



Education and Culture DG

Lifelong Learning Programme



TATA STEEL

GT VET

Greening Technical VET – Sustainable Training Module for the European Steel Industry



Work Package 3

Industry Driven Analysis of Job Requirements

An Overview of EU Vocational Education and Training Directives, Systems and Policies with a Focus on the European Green Skills Agenda

National Report

D.7.5.3

United Kingdom

Dr Dean Stroud

Dr Claire Evans



Content

1.0 Introduction.....	4
2.0 European VET Strategy and Policy	7
2.1 The Lisbon Strategy 2000.....	7
2.2 The Copenhagen Process, 2002	11
2.2.1 The European Qualifications Framework	14
2.2.2 National Qualifications Frameworks.....	16
2.2.3 European Quality Assurance System (EQAVET)	18
2.2.4 European Credit System for VET (ECVET)	19
2.2.5 Europass.....	19
2.3 Europe 2020 Strategy.....	20
2.3.1 Smart growth	20
2.3.2 Sustainable Growth.....	21
2.3.3 Inclusive Growth	22
2.4 Education and Training 2020 – Co-operation in VET so as to support the Europe 2020 Strategy	24
2.4.1 The 2010 Communication – “A New Impetus for European Cooperation in Vocational Education and Training to Support the Europe 2020 Strategy.”	24
2.4.2 The Bruges Communiqué.....	26
3.0 The EU’s ‘Green Skills’ Strategy	29
3.1 Sustainable Growth and Development.....	29
3.2 ‘Green’ jobs and skills	32
3.2.1 Government Interventions	36



3.2.2 The role of training providers	36
3.2.3 Green skills gaps and policy deficiencies	37
4.0 Conclusions	39
5.0 Bibliography	40



1.0 Introduction

Vocational education and training (VET) can be defined as that which “enables people to acquire the knowledge, skills and competences they need on the labour market, whether for a particular job or for a broader range of occupations.” (European Commission, 2010). It has been described as a bridge between educational and workplace environments (ibid.). It purportedly improves the employment opportunities of those who undertake it and ultimately, creates a more adaptable workforce. VET systems and practices are diverse – they exist in a variety of forms across different countries and also within any given country. Such systems are not linked to a particular type of institution, nor to the age or previous experience of the learners concerned. It takes place at different levels of education, from training to secondary to higher education. EU policy in this field is based on the Treaty (Article 166 TFEU) which gives it the role of supporting and supplementing the action of Member States.

VET purportedly delivers two major benefits for member states and citizens of the EU. First, VET is argued to play a role in the cultivation of economic growth through increasing competitiveness. It is averred that as the developed nations de-industrialise and shift towards a service economy that is knowledge-based and skill-intensive, technological innovations, new demographic trends and climate change all generate new demands for skills. Similarly, a globalised and thus more competitive economy is argued to increase demand for an adaptable and flexible workforce and an ever-changing skills base at the national level. Consequently, to meet such demands, there is an ongoing need for workers to complement, widen or upgrade their knowledge, skills and competences through VET.¹ Proponents of this ‘human capital’ argument aver that benefits accrue at the individual level, in the form of improved

¹ A distinction is made between ‘continuing VET’ (CVET) and initial VET (IVET).



working lives, employability, job and career prospects of individuals, as well as at the societal level, in the form of enhanced economic competitiveness. This is in accordance with the second benefit of social cohesiveness – greater economic well-being is believed to be linked to enhanced social cohesion.

Given the potential for outcomes of such magnitude, EU policy-makers have long argued that VET across and within member states must be of the highest quality. VET policy has grown in prominence, with strong arguments put forward proposing that the prosperity of the Union is dependent upon the skills of its workforce (CEDEFOP, 2010a).² Moreover, within the context of the three pillars of the ‘Europe 2020’ strategic policy framework –namely, growth that is smart, sustainable and inclusive - such systems and practices are deemed to be more important than ever (CEDEFOP, 2010).

This report will examine current EU strategy and policy on VET and identify the initiatives that impact at national level on policy, systems and practice. To this end, the report will begin with a chronological discussion of recent developments, starting with the Lisbon strategy of 2000. The Copenhagen Process was the initiative launched in 2002, in order to progress the aims of this strategy. One strand of this latter was the goal of modernising education and training systems within the Union, and thus, the Copenhagen process embodies the aspiration to strengthen cooperation in vocational education and training (VET) across member states, and align national-level practice with Union-level guidance. A number of shared principles were agreed by participants for developing common European instruments and for raising the profile of VET in related policy areas at European level. Principally, the instruments focus on improving quality of VET provision at national level through the development of a European quality assurance system (EQAVET); facilitating comparisons of qualifica-

² CEDEFOP, or the **European Centre for the Development of Vocational Training** (Cedefop) is the European Union's reference centre for vocational education and training. This organisation provides information on and analyses of vocational education and training systems, policies, research and practice. It was established in 1975 by Council Regulation (EEC) No 337/75.



tions across Europe through the creation of the European Qualifications Framework (EQF) with which national qualification frameworks must align and the development of a credit system, so that work experience and qualifications gained in one member country can be validated and recognised in another. Thus, the aim of these instruments is to support lifelong learning, ensure enhanced quality of VET provision and facilitate educational and job mobility within and between member states. These aspects will be discussed in more detail below, before proceeding into an overview of more recent developments, namely the Europe 2020 strategy which updates the Lisbon strategy. The three pillars of Europe 2020 – smart, inclusive and sustainable growth – and concomitantly, the targets set for attainment by 2020, have implications for VET. The aims of the recent ‘Education and Training 2020’ framework will be outlined, along with a discussion of the 2009 Communication and the Bruges Communiqué, both of which establish a vision of VET for achievement by 2020.

Another important strand – and of particular relevance for the purposes of this report – is the priority of sustainable growth within the Europe 2020 strategy. The formation of a low-carbon economy is perceived as providing significant opportunities for job-creation, but as a project which requires a sound base of new skills as well as the adaptation of skills already used at work (Cedefop, 2009). Green jobs and skills are a key component in the low carbon agenda and are also central to discussions about economic recovery (Pye and Evans, 2010). The development of such ‘green skills’ then are identified as being one of the major challenges facing the Union in the near future. Thus, the EU’s strategy, policy and practice for ‘Green Skills’ and their role in the creation of a low-carbon economy will be examined in the penultimate section of this report.



2.0 European VET Strategy and Policy

2.1 The Lisbon Strategy 2000

The European Council met in Lisbon, Portugal in March 2000, and adopted a ten-year programme, aimed at revitalising growth and sustainable development across the EU (ETUC, 2006). The Council noted the challenges that Europe was facing from globalisation with its concomitant of rapid and accelerating change, an ageing population associated with particular skills that could easily become obsolescent, and the emergence of a worldwide information society. Across the Union, employment rates were low and structural unemployment was persistently high, despite a favourable macroeconomic situation. At the time, the then 15 EU Member States were also planning to take in 12 new members which were at various stages of transition to market economies.

As such, the Council members resolved that economic and social reforms had to take place in the context of “a positive strategy which combines competitiveness and social cohesion”, and reaffirmed that the European social model, with its developed systems of social protection, must underpin the strategy.

In line with this resolution, the Union set itself a new strategic goal for the next decade:

“to become 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.”

The Lisbon Strategy set out a framework for action until 2010, and this shaped EU policy formulation for that decade. The Strategy aimed for increased economic



competitiveness, as well as social and environmental renewal. These latter goals meant that competitiveness was to be achieved through investment in a knowledge-based and highly productive society, as opposed to social dumping. The creation of such a knowledge-based economy was to be achieved through a range of policies including a sound macroeconomic policy mix conducive to high growth, completion of the internal market, investment in people and through the combating of social exclusion. EU leaders pledged to aim for full employment in Europe, in a society accommodating the personal choices of women and men.

The Lisbon Strategy set the following specific targets (ETUC, 2006):

- ▶ An overall employment rate of 70% by 2010
- ▶ An employment rate for women of over 60%
- ▶ An employment rate of 50% among older workers
- ▶ Annual economic growth around 3%

EU education and training policies gained impetus with the adoption of the Lisbon Strategy (Europa, 2011a). From the outset, Member States underlined the close links between education and training and employment policies. Employment guidelines included measures to encourage and improve lifelong learning in Member States.

As part of the strategic drive, concrete future objectives for education and training were agreed in 2001 (European Commission, 2001). The three main objectives



were improving the quality and effectiveness of education and training systems in the EU to the highest levels; easing access of all to education and training, thereby fostering lifelong learning for all; opening up education and training systems to the wider world so as to produce mutual benefits; that education and training systems in Europe will be compatible enough to allow citizens to move between them and take advantage of their diversity and finally, that holders of qualifications, knowledge and skills acquired anywhere in the EU will be able to get them effectively validated throughout the Union for the purpose of career and further learning (European Commission, 2001).

To these ends, the European Commission initiated the Education and Training 2010 work programme (Council of the EU, 2002) a series of thematic working groups, clusters and ad hoc groups to take forward the concrete future objectives and related issues.

Under the auspices of the Education and Training 2010 work programme, the benchmarks agreed at Lisbon were developed by the European Council in Stockholm, in 2001 (Council of the EU, 2001) and Barcelona in 2002 (Council of the EU, 2002). The Barcelona Council called for European education and training to become a world quality reference by 2010 and to develop instruments to improve transparency of qualifications. Five benchmarks were set for 2010 (Council of the EU, 2003) to help measure progress in addressing priority areas at all levels of learning:

The **Education and Training Targets 2010** were that, by 2010, there would be:

- A maximum of 10% early school-leavers;
- Reading literacy improvement : at least 20% fewer low-achieving 15-year olds than in 2000;
- At least 85% of 22 year-olds completing upper-secondary education;



- An increase the number of university graduates in mathematics, science and technology (MST) by at least 15%, and decrease the gender imbalance in these subjects.
- At least 12.5% of adults (25-64) participating in lifelong learning.

Source: Council of the EU. Education, Youth and Culture. 8430/03.
Brussels 5-6 May 2003.³

Although there was no specific benchmark, the Lisbon strategy also called for Member States to ‘substantially’ increase investment in education and training.

The overall aim of the various European Council conclusions, benchmarks and Education and training work programme 2010 was to create a European lifelong learning area (European Commission 2001). It was envisaged that this would enable people to move between countries and jobs, using their qualifications and competences as a ‘common currency.’ It would be the VET equivalent of the Bologna process⁴, designed to create a European higher education area by 2010.

³ In addition, targets were set for employment rates: that the average employment rate in the EU should be as close as possible to 70%, from the current 64.6%; to increase the number of women in employment to an EU average over 60% from 58.6 %; and to raise the average EU employment rate among men and women aged 55 to 64 to 50% from 46.0 %

⁴ Under the Bologna process, countries aim to base their higher education on three cycles (for example, bachelor, master and doctorate). The aim is to make degrees easily readable and comparable, establish a credit transfer system, cooperate in quality assurance, promote a European dimension in their curricula and support mobility for students, teachers and researchers.
The process was launched by the Bologna declaration in 1999.



2.2 The Copenhagen Process, 2002

Consequently, the European Commission, EU Member States, associated and candidate countries and the European social partners launched the Copenhagen process in 2002, in order to strengthen pan-European cooperation in VET.⁵ The Lisbon strategy of 2000 emerged out of concerns that the EU would be 'left behind' by technological advance, given the existence of an ageing workforce across the union, and the fast paced nature of technological change and the obsolescence of many extant skills bases. The perceived need to modernise education and training systems was part of this strategy and as such, the Copenhagen process was formulated so as to strengthen inter-state cooperation within vocational education and training (VET).

Across member states, responsibility for VET is very diverse, often shared between national and regional governments and social partners. This can make developing and managing VET policy difficult. By coordinating voluntary technical and political cooperation at European level, the Copenhagen process proved to be an effective way of working. The process gave VET a higher priority and clearer focus at European level and this helped to align European and national VET policies. Crucially, this made it possible for a **comprehensive European VET policy, which supports and complements national VET policies**, to emerge.

Since 2002, national education ministers have met every two years in order to review the process, with the countries involved working together to develop innovative policies and actions. The overall aim has been to improve the quality of vocational training so as to help to provide the skills, knowledge and competences required in the labour market. In furtherance of this, actions include those which encourage more individuals to make wider use of vocational learning opportunities, whether at school,

⁵ National authorities and social partners from 33 European countries are participating in the Copenhagen Process.



in higher education, in the workplace, or through private courses. The actions and tools developed thus far aim to allow users to integrate and build upon learning acquired at various times, in both formal and non-formal contexts.

Member states have reached agreement on, and committed themselves to, a set of common priorities. Several universal European principles and instruments have been developed, so as to make qualifications easier to understand and to promote geographical mobility and greater flexibility in VET systems. These include the following:

Table 1: Common European instruments and principles developed under the Copenhagen proces

Common European Instruments	
European qualifications framework (EQF)	Facilitates comparisons of qualifications across Europe, with the aim of supporting lifelong learning, educational and job mobility
European credit system for VET (ECVET)	Concerned with the validation, recognition and accumulation of work-related skills and knowledge acquired during a stay in another country or in different situations, so that these experiences contribute to vocational qualifications
European quality assurance framework	Facilitates the development, improvement, guidance and assessment of quality within national VET (EQAVET), VET systems and helps countries to develop quality management practices

<p>Europass</p>	<p>A portfolio of documents to support job and geographical mobility to enable people to present their qualifications and skills using a standard format understandable to employers throughout Europe. The Europass documents are the Europass CV, language passport, Europass mobility, diploma supplement and certificate supplement</p>
<p>Common principles and guidelines</p>	
<p>Guidance and counselling</p>	<p>Strengthens the role of lifelong guidance in developing European policies for education, training and employment. It addresses four priority areas: career management skills, access to services, quality of guidance provision and policy cooperation</p>
<p>Identification and validation of non-formal and informal learning</p>	<p>Sets out common principles to encourage and guide development of high non-formal and informal learning quality, trustworthy approaches and systems to identify and validate non-formal and informal learning</p>



A fundamental principle of these instruments is that VET must allow and encourage individuals to learn throughout their lives, both inside and outside the formal education and training system. The common European instruments and principles outlined above embody this lifelong learning perspective.

The implementation of these common instruments is influencing national VET policies to varying degrees (CEDEFOP, 2010a). The approach adopted is based upon the development of learning outcomes, which are statements of what an individual learner is able to do and understand following the completion of a learning process. In some countries, this outcomes-based approach represents an important change of focus and learning outcomes are being used in all types and levels of education and training, but in particular to reform VET standards and curricula.

2.2.1 The European Qualifications Framework

The European qualifications framework (EQF) has been a catalyst for countries to develop national qualifications frameworks (NQFs). NQFs are based upon a learning outcomes approach across all types and levels of education and training to support lifelong learning. Learning outcomes are statements that describe what learners should know, understand and be able to do, on completion of a learning process. Learning outcomes-based systems use competence-based standards as the basis of their qualifications systems. Use of learning outcomes varies between member states. In some, such as the UK, learning outcomes have been an important part of the education and training system for some time. Others, including Poland, are just starting to use them.



Learning outcomes-based approaches are particularly strong in VET as many countries have traditionally used functional (and task) analysis to define VET curricula and standards so as to ensure their relevance to the labour market.

Reform of VET standards and curricula is an area where implementing learning outcomes is most visible. Countries such as Poland have carried, or are carrying out, learning outcomes or competence-based developments or revisions of their VET standards.

Concerning VET curricula, a recent study (Cedefop, 2010a) on curriculum reform in nine countries (including Germany, Poland and the UK) showed that all have been, or are, reforming VET curricula and introducing learning outcomes and competence-based approaches.

Implementing learning outcomes has raised many issues. Learning outcomes-based curricula have important implications for content, assessment, teaching methods and learning conditions (Cedefop, 2010a), which require changes in attitudes of teachers and trainers and in the culture of education and training institutions. Teachers and trainers will, eventually, interpret standards, follow or develop curricula and assess the students. Their weak involvement in developing learning outcomes in many countries could, potentially, undermine progress. Support is needed to develop strong professional communities of practice to implement agreed standards.

There are also differences between and within countries and even between institutions over the understanding, function and role of learning outcomes. Learning outcomes can be defined as overarching goals of VET, or the results of a study programme or teaching unit. Learning outcomes are also identified by different titles, such as competences, or objectives. If learning outcomes are defined and introduced inconsistently it may seriously undermine the credibility of qualifications and raise questions about the validity and reliability of assessments. A consistent application of



the learning outcomes principle is critical to integrate developments at local, regional and federal levels.

This emphasises the importance of quality assurance arrangements to support the shift to learning outcomes-based frameworks, standards, curricula, certification processes, assessment and teaching methods. Progress with learning outcomes and strengthening quality assurance requires close cooperation at national and European levels in sharing experience in defining and writing learning outcomes for different purposes. Italy and Poland, for example, are promoting systematic exchanges of experience to describe, define and apply learning outcomes.

2.2.2 National Qualifications Frameworks

National qualifications frameworks (NQFs) then describe what learners should know, understand and be able to do based on a given qualification, as well as how learners can move from one qualification to another within a system. They have become integral to implementing the European qualifications framework (EQF). All countries have developed or are developing NQFs (Cedefop, 2010b). The objectives of NQFs, shared by almost all countries, are as follows:

- make national qualifications systems easier to understand and more transparent at national and international levels;
- strengthen coherence of qualifications systems by connecting different parts of education and training;
- improve permeability by clarifying and strengthening the horizontal and vertical links within the existing education and training system;



- support lifelong learning by making learning pathways visible and by easing access, participation and progression;
- simplify recognition of a broader range of learning outcomes (including those acquired through non-formal and informal learning);
- strengthen the link and improve the communication between education and training and the labour market;
- open up national qualification systems to qualifications awarded outside formal education and training (for example awarded by sectors);
- create a platform for cooperation and dialogue with a broad range of stakeholders;
- provide a reference point for quality assurance.

Most NQFs can be defined as comprehensive frameworks, covering all levels and types of qualifications not just VET. There are three main trends in the design of NQFs to strengthen integration of the education and training system.

NQFs in Germany and Poland, for example, have descriptors spanning all levels of education. These frameworks show how qualifications can be combined and make it possible to judge if, for example a VET qualification can provide a basis for a higher qualification. These NQFs also underline that higher level qualifications may be awarded by bodies other than traditional higher education institutions covered by the Bologna process. NQFs, in the UK for instance, also emphasise the need for people to be able to move easily between different parts and levels of the education and training system.



2.2.3 European Quality Assurance System (EQAVET)

ECVET is encouraging cross-border mobility and flexibility in national systems. However, the success of the European VET agenda and of EQF and ECVET in particular depends on trust being in place. At European level, quality assurance mechanisms have been developed in order to promote that trust.

Some countries have a tradition of quality assurance. However, since the European forum on quality in VET was established in 2001 and agreement on the common principles, guidelines and tools in the Council resolution in 2004, there has been some convergence in Europe. This led to the recommendation in June 2009 as to the establishment of a European quality assurance reference framework for vocational education and training (EQAVET). It invites Member States, by 2011, to develop an approach to improve their quality assurance systems, to make best use of the framework and participate fully in the European quality assurance reference framework network.

Implementing EQAVET is a complex and lengthy process. The quality model upon which the EQAVET recommendation is based has been used in several Member States including Denmark, Hungary, Norway, Romania and Finland to guide development of their national quality systems. EQAVET indicators are under discussion in many countries, including Germany and the UK (Northern Ireland and Scotland). Other countries, such as the Netherlands and the UK (England and Wales) have aligned their indicators to EQAVET.

There is increasing awareness amongst member states that quality assurance is more than accreditation procedures, which by themselves do not guarantee quality of provision. Almost all countries have produced strategic documents or specific reg-



ulations to introduce or improve quality assurance in VET, thereby promoting a quality culture.

2.2.4 European Credit System for VET (ECVET)

In order to help citizens develop learning paths or acquire qualifications through building on what they have achieved in different learning contexts at home or abroad at different periods of time, member states agreed in 2002 to explore a credit system for VET. The European credit system for VET (ECVET) enables citizens to transfer learning outcomes and have them recognised by different qualifications systems, or by general and vocational education.

Austria, Poland and Finland are giving ECVET high priority. Similarly, the Decvet initiative (2008- 12) in Germany is part of reforms to make it easier to move between different parts of the VET system. Most countries have national ECVET testing and implementation strategies and are developing it alongside their NQFs and validation mechanisms. However, implementing ECVET is not without challenges.

2.2.5 Europass

Europass integrates the European CV, certificate and diploma supplements and common European framework of reference for languages into a single framework. It is thus a portfolio of five instruments. It was established in 2004, so as to support transparency of qualifications thereby promoting geographical and job mobility, through making individuals' skills and qualifications more easily understood across Europe. It is increasingly used across the EU. Since its launch in February 2005, more than 29 million people have visited the Europass website and nearly 9.7 million Europass curriculum vitae were completed online by the end of September 2010 (CEDEFOP, 2010a).



2.3 Europe 2020 Strategy

As a result of the strategic goals of Lisbon and moreover, the economic crisis of 2008, the contribution of vocational education and training to economic competitiveness has become a major priority for the European Union in the coming decade. The Lisbon Strategy has been updated through the new EU2020 strategy. This strategy maintains the themes of ‘growth and jobs’ and places the period 2010-20 in the context of recovery from the economic crisis and the growing urgency for sustainable economic development. The EU 2020 strategy contains three main priorities: *smart growth*, *sustainable growth* and *inclusive growth* (European Commission, 2011a).

2.3.1 Smart growth

Smart growth entails improvements in the EU's performance in education, research and innovation, and the creation of a digital society. Targets have been set, as benchmarks for progress in the arena of ‘smart growth’. These are:

- combined public and private investment levels to reach 3% of EU's GDP as well as better conditions for R&D and Innovation;
- 75% employment rate for women and men aged 20-64 by 2020;
- better educational attainment – in particular:
 - a reduction in school drop-out rates to a level below 10%
 - at least 40% of 30-34-year-olds to have tertiary-level education (or equivalent)



It is envisaged that the ‘smart growth’ will be boosted through three flagship initiatives: a ‘Digital agenda for Europe’, focusing on high-speed broadband access for all; ‘Innovation Union’, which will re-focus R&D and innovation policy onto major challenges such as climate change, energy and resource efficiency, health and demographic change; and the ‘Youth on the Move’ initiative, which aims to enhance the performance of education systems and to facilitate the entry of young people to the labour market in the EU, through improving all levels of education and training and better equipping young people for the job market .

2.3.2 Sustainable Growth

Sustainable growth entails building a more competitive low-carbon economy that makes efficient, sustainable use of resources; protecting the environment, reducing emissions and preventing biodiversity loss; and capitalising on Europe's leadership in developing new green technologies and production methods. Targets include:

- reducing greenhouse gas emissions by 20% compared to 1990 levels by 2020. The EU is prepared to go further and reduce by 30% if other developed countries make similar commitments and developing countries contribute according to their abilities, as part of a comprehensive global agreement
- increasing the share of renewables in final energy consumption to 20%
- moving towards a 20% increase in energy efficiency



It is envisaged that the EU will stimulate sustainable growth through two flagship initiatives: ‘Resource-efficient Europe’, which aims to decouple economic growth from resource and energy use by reducing carbon emissions, promoting greater energy security and reducing the resource intensity of production and consumption; and ‘An industrial policy for the globalisation era’, which aims to support businesses as they respond to globalisation, the economic crisis and the shift to a low-carbon economy.

2.3.3 Inclusive Growth

Inclusive growth aims at the creation and maintenance of a high-employment economy that delivers economic, social and territorial cohesion.

Inclusive growth encompasses the goals of a higher employment rate across Europe (with particular emphasis on increasing such rates for women, young people and older workers); greater investment in skills and training, so as to help people of all ages anticipate and manage change; modernisation of labour markets and welfare systems; and ensuring that the benefits of growth are experienced across all parts of the EU.

As with the other two priority areas, targets have been set for inclusive growth. These include:

- A 75% employment rate for women and men aged 20-64 by 2020;⁶
- Improved educational attainment, specifically a reduction in school drop-out rates to a level below 10% and that at least 40% of 30-34 year olds completing tertiary-level education;⁷
- At least 20 million fewer people to be at risk of poverty and social exclusion.⁸

⁶ The employment rate in the EU is particularly low for women (63% as opposed to 76% for men aged 20-64) and older workers aged 55-64 (46% against a rate of 62% in Japan and the US). Youth unemployment averages at 21% across the Union.

⁷ Within the EU, there are approximately 80 million people with low or basic skills. It is estimated that, by 2020, 16 million more jobs will require high qualifications, with some 12million fewer requiring low level skills.



It is anticipated that inclusive growth can be boosted through two flagship initiatives, namely the 'European platform against poverty' and the 'Agenda for new skills and jobs'. This latter has both individual and collective dimensions: at the individual level, it aims to help people acquire new skills, adapt to changing labour markets and make successful career transitions; at the collective level, it aims to modernise labour markets so as to increase participation by raising employment levels and enhancing labour productivity, whilst sustaining the European social model of a floor of employment protection and labour rights for all. Ultimately, the initiative seeks to better match supply and demand for labour.

The 'Agenda for new skills and jobs' is of particular salience in the context of this report, as is the 'Youth on the Move' flagship area, as both emphasise human capital development. Thus, the aspirations of the Lisbon and Europe 2020 strategies have reinforced the role of VET. Moreover, VET systems and policies were widely cited as playing a central role in reversing the detrimental effects of unemployment, during the economic crisis of 2008, and this has similarly elevated the position and status of such measures within the policy agenda. Skills, in general, are seen as having a crucial role in restoring Europe's prosperity and competitiveness after the vicissitudes of the economic downturn. VET policy and practices have an obvious role in attaining two of the Europe 2020 headline targets, namely reducing rates of early school leavers and increasing the numbers of 30-34 year-olds having completed tertiary education to a level of 40%.

⁸ Even prior to the economic crisis of 2008, there were an estimated 80million people at risk of poverty, including 19 million children. Amongst working adults, 8% earn below the poverty line.



2.4 Education and Training 2020 – Co-operation in VET so as to support the Europe 2020 Strategy

2.4.1 The 2010 Communication – “A New Impetus for European Cooperation in Vocational Education and Training to Support the Europe 2020 Strategy.”

On 9 of June 2010, the European Commission presented a 10 year vision for the future of vocational education and training in Union, in its Communication "A New Impetus for European cooperation in Vocational Education and Training to support the Europe 2020 strategy"(European Commission, 2010c).⁹

The Communication emphasises the contribution that vocational education and training makes to economic and social challenges, particularly in relation to efficiency and equity in the labour market. The Communication outlines the priorities for VET, including

- Ensuring access to training and qualifications is flexible and open at all stages of life;
- Promoting mobility to make it easier to gain experience abroad, or in a different sector of the economy;
- Ensuring the highest possible quality of education and training;
- Providing more opportunities for disadvantaged groups such as school drop-outs, low-skilled and unemployed people, people with migrant backgrounds and disabled people;
- Nurturing creative, innovative and entrepreneurial thinking in students.

Within each 2020 initiative, both the EU and national authorities have to coordinate their efforts, so as to ensure that they are mutually reinforcing.

⁹ In addition to the Communication, the Maastricht (European Commission, 2004), Helsinki (European Commission, 2006b), Bordeaux (The Bordeaux Communiqué, 2008) and the Bruges Communiqué (2010), within the Copenhagen process, also emphasise the role of guidance in supporting learning and working.



Thus, the Communication, in addition to the strategic framework for European cooperation in education and training (ET 2020), launched in 2009, outlines the commitment to co-operation, the responses required by member states and the actions that will be taken at EU level in order to support national policy and practice.¹⁰

With each EU Member State responsible for its own education and training systems, Union- level policies are designed to support national actions and help address common challenges, such as ageing societies, skills deficits among the workforce, and global competition. These areas demand joint responses and countries can benefit from sharing experiences.

Under ET 2020, a series of benchmarks have been set for 2020, in order to achieve the priorities for VET as identified in the Communication (and ultimately, the Europe 2020 Strategy). These reiterate the EU 2020 goals and elaborate further on other reinforcing attainment levels. The ET2020 benchmarks then are that:

- at least 95% of children between the age of four and the age for starting compulsory primary education should participate in early childhood education;
- the share of 15-years olds with insufficient abilities in reading, mathematics and science should be less than 15%;
- the share of early leavers from education and training should be less than 10%;
- the share of 30-34 year olds with tertiary educational attainment should be at least 40%;
- an average of at least 15 % of adults (age group 25-64) should participate in lifelong Learning

¹⁰ ET 2020, adopted by the Council in May 2009, is the follow-up to the earlier Education and Training 2010 work programme, established in 2001.



The Communication highlights the increasing awareness of common EU reference tools in partner countries, and their potential to contribute to trans-national collaboration, regional development, and improvements in the management of legal skilled labour migration. Moreover, it emphasises that EU policy on vocational education and training should be subject to further policy dialogue and mutual learning with the international community, including third countries and relevant international organisations.

2.4.2 The Bruges Communiqué

The latest revision took place in December 2010 (Europa, 2010). The European Ministers for Vocational Training, the European Social Partners and the European Commission met in Bruges, Belgium, to set the priorities of the Copenhagen Process, and thus the common objectives for vocational training, for 2011-2020 (ibid.).

The Communiqué begins by setting out the challenges facing the Union. Specifically, it reinforces and reiterates that Europe is attempting to recover from the economic and financial crisis of 2008-9, the fact that unemployment rates, particularly amongst the under-25s, are high across the Union¹¹, and moreover, that there are some 76 million individuals across the Union that either have low or no qualifications.¹² The need for economic and societal reform and the Europe 2020 aims of being smarter, more sustainable and more inclusive are stressed. Other significant trends identified in the Communiqué are changing skill needs in line with technological advances and concomitantly, the ever-growing demand for high skill levels; the ageing population of Europe and the unacceptably high numbers of young people leaving education without qualifications.

¹¹ In September 2010, the general unemployment rate was 9,6 %, and the youth unemployment rate was 20,3 % across the EU27 member states (source: Eurostat).

¹² Across Europe, some 76 million 25-64 year olds - roughly equivalent to the combined total populations of Italy, Hungary and Austria - have either low qualifications or no qualifications at all (Bruges Communiqué, 2010).



In order to respond to these challenges, it is argued that that the EU needs responsive, need flexible, high quality education and training systems. The Communique states that the capacity of VET to respond to the changing requirements of the labour market must be enhanced, and the changing labour market needs must be integrated into VET provision over the long-term. This will require better understanding of emerging sectors and skills, and of changes to existing occupations. This will entail closer collaboration between relevant stakeholders, including representatives of professional sectors, social partners, relevant civil society organisations, and education and training providers. It is proposed that VET content, infrastructure and methods needs to be regularly adapted in order to keep pace with shifts to new production technologies and work organisation. The transition to a green economy is also identified as a ‘mega trend’, which affects skill needs across many different jobs and sectors. The Communique establishes that the labour market requires a balance between developing generic green skills (e.g. reducing waste, improving energy efficiency) and more specific skills, developing and utilising green technology for example.

Thus, in order to address these issues and to facilitate the attainment of the Europe 2020 strategic targets, the Bruges Communique adopted:

- a global vision for VET in 2020
- 11 strategic objectives for the period 2011-2020 based on that vision
- 22 short-term deliverables at national level for the first 4 years (2011-2014), with indication of the support at EU level
- general principles underlying the governance and ownership of the Copenhagen Process.



The global vision for VET in 2020 is that by 2020, European VET systems should be more attractive, relevant, career-oriented, innovative, accessible and flexible than in 2010, and should contribute to excellence and equity in lifelong learning, through the provision of the following:

- **Attractive and inclusive VET** with highly qualified teachers and trainers, innovative learning methods, high-quality infrastructure and facilities, a high labour market relevance, and pathways to further education and training;
- **High quality initial VET (I-VET)** which learners, parents and society at large may regard as an appealing option, of the same value as general education. I-VET should equip learners with both key competences and specific vocational skills;
- **Easily accessible and career-oriented continuing VET (C-VET)** for employees, employers, independent entrepreneurs and unemployed people, which facilitates both competence development and career changes;
- **Flexible systems of VET, based on a learning outcomes approach**, which support flexible learning pathways, which allow permeability between the different education and training subsystems (school education, VET, higher education, adult education) and **which cater for the validation of non-formal and informal learning**, including competences acquired in the workplace;
- **A European education and training area**, with transparent qualifications systems which enable the transfer and accumulation of learning outcomes, as well as the recognition of qualifications and competences, and which facilitate transnational mobility;



- **Substantially increased opportunities for transnational mobility** of VET students and VET professionals;
- **Easily accessible and high-quality lifelong information, guidance and counselling services**, which form a coherent network and which enable European citizens to take sound decisions and to manage their learning and professional careers beyond traditional gender profiles.

From this vision, the Communiqué (2010) then outlines the strategic objectives for the period 2011-2020, followed by an identification of short-term deliverables for the period 2011-14. For each objective, the participants also agreed on an action plan for the first years, which identified concrete measures to be taken at national levels with support at European level. In sum then, the Bruges Communiqué is essentially a package of objectives and actions for the development of VET at European and national levels, to be achieved by 2020.

3.0 The EU's 'Green Skills' Strategy

3.1 Sustainable Growth and Development

To reiterate, sustainable growth is one of the key pillars of the Europe 2020 strategy. Therein, sustainable growth means building a resource-efficient and competitive economy, reinforcing the competitive advantages of businesses, particularly in manufacturing and SMEs, and through assisting consumers to value resource-efficiency (CEDEFOP, 2009).



This goal of sustainable growth is compatible with the EU's 'fundamental objective' of sustainable development (European Council, 2009), where "sustainable development stands for meeting the needs of the present generation without jeopardising the abilities of future generations to meet their own needs ...a better quality of life for everyone, now and for generations to come" (European Commission, 2010). As sustainable development is an over-riding objective under the Lisbon Treaty, it continues to provide a long-term vision and is deemed to be the overarching policy framework for all Union strategies and policies (European Commission, 2010; European Council, 2009).¹³ It is of great significance therefore and its centrality was re-affirmed by the Council under the 2009 Review of the EU Sustainable Development Strategy (EU SDS).

The SDS was renewed by the Council in 2006 ('SDS for an Enlarged EU'). The overall aim of the strategy is the identification and development of actions so as to enable the Union to achieve a continuous long-term improvement of the quality of life through the creation of sustainable communities, able to manage and use resources efficiently, able to tap and use the ecological and social innovation potential of the economy, and ultimately, to ensure prosperity, environmental protection and social cohesion.

The strategy sets overall objectives and concrete actions for seven key priority challenges, which are as follows:

- Climate change and clean energy

¹³ Sustainable development became a fundamental objective of EU strategy and policy in 1997, when it was included in the Treaty of Amsterdam as such. At the Gothenburg Summit of 2001, EU leaders launched the first EU SDS based on a proposal of the Commission. The Gothenburg Declaration formed the core of EU policies towards SD. This 2001 strategy was composed of two parts. The first proposed objectives and policy measures to tackle a number of key, unsustainable trends, whilst the second part called for a new approach to policy-making, so as to ensure that EU social, economic and environmental policies are mutually reinforcing. The central instrument, designed for this end, was the obligation for the Commission to submit each new major policy proposal to an Impact Assessment.

The EU SDS added a third environmental dimension to the Lisbon Strategy of economic and social renewal.



- Sustainable transport
- Sustainable production and consumption
- Conservation and management of natural resources
- Public health
- Social inclusion, demography and migration
- Global poverty and sustainable development challenges.

Research, public policy and significantly, for the purposes of this report, education, are emphasised as central instruments in facilitating the transition towards more sustainable production and consumption patterns.¹⁴

The 2009 Review of the SDS outlines progress made towards these objectives, in addition to identifying areas for further action. It begins by stating that whilst the EU has mainstreamed SD into its policies, the economic crisis of 2008-09 served to highlight that sustainability is a key factor for member states' financial systems and the economy as a whole (European Commission, 2009). It refers to the Recovery Plan for jobs and growth launched by the Commission in 2008 (which focused investment on clean technologies and infrastructure) and emphasises how crucial it is that measures to support the economy and reduce the social impact of the financial crisis are compatible with long-term sustainability goals.¹⁵ The Review emphasises that the EU must turn the crisis into an opportunity to address financial and ecological sustainability, and develop a dynamic low-carbon and resource-efficient, knowledge-based, socially inclusive society. It places measures to overcome the crisis within the context of the Lisbon Strategy for growth and jobs (updated by the

¹⁴ According to the 2006 European Strategy for Sustainable Development: "Education is a prerequisite for promoting the behavioural changes and providing all citizens with the key competences needed to achieve sustainable development. Success in reversing unsustainable trends will, to a large extent, depend on high-quality education for sustainable development."

¹⁵ 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 (ECORYS, 2010).



Europe 2020 Strategy), and emphasises the importance of green growth within that directive. It proposes that, in the short-term, green measures help to revive the economy and create jobs, whilst in the medium to long-term, they also stimulate new technologies and reduce detrimental impact upon the climate, the depletion of natural resources and the degradation of ecosystems.

Thus, in addition to protecting the environment, preventing climate change and ensuring future prosperity, the building of a green economy is increasingly vaunted as a vehicle for job creation at European and national levels (e.g. European Commission, 2009; Cedefop, 2009; Innovas, 2009; Levy, 2010).¹⁶ Therefore, the momentum for a low-carbon economy has gained further impetus, in the face of European-level exhortations and policy measures such as the 2008 Recovery Plan, and as national-level governments seek to emerge from the economic recession and reduce unemployment at the same time as meeting their climate change obligations, renewing energy infrastructure and complying with other environmental legislation (CEDEFOP, 2009).¹⁷ The EU has also recognised that green jobs require green skills, and that these play a critical role in supporting a low-carbon economy (Environment DG, 2011).

3.2 'Green' jobs and skills

There is some debate as to what actually constitutes 'green jobs' and as to what skills will be required in a 'green economy'. Boundaries between what is and what is not low-carbon work are becoming increasingly blurred as economic activities improve their resource efficiency and as the CEDEFOP (2009) study illustrated, much

¹⁶ The Cedefop study of 2009 cites research into green investments, particularly in renewable energy and eco-construction, which indicates that such areas are potentially significant engines for job creation. A study recently commissioned by the UK government estimated that 400 000 gross jobs could be created by 2015 if plans to reduce greenhouse gas emissions were realised (Innovas, 2009).

¹⁷ The CEDEFOP (2010) study *Skills for green jobs* is part of a broader study carried out with the International Labour Organisation. The research looks at the skills needed to develop a low-carbon economy in six Member States (Denmark, Germany, Spain, Estonia, France and the UK).



of the skills base relevant for low-carbon jobs can be found in existing occupations. According to a study by UNEP (2008), green jobs are “jobs in the environmental sector and/or jobs requiring specific environment-related skills.” The United Nations Environmental Protection (UNEP) study predicts that green employment will be affected in at least four ways:

- Additional jobs will be created in a number of areas (e.g. in the manufacture of pollution control devices attached to existing production equipment);
- Substitution of employment will occur (e.g. shifting from fossil fuels to renewable energy sources, or from land filling and waste incineration to recycling);
- Particular jobs may be eliminated without direct substitution, for example, where the use of certain packaging materials are discouraged or forbidden and an end is put on their production;
- Many existing jobs (e.g. plumbers, electricians, metalworkers and construction workers) may be altered due to the ‘greening’ of day-to-day skill sets, work methods and profiles.

Specific skills identified for Europe’s green economy include:

- knowledge of sustainable materials,
- relevant traditional skills,
- ‘carbon footprinting’ skills,
- environmental impact assessment skills, and
- good understanding of the ‘sound’ sciences.

In environment related sectors, the following future skills have been identified:



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: ECORYS for the European Commission, 2010; CEDEFOP, 2008; UNEP, 2008)

Generic skills needed include ‘softer’ skills in leadership, entrepreneurship and risk analysis. The ability to recognise, adapt and transfer skill sets, systems analysis and a holistic approach are also valued. However, generic green skills – such as improving resource efficiency in the workplace and understanding environmental legislation – are equally important to the skills agenda. Improvements in provision of training on



both (generic and generic green skills) are crucial to almost the entire workforce and not just a small subsection of the population who work in highly specialised technologies.

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

- 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;
- demand for some new skills will be created as new occupations emerge to support adaptation to and mitigation of climate change;
- the skills required for existing jobs will have a stronger green element as existing professional profiles change

It is the latter two which are receiving most attention in the literature currently. For example, within the environment-related sectors, new skills will be created within the recycling/waste treatment recovery sector, as rapid technological changes in this area are likely to create growing need for new skills. However, within construction, the same generic skills of those already in the building sector are required, yet the job will require ‘add-on’ in terms of renewable energy knowledge, installation etc.

The ECORYS (2010) study proposes that 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 the workforce towards specific topics (e.g. increasing energy efficiency, renewable energy implementation, reduction of CO₂ emissions and protection of biodiversity). Similarly, the CEDEFOP report (2010) recommends that strategic skills responses ought to focus more on topping up current competences as opposed to focusing on the creation of totally novel skill-sets. In general, given a sound



basis of generic skills, upskilling or ‘adding to’ existing job-related skills will enable someone to carry out the full range of tasks required by a new green occupation.

3.2.1 Government Interventions

EU policy documents in this area clearly state that government intervention at national level – through, for example, subsidising research and early stage deployment into new green technologies - is crucial in supporting such job creation. This follows on the EU’s own economic recovery plan, a fiscal stimulus of around EUR 200 billion launched in 2008 that focused investment on clean technologies and infrastructure.

A December 2008 report for the EU Environment DG focused on steps needed to improve linkages between the existing European labour force and environmental factors (ECORYS, 2008). Its recommendations included better understanding and forecasting of the skills profile of green jobs. The research also showed that, as jobs are created at the local level, it is important to tie green skills to sustainable local economic development strategies.

A governmental role in ensuring that learners, providers and employers are more ‘joined up’ in their approach to creating training products relevant to industry needs is also identified.

3.2.2 The role of training providers

In terms of direction on training provision, a perusal of EU policy documents reveals that emphasis needs to be placed on ensuring that a large proportion of the workforce tops up their current skills sets, through the provision of affordable and accessible modules tailored to their particular needs. The CEDEFOP (2009) study states that training and guidance services ... should focus on skills related to energy efficiency and renewable energy implementation”. Core skills – including science, technology, engineering and mathematics (STEM) skills - need to be improved at



secondary and tertiary levels, as they provide the basis for high-level low-carbon skills, and engineering needs to be made more attractive by both governments and industry.

It is also advocated that vocational education and training (VET) providers should improve links with companies developing demonstration technologies, to attract further students to the industry (CEDEFOP, 2010).

3.2.3 Green skills gaps and policy deficiencies

Despite the fact that education and training have been identified as the critical foundation in attaining sustainable development and the creation of a green economy (European Commission, 2009; see also GHK, 2008), the research by ECORYS in 2010 for the European Commission highlighted the existence of a green skills gap. An earlier study conducted in 2009 on behalf of the EC demonstrated that there are a variety of green skills-shortages across different Member States and across different sectors of the European economy (ECORYS, 2009). The studies thus conclude that EU-level and national policies to address these skills shortages are required.

The CEDEFOP (2010) study which examined green skills development at national, regional and local levels in six member states (Denmark, Estonia, France, Germany, Spain and the UK), found that although these member states had launched economic stimulus packages for sustainable growth (tending to concentrate on construction, the automotive sector, energy efficiency and renewable energy), there are no explicit, overarching, national strategies targeting green skills in the six countries studied.¹⁸ This is in spite of the fact that all participating Member States recognise, in general policy statements, the skills dimension of climate change and low-carbon policies.

¹⁸ Some Member States are moving faster than others to rectify this, with France launching its recent mobilisation plan for green jobs, and the UK government's launch of a consultation exercise, entitled *Meeting the low carbon skills challenge* (BIS, 2010)



Yet, countries' environmental strategies and programmes do not currently integrate skill development.

Approaches to identifying skills for a low-carbon and resource efficient economy varies across the six countries, but has occurred most prominently at the regional level, in cooperation with other partners, such as industry, universities and vocational institutions. For example, the UK central government has created several low carbon economic areas (LCEAs) that capitalise on their geographic and industrial assets for a low-carbon economy and focus on stimulating employer demand for green skills. However, the authors of the CEDEFOP (2010) report are clear that a narrow sectoral approach to skills anticipation and development is insufficient to understand the greening of skills and occupations and may miss the innovation and job growth potential in exploiting new markets for green technologies. Within the countries studied, the experience is that restructuring responses are far more ad hoc, constituting opportunistic responses to new market demands reflected in changing skills requirements. This means that responses are largely case specific and built around regeneration efforts of particular regions/localities or sectors/companies. Even where national strategies exist, for example the vehicles sector, there is still reliance on regional or company level initiatives to design skills responses.

In sum, the CEDEFOP (2010) study concludes, despite the inclusion of some individual skills training responses in environmental strategies and programmes, as well as progressive development of diverse environment-related programmes in vocational and higher education systems, existing systems to identify and provide skills in the member states investigated, could be improved so as to incorporate strategic measures for developing green competences and supporting transition to a low-carbon economy.

The report provides the following recommendations:



- A cross-sectoral approach to identifying skills is needed; some green skills are job-specific but others are transferrable.
- Greater stimulation of jobs by national and regional governments is needed through co-ordinated employment, skills upgrading and innovation policy. Regional governments should encourage public-private initiatives and create networks of regional training centres.
- Every job should be considered a ‘green’ job that contributes in some way to improving resource efficiency.
- Environmental issues in industry should be mainstreamed into education and training systems.
- There needs to be more initiatives for promoting STEM education.
- Greater investment in trainers and teachers to teach new environmental techniques and to develop awareness of environmental issues is needed, particularly in the agriculture and construction sectors.
- The image of occupations related to low-carbon industries and resource efficiency needs to be made more attractive

Despite including, there are no explicit national strategies targeting skills needs for greening the economy. Public strategy documents identifying the need for more skills training are found across Member States but there is no overarching comprehensive skills training strategy identifying skills needs for the occupations involved.

4.0 Conclusions



5.0 Bibliography

Bird, J. and Lawton, K. (2009). *The future's green: jobs and the UK low-carbon transition*. London: Institute for Public Policy Research.

BVET (2009). *Skills for sustainability - Second edition*. New South Wales Board of Vocational Education and Training – New South Wales Department of Education and Training.

CEDEFOP (2008). *Future skill needs in Europe – focus on 2020*. Luxembourg: Office for Official Publications of the European Communities.

CEDEFOP (2009) *Future skill needs for the green economy*. Luxembourg: Publications Office.

Available at: http://www.cedefop.europa.eu/EN/Files/5501_en.pdf.

Date downloaded:

CEDEFOP (2010) *Skills for Green Jobs*. Luxembourg: Publications Office.

CEDEFOP (2010a) *A Bridge to the Future: European Policy for Vocational Education and Training 2002 – 2010*. Luxembourg: Publications Office of the European Union.

CEDEFOP (2011) *Lifelong guidance across Europe: reviewing policy progress and future prospects*. Luxembourg: Publications Office of the European Union.

Commission of the European Communities. *Consultation on the future 'EU 2020' strategy*. Brussels: CEC, 24 Nov 2009.



ECORYS (2008) *Environment and labour force skills: overview of the links between the skills profile of the labour force and environmental factors*. Final report to EC DG Environment, Dec 2008.

ECORYS (2009) *Environment and Labour Force Skills*. Rotterdam: ECORYS Consulting.

ECORYS (2010) *Programmes to Promote Environmental Skills*. Final Report to the EC DG Environment. Rotterdam: ECORYS Consulting.

ETUC (2006) *The European Union's Lisbon Strategy*.

<http://www.etuc.org/a/652>

Date downloaded:

Eurofound (2009) *Greening the European Economy*. European Foundation for the Improvement of Living and Working Conditions.

Europa (2011) *The Bruges Communiqué on enhanced European Cooperation in Vocational Education and Training for the period 2011-2020*. Bruges: Communiqué of the European Ministers for Vocational Education and Training, the European Social Partners and the European Commission; 7 December 2010.

Available at: http://ec.europa.eu/education/lifelong-learning-policy/doc/vocational/bruges_en.pdf

Date downloaded:

European Commission (2001) *Report from the Commission: The Concrete Future Objectives of the Education Systems*. Brussels: European Commission. 31 January 2001.



European Commission (2009) *2009 Review of the EU Sustainable Development Strategy*. Communication from the European Commission to the European Parliament, The Council, the European Economic and Social Committee and the Committee of the Regions.

[http://eur-](http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52009DC0400:EN:NOT)

[lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52009DC0400:EN:NOT](http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52009DC0400:EN:NOT)

Date downloaded:

European Commission (2010) ‘Sustainable Development.’

<http://ec.europa.eu/environment/eussd/>

Date downloaded:

European Commission (2011a) ‘Europe 2020.’

http://ec.europa.eu/europe2020/index_en.htm

Date downloaded:

European Commission (2011b) *Strategic Framework for Education and Training.*

European Commission, 7 November 2011.

http://ec.europa.eu/education/lifelong-learning-policy/doc28_en.htm

Date downloaded:

European Commission (2011c) ‘Vocational Education and Training.’

http://ec.europa.eu/education/lifelong-learning-policy/doc60_en.htm

Date downloaded:

European Commission (2011d) ‘A new impetus for European cooperation in Vocational Education and Training to support the Europe 2020 strategy.’

Brussels: European Commission, 9 June 2010.

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:0296:FIN:EN:PDF>

Date downloaded:



GHK Consulting (2008) *Inventory of innovative practices in education for sustainable development*. Final Report for the European Commission, DG Education and Culture. Brussels: GHK Consulting.

Innovas (2009) *Low carbon and environmental goods and services: an industry analysis*. For UK Department for Business, Enterprise and Regulatory Reform. Winsford: John Sharp, Innovas Solutions Ltd.

Levy, C. (2010) *A 2020 Low Carbon Economy: A Knowledge Economy Programme Report*. London: The Work Foundation

OECD (2009) *Economic survey of the European Union 2009: Energy policy and the transition to a low carbon economy*. OECD, Sept 2009.

Pye, J. (2010) *Green Skills, Green Jobs: Opportunities for the South West Low Carbon Economy*. SLIM Learning Theme Report; South West Observatory for Skills and Learning, January 2010.

UNEP (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

Date downloaded: