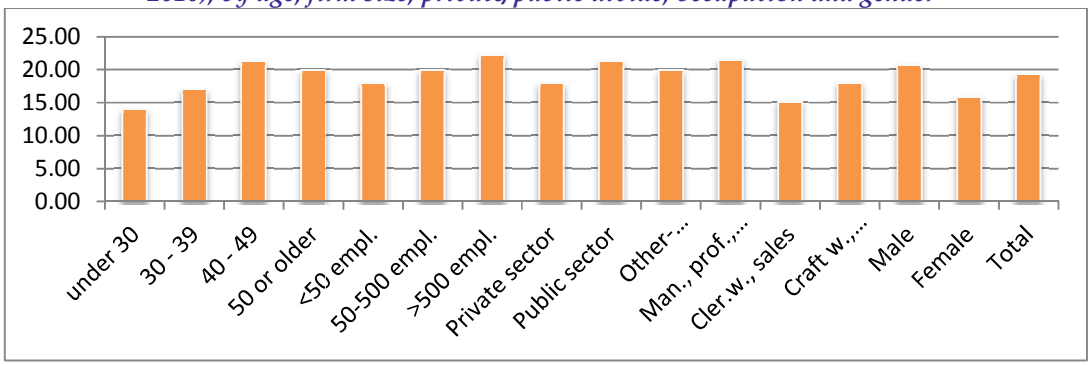
Graph 2.3 Water: Distribution over five categories of hourly wages, by age group and country



Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers in Water in Germany and the Netherlands. N= 450.

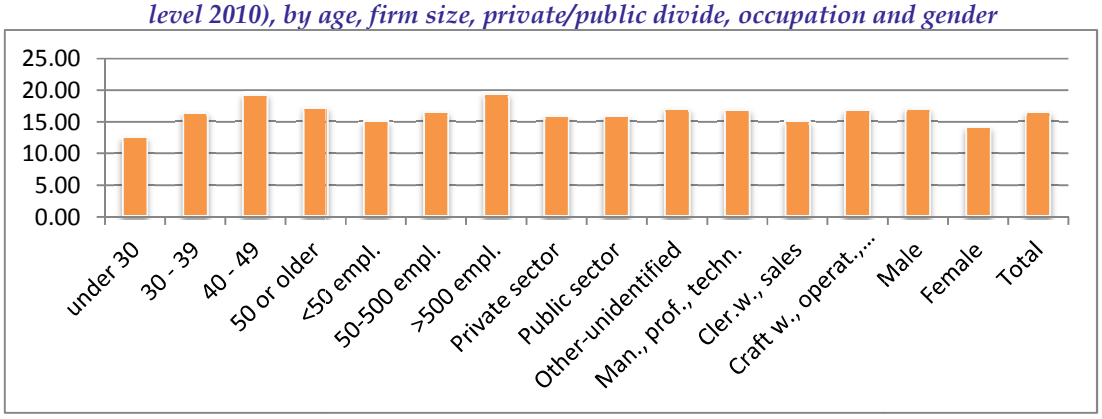
Graphs 6.9 and 6.10 reveal the median wages in water for Germany and the Netherlands, broken down by age, firm size, private/public divide, occupation and gender. It shows that in both countries median wages are highest for the age group 40-49, whereas it is lowest for the youngest group. The graphs show that wages in small firms are lower than in large firms, that wages in the occupational group of managers and professionals, and technicians is higher compared to other groups, and that the male workers have higher earnings than the female workers. In one respect, the countries differ: in Germany wage are higher in the private sector, whereas in the Netherlands they are higher in the public sector.

Graph 6.9 Water in Germany: median hourly wages (in Standardized German Euros level 2010), by age, firm size, private/public divide, occupation and gender



Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers in Water in Germany. N= 246.

Graph 6.10 Water in the Netherlands: median hourly wages (in Standardized German Euros level 2010), by age, firm size, private/public divide, occupation and gender



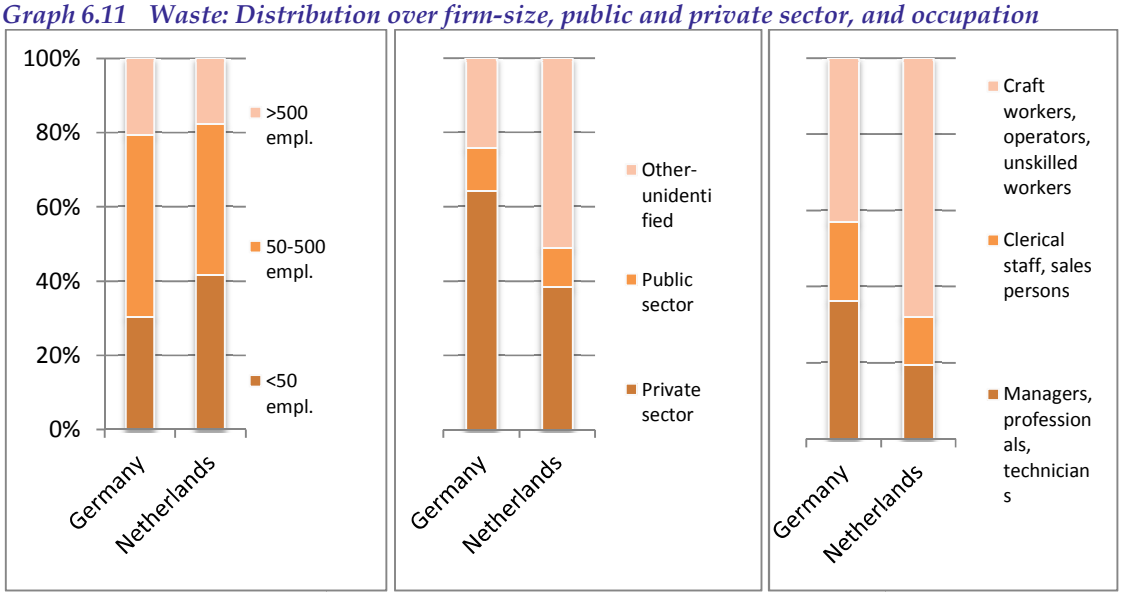
Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers in Water in Netherlands. N= 204.

6.4 Waste

Graph 6.11 shows the distribution of the respondents from the waste sub-sector in Germany and the Netherlands by firm size, by the public/private divide, and by the three occupational categories.

Like in energy and water, the division over firm size categories in waste does not differ that much across the two countries: in both only two in ten respondents work in large firms. And while three in ten Germans work in small organisations, this is the case for four in ten Dutch. Here too, a larger share of German respondents can be found in the private sector: over six in ten, against less than four in ten Dutch. Again, though less than in the other sub-sectors, in Germany a higher percentage can be grouped in (1), managers, professionals and technicians: nearly four in ten, against less than two in ten for the Netherlands. With two in three of the respondents in waste, in the Netherlands occupational group (3), craft workers etc., is by far largest; in Germany this group is just over four in ten.

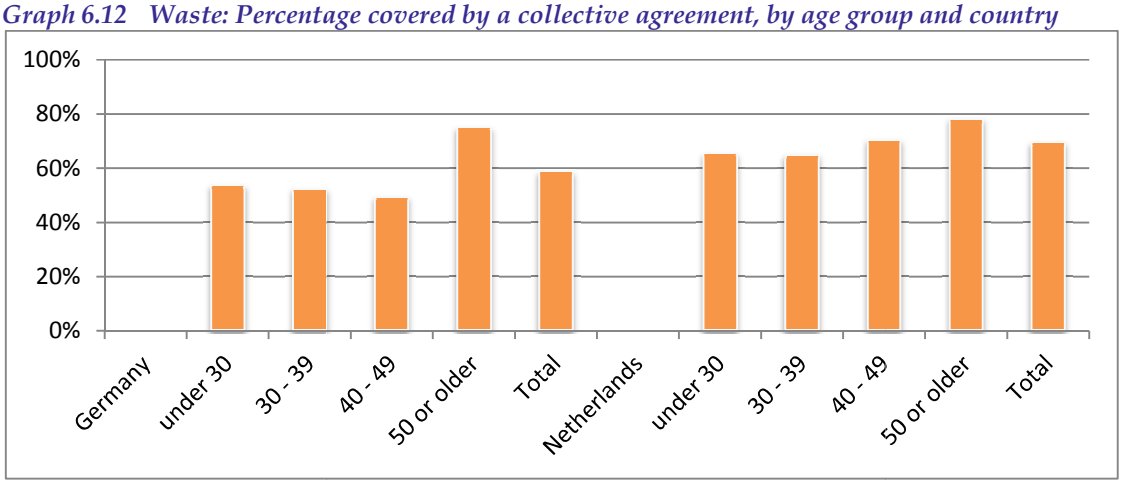
Graph 6.11 Waste: Distribution over firm-size, public and private sector, and occupation



Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers in Waste in Germany and the Netherlands. N= 1,383.

Which percentage of workers in waste reports to be covered by a collective agreement? Graph 6.12 shows that in Germany six in ten workers and in the Netherlands seven in ten workers are covered. The graph also shows that in both countries the age groups 50 and over have the highest coverage rates. Moreover, in Germany coverage rates in the younger age groups hardly differ, whereas in the Netherlands coverage is lowest in the age groups 30-39 and under 30 years of age.

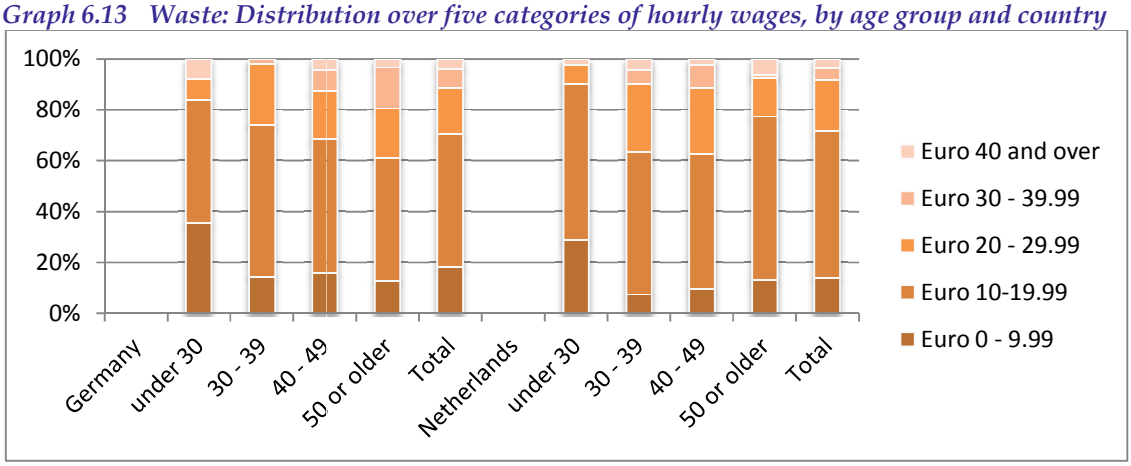
Graph 6.12 Waste: Percentage covered by a collective agreement, by age group and country



Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers in Waste in Germany and the Netherlands. N= 869.

Graph 6.13 shows how the workers in the waste sub-sector are distributed over five categories of hourly wages. Not surprisingly, in both countries the youngest age group reveals the lowest earnings and the oldest age group shows the highest earnings. Both in Germany and in the Netherlands the bracket 10-19 euro is the largest in all age groups: in Germany, around five in ten workers earn between 10-19 euro, whereas this is almost six in ten in the Netherlands.

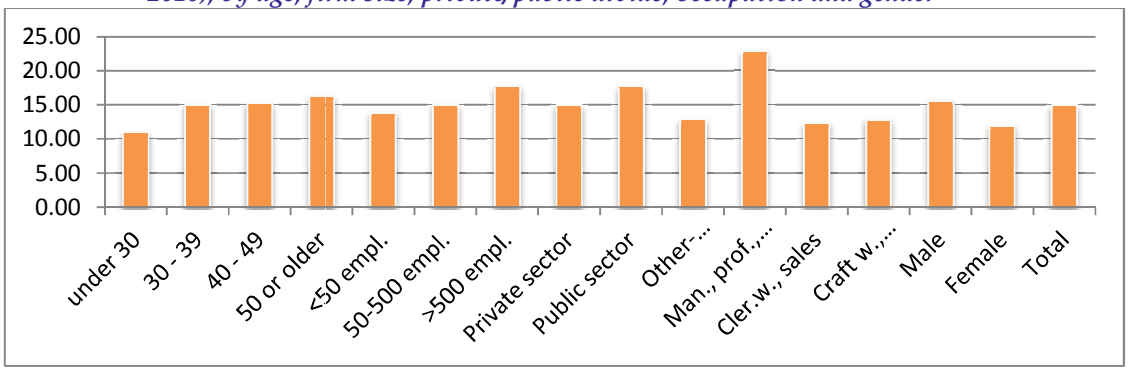
Graph 6.13 Waste: Distribution over five categories of hourly wages, by age group and country



Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers in Waste in Germany and the Netherlands. N= 713.

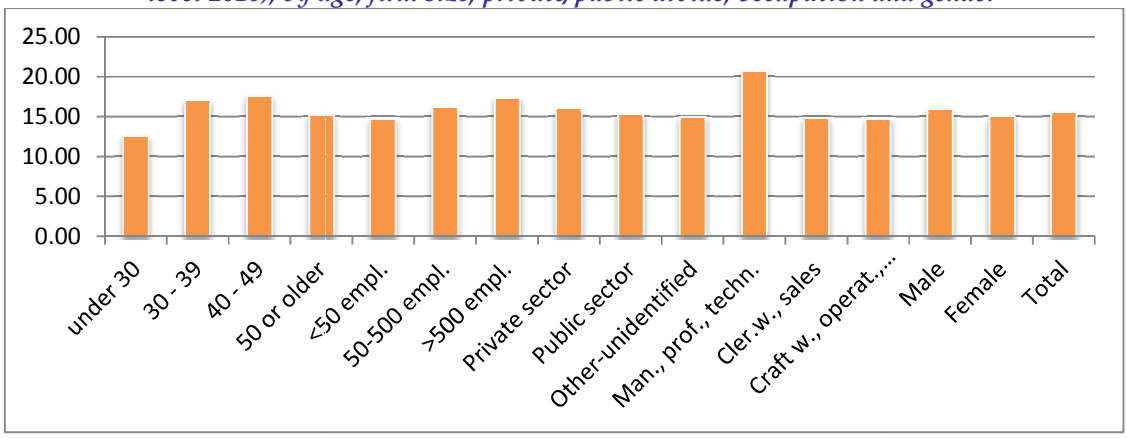
Graphs 6.14 and 6.15 reveal the median wages in waste for Germany and the Netherlands, broken down by age, firm size, private/public divide, occupation, and gender. It shows that in Germany median wages are highest for the oldest age group, whereas in the Netherlands these wages are highest for the group aged 40-49. The graphs also show that wages in small firms are lower than in large firms, that wages in the group of managers, professionals and technicians are substantially higher compared to other two occupational groups, and that the male workers have higher earnings than the female workers. In one respect the countries differ: in Germany wages are higher in the private sector, whereas in the Netherlands they are higher in the public sector.

Graph 6.14 Waste in Germany: median hourly wages (in Standardized German Euros level 2010), by age, firm size, private/public divide, occupation and gender



Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers in Waste in Germany. N= 198.

Graph 6.15 Waste in the Netherlands: median hourly wages (in Standardized German Euros level 2010), by age, firm size, private/public divide, occupation and gender



Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers in Waste in Netherlands. N= 515.

Chapter 7 Conclusions

Most prominent in our analyses of the web-survey outcomes are **wages**. A central finding here was that in all 13 countries under study the mean (average) wages were higher than the median wages, implying the existence of a relatively large group at the bottom of the wage distribution, and above the median a smaller number of respondents earning high(er) wages. This wage spread was particularly large in Italy, Spain and the UK, and smaller but also substantial in Belgium, Germany and the Netherlands. The latter outcome may come rather unexpected, at the backdrop of the relatively equal income distribution in these three countries. It may also be remarkable that Finland and France show up with comparatively low wages in utilities. The wage ranking of the three sub-sectors was similar across countries: everywhere median wages were highest for energy, followed by water, while waste closed the ranks.

At first sight, in 12 of 13 countries the median wages in utilities seem higher in the private sector compared to the public sector. Yet, if we make the comparison more 'honest' and control for the composition of the workforce, the wage differentials between public and private appear to be non-existent.

As was to be expected concerning occupational groups, in all 13 countries the median wages were highest for the managers, professionals and technicians. Their wage levels were 5 to 40% above those of the craft workers, operators and unskilled workers. Except for Finland, the Czech Republic and the Netherlands, themedian wages for the clerical staff and sales persons were lower than those of the craft workers, operators and unskilled workers. If we relate these outcomes to the developments in markets and employment described in Chapter 1, including outsourcing, the wage (and negotiation) position of the clerical staff and sales persons seems relatively weak.

Except for two countries, France and Italy, we everywhere found a considerable gender pay gap. Thus, there seems ample room for the further development of policies for equality and diversity in relation to changing employment patterns, at both company and (sub-)sector level. One should note that the gender pay gap most likely is hardly or not due to unequal pay for equal work, but due to lower pay in female-dominated occupations.

How do wages relate to benefits? Do workers in countries with relative low wages receive more often benefits, or vice versa? We studied to what extent workers receive holiday allowances, year-end of Christmas bonuses, profit shares and performance bonuses. Our analyses at country level showed no relationship between wages and benefits. Benefits do not compensate for low wages, and vice versa: benefits are not paid on top of high wages either.

We also treated **collective bargaining coverage** in the chapter on wages. In spite of the limited number of respondents in our survey, outcomes concerning this coverage remained close to the evidence from other sources: very high in the Scandinavian countries, substantial in all three sub-sectors in Belgium, Italy, the Netherlands and Spain, and in energy and water also in the Czech Republic, Hungary and the UK, as well as on average 60% in Germany. Weak spots are the waste activities in the Czech Republic, Hungary and the UK. The generally rather high coverage rates provide trade unions in energy, water and waste with a relatively good position for bargaining and other union activities. In the near future a larger response rate on the survey may allow for further analyses of collective bargaining coverage, focusing on the relation between coverage rates and wage-setting, and in particular going into the roles of union membership and gender.

A second major area of workers' interest representation is that of **working hours**. We found that very few respondents had working weeks of less than 32 hours, and that working weeks of 36.1-40 hours were the most common pattern in all countries. Long working hours, that is 44.1 hours

and more, were particularly found in Germany (one in three workers), and to a lesser extent also in Belgium, Denmark, France, Hungary, Italy, the Netherlands, Spain, and the UK. In most countries, the average usual working hours per week were longest in the waste sub-sector. Considerable percentages of workers reported usually to be working more hours than agreed, with France on top. The extent of overtime hours was also high in Germany, Italy, the Netherlands and the UK. Irregular hours were highest in the waste sub-sector, in particular in France. Yet, they were low in Germany, where also many overtime hours were reported. It may be worthwhile to continue following developments in working hours and overtime in utilities in the coming years, as they may be closely related to the development of the economic crisis.

We devoted a separate chapter to **occupational structures and educational/skill levels.** Here, the survey outcomes showed that educational levels of the respondents varied across countries: five to six in ten were highly educated in Belgium, France, Poland, Spain, Sweden, and the UK. In the remaining countries this share is three to four in ten, whereas in Denmark, Finland and Germany only two in ten were highly educated. The survey also asked, "Do your qualifications match your job?", allowing to look after the extent of over- or underqualification. It was remarkable that the vast majority (seven to eight of every ten workers) perceived to have the right skill level for their current job. Some two in ten perceived to be overqualified, whereas underqualification was an even smaller problem. Concerning the incidence of training, the outcomes suggested that this is not a major problem in utilities. The majority of workers reported having received at least one day of training over the past year. The results also suggest that promotion is rather common practice: across countries, between four to six in ten workers reported to be promoted.

As for **working conditions**, we selected eight yardsticks: four covering aspects of work-related stress (job stressful; boring; mentally exhausting; physically exhausting); dangerous work; the incidence and expectation of reorganisations, and job security. Job stress levels as perceived by the respondents were highest in the UK, followed by Hungary and the Netherlands. It was remarkable that in almost all countries no less than around four of ten workers found their job daily or almost daily stressful. 'Find job boring' was considerably less reported. Yet, the scores on both job stress yardsticks were highest in the waste sub-sector. Average perceptions of a mentally exhausting job were rather high again, in most countries higher than those concerning physically exhausting work. A similarity was that scores for these two yardsticks were mostly highest in the energy sub-sector. Rather small minorities of respondents reported to work in dangerous conditions daily or almost daily, with the highest scores in waste.
The survey question asking if reorganisations had affected workplaces in the respondents' organisation in the past 12 months resulted in widely varying answers, both across sub-sectors and across countries. In the Czech Republic, France, Spain, Sweden and the UK more than five in ten workers reported about reorganisations. Overall, even higher percentages of workers reported to expect reorganisations in the next 12 months. This was particularly so in Italy, the UK, the Czech Republic, and Germany. Not surprisingly against the backdrop of the 'reorganisation' questions, worries on job security were highest in the UK, though it may surprise that Hungary came second here.
Further analysis of the survey outcomes concerning quality of work, including those on yardsticks that we did not report about in this report, may help to draft assumptions on possible important factors and relations that we hope to test in next research, covering larger numbers of respondents in many EU countries. Our final chapter, going into more detail in German and Dutch outcomes at sub-sector level, can give a clue on how reporting based on such larger numbers may look like.

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Appendix 1 Occupations

Table A.1 Occupations, mapping and number of observations

	ISCO0813 ISCO 2008 further digits > 4	N	%	
1120010000000	Company director, chief executive >500 employees	8	.1	Managers, profess., technicians
1120020000000	Company director, chief executive 10-50 employees	16	.3	Managers, profess., technicians
1120030000000	Company director, chief executive 50-500 employees	6	.1	Managers, profess., technicians
1120040000000	Production or operations manager	12	.2	Managers, profess., technicians
1120050000000	Technical department manager	9	.2	Managers, profess., technicians
1120060000000	Engineering department manager	31	.6	Managers, profess., technicians
1120070000000	Installation or repairs department manager	12	.2	Managers, profess., technicians
1211010000000	Finance manager	10	.2	Managers, profess., technicians
1211020000000	Financial department manager	12	.2	Managers, profess., technicians
1212010000000	HR manager	10	.2	Managers, profess., technicians
1212020000000	Personnel department manager	17	.3	Managers, profess., technicians
1213020000000	Policy or planning manager	36	.7	Managers, profess., technicians
1219030000000	Laboratory department manager	8	.1	Managers, profess., technicians
1219050000000	Administrative services department manager	13	.2	Managers, profess., technicians
1219060000000	Administrative services manager	27	.5	Managers, profess., technicians
1219070000000	Purchasing department manager	7	.1	Managers, profess., technicians
1219980000000	Department manager, all other	74	1.4	Managers, profess., technicians
1221020000000	Commercial, sales or marketing manager	11	.2	Managers, profess., technicians
1221030000000	Marketing department manager	8	.1	Managers, profess., technicians
1221040000000	Sales department manager	10	.2	Managers, profess., technicians
1222040000000	Public relations department manager	6	.1	Managers, profess., technicians
1223010000000	R&D manager	9	.2	Managers, profess., technicians
1223030000000	R&D department manager	5	.1	Managers, profess., technicians
1322010000000	Mining site manager	8	.1	Managers, profess., technicians
1322020000000	Manager oil or gas company	9	.2	Managers, profess., technicians
1323010000000	Construction company manager	16	.3	Managers, profess., technicians
1324020000000	Distribution centre or warehouse manager	5	.1	Managers, profess., technicians
1324030000000	Logistics manager	5	.1	Managers, profess., technicians
1324060000000	Road, rail, water or air transport company manager	9	.2	Managers, profess., technicians
1324070000000	Recycling or refuse disposal manager	13	.2	Managers, profess., technicians
1324080000000	Energy plant manager	30	.6	Managers, profess., technicians
1330010000000	IT manager	8	.1	Managers, profess., technicians
1330020000000	IT department manager	9	.2	Managers, profess., technicians
1342990000000	Manager, all other health services	7	.1	Managers, profess., technicians
1420020000000	Wholesale manager	6	.1	Managers, profess., technicians
1439010000000	Call centre manager	5	.1	Managers, profess., technicians
1439990000000	Manager, all other services	27	.5	Managers, profess., technicians
2111010000000	Physicist	10	.2	Managers, profess., technicians
2113010000000	Chemist	10	.2	Managers, profess., technicians
2113020000000	Petroleum chemist	8	.1	Managers, profess., technicians
2113050000000	Quality inspector chemical products	5	.1	Managers, profess., technicians
2114010000000	Geologist, geophysicist	16	.3	Managers, profess., technicians
2114050000000	Oil or gas geologist	6	.1	Managers, profess., technicians
2114990000000	Physical scientists, all other	7	.1	Managers, profess., technicians
2133010000000	Environmental protection advisor	18	.3	Managers, profess., technicians
2141010000000	Industrial engineer	67	1.2	Managers, profess., technicians
2141020000000	Production engineer	12	.2	Managers, profess., technicians
2141030000000	Health and safety engineer	5	.1	Managers, profess., technicians
2141060000000	Planning engineer	8	.1	Managers, profess., technicians
2141070000000	Brand manager, product manager	5	.1	Managers, profess., technicians
2142010000000	Civil engineer	19	.4	Managers, profess., technicians
2142020000000	Building structure engineer	17	.3	Managers, profess., technicians
2142040000000	Water protection or land reclaim engineer	6	.1	Managers, profess., technicians
2143010000000	Environmental engineer	15	.3	Managers, profess., technicians
2144010000000	Mechanical engineer	88	1.6	Managers, profess., technicians
2144040000000	Hydraulics engineer	6	.1	Managers, profess., technicians
2144060000000	Thermo engineer	4	.1	Managers, profess., technicians

2145010000000	Chemical engineer	31	.6	Managers, profess., technicians
2146010000000	Mining engineer	5	.1	Managers, profess., technicians
2149030027600	DEU Mechatronic	4	.1	Managers, profess., technicians
2149990000000	Professional engineer, all other	93	1.7	Managers, profess., technicians
2151010000000	Electrical engineer	65	1.2	Managers, profess., technicians
2152010000000	Electronics engineer	49	.9	Managers, profess., technicians
2153010000000	Telecommunications engineer	4	.1	Managers, profess., technicians
2166030000000	Web designer	4	.1	Managers, profess., technicians
2310460000000	Researcher engineering, transport and logistic sciences	4	.1	Managers, profess., technicians
2411010000000	Accountant	71	1.3	Managers, profess., technicians
2411020000000	Compliance officer	4	.1	Managers, profess., technicians
2411030000000	Financial auditor	5	.1	Managers, profess., technicians
2413010000000	Financial analyst	7	.1	Managers, profess., technicians
2421010000000	Organisation analyst	4	.1	Managers, profess., technicians
2422010000000	Policy or administration professional, all other	9	.2	Managers, profess., technicians
2422020000000	Policy advisor	6	.1	Managers, profess., technicians
2423050000000	Personnel officer	16	.3	Managers, profess., technicians
2423050227600	DEU Personnel officer Personalsachbearbeiter	4	.1	Managers, profess., technicians
2423060000000	HR advisor	4	.1	Managers, profess., technicians
2431020000000	Marketing professional	26	.5	Managers, profess., technicians
2431070000000	Communication professional	16	.3	Managers, profess., technicians
2432010000000	Public relations officer	6	.1	Managers, profess., technicians
2434010000000	IT sales professional	5	.1	Managers, profess., technicians
2511010000000	IT systems analyst	11	.2	Managers, profess., technicians
2511020000000	IT consultant	24	.4	Managers, profess., technicians
2511040000000	IT project leader	15	.3	Managers, profess., technicians
2511050000000	IT information analyst	11	.2	Managers, profess., technicians
2512010000000	IT software engineer	25	.5	Managers, profess., technicians
2513030000000	Web programmer	5	.1	Managers, profess., technicians
2514010000000	IT applications programmer	31	.6	Managers, profess., technicians
2519990000000	Software or multimedia developer or analyst, all other	4	.1	Managers, profess., technicians
2521020000000	Database administrator (dba)	13	.2	Managers, profess., technicians
2522010000000	IT systems administrator	30	.6	Managers, profess., technicians
2523010000000	IT network specialist	10	.2	Managers, profess., technicians
2529990000000	Database or network professional, all other	21	.4	Managers, profess., technicians
2611010000000	Lawyer	4	.1	Managers, profess., technicians
2619020000000	Legal advisor	15	.3	Managers, profess., technicians
2631010000000	Economist	24	.4	Managers, profess., technicians
3111050000000	Nuclear monitoring technician	17	.3	Managers, profess., technicians
3112010000000	Civil engineering technician	9	.2	Managers, profess., technicians
3113010000000	Electrical engineering technician	35	.7	Managers, profess., technicians
3113020000000	Power systems engineer	24	.4	Managers, profess., technicians
3114010000000	Electronics engineering technician	14	.3	Managers, profess., technicians
3115010000000	Mechanical engineering technician	37	.7	Managers, profess., technicians
3116010000000	Chemical engineering technician	10	.2	Managers, profess., technicians
3117020000000	Metallurgy technician	7	.1	Managers, profess., technicians
3118010000000	Architectural or civil drafter	20	.4	Managers, profess., technicians
3118020000000	Technical illustrator	4	.1	Managers, profess., technicians
3118030000000	Electrical or electronics drafter	6	.1	Managers, profess., technicians
3118040000000	Mechanical drafter	7	.1	Managers, profess., technicians
3118050000000	Drafters, all other	4	.1	Managers, profess., technicians
3119040000000	Laboratory technician plastics, textiles, or chemicals	7	.1	Managers, profess., technicians
3119990000000	Physical or engineering science technician, all other	20	.4	Managers, profess., technicians
3131010000000	Control room operator power plant	98	1.8	Managers, profess., technicians
3132010000000	Drinking water treatment plant operator	49	.9	Managers, profess., technicians
3132020000000	Waste water plant operator	35	.7	Managers, profess., technicians
3132030000000	Refuse incinerator process controller	16	.3	Managers, profess., technicians
3133010000000	Chemical products process controller	18	.3	Managers, profess., technicians
3134010000000	Petroleum or natural gas refining plant operator	20	.4	Managers, profess., technicians
3134020000000	Gas plant operator	9	.2	Managers, profess., technicians
3139010000000	Process controller, all other	9	.2	Managers, profess., technicians
3141010000000	Laboratory technician biology, biotechnology	15	.3	Managers, profess., technicians
3141020000000	Laboratory technician water, milk, beverages	12	.2	Managers, profess., technicians

3257190000000	Inspector gas, electricity installations, waterworks	20	.4	Managers, profess., technicians
3257990000000	Quality inspector, all other products	6	.1	Managers, profess., technicians
3313030000000	Accounting associate professional	10	.2	Managers, profess., technicians
3313040000000	Bookkeeper	17	.3	Managers, profess., technicians
3313050000000	Credit counselor	9	.2	Managers, profess., technicians
3313060000000	Cost estimator	5	.1	Managers, profess., technicians
3313070000000	Salary or personnel administrator	20	.4	Managers, profess., technicians
3322000000000	Sales representative	9	.2	Managers, profess., technicians
3322060000000	Sales representative chemical products	4	.1	Managers, profess., technicians
3322230000000	Sales representative technical products	4	.1	Managers, profess., technicians
3322990000000	Sales representative, all other products	33	.6	Managers, profess., technicians
3323000000000	Buyer	5	.1	Managers, profess., technicians
3323020000000	Buyer chemical products	4	.1	Managers, profess., technicians
3323060000000	Buyer technical products	8	.1	Managers, profess., technicians
3323990000000	Buyer, all other products or services	18	.3	Managers, profess., technicians
3339980000000	Finance or sales associate professional, all other	13	.2	Managers, profess., technicians
3343010000000	Administrative secretary	11	.2	Managers, profess., technicians
3343020000000	Directors secretary	19	.4	Managers, profess., technicians
3343030000000	Office manager	8	.1	Managers, profess., technicians
3343040000000	Personal assistant	12	.2	Managers, profess., technicians
3411040000000	Legal associate professional	6	.1	Managers, profess., technicians
3511020000000	IT operations technician	22	.4	Managers, profess., technicians
3512010000000	IT user support technician	35	.7	Managers, profess., technicians
3513020000000	Computer systems technician	5	.1	Managers, profess., technicians
3513040000000	Computer hardware technician	4	.1	Managers, profess., technicians
3521040000000	Control-room equipment operator	22	.4	Managers, profess., technicians
3521150000000	Transmitting equipment operator	4	.1	Managers, profess., technicians
3522010000000	Telecommunications engineering technician	11	.2	Managers, profess., technicians
4110040000000	Marketing clerk	6	.1	Clerical staff, sales persons
4110050000000	Office clerk	170	3.2	Clerical staff, sales persons
4110080000000	Sales clerk	15	.3	Clerical staff, sales persons
4120040000000	Team or department secretary	14	.3	Clerical staff, sales persons
4120050000000	Secretary clerk	13	.2	Clerical staff, sales persons
4120060000000	Secretary	45	.8	Clerical staff, sales persons
4131010000000	Typist or word processing operator	5	.1	Clerical staff, sales persons
4132010000000	Data entry operator	7	.1	Clerical staff, sales persons
4214020000000	Bills clerk	30	.6	Clerical staff, sales persons
4222010000000	Contact centre information clerk	13	.2	Clerical staff, sales persons
4222020000000	Call centre agent inbound	27	.5	Clerical staff, sales persons
4222030000000	Client information clerk	10	.2	Clerical staff, sales persons
4222040000000	Customer service representative	51	1.0	Clerical staff, sales persons
4225010000000	Enquiry clerk	6	.1	Clerical staff, sales persons
4226010000000	Receptionist	16	.3	Clerical staff, sales persons
4226030000000	Receptionist, telephonist	4	.1	Clerical staff, sales persons
4227010000000	Survey or market research interviewer	4	.1	Clerical staff, sales persons
4229990000000	Client information worker, all other	29	.5	Clerical staff, sales persons
4311010000000	Accounts clerk	32	.6	Clerical staff, sales persons
4311020000000	Bookkeeping clerk	6	.1	Clerical staff, sales persons
4311040000000	Invoice clerk	19	.4	Clerical staff, sales persons
4311050000000	New accounts clerk	7	.1	Clerical staff, sales persons
4312020000000	Finance clerk	14	.3	Clerical staff, sales persons
4313010000000	Payroll clerk	8	.1	Clerical staff, sales persons
4321010000000	Stock clerk, warehouse clerk	17	.3	Clerical staff, sales persons
4321020000000	Order clerk	7	.1	Clerical staff, sales persons
4321030000000	Logistics worker	33	.6	Clerical staff, sales persons
4322020000000	Production planning clerk	43	.8	Clerical staff, sales persons
4322030000000	Materials scheduling clerk	10	.2	Clerical staff, sales persons
4323010000000	Road transport clerk	4	.1	Clerical staff, sales persons
4414010000000	Form filling assistance clerk	5	.1	Clerical staff, sales persons
4415010000000	Filing clerk	17	.3	Clerical staff, sales persons
4416010000000	Personnel clerk	11	.2	Clerical staff, sales persons
4416020000000	Staff scheduling clerk	27	.5	Clerical staff, sales persons
4419990000000	Clerk, all other	20	.4	Clerical staff, sales persons
5151010000000	First line supervisor housekeeping workers	6	.1	Clerical staff, sales persons
5151020000000	Housekeeper in hotels, offices or other	8	.1	Clerical staff, sales persons

	establishments			
5223990000000	Sales assistant, all other	8	.1	Clerical staff, sales persons
5244010000000	Call centre agent outbound	15	.3	Clerical staff, sales persons
5411010000000	Fire fighter	13	.2	Clerical staff, sales persons
5414010000000	Security guard	8	.1	Clerical staff, sales persons
7126020000000	Pipe fitter	9	.2	Craft w., operators, unsk. workers
7126030000000	Mains pipes layer-jointer	8	.1	Craft w., operators, unsk. workers
7126040000000	Pipe layer	17	.3	Craft w., operators, unsk. workers
7133010000000	Building exterior cleaner	8	.1	Craft w., operators, unsk. workers
7212990000000	Welder, all other	7	.1	Craft w., operators, unsk. workers
7214010000000	Structural metal or plate work fitter	5	.1	Craft w., operators, unsk. workers
7221030000000	Foundry worker, metal caster	6	.1	Craft w., operators, unsk. workers
7222040000000	Locksmith, safe repairer	5	.1	Craft w., operators, unsk. workers
7231030000000	Car mechanic	6	.1	Craft w., operators, unsk. workers
7231060000000	First line supervisor mechanics, installers, or repairers	14	.3	Craft w., operators, unsk. workers
7233050000000	Industrial machinery erector-installer	5	.1	Craft w., operators, unsk. workers
7233060000000	Industrial machinery mechanic	7	.1	Craft w., operators, unsk. workers
7233110000000	Plant maintenance mechanic	28	.5	Craft w., operators, unsk. workers
7311060000000	Instrument repairer	4	.1	Craft w., operators, unsk. workers
7411010000000	Building repairs electrician	17	.3	Craft w., operators, unsk. workers
7411050000000	Gas fitter	16	.3	Craft w., operators, unsk. workers
7411990000000	Electrician, all other	33	.6	Craft w., operators, unsk. workers
7412010000000	Electrical mechanic or fitter	69	1.3	Craft w., operators, unsk. workers
7412050000000	Heating installer or mechanic	20	.4	Craft w., operators, unsk. workers
7412060000000	Wind turbine installer or repairer	6	.1	Craft w., operators, unsk. workers
7412070000000	Plant maintenance electrician	9	.2	Craft w., operators, unsk. workers
7413010000000	Electric power line worker (low voltage)	43	.8	Craft w., operators, unsk. workers
7413020000000	Electrical power-line installer or repairer (high voltage)	63	1.2	Craft w., operators, unsk. workers
7421010000000	Electronics mechanic or servicer	9	.2	Craft w., operators, unsk. workers
7421010127600	DEU Electronics mechanic or servicer Elektroanlageninstallateur	12	.2	Craft w., operators, unsk. workers
7421010227600	DEU Electronics mechanic or servicer Elektroinstallateur	5	.1	Craft w., operators, unsk. workers
7421010427600	DEU Electronics mechanic or servicer Elektronikmechaniker, -monteure, Service-Fachkrafte	9	.2	Craft w., operators, unsk. workers
7422040000000	Telecommunication lines or cables installer or repairer	24	.4	Craft w., operators, unsk. workers
8113070000000	Operator service unit oil or gas well	5	.1	Craft w., operators, unsk. workers
8122010000000	Metal finishing, plating or coating machine operator	5	.1	Craft w., operators, unsk. workers
8131990000000	Chemical products plant or machine operator, all other	7	.1	Craft w., operators, unsk. workers
8181010000000	Glass or ceramics plant operator	10	.2	Craft w., operators, unsk. workers
8182010000000	Steam engine operator	6	.1	Craft w., operators, unsk. workers
8182020000000	Boiler operator	9	.2	Craft w., operators, unsk. workers
8189140000000	First line supervisor utilities workers	38	.7	Craft w., operators, unsk. workers
8189150000000	Production machine operator, all other	21	.4	Craft w., operators, unsk. workers
8189990000000	Stationary plant and machine operator, all other	15	.3	Craft w., operators, unsk. workers
8211010000000	Engine or machine assembler	4	.1	Craft w., operators, unsk. workers
8212010000000	Electrical equipment assembler	13	.2	Craft w., operators, unsk. workers
8212020000000	Electronic equipment assembler	6	.1	Craft w., operators, unsk. workers
8219990000000	Assembler, all other	13	.2	Craft w., operators, unsk. workers
8322010000000	Car driver	8	.1	Craft w., operators, unsk. workers
8332010000000	Truck driver	89	1.7	Craft w., operators, unsk. workers
8332030000000	Truck driver long distances	14	.3	Craft w., operators, unsk. workers
8342010000000	Earth-moving equipment operator	4	.1	Craft w., operators, unsk. workers
8342030000000	Excavating machine driver	6	.1	Craft w., operators, unsk. workers
8344010000000	Fork lift operator	6	.1	Craft w., operators, unsk. workers
9112010000000	Cleaner in offices, schools or other establishments	60	1.1	Craft w., operators, unsk. workers
9112030000000	First line supervisor cleaning workers	23	.4	Craft w., operators, unsk. workers
9123010000000	Window washer	23	.4	Craft w., operators, unsk. workers
9129030000000	Cleaner of boilers, tanks	6	.1	Craft w., operators, unsk. workers

9129050000000	Sewer pipe cleaner	12	.2	Craft w., operators, unsk. workers
9129980000000	Removal worker, all other hazardous materials	15	.3	Craft w., operators, unsk. workers
9129990000000	Cleaning worker, all other	68	1.3	Craft w., operators, unsk. workers
9329030000000	Manufacturing production helper	18	.3	Craft w., operators, unsk. workers
9333040000000	Road vehicles loader	5	.1	Craft w., operators, unsk. workers
9333090000000	Warehouse worker	5	.1	Craft w., operators, unsk. workers
9611010000000	Refuse collector	55	1.0	Craft w., operators, unsk. workers
9611020000000	Recyclable material collector	36	.7	Craft w., operators, unsk. workers
9612010000000	Refuse sorter	31	.6	Craft w., operators, unsk. workers
9613010000000	Sweeper, street cleaner	16	.3	Craft w., operators, unsk. workers
9622010000000	Handyperson	7	.1	Craft w., operators, unsk. workers
9623010000000	Meter reader utilities	34	.6	Craft w., operators, unsk. workers
	Occupations <4 obs. or occupation missing	961	20%	
Total		5361	100%	

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. N= 5,361.

Appendix 2 Tables

Table A2.1 Distribution over sub-sector and over firm-size

	Energy	Water	Waste	
Belgium (N=662)	52.1%	19.6%	28.2%	100%
Czech Republic (N=317)	56.8%	21.8%	21.5%	100%
Denmark (N=66)	18.2%	43.9%	37.9%	100%
Finland (N=461)	17.8%	17.1%	65.1%	100%
France (N=66)	56.1%	25.8%	18.2%	100%
Germany (N=1155)	61.6%	21.3%	17.1%	100%
Hungary (N=116)	53.4%	43.1%	3.4%	100%
Italy (N=98)	52.0%	19.4%	28.6%	100%
Netherlands (N=1046)	30.6%	19.9%	49.5%	100%
Poland (N=204)	47.1%	36.3%	16.7%	100%
Spain (N=579)	59.4%	17.6%	23.0%	100%
Sweden (N=165)	43.0%	38.2%	18.8%	100%
United Kingdom (N=426)	51.9%	21.8%	26.3%	100%

	<100 empl	100-1000 empl	>1000 empl	
Belgium (N=662)	44.3%	31.9%	23.9%	100%
Czech Republic (N=317)	56.8%	32.2%	11.0%	100%
Denmark (N=66)	72.7%	18.2%	9.1%	100%
Finland (N=461)	69.3%	18.7%	12.0%	100%
France (N=66)	21.2%	16.7%	62.1%	100%
Germany (N=1155)	33.3%	35.0%	31.7%	100%
Hungary (N=116)	26.7%	44.0%	29.3%	100%
Italy (N=98)	24.5%	30.6%	44.9%	100%
Netherlands (N=1046)	42.1%	36.9%	21.0%	100%
Poland (N=204)	54.4%	34.3%	11.3%	100%
Spain (N=579)	60.4%	24.0%	15.5%	100%
Sweden (N=165)	44.2%	44.2%	11.5%	100%
United Kingdom (N=426)	34.0%	29.3%	36.6%	100%

	Private sector	Public sector	Other-unidentified	
Belgium (N=662)	19.6%	59.2%	21.1%	100%
Czech Republic (N=317)	22.7%	54.6%	22.7%	100%
Denmark (N=66)	48.5%	40.9%	10.6%	100%
Finland (N=461)	37.3%	48.2%	14.5%	100%
France (N=66)	37.9%	45.5%	16.7%	100%
Germany (N=1155)	26.5%	68.3%	5.2%	100%
Hungary (N=116)	48.3%	31.9%	19.8%	100%
Italy (N=98)	31.6%	60.2%	8.2%	100%
Netherlands (N=1046)	22.2%	46.4%	31.5%	100%
Poland (N=204)	66.7%	30.9%	2.5%	100%
Spain (N=579)	15.7%	49.2%	35.1%	100%
Sweden (N=165)	53.9%	30.9%	15.2%	100%
United Kingdom (N=426)	22.1%	64.6%	13.4%	100%

	Occ missing	Managers, professionals, technicians	Clerical staff, sales persons	Craft workers, operators, unskilled workers	Total
Belgium (N=662)	7%	53%	24%	16%	100%
Czech Republic (N=317)	2%	55%	20%	23%	100%
Denmark (N=66)	2%	39%	11%	48%	100%
Finland (N=461)	1%	26%	21%	51%	100%
France (N=66)	5%	47%	18%	30%	100%
Germany (N=1155)	6%	52%	16%	26%	100%
Hungary (N=116)	10%	47%	22%	21%	100%
Italy (N=98)	5%	53%	16%	26%	100%
Netherlands (N=1046)	25%	33%	15%	27%	100%
Poland (N=204)	1%	71%	9%	19%	100%
Spain (N=579)	1%	61%	18%	20%	100%
Sweden (N=165)	2%	66%	21%	12%	100%
United Kingdom (N=426)	5%	58%	13%	23%	100%

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. N= 5,361.

Table A2.2 Percentage covered by a collective bargaining agreement, break down by sub-sectors

	Energy	Water	Waste	All
Belgium	89%	71%	82%	84%
Czech Republic	81%	69%	33%	69%
Denmark	100%	89%	87%	89%
Finland	96%	97%	100%	98%
France				
Germany	76%	61%	57%	70%
Hungary	83%	86%	33%	83%
Italy	91%	95%	80%	89%
Netherlands	79%	78%	65%	72%
Poland				
Spain	74%	83%	77%	76%
Sweden	98%	97%	92%	97%
United Kingdom	69%	69%	41%	63%

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. Wages are expressed in Standardized German Euros level 2010. N= 3,918 .

Table A2.3 Distribution over five categories of hourly wages in the thirteen countries.

	Euro 0 - 9.99	Euro 10-19.99	Euro 20 - 29.99	Euro 30 - 39.99	Euro 40 and over	Total
Belgium	13%	56%	18%	5%	7%	100%
Czech Republic	61%	30%	7%	2%	1%	100%
Denmark	3%	67%	26%	2%	3%	100%
Finland	34%	50%	9%	2%	4%	100%
France	24%	52%	11%	3%	11%	100%
Germany	8%	38%	34%	12%	8%	100%
Hungary	61%	31%	2%	1%	5%	100%
Italy	10%	66%	11%	3%	9%	100%
Netherlands	12%	57%	22%	5%	5%	100%
Poland	40%	44%	10%	1%	4%	100%
Spain	27%	41%	15%	4%	13%	100%
Sweden	3%	71%	20%	2%	4%	100%
United Kingdom	11%	42%	25%	10%	13%	100%

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. Wages are expressed in Standardized German Euros level 2010. N= 5,361.

Table A2.4 Median hourly wages by sub-sector (in Standardized German Euros level 2010).

	All	Energy	Water	Waste
Belgium	15.22	16.06	15.56	14.50
Czech Republic	8.80	10.23	8.34	6.16
Denmark	16.42	20.63	16.56	15.71
Finland	11.93	14.71	12.86	11.32
France	13.08	14.80	13.58	10.06
Germany	20.70	22.29	19.25	14.90
Hungary	8.01	8.55	7.64	6.75
Italy	15.24	15.90	14.24	14.83
Netherlands	16.16	16.93	16.54	15.47
Poland	10.79	11.91	10.08	10.18
Spain	13.72	14.82	12.83	12.28
Sweden	16.43	16.73	16.43	15.08
United Kingdom	18.60	22.20	17.53	14.30

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. N= 5,361.

Table A2.5 Median hourly wages by private/public/other ownership (in Standardized German Euros level 2010).

	Private	Public	Other-unidentified	All
Belgium	15.37	13.02	15.93	15.22
Czech Republic	9.15	7.75	8.80	8.80
Denmark	20.31	15.78		16.42
Finland	12.45	10.96	13.13	11.93
France	13.48	12.36	13.58	13.08
Germany	21.17	20.70	19.25	20.70
Hungary	10.26	7.21	6.77	8.01
Italy	15.26	14.46		15.24
Netherlands	16.49	16.37	15.74	16.16
Poland	13.21	10.47	9.95	10.79
Spain	13.56	15.77	13.21	13.72
Sweden	17.41	16.40	16.36	16.43
United Kingdom	20.80	14.16	18.27	18.60

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. N= 5,361

Table A2.6 Median hourly wages by occupational group (in Standardized German Euros level 2010).

	Managers, professionals, technicians	Clerical staff, sales persons	Craft workers, operators, unskilled workers	All
Belgium	17.37	13.15	13.53	15.23
Czech Republic	10.56	8.09	6.52	8.80
Denmark	19.63	14.41	16.27	16.49
Finland	16.43	12.06	10.12	11.89
France	17.88	10.16	11.13	13.08
Germany	23.96	15.01	15.86	20.75
Hungary	9.95	6.15	6.45	7.72
Italy	16.44	13.47	14.24	15.24
Netherlands	19.82	14.29	13.92	15.94
Poland	11.80	8.28	9.73	10.79
Spain	15.47	11.02	12.04	13.56
Sweden	16.94	14.06	16.08	16.42
United Kingdom	21.91	13.18	14.61	18.42

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. N= 4,895 - Note: not all respondents with valid wage information have indicated their occupational group.

Table A2.7 Median hourly wages by establishment size (in Standardized German Euros level 2010).

	<100 empl.	100-500 empl.	>500 empl.	All
Belgium	13.82	15.79	17.76	15.22
Czech Republic	7.90	10.72	11.92	8.80
Denmark	15.72	20.63	20.63	16.42
Finland	11.63	13.50	13.59	11.97
France	10.06	10.99	14.80	13.08
Germany	16.44	20.21	23.69	20.70
Hungary	5.93	7.63	9.58	8.01
Italy	14.83	15.47	15.24	15.24
Netherlands	14.80	16.40	19.32	16.13
Poland	10.47	10.88	11.97	10.79
Spain	12.58	16.42	16.67	13.72
Sweden	15.55	17.04	17.55	16.43
United Kingdom	16.73	19.46	20.82	18.60

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. N= 5,204 - Note: not all respondents with valid wage information have indicated their establishment size

Table A2.8 Median hourly wages by gender (in Standardized German Euros level 2010).

	Male	Female	All
Belgium	15.71	14.41	15.19
Czech Republic	9.39	8.36	8.80
Denmark	16.19		16.42
Finland	12.99	11.40	11.93
France	13.03	13.94	13.08
Germany	21.27	16.92	20.71
Hungary	8.40	7.35	8.07
Italy	15.06	15.26	15.24
Netherlands	16.55	14.89	16.16
Poland	12.03	8.93	10.79
Spain	15.39	11.54	13.70
Sweden	16.94	15.55	16.43
United Kingdom	20.11	16.52	18.52

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries.N= 5,204- Note: not all respondents with valid wage information have indicated their gender.

Table A2.9 Percentages of workers reporting to receive benefits.

	Holiday allowance	Year-end or Christmas bonus	Profit share	Performance bonus
Belgium	67.16%	57.19%	9.85%	15.50%
Czech Republic	49.59%	33.54%	12.34%	45.43%
Denmark	41.07%	3.70%	5.36%	33.33%
Finland	68.53%	5.85%	2.54%	23.64%
France	3.13%	36.92%	23.08%	25.76%
Germany	50.00%	34.20%	36.22%	17.51%
Hungary	24.04%	33.93%	2.00%	14.89%
Italy	8.42%	21.05%	3.19%	34.38%
Netherlands	57.62%	24.47%	11.36%	19.28%
Poland	41.67%	33.33%	25.00%	41.67%
Spain	13.02%	5.58%	4.04%	21.06%
Sweden	67.88%	13.33%	5.45%	23.64%
United Kingdom	4.05%	31.10%	10.27%	11.65%

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. N=4,514 (Holiday allowance), N=4,027 (Year-end or Christmas bonus), N=4,634 (Profit share), N=4,280(Performance bonus). Note: not all respondents with valid wage information have indicated their bonuses.

Table A2.10 Percentages of workers reporting to receive allowances in last wage.

	Dirty/ dangerous work allowance	Shift / unsocial hours / weekend allowance	Overtime bonus
Belgium	2%	4%	5%
Czech Republic	6%	17%	7%
Denmark	4%	34%	20%
Finland	6%	20%	13%
France	11%	7%	12%
Germany		13%	8%
Hungary	4%	23%	13%
Italy	6%	21%	19%
Netherlands		10%	12%
Poland	0%		9%
Spain	5%	10%	8%
Sweden	1%	15%	15%
United Kingdom	1%	16%	22%

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. N=1,916 (Dirty/dangerous work allowance in last wage), N=3,449 (Shift / unsocial hours / weekend allowance in last wage), N=3,110 (Overtime bonus in last wage)
Note: not all respondents with valid wage information have indicated their allowances.

Table A2.11 Thirteen country ranking (1=lowest - 13=highest) for median wage levels and for percentages of workers receiving benefits.

	bonus rank	wage rank
Hungary	4	1
Czech Republic	12	2
Poland	5	3
Finland	11	4
France	3	5
Spain	1	6
Belgium	10	7
Italy	6	8
Netherlands	8	9
Denmark	7	10
Sweden	13	11
United Kingdom	2	12
Germany	9	13

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. Wages are expressed in Standardized German Euros level 2010.
N=5,361 (Wage rank), N= 4,975 (Bonus rank for respondents reporting at least one benefit or allowance)
Note: not all respondents with valid wage information have indicated their benefits or allowances.

Table A2.12 Median hourly wages in manufacturing, utilities, public sector and national (in Standardized German Euros level 2010).

	Energy, water & waste	Public sector	Manufacturing	National median
Belgium	15.22	14.55	16.46	14.78
Czech Republic	8.80	7.56	8.44	8.20
Denmark	16.42	16.77	17.66	15.85
Finland	11.89	14.38	15.76	14.79
France	13.08	11.42	13.30	12.40
Germany	20.35	16.96	18.14	15.07
Hungary	7.88	7.25	7.29	6.64
Italy	15.24	14.02	14.85	14.19
Netherlands	16.17	19.23	17.07	15.95
Poland	10.79	8.90	10.36	10.08
Spain	13.72	13.64	13.56	12.30
Sweden	16.43	15.00	16.90	16.08
United Kingdom	19.10	18.62	18.20	18.01

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. N=18,301 for public sector, N = 53,170 for Manufacturing, N = 5,361 for Utilities, N = 304,302 for all

Table A3.1 Distribution over five categories of usual working hours in the thirteen countries.

	0-32 hrs/w	32.1-36 hrs/w	36.1-40 hrs/w	40.1-44 hrs/w	44.1 hrs/w and +	Total
Belgium	5.4%	6.8%	61.3%	8.8%	17.7%	100%
Czech Republic	3.2%	2.5%	74.8%	8.8%	10.7%	100%
Denmark	6.1%	3.0%	72.7%	3.0%	15.2%	100%
Finland	12.6%	9.1%	65.9%	4.1%	8.2%	100%
France	9.2%	30.8%	32.3%	7.7%	20.0%	100%
Germany	5.5%	3.0%	41.8%	15.7%	34.0%	100%
Hungary	6.0%	4.3%	56.9%	10.3%	22.4%	100%
Italy	7.1%	12.2%	51.0%	10.2%	19.4%	100%
Netherlands	11.8%	8.9%	47.7%	6.1%	25.5%	100%
Poland	1.5%	2.0%	71.6%	10.8%	14.2%	100%
Spain	7.8%	8.6%	52.5%	7.1%	24.0%	100%
Sweden	5.5%	7.3%	63.0%	12.1%	12.1%	100%
United Kingdom	5.2%	4.0%	55.6%	10.8%	24.4%	100%

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. N=5,357 - Note: 4 respondents have not indicated their working hours.

Table A3.2 Average usual working hours (mean hours per week), breakdown by sub-sector

	Energy	Water	Waste	All
Belgium	40.3	38.7	40.1	39.9
Czech Republic	39.4	38.7	42.9	40.0
Denmark	38.3	36.7	40.4	38.4
Finland	37.3	36.8	37.1	37.1
France	37.3	38.5	39.9	38.1
Germany	41.9	40.8	43.4	41.9
Hungary	41.6	40.5	37.0	40.9
Italy	38.9	40.7	37.4	38.8
Netherlands	40.2	38.9	40.9	40.3
Poland	41.1	41.6	42.5	41.5
Spain	41.2	39.8	36.9	40.0
Sweden	40.0	39.3	39.5	39.6
United Kingdom	40.8	40.3	42.9	41.2

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. N=5,357 - Note: Note: 4 respondents have not indicated their working hours.

Table A3.3 Percentages reporting usually working longer hours than agreed in their contract by sub-sectors.

	Energy	Water	Waste	All
Belgium	42%	40%	45%	42%
Czech Republic	38%	18%	46%	36%
Denmark	33%	16%	41%	28%
Finland	14%	19%	19%	18%
France	56%	50%	71%	58%
Germany	54%	48%	55%	53%
Hungary	34%	30%	0%	32%
Italy	44%	67%	27%	45%
Netherlands	41%	30%	39%	38%
Poland	16%	11%	15%	14%
Spain	31%	33%	26%	30%
Sweden	32%	35%	31%	33%
United Kingdom	38%	53%	35%	41%

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. N= 4,141 - Note: 1,220 respondents have not indicated if they work more hours.

Table A3.4 Percentage workers reporting shift work or irregular hours by sub-sectors.

	Energy	Water	Waste	All
Belgium	33%	25%	37%	32%
Czech Republic	35%	22%	25%	30%
Denmark	36%	19%	27%	25%
Finland	11%	23%	33%	24%
France	58%	47%	75%	58%
Germany	16%	13%	26%	17%
Hungary	51%	38%	50%	45%
Italy	48%	53%	54%	51%
Netherlands	39%	45%	33%	37%
Poland	40%	50%	0%	38%
Spain	14%	19%	28%	18%
Sweden	11%	23%	10%	15%
United Kingdom	31%	32%	33%	32%

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. N= 4,185 - Note: 1,176 respondents have not indicated if they work shifts.

Table A4.1 Distribution over three occupational categories by sub-sectors.

	Managers, profes-sionals, technicians	Clerical staff, sales persons	Craft workers, operators, unsk. workers	Total
Belgium-energy	54%	25%	21%	100%
Belgium-water	58%	16%	25%	100%
Belgium-waste	46%	27%	27%	100%
Czech Republic-energy	58%	23%	19%	100%
Czech Republic-water	62%	12%	26%	100%
Czech Republic-waste	40%	21%	40%	100%
Denmark-energy				100%
Denmark-water	41%	7%	52%	100%
Denmark-waste	32%	8%	60%	100%
Finland-energy	41%	18%	40%	100%
Finland-water	49%	16%	34%	100%
Finland-waste	16%	24%	60%	100%
France-energy	51%	16%	32%	100%
France-water				100%
France-waste				100%
Germany-energy	57%	14%	28%	100%
Germany-water	54%	15%	30%	100%
Germany-waste	33%	20%	46%	100%
Hungary-energy	44%	21%	35%	100%
Hungary-water	52%	22%	26%	100%
Hungary-waste				100%
Italy-energy	55%	20%	25%	100%
Italy-water	63%	11%	26%	100%
Italy-waste	43%	14%	43%	100%
Netherlands-energy	44%	15%	41%	100%
Netherlands-water	42%	13%	45%	100%
Netherlands-waste	23%	16%	62%	100%
Poland-energy	66%	13%	22%	100%
Poland-water	77%	8%	15%	100%
Poland-waste	74%		26%	100%
Spain-energy	63%	16%	20%	100%
Spain-water	63%	20%	18%	100%
Spain-waste	53%	23%	25%	100%
Sweden-energy	62%	28%	10%	100%
Sweden-water	76%	14%	10%	100%
Sweden-waste	55%	16%	29%	100%
United Kingdom-energy	60%	18%	22%	100%
United Kingdom-water	71%	9%	20%	100%
United Kingdom-waste	45%	9%	46%	100%

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. N= 4, 895 - Note: not all respondents with valid wage information have indicated their occupation.

Table A4.2 Distribution over three educational categories by country.

	Low education	Middle education	High education	All
Belgium	7%	29%	64%	100%
Czech Republic	2%	62%	36%	100%
Denmark	44%	38%	18%	100%
Finland	29%	46%	25%	100%
France	2%	53%	45%	100%
Germany	42%	42%	16%	100%
Hungary	11%	45%	44%	100%
Italy	1%	64%	35%	100%
Netherlands	28%	37%	36%	100%
Poland	3%	47%	50%	100%
Spain	16%	21%	63%	100%
Sweden	3%	36%	61%	100%
United Kingdom	8%	38%	54%	100%

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. N= 5,261- Note: not all respondents with valid wage information have indicated their education.

Table A4.3 Distribution over qualification categories.

	Underqualified	Rightly qualified	Overqualified	All
Belgium	11%	72%	17%	100%
Czech Republic	4%	76%	20%	100%
Denmark	9%	70%	21%	100%
Finland	5%	66%	29%	100%
France	8%	69%	22%	100%
Germany	5%	77%	18%	100%
Hungary	3%	79%	19%	100%
Italy	18%	71%	11%	100%
Netherlands	12%	67%	21%	100%
Poland	1%	96%	3%	100%
Spain	7%	65%	27%	100%
Sweden	3%	76%	21%	100%
United Kingdom	5%	66%	28%	100%

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. N= 3,276 - Note: 2,085 respondents have not indicated their occupation or their qualification level.

Table A4.4 Percentages having received at least one day of employer-paid training in the last year by occupational categories.

	Managers, professionals, technicians	Clerical staff, sales persons	Craft workers, operators, unskilled workers	All
Belgium	77%	64%	66%	72%
Czech Republic	83%	73%	56%	74%
Denmark	100%	50%	70%	78%
Finland	78%	57%	69%	69%
France	68%	67%	58%	65%
Germany	70%	49%	57%	62%
Hungary	72%	60%	43%	62%
Italy	64%	75%	50%	62%
Netherlands	77%	56%	69%	70%
Poland	74%	71%	57%	71%
Spain	57%	40%	48%	52%
Sweden	68%	55%	61%	65%
United Kingdom	82%	79%	69%	78%

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. N= 4, 093 - Note: 1,268 respondents have not indicated their occupation or their training.

Table A4.5 Percentages being promoted in current firm by occupational categories.

	Managers, professionals, technicians	Clerical staff, sales persons	Craft workers, operators, unskilled workers	All
Belgium	44%	41%	38%	42%
Czech Republic	47%	46%	39%	45%
Denmark	42%	57%	29%	37%
Finland	57%	45%	51%	52%
France	57%	45%	67%	58%
Germany	47%	45%	52%	48%
Hungary	62%	56%	39%	55%
Italy	57%	60%	63%	59%
Netherlands	54%	46%	56%	53%
Poland	50%	0%		20%
Spain	41%	44%	49%	43%
Sweden	56%	56%	58%	56%
United Kingdom	65%	72%	45%	61%

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. N= 3,704 - Note: 1,657 respondents have not indicated their occupation or their promotions.

Table A5.1 Distribution over five categories of job stress (1=never, .., 5= daily).

	Never	2	3	4	Daily
Belgium	5%	22%	30%	27%	17%
Czech Republic	4%	18%	34%	28%	16%
Denmark					
Finland	8%	26%	29%	26%	11%
France					
Germany	4%	14%	37%	32%	13%
Hungary	5%	18%	30%	18%	29%
Italy					
Netherlands	13%	10%	28%	24%	25%
Poland	7%	16%	30%	24%	23%
Spain	5%	16%	32%	23%	23%
Sweden					
United Kingdom	7%	5%	34%	30%	25%

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. N= 1,857 - No data is available for Denmark, France, Italy, and Sweden.

Table A5.2 Distribution over five categories of job boring (1=never, .., 5= daily).

	Never	2	3	4	Daily
Belgium	26%	36%	20%	11%	8%
Czech Republic	27%	33%	23%	14%	3%
Denmark					
Finland	9%	41%	33%	7%	11%
France					
Germany	35%	35%	18%	8%	4%
Hungary	15%	23%	44%	15%	4%
Italy					
Netherlands	32%	32%	23%	7%	5%
Poland	37%	26%	26%	10%	1%
Spain	21%	32%	25%	13%	9%
Sweden					
United Kingdom	17%	19%	31%	24%	10%

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. N= 1,939 - No data is available for Denmark, France, Italy, and Sweden.

Table A5.3 Distribution over five categories of job mentally exhausting (1=never, .., 5= daily).

	Never	2	3	4	Daily
Belgium	8%	21%	28%	34%	9%
Czech Republic	6%	22%	34%	24%	14%
Denmark					
Finland	4%	28%	33%	26%	9%
France					
Germany	5%	18%	34%	37%	7%
Hungary	4%	14%	33%	29%	19%
Italy					
Netherlands	15%	19%	34%	21%	11%
Poland	7%	15%	27%	34%	17%
Spain	4%	13%	21%	36%	26%
Sweden					
United Kingdom	11%	13%	26%	21%	29%

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. N= 1,908- No data is available for Denmark, France, Italy, and Sweden.

Table A5.4 Distribution over five categories of job physically exhausting (1=never, .., 5= daily).

	Never	2	3	4	Daily
Belgium	25%	26%	24%	15%	11%
Czech Republic	20%	28%	31%	14%	6%
Denmark					
Finland	16%	32%	25%	14%	14%
France					
Germany	9%	29%	36%	19%	7%
Hungary	11%	33%	32%	15%	10%
Italy					
Netherlands	21%	27%	29%	12%	10%
Poland	15%	28%	29%	18%	10%
Spain	12%	25%	27%	19%	17%
Sweden					
United Kingdom	8%	23%	33%	18%	20%

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. N= 1,985- No data is available for Denmark, France, Italy, and Sweden.

Table A5.5 Distribution over five categories of working in dangerous conditions (1=never, .., 5= daily).

	Never	2	3	4	Daily
Belgium	41%	18%	16%	14%	11%
Czech Republic	51%	17%	14%	9%	10%
Denmark					
Finland	38%	25%	33%	3%	3%
France					
Germany					
Hungary	41%	22%	17%	8%	13%
Italy					
Netherlands	32%	15%	21%	12%	20%
Poland	56%	18%	9%	6%	11%
Spain	39%	25%	16%	7%	12%
Sweden					
United Kingdom	45%	11%	16%	8%	21%

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. N= 1,293 - No data is available for Denmark, France, Germany, Italy, and Sweden.

Table A5.6 Percentages workers reporting about reorganisations in the past 12 months by sub-sectors.

	Energy	Water	Waste	Total
Belgium	31%	18%	15%	24%
Czech Republic	59%		60%	59%
Denmark				
Finland	31%	27%	33%	30%
France	60%			52%
Germany	47%	43%	42%	45%
Hungary				
Italy	52%	50%	37%	46%
Netherlands	24%	25%	14%	22%
Poland				
Spain	48%	0%	52%	49%
Sweden	55%	44%	64%	51%
United Kingdom	62%		46%	64%

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. N= 1,044. No data is available for Denmark, Hungary, and Poland.

Table A5.7 Percentages workers reporting about reorganisations in the next 12 months by sub-sectors.

	Energy	Water	Waste	Total
Belgium	31%	18%	15%	24%
Czech Republic	59%		60%	59%
Denmark				
Finland	31%	27%	33%	30%
France	60%			52%
Germany	47%	43%	42%	45%
Hungary				
Italy	52%	50%	37%	46%
Netherlands	24%	25%	14%	22%
Poland				
Spain	48%	0%	52%	49%
Sweden	55%	44%	64%	51%
United Kingdom	62%		46%	64%

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. N= .888. No data is available for Denmark, Hungary, Netherlands and Poland.

Table A5.8 Mean score on worries about job security (1=never, 5= daily) by sub-sectors.

	Energy	Water	Waste	All
Belgium	2.25	2.37	2.37	2.31
Czech Republic	2.35	2.51	2.82	2.48
Denmark	2.40	2.12	2.89	2.39
Finland	2.39	1.98	2.53	2.30
France	2.76	2.64	2.00	2.58
Germany	2.15	2.12	2.68	2.23
Hungary	2.78	2.79		2.82
Italy	2.69	2.41	2.41	2.54
Netherlands	2.02	2.34	2.51	2.27
Poland				
Spain	2.42	2.88	2.49	2.51
Sweden	2.03	2.20	2.50	2.17
United Kingdom	2.85	3.14	3.08	2.96

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. Wages are expressed in Standardized German Euros level 2010. N= 2,741 - Note: not all respondents with valid wage information have indicated their occupation. No data is available for Poland.

Table A5.9 Distribution over five categories of worries about job security (1=never, .., 5= daily).

	Never	2	3	4	Daily
Belgium	25%	40%	20%	9%	6%
Czech Republic	24%	35%	19%	13%	9%
Denmark	26%	32%	23%	16%	3%
Finland	27%	40%	18%	7%	8%
France	27%	24%	24%	13%	11%
Germany	32%	34%	19%	8%	7%
Hungary	18%	25%	26%	18%	12%
Italy	24%	42%	7%	10%	17%
Netherlands	31%	35%	16%	9%	8%
Poland					
Spain	25%	33%	18%	13%	10%
Sweden	28%	44%	16%	9%	4%
United Kingdom	13%	23%	31%	20%	13%

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers with valid wage data in energy, water and waste in 13 EU countries. N= 2,741 - Note: not all respondents with valid wage information have indicated their occupation. No data is available for Poland.

Table A6.1 Energy: Distribution over firm-size, public and private sector, and occupation

	<50 empl.	50-500 empl.	>500 empl.	Total	N
Germany	17%	30%	53%	100%	1322
Netherlands	19%	32%	49%	100%	599
	Private sector	Public sector	Other-unidentified		
Germany	61%	12%	27%	100%	1334
Netherlands	43%	6%	51%	100%	628
	Managers, professionals, technicians	Clerical staff, sales persons	Craft workers, operators, unskilled workers		
Germany	55%	13%	31%	100%	1334
Netherlands	43%	14%	42%	100%	628

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers in energy in Germany and the Netherlands. N= 1,962.

Table A6.2 Energy: Percentage covered by a collective agreement, by age group and country

	Germany	Netherlands
under 30	74%	75%
30 - 39	67%	72%
40 - 49	80%	84%
50 or older	85%	90%
Total	77%	80%

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers in energy in Germany and the Netherlands. N= 1,962.

Table A6.3 Energy: Distribution over five categories of hourly wages, by age group and country

	Euro 0 - 9.99	Euro 10-19.99	Euro 20 - 29.99	Euro 30 - 39.99	Euro 40 and over
Germany					
under 30	17%	50%	28%	2%	3%
30 - 39	1%	29%	49%	15%	6%
40 - 49	6%	31%	35%	18%	9%
50 or older	1%	19%	42%	20%	18%
Total	6%	32%	39%	14%	9%
Netherlands					
under 30	20%	67%	8%		4%
30 - 39	8%	47%	31%	5%	9%
40 - 49	4%	46%	35%	6%	9%
50 or older		42%	29%	18%	11%
Total	10%	52%	25%	5%	8%

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers in energy in Germany and the Netherlands. N= 1,028.

Table A.6.4 Energy: Median hourly wages (in Standardized German Euros level 2010), by age, firm size, private/public divide, occupation and gender

	Germany	Netherlands
under 30	15.91	13.21
30 - 39	22.89	18.50
40 - 49	22.27	20.03
50 or older	26.47	23.57
<50 empl.	17.01	14.30
50-500 empl.	20.63	16.40
>500 empl.	24.25	19.43
Private sector	22.97	17.13
Public sector	21.23	23.33
Other-unidentified	20.11	15.79
Man., prof., techn.	24.97	20.78
Cler.w., sales	16.17	14.11
Craft w., operat., unsk. w.	18.28	16.04
Male	22.84	17.26
Female	20.16	15.39
Total	22.29	16.93

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers in energy in Germany. N= 711; in Netherlands N= 320.

Table A6.5 Water: Distribution over firm-size, public and private sector, and occupation

	<50 empl.	50-500 empl.	>500 empl.	
Germany	42%	38%	20%	100%
Netherlands	33%	39%	28%	100%
	Private sector	Public sector	Other-unidentified	
Germany	50%	27%	22%	100%
Netherlands	31%	13%	56%	100%
	Managers, professionals, technicians	Clerical staff, sales persons	Craft workers, operators, unskilled workers	
Germany	49%	15%	36%	100%
Netherlands	34%	13%	52%	100%

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers in Water in Germany and the Netherlands. N= 840.

Table A6.6 Water: Percentage covered by a collective agreement, by age group and country

	Germany	Netherlands
under 30	67%	70%
30 - 39	47%	78%
40 - 49	71%	82%
50 or older	61%	81%
Total	62%	79%

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers in Water in Germany and the Netherlands. N= 614.

Table A6.7 Water: Distribution over five categories of hourly wages, by age group and country

	Euro 0 - 9.99	Euro 10-19.99	Euro 20 - 29.99	Euro 30 - 39.99	Euro 40 and over	
Germany						
under 30	29%	54%	18%			100%
30 - 39	4%	58%	29%	6%	4%	100%
40 - 49	6%	38%	35%	13%	8%	100%
50 or older	6%	45%	28%	13%	8%	100%
Total	8%	46%	30%	10%	7%	100%
Netherlands						
under 30	20%	70%	7%		4%	100%
30 - 39	12%	62%	18%	5%	3%	100%
40 - 49	6%	52%	35%	5%	2%	100%
50 or older		64%	22%	6%	8%	100%
Total	10%	61%	22%	4%	4%	100%

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers in Water in Germany and the Netherlands. N= 450.

Table A6.8 Water: Median hourly wages (in Standardized German Euros level 2010), by age, firm size, private/public divide, occupation and gender

	Germany	Netherlands
under 30	13.95	12.51
30 - 39	16.97	16.40
40 - 49	21.26	19.22
50 or older	19.90	17.21
<50 empl.	17.98	15.05
50-500 empl.	19.85	16.51
>500 empl.	22.20	19.30
Private sector	17.90	15.81
Public sector	21.26	15.93
Other-unidentified	19.89	17.02
Man., prof., techn.	21.50	16.84
Cler.w., sales	15.13	15.05
Craft w., operat., unsk. w.	17.98	16.82
Male	20.70	17.01
Female	15.80	14.07
Total	19.25	16.51

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers in Water in Germany N= 246; in Netherlands N= 204

Table A6.9 Waste: Distribution over firm-size, public and private sector, and occupation

	<50 empl.	50-500 empl.	>500 empl.	
Germany	30%	49%	21%	100%
Netherlands	42%	41%	18%	100%
	Private sector	Public sector	Other-unidentified	
Germany	64%	12%	24%	100%
Netherlands	38%	11%	51%	100%
	Managers, professionals, technicians	Clerical staff, sales persons	Craft workers, operators, unskilled workers	
Germany	36%	21%	43%	100%
Netherlands	19%	13%	68%	100%

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers in Waste in Germany and the Netherlands. N= 1,383.

Table A6.10 Waste: Percentage covered by a collective agreement, by age group and country

	Germany	Netherlands
under 30	53%	65%
30 - 39	52%	65%
40 - 49	49%	70%
50 or older	75%	78%
Total	59%	69%

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers in Waste in Germany and the Netherlands. N= 869.

Table A6.11 Waste: Distribution over five categories of hourly wages, by age group and country

	Euro 0 - 9.99	Euro 10-19.99	Euro 20 - 29.99	Euro 30 - 39.99	Euro 40 and over	Total
Germany						
under 30	35%	49%	8%		8%	100%
30 - 39	14%	60%	24%	2%		100%
40 - 49	16%	52%	19%	8%	5%	100%
50 or older	13%	48%	20%	16%	4%	100%
Total	18%	52%	18%	8%	4%	100%
Netherlands						
under 30	29%	61%	8%		3%	100%
30 - 39	7%	56%	27%	5%	5%	100%
40 - 49	9%	53%	26%	9%	3%	100%
50 or older	13%	64%	15%	1%	7%	100%
Total	14%	58%	20%	4%	4%	100%

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers in Waste in Germany and the Netherlands. N= 713.

Table A6.12 Waste: Median hourly wages (in Standardized German Euros level 2010), by age, firm size, private/public divide, occupation and gender

	Germany	Netherlands
under 30	10.94	12.52
30 - 39	15.01	16.95
40 - 49	15.19	17.55
50 or older	16.24	15.12
<50 empl.	13.84	14.60
50-500 empl.	15.01	16.07
>500 empl.	17.69	17.29
Private sector	14.96	15.96
Public sector	17.68	15.26
Other-unidentified	12.85	14.86
Man., prof., techn.	22.92	20.68
Cler.w., sales	12.28	14.71
Craft w., operat., unsk. w.	12.82	14.62
Male	15.54	15.86
Female	11.82	15.01
Total	14.90	15.48

Source: WageIndicator data Jan-2007 - Jul-2011, selection: workers in Waste in Germany N= 198; Netherlands N= 515