

Programmes to promote environmental skills

Final Report

Client: European Commission, DG Environment

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Executive Summary

More and better skills are indispensable for the European labour force as they make it easier to innovate, adopt new technologies, attract investment, compete in new markets, and diversify the economy. This, in turn, increases productivity and so jobs and growth. For this opportunity to be taken the **European work force needs access to environmental skills training**. For policy makers, it is important to understand which approaches to providing skills training are most appropriate and deliver the best benefits in terms of achieving sustainable development and providing good quality jobs.

This report maps the environmental skills programmes in six European countries: the **U.K., the Netherlands, Italy, Germany, Bulgaria and Poland**. The research was conducted by country correspondents who surveyed environmental skill programmes and followed up with in-depth interviews to elicit more details on the types of programmes being offered and their impact. Detailed case studies are included in the report.

A **typology of environmental skills programmes** is shown on the next page. It illustrates the possibility for very diverse approaches in delivery, target audience, and format. Some general conclusions are that:

1. There is a **lot of variety among Member States in environmental skills programmes**, as was expected due to the differing social, economical and environmental conditions of the Member States reviewed. In addition, there are many incumbent initiatives at Member State level, which result in specific programmes that promote environmental skills development.
2. These **programmes tend to be driven by employment demand** and often by the implementation of environmental legislation that requires sectors to train their staff to meet new or stricter regulation. The actual content of training and programmes varies across industries and is often tailored to specific companies needs.
3. **Firms are at the frontline of developing green skills** – as they provide in-house training to staff throughout different sectors of the economy. Large companies in ecological industries, in particular, have on-going learning opportunities for their staff. Employers thus play a major role in developing skills but, typically, the training provided is relatively short in duration, focussed on a specific sub-task of a job profile and does not lead to any officially recognized certification or qualification.
4. There is an **even mix of courses that cater for either the high-, medium- or low-skilled**. The target group of environmental skills programmes in various Member States shows the mixed nature of the course/programme, ranging from trainees to the self-employed. As already mentioned, the majority of the programmes being offered cater to the already-employed and are provided by company training resources.

Typology of environmental skills programmes

TARGET GROUP	LEVEL OF TARGET GROUP	ENTRANCE LEVEL FOR THE COURSE	ACCESSIBILITY	COURSE PROVIDER	MAIN GOAL OF THE COURSE	DURATION	FINANCING	ACCREDITATION
Employed				Schools, colleagues, universities and other higher education institutions		One day		
Self-employed		Basis education	Open enrollment	Public training institutions (financed by the gov. e.g. adult education centres)	Upgrading old skills	One week	Individual, family, relative	Yes, by government (recognised public institution)
Government scheme	Low skilled (ISCED 0-2)	secondary education (lower or upper secondary, general or vocational pathway)	Restricted enrollment for specified target group(s)	Private training providers	Providing new skills	One month	Company	Yes, by sector
Unpaid family worker	Medium skilled (ISCED 3-4)					Less than 3 months	Government, local authority	
Unemployed	High skilled (ISCED 5-6)	Tertiary education	Tailor-made company training	Employer's associations, chambers of commerce, sector bodies		Less than 6 months	Mixed funding	No
Student, apprentice, trainee				Trade unions		One year	EU	
						More than one year		

5. The most common method of financing environmental skills programmes is usually a mix of public-private as there is **considerable public funding of skills programmes conducted in partnership with companies**. Many Member States make public funding available for environmental programmes, with the provider usually then being a private company or collection of companies seeking to upgrade skills for their workforce. Public funding also targets secondary and tertiary education on a large scale, for example the establishment of special skills academies are usually funded by national governments rather than the private sector. **Financing from the EU also plays a role:** in countries such as the U.K., a significant proportion of European Social Fund (ESF) funding is geared towards developing the skills necessary for the green economy. However, some countries make little or no use of ESF for promoting green skills.

6. **Many environmental programmes do not have universal recognition of the qualifications** participants receive. Accreditation and other similar initiatives may help increase the mobility of green-skilled workers. Especially at the sectoral level, accreditation is something that could be approached more consistently, which would take away a barrier to allowing skilled labour to move to where demand for certain skills exist. In the eco-construction sector, for example, it is acknowledged that improving the portability of qualifications is a key goal to help achieve quicker build of affordable sustainable housing.

Overall, the research shows that there is **potential to promote exchange of best practice**, not only between Member States but also between businesses and others involved in the development of green workforce skills. Close cooperation between education institutions, governments, and the business community will be essential to ensure that education learning outcomes equip individuals with the skills necessary to be competitive in a greening job market. Indeed, involvement of all stakeholders from the start and design of a programme is important in safeguarding a demand-driven training approach, i.e. in making sure the programme fills a specific skills-gap.

Various economic sectors can also create **green partnerships** to advance the workplace and industry skills, knowledge and innovations required for the transition to a resource efficient economy. The close links between conventional and new industries should also be kept intact in any such partnership or alliance. Creation of new green jobs should go hand in hand with opportunities for “greening” throughout the economy. Green jobs are mainly created by the market and market needs and should be embedded in a wider concept of sustainability, recognising the need to develop more sustainable products and processes that will ensure job creation becomes more environmentally focused.

Life-long learning has potential to improve the upgrading of skills required to keep up with scientific and technological progress. The training can be delivered via a wide variety of means, these include distance learning or e-learning, training-on-the-job, product-schooling (teaching skills related to a specific product, often by the manufacturer of the product) or correspondence courses and also includes postgraduate programmes. An analysis of the potential for promoting life-long learning amongst the European labour force is thus required.

1 Introduction

1.1 Background

Moving to a low-carbon and sustainable European economy provides transition opportunities and challenges. Patterns of economic activity are evolving and nearly all sectors of the economy will need to adapt to green pressures and drivers. In order to adapt faster and with minimal pain, an environmentally-skilled workforce is essential. More and better skills are indispensable for the European labour force as they make it easier to innovate, adopt new technologies, attract investment, compete in new markets, and diversify the economy. This, in turn, increases productivity and so jobs and growth. Moreover, by implementing environmental strategies, governments can reduce emissions of pollutants and greenhouse gases and so improve public health and quality of life.

According to a study by UNEP on green jobs, which are “jobs in the environmental sector and/or jobs requiring specific environment-related skills”, green employment will be affected in at least four ways:

1. Additional jobs will be created in some areas, like in the manufacturing of pollution-control devices which are added to existing production equipment;
2. Substitution of some employment, for example due to shifting from fossil fuels to renewable energy sources, or from truck manufacturing to rail car manufacturing, or from land filling and waste incineration to recycling;
3. Particular jobs may be eliminated without direct substitution, like in the situation that the use of certain packaging materials are discouraged or are forbidden and an end is put on their production.
4. Many existing jobs (i.e. plumbers, electricians, metal workers, and construction workers) may be altered due to the greening of day-to-day skill sets, work methods and profiles¹.

A report by the ETUC addresses a very different trend concerning future employment in environment-related sectors- **the quality of new jobs**. It states that several involved parties believe jobs in new enterprises favoured by climate policies (in particular in renewable energies and energy services) to be less well-paid and enjoy less secure conditions of employment than in established branches. However, the report notes that this is a trend which is not specific to environment-related sectors but which also

¹ UNEP et al. (2008). Green Jobs: Towards decent work in a sustainable low-carbon world
http://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/documents/publication/wcms_098503.pdf

concerns new sectors like ICT². Since little relevant further information was found on this trend, more research might be useful in order to get more insights into this phenomenon.

It is clear however that a **green skills gap exists and policies to address these skills shortages are required**. Research shows a variety of skills-shortages across different Member States and across different sectors of the European economy³. In approaching the issue of how to influence skills development, investing in environmental training for employees and the unemployed is a logical action to pursue. Workforce training can produce better environmental performance and further career prospects for workers.

As a lot of environmental work takes place in manufacturing, construction, maintenance etc., then skills shortages often relate to traditional workers needing extra environmental skills if they are to green their work and occupations. Thus, to meet the demand for environmental skills that is emerging in the new economy, it has become necessary to expand education and training options for people already in work as well as for the currently unemployed.

There are a number of programmes in place that provide knowledge and skills in connection with the environment, sustainability, and the low-carbon future. However, there are no clear definitions of what constitutes such a programme, and indeed it is partly for this reason that it is necessary to carry out a study of what types of schemes and programmes are being offered across Europe that are broadly based on improving or providing environmental skills. It is the aim of this study to achieve a snap-shot of a group of Member States' environmental programmes being given across various sectors of the economy, and to draw conclusions about the type of programmes being supplied and their effectiveness in terms of the contribution to sustainability, employment growth and economic development.

Parallel work

This study builds on research and analysis of environmental skills in general and also complements research studies being conducted by European Centre for the Development of Vocational Training (Cedefop) and the International Labour Organisation (ILO). These other planks of research also identify what is being done in nations (outside Europe) to prepare their respective labour forces for a low-carbon future. The similarity between the work being done by ECORYS and the research of the ILO and Cedefop is in that case studies are being used to elaborate some of the best practices of some of the programmes for transfer of knowledge and sustainable impacts. Methodologically, the studies are not comparable, but together the studies provide a richer coverage of countries' programmes.

² ETUC (2007). Climate Change and employment. Impact on employment in the European Union-25 of climate change and CO2 emission reduction measures by 2030
<http://www.tradeunionpress.eu/Web/EN/Activities/Environment/Studyclimatechange/rapport>.

³ ECORYS, "Environment and labour force skills" (2009).

1.2 Outline of the Study

- chapter two presents a **review of the latest literature**, helping to shed light on the research being done by European and global organizations to facilitate the development of a green labour market;
- chapter three presents an **overview of programmes** and how they are organised for the selected Member States; chapter three also analyses the similarities and differences in these selected countries in terms of how the programmes are organised and what the impacts of these programmes are;
- chapter four describes a **number of case studies** from the selected Member States, and looks at how they have worked and their effectiveness. The case studies also make it possible to ascertain some of the best practices contained within these programmes that may be useful for knowledge sharing for future programmes;
- Lastly, chapter five will **suggest further analysis** that can be done to improve understanding of environmental skills programmes.

2 Literature review

2.1 Introduction

The transformation of the traditional European and global economy to one that is greener, low-carbon and sustainable is afoot. Ecological industries, renewable energies, and sustainable technologies are being promoted as environmental change drives political efforts to support cleaner and more environmentally economic practices. At the same time, environmental labour market demand and supply is changing.

Greening the European economy is a process that requires monitoring; in particular of which skills are needed in which sector, which parties are providing the solutions to meet these skills, and what Europe needs to do to respond effectively and facilitate the transformation of the labour market to meet the demand for green jobs and skills.

Moreover, the recent global recession has meant that policy makers need to do more to support job creation and growth. This has led to a call for upgrading skills and matching labour market needs in general but also in particular to facilitate the greening of Europe's economies. Evidence of this is for example found in the 21st edition of the annual "Employment in Europe" report⁴, of which one of the two crucial themes concerns the implications of climate change for labour market outcomes. The document recommends labour market policies that promote the creation of a sustainable economy by furthering research aimed at strengthening the EU capacity for assessing the employment effects of a transition to a low-carbon, knowledge-based economy, and that social dialogue should be reinforced in order to ensure that structural change in relation to climate change is achieved in a way that is efficient and acceptable from both economic and social perspectives.

To some degree, the demand for jobs and the skills necessary to do those jobs well have been documented and research is continuing; however, mapping the supply-side of these skills is not as far advanced. Hence, the present study aims to paint a clearer picture of the supply side of environmental skills, presenting the types of programmes that are available for workers, the unemployed, and graduates to help them (re-)enter the labour market and obtain work that is rewarding and is beneficial for long-term sustainability of the economy.

One must note at the outset that **information regarding the provision of training and programmes aimed at creating new environmental skills or upgrading existing "traditional" skills is difficult to come across**, especially as environmental skills

⁴ European Commission, DG Employment, Social Affairs and Equal Opportunities 2009.

courses are often run internally by companies, trade unions, industrial associations and/or other stakeholders, which makes it difficult to find publicly available literature. Nevertheless, throughout the course of this report, examples of publicly available programmes will be given.

In this chapter, the context that environmental skills development and provision is set in is given prominence. In particular, the current political focus is described in connection with green jobs and environmental skills. The aim is to provide an overview of the landscape of the provision of environmental skills programmes, thus linking the empirical research phase of this project describing the types of programmes to the present economic, environmental and social context.

2.2 What is driving the demand and supply of green jobs and environmental skills?

EU2020 and New Skills for New Jobs

The Europe 2020 strategy put forward by the European Commission sets out a vision of Europe's social market economy for the 21st century, and forms the roadmap for the European Union and its Member States over the next 10 years. It is based around three mutually reinforcing priorities:

- Smart growth: developing an economy based on knowledge and innovation;
- Sustainable growth: promoting a more resource efficient, greener and more competitive economy;
- Inclusive growth: fostering a high-employment economy delivering social and territorial cohesion.

One of the seven flagship initiatives is to develop "An agenda for new skills and jobs" to modernise labour markets and empower people by developing their skills throughout the lifecycle with a view to increase labour participation and better match labour supply and demand, including through labour mobility. So, skills – both in general and green skills – are at the heart of the EU's strategy for moving forward. The development of skills and environmental skills is a core point of the European policies and therefore also in the different Member States. Regarding the issue of employment, the training and skills of the workforce are considered to be key issues. This follows on from the importance of this issue in the original Lisbon strategy statement⁵, and the training and skills strategies developed under the Education and Training 2010 work programme⁶.

⁵ Another important policy driver underlying the up-skilling process that has been taking place for the last 10 years has been the Lisbon agenda, which aims at making the EU "the most competitive and dynamic knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion". Lisbon European Council 23 and 24 march 2000 – Presidency Conclusions

⁶ This has been done through the Education and Training 2010 work programme launched in 2001 and its follow-up, the strategic framework for European cooperation in education and training ("ET 2020") adopted by the Council in May 2009.

Climate change

Climate change and the consequent shift to a low carbon economy are recognised drivers of specific environmental skills.^{7, 8} The climate change driver manifests itself as an “active” approach (policy responses) or a “reactive” approach (commercial). The former approach calls for the development of new green skills in order to *avert (...) dangerous and potentially unmanageable climate change and protecting the natural environment which supports life on earth.*⁹ Policy makers and public institutions are the actors that hold this point of view. The latter approach to climate change meanwhile holds that market opportunities are the underlying reason to provide training in green skills. The bottom line is that climate change will

“alter patterns of energy use, impacting on how industry conducts its operations and raising demand for new skills across a broad range of agricultural, transportation, manufacturing and construction industries.”¹⁰

EU energy policy

The EU's overall energy and climate change policy, through its 20-20-20 targets, is clearly focused on renewable energies (RES) and energy efficiency (EE). As buildings account for nearly 40% of all energy used in the EU, major potential for energy savings exists in the building sector. Energy efficiency provides opportunities for emissions reductions at negative or low cost¹¹ and renewable energy provides opportunities for emissions reductions and a cleaner environment. A further imperative is provided by economic drivers, with opportunities available to both bolster economic recovery and to promote sustainable long term growth and employment in low carbon goods and services (see below for information on the “green new deal”).

Furthermore, it can be assumed that there will be a significant greening demand as policy measures to promote EE and RES take effect and therefore a strong increase in the importance and scale of sustainable production methods within the wider economy will occur.

As the European Commission has emphasized, EU climate plans and economic growth require Europe-wide mobilisation in education and training¹². Furthermore, the viewpoint of Commissioner Andris Piebalgs is that “climate change is a challenge requiring major societal change and that through education and training we can unlock the talents of our citizens and grasp a huge environmental and economic opportunity for Europe (2009)”. In addition, in 2009, the EESC's Public Hearing on Education and Training Needs for a Carbon-Free Energy Society underlined that a way out of the economic crisis is development of high-tech sectors in the field of environmental protection, but warned, “we must not let a lack of appropriate skills make us miss this opportunity to construct a Green New Deal”. Similarly, it was emphasized the need to make energy and climate

⁷ European Trade Union Confederation. The climate change, the industrial policies and the ways out of the crisis. ETUC, 2009.

⁸ International Labour Conference. Green Jobs: towards decent work in a sustainable, low-carbon world. ILO, 2009.

⁹ UNEP. Green Jobs: Towards decent work in a sustainable, low-carbon world. UNEP, 2008.

¹⁰ International Labour Conference. Green Jobs: towards decent work in a sustainable, low-carbon world. ILO, 2009.

¹¹ PCC (2007) Fourth Assessment Report: WG III Mitigation: Chapter 6 Residential and Commercial.

¹² EESC's Public Hearing on Education and Training Needs for a Carbon-Free Energy Society.

education part of early education and educate citizens and young people in interactive forms.

Resource efficiency

Efficiency of resource use is applicable in all economic sectors. Resource efficiency has been recognised as an important area for achieving sustainability due to the impacts on resource depletion, environmental issues and materials security. The issue of resource efficiency is gaining increasing importance across Member States and European and national policy is placing an increasing emphasis on greater efficiency in the use of materials and natural resources. It is furthermore the case that information gaps exist in labour market intelligence relating to resource efficiency. As a result further research is required to understand whether issues related to resource efficiency apply equally across different countries and regions of the EU. To support this growing area new skills as well as upgrading old ones are required to meet (future) employment and production needs.

The Green New Deal

The European Economic Recovery Plan, announced at the end of 2008, highlighted the need for coordinated action at national and the EU levels to respond to the current economic crisis¹³. The Plan identified an important number of green initiatives with a focus on energy-saving and climate-change related measures. It is one example of a Green New Deal (GND) responding to a general call from commentators to create 'green jobs' as part of the response to the "triple crunch" of volatile energy prices, climate change and global economic recession.

Environmental skills are seen as a key factor to realising any GND. For example, the United Nations Environment Programme's (UNEP) Green New Deal¹⁴ offers global policy suggestions for exiting the crisis, explicitly recognising the importance of skills development with respect to environmental goods and services and with respect to sustainable construction. Namely, "*trade liberalization of environmental goods and services will provide further impetus to green investments. (...) [A] phased-in approach to liberalization, accompanied by technology transfer and skill-building, should be promoted to allow for the growth of environmental goods and service industries*". As for sustainable construction, UNEP also underlines the fact that "*to achieve a wide adoption of (...) technologies and materials [to improve the efficiency of buildings] in new construction and renovation (...), there is a need for large-scale investments in skill development and capacity building*".

Sectoral drivers

In terms of specific sectors, vocational training for construction SMEs is considered by the European Builders Confederation for example, to be essential for providing skills for the job-creating renewable energy industries. At the same time, the confederation stated "that it can be difficult for SMEs to train their staff. Training needs to be tailored to SMEs' needs, for example, bringing training to them in a 'mobile classroom'". The

¹³ http://ec.europa.eu/environment/integration/pdf/recovery_plans.pdf

¹⁴ UNEP. Global Green New Deal. March 2009.

European Renewable Energy Research Centres (EUREC) Agency set out the various technical and 'soft skills' which are required in the climate and energy sectors.

2.3 Current trends in skills profiles

2.3.1 The need for high-level skills: development of new skills and skills-upgrading:

In the current EU economic situation the need for the development of new skills and for the upgrading of old skills are two tightly linked phenomena due to several factors that accelerate the pace of change in labour market and skills requirements:¹⁵

1. the application of technologies, especially ICT;
2. changes in work organisation;
3. globalisation and increased international trade;
4. the transition towards a low-carbon economy.

Application of technologies

With new technologies improving the effectiveness of the production process and changing the way we work, for example, towards more multitasking or team work, demand for higher-skilled workers is increasing.¹⁶ Higher-educated workers are in fact more able to correspond to these new technologies than less educated workers. This non-neutral technological change makes higher educated workers much more attractive for employers and therefore increases the demand for this type of workforce. At the same time, less educated workers become relatively in demand which reduces their wages or increases unemployment within this group.¹⁷

Changes in work organisation

Organisational changes are in part a consequence of technological changes and skills upgrading¹⁸; but also can arise independently¹⁹. Technological changes have allowed for more flexible forms of work, characterized by a wide range of changes like a decision making process that is much more decentralized, Just-in-Time Job Rotation, Teamwork or multitasking. Evidence is that organizational changes support an increase in relative labour demand in favour of the skilled²⁰.

Globalisation and increased national trade

Over the last decades, companies have been operating across a wider geographical scope and trade has become more internationalised. These factors are said to have a significant impact on EU labour market requirements,²¹ particularly for high-skilled professionals.

¹⁵ European Commission. New Skills for New Jobs – Anticipating and matching labour market and skill needs. Luxembourg: Office for Official Publications of the European Communities 2009.

¹⁶ Ibid.

¹⁷ Schlotter, M. et al. Origin and consequences of changes in labour market skill needs.

¹⁸ European Commission. New Skills for New Jobs – Anticipating and matching labour market and skill needs. Luxembourg: Office for Official Publications of the European Communities 2009.

¹⁹ Schlotter, M. et al. Origin and consequences of changes in labour market skill needs.

²⁰ Ibid.

²¹ European Commission. New Skills for New Jobs – Anticipating and matching labour market and skill needs. Luxembourg: Office for Official Publications of the European Communities 2009.

The impact of this factor is however not quite clear-cut. There is no doubt that international trade and ongoing globalisation have influenced the structure of labour demand and certainly have contributed to the acceleration of the rate of growth of the relative demand for skilled workers. Nevertheless, quantitative and conceptual arguments indicate that the extent to which globalisation and trade indicate a relative demand shift towards skilled labour may be smaller than first presumed.²²

Transition towards a low-carbon economy

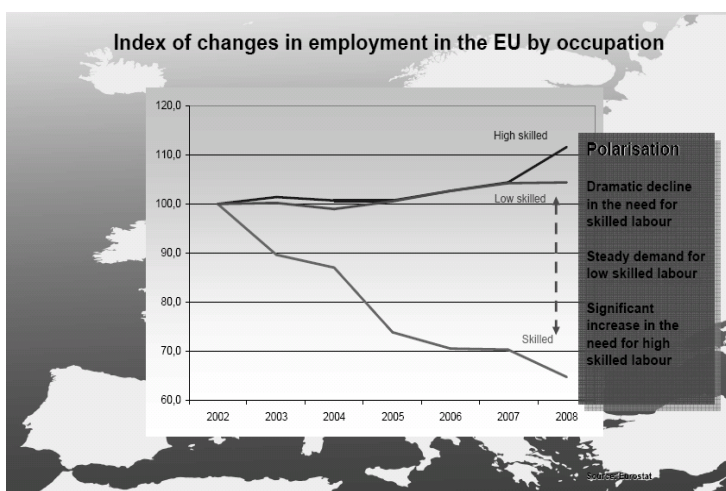
The effects of the ongoing shift to a low-carbon economy also link to technological change, and have thus an effect on skills demand. Europe already holds a leading position in some of the technology required for renewable energy as well as in environmental technologies and may yet benefit further from this shift. To preserve its present comparative advantage education and training programmes for emerging new professions are necessary.

2.3.2 Effects of demand-driving factors on skills

It is generally acknowledged there is a strong need for highly-skilled professionals in the labour force that can add value through being innovative, creative, by taking initiative, etc. In fact, three basic trends regarding the skills profiles of jobs have materialised in the last few years including:

- A relative decline in the demand for medium-skilled jobs;
- A relative increase in the demand for low / un-skilled jobs;
- A relatively sharp increase in the demand for high-skilled jobs.
-

Figure 2.1 Index of changes in employment in the EU by occupation.



Source: Oxford Research

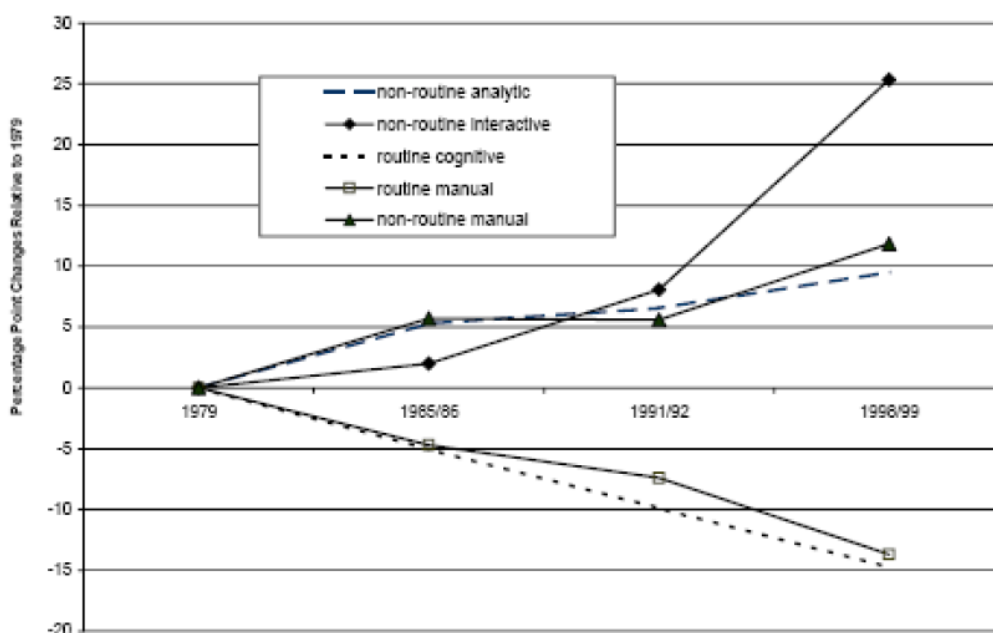
²² Schlotter, M. et al. Origin and consequences of changes in labour market skill needs.

Because of these trends, the largest profile representation in the future will be for highly- and lowly-skilled professionals, leaving a relatively smaller share for the medium-skilled.²³ This trend is not expected to deviate in the medium nor in the long term.²⁴

Employment growth in jobs requiring high skilled profiles stems directly from the high demand for the high skilled in the labour market. The rise in employment for the low skilled and the fall in employment for the medium skilled have mainly to do with the *type* of job – routine or non-routine – and with technological change. Low-skilled jobs where it is difficult to replace human capital by machines or computers have experienced considerable growth during the last decades. Non-routine *manual* tasks done by hairdressers or kitchen porters are as demanded as non routine *cognitive and interactive* tasks delivered by care assistants or software engineers. Routine task jobs, normally found in the middle of the wage distribution, however, decreased tremendously.²⁵

Figure 2.2 provides a historical overview of these trends, complementing Figure 1 with a historical timeline. Manual and cognitive routine jobs, corresponding to a medium level of skills, show a dramatic fall, whereas all other non-routine jobs show a large increase.

Figure 2.2 Evolution of aggregated skill inputs during the last decades



Source: Spitz-Oener, Alexandra. Technical Change, Job Tasks and Rising Educational Demands. *Journal of Labor Economics* 24 (2): pp. 235-270. 2006.

Additionally, a French report on the occupations in 2015 by the Centre d'analyse stratégique emphasizes that job polarisation is strongly associated with a tertiarisation of work. This means that the favoured jobs, both for the low and the high skilled, mainly

²³ Oxford Research, *ibid.*

²⁴ Cedefop. *Future skill needs in Europe – focus on 2020*. Luxembourg: Office for Official Publications of the European Communities, 2008.

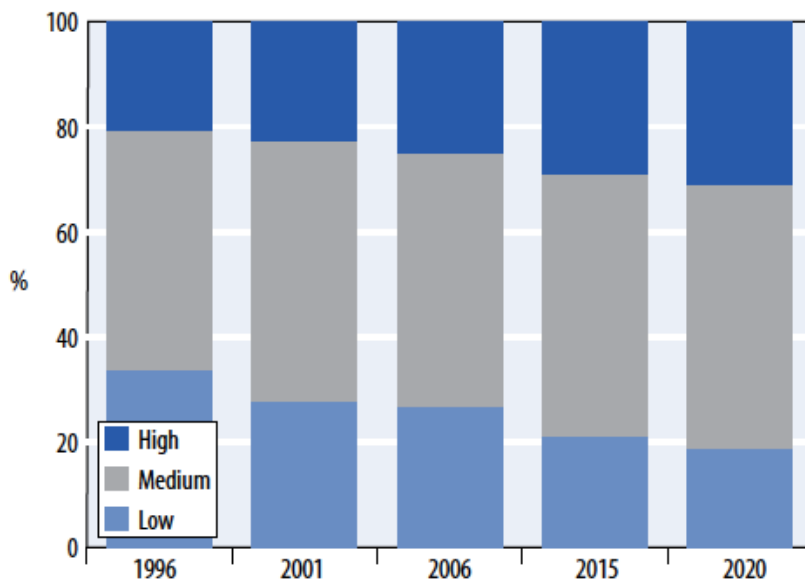
²⁵ Schlotter, M. et al. *Origin and consequences of changes in labour market skill needs*.

stem from the service sector. The routine task jobs of the middle-skilled that have been substituted by the adoption of new technologies are predominantly part of the manufacturing sector.

Although this trend is recognised in several sources, it should be underlined that different views exist regarding job polarisation. Although polarisation is perceptible in some Member States, it is not a clear-cut phenomenon, and it can also be expected that the polarising trend in net job creation should be largely offset by a high replacement demand for middle-skilled workers, though replacement demand will also accentuate the upward trend in skill demand.²⁶

Following these arguments on different views on job polarisation, figure 2.3 shows the evolution in terms of employment expected assuming that polarisation effect does not materialise.

Figure 2.3 Patterns of employment and polarisation effect in Europe



Source: Cedefop 2008

In this scenario employment for the high-skilled rises steadily directly driven by the labour market demand. Employment for the medium skilled seems to remain constant and not to suffer from the substitution effect of new technologies. Employment of the low skilled shows a drastic fall. Whilst this relates to employment overall, similar trends can plausibly be expected in relation to green jobs.

²⁶ European Commission. *New Skills for New Jobs – Anticipating and matching labour market and skill needs*. Luxembourg: Office for Official Publications of the European Communities 2009.

2.4 Development of new skills, skills upgrading and matching skills with jobs

The matching of skills to jobs is a strategic priority for the EU both in the shorter and the longer term.²⁷ Skills mismatches in the labour market, in fact, have been a growing concern in most Member States. **Businesses are not able to find workers with the right level of skills in the right areas**, which damages competitiveness in particular of smaller enterprises.

Skills matching and upgrading is essential in the short term, in particular for young people who, given their lack of work experience and being at the early stages of skills development, are critically affected by the current crisis.²⁸ In the current situation, with rising unemployment, it is especially important to ensure that as many available jobs can be filled by people with the right skills, and that retraining measures provide job seekers with the skills that maximize their immediate employability.²⁹

In the medium and long term, addressing skills mismatches through training and retraining is essential to occupational and professional mobility. In the long run, Member States will need to have a highly skilled and educated workforce to ensure that the EU continues to compete on the quality of its products and services.³⁰

In the long term, education and training systems should be able to both generate new skills, to respond to the nature of the new jobs which are expected to be created and maintain and upgrade the skills of those in and those out of employment, so that they can seize new employment opportunities which will develop in the coming years.³¹ Skills matching and upgrading is the best way to address structural changes and exploit new opportunities for sustainable jobs, such as the shift to a low-carbon economy, green jobs and the development of new technologies,³² currently, however, EU universities and training systems do not provide the right composition of skills that would be necessary to support a truly innovation-driven economy. This, along with other factors may later lead to a skill-job mismatch.³³

2.4.1 Green skills needs of the future

An “**emergent skill need**” is defined as the change in skills that is needed to adequately fulfil a certain job function in the future³⁴. This is the case for green skills, as new jobs in the low-carbon economy will require heterogeneous skills portfolios: environmental awareness will need to become a component of the core skills of new professionals, and

²⁷ European Commission. New Skills for New Jobs – Anticipating and matching labour market and skill needs. Luxembourg: Office for Official Publications of the European Communities 2009.

²⁸ European Commission. COM (2009) 257: A Shared Commitment for Employment. Volume 2: Annexes. 2009.

²⁹ see footnote 27

³⁰ see footnote 28

³¹ see footnote 27

³² see footnote 28

³³ see footnote 27

³⁴ E. Dijkgraaf et al.: Investing in the Future of Jobs and Skills: Scenarios, implications and options in anticipation of future skills and knowledge needs – Sector Report: Electricity, Gas, Water and Waste. May 2009.

an adequate flow of qualified workers will need to be ensured to facilitate the transition to the low-carbon economy.³⁵ With respect to the workforce, these needs do not directly imply the creation of new workers, but rather the up-skilling of the skills-profile of existing workers, in order to gear it towards specific topics (e.g. increasing energy efficiency, renewable energy implementation, reduction of CO₂ emissions and protection of biodiversity).³⁶

In detail three main aspects can be identified as regards the evolution in green skills:

1. some skills will become obsolete due to structural changes in the labour market and employment shifts within and across sectors due to demands for a greener economy;
2. demand for some new skills will be created as new occupations emerge to support adaptation to and mitigation of climate change;
3. the skills required for existing jobs will have a stronger green element as existing professional profiles change.³⁷

Of these three aspects, the latter two are regarded with particular attention by current literature. A detailed analysis of how they would specifically impact the economy and in what areas cannot be made as of now, as these aspects are likely to co-exist in several sectors. Table 2.1 provides an overview of their role across some sectors.

Table 2.1 Future skills in certain environment-related sectors

Sector	Change in skill profile	Type of skills required
Recycling / waste treatment and recovery	New skills created	Rapid technological changes in this area are likely to create a growing need for new skills.
Construction	Stronger green element of existing jobs	Same generic skills of those already in the building sector but job will require “add-on” in terms of e.g. renewable energy knowledge, installation, and diagnostic techniques. Industry may experience increased demand in higher-skilled employees but some jobs created as a result of Energy Performance in Buildings Directive likely to be low skilled. Recent documentation has pointed out that IT-literate artisans will be required in the long-term.
Bio-based products	New skills created / Stronger green element of existing jobs	Modern biotechnology likely to require highly-skilled employees with intensive knowledge although still unclear as to whether the skills they need are “new” or add on to existing skills.
Energy efficiency	New skills created / Stronger green element of existing jobs	Legislation such as the European Building Performance Energy Directive will create a strong demand for energy assessors (creation of new skills). Increased energy legislation and building regulation at national and international level will mean that the building industry will be much more closely regulated. Processes will be managed to avoid the exorbitant

³⁵ European Commission: [New Skills for New Jobs: Action Now](#), February 2010.

³⁶ Cedefop. [Continuity, consolidation and change. Towards a European Era of vocational education and training](#). Luxembourg: Office for Official Publications of the European Communities, 2009.

³⁷ European Commission: [Employment in Europe](#), 2009.

		<p>finances that will be levied for energy and environment violations. This shift will be supported by the emergence of multidisciplinary practitioners who belong to a single, integrated professional body. These high-calibre professionals will occupy well-paid positions with roles that extend from building design to the provision of through-life services</p>
Green Transport	Stronger green element of existing jobs	<p>Legislation on fuel economy standards will create demand for natural gas vehicles (NGV), liquid petroleum gas (LPG), biofuels and diesel / electric hybrid vehicle, for which updated skills and knowledge will be necessary.</p>
Renewable energy	New skills required / created / and up-skilling	<p>More systems-based approach required where skills related to understanding and applying specifications within the supply chain. Higher level and multi-disciplinary skills will be necessary. Specifically, knowledge of renewable energy, energy efficiency, sustainable construction techniques, legislation, resource management.</p>

Source: Based on European Commission "Employment in Europe, 2009" report and ECORYS research.

In general, the change in existing professional profiles will require more green management skills. These new skills are required to meet the need for emerging competencies across most sectors of the European economy. Knowledge of environmental or green topics is considered valuable both in technical and in managerial terms. Furthermore, possessing several areas of knowledge and being able to constantly combine green skills with these is also considered an added value. As outlined in figure 2.4, which describes the most requested skills in today's labour market environment, the greening of high-level skills is an essential component of the skills portfolio of social, technical and managerial professionals.

Figure 2.4 Emerging competences in various job domains

Social/cultural	Technical	Managerial
Intercultural skills	ICT skills	Intercultural management
Team work	New materials knowledge and skills	International value chain management
Self management	Skills/knowledge related to new processes and applications	Green management and environmental solution management
Entrepreneurship and innovativeness		International financial management

Source: ECORYS research, Oxford Research

The specific green skills that will be present in the different sectors of the economy are difficult to predict. What can be more easily identified, by listing a limited the number of sectors, is what skills will be needed by the green economy in the future. Table 2.2 shows what changes different sectors are expected to undergo.

Table 2.2 Future skills in environment-related sectors

Carbon capture and storage	technically more complex operations will involve workers with a very different skill set
Buildings	<ul style="list-style-type: none"> • due to energy-efficient equipment higher-skilled, higher-paying employment; • jobs are likely to be performed by workers who already work in the building sector. However, they will be redefined in terms of new skills, training, and certification requirements; • potential for highly skilled researchers and engineers. Extensive training needs in three main areas: diagnostic techniques, knowledge of renewable energy, installation, organisational skills (i.e. town planning).
Cement	jobs are expected to require higher levels of skills.
Wind power industry (renewable)	<ul style="list-style-type: none"> • many positions will require highly-skilled people; • universities need to consider offering entirely new study fields and majors due to technology development.
Climate change	climate information and forecasting, research and development into crops adapted to new weather patterns could create specialised and high-skill employment.
Agriculture	<ul style="list-style-type: none"> • jobs for agricultural skilled workers, clerks and craft and related trades workers will decrease; • requirement for skilled agricultural and fishery workers about 2.2 million in 2015
Electricity	probable that, together with technical competences, management skills will be required.
Rail sector	a dangerous shortage of skilled workers is emerging. This shortage might take place by 2030.
Waste treatment and recovery/recycling	rapid technological changes are increasing the demand for new skills.

Sources:

Cedefop. [Future skill needs in Europe – focus on 2020](#). Luxembourg: Office for Official Publications of the European Communities, 2008.

Dupressoir, S. (2008). ETUC – European Trade Union Confederation. [Impact on climate change mitigation policies on employment in the EU. Paper presented at Cedefop workshop ‘Future skill needs for the green economy’, held in Thessaloniki, October 2008.](#)

Ecotec (2002a). [Analysis of the EU eco-industries. their employment and export potential](#). A final report to DG Environment. Brussels: European Commission, Directorate-General for Environment.

ETUC et al. (2007). [Climate change and employment. Impact on employment in the European Union-25 of climate change and CO2 emission reduction measures by 2030](#). Brussels: ETUC.

UNEP et al. (2008). [Green jobs: towards decent work in a sustainable, low-carbon world](#). Nairobi: UNEP – United Nations Environment Programme.

2.5 Funding green skills

2.5.1 The European Social Fund

The **European Social Fund (ESF)** is one of the EU's Structural Funds, set up to reduce differences in prosperity and living standards across EU Member States and regions, and therefore promoting economic and social cohesion. It is a key element of the EU's strategy for Growth and Jobs, **targeted at improving the lives of EU citizens by giving them better skills and better job prospects.**

The ESF was established in 1957 and its focus has shifted in the past decade to become closely linked with the goals of the Lisbon agenda. In the 2000 – 2006 period, it was geared towards supporting the European Employment Strategy as part of the Lisbon strategy. Priorities, in this period, were to enhance the skills and flexibility of the existing workforce and to contribute to making the education system more responsive to labour

market needs. Focus was further put on lifelong learning and continuous training, also within companies.

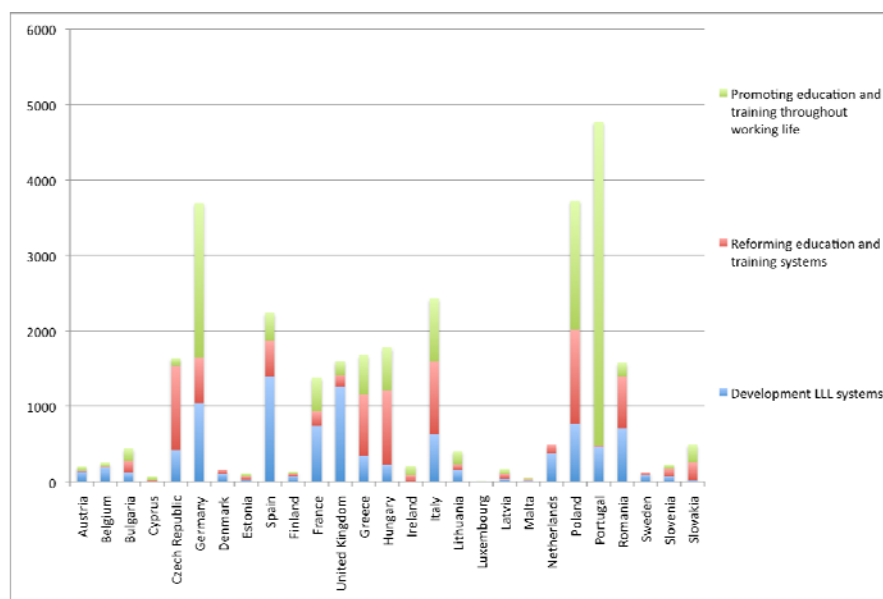
For the 2007 – 2013 period, more than EUR 10 billion per year will be invested through the ESF. The focus areas build on the previous period and along the same direction as for the Lisbon agenda, however, the role of the fund has become much larger, due to the EU’s increasing focus on growth and jobs. Particularly, the main ESF aim – contributing to the formation of a flexible labour market in the EU – will remain the focus. In addition, the priority will be to increase adaptability of workers, enterprises and entrepreneurs by improving the anticipation and positive management of economic change. Within this priority, ESF support will concentrate on the modernisation and strengthening of labour market institutions, on active labour measures and lifelong learning.

To promote workforce flexibility, the ESF is supporting projects in the Member States that:

- Train workers to prevent and anticipate unemployment;
- Support career and individual guidance that encourages individuals to actively manage their careers;
- Support outplacement and worker mobility schemes that encourage workers to move across regions, or indeed across the EU, to where their skills are in demand;
- Improve access to training, in particular for the low skilled and older workers;
- Help identify future occupational and skills requirements.

The ESF operates through Operational Programmes, decided by the different Member States. Within each programme, the ESF co-finances the implementation of projects that contribute to the programme itself achievement and, in a broader sense, to the achievement of the overall ESF goals. There are a lot of projects that are funded by the ESF that are either directly or indirectly concerned with environmental skills.

Figure 2.5 ESF Spending per priority area and Member State (in million EUR)



Source: ESF spending database

2.5.2 ESF funding in selected countries

ESF in Germany

Under the leadership of the Federal Ministry of Labour and Social Affairs, the following four federal departments are involved in the implementation of the ESF programmes in Germany: The Federal Ministry for Education and Research, the Federal Ministry of Economics and Technology, the Federal Ministry for Family Affairs, Senior Citizens, Women and Youth and the Federal Ministry of Transport, Building and Urban Affairs. This is a significant expansion of departmental participation compared to the previous funding period.

The European Social Fund supports Germany with more than 9 billion Euros over the period 2007 to 2013 based on four federal priorities. Some programmes were part of the previous funding period and will continue throughout the present funding period (2007-2013). In addition, new programmes will be introduced. The four federal priorities are the following fields:

- Employees, companies and start-ups
- Training and qualification
- Employment and social integration
- Transnational activities

The guiding principles and strategies are defined for the ESF programmes at the EU-level, and then have to be adopted in national framework strategies on national state level. The actual implementation then depends on the operational programmes designed and implemented according to the national framework strategy by the individual Federal States.

Referring to the four federal priorities, **environmental skills and education programmes as well as energy saving and energy efficiency programmes have gained importance**. However, each Federal State addresses the issue differently and includes environmental skills programmes funded by the ESF either as core elements under the four federal priorities or as additional elements under education programmes which also have an environmental component. Nevertheless, the ESF is used to promote green skills in Germany.

ZEWU-mobil is a programme initiated by the Chamber of Industry and Commerce in the Federal State of Hamburg aiming to effectively and practically approach Hamburg's craftsmen to engage in climate protection and resource saving measures. Throughout the programme, tailored advice is provided by energy saving managers on where firms can reduce operating resources such as raw materials, energy and waste.

The free energy efficiency advice for local craftsmen includes an inspection of the company, the inclusion of the actual state from an energetic point of view, proposals for energy conservation measures as well as information about various energy efficiency programmes and local contact points. In addition, further appropriate climate and resource protection measures can be developed on request of the companies.

Since May 2009, far more than 200 Hamburg based craftsmen have made use of the mobile energy saving service. The project ZEWUmobil is funded by the European Social Fund, the Hamburg Ministry of Urban Development and Environment and the Hamburg Ministry of Economics and Labour.

ESF in the Netherlands

The ESF funding in the Netherlands aids the Dutch strategy for the creation of more employment and enhancement of labour participation the labour market. The main purpose is to assist people that are currently inactive on the labour market to find a job. Special attention is given for education and training of the semi- and unskilled people. More specifically, the Netherlands formulated three priorities which will be financed by ESF:

- Priority 1: Increasing the number of available workers
- Priority 2: Enhancing the participation of the underprivileged
- Priority 3: Increasing flexibility and investment in human capital

Although none of these priorities express the (direct) need for environmental skills, it is mentioned that investment in green jobs and skills could support priority 1. However, of the 247 projects funded by the ESF, **not a single project targeted the promotion of environmental skills** or training of people directly or primarily.

ESF in Italy

Italy is the fourth largest receiver of ESF funds in the EU. According to its National Strategic Framework for regional development policy, the ESF finances three national operational programmes: "Competences for Development" and "Governance and System Actions" for convergence regions, "System Actions" in regional competitiveness and occupation regions.

At a regional level, the ESF contributes in all operational plans, together with other European funds.

In Italy, the ESF is enacted through 6 priority areas:

1. Adaptability;

2. Employability;
3. Social inclusion;
4. Human capital;
5. Transnational/regional projects;
6. Institutional Capacity (for convergence regions only).

With respect to vocational training, two of these priority areas – adaptability and human capital – present a link to the topic through their specific objectives. Specific objective “*Developing continuous training systems, while improving the quality and organisation of work*” in the area of Adaptability, and specific objective “*focusing on the quality, governance and integration of education, training and labour systems*” in the area of Human capital. Promotion of green skills is, however, not specifically mentioned at national level.

At a regional level, the different regional operational plans do not present a single approach to the usage of ESF funds. Each regional operational plan responds to the needs and peculiarities of the region, thus contents vary. **Environmental issues and green skills are unevenly present in these programmes.** In the plan of some regions (e.g. Calabria) these issues are not explicitly mentioned and it is unclear how interventions on the topic will take place in practice. In other regions (e.g. Tuscany), however, the promotion of environmental skills programmes is explicitly recognised, mentioned and made clear. This situation should be seen in light of the uneven distribution of the market for environmental technologies (e.g. renewable energy sources) in the country as well as in light of the different objectives under which different regions are grouped (convergence or regional competitiveness and occupation).

ESF in England

In England the ESF has been used to develop a ‘special focus on training for the new jobs that will be created as the economy recovers, especially ‘green jobs’ in a low carbon economy.’ Each region in England is now in the process of revising its Regional ESF Framework so that it contains a special focus on training for new 'green jobs' in a low-carbon economy. **ESF Frameworks in England are thus built to include a commitment to setting out the green sectors and skills that will be targeted with ESF Funding.** Examples of ESF mainstream and innovation projects in England that have been awarded ESF funding to develop green jobs and training programmes, include:

- Skills for Climate Change, Newham (London)
- EcoAdvantage (South East)
- Parklife (South West)
- South West Enabling Environmental Technologies (South West)
- GreenWays to Work (see text box below)

GreenWays to Work aims to enhance environmental skills in several ways. Using the experience of Impact Housing, training in energy efficiency will be rolled out to housing and social care staff, who will disseminate this information to tenants. This will not only increase awareness of green issues, but will also help those who are struggling with fuel bills to make energy and financial savings.

Recycling has been a part of Impact's work for a number of years, as donated furniture and white goods have been refurbished for sale. Their track record in training individuals in several key areas, including basic skills and recycling, will enable them to use ESF funding to create and provide a more structured and concentrated approach to the training requirements and job potential in recycling and energy efficiency. Working in conjunction with Cumbria Woodlands, they will also be able to construct and offer a training programme in the skills required to develop renewable energy.

Basic energy awareness training will be developed, streamlined and rolled out for those already working in the housing and advice sectors. Further qualifications in recycling and working with renewables will be developed, combining generic employability skills with more technical specific skills and knowledge as appropriate. These skills and qualifications, not currently universally available, will help to prepare people for work in the area of climate change, enhancing their employability.

Impact has well-established links with leading regional and national agencies in each of the three key areas the project is working in. In order to harness this expertise in the development of appropriate training, GreenWays to Work includes partners from each sector:

1. National Energy Action: the UK's leading fuel poverty campaigning organisation, with experience in developing energy efficiency projects, and developing and providing training in this area. NEA has already provided basic awareness training to Impact staff. NEA also has strong links with the appropriate sector skills council and the National Insulation Association.
2. Cumbria Woodlands: supported by the Forestry Commission, this organisation promotes the biomass (wood fuel) industry in Cumbria, and is also seen as having the greatest job-creation potential of the renewable technologies.
3. North West Community Waste Network: the regional representative of the national organisation for all community-based, not-for-profit recycling projects in the country, also charged with dissemination on behalf of the sector. The Cumbria Community Recycling Network meets regularly at Impact's Carlisle site.

Over a period of three years, the project aims to give energy advice to more than 2500 households, and to train 310 people (in total) in the skills required for renewables, energy efficiency and recycling in Cumbria. The particular expertise that will be gained from transnational working will be:

- the development of skills for recycling
- the development of supply chains for renewable energy, particularly bio-energy
- building public awareness and commitment for environmental technologies.

ESF in Poland

With more than 9, 7 billion Euros Poland is one of the biggest receiver of the ESF funds in Europe. The entire intervention of the European Social Fund in Poland for the years 2007-2013 will be covered by the Operational Programme Human Capital. The main objective of the Programme is to allow full deployment of human resources through an increase in employment and of adaptation potential of enterprises and their personnel, improving the education level of society, reducing areas of social exclusion and support for establishment of administrative structures of the state. More specifically, nine priorities were formulated for the OP Human Capital – five on a central level and four on a regional level – which is implemented in a parallel level.

Centrally implemented Priorities are:

- Priority I Employment and social integration;
- Priority II Development of human resources and adaptation potential of enterprises and improvement in the health condition of working persons;
- Priority III High quality of the education system;
- Priority IV Higher education and science;
- Priority V Good governance.

Priorities implemented on a regional level are:

- Priority VI The labour market open for all;
- Priority VII Promotion of social integration;
- Priority VIII Regional human resources of the economy;
- Priority IX Development of education and competencies in the regions.

None of the above mentioned priorities on a central or regional level addresses a need for environmental skills directly. However among the projects which have been awarded the ESF funding in Poland **there are projects which involve green skills trainings and target Polish employees or unemployed**. The majority of these projects are implemented under Priority II or Priority VIII. The most common environmental skills which are developed within the ESF-funded projects are: environmental management in enterprises, quality and environmental management systems audits, renewable energy, energy audits and advice as well as energy performance certificates audits. The projects which involve trainings in green skills are not government-driven and their implementation results from the initiative of their promoters.

2.5.3 Other European funding

Other than the ESF, a number of funding instruments are made available by the European Union for skills development:

- The European Regional Development Fund (ERDF) can contribute to developing skills and anticipation, by promoting technology forecasting, innovation, research and development and communication infrastructure and through cross-border cooperation between education and training organizations;
- The European Agricultural Fund for Rural Development (EAFRD), which invests in innovation, new technologies, research and development, and supports the skills upgrading of farmers, foresters and food processors as well as of the broader rural population through training, information and diffusion of knowledge actions;

- The Commission's proposal to amend the European Globalisation adjustment Fund (EGF) Regulation will allow for strengthening skills upgrading activities;
- The European Fund for the integration of third country nationals can also contribute – complementing the ESF - in upgrading and adapting immigrants' skills, in particular by supporting pre-travel measures (e.g. vocational and language training) in the country of origin, and language courses in the Member States.

2.6 Barriers to uptake of environmental skills programmes

It should also be noted that there exist many barriers to the uptake of environmental programmes and training, which include:

- Rapid technological change;
- A workforce that is risk averse;
- Low valuation of skilled work in some sectors;
- Low portability of qualifications;
- A variety of problems related to the quality of training and skills provision.

Variations in the types and severity of skills shortages exist between Member States. Where the single European labour market works efficiently, short term solutions to skills shortages can be found by drawing on skilled workers from other Member States. A reliance on this type of labour has been identified in the UK construction sector for example, though skills shortages are still reported. Some U.K. energy agencies and industry associations have cited evidence of the existence of skills shortages through the occasional poor performance of new buildings and EE and RES appliances in them, with high proportions of incorrectly installed technology. Other stakeholders in the construction sector, who are involved in technology-specific skills programmes have pointed to the *general* skills shortages in the sector as a cross-cutting issue affecting all due to the interlinked nature of the various crafts and trades in delivering a completed building, where skills deficiencies in one area can have a knock on effect on quality throughout the building.

Other barriers can include a lack of time for the workforce to undertake training and its high cost, especially for small enterprises. This barrier is especially prevalent amongst SMEs that cannot afford to spare time to have their personnel trained, or to meet the course costs. Additional barriers relate to the lack of certification and accreditation schemes and/or performance guarantees and the lack of an appropriate legal framework for the obligatory re-training / specialisation of certain occupations in recent advances in technology.

The lack of portability of qualifications between member states has also been identified as a major barrier to the functioning of the single European labour market. This is both due to a lack of clear and Europe-wide accepted accreditation and the different requirements of various sectors in Member States. These issues have the potential to exacerbate the skills shortages problem as skilled labour cannot be drawn from a European pool. This is true for European skills recognition in general, and is indeed one of the reasons why the EU supports learning mobility through various programmes and initiatives, such as

through the Lifelong Learning Programme 2007-2013, which cover a broad range of areas.

The Structural Funds also support learning mobility. Mobility and exchanges of higher education staff and students between European and extra-European universities is supported under the Erasmus Mundus and Tempus programmes. In addition, the European Commission has helped to develop a number of tools to facilitate mobility, such as the Europass, the Diploma Supplement, and the European Qualifications Framework for Lifelong Learning, the European Credit System for Vocational Education and Training (ECVET), and the "scientific visa" package³⁸. Nevertheless, it is essential that more is done to enhance recognition of qualifications pertaining to both green and non-green skills in Europe.

³⁸ Including the Council Directive 2005/71/EC of 12 October 2005 on a specific procedure for admitting third-country nationals for the purposes of scientific research ('Scientific visa').

3 Characteristics of environmental skills programmes

3.1 Introduction

This chapter summarises the findings of the team and provide some insights into how Member States are providing training for the workforce in the wide thematic area of green skills. These **findings are based on six Member States, viz. the UK, the Netherlands, Germany, Bulgaria, Poland and Italy**. These Member States were chosen by their representativeness across the Union, availability of data and the nationality of the team members. To make sure that limited resources were used most effectively, the team members followed a methodology based on web-based research, telephone-based follow-up interviews, and case studies. Given the private nature of most green skills programmes (i.e. companies and firms providing training for their own staff), the team were directed to make sure that a significant sample of programmes described in their research concentrated on setting out those characteristics, and the different formats such private programmes can take. This thus involved calling up firms and enquiring about their internal training facilities and the results and impacts on staff associated skills development.

What follows in this chapter therefore is a description of the typology of programmes for each country with an explanation of the background situation to green skills provisioning in each country, including the policy context, the funding arrangements that were found to hold, how the programmes were delivered etc. Given the fact that only a small fraction of private companies, public bodies and other organisations across different sectors of the economy could be sampled, it must be stressed that **the following summaries are indicative only and by no means represent an exhaustive mapping of green skills provisioning programmes**. Moreover, given the focus on ecological industries such as waste management and recycling, pollution management and control, green energy etc., where the bulk of green skills programmes are likely to have occurred, then it should be clear that the many other sectors of the economy may not be fully represented although they may well provide many green skills programmes themselves.

3.2 Typology

The country correspondents mapped as many green skills provision programmes as they could find within the time frame available³⁹. In figure 3.3 the typology can be seen for the

³⁹ The country-specific typologies can be found as Excel sheets in the annex to this report.

types of environmental skills programmes the team encountered during their research. Categorization is based on:

- the target group;
- the skills level the course is aimed at, i.e. low, medium or high-skilled workers;
- entrance level to the course, i.e. what are the prerequisite qualifications needed to take part in the course;
- accessibility, i.e. are there any restrictions to taking part in the course – is the course open to company employees only?;
- the course provider, i.e. which institution is organizing the course?;
- the main goal of the course, i.e. is the programme providing new skills or upgrading old skills?;
- duration of the course; the financing behind the course;
- and finally, programme accreditation, i.e. is the course recognized by sector or by public authority.

3.2.1 Typology trends

The country summaries that follow provide a thorough analysis of the environmental skills typology in the respective Member States (section 3.2 to 3.8 of this report), while some overall trends can also be ascertained. In figure 3.1, the skills level of the programmes are summarized per Member State, and shows there is an **even mix of courses that cater for either the high- or low-skilled**. In figure 3.2 meanwhile, the target group of environmental skills programmes in various Member States is depicted. This also shows the mixed nature of the course/programme target audience, ranging from **trainees to the self-employed**. Noticeably the **majority of the programmes being offered cater to the already-employed**.

The typology analysis also shows there is **a lot of variety among Member States in terms of provisioning of environmental skills programmes**, as was expected due to the vastly differing social, economical and environmental conditions of the Member States reviewed. In addition, filling in the typology has shown that there are many initiatives at Member State level already present, which in turn result in specific programmes that promote environmental skills development. In the Netherlands for example, two main national level “umbrella” programmes set up to meet the European sustainable energy requirements have resulted in skills programmes that either directly or indirectly flow out of this national-level initiative.

Figure 3.1 Skills levels of environmental courses being supplied

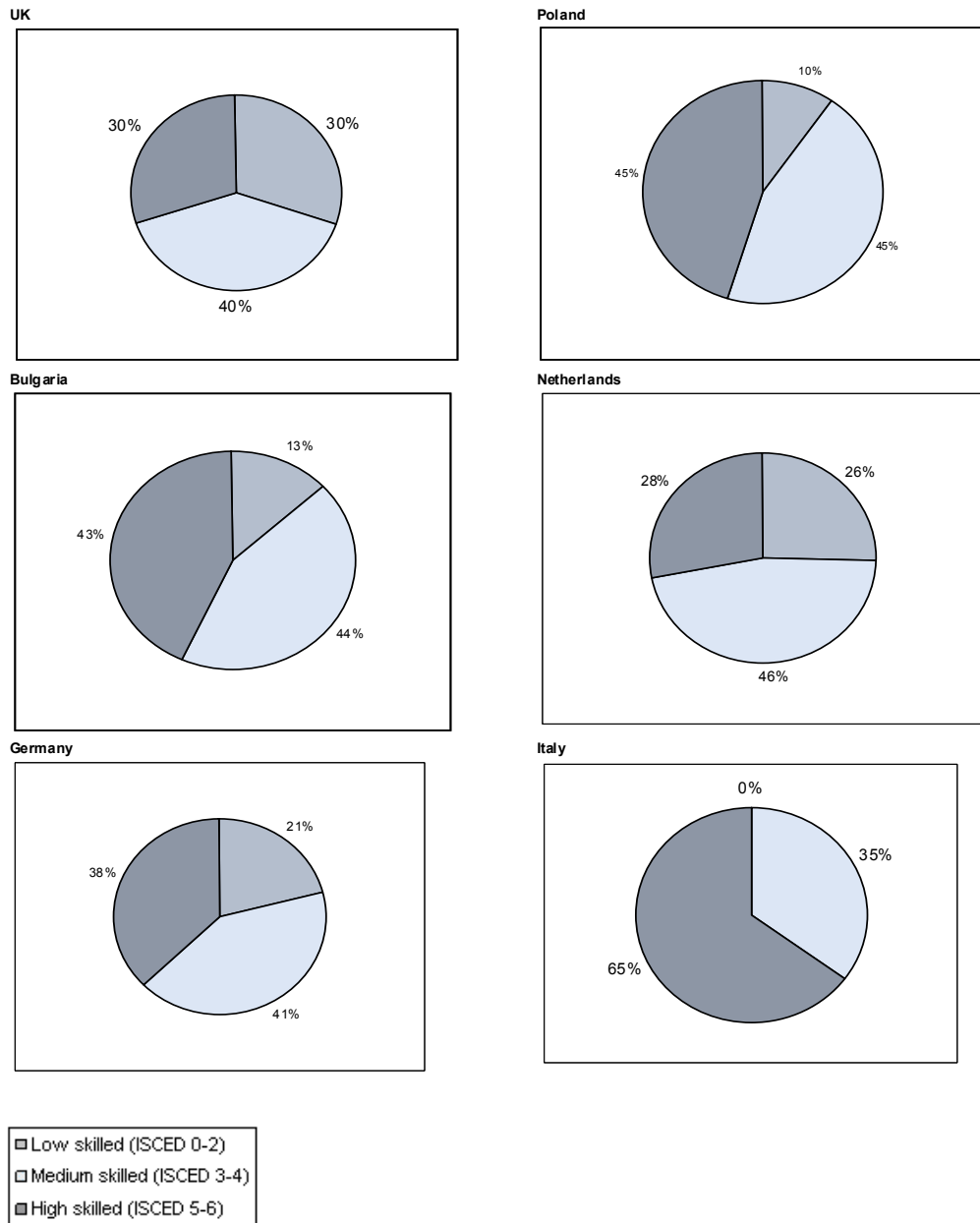
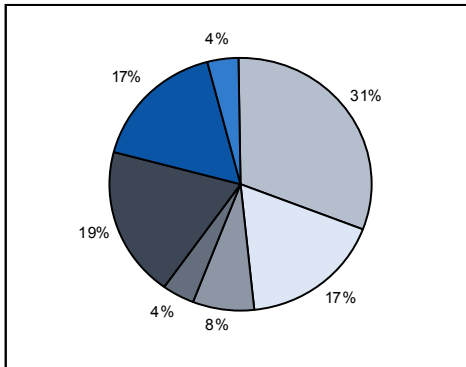
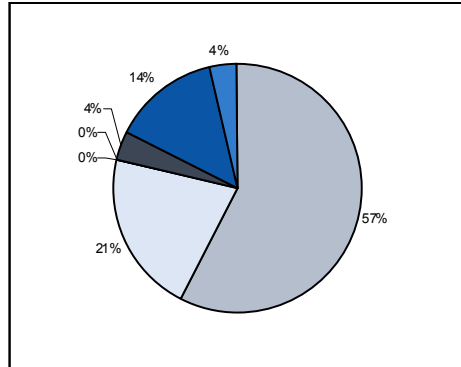


Figure 3.2 Target group of environmental skills programmes in various Member States

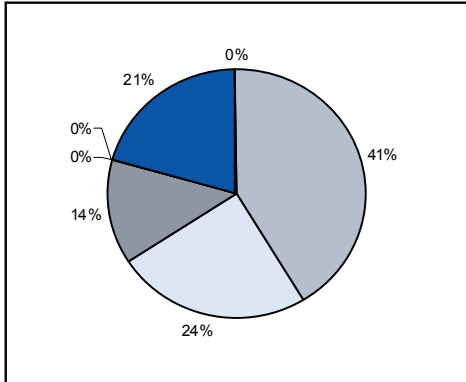
UK



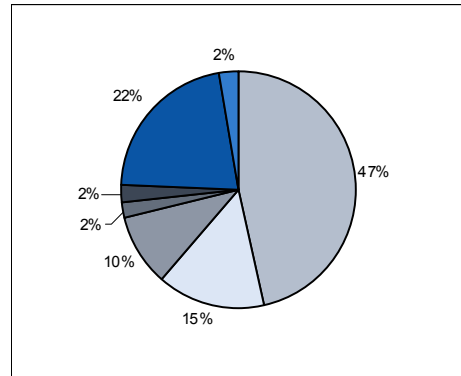
Poland



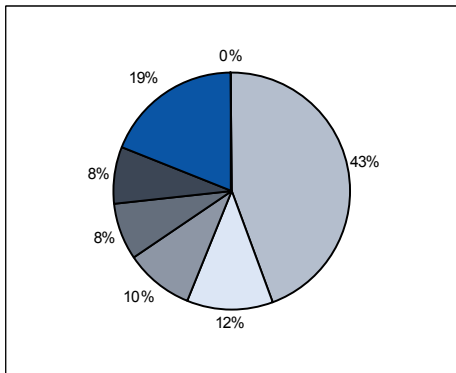
Bulgaria



Netherlands



Germany



Italy

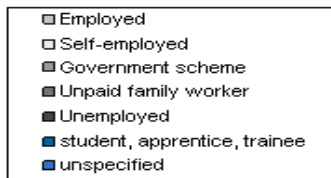
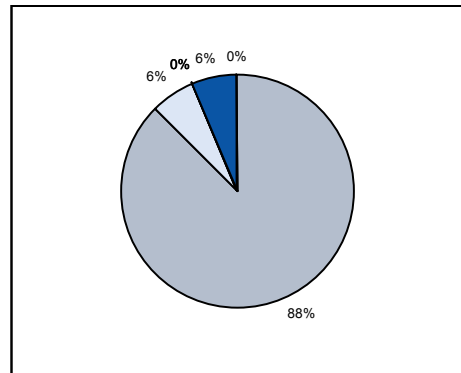


Figure 3.3 Broad Typology of Environmental Skills Programmes

TARGET GROUP	LEVEL OF TARGET GROUP	ENTRANCE LEVEL FOR THE COURSE	ACCESSIBILITY	COURSE PROVIDER	MAIN GOAL OF THE COURSE	DURATION	FINANCING	ACCREDITATION
Employed				Schools, colleagues, universities and other higher education institutions		One day		
Self-employed		Basis education	Open enrollment	Public training institutions (financed by the gov. e.g. adult education centres)	Upgrading old skills	One week	Individual, family, relative	Yes, by government (recognised public institution)
Government scheme	Low skilled (ISCED 0-2)	secondary education (lower or upper secondary, general or voactional pathway)	Restricted enrollment for specified target group(s)		Providing new skills	One month	Company	
Unpaid family worker	Medium skilled (ISCED 3-4)			Private training providers		Less than 3 months	Government, local authority	
Unemployed	High skilled (ISCED 5-6)	Tertiary education	Tailor-made company training	Employer's associations, chambers of commerce, sector bodies		Less than 6 months	Mixed funding	Yes, by sector
Student, apprentice, trainee				Trade unions		One year	EU	No
						More than one year		

3.3 United Kingdom

3.3.1 Policy and Governance

Skills and training policy and provision has been an area of high activity in the UK in recent years, culminating in the release of a new national skills strategy 'Skills for Growth' in November 2009 by the Department for Business, Innovation and Skills (BIS). The strategy built on the findings of the Leitch review⁴⁰, which characterised a system that successfully addresses the skills needs of the upper and lower ends of the skills spectrum but fails to sufficiently address needs at intermediate (vocational, advanced technician) levels. Skills strategy is based around demand led provision, with provision being targeted on skills that are demanded by employers and individuals with an aim to focus on 'the areas of the economy which can do most to drive growth and jobs'⁴¹.

BIS is the ultimate governance body for skills and training, it relies on the UK Commission for Employment and Skills (UKCES), an independent public body that draws on staff from the public, private and third sectors, for high level strategic advice on skills and training policy.

UKCES, on behalf of the government, licenses the Sector Skills Councils (SSCs) which are independent, national, employer led sector organisations. There are 25 SSC's covering key sectors and over 90% of the workforce. Their role is to articulate the needs of employers of all sizes to enable the demand-led skills system to function, they do this through building partnerships to influence providers, employers and funding organisations, defining national occupational standards and research to identify skills gaps, shortages and needs. They are also leading partners in the creation of National Skills Academies in 11 priority sectors, these are designed as centres of excellence in the delivery of skills training and provision. Among the most relevant SSC's to environmental skills are Lantra (land-based sector), EU Skills (Energy and Utilities), SummitSkills (Building services engineering), Construction Skills, Go Skills (Transport), SEMTA (Manufacturing) and Cogent (Chemical, process and nuclear).

3.3.2 Funding

The Learning and Skills Council (LSC) is the main public funding body for post-16 learning skills training and education. It has an annual budget of around £9 bn which is managed at a regional level. Around £6.9 billion of LSC funding is allocated to demand led funding, of which over £3 billion is spent on vocational learning through apprenticeships, work based learning and the Train to Gain programme. The Train to Gain programme has supported over 1.3 million participants to complete a training course since April 2006. Approximately 250,000 apprenticeships were started in 2007-2008. The LSC responsibility for post-19 skills training and education is set to be replaced by a new Skills Funding Agency (SFA) in 2010.

⁴⁰ HM Government (2006) Leitch Review of Skills: Prosperity for all in the global economy: world class skills.

⁴¹ BIS (2009) Skills for Growth.

The new skills strategy also outlines plans for the introduction of skills accounts for every learner which will allow learners to manage any public funding of their training and hope to avoid the problems and large-scale fraud that accompanied the introduction of individual learner accounts in 2000-2001.

Higher education is funded separately and is the responsibility of the devolved national governments. In England, funding is from the BIS budget and managed by the Higher Education Funding Council for England (HEFCE). Funding to the sector is in the range of £7-8 billion annually. Students are typically charged annual tuition fees by universities in the region of £1,000 - £5,000 each year.

The European Social Fund also supports adult skills funding in the UK allocating around £1.8 billion for the 2007-2013 period of which around 1/3 (aprx £100m annually) is targeted on developing a skilled and adaptable workforce. This is typically distributed to the LSC or Department for Work and Pensions (DWP) to co-fund programmes in line with ESF objectives. The provision of ESF funding is tied to meeting certain conditions relevant to environmental skills training such as contributing to the mainstreaming of sustainable development.

Employers also play a major role in the skills system, it has been estimated by the LSC that employers in England spend around £38bn annually on training (half as wages), with some sort of training for over 60 percent of the workforce⁴². This means that the UK has a relatively high proportion of employers offering some form of continuing vocational training. However, typically the training provided is relatively short and does not lead to any certification or qualification

3.3.3 Delivery

The Train to Gain programme is delivered through a brokerage service - employers call the Train to Gain service and advisors then assess their skills needs and provide links to training providers. Training providers must be contracted through the LSC to assure certain quality standards, and include a mix of further education colleges and private providers.

Apprenticeships are offered in over 190 fields and offer the opportunity to earn a wage and work alongside experienced staff to gain job-specific skills. Apprentices receive off the job training, usually on a day-release basis to further education or other vocational training institutions, to work towards nationally recognised qualifications. Anyone living in England, over 16 and not in full-time education can apply. Apprenticeships can take between one and four years to complete depending on the level of Apprenticeship, the apprentices' ability and the industry sector. The minimum salary is £95 a week; however, many apprentices earn significantly more.

⁴² LSC (2007) National Employers Skills Survey 2007: Main Report.

The LSC also funds UFI – Learndirect, an e-learning portal that provides a range of online and learner centre-based skills training courses. The course types are primarily core skills in English, maths or IT but do include vocational or sector specific qualifications. Over the last 10 years over 2.5 million courses have been taken through Learndirect.

Employers are also key deliverers of skills training with over half of the total training spend supporting on-the-job – on-site training and a smaller proportion supporting off-site training. A number of the largest firms, sometimes in partnership with the SSCs (national skills academies) and each other, have set-up their own internal training institutions and academies to provide standardised, tailored training or to meet perceived deficiencies in existing provision.

Private training providers are also important providers of skills training, most typically firms offering specialised short courses in 'soft' skills or businesses such as manufacturers offering training tied to their products.

Trade Unions and other third sector organisations provide training but on a smaller scale and provision is typically short courses that don't lead to recognised qualifications. Trade Unions are playing a growing role through their learning representatives who help workers into skills training.

Environmental Skills

Environmental and Low Carbon skills have been singled out as a priority area in a number of recent strategy documents including the national skills strategy. They recognise the strategic economic importance of the sectors for future growth and have indicated that priority funding for skills in these areas may be available from 2010. The strategy also outlined plans for the new SFA to become more selective in the skills training it funds, to focus on identified potential high growth sectors.

To date environmental skills training has not been a high priority within the UK, although relevant skills training is available within the scope of most publicly funded training. Over the last 5-10 years basic and core skills deficiencies (English, maths and IT) have been the primary focus of skills strategy. More recently, making the demand-led system a reality and addressing gaps at intermediate skills levels, through the expansion of Apprenticeships and reforming the qualifications system has been a key focus. It has only been in last 2 or 3 years that environmental skills have begun to move up the agenda and are now gaining ground as an important skills policy priority.

As a result of these factors the research into environmental skills programmes in the UK has found a number of initiatives on environmental skills but these have generally been on a local or regional scale and an ad-hoc basis. At the same time though a significant number of the programmes identified in the typology have been initiated within the last 18 months, pointing to an increasing recognition of the value and importance of environmental and low carbon skills.

The environmental skills sector provides an interesting challenge to the UK demand-led system in the form of skills needs being projected in a number of sectors and for these

needs to rapidly increase, yet at the same time the current demand for these skills is low. The danger is that current weak demand from employers for training in these skills leads to skills training capacity not being available when these sectors do experience large scale growth. For this reason many sector bodies are promoting a 'skills activist' approach to 'pump prime' the training provision to make it ready now to meet the projected demand for environmental skills. In respect of quantifying the scale of skills need this falls under the remit of the SSC's, with varying levels of detail of mapping carried out by each, Construction Skills⁴³ and SummitSkills⁴⁴ both conduct relatively frequent and detailed needs analysis.

Despite the lack of focus from employers, and until recently the public sector, on the emerging environmental skills needs, a growing range of accredited courses have been developed. There is a large range of courses at undergraduate and master's level in environmental skills subjects and there are also a growing number of environmental skills related courses and units at vocational levels. A search of national databases shows that there are hundreds of relevant accredited courses and units at all levels and many more non-accredited courses, pointing to a significant response to the challenge already being made by qualifications and certification bodies, if not yet providers.

Regulation is also becoming a driver of change, this is particularly the case in the buildings sector for energy efficiency and renewable energy, with for example the recast of the EC Energy Performance in Buildings Directive COM(2008)780 which stipulates in article 17 that Member States ensure training structures and qualifications are in place to enable skilled operatives to be trained. SummitSkills, the sector SSC, has been leading on the implementation of this in the UK. This has also been influenced by training requirements as part of the Micro-generation Certification Scheme (MCS) that is needed by installers to enable their customers to apply for government grants for renewable energy installations.

3.3.4 Typology Analysis

The typology of environmental skills programmes shows that over half are targeted at those currently employed, while around a 1/3 also target other significant groups such as the unemployed or trainees, apprentices and students. The majority of programmes target multiple groups. The level the programmes are targeted at is generally fairly open but there is greater access and focus on courses for those with at least secondary level education and at medium (ISCED L3-4) levels. This is in line with the general skills strategy targeting skills development at intermediate levels and also through the employer demand-led system focusing on the employed and potential workforce.

Over half of the programmes identified have access restricted to target groups, be they unemployed architects, recent university graduates or waste management professionals.

⁴³ <http://www.cskills.org/supportbusiness/businessinformation/csn/csnoutputs/index.aspx>.

⁴⁴ <http://www.horizon-ssa.org.uk/public/cms/File/2008%20update%20research%20SSA%20Additional%20Research%20Vol%201%20final%20080908.pdf>.

Around 35% of the programmes provide tailored training courses set-up for just programme participants, around half of these are also within the restricted access group. Less than 20% of the programmes had open enrolment. All identified programmes were focussed on developing new skills in some way and around 2/3 were building on and upgrading existing skills levels. Where the programme length was known they tended to be either short courses of one week or less or would last for around 1 year. Over half of the programmes led to a qualification recognised within the sector, and over 40% to a nationally accredited qualification. Around 1/3 of the programmes did not lead to any form of accreditation or qualification. The focus on short courses and targeting to specific skills reflects the nature of environmental skills programmes having a strong focus on upskilling and 'greening' existing key skills to meet environmental and low carbon needs. The link to accreditation is strong but the sizeable number of courses not accredited points to the evolving development of courses and qualifications.

The type of provider of the programme training element varied widely between the courses, with most major types of training providers involved, with the exception of trade unions. Schools, Further Education colleges and Universities, other publicly funded training, private training, sector associations and other training providers all each provided training in the range of 20-40% of all programmes. The range of provision reflects the more general diversity of skills providers within the UK.

Funding sources for the programmes were mostly mixed, with strong public funding of training programmes (> 80% of programmes), often in partnership with companies (contributions in over 60% of programmes). A typical programme would provide participant funding on a 50% public, 50% employer funded basis. EU funding also will often play a role in this funding either directly or indirectly. Contribution to participation in the programmes by individuals was found in only around 10% of programmes. This reliance on public funding to support environmental skills training reflects the low current employer demand for many environmental skills but also the public interest in building skills capacity ready for employers to take advantage of growth industries.

The programmes identified by the research fall across a number of key sectors including energy supply, renewable energy, waste, transport, agriculture and engineering. The industry with the highest number of identified environmental skills programmes is the construction and built environment sector. This is perhaps unsurprising given the traditionally weak record of the sector in skills development, meaning that many stakeholders are already highly engaged in improving skills provision for the sector. The implications of climate change in construction has attracted other key stakeholders and added another theme for existing stakeholders to address - in environmental skills.

Evidence of programme outcomes and wider impacts is somewhat limited with measured outcomes in only a handful of programmes. In general no clear link is being made between the training course and quantifiable environmental improvements. One of the few exceptions to this being the SAFED driver training courses that have quantified the fuel saved in both quantity and cost, conversion of this to environmental metrics such as greenhouse gas emissions and air pollution would not be too difficult.

The research to fill the typology drew upon a variety of sources across many different sectors, by doing this it is expected that the majority of recent or active large publicly funded environmental skills programmes were captured. Past programmes, smaller initiatives and the majority of private sector training are much harder to find evidence for. Our understanding is that in these areas the schemes identified in the typology are only a small fraction of what is available / has been carried out in the past.

Programmes that target the unemployed are in almost every case part or fully publically funded. The preferred partnership approach of the public sector has succeeded in some cases in drawing matching funding from EU sources such as ESF, for example the Beyond 2010 training (no. 10), or funding from companies, such as in the case of British Gas part funding a training centre (no. 14) in South Wales. Other initiatives such as the Retrofit Employer Accord in London (no. 13) are fully public funded.

3.4 The Netherlands

3.4.1 Policy and Governance

Environmental skills and training policy and provision have been an area of high activity in the Netherlands in recent years. It is very much recognized by the Dutch government that there is a need to make sure there are sufficient labour force environmental skills for the transition to lower carbon economic activity. The main objective of governmental policy is to increase environmental awareness and educating specific skills in the field of environment-related work. This policy is targeted at young people, students and apprentices, as well as to people who are already employed.

In the Netherlands, the Dutch national government mainly has a supporting role by granting subsidies. Two main programmes are currently running for this purpose:

- **“More with less”**. This programme is mainly targeted at energy efficiency. Although primarily aimed at providing subsidies for house owners who want to invest in energy efficient equipment, a small portion of the budget is allocated for educative purposes. More with less is funded by the **Ministry of Economic Affairs**
- **“Clean and thrifty”**. This programme from the **Ministry of Housing, Spatial Planning and Environment** is a broad subsidy programme, aimed at environmental and energy related issues. In this programme is also a small portion of the budget is allocated for educative purposes.

The Dutch government does not actively provide courses first hand such as workshops, trainings, etc. itself other than complete education studies for secondary and higher education.

3.4.2 Funding

With regard to public funding bodies of environmental skills programmes in the Netherlands, almost all are on a national level. Some exceptions are present where the

municipality finances local workshops. In addition, the funding by the EU has to be taken into account.

The funding for educational purposes – including environmental – on secondary and higher education stems from the **Ministry of Education, Culture and Research**. Since this is out of the scope of this study, this will not be further included. All other programmes that enhance environmental skills are mostly funded by the two programmes described above. Moreover, the **Agency of the Ministry of Social Affairs and Employment** and the **Agency NL** commission the subsidies for eligible programmes.

Furthermore environmental skills programmes are also financially supported through the **European Social Fund (ESF)**. Within the period of 2007 until 2013, the Netherlands will receive a total of 1.943.589.745 Euros from the ESF (for programmes in the areas of adaptability of workers and enterprises, enhancing human capital, access to employment and transnationality) of which 1.146.787.117 Euros are of national contribution. It is unclear how much of this funding is allocated to programmes that enhance environmental skills in the Netherlands, but from the 247 projects in the Netherlands that received funding from the ESF, none were directly or primarily related to green skills⁴⁵.

Although not specifically mentioned, the environmental skill programmes are supported by the ESF. The five priorities are:

- Helping employees and employers to adapt themselves to changing circumstances of the Dutch economy;
- Providing easy access to the employment process and integration to the labour market;
- Enhancing education and individual skills for a better education and training system;
- Encouragement of cooperation between employers, unions and non government organisations; and,
- Increase the social integration of the underprivileged to strengthen their opportunities on the labour market.

Most of the trainings, courses, workshop, etc. that enhance environmental skills are financed by companies, organisations and trades unions, and in some of the cases a part of the costs are remunerated by the government. In case where the trade unions contribute to the training of skills, the actual funds stem from the members (i.e. the employees) of that union in the form of a contribution. Other sectoral training funds come from sector representative bodies, stemming from the members (i.e. the organisations). This source of funding of environmental skills in the Netherlands is relatively marginal though, and most of the private funding stems directly from the companies and organisations themselves.

3.4.3 Delivery

The two programmes are delivered through a brokerage service, where employers or trade union members must make a proposal where they detail:

- The financial need;

⁴⁵ http://ec.europa.eu/employment_social/emplweb/esf_projects/result3.cfm?country_iso=nl&lang=nl

- The nature of the request;
- Possible outcomes; and,
- Training details.

As mentioned above, employers are key deliverers of skills training. A number of the largest firms have set-up their own internal training institutions and academies to provide standardised, tailored training or to meet perceived deficiencies in existing provision. Trade Unions and other third sector organisations also provide training. Trade Unions often work in close collaboration with firms and companies. In addition, private training providers are also important providers of skills training, sometimes in cooperation with employers of trade unions. These training firms offer specialised short courses and workshops in a wide variety of

3.4.4 Typology analysis

The majority of the programmes (70%) are in the private sector, mainly delivered by the firm with a specific skills gap. Other programmes are offered by government. In principal, there are three broad categories of environmental “skills” programmes that promote skills:

1. Environmental awareness. For instance programme 18, CSR in BAM Infra (large construction company in the Netherlands) business school creates environmental awareness among managers;
2. Energy efficiency related programmes. For instance programme 15, Energy saving programme of Heineken (large Dutch beer brewery) aimed at both production and non-production employees;
3. Other programmes, often aimed at training people very specific or practical skills. For instance programme 1, training students who want to become fishermen in the field of sustainable fishing.

In the Netherlands, there is a wide variety of programmes; there are hourly workshops, daily trainings, courses of several weeks and even programmes that lasts a couple of years. Logically, there are more small workshops than large programmes. The lion’s share of the target group covered by the programmes inventoried is employed people (47%) and students/interns/apprentices (22%).

From the inventory it became clear that every medium or large sized company in the Netherlands has a programme that enhances environmental skills, at least to a certain extent. Therefore, the list is not exhaustive and must be seen as a sample of the programmes that can exist in the Netherlands. Moreover, some of the programmes in the typology are umbrella programmes, from which several smaller workshops and courses can arise.

From the typology it can be deduced that the programmes have a variety of providers, more or less equally distributed:

- Schools, colleagues, universities and other higher education institutions (21%);
- Public training institutions (18%);
- Private training providers (31%);

- Employer’s associations, chambers of commerce, sector bodies (21%);
- Trade unions (9%).

The goal of the courses are often both to upgrade old skills and to create new skills. And the vast majority of the programmes (88%) have an entrance level only for a secondary or tertiary educational level.

3.5 Bulgaria

3.5.1 Policy and Governance

There are two main national bodies that are responsible for any initiatives with regard to employment and skills: the Bulgarian National Employment Agency (EA), and the National Agency for Vocational Education and Training (NAVET). Both are actively engaged in policy formulation.

EA, which functions as an executive agency under the Ministry of Labour and Social Policy (MLSP) is the implementing body of any programmes and initiatives with regard to the realization of the national employment strategy and priorities. It is a centralized agency, and defines its strategic goals as twofold: tackling unemployment in the short run, and improving the economic and labour potential of the population in the long run. In the light of recent EU accession, the policy formulation of EA emphasizes key terms such as lifelong learning and workforce adaptation through continuous training and skills improvement.

NAVET on the other hand is a specialized organ functioning under the umbrella of the National Ministerial Council. Its aim is to promote quality standards for professional education and skills development. In particular, NAVET elaborates the requirements for any professional qualifications and licenses public and private training centres based on those requirements. Among the most important skills centres are those on the Bulgarian Industrial Chambers, as well of the Chamber of Construction. NAVET is also serving as the contacting point with the social partners- employers, trade unions and course providers in order to ensure different viewpoints and reflect those in respective policy formulation.

There are several strategy documents underlying EA and NAVET’s activity. Beyond doubt, the most important ones are the Updated National Strategy for Employment (2008-2015), as well as the Operational Programme “*Human resources development*”, which seeks to raise skills levels and productivity among the country’s workforce by providing better training and easier access to lifelong learning and gives the framework for programmes co-funded by the European Social Fund. The OP makes direct reference to environmental skills in the context of the horizontal implementation principles of the Programme. Under the principle of “sustainability”, the Strategy states that one of the key aims of the Programme should be to:

“stimulate activities that positively contribute to the protection and improvement of the environment, such as waste reduction and recycling, energy effectiveness, increased

awareness for environmental sustainability, and, where appropriate, the organization of specialized trainings; support for skills projects focused on environment, as well as organization of trainings for environmental management."⁴⁶

In addition, since 2008 there exists National Programme for Promotion of Training and Skills Development for Adults (PTSDA), which explicitly aims at improving the qualification and training quality in adult vocational education. PTSDA is currently in its first, rather preparatory phase (see below).

It should be noted that on the policy level there are several existing national programmes that focus on energy efficiency, promotion of alternative energy sources such as wind energy, biomass and biofuels. However, they do not take an explicit position on the element of promotion or development of related skills trainings.

3.5.2 Funding and delivery

Programmes and actions connected to professional qualification and skills are funded through the EA, as well as, to a large extent, through the ESF, which is a co-funder for actions under the "Human Resource Development" programme. Total budget for the latter for the period 2007-2011 is about 1.2 Billion Euro, with more than 1 billion of it provided by the ESF. The budget of EA for 2009 was about 88 million Euro, whereas the current plans according to the MLSP is that funding for qualification and skills improvement of unemployed should reach 125 million Euro in 2010⁴⁷. The budget of PTSDA for 2008 was 165000 Euro, covered completely by the state budget. The foreseen deliverables under this programme were the training of 200 VET trainers to take up activities in the following stages of the programme, as well as the training of 100 experts that should works towards quality improvement of current VET offered.

In 2008 there were 1461 professional trainings undertaken for the unemployed aiming at the development of new skills, and 239 subsidized trainings for employed people that aimed at upgrading skills. 25634 unemployed and 3485 employed were the participants in these trainings. It should be noted that the total number of courses has diminished since 2003, when over 1900 courses were organized.

Employers are an important source of funding for vocational education and training of their staff. In 2005 costs for continuous vocational training (CVT) in enterprises represented 0.7% of their labour costs compared to 1% in 2002. In 2007, more than 60% of the employers surveyed in a national survey on the demand for skilled labour in Bulgaria stated that they have either already organized training activities at their company or plan to do so by the end of the year⁴⁸.

⁴⁶ Ministry of Labour and Social Policy, Operational Programme "Human Resource Development", September 2007, available at <http://www.az.government.bg/internal.asp?CatID=28/02/02&WA=Efunds/OPHRD/HRD.htm>.

⁴⁷ See interview with Minister T. Mladenov from 20.11.2009.

⁴⁸ <http://www.eurofound.europa.eu/eiro/2007/07/articles/bg0707039i.htm>.

It is interesting to note a special player within the training bodies- namely, the Bulgarian-German Training Centres (BGTCs). BGTCs exist in three major Bulgarian cities and were initiated by the Bulgarian Government already in 1995, in close cooperation with German VET providers. They aim at providing training, which corresponds to high-level technological and quality standards in Germany. BGTCs worked closely with German companies operating in the Bulgarian market, such as Mercedes and Liebherr.

Provision of vocational training and skills improvement is organized through state, municipal and private vocational centres (570 licensed), company training centers, vocational schools and colleges (170), Universities, vocational centers of employers organisations, trade unions, and NGOs. In general, there are several ways for provision of training that is sponsored by EA:

- In case an employer has contacted the regional/ local service point with specific skill needs and has agreed to hire registered unemployed for not less than 6 months. In this case the employer has the right to choose the training body;
- Regional bureaus can also organize training for registered unemployed clients without an existing specific placement. In this case, trainings are decided upon analysis of local needs of the labour market, and are conducted by training bodies chosen by the local EA branch;
- In connection with PTSDA, EA also finances training courses for employed personnel from small enterprises in order to ensure retention of working places in cases of restructuring or in connection with the economic and financial crisis. In such cases, the employer obliges to keep the trained staff for at least 6 months after course completion.

3.5.3 Training that promotes environmental skills

General

The issue of availability of programmes and trainings that promote environmental skills essentially has been influenced by two trends: a historical and a structural one, with European integration playing an important role for the recent departure from well-established patterns in both cases.

Historically, awareness for environmental issues in Bulgaria has not been very high and the country has suffered environmental degradation during the former regimes. There were hardly any regulations on the use of energy and natural resources. Cheap and dirty sources of energy were used and natural resources were overexploited, causing pollution. Therefore, an almost total lack of awareness and culture for environmentally friendly practices was in place. This already provides a difficult basis for mainstreaming or directly addressing environment in current professional training and skills initiatives. Unlike countries such as Germany and The Netherlands that have strong eco-movements, it was only in the context of EU membership and adoption of the environmental acquis that Bulgaria had to face questions of regulation for environmental protection. Within this process, a certain increase in environmental awareness and support for related actions in the Bulgarian population could be observed. This also has to be seen in the context of continuous EU-emphasis on greening the economy. As a consequence, employers began to realize the benefits of adopting a CSR strategy and eco-friendly practices. Therefore,

through increased general awareness for environment, demand for environmental skills is rising. A recent survey⁴⁹ carried out among employers showed that 66% of the respondent companies had appointed a dedicated employee to deal with environmental issues and 25% stated that their company has eco-policy and measures as a part of the CSR of the company. Nonetheless the view that environmental initiatives are expensive and are left up to rich countries - while Bulgarian companies due to the hardships of transition do not have the necessary resources - prevails.

Going back to the issue of adopting the environmental acquis it should be noted that it comprises over 200 legal acts, covering horizontal legislation, water and air pollution, management of waste and chemicals, biotechnology, nature protection, industrial pollution and risk management, noise and radiation protection. Adopting and transferring this legislation into national standards was only a first step, with the second one connected to the implementation of many huge - and extremely expensive - investment projects, particularly in the sewage and waste sectors. In particular funds through ISPA were available for such projects, which sometimes exceeded € 40 million⁵⁰. Thus, a challenge in this respect was administrative capacity and, as the 2005 Monitoring Report states: “substantial attention still needs to be paid to recruiting additional specially trained human resources”⁵¹. The main target groups here were thus respective employees at regional, local and municipal level. The investigation of environmental trainings showed that there are a number of trainings specially designed or open for these groups (see below).

Recent years have also seen a structural shift in the Bulgarian economy towards sectors such as renewable energy sources and biological farming that are currently benefiting from substantial funding through EU Cohesion Funds. Therefore, environmental skills connected to the establishment, management and exploitation connected with those areas, are on the rise. In the same time, traditional skills shortages, in particular ICT skills and languages, continue to be high on the priority agenda, together with more specific trainings that aim at skills upgrading in particular professions, for instance in the food production sector⁵².

3.5.4 Typology trainings on environmental skills

The mapping of programmes and trainings that promote environmental skills delivered fragmented and rather unsatisfying results. This finding is not surprising given the lack of political agenda as well as the low grade of public awareness and realization of the growing potential and necessity for such skills. In general, five types of programmes could be broadly defined: national/state level programmes; trainings connected to renewable energy sources; trainings that relate to biological farming; trainings for the construction sector; as well as in-company trainings on environmental awareness and environmental protection.

⁴⁹ Association of Industrial Capital in Bulgaria (2008), Analysis of Challenges in the areas of corporate management and CSR, 9in Bulgarian) available at www.biaca-bg.com/uploads/Analiz.pdf

⁵⁰ ECI (2008); Bulgaria's quest to meet the environmental acquis. Available at: <http://www.esiweb.org/index.php?lang=en&id=379>.

⁵¹ EC (2005); Bulgaria: Comprehensive Monitoring Report.

⁵² EA (2009); Yearbook of activity 2008.

National/ State level programmes

In the context of the current global recession, a National anti-crisis plan was released in 2009. It does not, however, include any foreseen measures targeted to the greening of the economy, also not in the context of measures for job retention such as subsidies for enterprises for trainings of employees. In addition, EA also concludes in its final annual report that throughout the whole year, none of the licensed centers has offered the programme “*Technologies for environmental protection*” that leads to the state recognized profession of “Ecologist”. In the same time, basically all NAVET-licensed professions include specific modules on environmental training, which differ depending on the specific profession. The modules range from waste management or dealing with hazardous materials for professions in the construction sector, through energy effectiveness for the technical professions, to elements such as paper recycling for administrative professions. Yet it is unclear to what extent are such modules actually being implemented and elaborated through the training centers, as interview stakeholders indicated that often the module is carried out only “pro forma”.

The only existing national programme that- still only somewhat explicitly- tackles development of environmental skills is the “Renewal and protection of Bulgarian forest” programme. Due to its uniqueness in Bulgaria, this programme has been selected as a first case study and will be reviewed in detail in a further section.

Furthermore, in connection with the implementation of the environmental acquis and the monitoring of investment programmes, there are several courses designed or open for municipality officials (Trainings 6,12,13,16). The most comprehensive trainings are provided by the Association of Municipal Ecologists (BAMEE). Since 2007, BAMEE has established a training centre for courses dealing with environmental issues. Apart from trainings connected to programming and monitoring of activities connected to environmental protection at municipal/ local level, BAMEE also offers trainings for environmental impact assessment techniques, on management of water, waste and air, courses on environmental awareness, on NATURA 2000, as well as on the whole environmental legislation in Bulgaria. Courses are open not only of public sector employees, but also for companies that are considering to apply or have applied for funding under specific EU programmes.

Trainings in the construction sector

In the construction sector, a pilot project on programmes for training in waste management, installation of biomass systems and solar panels was initiated in 2006 in the framework of the EU project EARTH. However, after the pilot phase in which two courses were carried out in Varna in cooperation with the Varna Technical University, the Bulgarian training providers did not qualify for further accreditation from the relevant European bodies and thus afterwards the courses have not been offered. Two interesting programmes (Programmes 8 and 9) have only recently been developed by Glavbolgarstroy, which is the biggest construction company at the Bulgarian market and also disposes of a large centre for vocational training. In addition, all contacted centers for vocational education training emphasized that with regard to the construction sector, ecology and environmental protection is an obligatory module in all offered professional trainings and is of particular importance.

Trainings related to biological farming

Given the recent positive growth developments on the Bulgarian market for biological farming, several relevant courses have been offered (Programmes 1 and 2). They focus on foundations of biological farming, agroecology, as well as on the EU funding requirements from EU structural and cohesion fund programmes. The completion of a course in agroecology is a prerequisite for the application for EU funding. For now there is only a limited number of farmers that are certified for biological production, but there is certainly an upward trend in this respect. This also explains why the trainings under 1 and 2 are now well-established and offered in a regular basis (at least 5 times a year). Training is also offered outside of Bulgaria, for instance in collaboration with the Thessaloniki University (given its proximity), as well as in Poland and Hungary.

In-company trainings

The majority of programmes are offered as in-company trainings in different sectors. Obtaining information from the water and the energy sectors (E.On, Toplofikacia AD, Plama Pleven) proved to be difficult as trainings are mostly carried out “on the spot”, are rather unsystematic and do not fit the dimensions of the typology that was offered (as is the case with non-formal)). Lukoil, as the biggest fuel producer, disposes of a large training centre and has an established programme for developing and upgrading environmental skills of its workers (Programme 7). An interesting example is Chelopech Mining, which is a daughter company of Dundee Precious (Programme 14). It conducts various in-house company trainings connected to environment, such as dealing with hazardous metals and materials, waste recycling, as well as energy management.

For most companies that are not directly engaged in the energy sector, in-company trainings focus on courses on energy effectiveness and awareness for environmental issues. As mentioned above, such topics are gaining more and more prominence in Bulgaria. The entrance of the first specialized consultancy (Denkstatt, Programme 5) for corporate solutions for sustainable business and environmental care, which has conducted trainings for Coca-Cola Bulgaria and has co-organized the first Green Innovations Forum in the country, confirms this upward trend. Trainings given by Denkstatt vary, but some issues that are repeatedly discussed are reduction of carbon footprints as well as the introduction of systems for environmental management.

Trainings on renewable energy sources

A final interesting type of training handles the topic of renewable energy sources (RES) (Trainings 11, 12, 13). This is not surprising, as currently there are significant opportunities for EU funding for projects that deal with the topic. There are several trainings offered, organized mainly in the form of workshops for employees on a management level. The main aspects connected to renewable energy, which are covered in such trainings are: specifics of the legal framework, possibilities for establishment of wind, solar and geothermal energy plants, the possibilities for financing of such projects through EU structural funds, as well as public-private partnerships and subsidy possibilities. An interesting programme is the EU-level SUPPORT_ERS project, which integrates regions with high potential for the use of renewable energy sources in the project activities and develops a modular regional training programme. In six new Member States and one candidate country SUPPORT ERS carries out pilot seminars

based on the elaborated training modules. Topics that are dealt with include waste management, biomass, heating from renewable energy sources, wind and thermal energy. In Bulgaria, a training is foreseen for April 2010 on the topics of heating and waste management.

Overgas, which is the biggest natural gas company on the Bulgarian market, has been highly active as regards trainings that promote skills connected to energy effectiveness and clean energy utilization. Its recently launched training “*More knowledge for clean energy*” represents a unique partnership with EA as well as with a private VET training centre; moreover it is co-financed through the “Operative Programme Human Resource Development”. Given the explicit aim of the programme to address anticipated skills shortages on the market connected to environmental issues, this programme was selected for a second case study.

3.6 Germany

3.6.1 Policy and Governance

Environmental skills and training policy and provision have been an area of high activity in Germany in recent years. The aim of all policy actions in the field of environmental skills programmes is to educate young people with regard to environmental awareness and protection and to open up greater opportunities for disadvantaged groups, such as unemployed. It is the goal to encourage individuals to engage in a field which has become increasingly important for the entire economy. In the light of an overall education policy it is furthermore the goal to adopt a continuous education and training approach which develops the education system in the direction of a “learning society” and “lifelong learning”

With regard to public policy, as far as environmental skills programmes are concerned, special reference has to be made to the wide variety of activities developed by Germany’s 16 Länder within the scope of their competence for education. The financial and administrative responsibility for education policy rests with the 16 Länder rather than the federal government. As the policy and governance structure with regard to environmental skills programmes is very diverse and the multitude of concrete, practical, case-specific environmental skills programmes in schools, regions, companies, inter-company training centers, non-company training facilities and facilities run by other providers is enormous, it is difficult to describe the policy and governance approach in full detail.

The National German Sustainability Strategy, adopted in 2002, comprises a variety of federal environmental education and skills programmes, aiming at broadening the scope of environmental education throughout different societal levels and sectors of the economy.

As an example the approach by the **Federal Ministry for the Environment** will be described here; one of the Federal Ministries, besides the **Ministry of Economics and Technology** and the **Ministry of Education and Research** responsible for environmental education. The Education Service of the **Federal Ministry for the**

Environment provides training materials, updated information, promotions and tips for schools and educational institutions. The education service has received an award, as an official measure of the national action plan under the UN Decade of Education for Sustainable Development, for providing schools and educational institutions many options for dealing with and teaching awareness of environmental issues. Towards the end of 2008, the Federal Ministry of the Environment has launched the most comprehensive climate education support programme for schools and educational institutions. Under the title "Climate School" the ministry provides over 3.4 million Euros to promote ideas and projects in schools, helping to reduce CO₂ emissions. In addition to supporting project days through materials such as an "environmental box", financial support for obtaining energy saving devices and training materials is provided.

In addition a vast number of associations and non-company training facilities and independent engage in the field of extra-curricular environmental (skills) trainings and programmes across Germany. The most prominent are the following:

The Association of Nature and Environment e.V. is the umbrella association of all environmental centres, initiatives, training providers, freelancers / self-employed and other individuals who are active in extra-curricular environmental education. The association represents the interests of its members at the federal level. The tasks of the association include promoting cooperation and exchange of information with regard to environmental educational material, supporting the creation of environmental institutions, advising decision-makers in politics and the business environment on issues related to environmental education, carrying out conferences and seminars in order to share experiences, developing ways of training and qualification of specialists in environmental education, supporting initiatives in order to develop and test new models of teaching and learning with regard to environmental skills. The association possesses a database of all environmental extra-curricular education centres in Germany, which add up to 1222 in total across the country.

The German Society for Environmental Education e.V. promotes environmental education as an educational and scientifically sound analysis of the natural, social and built environment. It was founded in 1982 as a charitable association. Members are scientists and educators of all levels of education, schools, environmental centres, etc.

The Society for Environmental Education Training was established in 1991. The aim of the society is to develop professional environmental education in theory and practice at national and international level. The society informs about activities, initiatives, programmes and projects in the field of education and occupation within different economic sectors and companies. The society further provides communication structures which help to maintain an information and cooperation network among businesses and promote and disseminate new approaches of environmental skills training programmes.

3.6.2 Funding

With regard to public funding bodies of environmental skills programmes in Germany, a differentiation between federal institutions, Länder institutions and municipalities has to be made. In addition, the funding by the European Union (EU) has to be taken into account.

The German education sector, which includes initiatives for environmental skills, is marked by a multitude of initiatives, pilot projects and network approaches. Many of these trainings in almost all fields of general education and vocational training are funded by the Federal Government, by the governments of the Länder and by the EU.

On federal level, the **Federal Ministry for the Environment, the Ministry of Economics and Technology and the Ministry of Education and Research** are the main sources of funding for countrywide education programmes related to environmental skills. With regard to extra-curricular educational facilities, providing environmental skills programmes, 2 out of 3 facilities also receive public funding. The source of public funding differs to some extent between the old and new (former GDR) Länder. Whereas the funding in the old states is often provided by the municipalities, the facilities in the eastern part of Germany receive more funding from the Länder and also from federal level. In summary, funding from federal state institutions has the largest proportion. Within this proportion, the nature of funding is however manifold and a variety of federal state institutions provide funding.

Furthermore environmental skills programmes are also financially supported through the **European Social Fund (ESF)**. Within the period of 2007 until 2013, Germany will receive a total of 15.706.000.000 Euros from the ESF (for programmes in the areas of adaptability of workers and enterprises, enhancing human capital, access to employment and transnationality) of which 6.326.000.00 Euros are of national contribution.

The level of ESF funding differs from region to region and depends on their relative wealth. Mecklenburg-Western Pomerania, Brandenburg-Northeast, Magdeburg, Dessau, Dresden, Chemnitz and Thuringia are the regions with a per capita GDP of less than 75% of the EU-25 average, and are therefore eligible to receive most of the funding under the objective of improving education and employment opportunities. Brandenburg-Southwest, Halle, Leipzig and Lüneburg are regions in which the funding is still available but to a smaller extent, as these regions have a per capita GDP of more than 75% of the EU-25 average but less than 75% of the EU-15 average.

Most of the German environmental skills programmes identified in the course of this study are offered by private companies to their employees. In most cases the company bears the costs for the training. External off-the-job trainings demand for an individual contribution by employees, whereas most companies are willing to bear the costs or support their employees financially if such training benefits the company as well.

3.6.3 Delivery

As surfaced above environmental skills programmes exist on public and private levels which are delivered in different manners. Whereas most private environmental skills programmes are offered to company employees only and carried out by private training institutions, public environmental skills programmes are manifold and open to a wider group of participants. However, most of the above mentioned Federal Ministries do not carry out or set-up environmental skills programmes themselves. These Ministries financially support training programmes and initiatives which are organised and carried out by environmental or educational associations or facilities. The Ministries do publish educational materials, such as teaching modules for school teachers in primary and secondary education. Besides the lower and higher education institutions in the Länder, the network of the Goethe Institutes offers environmental education to some extent on federal level which is also financed by the federal government.

In order to display an example on Länder-level, the most prominent education support programme, which is also eligible for environmental skills trainings, is initiated by the Land of **North Rhine-Westphalia** (the most populous Land of Germany). In North Rhine-Westphalia the government has set-up the programme of the so-called Bildungscheck (Education voucher). The Bildungscheck is offered to employees, businesses and people returning to a job. The Bildungscheck initiative, which is also supported by funding from the ESF, provides 50% of funding, up to a maximum of 500 Euros, for private and company training programmes.

The state programme is aimed at employees in small- and medium-sized businesses with up to 250 employees. Individuals and company employees can apply. Therefore, the Bildungscheck can be used by individuals for voluntary education as well as by companies in the cause of their company internal training programmes. Included are all categories of employees from professional employees, people engaged in so-called minijobs as well as women and men on parental leave. Entrepreneurs and freelance professionals can make use of the funding in the first five years after the founding of their business. Similarly, women and men who want to return after an extended parental leave and require special training for that can make use of the education voucher. Funding will be provided to all trainings aimed to maintain employability – also including environmental skills programmes. The case study B.E.E to follow below can also receive funding by the Bildungscheck initiative.

Environmental Skills

The majority of programmes identified is provided by private business entities or associations (16) all further environmental skills programmes (8) are offered by public institutions. It has surfaced above that a large variety of publicly funded environmental skills programmes exists on national and federal state level. The present research has identified only a few exemplary umbrella programmes/funds on national and federal states level. Most of the presented programmes are umbrella programmes in form of funds which are accessible by small- and medium-size enterprises (SMEs) in order to be able to provide their employees with different trainings related to environmental management systems and the creation of environmental awareness. These programmes are offered to a variety of industrial sectors but are strictly bound to SMEs. This can be

explained by the fact that all large companies analysed have set-up company internal capacities for carrying out environmental skills programmes.

3.6.4 Typology Analysis

With regard to environmental skills trainings and education programmes offered and paid by the private sector, most programmes are only offered to employed personnel, provided by private training institutions and differing in actual duration depending on the company and sector. The aim to communicate and teach environmental awareness and training of environmental skills has been on the agenda of most identified companies for some time already as past environmental skills programmes show. The actual content of trainings and programmes varies across industries and is often tailored to specific companies and their departments. However, the initiatives can be broadly described by “soft” skills programmes, aiming to raise environmental awareness, and actual trainings which teach environmental skills for the daily use during work and private life.

An interesting component of all private environmental skills programmes in Germany is the fact that environmental awareness trainings are often compulsory for trainees and apprentices, no matter what sector the company is active in. Without the attendance of such trainings, trainees are not granted their final certificate. Besides that, it is furthermore interesting that many of the large companies provide different trainings to different employee groups and levels, all aiming to upgrade the environmental performance of the company.

3.7 Poland

3.7.1 Policy and Governance

The inflow of the European funds to Poland in recent years resulted in the increased activity in an area of skills and training policy.

One of the main strategic documents concerning life-long learning is the Strategy for Lifelong Learning Development 2010 which was accepted by the Council of Ministers in 2003. The strategy outlines increased accessibility of life-long learning and improved quality of programmes and increased level of investment in human capital as the main objectives for the coming years. The strategy specifies activities for public and local administration, science and education institutes and for social partners who should cooperate aiming at building of a knowledge-based society, which is the overall aim of the strategy.

Investment in human capital is also one of the basic priorities of the National Action Plan for Employment 2009-2011 passed by the Council of Ministers in 2009. The Plan characterises a Polish employment policy framework and touches on issues associated with skills and training policy and provision.

The Ministry of Labour and Social Policy and the Polish Agency for Enterprise Development (PAED, the agency of the Ministry of Economy) are the main governmental

bodies for skills and training policies addressed to adults. The Ministry of Labour and Social Policy is responsible for employment policy in general, from a macroeconomic point of view, including actions towards human capital development. The Polish Agency for Enterprise Development is more practically orientated. The Agency identifies needs of enterprises with respect to skills of their present and potential employees and addresses these needs by implementation of training projects or by formulating relevant policies or programmes. On the other hand, the Agency aims at recognition of the workers' need. The PAED is interested in all enterprises; however its special focus is on small and medium enterprises operating in Poland. Concerning the skills and training system in Poland, its important elements are public and non-public centres for continuous education, vocational training and development.

3.7.2 Funding

In Poland there are various ways of financing of participation in programmes aiming at enhancing vocational knowledge and competencies. The market of annually delivered training services is estimated at approximately 0.6 billion Euro and the number of companies involved in various services amounts to several thousands⁵³.

The same as in other EU Member Countries, Polish employers may benefit from the funds of the European Social Fund under the Operational Programme Human Capital 2007-2013. The budget of the programme amounts to approximately 11.5 billion Euros of which 9.7 billion Euros comes from the European Social Fund and the rest is a national contribution. A significant share of funding for training programmes purposes stems from the national budget. This involves funding assigned for the Ministry of Labour and Social Policy, the Ministry of Science and Higher Education, the Ministry of National Education and the Ministry of Economy as well.

An important source of environmental skills funding in Poland are funds for environmental protection and water management which are operating at various levels: national, voivodship, poviats and commune. These are public funds obtained from environmental charges and fines, however these were separated from the national budget in order to ensure they are spent on environmental purposes. Especially funds at national and voivodship (regional) level play an important role in environmental education financing. The funding is granted in a form of subsidies for certain projects – various organisations apply for grants which are awarded based on results of projects' appraisal criteria within competition process. Usually NGOs are interested in such form of financing their activities with respect to environmental skills training.

Another important funding source is the Non-Governmental Organisation Fund set within Financial Mechanism comprising the EEA Financial Mechanism and the Norwegian Financial Mechanism.

⁵³ National Action Plan for Employment 2008, Ministry of Labour and Social Policy, <http://www.mpips.gov.pl/index.php?gid=747>.

However, the private sector is the most significant funder of life-long learning initiatives in Poland addressed to adult labour force. Most of the training programmes and workshops are financed either by their participants or by companies and enterprises.

3.7.3 Delivery

Within the Polish public sector there are various types of providers of the skills trainings. For example these are labour offices (courses for the unemployed or employed that are vulnerable to job loss) and permanent and practical training centres operating within the national educational system. There are also non-public centres for continuous education and non-public centres for vocational training and development.

The key players on the skills trainings market in Poland are private training providers. They are entitled to carry out courses based on law regulations that ensure freedom of business activity. Private training providers usually address their offer to individuals. Their offer comprises mainly short specialised courses or seminars in a wide variety of subjects.

Another significant type of providers of skills trainings are companies operating in the private sector. It is beneficial for employers to have an opportunity to adjust scope of trainings so that it meets their needs as far as particular skill gaps of companies' human resources are concerned. This refers mainly to larger companies.

NGOs are also one of the key providers of skills training in Poland, especially with respect to ecological education and environmental skills trainings. The role of trade unions and associations is relatively small however given the improved accessibility to the EU funding their role might increase.

Environmental Skills

The policy of the government in recent years in the field of environmental skills involved mainly raising general environmental awareness among Polish society and encouraging environment-friendly behaviour. Especially a need for ecological education of children and youth has been emphasized. Environmental skills' training of employees/adults has not been a priority in Poland.

Educational and promotional campaigns, conferences, events, fairs and trades, competitions for individuals and organisations were the most common activities undertaken by Polish government (mainly the Ministry of the Environment) with respect to ecological education in previous years. Training programmes that address environmental skills and are provided by the government are exceptions rather than a rule. In general, the government's role in a provision of environmental skills training programmes is rather supportive than active. It means the government is responsible mainly for formulating policy solutions and enabling funding of such programmes (subsidies, grants, etc.).

The National Polish Ecological Education Strategy, adopted in 2001, is a governmental policy document which identifies the national aims of environmental education and presents their hierarchy. The National Polish Ecological Education Programme, also

adopted in 2001, has been the first document in an area of environmental education implementation which specifies the basic measures and institutional framework and funding sources as well. The strategy characterises an efficient system for environmental education in Poland in which environmental skills trainings are essential component. The targeted level of spending on ecological education should account for 1.5-2.0% of national spending on environment protection purposes.

The research revealed that many of the environment-related programmes and courses that take place in Poland concern general ecological education and are addressed to pupils and students of schools at elementary and medium level. The related types of programmes/courses are programmes/courses targeted at teachers aiming at enhancing their skills and competencies in the field of ecological education. As a result of the trainings teachers are intended to become more knowledgeable on environmental issues in order to educate young generations. These types of programmes and courses, however common in Poland, were not taken into account as far as the typology is concerned.

3.7.4 Typology analysis

The inventory of the environmental skills programmes presents the overview of the most common programmes that are implemented in Poland. The majority of the programmes are provided by private training companies on a commercial basis. Access is open and participants do not need to meet any entrance requirements. However usually participants cover the programme fee on their own and attend in a course in their spare time. The other most popular training providers in Poland are government institution, NGOs, universities and private companies.

In general, for the majority of programmes in Poland the target groups are multiple. In many cases entrance level for the course is not specified. Yet it was observed that frequently programmes are addressed either to currently employed people or to those who are still within their education process, mostly students, trainees, apprentices or recently graduated.

The length and range of the environmental skills programmes in Poland varies from a few hourly workshops through daily or one-weekend trainings to courses that last a few weeks, months or even years. The majority of the programmes aimed at developing new skills of its participants. However, at the same time they contributed to upgrading already existing skills by providing participants with more general knowledge on sustainable development and environment-related issues.

The research also revealed that many of the environment-related programmes and courses that take place in Poland concern general ecological education and are addressed to pupils and students of schools at elementary and medium level. The related types of programmes/courses are programmes/courses targeted at teachers aiming at enhancing their skills and competencies in the field of ecological education. However these types of programmes and courses, however common in Poland, were not taken into account as far as the typology is concerned.

For the case study it is recommended to present the two programmes: ‘Challenges for Sustainable Development in Poland’ and ‘Nation-wide Programme of Trainings in the field of environmental protection’ which are described below.

The ‘Challenges for Sustainable Development in Poland’ is an education initiative organised by the Sendzimir Foundation (NGO) each year since 1997. It is a three-week intensive course, a kind of a summer school. The course is open for students, PhD candidates and those already working of various disciplines. Moreover, interdisciplinarity of course participants is an important factor during recruitment process. Main objectives of the course include ‘greening’ of vocational skills and activities of participant as well as encouraging participants and preparing them to disseminate the idea of sustainable development and green economy in their environments. The course comprises both of lectures and practice. The practical part has a form of workshops aiming at solving real problems that Polish local communities, enterprises and public institutions face with respect to environmental as well as sustainable development issues.

The second of the above mentioned programmes was addressed to Polish enterprises. The incentive for the project was a knowledge gap identified with respect to environment-related issues and environmental law especially among employees of SMEs. The project’s aim was to provide enterprises which such knowledge. The courses addressed also environmental management issues (ISO 14001 and EMAS) as well as potential sources of co-funding of environment-friendly investment. The programme lasted over two years. Within that period 676 courses were organised which were attended by 4418 participants. Overall number of enterprises involved in the project was approximately 2800. The project was co financed by the EU funds.

3.8 Italy

General

The information available for Italy on environmental skills vocational training is largely available due to the extensive work of the Institute for development and vocational training of workers (ISFOL), which publishes a yearly report on the offer of environmental vocational training (*Offerta Formativa Ambientale*)⁵⁴. Although raw data is not available, this report provides a detailed breakdown of the information on the provision of environmental vocational training.

It should be underlined, furthermore, that most of the information that has been collected through direct contacts with various stakeholders, e.g. trade unions, private companies, industrial associations has been rather challenging to access. It is not clear whether this should be read as an indication of the fact that concern for environmental issues is not sufficiently taken into consideration in Italy or if it is simply due to privacy reasons. Some of the contacted stakeholders refused to take part in the interview.

⁵⁴ Ammassari, R.; Palleschi, M. T. *Offerta Formativa Ambientale 2004-2009*; ISFOL (2009).

The figures and conclusions presented in the following paragraphs are a result of an analysis that takes into account the results presented in the ISFOL report as well as insight provided through specific analyses.

3.8.1 Policy and Governance

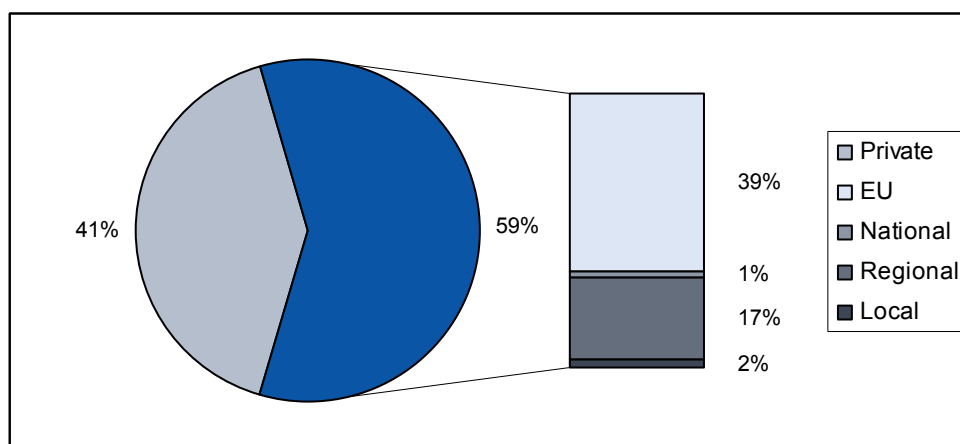
In Italy, the division of legislative competences between State and Regions, including the topic of education and training, is ruled by Art. 117 of the Italian Constitution. According to this article, vocational training is an exclusive competence of Regions, whereas education is an exclusive competence of the State. Furthermore, the main reference framework for vocation training has been established by Law 845/1978, which states that Regions have competence for providing vocational training to workers and to whoever has completed his mandatory tuition cycle.

3.8.2 Funding

Most of the environmental training programmes in Italy are public funded; unsurprisingly as Italy is the fourth largest receiver of funds through the European Social Fund (ESF henceforth), with a total budget of €15,320,983,077 for 2007-2013, of which €6,938,007,896 are coming directly from the EU and the remaining €8,382,975,181 are national funds in co-financing .

The share of public-funded environmental training programmes in Italy (59%)⁵⁵ is large compared to private-funds (41%), and is made up of EU, national, regional and local funding. Figure 3.2 provides a graphic snapshot of this situation.

Figure 3.4 Funding of environmental training programmes



The largest share of public funds is provided by the EU (39%), largely through the ESF. State funds appear to play quite a minor role (1%), as do local funds (2%). Environmental skills vocational training appears thus to be a priority for Italian regions and is in fact largely managed at regional level. Regional funds finance around 17% of the total publically provided programmes.

⁵⁵ Represented by the dark blue segment in the pie chart.

Mention should further be made of the *Fondi Paritetici Interprofessionali* (interprofessional joint funds). 14 funds of this type exist, each one linked to a specific sector. These funds offer companies the option to devote a part (0,30%) of the amount paid to public pension funds to the provision of vocational training to their employees. These funds will then collect and redistribute payments depending on the need for each vocational training programme. Monitoring is performed by the Ministry of Labour and Social Policies.

3.8.3 Delivery

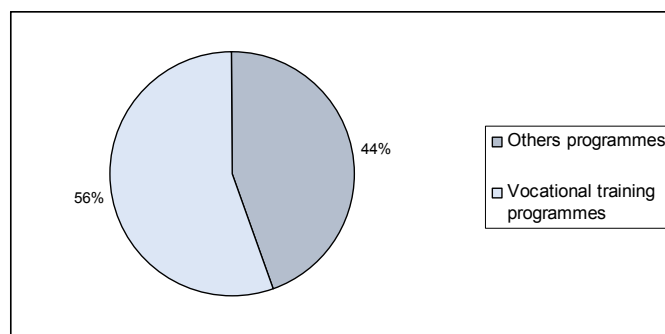
Courses are delivered differently according to the provider. Three different situations can be ascertained:

1. In-company training through the company's internal education system: This is mostly relevant for very large companies (multinationals), that can afford to have an in-house education system for their employees. The provided courses are very specific and are connected to the participants' core activity in relation to the company.
2. Information / training courses offered by industrial associations: A core function of industrial association is to follow up on new policies / market developments that are relevant for their sectors. The information / training services that are provided to their associates stem precisely from a reaction to this new development. In general, training takes place upon request from a number of associates on a specific topic.
3. Strategic training cycles: This situation can apply both to large companies and to industrial associations. The aim of these programmes is to create new skills or update existing ones in order to re-position the company or sector competitively.

3.8.4 Programmes analysed

Professional vocational training programmes make up the greatest share in the provision of environmental training programmes. Of the 1129 courses analysed in the IFSOL report, in fact, more than half (56%) is represented by professional training courses.

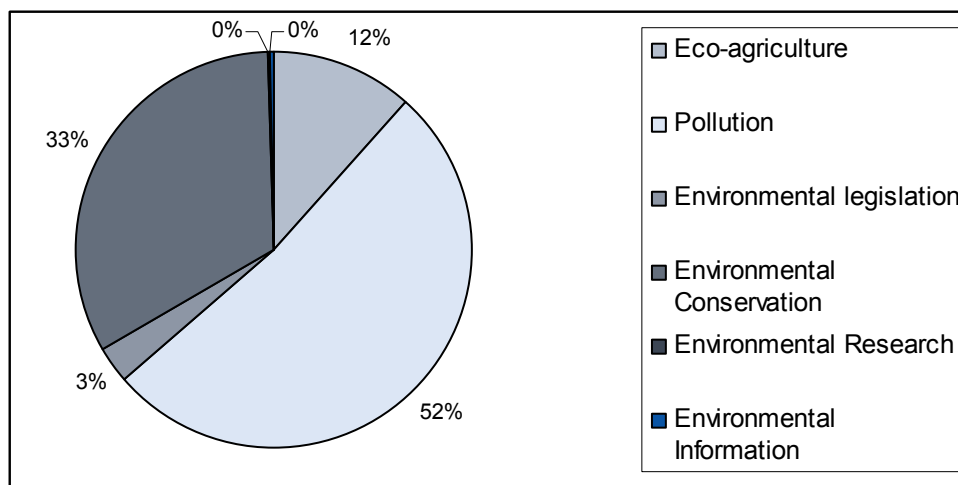
Figure 3.5 Shares of environmental skills training programmes



Professional training programmes are mainly provided through continuous training programmes with short courses. In 2008-2009 about three quarters of professional

training was provided through continuous training programmes and about half of the courses provided under these programmes lasted less than 50 hours.

Figure 3.6 Topics in environmental vocational training courses



Pollution management, resource savings and control is the main topic for more than half of the total of professional training programmes. Overall, 52% of environmental training courses fall under this category, although it should be underlined that its share has shown a slightly declining trend in recent years. This category includes topics such as quality control and certification, safety, waste management, renewable energy sources and resource management. The latter, in particular, has shown consistent growth from 2003-2004 to date and now counts for about 19% of the total offer. Waste management, on the other hand, had a drastic fall from about 20% in 2007-2008 to 6,5% in 2008-2009.

Several drivers can be identified for such programmes, primarily the increased public attention for energy topics, linked to the need of reaching EU goals and to their potential for economic recovery, which, in turn, call for the development of high-level technicians and experts for planning of integrated interventions.

Courses related to pollution management, resource savings and control are mainly provided through private continuous training programmes (more than 80%) with short courses under 60 hours aiming at creating and updating specific skills (73,4%). Longer activities, with more than 300 hours are mostly public-funded and dedicated to specific themes (monitoring, quality control and certification, water and renewable energy sources).

Programmes offering trainings in **environmental and territorial conservation, care and valorisation** represent about one third of the total offer. In particular, environment and resource management and planning, followed by urban green, resource defence and farming have been the most treated topics in this macro-area.

Most courses under this category are public-funded (74%). Professional continuous training is the main typology of provided courses, followed by basic and specialization training, which aim at favouring entrance and re-entrance in the labour market.

Eco-agriculture courses represents 11% of the total training offer. Very small interest is given for topics such as: **environmental legislation**, **environmental research** and **environmental information**, which represent around 0,4% of the total provision of training.

Table 3.1 Topics in environmental vocational training courses

General topics (bold) and specific topics	Number of courses in 2008-2009
Eco-agriculture	131
Biologic, integrated, biodynamic production, low-impact production	91
Quality control and certification	19
Marketing	3
Other	16
Pollution management, resource savings and control	588
Waste management	77
Renewable energy and resource management	218
Water	3
Air	6
Noise	10
Monitoring, safety, hygiene, environmental healthcare	157
Quality control and environmental certification	126
Land remediation	17
Electro-magnetic pollution	2
Environmental legislation	33
Environmental and territorial conservation, care and valorisation	370
Farming	61
Environmental tourism	37
Cultural and environmental goods	1
Soil, water and forest resource defence	61
Urban green	63
City management and planning	37
Environment and resource management and planning	110
Environmental impact	4
Base and applied research	3
Environmental information and communication	4

Eco-agriculture courses are prevalent in the North-West of the country and to a minor extent in the South. Centre and North-East have a minor share. Programmes on pollution are prevalent in the Centre and are more equally distributed in other areas. As regards environmental legislation, it appears there is a larger interest in the North. Centre and South do not enjoy a large presence of such programmes. The issue of environmental conservation does not seem to be much followed in the North-East, in comparison to the

amount of courses offered in other areas of the country, each of which offers more than double the amount offered in the North-East. Lastly, geographical distribution for environmental research and information related courses is not assessed, given the small number of courses offered in Italy on such topics.

Table 3.2 Geographical distribution

Number of courses Area	Eco-Agriculture	Pollution	Environmental Legislation	Environmental Conservation	Environmental Research	Environmental Information
North-East	11	158	14	48	1	1
North-West	94	128	11	102	0	0
Centre	6	195	3	101	1	1
South	20	107	5	119	1	2
Total	131	588	33	370	3	4

Environmental trainings in Italy are mainly driven by employment demand and by the evolution of environmental legislation. The first aspect is prevalent in the south, where programmes largely aim to allow the unemployed to enter or re-enter the labour market. The second driver is stronger in the centre-north, where production systems must be constantly updated to follow the evolution of environmental legislation and therefore require trained personnel. In general, though, it seems that environmental training has gradually acquired a short-term approach and that is not planned in the long term. Environmental training is in fact gradually becoming an instrument for requalification and skill update without a proper planning following an analysis of the existing and future skill mismatches. The interest for medium and high level environmental training has gradually shifted to university and master programmes.

3.9 Typology conclusions

Given the varied nature of skills programmes that the research has uncovered, there is little that one can point out as being common to all Member States. Nevertheless, there are some commonalities, namely:

- There is an **identified need for green skills training** which is recognised in Member States;
- **Accreditation** and other similar initiatives may help the training uptake at Member State level;
- **Qualifications** from programmes are usually not universally recognized;
- **Involvement of all stakeholders** from the start of a programme (design stage) is regarded as very important in safeguarding a demand-driven training approach, i.e. in making sure the programme fills a specific skills-gap;
- Funding varies, but **much comes from businesses** that have decided it is in their interests;

- **Public funding** often supports skills programmes and forms a public-private alliance;
- The use of the **European Social Fund** varies considerably between countries;
- Environmental skills programmes are often dispersed widely, suggesting that there is **room for co-ordination** and sharing of practices;
- There is a **mix of skills being targeted** by environmental skills programmes, i.e. low-skilled to high-skilled jobs.

4 Case studies

4.1 Introduction

Case studies were chosen from the identified programmes in the typology and further elaborated based on a number of criteria. These criteria were:

- that there should be sufficient information about the programme to be able to analyze it in depth;
- that they should provide examples on best practices;
- that they should showcase sustainable outcomes or environmental improvements;
- that there should be good lessons to learn for transfer of knowledge to other Member States or other sectors.

The following case studies thus provide these elements to varying degrees. The fact that information was very often not available publicly meant that all of the case studies are based on extended interviews with course organisers or others. In some cases two or even three interviews were held in order to be able to evaluate the course and judge the effectiveness and added value of the programme. Emphasis was placed on understanding the impact of the programme, but as many of the case studies are on-going or recently finished, it has been difficult to assess this satisfactorily in all cases. Nevertheless, the team was instructed to describe the effectiveness, added-value and impacts of the project as best they could, and in the case studies below the reader can find this information in a separate sub-heading on impacts and value-added⁵⁶.

4.2 U.K.

4.2.1 Case Study: SAFED – Energy efficient driving skills for heavy goods vehicle drivers.

Government worked with industry partners to develop the Safe and Fuel Efficient Driving (SAFED) training course to improve vehicle fuel efficiency and safety. The pilot project ran from 2003-2005 with over 6000 participants receiving government funded training at private providers. Successful participants received a SAFED certificate - recognised as part of CPC the compulsory professional training requirement for drivers. The SAFED course has both practical and theoretical tests with content focused on accident prevention, safe and fuel efficient driving. Over 375 trainers were trained and over 6,300 drivers trained (over half from SME's). Estimates of general 10% improvement in fuel efficiency leading to saving over 13 million litres of fuel (£10m in costs to firms) and consequent reduction in pollution and carbon emissions

⁵⁶ The Excel sheets in the Annex also provide a description of the value-added and impacts for every programme analyzed.

Background

The Safe and Fuel Efficient Driving (SAFED) programme was launched by the government Department for Transport (DfT) in 2003. The SAFED standard was developed by a steering group of industry experts with an external consultancy AEA Technologies contracted by the DfT to manage and deliver the SAFED programme. The two key elements of the programme are road safety and fuel efficiency. The SAFED programme was initially targeted at heavy goods vehicle (HGV) drivers but has now expanded to also cover van drivers (2006), aggregates truck drivers and bus and coach drivers (2009).

Case description and drivers for the programme

Among the drivers for the programme was a series of protests in 2000 when truck drivers, farmers and other road users blockaded petrol stations, refineries and other fuel infrastructure in protest at what they felt were high fuel taxes in the UK (oil prices had also risen rapidly at the same time). This rapidly led to fuel shortages and brought many areas of the country to a standstill, provoking panic. Fuel costs and taxes rose to the top of the political agenda, though it led to only minor changes in taxation policy. This focussed the minds of the DfT and industry on other ways to reduce costs for haulage firms and other major transport fuel users.

The other key driver was safety, with government drives to reduce deaths on UK roads matched with industry concerns of the trauma caused by accidents but also including the poor perception, damage to equipment and rising insurance costs for the sector. These were among the primary factors driving the safety element of the course.

The SAFED courses take the form of a 1 day, off the job training course with both practical and written elements. The subject areas covered include:

- Adjustable aerodynamics;
- Braking;
- Clutch control;
- Forward planning;
- Gear selection;
- Hazards;
- Cruise control;
- Exhaust brake;
- Height of the load;
- Positioning a load;
- Skip gears or block changes;
- Overfilling the fuel tank;
- Momentum;
- Low revs, low noise, low emissions;
- Dual carriageways;
- Tyres;
- Speeding;
- Plan your route;
- Vehicle technology;
- Weather conditions.

SAFED training delivered through an approved centre can also count towards CPC driver training hour requirements.

Goals of the programme

The primary goals of the SAFED training programme are to improve fuel efficiency and road safety to:

- Lower costs;
- Improve profit margins;
- Reduce emissions;
- Improve environmental performance;
- Less injuries and fatalities on our roads;
- Less accident damage to vehicles;
- Less unproductive downtime for vehicle repair;
- Reduce insurance premiums.

Target group

The target group of the SAFED programme is commercial vehicle drivers, specifically HGV, van, aggregates, and bus and coach drivers.

Funding of the programme

The programme was initially funded by the DfT, to fund the creation of the SAFED standard and to subsidise initial participation by HGV drivers. It is delivered under contract by AEA technologies. The HGV course is now fully commercially funded. The Aggregates course is the same as the HGV course but subsidised through an environmental levy on the aggregates sector. The van drivers' course retains an element of subsidy from the DfT. The full cost of a SAFED course is typically £100-£200 per driver.

Accessibility

The SAFED course is open to all participants but is specifically targeted at drivers in the commercial vehicles sector, in most cases this will require possession of an appropriate HGV (non-standard) driving license.

Results

On successful completion of the SAFED course the driver is graded and awarded with a certificate of completion. They are also presented with a 'before and after' comparison of their driving from the course. The course can count towards a drivers mandatory CPC training requirements.

Monitoring arrangements

The programme is managed by AEA Technologies and in Scotland by the Scottish Executive.

Impacts and Value added

Since 2003 over 25,000 drivers have completed a SAFED training course. An analysis of changes in driving techniques of over 6,000 drivers following the course showed:

- an average 10% improvement in fuel efficiency (miles per gallon);

- over 30% less gear changes – reduced wear and tear; and
- an average 1% decrease in journey time – more efficient driving just as or more time efficient.

Other impacts included reduced driver stress, improved safety and improved organisational culture.

Analysis of the impacts for participants to 2005, approximately 6,000, estimates savings for firms of over 13 million litres of fuel, valued at over £10 million in costs and around 35,000 tonnes of CO₂ emissions⁵⁷. Over the full length of the programme these impacts will have been significantly multiplied. Value added from the programme can arise in a variety of ways including where the techniques learnt on SAFED are taken into personal driving and passed onto others for non-commercial use.

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4.2.2 Case Study: ESFD – Energy Skills Foundation Programme

The Energy Skills Foundation Programme is targeted at secondary school leavers. It is a one year apprenticeship type course at Lowestoft College with academic and practical study. On completion individuals will be offered a 6 month work trial with partner firms. The programme is a pilot funded by the Engineering Construction Industry Training Board (ECITB) and energy firms that take on apprentices. Participants gain 2 nationally recognised energy industry qualifications, practical experience of industry and employer placements. Work trial can lead to employment and/or open way to advanced apprenticeships in the energy sector. The programme has been active since Sep 2009; initial results are encouraging with plans to fit qualifications to national frameworks and to expand the programme within the region and to other regions in the UK.

Background

The East of England is one of the hubs for the UK offshore oil and gas industry and areas off the regions coast have also been selected for major offshore wind farm expansion in Round 2 and 3 of the UK process. The region is also home to 2 of the UK's nuclear power plants, the sites of which have both been nominated for a new wave of nuclear power generation in the UK.

The Energy Skills Foundation Programme (ESFP) is a programme created by partners in the East of England to attract young people into apprenticeships in firms in the energy sector. Programme training development partners include Lowestoft College, Skills for Energy – East of England, National Skills Academy for the Process Industries, the

⁵⁷ Based on 2.62kg of CO₂ emitted per litre of diesel fuel consumed.

Engineering Construction Industry Training Board and Cogent (the chemical and nuclear industry sector skills council). 13 companies in the industry (including Royal Dutch Shell) have also committed to the programme.

Case description and drivers for the programme

The scale of the targets for renewable energy in the UK and award of rights to offshore wind development are both contributing to rapid growth in the sector. The sector has already seen shortages of experienced and qualified technicians to the point (prior to the financial crisis) where this was becoming a limiting factor on the pace of development. Other offshore industries such as oil and gas are also interested in securing a qualified workforce with the wider energy sector suffering from an ageing workforce profile.

The proposed new wave of nuclear development also raises skills issues with regional bodies keen to ensure that economic benefits accrue to the region and therefore the skills necessary to construct, supply and operate these plants are available.

The major overhaul of the energy generation infrastructure in the UK, rapid expansion in offshore renewables and new wave of nuclear development matched with an ageing workforce profile already suffering shortages in some key technical areas, provides a powerful need and driver for skills development in the East of England.

The ESFP is a structured 12 month engineering training apprenticeship open to school leavers (16 years old) designed to increase the number of young people entering the energy sector and to improve their retention. It was identified that existing apprenticeships tied young people to specific occupations and for school leavers not having a clear idea of what they wanted this led to high drop out rates. The ESFP programme is an apprenticeship designed to give participants exposure to a range of different roles in the sector, to give them the option to then go on and choose an advanced apprenticeship in their favoured role.

The training is run by Lowestoft College and involves a number of site visits, company placements and other practical experience. The programme will provide trainees with 2 nationally recognised qualifications that will form core competencies for those wishing to work in the energy sector in areas such as electrical, process operations, engineering maintenance, welding and fabrication; the qualifications are:

- Skills for Work in Energy - Level 2;
- Nuclear Industry Awareness Level 2 Award.

At the end of the programme the apprentices will be eligible to apply for a 6 month work trial with the companies that support the programme.

Goals of the programme

The primary goal of the pilot programme is to test the new apprenticeship scheme approach. The goals of the programme are to address the drop-out rate issue, encourage young people into the sector and importantly to give young people an informed choice of which part of the sector they want to work in.

Target group

The target group of the programme is graduating high-school students.

Funding of the programme

The programme was not eligible for public funding through the LSC as the qualification is not mapped to the Qualifications and Credit Framework. The qualification the pilot programme has developed is being mapped to the QCF during the pilot to enable funding in subsequent years.

Funding for the pilot programme has been provided by the Engineering Construction Industry Training Board (ECITB) – one of the project partners – through a levy that is applied to all firms, above a certain size, in the engineering construction sector. The ECITB investment is approximately £100k. Funding of approximately £1,800 per apprentice has also been provided by partner firms – this funds a £50 a week study bursary for participants.

Accessibility

Access to the programme is restricted to students that are 2009 high-school leavers and are 'highly motivated' and possess the minimum educational requirements of 4 GCSE's at grade C and above including English, Maths and a Science based subject⁵⁸.

Results

The programme has enrolled 16 apprentices and is now over halfway through. There have been 3 drop-outs from the course to date.

The programme managers are confident that the remaining participants will all complete the programme and that high demand from the sector will see all of the participants offered advanced apprenticeship employment opportunities.

Progress has been made with the certifying bodies (City and Guilds, Cogent and the ECITB) in bringing the pilot qualification towards QCF accreditation.

Other regions are also closely monitoring the pilot, expectations at this stage are that the programme could take on twice as many apprentices in the East of England in 2010 and could be expanded on a similar scale to 4 or 5 other regions across the UK.

Monitoring arrangements

The programme is closely monitored by the project partners, regular steering group meetings are kept informed on participants' progress on the courses, absenteeism and any other relevant issues.

Impacts and Value added

The impacts of the pilot are not yet clear but it is hoped that the programme will:

- bring 13 young people into the energy sector;

⁵⁸ GCSE's are usually taken at age 16 and achieving 5 GCSE's at grades C or above is regarded as a benchmark of average achievement.

- lead to an expanded programme in the East of England and in other regions;
- test and develop a new qualification to QCF accredited status; and
- to contribute to alleviating skills shortages in the sector caused by a lack of new entrants and an ageing workforce profile.

It should also add value in giving young people the ability to make informed choices about progression in the energy industry and raise the profile of the industry as a career choice for young people.

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4.3 Netherlands

4.3.1 Van Gansewinkel Groep

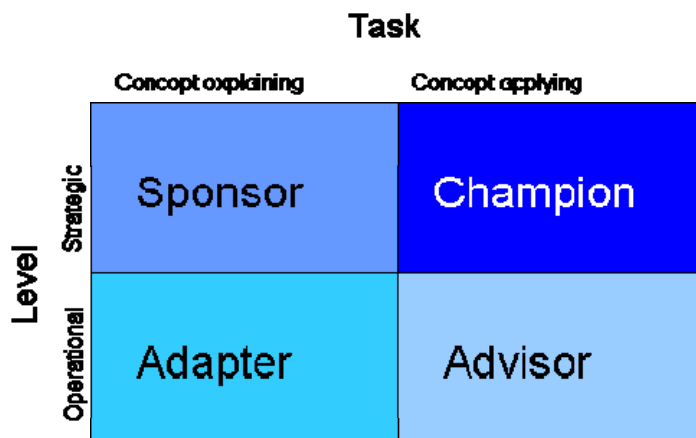
Introduction

The Van Gansewinkel Groep is started as a waste-disposal company in the Netherlands in 1974. Today, still headquartered in the Netherlands, the Van Gansewinkel Groep is a provider of waste services, as well as a supplier of raw materials and energy. This company is the largest private waste collecting company in the Benelux area. Moreover, the Van Gansewinkel Groep is active in Czech Republic, Poland, France, Hungary and Portugal. Their 6000 employees realised a yearly revenue of €1.2 billion in 2009. The Van Gansewinkel Groep includes the subsidiaries Van Gansewinkel, Coolrec, Maltha and AVR.

The Van Gansewinkel Groep is a supplier of raw materials and energy due to a strategic management decision to adopt the Cradle to Cradle (C2C) concept. Central in this concept is the view that products are composed of materials that are recyclable, or degradable for new, similar or high quality products. The Van Gansewinkel Groep, originally a waste management company, is perfectly situated to close the loop in the C2C concept, and created thereby economic prosperity and contributed significantly to an improved environment.

The Van Gansewinkel Groep has a joint venture agreement with Prof. Dr. Braingart, the founding father of the C2C-concept, and his organisation Environmental Protection Encouragement Agency (EPEA). As a response to fully incorporate the C2C-concept into the company, the Van Gansewinkel Groep created the programme “Cradle to Cradle opleidingen” to train its personnel. Within this programme, there are four different training forms based on what the specific task and level of the participants within the C2C will be. In other words, the four trainings are aimed at different target groups. These are schematically graphed in the box below:

Figure 4.1 The four C2C trainings



Funding of the programme

This programme is mainly financed by the Van Gansewinkel Groep self. However, for some of the employees a part of the training costs are subsidised by the government. This subsidy is targeted at the lower employment scales of the collective labour agreement. This results in a subsidy of €25 per day for more or less 33% of the participants. The programme itself was launched in the end of 2008 and an end date is not specified. Below, the four trainings that constitute this programme are described in more detail.

The training programme consists of four different courses which are described in more detail below.

1. Champion training course

This training is orientated at managers and heads within the Van Gansewinkel Groep. The people that have successfully finished the course are responsible for C2C within regions or specific (sub)-divisions. They actively propagate the C2C-concept towards both colleagues as well as clients. In addition, champions conduct a number of C2C projects and guide advisors by applying of the C2C-concept in their duties.

Champion - Target group

This training is targeted at the following list of people:

- Sales managers;
- Senior account managers with an affinity for C2C;
- Sales directors;
- Waste management directors;
- Directors Coolrec, Maltha, Ecosmart and A7G; and,
- Other employees in the top 200 of the company who would like to contribute directly to C2C.

Champion - Training facilitation

EPEA is facilitating this training due to their expertise in C2C, and education and training. The trainings are in the EPEA office in Hamburg, Germany. The training has a capacity of 160 people, divided over 8 groups, and will take 5 days. The costs are €2.500 per participant excluding travel, lodging and billable time spent.

Champion – Training Goals

After having successfully finished the training the participants have/are;

- A general picture of the C2c-concept, both broad as well in detail;
- Detailed knowledge of, and skilled in, C2C methods;
- Capable of conducting material flow analyses;
- Contributing actively to C2C applications within the Van Gansewinkel Groep across the board, ranging from a strategic to operational level;
- Knowledge and skills to apply C2C in their own activities as a structural element;
- The ability to convey the C2C-concept to their colleagues in theory and practice;
- Functioning as so-called “C2C-ambassadors”, on the inside and outside of the company; and,
- Access to, and actively maintain, a network of other champions, who collectively expand the C2C-concept within the Van gansewinkel Groep.

Champion - -Evaluation and monitoring

The training has an exam in the form of a presentation of a case study. If the participant finishes the case study successful, they receive a certificate which is being recognized by both the waste and public sector. However, if the champions leave the company, they loose their certificate.

The training groups come together periodically (4-6 times a year). This to improve the sharing of best practices, further developing knowledge and to reflect on the contribution to the C2C-concept in the Van Gansewinkel Groep.

Champion - Training Results

Although the trainings started only recently, there are some effects and results already. The waste is managed better, leading to a more efficient production of raw materials and generation of electricity. In addition, although not easily measurable, it is thought that their business has expanded due to a greener image.

Moreover, champions have developed a pro-active attitude towards the C2C concept. Because they have learned to see C2C business opportunities, the Van Gansewinkel Groep is engaged with a wide variety of partnerships with other companies and organisations. Not only champions who are creating new business, but sponsors, adapters and advisors have contributed to this result as well, mainly by their practical knowledge or supporting role. A few examples of these partnerships are detailed below.

The Van Gansewinkel Groep is working together with Philips for over a year. The development of C2C products is a difficult and complex process according to Mr. Slob, manager sustainable solutions and champion. He said that together with Philips the Van Gansewinkel Groep created some design rules, so that at the end of life phase of a product, the materials can be recycled more easily.

Another example is the collaboration with Van Houtum Papier. According to their CEO, Henk van Houtum, Van Houtum Papier does not have the knowledge of the logistical process associated with recycling of paper. Hence the working together, and due to the

training of the Van Gansewinkel Groep personnel, Van Houtum Papier has a constant input of old paper which is being transformed in toilet paper and tissues.

2. Sponsor training course

The people that have successfully finished this course are safeguarding the C2C-concept within regions or specific (sub)-divisions. They enunciate the C2C philosophy towards colleagues as well as clients and potentials. The difference with champions is that sponsors do not have content-wise tasks with regard to C2C. They have a more guiding, facilitating and sustaining role.

Sponsor - Target group

This training is targeted at the following list of people:

- Other groups managers;
- Operation managers;
- Middle managers; and,
- Staff specialists.

Sponsor - Training facilitation

The training is facilitated by a group of champions and representatives of EPEA. The trainings are in the Van Gansewinkel Groep main office in Eindhoven, the Netherlands. The training has a capacity of 50 people, divided over 4 groups, and will take 2 days. The specific costs are unknown, but are likely to be somewhere between €500 and €1.000 per participant.

Sponsor – Training Goals

After having successfully finished the training the participants have/are:

- A general picture of the C2c-concept;
- Knowledge of the C2C-methodology;
- Knowledge of a number of specific C2C cases;
- Able to make a translation of the C2C philosophy to their own organisation;
- Contributing from their own expertise or specific role to the development of the C2C-vision within the Van Gansewinkel Groep; and,
- Fulfilling a creative role for the realisation of the C2C goals within the Van Gansewinkel Groep.

Sponsor - Evaluation and monitoring

The training has an exam in the form of a presentation of a typical case study. If the participant finishes the case study successful, they receive a certificate which is being recognized by both the waste and public sector. However, if the sponsors leave the company, they loose their certificate.

Sponsor – Training Results

There is not an active monitoring process in place and it is unclear what the specific results and impacts are other than mere awareness.

3. Advisor training course

The people that have successfully finished this course are called advisors. These are (sales) employees that apply the C2C methodology in their daily work. It is possible that advisors, sometimes under supervision of a champion, conduct simple C2C projects.

Advisor - Target group

This training is targeted at the following list of people:

- Sales employees;
- Account managers;
- Project managers; and,
- Product managers.

Advisor - Training facilitation

The training is facilitated by a group of champions and representatives of EPEA. The trainings are in the Van Gansewinkel Groep main office in Eindhoven, the Netherlands, or if necessary on location. The training has a capacity of 175 people, divided over 15-20 groups, and will take 3 days. The specific costs are unknown, but are likely to be somewhere between €1.000 and €1.500 per participant.

Advisor – Training Goals

After having successfully finished the training the participants have/are;

- A general picture of the C2c-concept;
- Familiar with the C2C methodology and have a set of tools at their disposal;
- Known with the C2C-vision and goals of the Van Gansewinkel Groep;
- Recognise C2C opportunities in their daily work;
- The ability to inform and enthuse (potential) clients; and,
- Able to have a discussion with a (potential) client about the application of the C2C concept within its organisation.

Advisor - Evaluation and monitoring

The training does not have an exam or certificate. There is not an active monitoring process in place.

Advisor –Training Results

It is thought that besides awareness advisors contribute to actively promoting C2C opportunities within the Van Gansewinkel Groep and outside. The people have learned very practical skills. One example of the results of these newly learned skills is EcoSmart, a subsidiary of the Van Gansewinkel Groep. Due to advisors, EcoSmart is able to improve recycling of waste within other companies and organisations by sending some of the advisors on secondment. They collect all the waste from the working areas, whereby the percentage of refuse waste is reduced from 60% to 25% on average. Although this waste is incinerated whereby electricity is generated, recyclable waste is being reused without the need for new raw materials. Some of the companies produce only 10% of refuse waste, and recycle 90%. Due to the advisor C2C training programme, EcoSmart has been able to expand their business to 60.000 working areas in the Netherlands.

4. Adapter

The people within the Van Gansewinkel Groep that do not have an active role with regard to C2C, but are still interested in this concept can become adapters.

Adapter- Target group

All other employees

Adapter - Training facilitation

The employees are being informed by means of a C2C film, book and presentation of champions and sponsors. The specific costs are unknown.

Adapter –Training Goals

The main goal is that all employees of the Van Gansewinkel Groep are generally familiar with the C2C-concept and the goals and ambitions.

Adapter - Evaluation and monitoring

The training does not have an exam or certificate. There is not an active monitoring process in place.

Adapter – Training Results

The possible impacts are hard to estimate, especially since this course has not yet begun. The main result the Van Gansewinkel Groep is hoping for is general awareness and a commitment towards company policy and the C2C concept.

4.3.2 Case Study: Workshop “Vis en Duurzaamheid”

Based on interview with Lia Mercx – Van Dongen, product manager SVO, co-organisator of the workshop “Vis en Duurzaamheid”.

Background

SVO is a Dutch company that provides vocational education in the fresh food sector for over 100 years. Their business includes the training of butchers, poultrymen, supermarket personnel and greengrocers. STIVAVI, part of SVO, is specialised in the fishing sector. They are offering both complete courses vocational education as well as short trainings for the fishing industry and fish retailers.

Stichting De Noordzee (foundation the North Sea) is an independent nature and environment organisation, devoted for the sustainable use of the North Sea abundant with fish, dolphins and other marine life. The spearheads of their organisations are shipping, sustainable fisheries, marine spatial planning, renewable energy and nature protection.

The Marine Stewardship Council (MSC) is an international non-profit organisation, eco-labelling sustainable fisheries. The environmental certificate they give is rooted in the code of conduct for sustainable fishing as postulated by the Food and Agriculture Organisation and the United Nations in 1995.

The Productschap Vis (sector organisation fish) is the Dutch sector organisation for fish. It has the legal task to look after the best interest of the whole sector and act as a spokesperson towards the government. The main activities include assisting in Dutch and European policy making, conducting and supervising research and designing information campaigns.

The Verbond van de Nederlandse Visdetailhandel (VNV; Union of the Dutch Fish retailing sector) is a sector organisation for the Dutch fish retailers specifically.

Case description and drivers for the programme

Fish and sustainability are receiving more and more attention. The demand for sustainable fish is increasing and the fish retailing sector reports more questions related to the sustainability of its products. A number of fish shops are selling and promoting sustainably caught fish already in the Netherlands, but there could be more. Moreover, consumers are getting accustomed with sustainable fish available in supermarkets.

SVO/STIVAVI, Stichting de Noordzee, MSC, Productschap Vis and VNV recognised the importance of knowledge about sustainable fish in the fish retailing sector and decided to jointly organise the one-day workshop ‘Vis en Duurzaamheid’ several times in 2009 and 2010.

Goals of the programme

The overall aim of the programme is to raise awareness and build knowledge about the sustainable fishery sector in the Netherlands. More specifically, the workshops expounded on the following topics:

- Status quo regarding the sizes of the different fish stocks;
- Information about different catching techniques and the pros and cons of fish farming;
- Eco-labelling and certificates;
- Buying-in policy and knowing your suppliers; and,
- Learning communication and promotion skills.

Target group

The workshop is aimed at entrepreneurs and employees in the fish retailing sector. The capacity per workshop is between 12 and 15 participants.

Costs and funding of the programme

In 2009, the costs of the workshop were € 100,- per participant, with a reduction of € 25,- if the person was a member of VNV. The workshop was funded by the five organisations, without any subsidies from the government.

Accessibility

No specific access requirements are needed in terms of previous training.

Results and impacts

Participants received a certificate of participation. The participants have had an increase in their awareness regarding sustainable fisheries, and understand the need for sustainable fish better. This makes the fish retailers want to sell a larger share of sustainable fish than

before they participated in the workshop, buying a larger proportion of sustainable fish or even change suppliers.

In addition, due to an increase in their knowledge about sustainable fisheries regarding catching techniques, fish farming, eco-labelling and certificates, the participants can answer the questions of the customers, thereby selling more sustainable fish and informing the public.

Finally, by learning practical communication, selling and promotion skills, the fish retailers sell more sustainable fish and create extra awareness by their customers.

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4.4 Bulgaria

4.4.1 Case Study: National Programme “Renewal and protection of the Bulgarian forest”

Background

One national programme that stands out through its link to environmental skills is titled ‘Renewal and protection of the Bulgarian forest’. It was launched in 2003 in the context of massive fires that destroyed substantial forestry massifs in the last years. In particular, it is expected that given the currently ever growing amplitudes in the temperature and the cyclical nature of very dry periods followed by periods with rainfall way above average, wildfires will become even more critical, growing in number, intensity and duration.

Case description and drivers for the programme

Against the background of wildfires and the serious damage that they cause to the ecosystem, there was an increasing realization that a programme that involves two groups of stakeholders: the contracting authorities, which are the National Forestry Agency (NFA), as well as state forestry and hunting enterprises, national parks and private companies that act as contracted parties to carry out the programme. The aim of the programme is twofold: it seeks to ensure placement for unemployed people, and in the same time to promote working skills and habits in especially with regard to environmental and sustainable skills so as to increase their future placement chances. In addition, it should be noted that Bulgaria has substantial problems with illegal logging.

The programme encompasses employment opportunities for all areas of forestry, with trainings foreseen for following aspects:

- Cleaning of areas damaged by wildfires;
- Soil treatment and preparation after wildfires;
- Re-forestation;

- Support for natural resumption of impacted areas;
- Logging and paring;
- Forestry protection;
- Activities in forest nurseries;
- Monitoring for wildfires;
- Monitoring for illegal logging and hunting.

Trainings are carried out on the spot by the contracted companies, depending on the specific activity they want to engage in. The application documents for companies willing to participate in the programme do not specify in detail elements, duration or requirements for the trainings and they are evaluated on an ad-hoc basis. The lack of clear description and requirement for training courses does not, however, undermine the importance of the availability of such programmes for the financing decision on the side of the contracting authorities. However given regional landscape, forestry and wildlife differences, skills needs differ. For instance, in Northern Bulgaria (Varna region), projects under the programme include trainings and placements for 640 wildfire-specialists and forest rangers, which are rather preventive measures, whereas in Southern areas a particular issue are trainings and work places connected to re-forestation with certain trees and cultures that were especially impacted by wildfires.

Goals of the programme

The goals of the programme are formulated as follows:

- Ensuring full- or part-time placements for up to one year in the encompassed aspects of forestry and wildlife that lead to improvement and development of the environment situation in the country;
- Improvement of employment adaptability of programme participants through their inclusion in activities that lead to improvement of their qualification;
- Creation of social motivation of the participants for employment realization and established working relationship.

Target group

A condition for inclusion in the programme is registration as unemployed. A priority target group are the Roma minority, as well as unemployed that do not qualify any longer for monthly social assistance. Long-term unemployed are also stated as a priority target group. Up to 50% of the total participants should hold relevant prior qualification, yet priority is given to low-skilled workers. There are no requirements for education level.

Funding of the programme

The programme is carried out on the basis of subsidized employment, with split financing between MLSP and NFA. The MLSP grants a maximum amount granted to contactors 200 leva (ca. 100 Euro) per person working full-time. Trainers engaged in the programme through the contractors also receive an additional amount of 140 leva (ca. 70 Euro). NFA covers the difference between the subsidy by MLSP and the actual salary of the participants. It also ensures all kinds of additional financing needed, such as means for working equipment (including working uniforms); funds for paid vacation leave; and finally all social security contributions of the participants. With regard to trainings, applying companies can list costs for all foreseen trainings, and their financing is also covered by NFA on an ad-hoc basis.

Total funding for the programme has declined significantly (see Table 1). Beginning of December 2009 information in the media surfaced that funding for the programme will be stopped because of the more than 50% cut in spending for ALMP-measures for 2010. No further statements have been released to discuss the programme in detail.

Table 4.1 Total state funding for Programme "Renewal and protection of Bulgarian Forest", in Lev

	2005	2006	2007	2009
Total spending (EA + MSLP)	6 413 108	7 692 839	3 728 328	2 616 024

Accessibility

Apart from the requirements with regard to the target group/ participants, there are also certain requirements that apply to the contracting companies/ employers. Priority as employers is given to state forestry and hunting enterprises. A specific condition for private companies is that they offer such placements, which cannot be subsidized in parallel programmes.

Results

There are no certificates for trainings on environmental skills or similar are necessarily granted to the participants, even though in some cases people that received a specific training through the contractor have issued statements of participation (e.g. for forest rangers). In the same time, proven working record in the specific areas connected to forest and nature preservation and development serve as a basis for further development in the field. One should also consider that participants are mostly long-term unemployed people with minority status and hardly any prior working experience, thus targets for the accomplishments of the programme are set rather moderate.

Monitoring arrangements

Monitoring is carried out on a permanent basis, with particular emphasis on quality and efficiency for financed projects. Also, compliance with labour law and labour safety protection requirements is monitored. Each year, MLSP and NFA conduct a report for the activities under the programme, including a financial statement. The report also contains challenges encountered throughout the year as well as measures proposed to meet those challenges. On the basis of the report, suggestions for changes in the mechanism and the scope of the programme are made to the Minister of labour and Social Policy. However, the reports are not publically available, and inquiries in the corresponding implementing bodies were left without a reaction, so that the actual monitoring of the programme cannot be confirmed in practice.

Impacts and value added

A total of 1760 places were subsidized through the programme in 2009, all of them directly connected to environmental protection. It is difficult to present data on employment status of participants after completion of the programme, especially since the monitoring reports are unavailable. It should be noted that the programme implicitly targets such people who have been engaged in illegal logging. Therefore, a crucial impact

of the programme is the promotion of environmental awareness and the formation of skills connected to the environment.

4.4.2 Case Study: Overgas- More knowledge for clean energy

Background

Natural gas has only recently been introduced in Bulgaria as a heating source. Compared to other major heating sources in Bulgaria, such as coal and electricity, natural gas is considered to be not only cheaper and more convenient, but also more environmentally friendly. Consequently, in the last years, there is a widespread expansion of its utilization at the domestic level, and most of the major cities are currently in the process of establishing gas distribution networks for domestic end-users.

Case description and drivers for the programme

Overgas is the biggest Bulgarian company for natural gas, covering about 85% of the total gas market in Bulgaria. The company has a very explicit and pronounced environmental policy, and carries out a number of initiatives for the promotion of environmental protection. With the expansion of its gas networks, Overgas increasingly felt lack of skilled and experienced technicians and general personnel to meet the growing market needs. In particular, the company recognized that professions and skills connected to gas heating installation and systems are represented in the education and training sector only to a limited extent. Therefore, Overgas explains its motivation for offering the current programme to be driven both by ecological concerns as well as through the realization of future skills shortage on this market and the urgency of upgrading of professional qualification with regard to gas heating. The programme is closely related to the profession “Gas heating installer”, yet it contains substantial management training as well.

The programme is offered in collaboration with Gaztech, which is a licensed professional training centre, EA, as well as Operational Programme ‘Human Resource Development’. Teachers for the programme stem from the Overgas staff; from Gastech; from two technical universities, as well as from elected sub-contractors. The overall duration of the project is 12 months. A total of 39 rounds of training are foreseen, with 6 of them lasting 2 days, and the rest lasting three days. The compulsory modules include:

- Management of gas distribution company;
- Construction of gas heating installations;
- Installation;
- Gas distribution networks;
- Operational management of gas distribution networks;
- Working with clients;
- Fundamentals of gas heating processes.

In addition, every participant has to choose one of the following modules:

- Mastering of management skills;
- Improving team effectiveness and conflict-solving;
- Team-work and effective communication skills;
- Pro-active selling and conflict-solving.

Goals of the programme

The general aims of the “*More knowledge for clean energy programme*” are as follows:

- Investment in human capital;
- Lifelong learning and personal and professional development;
- Increasing effectiveness and efficiency of work processes.

In addition, specific goals are identified:

- Ensuring skilled labour force for realizing the company mission, policy and goals of Overgas;
- Provision of additional, skills enhancing training connected to gas heating systems, which reflects the conditions of fast-changing technological environment;
- Development and mastering of skills, knowledge and competencies of Overgas staff as a pre-condition for sustainable employment;
- Retention of workplaces of participants in the programme at least for one year upon completion of the programme.

Target group

The target group of the programme are already employed people, working for Overgas and its operating companies. Selection is made from the direct managers of the employees, whereas final approval for participation is given by the executive managers of Overgas or its operating companies. In addition, for the first round of the project, the company has selected two highly talented students from the Technical Universities involved in the training.

Funding of the programme

The total costs for the project amount to 153.485 leva (ca. € 77.000). Funding is shared between Operational Programme “Human Resource Development” and Overgas, with the former covering 70%, and the latter 30% of the costs. It is estimated that costs per person amount to 760 leva (ca. € 375), and Overgas additionally covers all transportation and accommodation costs, with which total costs add up to about 1000 leva per participant (ca. € 500).

Accessibility

Apart from being already employees of Overgas, a further condition for enrolment is that participants have completed at least secondary education.

Results

A total of 215 people are expected to undergo the trainings in the programme. End of January 2010 the first batch of 43 people successfully completed the programme. The trainings end with the granting of a certificate for part of the licensed professions from the NAVET catalogue “Installation of energy equipment and networks”, and/ or “Gas technician”.

Monitoring arrangements

After every module, participants have to pass an exam in order to receive a certificate of completion. For some the elective modules, tests in the form of a case-study solving are

foreseen. At the end of the programme, every participant has to fill out a satisfaction survey in order to monitor effectiveness of the programme.

Impacts and value added

Results of the programme so far are highly positive. All participants have successfully passed the exams, and have improved their qualification. Value added of the programme is considered to be very high, as it develops rather unique practical skills connected to actual shortages the by far most important environmental development at the Bulgarian heating market. It has to be noted that the booming of gas heating in the country, which currently amounts to only 3% is estimated to decrease harmful emissions by 8%, and to increase energy effectiveness by 8%.

4.5 Germany

4.5.1 Case Study: B.E.E. - A career-long skills training and coaching program for energy efficiency managers (B.A.U.M. e.V.)

Background

The Bundesdeutsche Arbeitskreis für Umweltbewusstes Management e.V. (B.A.U.M. e.V. / German Environmental Management Association) was founded by a group of Hamburg-based entrepreneurs in 1984. Since then over 500 companies of all sizes and from all sectors have joined forces in B.A.U.M. Thanks to this, over the years B.A.U.M. has grown into the European business community's largest environmental initiative.

B.A.U.M. initiates practical projects, takes part in application-oriented research, conducts major media-oriented campaigns to promote sustainability, organizes events, provides platforms for networking and dialogue between the business community, scientists, politicians and non-profit organisations. This work is complemented by a wide range of information services and publications.

Case description and drivers for the programme

Against the background of rising energy prices and climate change, energy efficiency is a key aspect for reducing costs for businesses as well as an active contribution to climate protection and a way towards a sustainable business success.

The professional training and coaching program B.E.E. (Betriebliches Energieeffizienz-Programm - Corporate Energy Efficiency Program) helps especially SMEs to obtain the necessary in-house skills and experience to permanently reduce energy consumption and costs. Apart from imparting technical knowledge, employee motivation and participation form the second focus of the program. Only the link between technology and motivation as well as organisation can ensure the aim of a more energy efficient company.

In addition to increasing energy efficiency and the operational capacity within companies, participating companies also benefit from regular information and experience exchange in regional networks, and the access to more information from the network of the The Bundesdeutsche Arbeitskreis für Umweltbewusstes Management e.V. (B.A.U.M. e.V. / German Environmental Management Association).

The qualification program consists of seven modules. For each module, participants will receive study and work materials. They serve as supporting documents for the presence during seminars, for independent study and work during operation. In addition, support by B.E.E. coaches is given.

The B.E.E. program has the following scope:

- 2 x 2 days of classroom training;
- 2 half-day on-site counselling appointments by experienced coaches within the company;
- Self-study on technical energy topics (per topic max. 4 hours);
- Exchanges with other B.E.E. participants in an online community;
- Guidebook for the implementation within the company (duration 6 months);
- Additional support from B.E.E. coaches via phone, email and chat;
- Support staff in the company on demand.

The programme was developed by B.A.U.M. e.V. and the B.A.U.M. Group, which has successfully consulted over 1,200 companies with regard to environmental and climate advice in recent years.

Goals of the programme

The B.E.E. programmes aims to accomplish the following goals:

- Development of operational capabilities for energy efficiency:
 - Development and implementation of technical measures;
 - Development of organizational and motivational structures to ensure the sustaining of the energy-efficiency measures;
- Practical support for on ground implementation;
- Regular information and experience exchange amongst the regional networks;
- Access to more information and opinion sharing through the B.A.U.M network ;
- Ways to represent the acquired skills and energy-related measures.

Target group

B.E.E. is an effective training and coaching program for people who want to stand up for energy efficiency in the company and need to acquire the necessary skills.

The programme is designed for commercial or technical staff, engineers, facility managers, energy and environmental representatives, plant managers, technicians and property managers from all over Germany. From autumn 2008 onwards, the programme was first offered in the pilot regions of Aachen, Westphalia, Ebersberg, Hamburg, Berlin and Lüchow-Dannenberg and will be extended to further regions shortly. .

Funding of the programme

In 2008, The German Nature Conservation (DNR) launched the nationwide campaign "Energy Efficiency - now!" The campaign is funded by the German Federal Environmental Foundation. The training and coaching program B.E.E. is part of this campaign.

For the project, all major German environmental associations, e.g. the German environmental conservation ring, German Environmental Aid, Öko-Institut, BUND and BAUM have joined forces. The aim of the project is the development of energy-efficiency potentials in the domestic SME sector.

The entire project was divided into several modules, each of which is handled by the responsible organization involved. B.A.U.M. is responsible for the training module ``energy efficiency`` for SMEs. Companies are supported and encouraged to discover new and make use of exciting energy efficiency potentials.

The B.E.E. program is financially supported by the German Federal Environmental Foundation. Therefore it can be offered at a reduced price of 2,500 € net (B.A.U.M-members pay € 2,000). For several participants from one company the second application pays a reduced fee of € 2,000.

If participants come from the state of North Rhine-Westphalia they have the opportunity to pay for part of the course with the "education voucher", the public funding mechanism for educational trainings by the federal state of NRW described above.

Accessibility

The programme is open to all SMEs which are eager to improve their energy efficiency performance and to all employees which are responsible in some manner for the energy performance of the company. The registration is possible via an online platform.

Results

An award is given to the energy-efficient company which can then be used for presenting and promoting the company. Conditions for the award are an energy analysis, a plan of measures and first implementation successes. No proper examination is required

Monitoring arrangements

The BEE programme meets the requirements of the German Federal Law of distance learning (FernUSG) and was approved by the National Center for Distance Learning (ZFU) under the number 7203309 as an official correspondence course.

The Institute for European consumer policy and consumer behaviour at the SRH Hochschule Calw is responsible for monitoring and evaluating the programme. The institute's research focuses on the areas of consumer policy (national / European), consumer information and communications, consumer information and advice, consumer research and consumer behaviour (sustainable consumption and production, consumer co-producers, Behavioural Economics) in deregulated markets.

Impacts

Until today 30 individuals, on behalf of their companies, have completed the B.E.E. programme since the end of 2008. Currently more than 40 participants are enrolled in the programme.

As it is only possible to measure the success of most of the energy efficiency measures after a certain operating time, it is not possible to provide a quantitative overview of the

total energy saving impact of the B.E.E. programme yet. However, the examples of the B.E.E. trained energy efficiency managers at the congress centre Halle show a precise impact of multiple energy saving approaches.

- The lightning in the halls is equipped with energy-saving halogen light bulbs which reduced costs by 30 percent and the annual CO2 emissions by 8.6 tons.
- The water in the tank of the sprinkling system, located in the middle of the hall, is used to cool the place. Supported by a small refrigeration unit, using only 430 kilowatt, a pleasant climate is achieved by using three times less energy as with normal air conditioning equipment.
- In addition, the energy efficiency managers exchange flickering neon-lights as the broken filament uses 200 instead of the usual 65-watt.

Value added

As part of a unique cooperative project ("Energy Efficiency - now!") the B.E.E. programme will inform people from different economic sectors and enable them to act in order to save energy. In the light of the political objective, to reduce the national energy consumption by 9 percent by 2017, the B.E.E. programme presents a clear added value to achieve this objective.

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4.5.2 Case Study: Deutsche Bahn Umweltzentrum and Deutsche Bahn Training – Environmental Protection and Energy Saving Training

Background

With about 230,000 employees, the DB Group is one of the largest employers in Germany. Privatized in 1994, the company has become one of the leading international transportation and logistics service providers.

Case description and drivers for the programme

In order to develop the competitive advantage of being the most environmentally friendly means of transport further, the DB Group sees the education and training of its employees in the field of environmental skills as an essential part of its activities. All employees are trained in order to understand the impact of their daily work on the environment and how they can contribute to environmental awareness and protection.

With the DB Environmental Center, the company has created a group-wide platform for environmental concerns. The environmental centre coordinates the implementation of environmental policies and programmes. It is the goal of the centre to raise environmental

awareness among employees of the company and provide them with practical information and skills on how to improve the environmental performance of the company. In-depth training in environmental protection also provides for the necessary legal certainty and compliance. Therefore, the company offers a variety of technical training seminars on environmental issues to employees who are engaged with tasks of environmental protection in their daily work. The DB environmental centre provides the guidelines and principles of environmental skills trainings, information and coaching events. Each company wide business unit can then decide individually for which training or course a demand exists. Very basic environmental awareness information campaigns, such to use less paper in offices, are carried out companywide.

In practice, the actual training offers are mostly carried out by the company unit DB Training and are targeted at specific employee groups. Foundation courses provide an insight into technical and legal aspects. Throughout continuous courses the participants will receive complementary and constantly updated knowledge. In the course of the seminars, all major environmental issues with regard to the company activities are addressed. Topics include environmental management, energy efficiency, recycling-, waste- and water-management, pollution control and vegetation management.

The DB Environmental Center ensures that environmental issues are integrated into other vocational trainings as an integral part. Through delivery of materials and workshops it supports trainers of DB Training to include environmental aspects in their seminars.

Underpinning the focus on environmental trainings, the DB Group provides a variety of additional information to employees. Environmental information newsletters are regularly published on the group's intranet, informing briefly about issues like climate change or noise.

The DB Environmental Center also informs young trainees in the company, as environmental awareness and protection are regarded as aspects of great relevance to every company department. Even the welcome folder which is presented to each trainee draws attention to the important issue of environmental protection. One part is the brochure "Heading for the environment with Deutsche Bahn" which provides interesting tips on environmentally friendly behaviour.

The overall approach of the training programmes addresses the following aspects::

- Organization of environmental protection at the DB Group;
- Legal framework of environmental protection;
- Pollution control;
- Train hygiene, noise, vibration and clean air management;
- Contaminated soil disposal management;
- Water conservation and vegetation management;
- Radiation control;
- Energy efficiency and savings;
- Environmental information system of the DB Group.

The duration of trainings differs depending on the course and level. In general trainings last between 1 and 3 days.

Goals of the programme

It is the goal of the extensive environmental education program of the DB Group to train employees with regard to internal environmental standards and provide them with knowledge and skills to comply with the relevant legal, regulatory and technical standards and implement them effectively throughout the entire company.

Target group

Trainings are open to all employees who need to possess basic environmental knowledge and skills for their work within the DB Group. The need for such trainings is assessed within the different business units independently. Especially maintenance engineers, planners, buyers, controllers, trainees and aspiring managers in environmental protection are participating in trainings.

The training programmes are also offered to employees of sub-contracted firms (e.g. in the area of waste disposal) in order to ensure that these companies also comply and implement the environmental standards of the DB Group. Prior to contracting a company outside the DB Group, these contracted entities have to go through a pre-qualification test with regard to environmental compliance to DB environmental standards.

Funding of the programme

All trainings, information campaigns and coaching events in the area of environmental skills and awareness building are completely funded by the DB Group. A company intern system of payments exists and business units (e.g. DB Regio, DB Fernverkehr) have to pay DB Training for the particular trainings.

In addition, all trainings and courses are offered to employees within working hours.

Trainings provided to individuals and companies which are not employed by the DB Group are charged.

Accessibility

No specific access requirements are needed further than being an employee of DB Group or of a firm interested in the trainings of DB Training. Whether an employee is eligible to a specific training has to be decided within the particular business unit.

Results

30 different basic and advanced seminars in environmental management, energy efficiency and saving, waste management, nature conservation, soil conservation and other topics related to environmental and rail-specific issues are offered by the DB Environmental Centre together with DB Training. In 2008, nearly 40 environmental seminars were conducted, and thus about 450 DB-employees, who are entrusted with environmental tasks specifically, were trained.

Participants receive an overview of all important technical and legal areas of environmental protection and their application and implementation of the DB Group.

Monitoring arrangements

All measures (including training programmes) towards environmental protection are incorporated into a company-wide environmental action programme, which is updated annually and adopted by the companies Environment Committee. The implementation of the environmental programme is monitored by a monitoring committee which reports to the companies Environment Committee.

In addition, the DB Group – a former state owned enterprise – has to comply with the standards and requirements for environmental skills trainings set out by the Eisenbahnbundesamt (Federal Railway Authority). One requirement is that at least every 2 to 3 years, an employee has to re-fresh his or her knowledge with regards to environmental skills.

Impacts and value-added

All environmental training programmes and environmental skills seminars have an impact on the environmental performance of the DB Group. Some impacts are rather difficult to quantify as they also provide the employees with legal skill related to environmental aspects. Other training programmes, for example the skills project “Driving energy efficient” do show a large impact.

DB Training offers the train drivers of interested business units the opportunity to improve their way of driving in a driving simulator which immediately depicts the changes in energy consumption, depending on the manner of driving.

In 2002 the DB started to train its engine drivers how to drive energy efficient. Since the beginning of the project more than 270 million kilowatt hour’s electricity and 9.5 million litres of diesel fuel have been saved. Including passenger and freight transport, the programme has saved more than 250,000 tonnes of CO2.

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4.5.3 Case Study: Deutsche Telekom Eco-driving trainings and “Fleet Energy Trophy”

Background

The Deutsche Telekom AG is one of the world's leading service companies in the telecommunications and information technology industry.

As an internationally oriented company, Telekom is represented in around 50 countries. More than half of the Group's turnover is generated outside Germany. Overall, the company employs approximately 260,000 employees

The Deutsche Telekom is committed to the principles of sustainability and sets its commercial activity on the basis of economic, social and environmental criteria. With its environmental and social performance, the Deutsche Telekom regularly occupied top positions in international sustainability ratings. Thus, since January 2008 the group covers its total electricity needs from renewable energy sources in Germany.

With approximately 10,900 students in a dozen technical and commercial occupations and nearly 500 students in dual degree programs, the Deutsche Telekom is still the largest training company in Germany. A separate quality management system ensures the consistent high standard of training at Telekom. This ensures Telekom's apprentices and students with an optimal dual career start.

The German telecom company T-Com, part of Deutsche Telekom, has approximately 30,000 service and commercial cars in operation.

Case description and drivers for the programme

Innovative technology alone is not enough in order to succeed in climate and environmental protection. Deutsche Telekom believes that the personal involvement of employees is also a key factor.

To reduce the CO₂ emissions caused by the car fleet of the Deutsche Telekom, the mobility service provide of the group, DeTeFleetServices, initiated a comprehensive package of measures.

- In order to reduce the emissions of the entire car fleet, the company car portfolio was changed towards consumption and low-emission company cars;
- In the car rental business DeTeFleetServices only rents new cars with maximum emissions of 130 grams of CO₂ per kilometre. For the year 2008/2009, the average emissions of the rented company car fleet was then at 133 g CO₂ per kilometre.

The steps to optimise the fleet were accompanied by measures to alter the individual driver behaviour. Thus, for example, the fuel consumption is consistently monitored. Each company car driver receives an individual consumption feedback in form of a traffic report. With above-average fuel consumption, the drivers receive the "red card". Comprehensive information on ways of how to save fuel supplements the offer.

In October 2008, a pilot project called “Ökofahrtraining” (Eco-driving training) for drivers of commercial vehicles was set-up. It consists of theory and driving experience.

The results were very positive. Therefore, from 2009, all group units of Deutsche Telekom are encouraged to offer the training to employees.

The fuel saving contest "Fleet Energy Trophy" for drivers of commercial vehicles underlined the potential of such measures. The approximately 100 participants saved an average of 8.36% of fuel over the period April-December 2008 compared to the same period a year before.

Goals of the programme

It is the aim of the programme to raise awareness and build knowledge with regard to safe and economically beneficial driving techniques and also change the driving behaviour towards an energy saving one.

Target group

Trainings are open to all employees using company vehicles or driving to work by car.

Funding of the programme

Funded by T-COM.

Accessibility

No specific access requirements are needed further than being an employee of Deutsche Telekom.

Results

Some results were already mentioned above. In addition it can be stated that, during the pilot phase of the training in 2008, which was carried out for employees of the T-COM unit in the region of Schwäbisch Hal and lasted 6 months, 183 vehicles saved 8,000 litres of fuel and therefore reduced CO₂ emissions by 21,120 kilograms. This represents a percentage of about 7.25%.

Monitoring arrangements

Since 2005, the Deutsche Telekom has a central organization for all compliance and monitoring issues. It supports entrepreneurial action in questions of values and compliance management as well as governance of certain tasks, including environmental skills trainings. It also formulates the group's overall compliance standards and coordinates the company's anti-fraud management.

Impacts and value-added

See above.

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4.6 Poland

4.6.1 Case study 1: The Sendzimir Foundation – ‘Challenges of sustainable development in Poland’ (summer school)

Background

‘Challenges of sustainable development in Poland’ is a programme offering three-week courses that have a form of a field summer school. It has been organised by the Sendzimir Foundation in Poland every year since 1998 when the first edition of the course was held. The aim of the Sendzimir Foundation is to help Polish society in finding solutions to complex environmental, economic and social problems.⁵⁹

The most important partners involved in the course organisations are: AGH - University of Science and Technology (Krakow, Poland), the Environmental Partnership Foundation (Poland), University of Florida (USA) and recently also BUP (Baltic University Programme) and the Centre for System Solutions (Poland).

Case description and drivers for the programme

The programme has a form of the summer school lasting three weeks and organised in July on an annual basis. Each year approximately 30 persons participate in the course, mainly students and PhD candidates from various academic centres in Poland and from abroad. The course combines traditional education and practical sustainable development implementation. A summer school programme consists of a theoretical part including:

- Classical lectures, seminars and workshops;
- Less conventional methods, such as e.g. computer simulations, games, Oxford debates, movies and documentaries.

as well as a practical one that includes mainly two large practical projects:

- ‘Sustainable local development’;
- ‘Sustainable business’.

The above mentioned projects consume most of the time during the course. The projects aim at promoting the application of theoretical knowledge in real situations by students. The ‘Sustainable local development’ project concerns the sustainable development issues in selected Polish local communities. The project includes, among many other, field visits, meetings and interviews and public debates with stakeholders and simulations as well. The outcomes of the project are presented in a final report elaborated by students and facilitated by the course lecturers. Within the second project, ‘Sustainable business’, the course participants deal with sustainable development issues with respect to business. They visit selected enterprises and serve consulting services on how these can introduce environmental change in their activity. Furthermore, the course participants help their case organisations become more socially responsible and develop sustainability strategies

⁵⁹ About Foundation – SENDZIMIR FOUNDATION Website, <http://www.sendzimir.org.pl/en/node/42> [Accessed on March 4th, 2010].

for them. Similar to the ‘Sustainable local development’ project, the outcomes of the project are summarised in a report elaborated by students.

The first edition of the course took place in 1998 and was one of the first educational initiatives regarding sustainable development in Poland. The main initiator of the programme was the Sendzimir Foundation who still plays the most important role in the initiative. In the beginning the main objective was passing knowledge on sustainable development that was poorly recognised and available in Poland at that time; especially it was hardly accessible for students of most faculties and academic centres in Poland. Nowadays traditional education is still a very important element of the course as Polish students, especially those of faculties which are not typically environment-related, do not get enough if any knowledge on the idea of sustainable development or ‘green economy’ issues. For examples, the study programme of architecture or construction faculty includes lectures or seminars neither on sustainable building nor on sustainable land use planning. However, currently more emphasis within the ‘Challenges of sustainable development in Poland’ programme is put on acquiring practical skills by participants as far as sustainable development implementation in Poland is concerned.

Goals of the programme

The main goal of the programme is to pass knowledge and understanding of sustainable development in order to create a group of sustainable development professionals.

However during its twelve years history the summer school has evolved and in its current shape its objectives is not only traditional education, but also:

- Combine education with initiatives towards dissemination of idea of sustainable development into Polish local communities, enterprises and public institutions;
- Train and encourage participants to undertake initiatives in the field of sustainable development, to introduce environmental change in their surrounding;
- Dissemination of good practices and solutions applied in more ‘sustainable’ countries to Poland.

Target group

The programme is addressed to people (mainly students) of very different backgrounds (e.g. environmental protection and engineering, economics, management, agriculture, architecture, social sciences, but also arts, history, journalism) who are willing to enhance their knowledge on sustainable development. The target group is diverse. Mainly these are students and PhD candidates, but also academic researchers, teachers, public and local administration representatives as well as employees of various occupations. The aim of the recruitment process is to build as diverse and interdisciplinary group of participants as possible. Other important factors influencing candidates appraisal procedure are geographical diversity and gender equity.

Until 2008 the summer school was addressed to participants from Poland only, however from 2009 it is open also for representatives of other countries.

Funding of the programme

Until 2009 the funding of the programme was mixed – the Sendzimir Foundation and participants. The programme is a non-profit initiative and the Sendzimir Foundation was

the main funding source of the course. A fee paid by participant was relatively low compared to real cost of participation per person.

In 2009 the summer school was funded by the National Fund for Environmental Protection and Water Management and DBU (Deutsche Bundesstiftung Umwelt) within a campaign 'The Challenges of Sustainable Development') implemented by the Sendzimir Foundation and its partner The Centre for System Solutions. The participation in the course was free. Such funding scheme aims at enhancing accessibility of the programme for less wealthy persons. The organisers hope to continue such funding mechanism for the next few years.

In 2010 the summer school will be financed from grants obtained from the Non-Governmental Organisation Fund set within Financial Mechanism comprising the EEA Financial Mechanism and the Norwegian Financial Mechanism.

Accessibility

No specific access requirements or restrictions as far as accessibility is concerned. Preferred candidate would be active in his environment (local leaders, students' organisations, etc.). Most preferred are students and PhD candidates.

Results

Twelve editions of the course have already been held until 2010. Approximately 360 people were trained in sustainable development and environment-related issues.

Monitoring arrangements

The course does not finish with an exam in a traditional form. The participant's performance is verified based on the quality of their work on final reports summarising the two projects. Furthermore, participant's involvement in all activities within the course is taken into account during a final evaluation process of a participant. Successful participants get a certificate of accomplishment of the course.

The quality of the training is assessed based on questionnaires filled in by participants every week during the summer school (internal evaluation).

Impacts and value added

One of the impacts of the programme is that having accomplished the course many of its participants remain active in the field of sustainable development and undertake activities aiming at dissemination of this idea in Poland. Programme alumni have established several organisations, many of them NGOs, (e.g. Aeris Futuro Foundation which mission is to prevent global change, preserve biodiversity and support local communities in their efforts to develop in a sustainable way and to promote corporate social responsibility); they also established the Polish Sendzimir Foundation. Furthermore, participants of the previous courses become increasingly more and more involved in organising next editions of the programme; they also conduct lectures within the summer school.

The programme has a significant impact not only on course participants, but also on Polish local communities and enterprises or other institutions which are partners in 'Sustainable local development' and 'Sustainable business' projects. Usually topics of the projects in Polish communities were chosen by representatives of a particular commune

or local stakeholders so that the project results and recommendations would be of utmost usefulness for them. The exemplary subjects covered by projects were as follows: sustainable water management at local level, to analyse and ‘green’ local spatial management plan, to solve local conflict resulting from designation of Natura 2000 areas in a commune. As reported, the representatives of local partners were usually very satisfied with cooperation and practical usefulness of the project summary reports they were provided with. Furthermore, local partners appreciate the fact that local stakeholders are involved in a project by means of a wide variety of activating methods such as meetings, interviews, simulations, public debates and consultations and environmental conflict resolution as well. Also ‘Sustainable business’ projects are usually very successful in opinion both of the course participants and the partner enterprises. Many of the suggestions for improvement towards sustainability were implemented in the companies who were cooperating within the projects.

To sum up, the programme results not only in enhanced knowledge and awareness of sustainable development issues among its participants but its influence is more widespread. It provides also enterprises, local communities and other institutions with practical support on their way towards sustainability and therefore contributes to building ‘green economy’ in Poland.

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4.6.2 Case study 2: The Polish Agency for Enterprise Development – ‘The national programme of trainings in the field of environmental protection’

Background

The Polish Agency for Enterprise Development is a governmental agency which has been operating since January 2001. The mission of the Polish Agency for Enterprise Development is to act for the benefit of Polish economic and social development.⁶⁰ The main objective of the agency operations is to stimulate and support entrepreneurship in Poland. Its activities involve undertaking of a wide variety of measures which are financed from state budget or the European funds. The agency operations focus on implementation of innovation policy and development of human resources and regional development as well.

⁶⁰ PARP: Polish Agency for Enterprise Development – 10 years of activity <http://en.parp.gov.pl/index/index/1513y>

Case description and drivers for the programme

The programme ‘The national programme of trainings in the field of environmental protection’ was implemented by the Polish Agency for Enterprise Development in a form of a project co financed from the EU structural funds. It was addressed to Polish small and medium enterprises. The programme lasted over two years – from April 2005 until November 2007.

The Polish Agency for Enterprise Development commissioned an organisation of trainings to contractors based on a public procurement procedure. As a result training within the programme were organised by a consortium of four companies: ABC Poland, Eko-Konsult Design and Consulting Office, The Institute for Sustainable Development Foundation and the University of Gdańsk .

The training programme consisted of two components. The first component included trainings in:

- environmental law – IPPC, waste management, environmental impact assessment, gases and dust emission, environmental charges, environmental law ABC, waste electrical and electronic equipment, (one-day courses),
- the EU Structural funds on environmental investment (two-day courses).

and consultations with specialists on preparation of environmental investment (one day).

The subject of the courses within the second component was environmental management system (ISO 14 001 and EMAS). There were three types of the courses: A – for management (two-day course), B – for quality management specialists (two-day course) and C – for teams implementing environmental management system (three-day course). Apart from courses, the second component included also individual consultations for participants of A and B-types courses. There were two restrictions concerning participation in the courses: the same person could have attended only one course within the first component and no more than two employees from enterprise were allowed to participate.

With a view to increase accessibility of the programme to employees of small and medium enterprises, trainings were held in various regions in Poland.

The incentive for the programme was a knowledge gap identified with respect to environment-related issues and environmental law among employees of SMEs. The environmental law had been changing rapidly and numerous EU directives and national acts had been adopted in a period preceding the programme implementation. Furthermore, environment-related regulations are complicated and their interpretation is difficult. As a result Polish small and medium enterprises are very often not aware of the environment-related law regulations and their responsibilities in this area. Such situation may results from limited finance resources or it may occur due to a number of other reasons such as limited number of employees and no environment protection specialist employed, lack of knowledge or insufficient awareness of ecological problems and impact of their operations on environment. Moreover, SMEs are less likely to invest in

their employees, especially in areas of low priority and usefulness (in their opinion), which does not refer to their core business operations.

Goals of the programme

The main goal of the programme was to provide Polish small and medium enterprises with knowledge on environmental law and management. Its objectives were:

- to provide Polish small and medium enterprises with knowledge on the EU and national environmental law and their responsibilities resulting from these regulations,
- to provide management and employees of Polish small and medium enterprises with knowledge and skills on environment management systems (ISO 14 001 and EMAS) in order to prepare enterprises for implementation of EMS.

Furthermore the programme aimed at providing SMEs with knowledge on possible funding sources of environmental investment and on how to plan investment process in accordance with environmental regulations.

The assumed benefits for SMEs included also increased competitiveness on the Single European Market and access to new markets resulting from improved image of a company.

Target group

The training programme was addressed to employees of small and medium enterprises in Poland. Especially it was targeted at management and employees dealing with (depending on the organisational structure of enterprises):

- environment protection e.g. managers of environment protection department, lead energy specialists, managers of production departments, environment protection specialists, health and safety specialists),
- quality management specialists in enterprises which successfully implemented quality management system and are willing to introduce environmental management system.

Funding of the programme

The programme had a form project implemented by the Polish Agency for Enterprise Development (the agency of the Ministry of Environment). The project was implemented under the Sectoral Operational Programme Human Resources Development 2004-2006 and co financed from the European Social Fund. The budget of the project amounted approximately 1 million Euros.

The participants' contribution covered 20% of training costs. The participants were charged approximately 12 Euros for one-day training. In case of two-day training the charge was approximately 35 Euros and for three-day training it was approximately 60 Euros.

The alternative form of contribution for SME's was that a company paid a salary to its employees for days they were participating in the trainings although they were out of office (the same as if these were employees' holiday days).

Accessibility

The programme targeted at employees of small and medium enterprises. For the first component of the programme there were no special requirements concerning participants, however management and environment protection specialists were preferred. Within the second component of the programme a part of the trainings was addressed to management of SMEs and quality management specialist. There were also trainings dedicated only to employees of these SMEs which decided to implement environmental management system.

Results

Within the programme 676 courses were organised. These were attended by 4418 participants. Overall number of enterprises involved in the project was approximately 2.800 (SME: 2 539, big: 259).

Monitoring arrangements

Due to the fact that the programme was implemented as the project co financed form the structural funds it was monitored in line with the EU standards. Furthermore the project was subject to ex-post evaluations carried out for the measure 2.3 of the Sectoral Operational Programme Human Resources Development.

Impacts and value added

It was the first such a big training programme in the area of environment protection in Poland. It resulted in an increased knowledge and competencies of participants. In the evaluation study most respondents (at a level of approximately 70%) declared that they used the acquired knowledge and skills in their work. The respondents' statements concerning whether the participation in the programme had a positive impact on their compliance with the EU and national environmental law indicated that for 57% the impact was definitely or rather positive. Moreover, having finished the participation in the programme, 9% of enterprises have introduced the environmental management system. Among enterprises who have not introduced EMS 33% declares an intention to implement the system in future.

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4.7 Italy

4.7.1 Case Study: ADICONSUM

Background

ADICONSUM is a consumer association in Italy, with more than 122.000 associates, which has been involved for 10 years in energy efficiency (EE) and renewable energy sources (RES) in buildings, mainly for families as final customers. ADICONSUM has been established in 1987 with the overall aim of defending consumers and operates independently of parties, government and workers' unions. ADICONSUM is present in all Italian regions with a network of 283 contact points.

Case description and drivers for the programme

Throughout its long-lasting involvement in issues of energy efficiency and renewable energy source, ADICONSUM has identified three main barriers that hamper the uptake of EE and RES systems in the built environment.

The first barrier is the lack of knowledge of customers for EE and RES topics. The second barrier is a lack of professional skills of project managers and installers. In particular, evidence has shown that in Italy systemic project management (i.e. seeing the project as a whole) is seldom and interventions are mainly “spot” interventions that often provide a short term, less efficient solution from the environmental perspective (e.g. changing a boiler instead of repairing it or without taking into consideration insulation of the pipes). The third and main identified barrier is the fact that often analyses for energy performance certification in buildings are not performed independently from the material intervention. In other words, if an auditor is called to do such an analysis on a building, the same professional will often materially do the work and could potentially look at his personal return, rather than at the overall efficiency of the intervention.

The aim of the ENFORCE project is precisely to overcome this third barrier through the provision of courses which would then culminate in the creation of a network of specialized energy auditors, autonomous and independent (i.e. they conduct the analysis but they do not provide the intervention).

The format chosen is a three-week long course, for a total of 120 hours. Of these 110 will be spent in class, the remaining 10 will be a stage or in-company training. At the end of the course, participants take an exam and, upon passing the exam, sign a gentlemen's agreement. After this, they are included in the network of certified operators.

ENFORCE is taking place in parallel in 5 European countries: Italy, Spain, Portugal, Greece, and Slovenia.

Goals of the programme

The ENFORCE programme has the following goals:

- training of energy auditors for energetic and energy efficiency analyses in buildings;
- Set-up of a publicly available and recognised network of independent and qualified energy auditors that will then feed in a European network,
- Creation of a system that would provide additional guarantees to the final consumer.

These three goals are a part of the overall scope of the programme, which however is not fully in the aims of this project. For example, the ENFORCE project also provides an awareness raising campaign to final customers, which lies outside the scope of this study.

Target group

Two target groups are envisioned in ENFORCE:

- Fresh graduates;
- Existing professionals;

Fresh graduates will be contacted through universities and selected with respect to their graduation mark and age. In their case, the course will provide balanced training for developing the necessary technical and ethical skills. At the end of the programme they will be directly included in the professional network. Support schemes for this category are provided.

Professionals that are already in the sector can also participate in the programme. The main difference between the course their training and the one of young professional is the balance of the provided skills, as in this case the course is mainly ethical and less technical, the rationale being that technical skills are assumed to be more possessed by professionals through experience. No support schemes are provided for this category and an additional charge is required to be included in the network at the end of the course.

Funding of the programme

It should be underlined how the cost for each course is likely to vary considerably. Thus, an indication can only be given in terms of tens of thousands of Euros.

Additional funding is provided for fresh graduates, who would pay only EUR 500 to take part in the courses. The rest will be covered by European funds or local sponsors.

In the case of existing professionals, no additional funding is provided and the full cost of the course will be paid by the participant.

Accessibility

The programme is open to high-level graduates, who are contacted through universities and offered participation. Other professionals active in the field may also join the course upon request and following approval of the organisation.

Results

At the end of the course, and after passing the exam, participants will receive a diploma for the course and become able to give energy certification to buildings according to EU directives. These courses are done on a regional level, given the situation in Italy, where certification is done at a regional and not at a national level.

Monitoring arrangements

A control system on results and outcomes is embedded in the structure of the goals of the programme themselves. After the course, in fact, all operators will be included in a network that would serve on one hand as a search database for such professionals and as a monitoring system on the other hand.

After each analysis or intervention, in fact, they will need to input the results of their job in the network, making them publicly available as a measure for accountability. Furthermore, in case of an unsatisfactory performance, consumers will refer to ADICONSUM, being the contact point for Italian consumers. The association, being also the creator of the network, would be able then to precisely identify the responsible. This yields a double result: a guarantee of quality is given to final consumers and feedback on the quality of the courses is automatically provided.

Impacts

At the time of the interview, subscriptions to the first round of courses were in its final stages, hence there is no information as regards impacts yet. As for international implications, a conference with all European partners involved in similar projects took place on March 2nd and 3rd thus results will be available shortly.

Value added

The main impact of the ENFORCE programme would be to unlock the full potential of energy savings in the built environment in Italy. In addition, though, its peculiar characteristics can yield specific results. Firstly, the programme provides courses at a regional level. This is particularly relevant for Italy, as certification in Italy is provided at a regional level and not at state level. ENFORCE, thus, provides significant impacts in addressing the differences in EE and RES treatment in different regions, providing skills on a common base but proving outputs on a regional level, implicitly harmonising certification on the built environment.

Furthermore, this programme will create a qualitative, tangible difference between operators included in the network and operators not included, linking trust and guarantees of the final consumer to the choice that would yield the best results in terms of energy and energy efficiency. On a larger scope, this project will introduce a new structure in the market, the network of specialised energy auditors. This new structure will create a new competitive aspect in the market revolving around energy performance of buildings, specifically between experts who are included in the network and experts who are not. The increase in competitiveness is thus expected to yield results in the long term in terms of an increase in quality and more efficient allocation of resources.

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4.7.2 Case Study: APER

Background

APER is the Italian association of producers of renewable energy. The association was founded in 1987 with the aim of protecting the rights and promoting the interests of renewable energy producers in Italy and worldwide. As of today, the association is one of

the largest ones in Europe, with more than 440 members, which count for an installed capacity of more than 6200 MW in 450 plants.

APER has provided assistance and training to its associates and external stakeholders throughout its existence. In 2006, the training activity of the association was formalised through the establishment of the APER training centre, which provides courses in Milan and overall the country.

Case description and drivers for the programme

The courses provided through the APER training centre respond to specific needs of the local or national market. Their scope also differs: it can be technology-specific or in other occasions it could be on a broader, e.g. policy, level.

Table 4.2 provides an overview of the courses carried out to date. It should be underlined that the training centre of APER also provides information days, however those have not been included in this table as not directly relevant for this study.

Table 4.2 APER Courses

Year	Place	Title	Participants	Target group	Fee in €*	Recognised	Length
2006	Rome	Biomass plants: criteria and elements for environmental impact assessment	n/a	- Sector operators	n/a	No	n/a
2006	Milan	Realisation and management of large PV plants (>50 kWp)	25	- Sector operators	A: 50 NA:250		1 day
2007	Milan	Energy production from biogas	n/a	- Sector operators	n/a	n/a	n/a
2007	Milan	PV systems	n/a	- Sector operators	n/a	n/a	2 days
2007	Milan	Economic advantages of biomasses		- Energy managers; - Plant managers; - Financial directors	1640	No	2 days
2007	Milan	Energy efficiency in the built environment	50	- Project engineers	n/a	Yes	3 days
2007	Milan	PV systems: project and installation	n/a	- Project managers; - Installers	720	Yes	2 days
2007	Milan	Technical and	n/a	- Sector operators; - Public administrations	240	No	3 days

Year	Place	Title	Participants	Target group	Fee in €*	Recognised	Length
		legislative aspects of PV energy production					
2007	Trento	Wind energy: technology, legislation and environment	n/a	- Public administrations; - Engineers; - Wind energy professionals	1300	No	7 days
2007	Perugia	Technical and legislative aspects of renewable energy production	n/a	- Public administrations, - Operators and professionals	0	No	1 day
2007	Milano	Bilateral trading in green certificates	n/a	- Associates only	0	No	1 day
2008	Lecce	Incentives, technologies and financing for RES	n/a	- Sector operators	n/a	n/a	1 day
2008	Lecce	Technical, economic, financial, administrative and legislative aspects of renewable energy production	n/a	- Sector operators	n/a	n/a	3 days
2008	Lamezia Terme	Wind energy: technical and legislative aspects	n/a	- Public administrations; - Sector operators	A:500 PA: 750 Other: 1200	n/a	3 days
2008	Milan	New regulation for gas trading	100	- Traders - Gas operators	A: free NA: 60	no	1 day
2008	Milan	Investment optimisation in PV plants	50	- PV plants operators - PV plants investors	360	No	1 day
2008	Milan	New incentivising methods for RES	n/a	- RES plants operators - RES plants investors	A: free NA: 100	No	1 day

Year	Place	Title	Participants	Target group	Fee in €*	Recognised	Length
2008	Rome	New incentivising methods for RES	n/a	- RES plants operators - RES plants investors	Free	No	1 day
2009	Milan	Legislation for RES (first edition)	12	- Lawyers; - Sector operators	600	Yes	4 hours for 3 days
2009	Milan	Legislation for RES (second edition)	12	- Lawyers; - Sector operators	600	Yes	4 hours for 3 days
2009	Milan	Legislation for RES (third edition)	12	- Lawyers; - Sector operators	600	Yes	4 hours for 3 days
2010	Milan	Usage of RES in developing countries	30	- Not-for-profit organisations operating in developing countries.	120	No	1 day

*A = Associates; NA = Non-Associates; PA: public administrations

Goals of the programme

The aim of the courses provided by the training centre is twofold. Firstly, they are a tool for achieving the general goal of the association, i.e. to protect the rights and promote the interests of renewable energy producers. Courses respond to the local and national needs of renewable energy producers. Such needs may either stem from market researches and analyses conducted by the association itself, or may be a transposition of a training need expressed to APER by one of its associates. In either case, where grounds for the provision of training exist, courses are provided.

Secondly, such events have the overall aim of creating a stronger network and networking opportunities for renewable energy producers. For this reason, courses are provided in different locations in Italy and involve stakeholders coming from different areas, such as public administration representatives or project engineers. Milan appears to be prevalent in hosting APER trainings, this is due to the fact that the association is based in Milan and that networking is sought primarily through the association.

Target group

The courses provided through the APER training centre are open to all stakeholders and professionals as regards renewable energy production, although priority is given to associates. Although this depends on the specific topic, APER's courses tend to be quite comprehensive in terms of attractiveness to favour their networking aspect.

Although the specific target group depends on each course, three general target groups are identified:

1. Renewable energy producers (APER associates for the largest part);
2. Public administrations;
3. RES professionals, e.g. investors, installers, traders...

Funding of the programme

The financing method of the provided trainings differs per course. Apart from the associations financing, the provided courses may also be sponsored by local public administrations or by other sector representatives, clearly depending on the treated topic and on the relevance of that topic for such stakeholders.

In general, participants must pay a participation fee that may vary between 50 and 800 € per day, however, in several occasion participation is free and fully supported by APER, local sponsors or dedicated funds. APER does not make use of national or European funds for its courses.

Accessibility

Courses are open to all associates and non-associates, with priority being given to associates. In some cases participation is only for associates.

Courses are published on the association's website and, in addition, associates are notified directly via email or newsletter on upcoming trainings.

Results

All courses provide a certificate of participation. In some cases, for example for the "legislation for RES" cycle, these certificates are officially recognised by public bodies. There is no general trend for the recognition of such certificates as it is set on a case-by-case basis.

Monitoring arrangements

At the end of each course, an evaluation questionnaire is provided to have an understanding on the quality of the course and to provide information on what improvements may be reached with the following edition of the course. No long-term monitoring system is in place.

Impacts

No formal analysis of impacts of their courses has been undertaken; however there is a tangible perception of the thickening of the network within associates and external actors, as planned in the goals of the centre.

Value added

The courses offered by the APER training centre differ from other training programmes in Italy for the networking aspect embedded in each event. The capability of these courses of bringing together different stakeholders in the comprehensive picture of renewable energy production in Italy is, in fact, extremely high from different points of view.

Firstly, APER can rely on a vast network of associates and RES stakeholders, on a local and national level. Its association nature directly gives APER a thick network of contacts, which provides a detailed overview of the renewable energy market and allows for identifying training needs for different technologies and for different geographical areas.

Secondly, the association represents renewable energy producers on a national and local level, thus it possesses established contacts with public administrations and other relevant actors, e.g. regulatory bodies or other associations, with a high networking potential. Such

experience allows the association to identify, for each course, specific potential participants apart from its associates and invite them for the course, possibly planning the contents of the course on particular issues that would on one hand favour participation and on the other allow for a more efficient level of networking.

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5 Conclusions and possible ways forward

In this chapter we summarize some of the most important conclusions from our mapping of skills programmes in selected Member States, and provide ideas on what can be done to further the provision of green skills for the workforce.

5.1 Conclusions

There is a mix of skills being targeted by environmental skills programmes

Our research shows that environmental programmes target the full range from low-skilled through medium- to high-skilled audiences. These programmes tend to be driven by employment demand and by the implementation of environmental legislation that requires sectors to train staff to meet new or stricter regulation. The actual content of trainings and programmes varies across industries and is often tailored to specific companies. A common thread is the “soft” skills programmes, aiming to raise environmental awareness, and provide training which improves environmental skills for every day use.

Green skills provision is relatively less mature than other skills provision areas

In countries across Europe skills provisions programmes have been mainly targeted at traditional jobs and traditional skills over the past years. Indeed, even *green* skills programmes often target such traditional jobs, but placing an emphasis on the extra green elements of a job that must be learned to be able to contribute to a low-carbon economy. Given that the emphasis on green skills as a specialisation has been recently coming to the fore, and is especially focussed on the ecological industries such as waste management, renewable energies etc., the maturity of the specialist green skills programmes is increasing but remains behind those programmes targeting traditional skills.

Recognised need for green skills training across Member States

Based on the case studies presented in this report, it is clear that the majority of people we spoke to recognize the need for green skills training and its importance in facilitating green growth. Some people perceive the importance of green skills development to be more important than other stakeholders in other Member States; however the conclusion that can be drawn is that environmental skills programmes are found in every country studied in this research with both public and private sector involvement. However, financing of environmental skills programmes varies between countries, with the U.K. for example, funding sources for the programmes were mostly mixed, with strong public funding of training programmes (> 80% of programmes), often in partnership with companies (contributions in over 60% of programmes). In other countries such as the Netherlands, private financing (internal company trainings) made up the majority of

financing. This variation should be treated with caution, however, as the sample of environmental programmes may not have captured the true picture of financing sources and possible bias in the results should not be excluded.

Firms are large investors in green skills, supported by national and European funding

Even bearing in mind the cautionary note on sample size, one can still see that firms are at the frontline of developing green skills – as they provide in-house training to staff throughout different sectors of the economy. Our research shows that large companies in ecological industries in particular have on-going learning opportunities for their staff that are linked to sustainability in a number of different formats.

Public funding is available for environmental programmes driving green skills development with the vehicle of that provision usually being a private company or collection of companies seeking to upgrade skills for their workforce. Indeed, funding arrangements for environmental programmes that involve both public and private resources is the common method of supplying environmental skills programmes. Thus a company can acquire subsidies from public sources (that are often originally EU funds, e.g. ESF funding) to provide skills development courses for their staff. Public funding also targets secondary and tertiary education on a large scale, for example the establishment of special skills academies are usually funded by national governments rather than the private sector.

Some countries further advanced than others

The U.K. is one such country where the needs of a green economy have been analysed more than elsewhere: for example, there has been much research on what skills gaps exist and how they can be filled. In the short-term it is recognized that some of the gaps will have to be filled in with migrant workers who have such skills⁶¹ and more investment is needed to develop technical and other green skills in the long-term. Our research shows that the U.K. is also politically active in attempting to link green jobs to long term economic growth and a sustainable recovery from the current economic malaise. This is reflected in a “Green New Deal”, which emphasizes the need for low-carbon and resource efficient economic development that is delivered in part through training the workforce in environmental skills and creating green jobs while greening ‘traditional’ jobs.

Other countries have less well-established green politics, and therefore also lag in terms of the supply of environmental skills programmes. Based on interviews conducted in Bulgaria, there is a perception that the Bulgarian economy must develop in many ways before the agenda on green skills and the provision of environmental skills programmes is taken as seriously as in the United Kingdom for example.

Financing from the EU also plays a role in the process of influencing the agenda in Member States. In countries such as the U.K., a significant proportion of ESF funding is geared towards developing the skills necessary for the green economy. European funding in some of the New Member States is rather geared towards traditional priority spending on social inclusion, and labour market reforms for traditional employment issues.

⁶¹ Aldersgate Group 2009

Qualifications from programmes are usually not universally recognized

Our research also shows that many environmental programmes do not have universal recognition for the qualifications participants receive. Accreditation and other similar initiatives may help increase the mobility of green-skilled workers. Especially at the sectoral level, accreditation is something that could be approached more consistently, which would take away a barrier to allowing the labour market to flow to where demand for certain skills exist. In the eco-construction sector for example, it is acknowledged that improving the portability of qualifications is a key goal to help achieve quicker build of affordable sustainable housing.

5.2 Developing green skills: recommendations for research and practice

Exchange of best practice

The research carried out has shown that there is **potential to promote exchange of best practice**, not only between Member States but also between businesses and other institutions involved in the development of green workforce skills. With support, training and incentives from the EU and national levels, large and medium enterprises should also create ‘green teams’ to innovate and develop environmentally sustainable workplaces, products and services. This should include the development of a European green mentoring program to help small enterprises and sole traders make similar changes.

Links between educational institutions and the reality of the market place

The employment market is a dynamic market which is changing rapidly and, therefore, education systems should place a greater emphasis on vocational and educational training and employability skills to more effectively respond to rapidly changing labour market needs. Close cooperation between education institutions, governments, and the business community will be essential in order to ensure that education learning outcomes equip individuals with the skills necessary to be competitive in a greening job market. Indeed, involvement of all stakeholders from the start of a programme (design stage) is regarded as very important in safeguarding a demand-driven training approach, i.e. in making sure the programme fills a specific skills-gap.

Dedicated European Funds

Another way forward is to ensure that European funds, such as the ESF, include a dedicated element of funding that can only be used for green skills programmes. This would have the advantage of strengthening the link between the European funds and the objectives of the EU2020 strategy. It would also address the variability in use of ESF financing in this context which currently exists.

Partnerships

Training sectors should create ‘green collar partnerships’ to advance the workplace and industry skills, knowledge and innovations required for the transition to a low carbon economy. The close links between conventional and new industries should also be kept intact in any partnership or alliance stimulating green jobs and green skills. While certain jobs are considered “green”, they will still rely on conventional industries. For example, building and maintaining railways, hybrid cars, solar panels and wind turbines all necessarily rely on traditional industries such as steel, chemicals, transport and

manufacturing. The role of traditional industry should not be neglected when planning a new generation of jobs, since they are mutually reinforcing. The links between conventional and new industries must therefore be borne in mind and taken into consideration in any discussion about the greening of jobs.

There should not be any artificial separation between “green” and “brown” jobs, which could lead to policies encouraging one category without taking fully into account that these sectors rely on each other. A more proactive approach would be to look at the creation of new jobs, while at the same time assessing opportunities for “greening” throughout the economy. New jobs – green or otherwise - are mainly created by the market and market needs. The issue of “green jobs” should be embedded in a wider concept of sustainability, and recognise the need to develop more sustainable products and processes that will ensure job creation becomes more environmentally focused.

European and national standards

It is important to see whether **establishing European qualifications and standards** and identifying the necessary learning outcomes for workers in the green sector is appropriate and feasible. First indications are that it is appropriate, doing so would: increase the mutual trust among training providers in the green sectors of the European economy; should allow for better quality of training; improve the public image of the sector; and increase the mobility of workers in the sector. However, the potential barriers to such a European approach needs to be assessed – first indications are that possible problems would be that Member States are reluctant to give up well-established national qualifications in fear that it will confuse domestic employers. Overall, it seems that establishing European standards would probably help for some types of work, but not others.

Another suggestion for analysis relates to the **certification of the workforce**. Member States could develop and implement a national training and accreditation programme for installers of for example renewable energy and energy efficiency systems. An important first step for this certification is to standardise the training courses by defining the required skills. Several energy agencies address the point that appropriate legislation needs to accompany any proposition for mandatory certification of the workforce in different green sectors. An analysis is therefore required on the feasibility of establishing a national (or regional) scheme for training and upgrading skills for the workforce related to different green sectors, such as energy efficiency or renewable energy, which could be implemented through partnership/grouping/structure of a diverse set of stakeholders in each Member State. It is foreseen that such a scheme could be co-financed from different financial sources (public and private) while the cost of setting up the scheme, preparatory and piloting phase could be financed from the European Community funds. The schemes could be adapted to the national/regional needs regarding target groups to be trained as well topics to be covered.

Sectoral approaches

Further analysis could be done in the form of mapping the skill-needs of the various sector workforce’s and modelling future demand as these types of data are not readily available. This is essentially a three-step approach:

- mapping skills needs in a particular sector;
- identifying current provision;
- indentifying/modelling future demand.

Mapping the skills profile of various eco-industries should be done in tandem with understanding the level of educational attainment in each sector – making the link between qualifications and skills easier to bring into focus. The analysis could include measuring the size of the target audience, i.e. how many workers are there in the different industries with skills needs. In addition, identifying variations in the scale and nature of the skills need will be necessary with significant variation to be expected both between and within Member States. An independent statutory body could furthermore lead a European program to identify and stimulate green skills, knowledge and work needed for a low carbon economy, with special emphasis on the building and construction, transport, agriculture and food, energy, and manufacturing sectors.

Other parts of this kind of analysis could include how to:

- improve motivation for enterprises and employees from various sectors;
- improve anticipation of ongoing activities and;
- identify procedures for accreditation of training and certification processes within sectors.

Dissemination and increasing the scope of programmes

Promoting awareness amongst workers that skills training is a way to career development is an area that also requires further analysis. What are the ways that active dissemination and promotion of any training can be developed? Most likely, these kinds of activity should be pursued in close cooperation with educational institutions that have good specific access and links to certain parts of the workforce. Analysis of the kinds of incentives that may be required and that could be given to institutions involved and to the workforce who might use those schemes is further required.

Life-long learning should be further assessed as a way to deal with the upgrading of skills that are required to keep up with scientific and technological progress. The training can be delivered via a wide variety of means; these include distance learning or e-learning, training-on-the-job, product-schooling (teaching skills related to a specific product, often by the manufacturer of the product) or correspondence courses and also include postgraduate programmes. An analysis of the potential for promoting life-long learning amongst the European labour force is thus required.

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