

DIRECTORATE-GENERAL FOR INTERNAL POLICIES

**POLICY DEPARTMENT**  
**ECONOMIC AND SCIENTIFIC POLICY** **A**



**The impact of climate  
change policies on the  
employment situation**

EMPL





**DIRECTORATE GENERAL FOR INTERNAL POLICIES**  
**POLICY DEPARTMENT A: ECONOMIC AND SCIENTIFIC POLICY**

**EMPLOYMENT AND SOCIAL AFFAIRS**

**The impact of climate change policies on the employment  
situation**

**Summary of evidence note**

**Abstract**

This summary of evidence note aims at gathering existing literatures on the impact of climate change policies on employment. Taking into account the wide and very complex topic, this summary of evidence note cannot be considered as exhaustive and complete but intends to provide the reader with the best overview possible. Through sources selected in cooperation with the Library services, the note contributes to answering the following questions: what is the employment-enhancing potential of the climate change policies and which policy responses are appropriate at EU level in order to increase that potential.

This document was requested by the European Parliament's Committee on Employment and Social Affairs.

## **RESPONSIBLE ADMINISTRATOR**

Laurence Smajda and Catherine Lauranson  
Policy Department Economic and Scientific Policy  
European Parliament  
B-1047 Brussels  
E-mail: [Poldep-Economy-Science@europarl.europa.eu](mailto:Poldep-Economy-Science@europarl.europa.eu)

## **LINGUISTIC VERSIONS**

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## **ABOUT THE EDITOR**

To contact the Policy Department or to subscribe to its monthly newsletter please write to: [Poldep-Economy-Science@europarl.europa.eu](mailto:Poldep-Economy-Science@europarl.europa.eu)

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## Introduction

There is an evolving political consensus at EU level that a switch to a **low-carbon economy** is required both to combat climate change and for European industries to remain competitive in the long term<sup>1</sup>. Climate change represents thus a challenge but also an opportunity for developing new technologies, creating new jobs and move toward a green growth<sup>2</sup>. But the current challenge is to maintain that long term objective in the face of short term difficulties. At the wake of the financial crisis and the economic slowdown, the short term needs of the industry, most notably the automotives, have indeed overrun certain environmental policy objectives.

After Copenhagen, Europe has to convince the rest of the world that a transition to a low carbon economy is possible and even positive for global economy. As morality arguments and scientific data on climate change seem to have failed to convince people about the need to adapt, concrete effects on job creation might better work.

A recent Euro barometer<sup>3</sup> survey shows that European citizens have equally split views on the alternative: priority to economic growth vs. protection of the environment. They also consider that economic growth and environmental friendly actions are not necessarily mutually exclusive priorities. The same Euro barometer survey shows that the first citizen concern is still **employment**.

This summary of evidence note aims at gathering existing literatures on the impact of climate change policies on employment. Taking into account the wide and very complex topic, this summary of evidence note cannot be considered as exhaustive and complete but intends to provide the reader with the best overview possible. Through sources selected in cooperation with the Library services, the note contributes to answering the following questions:

1) What is the employment-enhancing potential of the climate change policies?

1.1 Indication of the numbers of new jobs that will be created and jobs that will be lost

1.2. The impact of climate change policies on the sectoral composition of employment, on gender distribution, on qualifications levels

1.3. The impact of climate change adaptation on skills and changes in the demand for skills, the share of public and private funding on education, the current contribution by businesses to vocational training and lifelong learning

2) Which policy responses are appropriate at EU level in order to increase that potential?

2.1. Indication of EU policies and instruments supporting the transition to a low-carbon economy and green jobs

2.2. Overview of initiatives undertaken or planned by the European social partners

2.3. Policy responses undertaken by the Member States

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<sup>1</sup> *Europe's contribution to a low carbon economy*, Stavros Dimas SPEECH/09/21 of 26/01/2009, Press conference at the launch event of the McKinsey Report, Brussels.

<sup>2</sup> Lord Stern of Brentford, author of the eponymous review in 2006 argues for example that by spending about a fifth (\$400bn) on green technologies the world could begin a path towards sustainable growth, Financial Times of January 28 2009 : "Stern calls for 'green' global stimulus" by Andrew Bounds, Manchester.

<sup>3</sup> Eurobarometer 72. December 2009: [http://ec.europa.eu/public\\_opinion/archives/eb/eb72/eb72\\_first\\_en.pdf](http://ec.europa.eu/public_opinion/archives/eb/eb72/eb72_first_en.pdf)

# 1. What is the employment-enhancing potential of the climate change policies?

## ➤ Introduction

*Employment in Europe 2009, European Commission, DG Employment, Social Affairs and Equal Opportunities, November 2009 (chapter 3: Climate change and labour market outcomes, p. 105-147).*

The EU's moves towards a competitive low-carbon economy will become important driving forces from a labour market perspective. Although the total net job creation effects may not be very large – as creation of new 'green' jobs and greening of existing jobs will partly be offset by loss of some existing jobs – the underlying structural changes will involve re-allocation of workers across economic sectors and skill types.

The combined impact of climate change and climate policies on the **overall employment** level is likely to be neutral or **even slightly positive** in the long run at EU level – provided adequate policies are implemented. However, the impact will differ substantially across economic activities, skill types and regions whereby some jobs will be lost or require different skills sets as they are 'greened', but others will be created. Sectors likely to be most affected include energy supply, agriculture, fisheries, tourism and construction. For instance, it is estimated that total employment in the renewable energy sector could amount to some 2.8 million jobs in 2020 in the EU if these sources are actively promoted in comparison to 1.4 million jobs in 2005. However, since some jobs would also be lost (e.g. in traditional energy sectors), the net employment creation is estimated to be between 100,000 and 400,000 jobs. Regions will be affected very differently. In particular, energy-intensive and high carbon areas with poor economic diversification could be severely hit during the transition process. These adjustments are likely to affect low-skilled workers more than high-skilled workers, highlighting the importance of maintaining and improving skills.

*Source: Environment and labour force skills - Overview of the links between the skills profile of the labour force and environmental factors / Allister Slingenberg and others, ECORYS for the European Commission, DG Environment, December 2008, 77 p.*

In terms of future employment in green jobs, employment will be affected in at least four ways:

- Additional jobs will be created in several areas, such as in the manufacturing of pollution-control devices which are added to existing production equipment;
- Substitution of employment will take place, for example due to shifting from fossil fuels to renewable energy sources, from truck manufacturing to rail car manufacturing, or from land filling and waste incineration to recycling;
- Particular jobs may be eliminated without direct substitution (e.g. when the use of certain packaging materials is discouraged or forbidden and an end is put to their production);
- 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 profiles.

*Rethinking the Economic Recovery: A Global Green New Deal / Edward B. Barbier, UNEP, April 2009, 144p.*

In 2008, the world was confronted with multiple crises – fuel, food and financial. The result of these crises has been the worst global economic recession since the Great Depression of the 1930s. In 2009, for the first time in decades, the volume of world trade is projected to decline as global per capita income contracts. The number of unemployed globally could rise this year by between 18 million and 51 million over 2007 levels. Every 1 per cent fall in growth in developing economies will translate into an additional 20 million people consigned to poverty. Faced with the social and economic consequences of a deepening world recession, it may seem a luxury to consider policies that aim at **reducing carbon dependency** and environmental degradation. Such a conclusion is both false and misleading.

The three objectives of a Global Green New Deal (GGND) are:

- Revive the world economy, create employment opportunities and protect vulnerable groups.
- Reduce carbon dependency, ecosystem degradation and water scarcity.
- Further the Millennium Development Goal of ending extreme world poverty by 2015

*Source: Low Carbon Jobs in an Interconnected World, Global Climate Network, 30 March 2010, 37 pages.*

This paper—the product of nine separate national studies conducted over recent months by each of the GCN's member institutes—provides a major fillip for climate optimism and positivism. It shows that:

- Not only will the development and wide use of low-carbon technology create jobs, but globally these will be measured not in thousands but in millions.
- New low-carbon jobs are likely to outnumber job losses in carbon-intensive sectors.
- The jobs created will on the whole attract above -average salaries.

The GCN's exhaustive survey of existing literature on low-carbon jobs and its own estimates – while uncertain in some cases due to a shortage of source data on jobs and low-carbon technology markets – consistently support these conclusions. Policymakers should aim to fill some of the gaps in data identified in this paper and to come to their own conclusions about precise numbers, but it is the firm, collective view of GCN members that the economic promise from bold, clear and decisive low-carbon policies is very significant indeed.

## 1.1. Indication of the numbers of new jobs that will be created and jobs that will be lost

Numerous studies have tried to estimate the number of job creation that will be generated to adapt to a low carbon economy. According to many literature sources, climate change policies will lead to job creation in some sectors (e.g. related to renewable energies source, energy efficiency, carbon capture storage, etc), while some jobs will be lost in others (e.g. related to fossil fuels and production of inefficient products).

In general, many studies highlight that the overall net effect is likely to be positive, as jobs in less labour intensive industries could be replaced by jobs in more labour intensive ones, or in sectors with longer value chains – hence having wider effects in the economy.

### ➤ A small but positive job creation

*Source: European Trade Union Confederation (ETUC), Instituto Sindical de Trabajo, Ambiente y Salud (ISTAS), Social Development Agency (SDA), Syndex and Wuppertal Institute. 2005. "Climate Change and Employment- Impact on Employment in the European Union 25 of climate change and CO2 reduction measures by 2030.*

The ETUC foresees a small but positive **increase of 1.5%** in the number of jobs in the next 10-20years resulting from CO2 emissions reduction policies.

*Source: Low Carbon Jobs for Europe: Current opportunities and future prospects / Meera Ghani-Eneland, Michael Renner, Ambika Chawla; WWF, June 2009, see namely p. 5-10*

This study shows that **at least 3.4 million European jobs** are directly related to renewable energy, sustainable transport and energy efficient goods and services. It provides evidence that climate-friendly policies and technologies make a positive contribution to the economy.

*Source: Jobs and the Climate and Energy Package: Climate Protection Creates EU Employment. WWF note, September 2008, 13 p.*

Climate policy measures impact employment through different channels of influence, having direct and indirect effects. Indeed while the GHK 2007 study (*Links between the environment, economy and jobs, GHK for the European Commission, DG Environment, November 2007*) states that even though the direct effects of policy on employment may be neutral or small due to the shift to greener jobs, the **indirect effect can be much larger** and indicate that the EU economy would gain, due to the change in technology and production systems and due to multiplier effect- due to higher demand for goods and services. An example from this study shows the impact on employment and output through increased energy efficiency in the manufacturing sector and energy intensive industries, increase in bio-fuels in transport and increase in electricity generation from renewable energy technologies.

An overview of direct and indirect and total impacts on employment and outputs of the above mentioned policies is shown in the table below. The results in the table show the net direct and indirect effects accounting for jobs and output losses in some sectors and gains in the others. Overall scenarios showed that the move towards greener options would be beneficial for the EU economy due to the longer supply chain and higher labour intensity of the more environmentally-friendly sectors.

Table 1: The Economic Impacts of Selected Policy Scenarios

Policy scenario	Net Direct Impact		Net Indirect Impact		Total Net Impact	
	Output (€ m)	Jobs (FTE)	Output (€ m)	Jobs (FTE)	Output (€ m)	Jobs (FTE)
10% energy saving in manufacturing	0	122500	480	14600	480	137200
10% energy saving in energy intensive industries	1000	54000	8000	37000	9000	91000
10% bio-fuels	0	108100	1500	31400	1500	139500
10% RES	0	0	8610	58200	8610	58200

Source GHK, IEEP and Cambridge Econometric, adapted by WWF, where Output is turnover and gross value added (GVA) associated with activities related to environmental resources and FTE stands for Full Time Equivalent.

➤ Loss of jobs in the high pollution-intensive activities

Source: Thematic Expert Work on Green Jobs for DG EMPL/D1, GHK and European Employment Observatory (EEO), Thematic Paper, August 2009, 50 p.

At the level of individual sectors, environmental and climate change policies are likely to have an especially strong impact on sectors sensitive to international competition. A number of EU industries are losing their market share over time due to the growth in global competition. The costs of stringent product and quality standards resulting from environmental regulation and/or from the EU ETS **increase the burden of competing** in international markets. As a result job losses (and job shifts) will occur, especially in energy extraction and refining, the power sector, and in energy-intensive industries like chemicals, steel, aluminium, paper, and cement.

Source: Working for the climate: renewable energy and the green job revolution, Greenpeace International and European Renewable Energy Council, August 2009

This recent study found that under an Energy Revolution scenario, there would be an overall increase of around **2 million power sector jobs** over 20 years. But that without measures to make the shift to clean energy, there will be sector-wide job losses – half a million energy supply jobs would disappear between 2010 and 2030. With policies to create an Energy Revolution, there would be more than 8 million jobs in renewable energy and energy efficiency in 2030, more than three times as many as with a 'business as usual' approach".

## 1.2. The impact of climate change policies on the sectoral composition of employment

### ➤ Introduction

Source: *Green economy, CEDEFOP Skillsnet Sector Flash, June 2009, 4 p.*

Source: *Thematic Expert Work on Green Jobs for DG EMPL/D1, GHK and European Employment Observatory (EEO), Thematic Paper, August 2009, 50 p.*

The sectors where the employment potential is most pronounced are **renewable energies** (even after taking account of reduced conventional energy activity), followed by **green transport** infrastructure and technology and investment in the **energy efficiency** of goods and services.

Sectors which are the greatest contributors to greenhouse gas emissions are supposed to experience major changes: **electricity, transport, construction** and **energy-intensive industries**.

In economic restructuring towards sustainability, some sectors, such as **coalmining** and other **heavy industries**, will decline causing some sections of society to experience losses, but no sector will disappear. Large-scale redistribution of jobs will probably occur within sectors, considering lower retraining costs and shorter search periods for the new workforce. For example, the **automotive industry** is likely to manufacture hybrid, low-emission vehicles instead of inefficient cars, and is likely to retrain its employees in accordance with new necessities.

### ➤ Renewable energies

Source: *Low Carbon Jobs for Europe: Current opportunities and future prospects / Meera Ghani-Eneland, Michael Renner, Ambika Chawla; WWF, June 2009, see namely p. 5-10*

A modelling exercise<sup>4</sup> supported by the EU found that under current policies, there could be a net gain of 950,000 direct and indirect full-time equivalent (FTE) jobs by 2010 and 1.4 million by 2020 in the sector of renewable energies. Under an "Advanced Renewable Strategy," there could be 1.7 million net jobs by 2010 and **2.5 million by 2020**. About 60–70 percent of the jobs would be in renewable industries (primarily bio fuels and biomass processing and wind power), the remainder in agriculture. Similarly, the European Renewable Energy Council (EREC) argues that by raising the share of renewable energy to 20 percent of the EU's energy consumption by 2020, the number of green jobs could rise to more than 2 million.

### ➤ Construction

Source: *Burden Sharing - Impact of Climate Change mitigation policies on growth and jobs, Institute for European Environmental Policy for Policy Department A, March 2008, 44 p.*

The construction sector is expected to experience significant job creation. Employment is already stimulated by existing policies aimed at **energy efficiency in buildings**, increasing the overall demand for construction workers by almost 1%. Additional policies and measures have great potential in terms of energy savings, CO2 reduction, and employment, especially in the new Member States.

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<sup>4</sup> European Commission, "Meeting the Targets & Putting Renewables to Work. Overview Report," MITRE—Monitoring & Modelling Initiative on the Targets for Renewable Energy, at [www.ewea.org/fileadmin/ewea\\_documents/documents/policy/external\\_documents/040330\\_MITRE\\_overview\\_-\\_Meeting\\_the\\_targets\\_and\\_putting\\_renewables\\_to\\_work.pdf](http://www.ewea.org/fileadmin/ewea_documents/documents/policy/external_documents/040330_MITRE_overview_-_Meeting_the_targets_and_putting_renewables_to_work.pdf); MITRE project site, <http://mitre.energyprojects.net>.

These policies and measures could increase growth and employment in the construction sector by an additional 3%. The jobs directly created from thermal renovation of buildings are expected to be of relatively low qualification level; however, workers already in the sector should receive training in sustainable building.

➤ Energy-intensive industries

*Source: Climate disruptions, new industrial policies and ways out of the crisis, A study by Syndex, S. Partner and WMP Consult, ordered by ETUC in partnership with EMF and EMCEF, December 2009*

This multi-sectoral study concentrates on trend in employment for the industrial sectors responsible for greenhouse gas emissions which are directly concerned by the low-carbon transition.

First, the ones subject to the carbon market: electricity; the steel industry; refineries; cement; the chemical industry; glass; aluminium.

The seconds subject to the carbon regulations: the automobile sector; machinery and electric equipment; insulation materials and construction; renewable energies.

The study also analyses the impact on employment of a European clean **coal industry**.

About 27% of the overall electricity generation in the EU is provided by coal-fired power plants. It represents 1 billion tonnes CO<sub>2</sub> emissions in EU-27 in 2007. Germany, Poland and UK represent together 58% of these emissions.

In Poland for example, the construction and modernization of coal fired plants with super critical cycle technologies will have a negative impact over employment in coal fired power plants as process automatization and externalization are going to be higher. Moreover, Poland is going to partially switch from coal fired power plants to less labour intensive sources of energy. As a result, it is expected that the total amount of workers in power plants will fall from 31 000 to 14 000. As demand for coal is going to be reduced, 22 000 job losses are expected in the energetic hard coal subsector and 4000 in the lignite subsector. As consequence, additional job losses may appear in the coal mining equipment sector. As a great part of Polish power plants are going to be replaced by 2030, this loss of jobs could be compensated by the creation of direct and indirect jobs in the construction and equipment sectors.

Regarding **Carbon Capture Storage**, there is a need to design and implement tools and mechanisms like a "forecast management of jobs and professional skills" dedicated to CCS coal technologies value chain so as to facilitate the social employment transition.

➤ Transport

*Source: Low Carbon Jobs for Europe: Current opportunities and future prospects / Meera Ghani-Eneland, Michael Renner, Ambika Chawla; WWF, June 2009, see namely p. 5-10*

Even though a sustainable transport policy may ultimately lead to fewer jobs in car manufacturing and related fields such as vehicle retailing and repair services, it offers more jobs in manufacturing of buses, light **rail**, subways, and railways; in the provision of the required infrastructure for these modes of transport (including tracks, signals, stations, etc.); and in planning, running, and maintaining transport systems (bus drivers, conductors, and other operators; route planners, maintenance staff, etc.).

*Source: Burden Sharing - Impact of Climate Change mitigation policies on growth and jobs, Institute for European Environmental Policy for Policy Department A, March 2008, 44 p.*

The effect of climate change policies on growth and employment in the European *transport sector* is ambiguous. Fuel efficiency measures to reduce CO2 emissions per km for passenger **cars** are assumed to have a relatively marginal impact on growth and direct employment in the automobile sector, while they could stimulate growth and employment in the upstream component supply sectors. The economic and social impacts of bringing **aviation** under the EU ETS were assessed to be minor, while the environmental benefits could be substantial. With respect to policies that affect the relative prices of transport modes, some modes will lose while others may win. Overall it is possible that employment would be positively stimulated by policies that rebalance transport modes in favour of less-emitting modes (rail), and that stimulate clean technologies in all forms of transport.

➤ Agriculture

*Source: The employment effects of climate change and climate change responses: a role for International Labour Standards / Lene Olsen, International Labour Office, GURN discussion paper; no.12, 2009, 32 p.*

The physical impact of climate change on the agriculture sector is clear. Extreme weather events, increased incidence of droughts and floods, variability in rainfall patterns and degradation of marginal lands will have an influence on the agriculture sector and its many workers. This sector is known for its growing job insecurity, low rates of pay, poor working conditions and growing levels of poverty. Climate change challenges will thus place an enormous burden on already affected workers. The many millions of people working in the agriculture sector will have to face change in the way crops are produced or even look for new pastures elsewhere. Adaptation measures in the agriculture sector are not new. Farmers have been adapting to weather conditions for as long as farming has existed. However, the new challenges might be more extreme than earlier, cover larger geographical areas and take place more rapidly. Adaptation measures could include: **reduction of risks** for flooding; alteration of crops or relocation; improvement of land management; the institutionalisation of land reform, capacity building, financial incentives and measures to help workers cope with the loss of employment.

➤ Tourism

*Source: The employment effects of climate change and climate change responses: a role for International Labour Standards / Lene Olsen, International Labour Office, GURN discussion paper; no.12, 2009, 32 p.*

The hotel, catering and tourism (HCT) sector is one of the fastest growing industries globally but it is a sector highly affected by climate change. As a result of rising sea levels, many coastal areas and small islands will have to address changes in relation to jobs. Coastal zones are not the only places affected; mountain regions will also face disruptions of economic activities and employment. The skiing industry, for example, is sensitive to climate change. Tourism in the Alps is important for the economy with 60-80 million tourists and 160 million ski days in France, Austria, Switzerland and Germany each year. Winter tourism in the mountains of North America may face the same problems.

This will have an enormous impact on employees in this sector – travel guides, workers in hotels and restaurants and even in the transport sector. Particular adaptation measures for tourism could include an increased **diversification** of tourism attractions. Winter sport areas could for instance explore the addition of alternative activities for the summer season. Some ski stations and slopes have moved their installations to higher altitudes and glaciers. In terms of financial incentives, support could include tax breaks on adaptation investments as well as subsidies for capacity building in relation to development of new skills.

*Source: Davos Declaration, Second International Conference on Climate change and tourism responding to global challenges, 3 October 2007.*

Climate is a key resource for tourism and the sector is highly sensitive to the impacts of climate change and global warming, many elements of which are already being felt.

It is estimated to contribute some 5% of global CO2 emissions.

The tourism sector must rapidly respond to climate change, within the evolving UN framework and progressively reduce its GHG contribution. This will require action to:

- mitigate its GHG emissions, derived especially from transport and accommodation activities;
- adapt tourism businesses and destinations to changing climate conditions;
- apply existing and new technology to improve energy efficiency
- secure financial resources to help poor regions and countries.

➤ *The service sector*

*Source: Climate change, the environment and jobs in UNI europa's sectors / Sophie Dupressoir, ETUI, Report 109, May 2009, 30 p.*

Although services represent 70% of employment in Europe, they account only for 4% of GHG emissions, and they have managed to reduce their emissions by 1% since 1990 (European Environmental Agency, 2006 data). But to understand the real impact of services on environment, account needs to be taken of the fact that, to produce and consume services, a whole spectrum of material and energy consumption is essential.

This report explores the future of employment in the European service industry from a sustainable development perspective, particularly in an environmental sense of the word.

Five service sectors were assessed:

- ICT services;
- Postal services and logistics;
- Retail;
- Financial services;
- Insurance.

The report concludes that in each of these sectors, risks and opportunities for employment will result from the implementation of environmental policies. And their nature and balance differ widely across sectors. The majority of sectors will be winners but at the cost of innovation and investment in developing new skills. Some sectors will face significant risks. **Insurance sector** for example will be particularly vulnerable to the effect of global warming itself if nothing is done to prevent it.

Emission reduction targets for each sub sector with binding measures could be supported. Their absence in today's climate-energy package leaves the way open for companies to take voluntaries measures, whose effectiveness is uncertain. The British Government initiative to introduce quotas for major operators in the service sector, particularly in the **retail trade** is of interest in this respect.

• **Impact on gender distribution**

Source: *Green Jobs and Women Workers - Employment, Equity, Equality / Candice Stevens, International Labour Foundation for Sustainable Development (Sustainlabour), Draft Report, September 2009, 11 p.*

Theoretically, women can perform all categories of green jobs in the primary, secondary and tertiary sectors of the economy because automation has reduced the need for greater physical strength. In addition to more manual positions in the agriculture, energy and construction fields, the green economy should create a range of administrative and service employment opportunities.

However, the majority of green jobs are expected to be in the construction, manufacturing and engineering fields where women are significantly under-represented. As a result, the **green economy may unintentionally exclude women.**

A combination of traditional and innovative strategies is needed so that women as well as men can benefit from the green economy. Steps should be taken to increase the number of women who are:

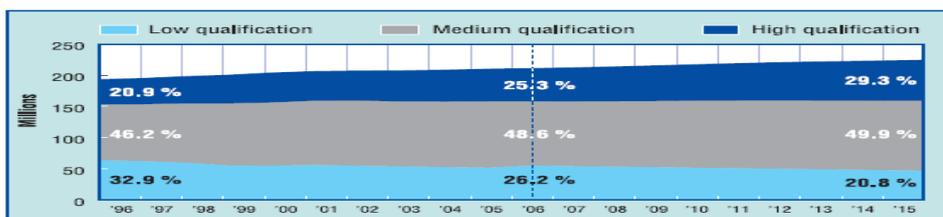
- Employed: through anti-discrimination laws and family-friendly mandates;
- Recruited for non-traditional jobs: through quotas and targeted schemes;
- Trained in green jobs skills: through specialized apprenticeship and training initiatives;
- Paid equitably: by reducing gender-based job segmentation and wage gaps; and
- Organized: through increasing the union membership of women in potential green sectors.

• **Impact on qualification levels**

Source: *Environment and labour force skills - Overview of the links between the skills profile of the labour force and environmental factors / Allister Slingenberg and others, ECORYS for the European Commission, DG Environment, December 2008, 77 p.*

A large number of sources seem to agree that a transition to a green economy will create demand for high skilled workers. See for example this study *UNEP et al. (2008). Green Jobs: Towards decent work in a sustainable low-carbon world.* This is also a general trend because the demand for higher level skills will continue to increase in general due to structural, occupational, technological and demographic change.

Between 2006 and 2015, the number of jobs with the **highest qualification level** will increase by more than 12.5 million jobs in Europe. Jobs at medium level (including vocational qualifications) will increase by almost 9.5 million and jobs with the lowest qualifications will decrease by 8.5 million. In 2015, the share of jobs that require high, medium and low qualifications will respectively be 30, 50 and 20 percent.



Qualification requirements by level of qualification (in million, %), 1996-2015, EU-25, Norway and Switzerland.

Not much information is available on qualifications levels in environment-related sectors, though information exists on the skills necessary in eco-consulting, eco-industry and waste management, agriculture and fishery (number of skilled workers) and the agrifood sector (education level). For the total labour force in the EU, as well as for the three sectors (eco-consulting, eco-industry and waste management) the highest share of educational background is grammar school, secondary school, or a completed apprenticeship (varying between 48 % and 58 %). However, the proportions of the other educational backgrounds differ significantly within sectors. For example, while the proportion of people without a learning certificate is 42 % in waste management (waste collection, handling and recycling pick-up tasks), it is only 1 % in eco-consulting. For most of the jobs in waste management it is not necessary to have completed education and training.

The **eco-consultant sector** has the highest share of people with a university degree and the waste management sector the lowest. Jobs in environmental consulting are thus mainly undertaken by highly-skilled people, while jobs in waste collection and sorting are mainly undertaken by relatively low-skilled people. In eco-consulting more technicians and crafts people are employed than in other sectors; however, the sector as a whole has more helpers and labourers than average.

### 1.3. The impact of climate change adaptation on skills and changes in the demand for skills

- *The skills profile will change as green jobs will change*

*Employment in Europe 2009, European Commission, DG Employment, Social Affairs and Equal Opportunities, November 2009 (MEMO/09/514).*

In a low carbon economy, some skills are likely to become obsolete due to structural changes in the labour market (e.g. in production of coal heating systems or traditional light bulbs); some new skills will be created as new 'green-collar' occupations emerge, while some existing jobs will change in nature.

The new skills will cover a broad spectrum of competences. Some new jobs will require the same **general skills** used now, for example in areas such as project management or risk analysis, coordination skills, and entrepreneurship. The complexity of these skills increases with the complexity of the jobs. In addition, there will be a need for more **specific skills** associated with the green economy, such as knowledge of sustainable materials, installation of new technologies, skills to measure "carbon foot-printing" and environmental impact assessment skills (flora, fauna) with good understanding of the 'sound' sciences.

The transition towards a low carbon economy will also lead to a large-scale redistribution of jobs *within* rather than between sectors. This is positive as it is usually easier for workers to change companies within the same sector than to find work in a different one. But job movements will occur in all sectors, largely because jobs will be gained in companies able to take advantage of opportunities created whereas others will be lost where companies cannot adapt.

- *New lifelong learning strategies and training systems needed*

*Source: Future skill needs for the green economy, CEDEFOP Research Paper, October 2009, 99 p.*

Green sectors will require new jobs, but they will also need to redefine many existing job profiles. This publication examines the links between education, training, employment and environment policies. The demand for new related skills will rise in most occupations. To meet this challenge, education and training systems will need to supply a well-trained, highly skilled labour force.

Training and guidance services that steer people towards jobs in growing sectors should focus on skills related to energy efficiency and renewable energy implementation. Putting in place the right training programmes for employees in declining sectors will help European economies redeploy workers who are difficult to place. A well-trained and environmentally aware workforce will also be more innovative in improving resource efficiency. To achieve this we need comprehensive **lifelong learning strategies** and training systems that integrate sustainable development and ensure that the right skills are supplied.

- **The current share of funding on education by the states and by businesses**

- Total public expenditure on education as percentage of the GDP remains stable since 2001 with highest cost per pupil in tertiary education

*Source: Eurydice report 2009: Key data on Education in Europe. Chapter on financing, page 121.*

In the period 2001-2006, the overall proportion of EU-27 GDP given over to education remains stable around 5.1%.

However, this average rate hides disparities between countries, some of which experienced significant changes during the period. In 2006, the share of public expenditure on education **was more than 5% of GDP in just over half of the European** countries. In the Nordic countries and Cyprus it was even above 6%. Elsewhere, public expenditure on education as a share of GDP was below 5%.

In terms of the EU-27, public-sector investment in education remained stable overall in the 2001-2006 period by representing around 11% of total public expenditure. In the majority of countries for which data are available, the share of public funding on education in total public expenditure has stayed relatively stable except in Bulgaria, the Czech Republic, Ireland, Slovakia and Iceland where it has increased significantly. Only the Baltic countries, France, Luxembourg and Portugal have recorded falls in the expenditure on education as a proportion of public expenditure.

- Private funding in education remains marginal

*Source: Eurydice report 2009: Key data on Education in Europe. Chapter on financing, page 121.*

Public expenditure includes all direct purchasing of education resources by the public sector (at whatever administrative level), whereas private expenditure includes the payment of tuition fees (and all other payments) primarily by households, businesses and non-profit associations.

As small as it is, **private funding varies significantly from one country to another**. At the same time and with reference to trends between 2002 and 2006, that share seems not to have grown significantly in most countries and has even fallen in some.

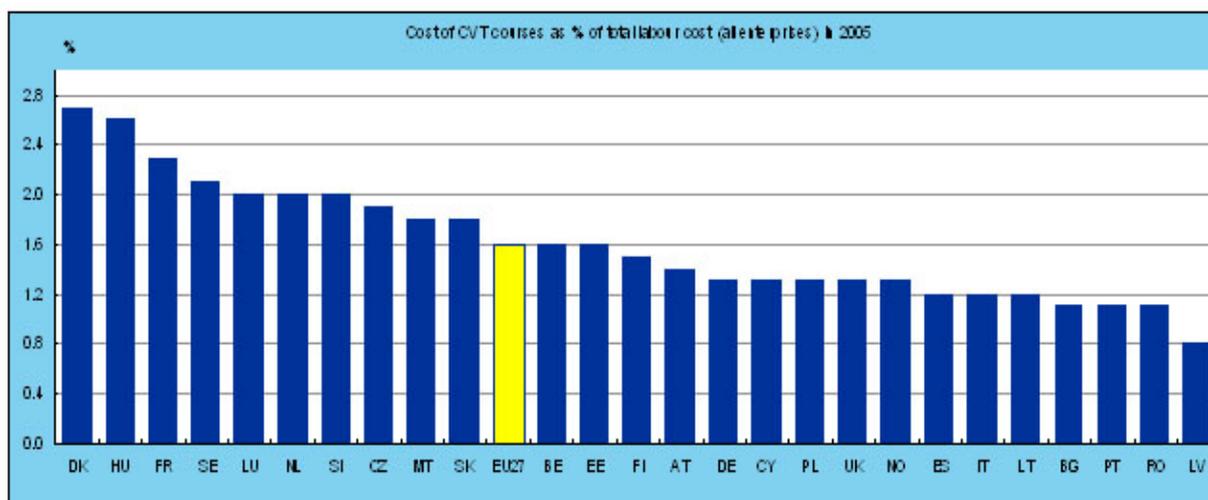
The share of private funding depends, among other factors, on whether or not access to education-oriented pre-primary schooling is free and whether registration and tuition fees are payable by students in tertiary education and, if so, on the amount of those fees.

The relative shares of public and private funding for education are also linked to institutional autonomy in raising private funds and to the types of resources to which schools providing compulsory education can allocate such funds, as well as to the methods of financing grant-aided private schools in each country.

- **The current contribution by businesses/employers to vocational training and lifelong learning**

*Source: CEDEFOP: Cost and financing of continuing Vocational Training course in enterprises.*

In 2005, in EU-27, cost of CVT courses represented 1,6 % of total labour cost in all enterprises:



*Source: The Impacts of Climate Change on European Employment and Skills in the Short to Medium-Term: Company Case Studies, GHK Consulting for DG Employment, Social Affairs and Equal Opportunities, May 2009*

This report contains fifteen company cases studies across a range of sectors examining **how businesses are being influenced by, and responding to climate change** and related policies.

All companies saw skills as a major area for impact from climate change drivers and much more significant than impacts on the numbers of jobs. All companies, except the energy companies, had environmental training programmes to raise general skills and awareness of environmental and climate change issues, energy efficiency opportunities etc. **Indeed, the major response to climate change drivers in companies has been to increase energy efficiency.** Training their staff in this area is seen by employers as an opportunity to develop a "Cost-cut policy"; while showing to consumers and public a greener reputation.

Beyond this general training different companies had tailored training to address their specific needs. For example:

- Kiln operators in Holcim are trained on a fuel mix optimiser combined with financial software which evaluates savings from different fuel mixes for producing cement;
- Coca Cola trained its packaging designers to develop lighter packaging;
- Virgin Atlantic has trained its pilots in more fuel efficient procedures for take-off and landing;
- ANCC-COOP has a training centre (the "COOP School"). Training on sustainability and climate change is part of mainstream training programme for head of sale points. Specific training modules are also organised on specific topic (for example on packages and recycling) and when new technology or management procedures are introduced (i.e. waste reduction, recycling, energy saving and management);
- Menzies has trained its drivers extensively, with refresher courses, in more fuel efficient driving.

## 2. Which policy responses are appropriate at EU level in order to increase that potential?

### 2.1. Indication of EU policies and instruments supporting the transition to a low-carbon economy and green jobs

#### ➤ EU 2020 Strategy

*Source: Europe 2020, A Strategy for smart, sustainable and inclusive growth, Communication from the Commission of the 3rd March 2010, COM 2010(2020).*

The Europe 2020 Strategy sets out a vision for Europe's social market economy over the next decade, and rests on three interlocking and mutually reinforcing priority areas: Smart growth, developing an economy based on knowledge and innovation; Sustainable growth, promoting a more resource efficient, greener and more competitive economy; and Inclusive growth, fostering a high-employment economy delivering social and territorial cohesion.

The Commission is putting forward seven flagship initiatives to catalyse progress under each priority theme, among which:

- "Resource efficient Europe" to help decouple economic growth from the use of resources, support the shift towards a low carbon economy, increase the use of renewable energy sources, modernise our transport sector and promote energy efficiency.
- "An industrial policy for the globalisation era" to improve the business environment, notably for SMEs, and to support the development of a strong and sustainable industrial base able to compete globally.
- "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.

#### ➤ Employment dimension of tackling climate change : Community action

*Source : The Employment Dimension of tackling Climate Change - Overview of the state-of-play in Member States, Employment Committee, EMCO Report Issue 3, October 2009, 10 p. (EMCO's mandate to the Ad Hoc Group asked for a deepening of the analytical background and an input to an EMCO discussion paper on the employment dimension of tackling climate change.)*

The EU should play an important role when it comes to awareness raising on the employment implications of tackling climate change. Setting the context of policy development and promoting an integrated and coordinated approach at EU level is crucial for defining the direction of structural reforms and EU development strategy. Various campaigns and actions targeted at different groups and stakeholders will be needed (e.g. taking the issue to the Tripartite Social Summit; social dialogue at sectoral level in particular Member States in order to diffuse best practices; organise European Year of Green Employment, etc). The European Employment Strategy should support but also promote the greening of the EU economy. Member States stress the need to define and clarify the concepts and issues at stake, foster the work on monitoring and information dissemination, as well as development of relevant indicators. Green employment cannot be regarded as a matter of one sector, i.e. use and penetration of renewable technology, but it should concern the whole economy.

The fundamental value added of EU engagement will come up through sharing good practices and encouraging mutual learning. However, EU funds should also be used as leverage for widening the application of green measures throughout Member

States and encourage European companies, **especially SMEs, to promote green products** and working methods.

In replies to the questionnaire sent to them, Member States expressed the wish for wide-ranging policy guidance by the **European Employment Strategy**. Numerous MS opted for development of tools that would: reward employers which take actions focused on greening workplaces, and motivate employees to introduce improvements and innovations at the work place that would contribute to tackling climate change.

Community actions contributing to greening of the EU work places might involve rewarding best green practices in terms of **Corporate Social Responsibility** or providing **financial support and/or guidance (toolkit) for SMEs** companies that might lack sufficient knowledge and resources to implement policy directions and take advantage of regulatory development. The renewal of enterprises to become greener should incorporate the training of their workers. Fiscal policies and modernisation aid (focused on companies' adaptation to new standards) might stimulate investments leading to greening of the labour markets. However, in the long term perspective making jobs cost-effective and sustainable (e.g. through investment in R&D and innovation) should have a primacy over subsidising them.

The degree of labour market mobility will be also a decisive factor for economy' modernisation.

EU should also be ready to provide instruments that would help reducing potential adverse effects. Important scope for improvement remains when it comes to defining general job profiles linked to tackling climate change and shaping accordingly the training programmes for workers. Therefore Member States underline the supportive role of **European Social Fund** in that domain. Training for new rising sectors and occupations is the most often cited as possible ESF initiatives while it was stressed that the current provisions allow already for a wide range of interventions. A few Member States articulate their views on a Green Job Act as a benchmark for further development of policy instruments, with one opposing such a possibility and others stressing the need for having the 'effectiveness check' before building further on it.

➤ *The SET-Plan is the technology pillar of the EU's energy and climate policy*

*Source: Investing in the Development of Low Carbon Technologies (SET-Plan), Communication from the Commission of the 7th October 2009, COM (2009)0519.*

To develop a low-carbon economy, the EU has put in place a comprehensive policy framework, including among others: the climate and energy targets for 2020 and a carbon price through the Emissions Trading System. The European Strategic Energy Technology Plan (SET-Plan) is the EU's response to the challenge of accelerating the development of low carbon technologies, leading to their widespread market take-up. It sets out a vision of a Europe with world leadership in a diverse portfolio of clean, efficient and **low-carbon energy technologies** as a motor for prosperity and a key contributor to growth and jobs. It proposes joint strategic planning and more effective implementation of programmes. It now needs to be taken forward to implementation.

The Technology Roadmaps 2010-2020 prioritise the different needs of the various technologies. The costings include private investment and public funding, both at EU and national level. Future priorities for the EU budget will need to be defined as part of the budget review and in the context of the preparation of the next multiannual financial framework.

➤ The Climate and energy package

*Source: Climate change package adopted by the European Parliament on 17 December 2008: the revision of the EU Emission Trading Scheme, the effort-sharing decision, the carbon capture and storage (CCS) legal, the renewable energies directive, the regulation on CO2 emissions from cars and the fuel quality directive.*

The EU has committed itself to a **20% reduction** in GHG emissions, a 20% improvement in energy efficiency and a 20% share of renewable energy in its energy mix ('20-20-20 target') by 2020. To meet those targets, a climate energy package was adopted in December 2008, with four texts to implement:

- A revised directive on EU Emission Trading System
- An effort sharing decision which set binding national targets for CO2 reduction
- A directive for pilot projects on carbon storage
- A directive on renewable energy in electricity generation, transport, heating and cooling.

Aside the package, the European Parliament also adopted a long-term reduction target of CO2 emissions from new cars and asked for environmentally and socially sustainable biofuels.

It's the first region in the world to set such far-reaching and legally binding targets for all sectors of the economy. The EU has also undertaken to go further and cut greenhouse gas (GHG) emissions by 30%, provided an ambitious international agreement is reached. But the EU also needs to ensure that within the post 2012 climate regime its competitiveness does not suffer too much. Thus, there is a main challenge for EU green diplomacy to reach an international agreement that can provide a stimulus for the 'New Green Deal' and establish an effective global carbon market.

➤ European Recovery Plan

*Source: A European Economic Recovery Plan, Communication from the Commission to the European Council, COM (2008) 800 final, 26.11.2008.*

In its European Economic Recovery Plan published in November 2008, the Commission recommends investment in green measures, for example, alternative and sustainable energy sources, increased energy efficiency in buildings and low CO2 emission cars and public transport networks.

➤ Green projects under the EU's cohesion policy

*Source: Euractiv, 10 mars 2009, "EU regions to get 105 billion Euros for green projects".*

As part of the recovery plan, the Commission intend to back job creation by investing €105 billion in green projects under the EU's cohesion policy. The green funding represents more than **30% of the regional policy budget** for 2007-2013, almost three times as much as in the last budgetary period. The Commission hopes this will boost growth and create new jobs that are unlikely to flee to emerging economies such as China and India.

The lion's share of the money will be spent on helping member states to comply with EU environmental legislation. A further €48 billion will go to achieving Europe's climate objectives, including €23 billion for railways, €6 billion for clean urban transport, €4.8 billion for renewable energies and €4.2 billion for energy efficiency. Research and innovation will also receive a boost, with €3 billion given to SMEs to help develop environment-friendly products and processes.

Moreover, in April 2009, the European Regional Development Fund (ERDF) has been revised in order to extend EU regional development funding to energy efficiency and investment in renewable energy for housing to all member states. Only new member states with low GDP per capita were allowed to use money from the ERDF for projects like installing solar panels in housing or replacing old boilers with more efficient ones. The measure aims at helping to create jobs in the building sector (a sector severely affected by the financial crisis) while slowing down climate change by reducing energy consumption. The new rules give all Member States the option of spending up to 4% of their total ERDF allocation on efficiency and renewable energy schemes for houses.

➤ *Adapting to climate change: Towards a European framework for action*

*Source: Adapting to climate change: Towards a European framework for action, White Paper from the Commission on 1.4.2009, COM/2009/147 final.*

This White Paper sets out a framework to reduce the EU's vulnerability to the impact of climate change. It builds on the wide-ranging consultation launched in 2007 by the Green Paper on Adapting to Climate Change in Europe and further research efforts that identified action to be taken in the short-term. The framework will respect the principle of subsidiarity and support overarching EU objectives on sustainable development. The EU's framework adopts a phased approach. The intention is that phase 1 (2009-2012) will lay the ground work for preparing a comprehensive EU adaptation strategy to be implemented during phase 2, commencing in 2013.

Enhancing the EU's resilience to the impacts of climate change also means the chance to invest in a low-carbon economy, for instance, by **promoting energy efficiency** and the uptake of green products. This is one of the key objectives of the European Economic Recovery Plan. At the same time, we can facilitate structural changes through the modernisation of European infrastructure and enhance the competitiveness of our economy. Developing this framework has been a cross-cutting exercise and this white paper is accompanied by three sectoral papers on agriculture, health and water, coasts and marine issues.

## **2.2. Overview of initiatives undertaken or planned by the European social partners**

➤ *Introduction*

*Source: Greening the European economy: Responses and initiatives by Member States and social partners/ Andrea Broughton, Eironline, December 2009, 34 p.= Eurofound study*

The green agenda is taken seriously by the social partners in all of the European countries. Employers and trade unions have undertaken a range of activities in this area over the recent year, including the publishing of position papers and the setting up of bodies to look specifically at green issues. General issues covered include housing, energy efficiency and the use of renewable energy, transport and public procurement.

While the green agenda is generally not a particularly contentious issue between the social partners, some differences in viewpoints have arisen between the trade unions and employers in a number of countries. In other countries, trade unions and employers maintain a united stance. The social partners are aware that the expansion of the green economy will change the context in which they operate. For both the trade unions and employers, the type of knowledge that they will require to operate and to provide services to their members will be different in the future. The green economy will undoubtedly require new and additional skills and expertise on the part of both workers and employers.

Aware of this, many employer and trade union organisations have put in place training programmes for their members on green issues, although it should be noted that many trade unions state that they do not have sufficient resources to fund training programmes.

→ Employers:

Many employers have issued positions detailing their particular stance on green issues and employers in some countries have formulated policy proposals on specific issues, such as automotive policy, **buildings insulation** and renewable energy. Employer organisations are also aware that the green economy poses a range of challenges. As a result, many organisations have been active in raising awareness of the main issues in this field among their members. Activities tend to focus on issues such as compliance with environmental legislation, reducing emissions, remaining competitive in a green economy, and making the most of the business opportunities presented by the new green economy. Employer efforts to increase knowledge have mainly been targeting their members, as part of initiatives to help them to cope with new regulatory requirements.

→ Trade unions:

Trade unions have been active in many countries in promoting the green agenda and explaining their position. The stance of trade unions often includes proposals to government and employers to act on green issues. Some trade unions have been voicing their views through the hosting of dedicated seminars and conferences, or the setting up of special working groups to deal with environmental issues. Some additional actions and approaches can be reported – usually in the form of engaging in political debate. Trade unions in many countries have in place awareness-raising campaigns for members on environmental issues. Actions related to these campaigns take the form of leaflets, regular publications, dedicated website pages and targeted seminars. For the trade unions, their negotiators will need to be trained in environmental issues, and some trade unions are already addressing this aspect.

➤ ETUC

*Source: A European approach to tackling climate change / Joël Decaillon, ETUC. Published in: Working on change – the trade union movement and climate change, p. 48-53, September 2009.*

The ETUC has started a new project that focuses on climate change, new industrial policies and paths out of the crisis. It is a follow up to their 2007 study on climate and employment and is being conducted in collaboration with the ETUC European industrial federations. It should lead in the near future to new recommendations for European policy makers – recommendations that will be driven by the ETUC's willingness to contribute to environmental and social progress and to building a sustainable society.

In his article Joël Decaillon exposes the European Trade Union Confederation's approach to climate change articulated around the following main issues:

- A real integration of climate policy and the Lisbon Strategy for growth and jobs, together with just transition programs;
- Binding consultation of the European social partners on climate change policies;
- 20 per cent emission reduction by 2020 as a minimum;
- Priority should be given to energy efficiency;
- Burden sharing by the economic sectors that takes account of the need to maintain a sustainable industrial base in Europe;

- Revision of the emissions trading scheme (ETS);
- Proposal for a directive on renewable energy;
- Social cost of electricity prices.

➤ *The example of the German employers (BDA Die Arbeitgeber)*

*Source: Towards a new understanding of "green jobs", A discussion paper from German employers, BDA, March 2009, 5 p.*

Though German employers welcome the fact that the discussion on "green jobs" has now also moved the employment policy dimension of climate change more sharply into focus among policy-makers and the general public, they point out the following:

- The need for "Green jobs" to be understood as an employment policy approach in the climate protection debate. The core idea of "green jobs" must be that environmental protection, employment growth and economic development go hand in hand.
- The fact that environmental protection has been a reality for German enterprises for decades and that many companies have put in place ambitious climate protection programmes.
- A sustainability-oriented society requires a commitment from all players, among which political will, and not exclusively from business.

➤ *Differences between Member States in social partners' involvement*

*Source: Climate Change and employment - Impact on employment in the European Union-25 of climate change and CO2 emission reduction measures by 2030, European Trade Union Confederation (ETUC) and the Social Development Agency (SDA) for European Commission, DG Environment, February 2007, 208p.*

The interest and level of knowledge of union players on policies to counteract climate change differ appreciably in old and new Member States. In the new Member States studied, except for Slovenia, players in the unions have a lower level of knowledge of questions relating to climate policies. They have little involvement in the consultation process accompanying the development of national allocation plans. By contrast, the unions in Slovenia have had discussions with the government and employer organisations about the social and employment consequences that could result from the application of the Kyoto protocol. If the absence of a real issue for employment at this stage may explain the absence of involvement, one may nevertheless fear that the lack of expertise in union organisations on these questions will lead to a risk of weak representation of their interests when climate-policy measures become more restrictive. In the EU-15 countries, union organisations have a generally better-developed level of knowledge and expertise. In a certain number of countries, they are directly involved in tripartite dialogues, with governments and employer organisations, on the implementation of the Kyoto protocol, or in national and regional debates on long-term emission-reduction scenarios.

➤ *Social dialogue and collective bargaining instruments adapted to climate policy challenges*

*Source: Climate Change and employment - Impact on employment in the European Union-25 of climate change and CO2 emission reduction measures by 2030, European Trade Union Confederation (ETUC) and the Social Development Agency (SDA) for European Commission, DG Environment, February 2007, 208p.*

Rather than being mere spectators, workers' representatives must become actively involved in the strategic guidelines defined and implemented to tackle emissions. A number of social dialogue and collective bargaining instruments and mechanisms should be introduced, and existing ones strengthened and updated.

This paper also recommends the creation of a European sectoral and crosssectoral observatory on economic and socio-employment changes associated with the adaptation to climate change and greenhouse gas reduction measures. The aim of the observatory will be to develop tools to monitor, follow up, analyse and evaluate sectoral and cross-sectoral changes in the post- Kyoto era, with a view to assisting dialogue between stakeholders (government, employers, unions, NGOs) about how to anticipate and manage these changes. It would be financed by the European Commission and the Member States and supervised by a steering committee made up of stakeholder representatives. Further on, the text proposes to set up dialogue bodies involving specific stakeholders in the fight against climate change. Taking as a reference the Spanish national pact on implementation of the Kyoto Protocol, concluded between the government, employers and unions (framework agreement), the aim would be to create such bodies at national, regional and European levels. The Spanish national pact established inter-sectoral and sectoral dialogue bodies to deal with adaptation to climate change and greenhouse gas reduction measures with a view to reaching framework agreements. To this end, sectoral round table discussions were introduced in 2005 (in seven sectors: power generation, oil refineries, steel, cement and lime, glass, ceramics, paper pulp), with financial and logistical assistance from the government and regional authorities. In this framework, regional conferences are also held to bring together sectoral and territorial issues and consider the drafting of regional climate plans. The paper also calls for new rights for workers' representatives, which would apply at country, European Works Council and European sectoral social dialogue committee level and would focus on measures for adapting to climate change and cutting greenhouse gases. They should involve the allocation of appropriate resources to information, consultation, participation and negotiation procedures for workers' representatives (operation, training, expertise, etc.). Such rights already exist in some countries and regions of Europe (Germany, Flanders); the aim would be to extend them to all EU countries.

### **2.3. Policy responses undertaken by the Member States**

➤ *Introduction*

*Source: An indicator-based assessment framework to identify country-specific challenges towards greener growth. Joan Canton, Ariane Labat, Anton Roodhuijzen, European Economy, Economic Papers 401, February 2010, 63 p.*

The paper sets the basis for an indicator-based analytical framework to assess Member States' policies to promote "green growth". It may therefore serve to encourage relevant structural reforms bringing about a competitive greener economy.

Four key areas have been identified that find a link between environmental policy to growth and jobs potential:

- "Reducing negative environmental externalities, relying on cost-efficient environmental policies to internalise environmental externalities.

- Ensuring environmental policy interventions contribute to sound use of public finances and to fiscal consolidation.
- Improving the functioning of markets to deliver sustainable consumption and production.
- Increasing total factor productivity from aiming for environmental improvements (capital deepening, developing knowledge assets and human capital)."

In the table below, we see that Member States' performances to concerns vary when environmental challenges for growth are being addressed. "The level of environmental risk corresponds to the country's performance."

Table 3: Levels of green concerns by environmental area

Level of "green" concerns (based on indicators in levels)	Low	Medium	High
Cost-efficiency	BE, DK,	BG, CZ, DE, IT, CY, LU, HU, MT, NL, AT, PL, PT, RO, SI, SK, FI, SE, UK,	EE, IE, GR, ES, FR, LV, LT,
Sound use of public finances	BG, DK, EE, IE, CY, MT, NL, PT, SI,	CZ, GR, IT, LV, LT, LU, HU, AT, PL, RO, SK, FI, UK,	BE, DE, ES, FR, SE,
Better market functioning and competitiveness	DE,	BE, DK, FR, IT, NL, AT, FI, SE, UK	BG, CZ, EE, IE, GR, ES, CY, LV, LT, LU, HU, MT, PL, PT, RO, SI, SK
Long-term productivity	DK, EE, LV, FI, SE,	BE, BG, CZ, DE, IE, ES, FR, CY, LT, HU, NL, AT, PL, PT, SI, SK, UK,	GR, IT, LU, MT, RO,

Source: *The Employment Dimension of Economy Greening. EEO Review: Autumn 2009, December 2009, 39 p.*

The European Employment Observatory has identified that greening of the economy might have a significant impact on EU industries and labour markets. Member States have responded to this: Some countries, such as Croatia, Lithuania, the Netherlands, Portugal, Slovenia, Spain and Turkey have focused more on responding to the economic crisis, yet others have maintained a strong focus on environmental policy. According to the EEO "there are significant differences across EU Member States in terms of the development of a green economy. Some countries are only just beginning to implement measures targeted at the greening of the economy (for example, Latvia, Slovakia and Turkey). Others have already made considerable progress (such as, Denmark, Germany and Sweden).

National programmes which include measures and strategies to stimulate the greening of the economy have been introduced in several European countries, as identified by the EEO. In addition, EU Member States responded accordingly to this policy demand and introduced policy instruments to improve energy efficiency in a cost-effective way, such as environmental tax reforms, promotion of environmental technologies and R&D, the introduction and monitoring of minimum energy-efficiency standards, the labelling of products and services, the improvement of state aids and the construction of green infrastructures.

Source: *The Employment Dimension of tackling Climate Change - Overview of the state-of-play in Member States. Employment Committee, EMCO Report Issue 3, October 2009, 10 p.*

Labour Market Instruments already exist that deal with the employment dimension of tackling climate change, yet the European Commission identified that there is a strong need to streamline more in terms of coherence between different policies in most Member States.

It has been identified that a limited amount of policy responses in terms of labour market measures tackling climate change have been implemented. Austria, as well as Germany and Ireland for example offer training opportunities to adapt to the environmental policy demand: Klima:aktiv (AT); Environment Creates Perspectives (DE); Trainings in construction sector (IE). Belgium on the other hand offers the purchase of enumerative list of environmental products and/or services (Eco-cheque).

Source: *Greening the European economy: Responses and initiatives by Member States and social partners. Andrea Broughton, Eironline, European Foundation for the Improvement of Living and Working Conditions. December 2009, 34 p.*

Green initiatives and actions of governments are being implemented by various national institutes or institutions. However, greening the economy can also be a local level decision, initiated by public or private sector bodies. Actions and initiatives can include awareness raising, green procurement or training programmes.

EIRO identified the various actions taken at various governmental levels in the EU.

See for examples Table 1 and 2 and 3:

**Table 1 Main green recovery initiatives of governments, by country and type of initiative**

Initiative	Countries
Subsidies for the insulation and heating refurbishment of domestic and commercial premises	Austria, Ireland, Lithuania, Hungary
Tax credits for households investing in alternative energy and insulation	Belgium
Car scrappage schemes	Austria, the Czech Republic, Germany, Italy, Luxembourg, Slovakia, Spain, the UK
Using taxation and financial support to encourage energy efficiency and promoting the use of alternative energy such as solar and wind power	Cyprus, Finland, Malta, the Netherlands, Portugal, Romania, Slovakia, Spain, the UK
Support for specific industries	Italy – encouraging consumers to choose environmentally-friendly consumer goods Lithuania, the Netherlands and the UK – supporting the construction sector in the building of more energy-efficient houses and public buildings
Support for the agriculture sector or the organic farming industry by means of financial incentives	Cyprus, Denmark, Ireland
Encouraging the development of green transport systems	Germany – hybrid cars and battery-powered trains Ireland – lower car use, improvements in public transport and cycling provision Luxembourg – cars with low CO <sub>2</sub> emissions Norway – electric cars, walking and cycle paths
Investment in new technology such as carbon capture*	Norway, the UK
Sustainable tourism	Bulgaria, Ireland, Malta

Note: \* 'Carbon capture' refers to a technological process designed to capture CO<sub>2</sub> emissions generated by power plants and other industrial processes and then store the CO<sub>2</sub> securely away from the atmosphere.

Source: EIRO national centres, 2009

**Table 2 Examples of sector-specific initiatives, by country**

Sector	Country examples
<b>Environmental technology industry</b>	In Austria, national and local governments have launched a joint initiative, known as Masterplan Environmental Technology (Masterplan Umwelttechnologie, MUT). The aim of the initiative is to set up a joint strategy for policymakers, business and relevant research institutions to improve the competitiveness of the Austrian environmental technology industry.
<b>Renewable energy</b>	<ul style="list-style-type: none"> <li>In Hungary, a range of government initiatives been introduced to promote the use of alternative, renewable energy sources. The production of biofuels has received the most support, although this has generated debate and criticism from green NGOs.</li> <li>In Portugal, the government has made efforts to create green clusters in industry and services, particularly in the area of renewable energy.</li> </ul>
<b>Tidal, wind and nuclear power</b>	<ul style="list-style-type: none"> <li>The UK has made a commitment to source 15% of its energy from renewable sources by 2020, principally from wind, tidal power and nuclear power. Future plans include a large wind farm off the southeast coast of the country.</li> <li>In Germany, the government is giving support to wind energy projects.</li> <li>In Sweden, the government is committed to expanding nuclear energy.</li> </ul>
<b>Waste management</b>	In Ireland, a variety of initiatives has recently been launched in the waste collection sector, including new recycling initiatives.
<b>Construction</b>	<ul style="list-style-type: none"> <li>In Slovakia, state support is available in the construction sector for insulation in private homes.</li> <li>In the Czech Republic, the government is also supporting energy-saving measures in construction.</li> <li>In France, the government is promoting the insulation of homes as well as the construction of energy-efficient buildings and the energy-efficient refurbishment of existing buildings.</li> </ul>
<b>Transport</b>	<ul style="list-style-type: none"> <li>In Denmark, the government has developed a green transport policy – among other things, this policy seeks to promote access to public transport and to improve the infrastructure for use of bicycles.</li> <li>In Italy, the government is offering financial support for the purchase of bicycles and mopeds.</li> <li>In Sweden, the government aims to create a fleet of vehicles that are independent of fossil fuels by 2030.</li> </ul>
<b>Agriculture</b>	<ul style="list-style-type: none"> <li>In Estonia, the government is supporting environmentally-friendly production.</li> <li>In Bulgaria, the agriculture sector is one of the sectors that is being supported by the government, as it is deemed to be important in terms of its economic, environmental and employment impact.</li> <li>In France, government strategy is creating additional areas of protected land and promoting organic agriculture.</li> </ul>
<b>Tourism</b>	<ul style="list-style-type: none"> <li>Tourism is an important sector in many countries in Europe. Specific initiatives designed to promote ecologically sustainable tourism have been set up in a range of countries.</li> <li>In Malta, for instance, the Malta Tourism Authority has set up an Eco-Certification scheme – under this scheme, hotels must comply with several criteria designed to improve their environmental performance and increase environmental awareness among staff.</li> </ul>
<b>Automotive sector</b>	<ul style="list-style-type: none"> <li>As mentioned earlier, car scrappage schemes are popular in many EU countries. In countries where automotive production forms an important part of the economy, targeted initiatives are in place.</li> <li>This is the case in Sweden, for instance, where the government has developed a clear greening strategy for the country's automotive sector, focusing on the development of more energy-efficient vehicles.</li> </ul>

Source: EIRO national centres, 2009

**Table 3 Examples of green procurement schemes, by country**

Country	Scheme
<b>Czech Republic</b>	The government offers support for low-emission heating sources and investment in energy-saving measures in construction projects and new builds.
<b>Denmark</b>	All public institutions are, in principle, obliged to mainstream green issues in all procurement activities.
<b>Finland</b>	Proposals have been drafted for a new government policy on public sector procurement, which will encourage suppliers to adopt environmental policies and procedures.
<b>Malta</b>	The government launched a Green Office Label in 2006 for its departments: in order to obtain this label, departments need to show adherence to environmental best practices in areas such as environmental planning, waste reduction, energy and water conservation, transport and green public procurement.
<b>Norway</b>	There are a range of green procurement initiatives in place in areas such as hotel services, information and communication technologies (ICT) equipment, construction, furniture and textiles.
<b>Poland</b>	Public procurement legislation was amended in 2006 to include the application of environmental criteria in the public procurement process.
<b>Portugal</b>	Portugal aims to ensure that half of public tenders will include environmental criteria by 2010.
<b>Romania</b>	In 2008, the government devised a National Plan for Environmental-friendly Public Procurement 2008–2013, due to take effect in 2009. Under this plan, public administration authorities have a target of 7% concerning green procurement.
<b>Sweden</b>	In 2007, the government launched a green public procurement policy, which includes help and advice on green procurement for local authorities.

Source: EIRO national centres, 2009

➤ Examples of Member States best practice

France

*Source: Croissance verte et emploi. France, Rapport de Conseil d'orientation pour l'emploi, January 2010, 74 p.*

France strengthened environmental policy implementation over time, in particular through the implementation of the 'loi Grenelle Environnement' to prepare for an energy transition and sustainable mutation of society or the 'Plan Climat 2004-2012'. France introduced and adopted a series of specific objectives to adapt major economic sectors to climate change, such as the building, transport, energy, biodiversity, water, agriculture and waste sectors.

Germany

*Source: A growth strategy for Germany, New jobs through investments in energy and environment. Frank-Walther Steinmeier, Sigmar Gabriel, Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU), Berlin, June 2009, 16 p.*

Germany identified the need to adjust its economic model and be more innovative in regards to environmental policy. Its ecological industrial policy includes climate protection policy, energy strategies, strengthening of renewable energies, the sustainable use of bioenergy, and the innovation of the mobility sector. Therefore new public and private investments are being boosted, as well as the training of experts, the financing of new instruments, the introduction of a public procurement policy and more focus on research and development.

*Source: Report on the Environmental Economy, 2009, Facts and Figures for Germany. Peter Franz, Dr. Florian Mayer, Jenny Behrendt, Dr. Andreas Burger, Dr. Sylvia Schwermer (Editors), Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU), Berlin, January 2009, 142 p. (see p. 28 - 33)*

According to the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, policy-making needs a focus on structuring the economic framework to support environmental innovation and sustainable economic practices. Ecological industrial policy also focuses on environmental policy, innovation policy, investment policy, employment policy and forward-looking industrial location policy.

United Kingdom

*Source: Changing Work in a changing climate: adaptation to climate change in the UK - new research on implications for employment. Trade Union Congress (TUC), 2009*

The Trade Union Congress in the UK identified that public sector bodies are driven by policy initiatives. The UK therefore implemented the Climate Change Act in 2008 and introduced an indicator on adapting to climate change in the new local government performance framework. The Adapting to Climate Change Programme aims to bring together the public sector to adapt to climate change. In addition, private sector is also responding through initiatives and action plans, yet in general the main focus is to raise awareness.



DIRECTORATE-GENERAL FOR INTERNAL POLICIES

## POLICY DEPARTMENT ECONOMIC AND SCIENTIFIC POLICY **A**

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