

Chapter 9

Anticipating and managing the effects of greening of industries in the European Union: Skills development in the overall context of job quality

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This chapter starts by summarising the available evidence on the effects of greening of industries on job quality. It then provides an overview of the approaches companies use to anticipate and manage these effects. Finally, it outlines some of the measures that public authorities could take to facilitate the development of the workforce in preparation for a green economy.

Introduction

Research on the employment effects of greening of industries largely focuses on job quantity issues. Effects on job quality are considerably less often addressed. The 2009 *Employment in Europe* report concluded that “... there appears to be almost no literature with an equivalent level of detail on working conditions within environment-related sectors in Europe” (European Commission, 2009). Current research on the effects of greening on job quality focuses either on quantitative aspects including indicators and forecasts (EMCO, 2010; Cambridge econometrics et al., 2011) or skills (e.g. Cedefop, 2010; Strietska-Ilina et al., 2011).

Skills development is the job quality dimension that is the most affected by greening. However, green skills are not developed in isolation from other job quality dimensions, including career and employment security, health and well-being, and work-life balance. Green skills development usually takes place in the overall context of rising job quality standards. This chapter thus examines the relationship between skills development and other job quality dimensions in the context of anticipating and managing the effects of greening industries. The key message of the chapter is that successful green change depends not only on a smooth development of green skills, but that it may also be facilitated by positive changes in the employee culture that relate to other job quality dimensions.

This chapter is based on the Eurofound study “Growth and employment: Anticipating and managing the effects of greening of industries in the EU”¹ including 48 company case studies² carried out in the European Union (EU) in the automotive, chemicals, construction, distribution and trade, energy, furniture, non-metallic materials, shipbuilding, textiles and transport sectors. The available evidence does not allow for generalisations, either at national or sector levels, but does allow an exploratory analysis of recent approaches to developing a workforce fit for a green economy.

This chapter focuses, as does the study, on the effects and approaches of greening in relation to mitigation (i.e. practices addressing causes) rather than on the adaptation (i.e. practices addressing consequences) to climate change.³ It focuses on the direct effects in the supply chain that provide the intermediate products or services for the target sectors.

This chapter consists of three main parts. The first part summarises the available evidence on the effects of the greening of industries on job quality. The second part provides an overview of the approaches that companies use to anticipate and manage these effects. The third part briefly outlines a few of the measures that public authorities could take to facilitate the development of the workforce for a green economy, while the final section contains conclusions and recommendations.

Effects of greening of industries on job quality

The greening of industries may affect the following four job quality dimensions (Eurofound, 2002):

- Skills development, including requirements for qualifications, demand for training, patterns of organisation of learning activities, career development issues.

- Career and employment security, which covers employment status (e.g. full- or part-time, self-employment), wages, workers' rights (e.g. equal opportunities, information, consultation and involvement in organisational change) and social protection.
- Health and well-being of workers, which encompass psychosocial or physical health problems, risk exposure, work organisation (e.g. work intensity, share of monotonous tasks, job satisfaction, length and organisation of working hours in relation to health) and ageing-related issues.
- Reconciliation of work and family life covering such issues as length, flexibility, predictability of working time, ability to carry out non-working tasks and the availability of social infrastructure such as day care centres.

Available evidence suggests that the effects of the greening of industries on the quality of jobs are moderate and differ across these four dimensions. Skills development is the job quality dimension that is the most notably affected by greening. Employees working with green business practices⁴ face somewhat higher qualification requirements and greater demand for training than other employees. However, skills development is mostly about improving existing skill sets and not about introducing new occupational profiles. The Eurofound study (2013a) reveals that skills development is likely to be positively associated with other job quality dimensions – the higher the level of skills associated with an occupation, the better the career and employment security, health and well-being, and work-life balance of the occupation. Companies focus their resources on higher skilled employees who tend to have better job quality.

Studies (e.g. AK WIEN, 2000, Cambridge econometrics et al., 2011, European Commission, 2009a), company cases and sector overviews (Eurofound, 2013a) show that, *ceteris paribus*, at least in the short term greening may increase the demand for highly skilled workers (e.g. managers, engineers, business and computer professionals, technicians) and decrease the demand for or have no effect on medium- or lower skilled ones (e.g. clerks, operators and assemblers, labourers). Thus greening may imply contrary effects for employees – higher job quality for highly skilled employees and unchanged or lower job quality for lower skilled employees. However, over the medium to long term, when technologies mature, demand for high-, medium- and low-qualified workers (e.g. maintenance workers in windmills) may even diminish (Cambridge econometrics et al., 2011; European Commission, 2009a). This may soften the above-mentioned negative effects on employees. Generic, STEM (science, technology, engineering and maths) and interdisciplinary skills as well as multi-skilling are increasingly important in this process. The effects of greening of industries on other job quality dimensions are less clear. Approximately half of the companies studied have experienced at least some effects on career and employment security, and health and well-being. For career and employment security, the key effects were the under-representation of certain groups (e.g. women, young or older workers) and the lack of involvement of employees in the green change processes. For the health and well-being dimension, the key effect was a more intense development of new combinations of risks (compared to conventional jobs) that still need to be anticipated, assessed and managed. The reconciliation of work and family life was likely to be the least affected job quality dimension, in which greening effects are still the most contested.

Evidence suggests that the effects of greening on employees' job quality depend not only on their qualifications, but on the overall attitude of the company management as well. Some cases show that green companies, which are very innovative and technology

driven, have progressive management that is highly concerned with the job quality of their employees. Examples of this are provided in the next section.

Overview of businesses' approaches to anticipate and manage the effects of greening on job quality

This chapter is based on 48 case studies carried out in the Eurofound study (2013b). The first two sections discuss autonomous (internal) and collaborative approaches that companies apply when anticipating (first section) and managing (second section) greening effects on job quality. The third section analyses cross-cutting issues, including the importance of a favourable employee culture for a successful green change process.

Anticipating greening effects on skills development

Companies are more often likely to manage rather than anticipate green change – only approximately one quarter of the companies studied (and an even smaller share of SMEs) has carried out some form of anticipation activity. Additionally, all anticipation activities were related to skills development. In most cases, the greening effects on skills development were anticipated by a few years and on the basis of estimated business development trends. For example, skills demand was estimated when considering a particular business strategy, plan or concrete action such as planned production facilities or commercial openings, and then differentiated by qualification and occupational groups. Less common anticipation approaches are outlined in Box 9.1.

Box 9.1. Examples of other autonomous approaches to green skills anticipation

Volvo Penta, a Swedish manufacturer of engines and power systems for industrial and marine applications, anticipates skills on the basis of a clearly defined strategy, outlined in a grid. On one axis, the company estimates how difficult it is to recruit a person with the needed skill or up-skill an existing employee with a particular skill if someone leaves. On the other axis, it assesses the strategic influence that specific skill has for the company. The company then focuses on anticipation (and management) of skills that are the most difficult to replace and that have the largest strategic influence (see table below).

		Strategic influence of the analysed skill for the company	
		Low	High
Difficulty in recruiting a person with the analysed skill or up-skilling an existing employee with the analysed skill	Low		
	High		

Other companies leave the anticipation of green skills for particular departments. Danfoss Trata, a Slovenian manufacturer of district heating products and solutions, has established a Product Development Management Department, which analyses megatrends and makes suggestions on what products and processes it should engage in the future, including new skills that are needed for those. It carries out systematic idea generation based on specific target products and geographical area.

Meanwhile, the Environment Protection Department of Sofiyska Voda AD, the largest water utility company in Bulgaria, adheres to already established standards (e.g. ISO 14001) and elaborates a special procedure entitled “Human resource management: Environment training and sharing information/communications” to continuously assess the need for particular green skills in a company.

Box 9.1. Examples of other autonomous approaches to green skills anticipation (cont.)

Finally, there are companies which leave anticipation of skills to so-called “gradual development”, then managers note relevant skills gaps and plan their training or recruitment accordingly; or employees themselves care for their up-skilling. For example, System Photonics, an Italian efficient photovoltaic surfaces producer, encourages workers to develop and share the best methods of production in order to maximise the benefits for both themselves and the company. Employees therefore develop a deep knowledge of the whole production process and feel encouraged to anticipate problems as they know that there is reciprocity in such an effort.

Source: Eurofound (2013), *The Greening of Industries in the EU – Database of Case Studies*, European Foundation for the Improvement of Living and Working Conditions, Dublin, available at: www.eurofound.europa.eu/emcc/labourmarket/greening/search.php (accessed 25 February 2013).

Out of all of the companies studied, only a few have co-operated with other partners in anticipating the effects of greening on skills development. Box 9.2 overviews collaborative approaches used to anticipate greening effects on skills development.

Box 9.2. Examples of collaborative approaches to anticipate greening effects on skills development

The companies studied co-operated with different actors in anticipating the effects of greening on skills development. For example, some companies involved trade unions in green change development through work council discussions about future employee skills and sustainability oriented behaviour.

Companies also actively co-operated with various different associations. For instance, Kinnarps, a Swedish furniture manufacturer, collaborated with the Swedish Forest Stewardship Council in anticipating changes in wood certification standards. This helped the company to prepare for emerging new skills requirements. OHL ŽS, the fifth largest construction company in the Czech Republic, through co-operation with the Branch Council (an association of employers in the industry), was in constant dialogue with schools to ensure that their theoretical and practical training were up-to-date and that they acquired new green skills emerging in the market.

Other companies collaborated with universities, trying to foresee trends in technological advancement. They also provided inputs to shape university curricula to adhere to the latest product developments in the markets. Some companies also commissioned research at academic institutions in order to drive green change in their respective sectors.

Source: Eurofound (2013), *The Greening of Industries in the EU – Database of Case Studies*, European Foundation for the Improvement of Living and Working Conditions, Dublin, available at: www.eurofound.europa.eu/emcc/labourmarket/greening/search.php (accessed 25 February 2013).

For one online survey (Eurofound, 2013a), some stakeholders indicated that companies that adopt environmental management systems are usually well ahead of other companies in anticipating green change. This may be a result of the requirement for continuous improvement that is present in environmental standards.

Managing greening effects

Most of the management approaches, both autonomous and collaborative, are applied to skills development rather than to other job quality dimensions. However, most companies are likely to use traditional or conventional approaches (e.g. formal

discussions, amendment of current partnership agreements and provision of traditional internal training courses). Only a few engage in more innovative approaches, such as new types of training (e.g. on-site training), innovative partnership agreements with education providers or new ways of involving employees in green change processes.

Autonomous management of green skills

Almost all of the companies analysed had applied at least some autonomous approaches in the management of greening effects on skills development. Most of these approaches were related to internal training. This type of training, if effectively provided, could significantly reduce a company's need for external services and thus business costs. Internal training in the companies studied was provided selectively as a one-off intervention or continuously through on-the-job training and was often based on educational plans. Traditional autonomous management approaches adopted by companies to develop the green skills of their workers include the following:

- Training for a limited number of senior or environmental staff usually accompanied by some additional obligations (e.g. provision of on-the-job training to their colleagues, see below). Such training is often specific and provided for technical staff (especially for new employees who have been hired for technical positions, but did not have prior work experience) and company management.
- Introductory training is provided to all employees, including non-technical staff, to acquaint them with generic green skills (e.g. energy saving in the workplace, principles of energy efficiency in the production process, tools such as a sustainability scorecard, etc.).
- Self-training (for example to provide energy performance labels to buildings or certify wood according to established guidelines) or on-the-job training through, for instance, direct in-house mentoring in which senior employees train and consult their less experienced colleagues. Continuous dialogue transfers knowledge and skills from those who plan the green change process to those who implement it.
- Educational plans elaborated in collaboration between HR and production, commercial or other departments. They summarise the most important skills and foresee measures to ensure their adequate provision. Very often plans are a constituent part of environmental standards such as the Eco-Management and Audit Scheme (EMAS) or ISO 14001. Companies often report the positive effects of environmental standards on training – they not only structure the training, they also increase its incidence.
- Less widespread autonomous management approaches such as training abroad, information sessions providing the latest news on the greening agenda and/or identifying needs for further information/training, computer-based guidelines (e.g. eco-driving guidelines), information packages for self-learning and paid or unpaid training leave.

Some companies do not limit themselves to the above-identified traditional approaches; some of the more innovative management approaches are outlined in Box 9.3.

Box 9.3. Examples of innovative autonomous management approaches to green skills development

EDP, a large wind energy producer in Portugal, set up a company university to effectively manage its human resources. The university is split into five business schools which provide specific skills and two transversal schools which provide generic skills. As a whole, the schools co-ordinate training, career development, knowledge management and change management in line with the present and future needs of the company.

Willmott Dixon, a large British construction company, has introduced a “skills matrix” initiative to identify skills gaps and address them with the necessary learning interventions. Firstly, employees’ performance is gauged against certain sustainability criteria, to identify skills gaps and signpost areas where an individual requires training. Secondly, where skills gaps are identified, the company has over 200 learning interventions available on its intranet, to ensure that employees maintain and develop green skills. The training provided via these learning interventions might interface with the different sustainability criteria e.g. training in waste handling or refreshing one’s knowledge of the “Building Research Establishment Environmental Assessment Method” issues. The skills matrix covers all employees in the company and serves as a gateway to training.

Tesco Plc, one of the world’s largest retailers, trains all their truck drivers with eco-driving skills. They are trained on a one-to-one basis by internal trainers. In addition, company trucks are equipped with telematic monitoring systems, which track vehicle movements and speed, facilitating efficient driving behaviour: after each journey, drivers have a debriefing session with their manager to evaluate the driving performance.

Source: Eurofound (2013), *The Greening of Industries in the EU – Database of Case Studies*, European Foundation for the Improvement of Living and Working Conditions, Dublin, available at: www.eurofound.europa.eu/emcc/labourmarket/greening/search.php (accessed 25 February 2013).

Collaborative management of greening effects on skills development

The analysed case studies showed that companies that often manage green skills development do so in co-operation with a partner. Partners usually include vocational schools, universities and associations. Examples of collaborative approaches with these and other types of partners are summarised below:

- Vocational schools: apprenticeship programmes when part of a student’s time is spent at school and part working in a company. After completion, the apprentice is often hired by the company.
- Universities: traineeships through which students reinforce and enrich knowledge learnt at the university and the company becomes familiar with someone who may become an employee; development of new study programmes (e.g. bachelor engineering programme with a focus on renewable energy carried out part-time thus enabling employees to study); sponsorship of PhD students in examining issues relevant to the company; joint organisation of contests or conferences for students; research on new technological breakthroughs.
- Associations, networks (e.g. National Passive House Association, Association of Photovoltaic Technology and Business or the Society of Electric Vehicles): collaboration with training providers to include green skills in the curriculum; organisation of informational events for targeted audiences to raise their awareness of greening; exploratory work aimed at improving existing green solutions.

- Trade unions: formal or informal dialogue or collective bargaining with the company's management to agree on skills development requirements and include them in collective agreements and co-ordinate the implementation of training.
- Employment agencies: co-operation in providing guidance for jobseekers (e.g. company recommends suitable training providers to prepare jobseekers for employment in the company).
- Private training providers, consultants: often contacted to address specific training needs of the company. Examples include training in the development of product certification standards, of environmental training content and creation as well as transfer of environmental practices such as eco-driving.
- Suppliers of products or services, business partners: provision of training needed to use specific products or services. Usually suppliers or business partners train a few specialists who, after the training course, transfer the knowledge and skills to their colleagues.

The company cases analysed for this study did not provide many examples of collaboration between companies and public authorities, except in a few instances where the public authority supported study programmes or training for jobseekers or those changing jobs.

The case studies showed that the key driver for co-operation is cultural, as the company should benefit from long-term intangible benefits arising from such co-operation, beyond those visible in the delivery of new products or services.

The traditional examples outlined above are complemented by more innovative and complex management approaches that companies, together with their partners, use to develop skills. Some of these are summarised in Box 9.4.

Box 9.4. Examples of innovative collaborative management approaches to green skills development

To manage the needs of blue-collar workers, Swedish office furniture manufacturer, Kinnarps, co-operates with a local VET school through a specialised division of the company, called the Kinnarps Academy. Students spend two days per week in the school and three days in the company, where they are provided with all the practical aspects of their training. Sixteen students are accepted each year to the three-year course. Teachers are employed by the company and the municipality compensates the company for their training. The students learn all aspects related to the industrial production of wooden products, so that they are able to work in production from the start of their career.

British retailer Tesco Plc funded the launch of the Sustainable Consumption Institution (SCI) at the University of Manchester. The SCI researches major issues associated with sustainability and climate change. The company collaborates with the SCI on various projects to understand the possibilities and options for suitable technologies in order to pursue its vision of a zero-carbon business.

The large Portuguese wind energy producer EDP is highly involved in internship programmes. However, the company does not simply accept university graduates, but instead provides the option of summer internships for the children of its employees who are currently studying at university. This not only supplies the company with a potential new workforce, but also reinforces the motivation of existing employees to work for the company.

Box 9.4. Examples of innovative collaborative management approaches to green skills development (cont.)

When French electronic vehicles producer Mia Electric hired a number of new employees, they received 19 days of training in co-operation with the local branch of the Public Employment Service. Training was carried out in the framework of an “Action Plan for Pre-recruitment Training” (*Action de formation resalable au recrutement*). A plan to secure the career path of various professionals (*Plan de sécurisation des parcours professionnels*) was funded by the state, which took charge of those who were in part-time work, and the regional public authority, which was responsible for training those who had lost their jobs as a result of the bankruptcy of a former car producer in 2009. The plan is intended to avoid laying off experienced workers, who are crucial for the production of electric cars, and the costs associated with redundancies. The training plan, with financial support from the government and other involved parties, has helped some 300 people to acquire the skills necessary for the production of electric cars. In addition, the regional administration encourages the reallocation of workers from different parts of the former producer. The receiving employer may benefit from a training subsidy of up to EUR 3 000 per employee.

Construction company Willmott Dixon is a member of the UK Green Building Council (UKGBC), an organisation established to provide leadership in sustainable practice in the sector and to influence government policy. The UKGBC has established the Sustainability Training and Education Programme (STEP), which aims to improve the recognition and awareness of sustainability within the sector and to develop leadership skills in the area. Launched in September 2010, STEP offers an introductory course to sustainability as well as leadership in the built environment course, which is designed to transform the sector through training senior managers, directors and decision makers in the sector and beyond. Training is provided through the College of Estate Management and the University of Cambridge. Senior managers in the construction company have completed or are undertaking STEP training.

One of the largest shipbuilding companies in the United Kingdom, A&P Group, uses knowledge transfer partnerships (KTP). The KTP helps businesses to improve their competitiveness and productivity through the better use of knowledge, technology and skills. There are three players in this partnership: the shipbuilding company, which provides a two-year job contract; a knowledge base partner – in this case, a university, but it could also be a public or private college or research organisation; and a KTP associate – a recent university graduate who is temporarily working in the company and who transfers the knowledge the company is seeking into the business via a strategic renewables projects. Part of the KTP associate’s salary is paid by the company and part by the university. The KTP associate also has a personal development budget that can be spent on relevant training (e.g. on small vessel driving courses). The KTP associate, who has a direct link to the academic source, acts as a knowledge transfer agent and helps the company enter the renewables market.

Source: Eurofound (2013), *The Greening of Industries in the EU – Database of Case Studies*, European Foundation for the Improvement of Living and Working Conditions, Dublin, available at: www.eurofound.europa.eu/emcc/labourmarket/greening/search.php (accessed 25 February 2013).

SMEs and large companies anticipate and manage green skills differently. Large companies have more resources – they often have staff whose job it is to estimate skills needs and organise training, foresee large investments for training, and assess and manage new health and occupational risks, launch new initiatives to improve work-life balance, etc. Meanwhile, SMEs, due to limited budgets and widespread multi-tasking or intensive work practices, are often unable to devote significant time and effort to green skills development. Thus they rely heavily on partners such as local associations and networks. If specific knowledge is needed, the SME trains one or several employees externally at the national level or if the local market cannot provide the training, at an

international level. For example, Statybos Projektu Sprendimai, a Lithuanian passive house construction company, sent a project manager on a half-year long training course conducted by the Passive House Institute in Germany. In turn, the project manager then trained his colleagues on-the-job. External training of few employees who then train the remaining staff is often the most affordable option for SMEs.

Management of greening effects on other job quality dimensions

Those companies studied, particularly the SMEs, have managed greening effects considerably less often on the other job quality dimensions. Approximately half of them applied some measures to manage the effects on the career and employment security dimension and approximately a quarter on the effects in the health and well-being dimension. Only a few companies have applied some management approaches to address work-life balance. Informing and involving employees was one of the most often applied approaches in the remaining job quality dimensions (Table 9.1).

Table 9.1. **Autonomous approaches to manage greening effects on other job quality dimensions**

Types	Description/examples
Career and employment security	
Saving jobs	DPD, one of the largest parcel and logistic services providers in Germany, has introduced the position of a waste and sustainability manager in each distribution centre. Sometimes the new position is used to secure employment for persons who are no longer able to do physical work in the centres. They are retrained in order to give them a new opportunity within the company instead of dismissing them.
Information and consultation	Information and consultation are usually provided to all employees to make them understand the company's philosophy towards the environment and to accept the green change processes that are underway. Services are usually provided by the company's management or senior/environmental staff who are responsible for ensuring that co-workers have the ability and tools to receive and comprehend relevant information. Companies inform employees during meetings, via newsletters, through their intranet, regular briefings, booklets, etc. Ecociclo, a wood recycling company in Portugal producing raw materials for the furniture industry, uses written messages, often in the form of printed sheets hanging on a wall, as the main method of keeping staff informed and providing recommendations. The company's staff are mostly blue collar workers, and this type of approach tends to work better.
Involvement	Companies involve employees in different ways: by emphasising a flat structure, reducing hierarchy and introducing a culture of debates and participation of the personnel at the workplace level; by organising a number of moderated discussions with employees and other stakeholders to formulate the company's vision; or by involving trade union representatives in green business initiatives and in the management of the company. EDP, a Portuguese renewable (wind) energy producer, encourages employees' children to visit their parents' workplaces in the company. The purpose of this is to heighten the involvement and the feeling of belonging between the company, workers and their families. Meanwhile, once or twice a year, employees of the Portuguese wood recycling company Ecociclo, attend a one-day greening event with their families, to plant new trees and informally discuss sustainability issues. These events help workers to better understand the benefits of the wood recycling process undertaken by the company.
Employment status	Some companies undertake specific measures to improve the employment status of their employees as a means of implementing green change. For example, Biogros SA, a specialised bio-products wholesaler in Luxembourg, supports full-time work (compared to the part-time conditions that are prevalent in rest of the sector), which allows their employees to have better living conditions in the context of the high prices existing in Luxembourg.
Adapting remuneration	To create a culture favourable for green change, some companies provide green bonus schemes. For example, DSm, a Dutch life and materials sciences company, created a remuneration structure for higher ranking employees incorporating bonuses tied to performance on sustainability targets. The overall income level has not changed significantly, but it did increase employee engagement. Meanwhile, the large British construction company Willmott Dixon uses a sustainable project criteria system to partly determine the level of employee bonuses. Under this arrangement, managers must meet six out of ten of the criteria to earn between 100% and 120% of their bonus. Some other companies, such as retailers, make sure that all employees aim for carbon-reduction targets through non-monetary performance appraisals.
Equal opportunities	Equal opportunities policies are rarely managed by companies. Some have more general measures, ensuring gender equality in terms of access to employment, training, career development and average wages, and retirement options. Others, like Wienerberger, an Austrian clay bricks and roof tiles manufacturer, have more concrete measures, such as a commitment to increase the share of females by giving priority to female job applicants over a male one when they are equally qualified and apt for the job.

Table 9.1. **Autonomous approaches to manage greening effects on other job quality dimensions** (*cont.*)

Types	Description/examples
Health and well-being	
Addressing disability	Mia Electric, a French electric car producer, to facilitate the employment of disabled workers, has introduced special workplaces in the plant which are adapted to the needs of disabled employees and constitute around 6% of the total jobs.
Insurance	A representative of Successori Reda, an Italian woollen mill, stated: “when the [global financial] crisis was announced, we provided supplementary health insurance to all employees’ family members, in order to give them a signal against uncertainty”. Some other companies also provide pension or life insurance schemes, or well-being initiatives.
Physical risks	For shop floor workers, the Portuguese wood recycling company Ecociclo provides and encourages using individual protection gear. It also builds physical barriers in the compound to reduce wind speed and thus airborne dust and, with the help of local fire-fighters, consults employees to reduce fire hazards.
Job satisfaction	Every two years, Sonae Indústria, a mother company of Ecociclo, assesses employee satisfaction. Results show that (green) wood recycling workers always rank as the most content and are also more embedded with the company’s values than other (non-green) employees in the group of companies.
Psychological risks	Stress usually arises in situations where staff are not sure what to do or lack experience. To reduce employee stress arising from the wood auditing procedure, Kinnarps, a Swedish furniture producer, provides very clear guidelines.
Work environment	British construction company Willmott Dixon has invested in eco-cabins – portable structures that provide on-site offices as well as a kitchen, rest, drying and toilet facilities. Eco-cabins have been designed to include a range of energy-saving technologies such as lighting controls, timed heating controls and double glazing. The eco-cabins provide qualitatively better on-site accommodation for workers than was available previously.
Work-life balance	
Commutation	Some green companies (e.g. wind or hydro energy producers) are located in remote areas, sometimes more than 100 kilometres between residence and workplace. To address this, companies either provide a free bus shuttle for employees who do not have a car, or provide financial compensation of transport costs.
Culture, leisure	Companies located in remote areas also sponsor cultural activities in their region to increase the general attractiveness of the area for existing and new employees. To attract employees, some companies in the offshore wind energy industry promote their jobs as an opportunity to combine well-paid work with leisure activities such as wind or kite surfing.
Social infrastructure	Distant employers also sponsor kindergartens in regions around their headquarters to ensure that there are enough places available for all of their employees’ children.
Friendly working time	Green companies strive to reconcile the working and non-working time of their employees. For example, Danish energy producer EnergiMidt and Irish green cement manufacturer Ecocem emphasise flexible working time – for example, in cases of family emergency, staff may work from home. However, working time is more flexible for non-manufacturing staff than manufacturing-based employees (who tend to work shifts).

Source: Eurofound (2013), *The Greening of Industries in the EU – Database of Case Studies*, European Foundation for the Improvement of Living and Working Conditions, Dublin, available at: www.eurofound.europa.eu/emcc/labourmarket/greening/search.php (accessed 25 February 2013).

Employees were involved in green change processes not only internally; they were also engaged in co-operation activities such as training of sub-contractors or voluntary work with schools (Table 9.2).

Studied company cases have shown a positive link between approaches that address skills development and those that address other job quality dimensions. For example, more intense skills development was noticed in companies that tried to involve their staff in green change processes and to incorporate greening in the company’s work culture and hereby overcome initial scepticism or the unwillingness of its employees to implement or initiate green change processes. This positive link is discussed in more detail in the next section.

Cross-cutting issues: Successful green change needs cultural change

As the previous section showed, a successful green transition is conditional on the overall development of staff. Companies tend to focus on the development of green skills in their employees. However, as discussed above, some companies invest considerably to

improve other job quality aspects, including informing and involving employees in green change processes. This section discusses the importance of creating an employee culture which is favourable for a successful transition to a low-carbon economy.

Table 9.2. Collaborative approaches to manage greening effects on other job quality dimensions

Type of partner	Description/examples
Career and employment security	
Trade unions	Co-operation between companies and trade unions is usually based on formal or informal discussions. Discussions often focus on the environmental impacts of the company's activities, the implementation of green business strategies, formation of sustainability oriented behaviour, etc. However, trade unions are also involved with integrating the sustainability dimension into employee appraisal forms, reward schemes and collective labour agreements, to encourage staff to develop sustainable ideas and form a culture that is favourable for green change.
Sub-contractors/suppliers	Companies not only require but also provide training for their sub-contractors or suppliers. For example, technical supervisors in the Lithuanian passive house construction company Statybos Projektų Sprendimai provide training to their sub-contractors' staff on issues which are of critical importance in this type of construction. This pro-active training not only ensures that the buildings' design requirements are met, but it also increases the involvement of both the contractors' and the sub-contractors' workers in green change processes.
General	Companies also use various <i>ad hoc</i> opportunities to involve their employees, including networking; organisation of information events addressed to the general public, businesses, the scientific community or policy makers; and contributing to energy saving events, etc. These approaches increase the participation rates of employees' involvement in the green change process and thus formulate a corporate culture which is favourable for green change.
Health and well-being	
Secondary schools	Co-operation with schools could contribute to increasing employees' job satisfaction. Portuguese wood recycling company Ecociclo has been contacted by a local secondary school asking them to give a presentation to the children on recycling and its benefits. The workers continued their presentations in other local schools, which in turn, has boosted workers' self-esteem and job satisfaction. Workers who participated in these activities have developed a sense of pride in relation to their role in the recycling process.
Work organisation	Some working arrangements, such as shift or night work, may negatively affect people's health. Green Cargo, a Swedish railway-based transport services provider, had train drivers assigned to a particular route and schedule depending on their ability to drive a particular type of locomotive. Thus, there was a need for more flexibility to allow the drivers to drive different locomotives. The work organisation issue was discussed between the company, drivers and trade unions to balance staff working time and business needs.
Work-life balance	
Housing providers and schools	Remotely located companies such as wind energy producers engage in regional co-operatives aimed at solving specific problems of their employees. For example, companies co-operate with housing providers to provide their new employees with pre-selected apartments or houses in the region. Similarly, they co-operate with local schools and kindergartens to ensure that there are sufficient places available for the children of their new employees.

Source: Eurofound (2013), *The Greening of Industries in the EU – Database of Case Studies*, European Foundation for the Improvement of Living and Working Conditions, Dublin, available at: www.eurofound.europa.eu/emcc/labourmarket/greening/search.php (accessed 25 February 2013).

Smooth green change requires a clear understanding and acceptance among employees. Clear and open communication is therefore very important. Evidence (Eurofound, 2013a) shows that although green change definitely brings savings to business, it is not automatically beneficial for employees in terms of, for example, saved jobs, higher income or qualification, better health and safety, etc. The benefits resulting from green change are usually either not clearly communicated and thus not understood or not provided altogether. In contrast, energy efficiency is often invoked by companies to cut business costs (e.g. smaller offices and thus lower fixed costs, car parking charges, fewer or more productive staff meaning smaller wage bills, etc.). The recent economic crisis further reinforced such cost-cutting policies. Lack or limited awareness of the benefits of green change and a lack of understanding of this process may lead to employee resistance to green change, inadequate efforts and adverse attitudes towards the

implementation of green change processes. Thus, benefits need not only be shared, but also clearly communicated.

One-way communication (i.e. from management to employees) of green change and its benefits may not be enough for a successful transition to a low-carbon business. Decreasing marginal benefits of green change are a widespread challenge to companies carrying out green business practices. To ensure stability and continuity of green change, companies need to create not only external (e.g. environmental standards) but also internal long-term drivers. Internal drivers could be created through continuous investment in cultural change (i.e. bottom-up involvement of employees based on two-way communication) which is needed to ensure the successful transition to a low-carbon business.

An online survey (Eurofound, 2013a) shows that employees are usually not involved in discussing green change. They are thus often not willing to change. For example, a case study of Arginta, a provider of metal processing, water management and renewable energy solutions in Lithuania, showed that employee consciousness is vital for the smooth implementation of greening processes: adherence to the “green” rules inevitably makes the technological process longer, requires care and internal discipline. Meanwhile employees, especially those in a lower chain, are unwilling to adapt to some additional requirements without a clear understanding and/or incentives; thus a lot of policy and patience is required from management to turn the implementation of green processes into a conscious act.

The involvement of employees in the green change process could increase employee awareness, accommodate their initial doubts and thus lead to increased consciousness for green change. This could result in higher employee motivation to up-skill and thus a smoother implementation of the related new green procedures and technologies. Furthermore, literature shows that employee participation can reduce the negative effects of green change on job quality (AK WIEN, 2000). Thus, involving employees could lead to a circle of positive green developments within the company (Figure 9.1).

Available evidence (Eurofound, 2013a) suggests a few pointers to win the “hearts and minds” of employees and create an employee culture which leads to a smooth transition to a low-carbon business:

- Commitment to green change needs to be viewed as an imperative, rather than an option, leaving no doubts for those who implement it. As a representative of DSM Engineering Plastics, a Dutch global supplier of high-performance engineering thermoplastic solutions, noted, the: “[sustainability strategy] is not really a skill, but a mind-set. People need to believe that there is no other way for a business to survive, but to implement green business practice”.
- The company’s green vision and action plan should not only be understood, but also shared (or owned) by employees. To this end, employees should participate in the formulation and implementation of this vision and subsequent action plan.
- Companies (particularly large ones) need to embed the climate change dimension into their business operations from the strategic to the operational level. Possible measures include setting climate change performance targets, regularly monitoring them and integrating them into remuneration systems. With a continuous flow of information, companies could also create positive competition where employees in different departments compare and try to exceed each other’s performance in achieving environmental targets.

- Employee involvement in SMEs should be ensured through continuous direct contact between management and staff. Meanwhile, large companies need to ensure practically functioning and institutionalised employee representation in green management structures.
- Green change is usually enforced by external specialised environmental agents (especially in SMEs) who develop internal expertise and disseminate it across the company. Larger companies sometimes establish separate climate departments formulating the company's green strategy, setting targets for CO₂ emission reductions, and sharing the expertise on climate science and policies. However, companies rarely foresee the need for a green workplace representative or additional green responsibilities for existing representative(s). Such a representative could effectively create an employee culture which is favourable for green change. However, this representative would need to have adequate resources, both to gain an understanding of green change issues and to carry out his/her environmental functions. A 2009 survey of 940 UK union representatives on climate change showed that 73% of them did not have the facility for environmental work and lacked the available time to put their enthusiasm into practice (Labour Research Department, 2009).
- Higher autonomy and flexibility of employees may be encouraged by, for example, providing them with the means to apply their ideas and experiment with new technology applications. This could not only increase employee engagement, but also stimulate eco-innovation.
- Surveying staff on green change issues may: *i)* provide management with ideas for further green actions; *ii)* give mandate for the company to act; *iii)* provide employees with a sense of ownership of the green processes; and *iv)* help formulate the company's green vision.
- Close attention needs to be paid not only to skills, but to other job quality dimensions as well in order to facilitate the greening transition. For example, measures aimed at reducing stress at work could improve employees' mental conditions and increase motivation to perform. Thus not only skills development may lead to better health, but improved health conditions may lead to more greater skills development.
- White-collar employees easily master green change processes, while a significant share of blue-collar workers find it difficult to translate new knowledge and skills into their daily activities. To enforce a culture favourable for green change amongst all employees, companies need to focus on blue-collar staff and provide additional resources to facilitate their engagement. For example, blue-collar workers could receive more generic green skills training accompanied by realistic work-based simulations. This may lead to behavioural changes that are positive for greening.

To conclude, a successful green business transition goes hand-in-hand with a cultural change that relates to all job quality aspects rather than one particular dimension or separate business unit. A successful cultural change could lead to a successful green transition and, as a result, significantly increase employee satisfaction. The companies studied often report that successful green change has brought significant benefits in terms of improved work processes, skills development and working conditions. Apart from the financial benefits, such developments also contribute to the company's reputation and

desirability as an employer. For example, they increase levels of employees’ pride and loyalty to the company. As one company representative said: “employees and management want to be engaged with the green approach, because it’s a good thing. It’s not only business, but it is something that you should do if you have a possibility”. Increased job satisfaction further reinforces green change processes leading to a circle of positive green developments (Figure 9.1), which spreads both within the company and outside of it, from suppliers to other sectors and leading to a stronger economy and a healthier environment for all.

Figure 9.1. **Cultural change leads to successful green change**



Role of public authorities in facilitating the development of a workforce for a green economy

An online survey of stakeholders (Eurofound, 2013a) showed that regulatory and financial measures are one of the main actions public authorities could take to facilitate the development of job quality of employees working with green business practices. In regulatory policy measures, particular attention should be paid to establishing and enforcing a clear, consistent and uniform legal framework. Financial measures need to be well-balanced, flexible and targeted at those most in need of support, including SMEs and blue-collar or vulnerable employees. A good example of public authorities’ involvement is the UK government’s decision to set up a Union Modernisation Fund to support Trade Union Congress’s (TUC) Green Workplaces project⁵ aimed at stimulating environmental behavioural change at work. European Social Fund funds⁶ also support green activities and could be used more actively by EU member countries. Public funding is indispensable as it provides a long-term perspective to green change.

However, regulatory and financial measures are not enough to develop a workforce for a green economy. To increase their effectiveness in reaching those the most in need, public authorities should implement the following additional measures.

Firstly, public authorities could devote significant resources to raising public awareness of green change and particularly the importance of green skills and an overall cultural change for successful green change processes. Increased awareness of green change among company shareholders and employees as well as (sub)contractors, suppliers, investors and clients could strengthen the need for green change within companies. Secondly, greening could be stimulated by the additional guidance services for companies (especially SMEs) by, for example, providing information on relevant support schemes or tools for implementing green change.

Thirdly, public authorities could support networks of SMEs aimed at facilitating green change. Networks such as the Retail Forum for Sustainability,⁷ Green Workplaces Network,⁸ BUILD UP Skills Initiative⁹ and their tools could help SMEs gain the necessary knowledge and skills for green change and could become vital for their quick adaptation to the green business environment. Sector-based training funds linking SMEs in a particular sector with pre-determined green skills providers could also be an important initiative.

Fourthly, public authorities could play a significant role in adapting education and training policy for green change. There are currently not many education and training providers for the new specialised programmes needed for green skills (particularly in initial education and training levels) and this gap needs to be closed. Recognition, validation and certification of competences are yet to be developed for new green or greening occupations.

Furthermore, co-ordination of education and training policy with environmental, labour market and other public policies need to be strengthened to achieve higher coherence and synergy of different policy efforts. Greening of initial education and training is of particular importance as the 2050 targets will need to be met by young workers entering the labour market “today” and not by existing workers leaving the labour market “tomorrow”. Finally, there are a number of measures that public authorities could consider which stretch beyond the scope of this chapter, including changes in working time policies, giving more responsibility to local communities and encouraging community-based sustainability initiatives, to name but a few.¹⁰

Policy implications

Analysis shows that most of the effects of the greening of industries are concentrated in skills development. Effects on other job quality dimensions such as career and employment security, health and well-being, and work-life balance are far less prominent. However, companies that anticipate or manage the effects on other job quality dimensions reveal the importance of providing information and involving employees in green change processes. Case studies demonstrate the positive link between changes in work culture and successful green change – the more employees are informed and involved in green change, the more motivated and aware they feel, the more they learn and the more successful the green change process and the greater job satisfaction. The implementation of green business practices thus can result in a “triple win” situation:

- greater competitiveness and profitability for companies
- more and better quality jobs for employees
- A stronger economy and a healthier environment for all.

Public authorities play a key role in ensuring that greening benefits everyone. They could facilitate the workforce development for a green economy not only through traditional regulatory or financial measures. Green culture and greening of businesses could be effectively stimulated with the help of accompanying measures, including awareness raising, provision of specialised guidance services, facilitation of networks, adaptation of education and training policy and its better co-ordination with other public policies. Any measure needs to be focused on the “weak links” in greening processes such as SMEs or blue-collar workers.

Research of greening effects on job quality is still in its infancy. There are a lot of limitations to this research, including: difficulties in disentangling the effects of greening of industries from those of broader contextual factors such as technological development; differences of greening effects across sectors, occupations, regions, time, to name but a few; and a lack of evidence on a clear-cut cause and effect relationship between greening and job quality. This chapter has outlined only tentative/exploratory trends instead of providing hard evidence. Further research at sub-sectoral level is needed to verify these trends. Amongst other issues, future studies could research innovative approaches for anticipating and managing green change (especially those involving public authorities and SMEs) and greening strategies across value chains that are very significant at industry level. This chapter is based on evidence collected during the period when the effects of the financial and economic crisis were still very prevalent. Future research could also try to examine whether or not the crisis has made any significant effects on employer’s perceptions of greening and what measures could prevent or mitigate this.

Notes

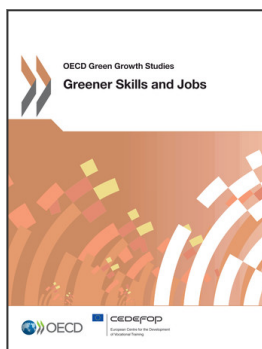
1. The study is available at: www.eurofound.europa.eu/publications/htmlfiles/ef1248.htm (accessed 25 February 2013).
2. Case studies are available at: www.eurofound.europa.eu/emcc/labourmarket/greening/search.php (accessed 25 February 2013). The sample includes companies which are well advanced in greening processes in the sector. The sample therefore does not reflect a common trend in the sector, but represents high-achieving companies in the market. Furthermore, 14 of the 48 companies studied were SMEs. SMEs were very hard to reach not only due to their lower awareness of the topic, but also due to the lack of resources for any additional activities (including green change), which was further escalated by the crisis.
3. Climate change mitigation includes all of the measures to reduce the negative impacts of human activities on the environment and is achieved by reducing both the energy intensity of GDP and the carbon intensity of the energy used. Climate change adaptation consists of deliberate actions undertaken to reduce the adverse consequences of climate change as well as to harness any beneficial opportunities (Martinez-Fernandez et al., 2010). If radical mitigation measures are not taken in due time, adaptation could eventually prove impossible (European Commission, 2009).
4. “Green business practices” are understood as business activities and processes that contribute to climate change mitigation by minimising greenhouse gas emissions from economic activities or using fewer natural resources.
5. www.tuc.org.uk/greenworkplaces (accessed 25 February 2013).
6. For example, the ESF has contributed to the training modules for SMEs on energy consumption/saving and on climate protection in Denmark and Germany. In Poland, the ESF is currently supporting a post-graduate course for employees of companies dealing with environmental engineering and the management of environmental protection in enterprises (European Commission, 2010). A few of the companies reported the use of EU funds for environmental training for their employees: for example, one construction company implemented a project entitled “Training of employees in the construction sector” which also covered environmental management training; a chemicals producer has received EU support for two research projects in bioplastics industry; a waste treatment company has carried out few ESF projects aimed at enabling and encouraging environmental awareness through the empowerment of socially disadvantaged persons through adequate training and skills transfer.
7. <http://ec.europa.eu/environment/industry/retail/about.htm> (accessed 25 February 2013).
8. www.tuc.org.uk/workplace/index.cfm?mins=392&minors=87&majorsubjectID=2 (accessed 25 February 2013).
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10. An overview of these and other measures that public authorities could take to ensure the transition to a green economy is provided in Jackson (2009: 171-187).

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