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Impact of climate change on public services in Europe

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- Europäischer Gewerkschafts-verband für den Öffentlichen Dienst
- Европейская Федерация Профсоюзов Общественного Обслуживания

Discussion paper prepared for EPSU by Sophie Dupressoir

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EPSU is a member federation of the ETUC EPSU represents PSI in Europe

EPSU position on the discussion paper on climate change and its impact on public services

Adopted by the Executive Committee 13 – 14 April 2011

Global warming and the resulting climate change will have an enormous impact on our economies and societies. To prevent temperatures rising with more than 2 degrees Celsius measures are needed to reduce CO_2 and other green house gas emissions. And the consequences of a rise of global temperatures with around 2 degrees Celsius will force us to adapt. While the changes climate change will bring for the energy and several industrial sectors have been relatively well explored, this is not the case for the impact of climate change on public services. EPSU commissioned this paper to obtain an overview of how climate change affects a broad range of public services such as health and social services, local and national government, energy, water, waste.

The paper was discussed in several EPSU bodies and a set of recommendations was adopted by the EPSU Executive Committee in April 2011.

First and foremost we endeavor that the study is used by the affiliated unions to stimulate discussion and reflection on the impact of global warming on public services and what this means for workers and the services they provide. Second, we will bring the study to the attention of the European institutions and relevant European organizations. EPSU is a member of the Spring Alliance and we expect the study is a contribution to its work

The recommendations of the study are many and broad and will provide a basis for EPSU policy and how we position ourselves. EPSU's Standing Committees will consider if and which sectoral parts will need to be developed further. The study can also play a role in the sectoral social dialogue. We have developed an internal document to track progress.

Based on the study the EPSU Executive underlines several key issues:

- We support binding energy efficiency targets in the EU. Addressing energy efficiency will make an important contribution to lower electricity consumption and safe fuels. It is important that energy efficiency is tackled together with energy poverty. It is often the housing of low income households that lacks appropriate isolation but which can be addressed with making appropriate funding available.
- In*tegrating* social and environmental criteria in public procurement remains a priority, ensuring public funds are used to contribute to deal with poverty, social dumping and climate change for example. EPSU has supported this over the years and together with many other organizations such as in the Spring Alliance, have demanded action of the European Commission to make this more binding.
- A controversial issue is how the reduction of CO_2 emissions can be achieved. EPSU and ETUC have criticized the Emission Trading Scheme of the European Commission arguing a carbon tax might be a better way forward. EPSU also supports taxes on environmental polluting products and processes and we will explore this further to develop EPSU's position in more detail.

- The same is true for the appropriate targets for CO_2 and other green house gas emission reductions for 2020 till 2050.The targets have important consequences for several industries and the workers in these industries. We will continue discussing this also in the light of the strategy of the European Commission Towards a low carbon economy in 2050 which foresees significant cuts for several sectors with close to 100% for the power sector.
- Corporate and economic policy remain focused on profit-making and economic growth independent if the profits and growth contribute to realizing societal and environmental objectives and independent if these activities destroy or not human health, the environment etc. EPSU argues different measures are needed and we will participating in the discussion on Beyond GDP, as an element in exploring a different basis for economic policy and exploring the implications of smart, sustainable or even less growth for workers unions and our communities.
- It was stressed in several discussions in EPSU that change starts at the work place. EPSU is committed to assist work place representatives by making information available on how environmental and climate change can be addressed at workplace level and collective bargaining.

We commented on the many recommendations and how EPSU can implement and follow up in a separate document for affiliated unions. This will be a basis for further discussion and work in EPSU.

We thank Sophie Dupressoir for making the analysis for us which is the first in its kind. She also took account of comments made by members of the EPSU Standing Committees and in particular the colleagues of the committee on utilities and of Members of the Executive Committee. We thank all for their constructive contributions.

We expect the study will contribute to further discussion and action leading up to the negotiations on a global agreement to reduce CO2 emissions in 2011 in Durban, South Africa, and beyond.

EPSU May 2011

TABLE OF CONTENTS

1. Summary

This study has been commissioned by the European Federation of Public Service Unions (EPSU) as a contribution to assessing the potential impact of climate change on employment in public services in Europe. It aims at informing policy positions to be taken by public services unions on foreseen policy initiatives and prioritise union policy strategies. EPSU's 2009 Congress called climate change "a big challenge to current and future generations".It argued for the mainstreaming of climate change and its implications in EU policy and legislation, development policy and investment decisions. Clear and ambitious targets are needed. EPSU demands a Just transition towards a low or even zero carbon society.

The study first examines the literature on the impacts of climate change . It concludes that the lack of action to reverse the growing trend in greenhouse gas emissions would have large, irreversible impacts on nature and communities in Europe which risks seriously undermining the provision of public services. Lack of action is therefore not an option. Deep emissions cuts are to be achieved in the next decade to keep climate change at a safe level, focusing in priority on energy efficiency improvements and renewable energy. The power sector and the electric utilities will need to get 'almost-zero' emissions ("decarbonisation") by 2050. This will require a significant effort in terms of R&D, as existing technologies are not sufficient . As some warming will occur irrespective of mitigation efforts, both adaptation and mitigation strategies will need to be pursued, with a complementary role.

An important issue is the relative role of the state and the private sector in climate adaptation and mitigation. Research reviewed by the IPCC highlights that adaptation activities typically involves public goods or raises distributional issues that justify direct state provision of the good. This includes for instance flood protection, water infrastructure and rescue services. Yet, the European Commission White paper on Climate Change Adaptation hardy mentions public investment for adaptation and instead, promotes Public-Private Partnerships as well as Innovative Financial Mechanisms, such as Payments for Environmental Services (PES).

The EU mitigation policy is influenced by two 'mantra's: a global carbon market is superior to any other policy instruments, and competition on electricity and gas markets is a necessary condition for the decarbonisation of the electricity sector. Again, both the literature and the actual functioning,of the carbon markets and liberalized electricity markets do not support the Commission's assertions. Our conclusion is that adaptation and mitigation will not be successful unless significant additional, stable public resources are brought into public services and infrastructure, both in Europe and in the rest of the world.

The study confirms that public services workers will be in the front line of climate change. Public services already provide the bulk of the 'green jobs' in Europe, according to studies undertaken for the European Commission. However, for public services to play their full role in climate mitigation and adaptation, workers should have proper tools and skills., and gender equity should be ensured. Climate change has significant health and safety impacts. Women suffer disproportionally from weather-related disasters and may be excluded from the green economy.

The analysis of the selected public sectors - central administration, local governments, social services, health care and water, electric and waste utilities- show that none of these sectors can afford ignoring climate change. Both adaptation and mitigation are relevant for the selected sectors, although to a different extent. Climate change in itself may alter the pattern of job-skill demand, health and safety requirements and work organisation. Jobs linked to the coal-fired power plants or waste disposal for instance could be affected by the shift away from coal and waste disposal.

The report makes a range of recommendations in the following area:

- securing public funding for climate adaptation and mitigation, as part of the exit strategy from the financial and economic crisis
- implementing Just Transition programmes to a low-growth, sustainable economy
- tackling climate change efficiently
- enhancing energy efficiency
- tackling energy poverty and environment related poverty
- advocating for biodiversity as a public good
- sustainable production and consumption, including public procurement
- further adress climate change in the European sectoral social dialogue in EPSU sectors.

2. Introduction

The current financial and economic crises have highlighted the political threat of the lack of corporate responsibility and rising unemployment. This is compounded by growing public concern about climate change and other global environmental threats such as deteriorating ecosystems.

The scientific evidence on climate change is now overwhelming. If we don't reverse the rising trend in global greenhouse gas emissions, very damaging consequences on human development must be expected. At the same time, we need to prepare for the unavoidable consequences of climate change, as Europe will not escape these effects.

The Millennium Ecosystem Assessment, a UN-led study on the world´s ecosystems which was released in 2005, states that today, 60 per cent of the free ecosystem services that we use are exploited in an unsustainable manner. Crucial ecosystem services such as air- and water purification, the pollination of crops and the seas´ capacity to produce fish are in serious decline.

New approach to sustainable development recognizing that our societies are an integrated part of the biosphere and dependent upon functioning ecosystems are therefore needed if humanity is to continue to develop and thrive for generations to come. An ambitious attempt to identify and quantify the 'planetary boundaries' that must not be transgressed in order to avoid catastrophic environmental change has been proposed by the Stockholm resilience center (see box 1).

Box 1 - Planetary boundaries

In an article published in Nature in September 2009, a group of 28 internationally renowned scientists led by the Stockholm Resilience Centre has attempted to identify and quantify the safe biophysical boundaries outside which the Earth System cannot function in a stable state.

Nine boundaries identified were climate change, stratospheric ozone, land use change, freshwater use, biological diversity, ocean acidification, nitrogen and phosphorus inputs to the biosphere and oceans, aerosol loading and chemical pollution.

The study suggests that three of these boundaries (climate change, biological diversity and nitrogen input to the biosphere) may already have been transgressed.

Although this approach does not offer a complete roadmap for sustainable development and the science is preliminary, it should be viewed as an important attempt to quantify the critical limits to our growth and existence on earth, and provides a good basis for discussion and future refinement.

Source: http://www.stockholmresilience.org/planetary-boundaries

Preparing for those changes, while making the transition to low-carbon and environmentally-sound economies as rapidly as possible, opens opportunities and challenges for the public services and workers. This will not be possible to address these challenges without the full recognition of the role of the state and public regulation.

This study aims to contribute to a better understanding of the relationships between public services and climate change in Europe, with the view to inform policy positions to be taken by public services unions on foreseen policy initiatives and prioritise union policy strategies.

It is based on a review of the existing literature on climate change, public services and employment.

The paper starts with a description of climate change, considering two aspects of climate change: reducing emissions (mitigation) and adapting to the effects of the climate change that is already likely to happen as result of past carbon emissions (adaptation). The policy options that have been adopted or proposed by the European Union for addressing climate change adaptation and mitigation are discussed, considering accepted principles for

government intervention and public spending. We give an overview of the general implications of climate change for employment and the quality of jobs before examining the implications for some selected public services. At the end, proposals are made for EPSU policy strategy.

3. Climate change, mitigation and adaptation

In this section we explain why not taking action to prevent climate change is not an option. The risks for Europe and public services are examined. Action to avert climate change is possible, although challenging. We finish by defining adaptation and mitigation.

3.1.1. Not taking action to tackle climate change is not an option

The scientific evidence is now overwhelming: climate change is a serious global threat, and it demands an urgent global response. The landmark Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) confirms global warming is now "unequivocal" and states with more than 90 percent certainty that human activity "very likely" has been the primary cause of rising temperatures worldwide since 1950 (IPCC, 2007).

If no action is taken to reduce emissions beyond current climate change mitigation policies, global GHG emissions will continue to grow over the next few decades. The concentration of greenhouse gas (GHG) in the atmosphere could double its preindustrial level as early as 2035, virtually leading us to an average temperature rise of between 1,8°C and 4°C, at the end of the 21th century. In the worse case scenario, temperature rise could reach 6,4°. For Nicholas Stern, author of an important report on the economics of climate change, "The Stern review", "such temperature increases would take us into territory unknown to human experience and involve radical changes in the world around us" (Stern, 2006).

The risks of severe and irreversible impacts increase strongly as temperature rises:

- Hundreds of millions more people could be flooded each year with warming of 3 or 4°C, with serious risks for large coastal cities, such as Tokyo, New York, Cairo and London. According to one estimate, by the middle of the century, 200 million people may become permanently displaced due to rising sea levels, heavier floods, and more intense droughts;
- Water availability and hydropower potential will be severely reduced in many areas. A billion people could suffer water shortages in the 2080s, many in Africa;
- Extreme weather related events, such as storms, forest fires, droughts, flooding and heat waves, will rise in intensity;
- At 4°C and above, global food production is likely to be seriously affected by decreasing yields including in developed countries.

More worrying, while there is much to learn about these risks, the risk of abrupt and large-scale changes in the very long term cannot be excluded with higher temperatures. Loss of ice sheets on polar land for instance could imply metres of sea level rise, major changes in coastlines and inundation of low-lying areas (IPCC, 2007). Recent evidence indicates that changes go faster than predicted by the last IPCC report (Copenhagen Diagnosis, 2009, and Annex 1).

3.1.2. Europe will not be spared

The developing world will be hit most by the impacts of climate change, but developed countries will not be spared.

In Europe, changes in climate conditions are already being felt: average temperature in 2007 was 1.2°C above pre-industrial level, a heat wave of unprecedented magnitude occurred in 2003, glaciers are retreating, spring is arriving earlier, the ranges of plants and animals are shifting, and seas are rising (EEA, 2008).

Future impacts on climatic conditions in Europe have been documented by the IPCC (2007), the European Environment Agency (2008) and the OECD (2008). As indicated in the box below, the scenarios for Europe suggest that higher temperatures, combined with changing patterns of precipitation, will lead to hotter, possibly drier summers, and milder, wetter winters. Even in the short term, changes in storm surge height are expected, as is an increase in extreme weather. There are also wide variations across Europe.

Box n°2 - Potential physical and meteorological Impacts of climate change in Europe
Sources: IPCC, 2007, EEA, 2008; OECD, 2008

Depending on global scenarios, annual average temperature in Europe would increase between 1° and 5.5°C over the 21st century, with a strong distributional pattern of warming across Europe. The largest warming will occur over eastern and northern Europe in winter, and over south-western and Mediterranean Europe in summer. Winter precipitation would increase in Northern Europe, summer precipitation would decrease in Southern Europe. There are still large uncertainties on the magnitude and geographical details of the change.

Global sea level rise would be between 0.18 and 0.59m by 2100 (IPCC, 2007), although recent projections indicate it could be much higher because of changes in the polar ice-sheets (Copenhagen Diagnosis, 2009).

Extreme events will become more frequent and intensive even in the short term. The risk of inland flash floods will increase. Coastal flooding will be more frequent and erosion will increase (due to storminess and sea level rise).

For Europe as a whole, heat waves are projected to increase in frequency, intensity and duration. Projections of future storminess are still very uncertain.

In southern Europe, climate change is projected to reduce water availability, hydropower potential, summer tourism and, in general, crop productivity.

Climate change is also projected to increase the health risks due to heat waves and the frequency of wildfires.

The decreases of European glaciers and snow cover are projected to continue.

3.1.3. Unmanaged climate change would undermine essential services

The Stern Review estimates that unabated climate change - that is, increases of 3 or 4°C and upwards – would be equivalent to a reduction in consumption per head of between 5 and 20%.

Poor people would be the most exposed and vulnerable to these changes. The UN estimates that by 2080, climate change could lead to an extra 600 million people affected by malnutrition, 400 million exposed to malaria and 1.8 billion without enough water. In a world ravaged by climate change, the struggle against poverty would become still more difficult for hundreds of millions of people.

Even with a modest temperature rise of 2°C and in developed countries, the unavoidable consequences potentially affects many of the key infrastructure and essential services that governments are expected to provide, such as health, security, water, energy and mobility, thus leading to disruption to a wider sector of society and the economy.

For example, the immediate chain of impacts from flooding might be disrupted supply chains, with waterborne diseases increasing, damage to important natural habitats and staff not able to get to work. The knock on consequences of these impacts could be schools closing, children having to be looked after at home, parents (who could be bus drivers, teachers at other schools or production engineers) missing work and therefore disruption to a wider sector of society and the economy.

It is important to realise that climate change already has impacts on the society and ecological systems. Between 1975 and 2001, the annual number of flood events increased and the number of people affected by floods rose significantly in Europe (EEA, 2004).

The seasonality and duration of allergic disorders is changing, with implications for health care services. Gradual, less visible changes developing over time, such as desertification in Southern Europe, could increase precariousness in an invisible manner and affect the capacity of public services to deliver essential services in a secure and affordable manner.

Not all effects are expected to be negative, but this holds true only as long as temperature increase remains below a certain threshold (an increase of no more than 2°C).

3.1.4. Limiting climate change is achievable, yet challenging

The message of the IPCC scientists is clear: it is not too late to avert dangerous climate change, but it requires ambitious, yet achievable, measures from the governments.

According to the IPCC, global GHG emissions need to be cut by between 50-80% in 2050 compared to 1990 levels to limit the temperature increase to 2°C above preindustrial levels, thereby avoiding some of the most damaging and irreversible impacts. Developed countries, which have a greater responsibility in climate change, will need to cut their emissions by 25% to 40% in 2020 and 80-95% by 2050.

The task is challenging. The target means achieving in 2050 an annual emissions level of 2 tonnes per capita in 2050, whereas the EU emissions per capita is currently around 10-12 tonnes and the United States, Australia and Canada over 20 tonnes per capita (Stern, 2009). And as all countries have to achieve emission reductions, the EU will have to realize this within its borders.

The good news however, is that a large part of the emissions cuts required can be made using available, proven technologies, among which energy efficiency and renewable energy (IPCC, 2007). Stern estimated the costs of such an effort to around 1% of GDP. In particular, the potential for efficiency improvements to reduce emissions and costs is substantial. Studies by the International Energy Agency (IEA) show that, by 2050, energy efficiency has the potential to be the biggest single source of emissions savings in the energy sector.

It is important to underline that the rest of the required emissions cuts cannot be achieved through current and foreseeable technologies, according to both the IEA modeling (2008) and the Stern Review. This will require additional investment in Research and Development in new low carbon technologies as well as profound changes in life styles. Stern warns that "Stabilisation at 450ppm CO2e [required to stay below the 2°C threshold] is already almost out of reach, given that we are likely to reach this level within ten years and that there are real difficulties of making the sharp reductions required with current and foreseeable technologies. Efforts to reduce emissions rapidly are likely to be very costly".

3.1.5. Both 'adaptation' and 'mitigation' are needed

It is important to realize that, whatever success there is with reducing future greenhouse gas emissions, some global warming will continue during this century as a result of past carbon emissions. Even for the best mitigation scenarios assessed by the IPCC, average global temperatures will rise by 2 - 3°C within the next fifty years or so (IPCC, 2007).

It is therefore important to consider both "adaptation" and "mitigation" when it comes to climate change. Adaptation and mitigation are different in nature, therefore they will be distinguished in the rest of the study.

Box 3 - Mitigation and adaptation

Mitigation: In the context of climate change, a human intervention to reduce greenhouse gas emissions or enhance the removal of these gases from the atmosphere (enhancing carbon sinks). Examples include using fossil fuels more efficiently for industrial processes or electricity generation, switching to solar energy or wind power, improving the insulation of buildings, and expanding forests and other "sinks" to remove greater amounts of carbon dioxide from the atmosphere.

Adaptation is a response to climate change that seeks to reduce the vulnerability of natural and human systems to the inevitable effects of climate change. Even if emissions are stabilized relatively soon, climate change and its effects will last many years, and adaptation will be necessary. Examples of an adaptation strategy include shore protection which can prevent sea level rise from inundating low-lying coastal property, public health resources to prevent deaths during excessive heat events in urban areas, and planning for alternative water sources such as treated wastewater or desalinated seawater.
Source: UNFCCC Glossary of Climate Change Acronyms".
http://unfccc.int/essential_background/glossary/items/3666.php

In general the more mitigation there is, the less will be the impacts to which we will have to adjust. If we do not stop the growth of and eventually reverse greenhouse gas emissions, then our opportunity to adapt will be limited by the rapid pace of climate change.

Thus, climate mitigation and adaptation policies are complementary, not exclusive. Unmitigated climate change would, in the long term, exceed the capacity of natural, managed and human systems to adapt. Adaptation alone will be ineffective for some cases such as the loss of Arctic sea ice, the disappearance of mountain glaciers that play vital roles in water storage and supply, or adaptation to sea level rise of several metres (IPCC, 2007).

4. Critics of the EU approach climate mitigation and adaptation policies

In this section, the adaptation and mitigation policies of the Commission are assessed against commonly agreed principles for government intervention and public funding.

4.1. The Adaptation White Paper is biased towards private funding

The debate in Europe about policy for climate change mitigation is prominent. It has tended to dominate the public debate, with climate change adaptation receiving relatively little public attention.

A Green Paper was published in June 2007, followed by a White paper in April 2009, entitled ‘Adapting to climate change: Towards a European framework for action’. Overall, the emphasis of the White Paper is on creating and distributing information. It emphasizes the need to build understanding and adaptive capacity, mainly based on strategies related to information provision. It does not consider mandatory national adaptation strategies, nor does it propose dedicated EU financial means.

Although the rationale for public intervention and public spending for adaptation efforts is widely recognized by International organizations such as the IPCC and the United Framework Convention on Climate change (UNFCCC), the Adaptation White Paper strongly promotes both Public-Private Partnerships (PPP) and innovative financial instruments.

> “In any adaptation framework, consideration should be given to the role of specialised Market Based Instruments (MBIs) and Public-Private Partnerships should be encouraged with a view to the sharing of investment, risk, reward and responsibilities between the public and private sector in the delivery of adaptation action”. MBIs refer notably to “incentive schemes for protecting ecosystem services or for projects enhancing the resilience of ecosystems and economic sectors in the form of Payments for Ecosystem Services (PES)”.

This contradicts several existing analysis, including the Commission's own impact assessment study, as well as evidences of the actual working of Public-Private Partnerships:

- The White paper does not offer any assessment of experience with both PPPs and PES. A recent PSIRU paper set out an analysis of the risks and impact of PPPs, including a number of examples (PSIRU, 2008). While PES schemes have received growing interest in many parts of the world, their impact is not necessarily positive (Engel et al., 2008). A number of concerns have been expressed regarding the environmental and social impact of PES projects. Some of these concerns are highlighted in the Impact Assessment document: Increasing the use and promoting the development of market based instruments "should be part of an adaptation strategy, but should duly take into account possible impacts of social and territorial exclusion".
- The UNFCCC 2007 report „Investments and Financial Flows to Address Climate Change" estimates the cost of adaptation for OECD countries to between 14 to 100 billion US$ in 2030, "most of it to be covered by public spending". At the same time, developed countries will need to make available to developing countries significant additional finance to help them cope with the impact of climate change, which is foreseen to cost several 100 billino per annum by 2030 (UNFCCC, 2009).
- The European Commission itself, in the Impact Assessment on the White Paper, makes the case for public finance: "public finance is needed in specific areas such as infrastructure provision (water, flood control, transportation), public goods (to address public health risks and to facilitate adaptation in agriculture, forestry or tourism), subsidies (to facilitate the relocation of population and activities) and to act as ultimate source of reinsurance when no insurance exists" (EC, 2009b).
- The White paper Impact Assessment emphasizes that, because of uncertainty about the future impacts, the private sector will not undertake preventive action at the level required even if the costs of taking action to address climate change will be much lower than the costs of inaction over the long term. Importantly, insurance companies tend to refuse to cover climate risks (OECD, 2008; UNFCCC, 2007). "Responses to market signals or environmental changes (what is called 'autonomous adaptation') is not likely to be optimal and adaptation efforts cannot be left to individuals or businesses" (EC, 2009a).
- Adaptation to the effects of climate change essentially consists in securing the provision of essential public services, such as water supply and civil protection, in such a manner that will enhance the resilience of the society to future natural disasters (EC, 2009a).
- Public intervention is needed for solidarity purposes, to compensate for the unequal distribution of the risks associated with the impact of climate change across individuals, regions and economic sectors (Pye et al, 2008; WHO, 2008). The conference organized in February 2009 by the European Commission's - DG Employment, Social Affairs and Equal Opportunities, under the title 'Social Fairness in Sustainable Development – A Green and Social Europe', described climate change as a factor of 'environmental injustice'. The socially-disadvantaged groups (low income households, ethnic or linguistic minorities, older people) are more vulnerable to impacts of climate change because of where they live, their current state of health or their economic status. For example, the more deprived populations are more likely to be living within zones at risk from flooding and to lack insurance against flooding (UK Environment Agency, 2007). In regions that are less populated and economically less performing, and particularly sensitive to climate change risks (coastal and mountain regions e.g.), the cost to cover adaptation needs will be so huge that they exceed the capacity of public funding (European commission, 2009b).
- In addition PPPs are criticized for not delivering on what the European Commission and others claim is a core advantage – that they relieve public budgets. PPPs turn out to be more expensive for public authorities and they consume public finance (PSIRU 2010).

4.2. EU mitigation policy: the limits of the market-oriented approach

The Stern Review states that “Climate change presents a unique challenge for economics: it is the greatest and widest-ranging market failure ever seen”. The EU mitigation policy is yet influenced by two ‘mantra’: carbon trading is superior to many other policy instruments, and competition on electricity and gas markets is necessary for the decarbonisation of the electricity sector. Those points are discussed below. The generally admitted rationale for public spending for mitigation is then outlined.

4.2.1. The ‘carbon trading’ mantra

Following the ratification of the Kyoto Protocol, there has been a wide variety of policies and measures implemented in the EU and member states to limit greenhouse gas emissions, encompassing regulation and standards, carbon taxes, tax credits, subsidies, tradable permits. Still, the EU Emissions Trading Scheme (EU ETS) introduced in 2005 to cap CO2 emissions from large industrial facilities and electricity producers.is considered by the European Commission as the cornerstone of the European climate mitigation policy, despite fundamental flaws and bad records. Historically, the adoption of the ETS comes from the impossibility to reach a consensus among member states on carbon taxation. The EU ETS covers electric utilities and energy intensive industries.

What is more worrying yet is the attempt of the European Commission and the member states in the international climate negotiations to ‘sell’ the EU ETS to third countries and move the EU ETS to a global carbon market. It prevents the consideration of alternative instruments such as an international carbon tax or a Tobin-type tax to fund public climate change investment. Most economists believe yet that a carbon tax would be a superior policy alternative to an international emissions-trading regime. They argue that it is more cost-effective, provides public funding, offers a more predictable long-term price for energy producers, and that emissions trading schemes would be subject to manipulation by special interests.

Experience with cap and trade systems indicates that:

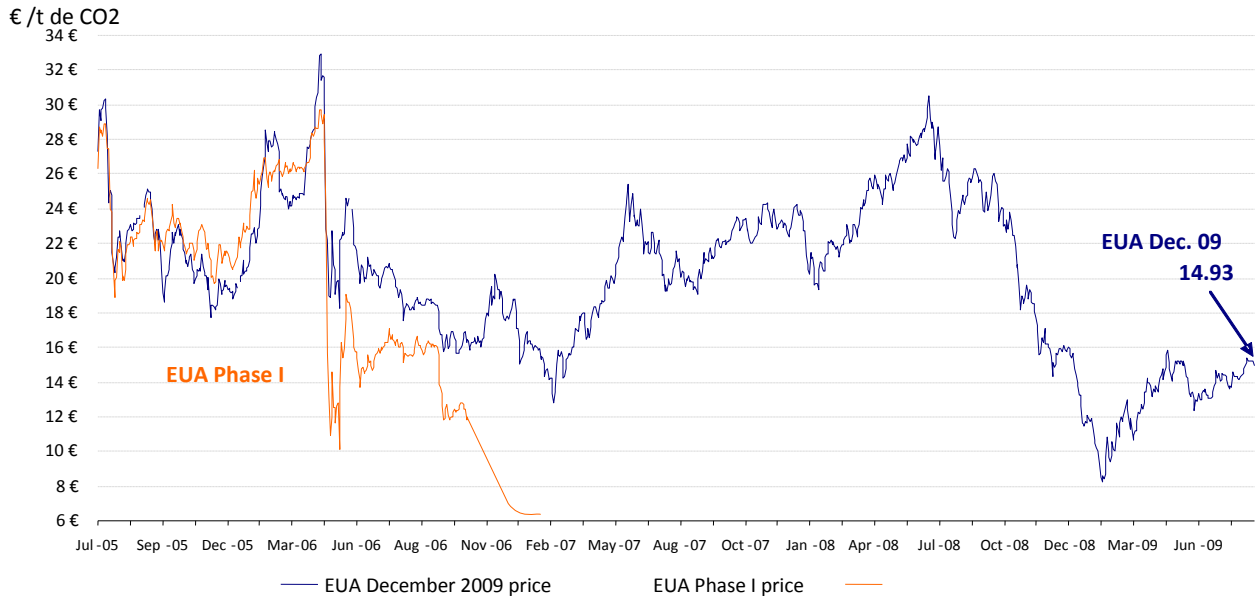
- The CO2 prices have been too low and too erratic to drive structural, lasting changes in the energy system (figure 1). The scheme has allowed investments in highly emitting coal-fired power plants to continue.
- The risk of excessive financialisation of the international greenhouse gas market has also been highlighted by reports. For instance a report by la Caisse des dépôts found that most of the 80 carbon investment funds set up to finance offset projects or buy carbon credits are oriented more toward speculation than toward helping companies comply with regulated carbon caps (Caisse des dépôts, 2007). See also the very documented report by the Corner House (Corner house, 2007).
- Importantly, there is evidence that the power companies and the energy intensive industry have made huge windfall profits during phase 1 (from 2005-2007) and phase 2 (from 2008 till 2012) of the EU ETS by passing through the value of their freely obtained allowances in the product prices. Windfall profits have been estimated to between €24-35 billion in 2005-6 (Sijm et al., 2006). Although a normal behavior in a free energy market where electricity price is based on the marginal production cost[1], it raises concern because there is no evidence that the companies invest those profits in lowering their carbon footprint. By contrast, alternative policy options such as

[1] The reason is that price-fixing in the electricity markets are based on the marginal cost of production, i.e. the cost of the last produced kWh. The cost of an emission allowance will therefore apply to the marginal unit of electricity, raising the market price for all kWh produced. So fossil power producers will receive the higher price for each kWh they produce, but costs for emitting CO2 will only apply to the very small share of kWh that do not benefit from free allocation

auctioning the CO2 permits or a carbon tax would generate revenues for governments that would benefit the citizens.

- In a deregulated electricity market, the increase in the retail price of electricity that results from CO2 pricing could have an important effect on the lower income households.
- Power companies make an intensive use of the flexible mechanisms (Clean development mechanism, CDM) that allow them to offset their emissions with credits from projects in developing countries.[2] This raises several issues, among which the fact that companies make profit from buying cheap carbon credits in developing countries instead of modernising their plants at home.

Figure 1 - CO2 prices on the European carbon market



Source: ECX, BlueNext, Reuters.

4.2.2. Decarbonisation vs Competition on electricity market

Measures to curb greenhouse gas emissions take place in a liberalized electricity market. This requires at least a thorough examination of the impact of liberalization policies on the reduction of greenhouse gas emissions in the power sector. Unfortunately, such assessment is lacking.

The available literature, including the climate change review by Sir Nicholas Stern and some PSIRU research, provides evidence that liberalisation is hindering, not facilitating, the efficient and rapid reduction of greenhouse gas emissions in this sector.

Many of the proponents of market liberalization advocate a positive impact of market liberalization on climate change goals. They argue that increased competition, the segmentation of activities (generation, transmission, distribution, sales) and the freedom of consumers to change their supplier encourage new producers to enter the market such as renewable production and decentralized generation. They also claim that price differentiation allows power companies to diversify their product by selling electricity from renewable energy sources or energy services aimed at promoting energy efficiency for the end-user.

[2] Japan's electric power companies have bought 250 million tonnes of carbon credits from abroad to meet its voluntary goal to help achieve the nation's commitments under the Kyoto Protocol.

However, the reality shows a different picture (see for example Professor for energy policy Steve Thomas inaugural address, February 2010) http://www.psiru.org/reports/2010-02-E-future.pdf. Considerable regulatory instruments have been necessary to allow for grid access for electricity produced by decentralized generation or renewable, or to assist them financially through feed-in tariffs, obligations to purchase, harmonisation of technical standards and connection procedures. Even in countries, such as Germany, that have achieved a significant integration of decentralized production in the grid, network operators tend to limit as far as possible the number of distributed generation connections on their networks. Financial support through guaranteeing the price has been instrumental in making Germany one of Europe's leading countries in solar technology and installed solar power.

Electricity is a homogeneous product, i.e. consumers are not ready to pay extra for carbon-free electricity that does not deliver more service than carbon-intensive electricity. Therefore power companies have no incentive to develop new power generation technologies that takes several decades before they become commercially viable. Nor do they have interest in providing demand side management that erodes their incomes. As a result, government are developing costly market schemes to make it profitable for the power company to supply demand-side energy efficiency services.

Furthermore, in a context of greater price volatility on the electricity markets, investors discriminate against peaking units (risky cash flow), and capital intensive base load technologies (e.g. nuclear, renewables). Indeed, following market liberalization, electricity companies have massively invested in gas generation which maximizes short-term profit and uses well-developed technologies, to the detriment of renewable and decentralized generation which are characterized by unfavorable price structures. This has blocked the structural changes in the power system needed for the long term. Similarly, investments in infrastructure have been deferred. This is worrying considering the huge needs of investment to tackle climate change. The box below highlights a recent report from the UK regulator OFGEM. It questions the ability of liberalized markets to deliver green energy and keep the lights on (http://www.guardian.co.uk/business/2010/feb/03/ofgem-uk-energy-supplies)

Massive cuts in employment and training expenditures that have occurred in power companies over the last two decades following market liberalization undermine companies' ability to rapidly develop the new technologies and services when the carbon constraint will tighten.

Box 4: Report from the UK electricity and gas regulator (OFGEM) - Options for delivering secure and sustainable energy supplies

The UK regulator OFGEM published a report in February 2010. It examines if the "current arrangements in GB are adequate for delivering secure and sustainable electricity and gas supplies over the next 10-15 years. The key issues are:

- There is a need for unprecedented levels of investment to be sustained over many years in difficult financial conditions and against a background of increased risk and uncertainty
- The uncertainty in future carbon prices is likely to delay or deter investment in low carbon technology and lead to greater decarbonisation costs in the future.
- Short term price signals at times of system stress do not fully reflect the value that customers place on supply security which may mean that the incentives to make additional peak energy supplies available and to invest in peaking capacity are not strong enough.
- Interdependence with international markets exposes GB to a range of additional risks that may undermine GB security of supply.
- The higher cost of gas and electricity may mean that increasing numbers of consumers are not able to afford adequate levels of energy to meet their requirements and that the competitiveness of industry and business is affected years.

http://www.ofgem.gov.uk/Markets/WhlMkts/Discovery/Documents1/Project_Discovery_FebConDoc_FINAL.pdf

OFGEM is consulting on the best approach and one of the options includes a Single Buyer model to allow long term contracts.

Another problem arises as carbon constraints are likely to drive electricity prices up, at least for the short term. Lack of regulated tariffs leaves the power companies with the responsibility to mitigate the impact of high energy prices on the most vulnerable in society.

To sum up, whereas energy efficiency concerns would require more coordination between production, transmissions and distribution activities, vertical disintegration introduces asymmetry of information and conflicts of interest between the generator, the network operator and the consumer that can only be overcome with expensive coordination mechanisms.

4.2.3. The rationale for public finance in climate mitigation

Also mitigation is generally said as requiring less public funding that adaptation, the literature and experience provide numerous arguments for public funding in this area.

The IPCC fourth assessment report states that :"Scaling up public funding for mitigation and shifting public-sector investments to more climate-friendly alternatives were identified by the 2007 report as essential for generating additional investment and financial flows to address climate change".

Public funding and direct public investment are justified for:

- Bringing down the costs of existing carbon mitigation technologies so that they are competitive with fossil-fuel alternatives. Many EU countries support renewable energy through feed-in tariffs;
- Removing the barriers, such as lack of information, transaction cost, lack of upfront finance, to realize cost-effective efficiency measures. Minimum standards for buildings and appliances for instance have proved a cost-effective way to improve performance, where price signals alone may be too muted to have a significant impact;
- Scaling up low-carbon R&D. The private sector spends little or nothing on R&D in crucial sectors such as electricity (OECD, 2006; PSIRU, 2008). The 2020 Commission strategic paper also acknowledges that R&D spending in Europe is too low compared with Japan and the USA "mainly as a result of lower levels of private investment". Stern and the IEA (2008) call for a doubling the budget for public energy R&D from the current level of around $10 each year;
- Remedying to the lack of price of carbon: Interestingly, Stern makes it clear that carbon pricing needs not necessarily to be explicit (through tax or trading) but can also be 'implicit', e.g. through regulation. The IPCC analyses suggest that carbon prices of $20 to $80 per ton CO2-eq, sustained or increased over decades, could eliminate most carbon emissions from power generation;
- Given the character of natural monopoly of electricity utilities and mass transport, two key areas for mitigation;
- Helping achieving public goods other than climate mitigation, for instance reducing ill-health and mortality from air pollution.

Too often, however, public funding is viewed as a leverage instrument for private capital, potentially involving Public private partnership, or a second best option, "before carbon markets realise their potential" (Stern, 2006). It brings us back to the issue of the efficiency of PPPs and carbon markets addressed in the previous sections.

The International Energy Agency (IEA) estimates that the stabilization of global emissions at 2005 levels by 2050 would require an additional $7.3 trillion of investment in OECD countries by mid-century (IEA 2008). In the context of global investment, these numbers are relatively small, but they imply a very significant increase from current levels of climate-related investment.

5. Impact of climate change and carbon reduction policies on the public sectors

Before considering the relationship between climate change and selected public sectors (central administration, local and regional government, health, social services and utilities (water, energy and waste)), we will give an overview of how climate change affects jobs in the public services.

5.1. Climate change policies, employment, skills, H&S and gender

The analysis above calls for an important role of the public sector (government, local authorities, utilities, etc…) in both adaptation and mitigation strategies. This section underlines that public services already provides the bulk of the 'green jobs' in Europe. However, for the public services to play its full role in climate mitigation and adaptation, adequate attention should be paid to the impacts in terms of skills, occupational health and safety and gender.

5.1.1. Opportunities for quality and secure jobs in public services

Climate change adaptation and mitigation bring substantial opportunities for the creation of secure, quality jobs in public services such as water management, energy supply, health care, coastal and natural resource management, disaster preparedness, urban planning.

But the content of many of these jobs is likely to be different from today, requiring innovative capacities and skills development programmes to ensure opportunities are seized. For instance, while the current approach to adaptation is principally through investment in physical infrastructure (sometimes referred to as 'rubber cutting'), 'green' infrastructure and 'soft, regulatory' approaches to adaptation will increasingly be preferred, because more sustainable in the long term (EC, 2009). 'Green' infrastructure consists in using the functions and services provided by the ecosystems to increase resilience to climate change. This includes for instance using the cooling capacity of trees and other biomass in densely populated urban spaces. It can be assumed that green infrastructure is more labour intensive than physical infrastructure (building dikes).

Most of the sectors providing environmental services today are public services. The European Commission has produced three reports describing eco-industries' activities i.e. economic activities that produce goods and services to measure, prevent, limit, minimise or correct environmental damage to water, air and soil, as well as problems related to waste, noise and eco-systems (GHK/CE/IEEP, 2007; Ernst and Young, 2006; Ecotec, 2002). Four sectors of public service character (solid waste management, waste water treatment, general public administration related to environment, and nature protection) make up almost 90% of total employment in pollution management industries. They employ 1,4 million of jobs, and employment is growing.

Table 1: Estimates of the direct employment in environment related activities ('000 full-time equivalent) in selected sectors

	GHK/CE/IEEP (2007)	Ernst and Young (2006)	Ecotec (1999)
Solid waste management & Recycling	846	843	760
Waste Water Treatment	428	587	427
General Public Administration	104	121	75
Nature protection**	68	100	99
Total employment in pollution management eco-industries	1544	1840	1454
% the 4 sectors	89%	84%	87%

Source: GHK/CE/IEEP

Adaptation solutions already developed by EU organisations may be transferable to developing countries where the need for adaptation solutions will be the highest. Public-Public Partnerships, which have proved to be efficient means of transferring knowledge and technology in utilities, should be promoted and implemented. Other area include strengthening and development of social security policies in developing countries, as they have proven to be among the most important measures for enhancing economic resilience to climate change (ILO, 2009).

These opportunities for job creation in the public services linked to adaptation strategies, if matched with adequate skill development, can greatly contribute a 'green jobs' strategy. The need to reduce emissions associated with the production and provision of public services will require major investment and skills changes in the production processes of the most energy intensive public services (energy utilities and to a certain extent, water and waste water services). Some more work needs to be done on the employment implications of climate change adaptation, as noted by the IPCC fourth assessment report: "Broader macroeconomic and economy-wide implications of adaptations on economic growth and employment remain largely unknown".

5.1.2. Occupational health and safety in a changing climate

A groundbreaking TUC report entitled 'Changing Work in a Changing Climate', looked at the impact of climate change and adaptation strategies on people at work in the UK public and private sectors. They found that climate change may have significant impacts on occupational health and safety (TUC, 2009). Some workers are in the front line of emergency response to climate related events and face higher risk. Moreover, some of the most exposed jobs are the least well-paid.

Workers who are involved in the immediate response to climate related disasters, are the most exposed to higher temperature, strong winds and water floods and epidemics and face higher risks of physical injury, diseases and skin cancers. It is also extremely difficult to control their working conditions. This concerns such public service workers as policemen, firefighters, emergency medical staff, park rangers and life guards. Also, health care workers will be more exposed to pandemic or disaster occurring as a result of climate change, if they remain on duty. In energy companies outdoor workers and engineers required to fix problems across the network could be placed at higher risk during extreme weather events.

Equipping those workers with proper protective equipment and clothing and putting in place health and safety prevention measures will be crucial. All workers, but particularly those who, by the nature of their jobs, are more exposed to climate risks, will need to be adequately trained to cope with changing working environments. And this requires a departure of working with minimal staff contingents.

Even in non-emergency services, people in some jobs are more exposed to climate change impacts, especially working outdoors or work in restricted spaces such as transport vehicles. Municipal caretakers and street sweepers regularly experience unsafe working conditions during heatwaves and have limited options for adapting to more frequent occurrences of this type of weather event. Changes to shift patterns and flexibility in work requirements during extreme climate events need to be considered in order to ensure that employees are not forced to work in unsafe or unhealthy conditions.

Climate impacts can also hinder the ability of public sector workers to get to work, thereby affecting the capacity to deliver the services to the public. Possible responses by organisations to ensure service continuity include the development of home working and alternative travel plans.

It will be important to increase the adaptive capacity of those vulnerable workers in order to ensure both more social equity in the face of the changing climate and service continuity. It should be recognized that a workforce that can react to these developments does not come for free and requires investment (see section 3).

5.1.3. Skills needs arising from climate change policies

The number of studies undertaken in recent years to identify which skills, both specific and generic, associated with a move to a lower carbon development path, remains relatively limited.

The European Commission published a series of studies on the Future of Skills and Jobs (http://www.eurofound.europa.eu/publications/htmlfiles/ef0956.htm). These studies include several scenarios which indicate the likely skill bottlenecks for example in a green energy efficiency scenarios:

A study undertaken by GHK for DG employment characterizes the changes in skills profiles as falling along the following lines (GHK, 2009):

- Some skills will become obsolete due to structural changes in the labour market and employment shifts both within and across sectors due to demands for a greener economy (e.g. as utility meter reading services are rendered obsolete by introduction of 'smart' household meters that automatically relay data to utility companies)
- Demand for some new skills will be created as new 'green-collar' occupations emerge to support adaptation to and mitigation of climate change (e.g. support and servicing of solar, wind and other renewable energy technologies)
- The skills required for existing jobs will have a stronger green element as existing occupational profiles change (e.g. bottle manufacturers learning new technical skills to reduce carbon emissions from production).

The 2009 Employment report stresses that green jobs cover all sorts of skill needs, including low and high skilled. However, it is to be expected that in an initial phase the new jobs associated with the development, installation and operation of the new technologies, will generally require highly skilled workers who are at the cutting edge of new technologies. Only in the medium term when technologies mature, lower skilled workers will also be able to fill these jobs. However, the negative effect for the low-skilled workers will be tempered if account is taken of the fact that, in the initial phase of the transition, a significant number of low-skilled will be needed to build and install the new infrastructure. http://ec.europa.eu/social/main.jsp?catId=119&langId=en

According to Cedefop (2009) the green economy reinforces the trend towards a new skills paradigm where the importance of 'generic' skills is recognised to complement 'specific' skills. The former include strategic planning and leadership, adaptability/transferability skills, systems analysis, risk analysis, coordination, communication, etc…
The specific skills associated with the green economy are not entirely new skills (Szovics et al., 2008). They are add-on or a mixture of existing skills, with examples being knowledge of sustainable materials, relevant traditional skills for installation of new technologies (e.g. fitting or electrical skills for installation of solar tube or panel technologies), skills to measure carbon footprinting and environmental impact assessment skills (e.g. energy assessment).

In some sectors (such as logistics, inter-modal transport, building, electrical engineering) however, the additional jobs are perceived as less 'secure' in terms of pay and working conditions, and will need to 'evolve' to be able to attract well-qualified workers (GHK, 2009).

5.1.4. Gender equality in adaptation and green jobs

There is a body of research that highlights that climate change has gender specific implications in terms of both adaptive capacity and access to green and quality jobs. The role of gender in influencing adaptive capacity and seizing the opportunity of green jobs are thus an important consideration for the development of climate adaptation and mitigation policies. Regrettably, the White paper on climate adaptation however, the gender dimension of adaptation in Europe is not addressed by the White Paper on Adaptation. Yet, such gender dimension is ignored by the European policies on climate change.

Women vulnerability to climate change impacts

The fourth IPCC report on climate change emphasizes that vulnerability and adaptive capacity to climate change impacts are different for men and women, with vulnerability more apparent in resource-dependant societies, such as agriculture, in activities directly dependant on climatic conditions and in the impact of extreme weather-related events.

In the developing world in particular, women are disproportionately involved in natural resource-dependent activities, such as agriculture, compared to salaried occupations. Changes in climate variability projected for future climates are likely to affect women through a variety of mechanisms: directly through water availability, vegetation and fuel wood availability and through health issues relating to vulnerable populations (especially dependent children and elderly).

Women are more vulnerable than men to weather-related disasters, because of less work opportunity outside the home, and more responsibility for the additional care burden during the period of rehabilitation.

The Hyogo[3] Framework for Action that emerged from the United Nation's 2005 World Conference on Disaster Reduction states that "a gender perspective should be integrated into all disaster risk management policies, plans and decision-making processes, including those related to risk assessment, early warning, information management, and education and training" (ISDR, 2005: 4). It is, therefore, imperative that governments and other stakeholders build into their policies and programs strong links between gender, human security and climate change.

Green jobs and women

A Sustainlabour study entitled "Green jobs and women workers" examined the trend in the creation of green jobs and their access to women workers (Sustainlabour, 2009). It warns that "the green economy may unintentionally exclude women".

Women may be excluded from the green economy due to gender-segregated employment, discrimination, and traditional attitudes. Most green jobs are expected to be in the secondary sectors of construction, manufacturing and energy production, where women are significantly underrepresented. In developed countries, the share of female employees in the energy industry – a sector expected to generate a large share of green jobs as renewable energy develops- is estimated at 20%. While women may fare better in the tertiary sector, men dominate the better paid jobs in engineering, financial and business services, where the bulk of green service positions are likely to be created.

The Sustainlabour report recommands government and union action to raise the proportion of green jobs filled by women and to ensure the quality of those jobs. In particular, targeted schemes should be adopted to recruit and train women in non-traditional, green jobs. For instance, government spending through green stimulus packages and public procurement should require employers and contractors to adopt affirmative action goals to recruit women.

5.2. Central governments

Climate change and measures to reduce greenhouse gas emissions will have impacts in virtually every central government policy area. It will often involve changes in practices and skills and additional staff in some areas.

Environment department and environmental protection agencies – they will need to develop the whole area of environmental policy making on climate change (research, policy design, awareness raising, etc…). Investment in green infrastructure, such as national parks, Natura 2000 zones, will be extended.

Meteorological services- Will develop climate forecasting and short-term flood and fire alerts. New skills requirement on climate modelling, whereas they were used to utilize past records.

[3] Hyogo is the name of the town were the agreement was reached.

Insurance regulation- Publicly supported insurance schemes against natural disaster will need to be expanded. New schemes to extend insurance protection against floods and other natural disasters will need to be worked out and monitored. The European Commission is considering compulsory standard weather-related insurance for critical infrastructure and zones most at risk.

Public Buildings and infrastructure: Public buildings will need to be adapted both to changing climate patterns and to new requirements to improve building performance in terms of energy, materials, and land use.

The recast of the Directive on the energy performance of buildings (EPBD) in 2010 is expected to require public authorities to lead the way by ensuring that new buildings occupied and owned by public authorities be nearly zero energy buildings after 2018.

Low-energy buildings typically use high levels of insulation, energy efficient windows, heat recovery ventilation, passive or active solar technologies reducing energy consumption.

Trade unions throughout Europe are involved in "greenworkplaces" projects aiming at reducing energy and material consumption. The scope of such projects far exceeds energy efficiency, to include green travel plans, sustainable procurement or reduced working schedules to save energy (see for instance Prospects 'Greening your workplace – Negotiator's guide' for a description of how Prospect's members in the Met Office, research councils, the Environment Agency and the energy sector are involved in greenworkplaces projects).

Economic and financial administration: the scope of the so-called 'economic instruments' is broadening, leading to more staff affected to designing, implementing and monitoring eco-tax, tax credits, CO2 permits, white and green certificates.

Research: Research and education policy is necessary to promote better understanding of climate change impacts and the development of skills, methods and technologies to cope with the consequences of climate. A recent Commission Staff Working Document (EC, 2008b) provides detailed information on research needs, including on the impacts of climate change and adaptation.

Security – climate change is increasingly recognized as a human security challenge. On 17 April 2007, the UN Security Council took up the issue of climate change for the first time in history. More frequent and severe natural disasters, sea level increase will trigger or accelerate migration flows both within countries and cross border and could increase existing political tensions and instability.

5.3. Local authorities

Both adapting to climate change and reducing greenhouse emissions should be a concern for all local and regional governments. Municipalities and local governments have been given more tasks and responsibilities for disaster risk reduction and most of the mitigation, preparedness, planning and recovery efforts have been transferred to this level (UNISDR, 2009). Over half of greenhouse gas emissions are created in and by cities, where up to 80% of energy is consumed, requiring action in urban planning, sustainable transport, district heating systems, waste management, etc….

As shown in Table 1, regional and local authorities have a significant role to play for adaptation to climate change.

Table 2: The role of city/municipal governments in the four aspects of adaptation (Source: OECD, 2009)

Role of city/municipal government	Long-term protection	Pre-disaster damage limitation	Immediate post-disaster response	Rebuilding
Built environment				
Building codes	High		High[1]	High
Land use regulations and property registration	High	Some		High
Public building construction and maintenance	High	Some		High
Urban planning (including zoning and development controls)	High		High[1]	High
Infrastructure				
Piped water including treatment	High	Some	High	High
Sanitation	High	Some	High	High
Drainage	High	High[2]	High	High
Roads, bridges, pavements	High		High	High
Electricity	High	Some	High	High
Solid waste disposal facilities	High	Some		High
Waste water treatment	High			High
Services				
Fire protection	High	Some	High	Some
Public order/police/early warning	Medium	High	High	Some
Solid waste collection	High	High[2]	High	High
Schools	Medium	Medium		
Health care/public health/environmental health/ambulances	Medium	Medium	High	High
Public transport	Medium	High	High	High
Social welfare (includes provision for child care and old-age care)	Medium	High	High	High
Disaster response (over and above those listed above)			High	High

1. Obviously it is important that these do not inhibit rapid responses.
2. Clearing/de-silting drains and ensuring collection of solid wastes have particular importance just before an extreme rainfall; many cities face serious flooding from extreme rainfall that is expected (for instance from the monsoon rains) and this is often caused or exacerbated by the failure to keep storm and surface drains in good order.

Municipalities are responsible for the functioning of key public services − such as local infrastructure for transport, water, waste, care for the elderly and other vulnerable populations, health services and information to the public − and their coordination during emergencies. They are also responsible for preventive planning and disaster management within their territorial borders.

ICLEI, the local governments for sustainability, organised the first-ever global congress on cities and adaptation to climate change in May 2010, Key challenges identified are the consequences of climate change on the urban poor, more funds to cities' climate adaptation and greater local government involvement in international climate proceedings.

Preparation of regional and municipal adaptation strategies

Developing regional adaptation strategies, including drought flood mitigation plans, is a new task for local governments, with substantial human and financial resources requirements. The European Commission guidelines for regional adaptation strategies emphasize that "an important condition for developing and implementing adaptation strategies is that sufficient human and financial resources will be made available".

Workers in local authorities will have to provide information and education services to the public and communities struggling to comprehend the practical implications of climate change and the local and personal solutions they can consider.

Fire, emergency, civil protection and disaster management services

Fire fighting services and rescue services may need to cope with a higher demand of interventions for forest fires, avalanche and floods. The potential increase in work load is set against a background of shortage of adequately-trained personnel, along with financial and technical capacities, in the area of disaster preparedness, highlighted by a UNISDR report in

2009. This is often compounded by the general decline in the numbers of volunteers, due to demographic changes, in those countries which have significant voluntary sectors.

Occupational health and safety of firefighters and emergency rescue employees will need to be ensured in the new climate conditions through the provision of adequate protection and clothes. In areas where new kind of damages will increase, new equipment and new skills may be needed, as for example fire fighting protection and equipment is not suitable for use during flooding incidents.

In areas prone to increased flooding, there will be opportunities to develop new professional roles for highly trained water rescue experts in the emergency services (TUC, 2009).

Fire and emergency work will need to incorporate more prevention activities so as to keep the occurrence and costs of extreme events manageable. Firefighers are already carrying out more prevention tasks (Lethbridge, 2009).

The TUC report warns that there is also a risk that emergency service planners in public authorities may elect to cut jobs in order to fund investment in equipment to cope with climate change, such as boats for flood rescue. Teams may have to relocate and set up at emergency sites, putting additional strain on the remaining local emergency resources.

Urban planning: Local government activities in planning areas are very broad and encompass both adaptation and mitigation activities. Priority will need to be given to prevention measures, such as avoiding infrastructure development and building in areas at high risk of water scarcity or flooding. Particular attention will need to be paid to ensuring that low-cost housing is available outside high risk zones (such as away from floodplains and outside of urban heat islands).

Infrastructure: When building of infrastructure will be considered, for example to protect from sea level rise or floods, it will need to prioritise 'green infrastructure' land use planning, such as sustainable drainage systems to prevent runoff into storm sewers, mass transit systems and alternatives to roads (dedicated bus and biking lines, tramway) or using the cooling capacity of trees in densely populated urban spaces. The use of relatively new methods such as life cycle analysis of energy use and emissions, or environmental risk assessment, will have to be systematically undertaken when conducting reviews of installations and infrastructure.

Protection of natural sites, parks and forests: The management of the current Natura 2000 areas and other ecosystems will need to be adapted to respond to the rapid changes to ecosystems induced by climate change.

Energy: Municipalities are already taking initiatives to create green energy companies. Local governments may run and maintain energy generation plants that use the methane collected from land-fills and waste treatment plants. For the larger local authorities that collect and recover green waste, they will run and maintain bio-energy plants that burn wood waste and waste from other biomass to produce electricity. It has a special appeal because it creates direct and indirect jobs in rural areas.

The Covenant of Mayors, an initiative supported by the European Commission, encompasses 1600 cities which commit to go beyond the objectives of EU energy policy in terms of reduction in CO_2 emissions through enhanced energy efficiency and cleaner energy production and use. Interestingly, signatory cities commit to "mitigate climate change through the implementation of intelligent local sustainable energy policies, that create stable local jobs and […] to allocate sufficient human resources to the tasks".

Economic, vocational training, insurance: Government should consider ways of ensuring access to insurance against flooding for low income households. Local and regional governments responsible for employment and vocational training may need to develop plans to boost regional investment in green activities, and ensure workers who are forced to move or look for alternative work, are provided with equivalent jobs or retraining opportunities.

Impact on local and regional authorities budget: The Commission's Adaptation White Paper recognizes that local and regional authorities will have to bear the cost of developing and

implementing adaptation strategies. A new context for solidarity and burden sharing will therefore emerge, and there will be the need for revising the framework for EU financial support to the regions to facilitate adaptation.

5.4. Social services

Climate change will affect social services such as elderly and child care, care for homeless, youth services in several ways.

A key task of the social services will be to help identify the populations and individuals most vulnerable to both climate change impacts and carbon mitigation measures. Social services will coordinate with the appropriate services (health, housing, environmental agencies) to develop and implement prevention and response plans.

Population at risk of severe weather injuries include people in poverty, homeless or in shelters, who will need to be provided with information on risks of heat waves, equipped with air cooling systems, or helped to get to hospitals. They might also need assistance for relocation after a flood or storm events.

In addition to the direct impact on vulnerable groups, weather events such as droughts or floods may worsen economic conditions of low income people by increasing the price of essential goods such as food and energy, or hindering transport to work, thus increasing the need for social services.

Also, it is essential that social services be involved in the design and implementation of programmes aimed at reducing dependency of poor income households on expensive fossil energies, such as energy refurbishment of social housing. Such programmes can simultaneously help lift the poorest customers out of fuel poverty and reduce carbon emissions.

In the long term, social services might have to cope with the effects of increased migration of population to the national territory as climatic and economic conditions worsen in poorest countries. There might be growing needs for humanitarian assistance and health protection of vulnerable groups. The Commission's White Paper on Adaptation underlines that "climate change could lead to vast displacement of populations, including into regions close to Europe or EU ultra-peripheral regions". Parts of the Mediterranean region being both a neighboring region and susceptible to the effects of climate change is particularly important in this respect".

As with other public services energy efficiency measures will need to be considered.

5.5. Health care

Adaptation

The health effects of climate change have been reviewed by the 2007 report of the Intergovernmental Panel on Climate Change (IPCC; Metz et al. 2007), several WHO reports (WHO, 2009) and the 2006 report of the Climate Change and Adaptation Strategies for Human Health (Menne and Ebi 2006). European Research projects such as PESETA (Projection of Economic impacts of climate change in Sectors of the European Union) have looked at the health effects of climate change in Europe.

At this early stage the effects of climate change on human health in Europe are small but they are projected to increase progressively in all countries and regions. Climate change is expected to have both positive and negative consequences, with large variations across the regions.

The primary health impact of climate change in Europe is the increased numbers of heat-related illnesses and deaths from average temperature increases and heat waves. 86 000 net extra deaths per year are projected for the EU Member States for a high-emissions scenario with a global mean temperature increase of 3 °C in 2071–2100 relative to 1961–1990 (PESETA project, final report). The summer heat waves in 2003 alone are believed to

have resulted in more than 70 000 excess deaths. This may be countered to some extent by a reduction in the number of cold-related illnesses and deaths.

Temperature-sensitive infectious diseases, such as foodborne infections (Salmonella sp., and others) are likely to grow. The disease burden in Europe could be significant with potentially an extra 20 000 cases per year by the 2030s and 25,000 to 40,000 extra cases per year by the 2080s (PESETA project).

New and unfamiliar diseases borne by vectors (transmitted via disease-carrying organisms such as insects) have the potential to increase. Although the risk of transmission of malaria in Europe has been assessed as very small (EEA, 2008), the 2007 Chikungunya virus outbreak in Europe showed that when infectious epidemies appear in new locations, where people do not have immunity and health services may not have experience in controlling or treating infections, the effects can be dramatic.

Climate effects on air quality such as increased ozone formation, especially in Central and South-western Europe, are likely to increase mortality and numbers of people with respiratory illnesses.

Other health impacts include changes in UV radiation and skin cancers, and the seasonality of allergic disorders, as well as increased incidences of depression and mental illness related to the stress of flooding.

Finally, the growing needs for humanitarian assistance and health protection of vulnerable groups migrating both to and even within the EU territory due to climate change impacts could require an enhanced capacity of Member States' health systems (European commission, 2009a).

Not all climate-related changes are negative for human health. In temperate areas, milder winters will lead to less cold-related fatalities. The indoor environment will be improved because of milder measures to keep comfortable indoor temperatures. Outdoor workers will have less cold related stress during winter season, which will improve productivity (IA health white paper).

Mitigation

The health sector is concerned both directly and indirectly with greenhouse emissions reduction.

The health sector is one of the largest global employers and a major consumer of energy and other resources. This results in significant contributions to climate change, due to electricity use, plus heating and cooling emissions. For example, a recent research estimated that the health-care sector in the USA accounts for approximately 16% of national gross domestic product (GDP), and 8% of greenhouse gas emissions (Chung et al., 2009).

Energy has historically been a secondary consideration for hospitals because health care facilities have often been exempted from energy and greenhouse gas emissions regulations. Increasing, volatile energy prices and growing awareness of environmental issues are raising energy and climate change issues to prominence in the health care sector. While the public sector is not covered by the EU emissions trading scheme, some member states (this is not a member state?), have introduced mandatory carbon constraints on the emissions from the public sector. An example is the UK Carbon Reduction Commitment (CRC) energy efficiency scheme (see box 3).

Box n° 3: The UK Carbon Reduction Commitment (CRC) energy efficiency scheme

The CRC Energy Efficiency Scheme is a UK's mandatory CO2 cap-and trade scheme starting in April 2010. It covers large public and private sector organizations that are not included in the EU Emissions trading scheme and which electricity consumption was greater than 6,000MWh during 2008.

The scheme will cover around 5.000 organisations. All Central Government departments in Great Britain are included in the CRC. Non-departmental, autonomous public bodies and public corporations participate if they meet the qualification threshold.

Participating organisations will have to monitor their emissions and purchase allowances, initially sold by Government, for each tonne of CO2 they emit. The more CO2 an organisation emits, the more allowances it has to purchase. During the introductory phase (2010-2013), allowances will be sold at a fixed price of £12 per tone of CO2. Following the initial sale period, participant organisations can buy or sell allowances by trading on the secondary market. This enables organisations that have reduced their energy supplies more than they expected to sell some allowances, while those that have higher emissions than anticipated can purchase extra allowances.

All the revenue raised from selling allowances is 'recycled' back to participants, and the revenue each organisation receives depends on the performance of the organisation in terms of reducing its emissions.

Source: The CRC Energy Efficiency scheme – user guide, The Environment Agency – available at: www.environment-agency.gov.uk/crc

Reducing the carbon footprint can potentially have important effects on the way hospitals operate, including on the type of services delivered. For instance, a joint report by WHO and Health Care Without Harm, an NGO, advocates that prioritising primary health care and pursuing disease prevention strategies would help lower dependence on resource-intensive therapies, while reducing the burden of disease and the health sector's fossil fuel consumption (WHO and Health Care Without Harm, 2009).

Future policy developments

The White paper on adaptation foresees that the European commission should explore with the WHO and EU agencies ways of ensuring adequate surveillance and control of the impact of climate change on health, such as epidemiological surveillance, the control of communicable diseases and the effect of extreme events.

Impact of adaptation on activity and investment

The WHO stresses that climate change makes protecting global public health security even more difficult (WHO, 2009). The underlying problems of public health security are long-standing: inadequate investment in public health services and global disease surveillance and control, and failure to manage environmental risks to health.

Extreme climatic events may also interfere with the ability to cope with demand by undermining infrastructure, technology and the availability of workforce in health care sector.

Most studies indicate that most of the measures required for adaptation to future climate change in the health sector already exist, and most of them build on well-established public health approaches.

Health-system preparedness planning is essential. The health sector will need to enhance its capacity of disaster risk reduction, early warning and health action in emergencies to help ensure that people are better protected from the increasing hazards of extreme weather and help communities recover faster following a disaster. Key measures include :

- Reinforcing surveillance systems and networks, through enhancing public health data systems and capacity.
- collaborating with weather services in providing accurate, timely weather-related health alerts;

- Strategies to reduce the consequences of thermal stress, especially among vulnerable populations (e.g. providing air-conditioned shelters);
- Planning health and social services and infrastructure;
- Ensuring hospitals and other healthcare facilities are resilient in the face of heatwaves, wetter weather or extreme weather events.

Impact on employment

Implementation of preparedness planning is likely to require additional staff. In most cases, the skills required already exist but need to be coupled with forward planning and collaboration with weather services. The WHO underlines that the international health community already has a wealth of experience in protecting people from climate-sensitive hazards, and proven, cost-effective health interventions are already available to counter the most urgent of these.

The skills required range from researchers trained in epidemiology and laboratory research (to provide a sound basis for surveillance and response), to social scientists (to contribute to an understanding of social behaviours and demographics as they relate to causes and control of diseases) and people trained in the operation, quality control and maintenance of public health infrastructure, including laboratory equipment, communications equipment, and sanitation, wastewater, and water supply systems.

Particularly challenging will be to detect and deal with longer–time frame changes such as slow changes in endemic diseases, which are far longer than the time domains on which public health planning usually takes place.

Where a gradual shift in clinical demands is expected (e.g. to cope with higher incidences of heat-related illness and fewer cold weather related problems), some amount of re-skilling and planning could ensure appropriate staffing levels at different times of year.

Occupational Health and Safety

The European Agency for Health and Safety at Work *Expert forecast on Emerging Biological Risks related to Occupational Safety and Health 2007* reports that Health care staff face increased risks of contracting epidemics of endemic diseases caused by climate change. They found that average temperature rise observed in the last century has favoured the importation of new disease-vectors into Europe — such as mosquitoes transmitting malaria, or phlebotomine sand-flies which are vectors of Leishmania.

The report also points that climate change may also lead to the disappearance of other diseases, without being more specific.

5.6. Water utilities

Adaptation

According to a study commissioned by the European Parliament in 2008, climate change will substantially affect water availability and water management in Europe (Anderson et al. 2008).

Alongside an increased risk of flooding, climate change will make water scarcity and droughts as well as intense rainfall, increasingly frequent phenomena.

More frequent and severe flooding could challenge the capacity of the waste water treatment plants and conveyance infrastructure. Droughts can affect the quality of ground water and increase the need for pre treatment of water.

Water companies are likely to face difficulties in meeting increased water demand during periods of drought and hot weather, exacerbated by demand peaks in heat waves. Limited water availability already poses a problem in many parts of Europe and the situation is likely to deteriorate further due to climate change, with Europe's high water stress areas expected

to increase from 19% today to 35% by the 2070s (EEA, 2008). Higher demand for irrigation for agriculture can be problematic. Water scarcity in Southern Europe will increase tension and conflicts and impact on (potential for) tourism.

Employees working on site in the water sector may be at greater risk from extreme weather: one major UK utilities supplier, for example, found that access to critical drain facilities and waste treatment works was cut off during winter flooding.

Mitigating carbon emissions and other environmental problems

Although water supply does not generate much carbon emissions per se, the conventional wastewater system established in the EU based on aerobic treatment requires high energy consumption for aeration and pumping. If energy is produced with fossil fuels, the greenhouse gas emissions can be significant. It is estimated that sanitation including wastewater treatment contributes to global greenhouse gas emissions of 1.6%.

The sewage sludge cannot be recycled in agriculture due to heavy metal and organic pollutants.

Besides, leakage in public supply networks can be significant. Preventative maintenance and network renewal are key to minimising these losses.

Future policy developments

The Water Framework Directive (WFD), which entered into force in 2000, obliges member states to introduce water pricing policies and water saving measures. Water pricing should lead to a gradual move to full cost recovery in all sectors, including the ecological costs, and to ensure that these costs are shared fairly between users, providers and polluters. The Adaptation White Paper adds these costs the cost of adapting to climate change impacts.

Most European countries are progressing towards water pricing for public supply, but the impact of such measures upon efficient use of water has not been quantified (EEA, 2009).

The European commission argues that 'fundamental to the success of water pricing is its link to the volume of water consumed, since this underpins the incentive for efficient use of water' (EC, 2000).

There is a lack of attention to the social issues associated with water pricing, simply mentioned as a possible negative side-effect. Yet there are well known social issues related to water pricing[4] namely ensuring access for all to basic water services. Further progress should be linked with integrating the fundamental human right to water as implicitly recognized by the EU in a statement adopted on World Water Day 22 March 2010. The statement underlines the importance of access, of affordability and quality of water services. (http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/fr/cfsp/113473.pdf).

More generally, there is a growing recognition that increased pressure on water sources, combined with environmental and equity concerns related to water requires a new approach to water governance, including the way in which water is legally allocated, financially valued, physically distributed and inefficiently used. The participative approach of the Water Framework Directive should be further developed. EPSU has stressed that unions should be involved and further supports rational water use, river basin management, safe treatment of sludge and zero pollution at the source.

Impact on activity and investment in water utilities

Both the need to reduce the impact on the environment and to anticipate potential climate related threats will have an impact in the operations and investment in services or companies supplying water and wastewater treatment.

[4] The EEA report highlights that "a further important issue with respect to domestic water pricing is the ability to pay, since it is generally recognised that no one should have to compromise personal hygiene and health in order to pay their water bill' (EEA, 2009).

- Analysis of the vulnerability of the facilities upon sewer overflows and droughts and planning how to deal with different scenarios.
- Maintaining and upgrading the infrastructure to deal with both growth and the increased flow predictions.
- Responding to extreme weather events with a robust emergency response effort.
- Water conservation programmes in the utilities facilities will be a key component of adaptation in water sector. This includes preventative maintenance and network renewal, use of technologies to detect leaks and water conservation training for the workforce.
- Diversification of water resources: investment in reclaimed water distribution systems can be an excellent source of water for irrigation, industrial processes, groundwater recharge and stream augmentation.
- Reclaimed water is a possible safe water resource for onsite industrial processes and landscape irrigation at the treatment plants.
- Investment in energy conservation programmes and technologies, for instance to convert the plant's digester gas to energy can help reduce dependency on fossil fuels.
- Introduction of water pricing and water meters at final consumers' places can contribute to a more efficient water use policy, As argued before there are social issues (implications for low income and other domestic users as well as employment and privacy issues when meters are installed that are "smart".

Impact on employment

The investment outlined above are likely to trigger increased activity for water utilities and therefore lead to additional employment. New skills may be required, especially to implement energy savings measures, as it is a rather new concern for water utilities. However, it is likely that most of the activities entailed by climate change impacts are already harnessed by utilities, and climate change will only increase their frequency and gravity.

One negative employment effect may come from the reduction of demand for water. A study for the European Commission found that a reduction of demand for water by 10% would result in a loss of employment in the water supply sector by 28,000 FTE. If the reduction in demand in achieved through the use of water saving technologies, this loss would be offset by an equivalent increase in employment in sectors proving water saving technologies (Mechanical Engineering, Construction and Professional Services) (29.000 FTE) (GHK/CE/IEEP, 2007).

5.7. Electric and gas utilities

Adaptation challenge

In the energy sector, the direct impacts of climate change could include the flooding of power plants due to increased winter rainfall or sea level rise and storm wave surges, which could in turn could bring damage to electricity transmission infrastructure and lead to power cuts, affecting other sectors of the economy.

Where rivers provide cooling water, reduced rainfall and lower river levels could impact on electricity generation processes. Hydropower production could increase by 5% or more in northern Europe and decrease by 25% or more in southern Europe.

Decreased precipitation and heat waves are also expected to influence negatively the cooling process of thermal power plants.

On the demand side, reductions in energy use for winter heating coupled with increases in energy use for summer cooling are expected, with a transfer of peak demand from winter to

summer at some point in the medium term. Increased demand for irrigation water also would augment the demand for energy.

Outdoor workers and engineers required to fix problems across the network could be placed at higher risk during extreme weather events.

Mitigation and other environmental challenges

Energy production is a major source of greenhouse gas emissions in Europe, with 34% of the global EU GHG. Electricity represents 25% of total GHG in Europe. Fossil fuels – coal, gas, oil - satisfy 80% of the energy needs in Europe.

If the current trend in energy consumption goes on, European energy consumption will increase by 10% by 2020 and greenhouse gas emissions will be higher by 1,5% relative to 1990, instead of the 25-40% reduction the IPCC scientists outline as necessary in the developed countries to avert dangerous climate change. Energy imports would raise from 50% today to 70%.

Peak oil is also a threat for our energy security. Recent declaration from the International Energy Agency (IEA) indicate that the peak of usable oil supply could peak within 10 years, so far earlier than expected. This could result in soaring prices that could blow any economic recovery (The Independent, 2009).

In addition to greenhouse gases and peak oil, energy production from nuclear poses threats to human health unsolved nuclear waste.

Main policy development

In March 2007, the EU Heads of State and Government set the target of reducing EU greenhouse gas emissions of at least 20% below 1990 level in 2020.

To achieve these cuts, energy efficiency and renewable energy are essential. According to the IEA, the power sector will have to be least 75% decarbonised by 2050. This is the reason why two other targets have been set for 2020: 20% of EU energy consumption to come from renewable resources and a 20% reduction in primary energy use compared with projected levels, to be achieved by improving energy efficiency.

It should also be realized that most of these 20% cuts will have to be made in the EU itself and that the possibilities to offset this by buying emission rights in developing countries will be limited as also other countries have to reduce their emissions.

In 2009, the Council and the European Parliament adopted the Climate and Energy Package for the period post-2012. The package includes a revised EU ETS directive and a revised Renewable energy directive.

The main elements of the package that have implications for the electricity and gas utilities are the following:

- The number of total CO2 allowances available for the energy intensive plants – including power plants- is capped at 21% below 2005 levels by 2020;
- 100% of the allowances to the power sector will be auctioned from 2013 onwards, while other energy-intensive industries will continue to receive part of the allowances for free until 2027[5]. The reason for this differential treatment is the belief that the power sector was making windfall profits during Phase 1 and Phase 2 of the EU ETS, whereas energy intensive sectors cannot pass through the costs of auctions into the product prices, because they are exposed to global competition. However, a research commissioned by the European Climate Foundation shows that the potential of both cost pass-through and windfall profits in the energy intensive industries exposed to global competition have been underestimated (de Bruyn et al, 2010). As a result, under

[5] The reason is that the power sector is not exposed to international competition and can therefore pass on the cost of carbon dioxide to the consumer.

free allocation, windfall profits and carbon leakage[6] may be stimulated, but without governments benefiting from revenues and hence pass on the benefits to citizens.

- The impact on the electricity price is expected to be a 10-15% rise, taking into account the fact that power companies, especially in a liberalised market, are already passing on the cost of carbon dioxide allowances to the consumer.
- Up to 300 million allowances will be made available to subsidise the construction of 12 carbon capture and storage (CCS) demonstration plants and support projects on innovative renewable energy technologies
- National binding targets for the share of renewable energy in total energy consumption are set so that the EU achieve globally a 20% share in 2020. This target assumes a doubling of electricity from renewable energy sources, from 16% today to 30% in 2020.

Energy efficiency improvement is the most cost-effective way for meeting the emissions and renewable targets as it obviates the need for additional electric power plants. To achieve energy efficiency, economic incentives for utilities must be changed so that profits increase with increased energy conservation, not in proportion to amount of energy sold. This is one of the purposes of the EU directive on energy services makes energy utilities (sellers of electricity, natural gas, heating oil and district heating) responsible for some energy efficiency activities:

- they must supply information on their final customers needed to develop and implement programmes to improve energy efficiency;
- at the discretion of the Member States, they can use instruments such as white certificates, offer and promote to their final consumers energy services, energy audits and measures to improve energy efficiency.

Table 3: List of the EU's "dirty thirty" including CO2 figures for 2008 and 2009 in Mt of CO2 equivalent, percentage change, the number of free emissions permits allocated and the permit surplus/deficit faced by each.

RANK					**EMISSIONS**		**PCT**	**PERMIT**	**LONG/**
		STATE	**COMPANY**	**PLANT**					
NEW	**OLD**				**2009**	**2008**	**CHG**	**ALLOCATION**	**SHORT**
1	1	Poland	BOT Elektrownia	Belchatow	29.5	30.9	-4.5	26.9	-2.5
2	2	Germany	RWE AG	Niederaussem	26.3	24.9	5.7	14.9	-11.4
3	3	Germany	Vattenfall	Jaenschwalde	23.3	23.5	-0.9	12.2	-11.0
4	4	UK	Drax Group	Drax	19.9	22.3	-11.0	9.5	-10.4
5	5	Germany	RWE AG	Weisweiler	19.0	21.4	-11.2	10.6	-8.4
6	7	Germany	RWE AG	Neurath	17.9	18.0	-0.4	8.4	-9.5
7	6	Germany	RWE AG	Frimmersdorf	16.8	18.6	-9.6	8.2	-8.6
8	8	Italy	Enel SPA	TE Brindisi Sud	13.0	14.9	-13.0	10.4	-2.6
9	11	Greece	Public Power	Agios Dimitrios	12.9	11.8	9.5	11.0	-1.9
10	12	Germany	Vattenfall	Bohlen	12.8	11.4	12.2	8.6	-4.2
11	9	Poland	BOT Elektrownia	Turow Bogatynia	11.6	12.9	-9.7	11.2	-0.5
12	17	Poland	BOT Elektrownia	Kozienice	10.7	10.0	6.8	9.6	-1.1
13	10	Germany	Vattenfall	Schwarze Pumpe	10.7	12.5	-14.4	8.1	-2.5
14	20	Greece	Public Power	Kardia	9.6	9.6	0.0	8.4	-1.2
15	13	France	ArcelorMittal	Dunkerque	9.2	11.3	-18.6	11.7	2.5
16	16	UK	EDF	Cottam	8.4	10.2	-17.0	4.9	-3.5

[6] Carbon leakage occurs when there is an increase in emissions in one country as a result of an emission reduction by a second country with a strict climate policy. It implies the relocation of production and/or investment in the second country.

17	21	Germany	Vattenfall	Boxberg	8.1	9.3	-13.4	4.3	-3.8
18	18	UK	E.ON	Ratcliffe on Soar	7.6	9.9	-23.2	4.9	-2.7
19	New	Poland	BOT Elektrownia	Opole	7.4	6.9	7.3	6.5	-0.9
20	New	UK	Scottish Power	Longannet	7.3	5.9	24.4	5.6	-1.7
21	26	Poland	BOT Elektrownia	Rybnik	7.2	8.1	-10.8	7.6	0.4
22	New	Germany	Vattenfall	Boxberg	7.2	6.1	17.2	4.3	-2.8
23	19	UK	EDF	West Burton	7.2	9.7	-25.7	4.9	-2.3
24	25	Estonia	Eesti Elektrijaam	Narva	7.0	8.3	-15.0	7.2	0.2
			GKM (RWE, EnBW &						
25	30	Germany	MVV)	Mannheim	6.6	7.1	-6.5	5.9	-0.8
26	24	Germany	ThyssenKrupp	Duisburg	6.6	8.8	-25.0	19.6	13.0
27	New	Hungary	RWE AG, MVM, EnBW	Visonta	6.2	6.2	-1.1	4.6	-1.6
28	New	Poland	BOT Elektrownia	Patnow I, Konin	6.1	7.1	-13.7	6.1	0.0
29	New	Germany	E.ON	Schkopau	6.1	6.3	-4.1	3.6	-2.5
30	29	Romania	Termoelectrica	Turceni	6.1	7.4	-18.5	5.6	-0.4
				TOTAL	**348.1**	**387.8***	**-10.2**	**265.4**	**-82.7**
				AVERAGE	**11.6**	**12.9**	**-10.2**	**8.8**	**-2.8**

**2008 TOTAL figure is sum of last year's top 30.*

Source: European Commission (Reuters 06/04/2010)

Effect on investment

The Impact Assessment study carried out for the White Paper on Adaptation foresees that climate change impact may trigger building new infrastructure for the protection of existing infrastructure, as well as building new power plants and distribution grid to deal with disruptions due to extreme events and changing demand and supply localization. All regions of Europe are concerned but Southern Europe will be particularly impacted (EC, 2009b).

The results of the scenario developed for the Climate and Energy Package Impact Assessment gives an idea of the possible changes in the power sector investment and energy mix to meet the 20% emissions reduction target (Capros et al., 2008).

Substantial net additional investment in the power sector (compared to business as usual scenario) will be needed to renew existing coal-fired power stations, increase reserve capacity and meet growth in demand. Total investment expenditure in power generation and in power transmission between 2006 and 2030 approaches 1250 billion €, 26% up from the business as usual scenario. Despite the reduction of electricity demand as a result of energy efficiency gains by final consumer, investment in transmission grids increases by roughly 25% relative to the business as usual scenario.

However, this masks considerable structural changes in the energy sources and generation technologies: total capacity of renewable energy sources increases by 25% relative to business as usual (or an additional 100 GW) while coal-fired capacity reduces by 70 GW. New net investment in renewable results essentially from wind power and biomass.

It should be noted that all new jobs created in 2000-2005 are due to renewable and gas fired power stations (Syndex et al, 2009).

Among the solid-fired plants, only the advanced coal plants (primarily advanced supercritical coal plants and secondarily IGCC plants) maintain their position in base load generation. Gas-fired power is less reduced than coal fired, because of the carbon prices but also because part of the RES power requires extensive support by flexible reserve power, which is supplied mainly by gas units.

Nuclear energy increases only marginally compared to the business as usual scenario, because it is assumed that today's nuclear policies remain unchanged despite the presence of the GHG emission targets.

Box n° 6 : Successful integration of decentralized energy in Denmark

Several OECD countries have demonstrated that it is possible to smoothly integrate a large proportion of decentralised energy, including variable sources such as wind. Denmark has the highest percentage of combined heat and power generation and wind power in Europe. 50% of electricity and 80% of district heat is now supplied by cogeneration plants. Wind power has reached more than 18% of Danish electricity demand. At certain times, electricity generation from cogeneration and wind turbines even exceeds demand. The load compensation required for grid stability is managed both through regulating the capacity of the few large power stations and through import and export to neighboring countries. A three tier tariff system also enables balancing of power generation.

Effect on employment

The potential effects of the EU emissions reduction target on employment in the power sector have been estimated by a study commissioned by the ETUC (Syndex et al, 2009).

Jobs in the production and maintenance of renewable energy sources will see a sharp increase compared with business-as-usual scenario (+57% in 2030). In 2020, there would be more jobs in the production of renewables than in coal, gas or nuclear-fired power plants.

The main challenge of the emissions reduction scenario is the contraction of employment in the coal-fired plants and coal mining sectors (-20% relative to business as usual in 2020). The impact will be higher in the countries that rely heavily on coal or have few opportunities for developing renewable production. In Poland the share of coal in power generation is above 90%. Coal accounts for around half of electricity generation in Germany and one-third in the United Kingdom.

Overall, however, the impact on employment in energy production and maintenance sector is positive. There are more jobs created in the renewable power sector than there are jobs lost in the fossil fuel sector, relative to a scenario without carbon constraints.

This results from the fact that renewable energies are more labour intensive than the fossil fuel sector. A comparaison of employment factors for renewable and fossil fuel electricity technologies (Table n° 3) shows that renewable energy creates more jobs per megawatt than fossil fuels power plants, not only in the manufacturing stage but also in the operation and maintenance stages, with maybe the exception of wind power. In addition, in non oil producing countries, renewable and energy efficiency have a greater domestic content, hence create more local jobs compared to the oil industry.

Table n° 4. Estimated Employment per Megawatt, Renewable and Fossil Fuel Power Plants

	Average Employment over Life of Facility (Jobs per MgW of average capacity)		
	Manufacturing,construction, Installation	Operations & Maintenance/ Fuel Processing	Total
Solar PV	5.76–6.21	1.20–4.80	6.96–11.01
Wind power	0.43–2.51	0.27 (0.7 in Greenpeace*)	0.70–2.78
Biomass	0.40 - 0.38	2.44	0.78–2.84
Coal-fired	0.27	0.74**	1.01
Natural gas-fired	0.25	0.70	0.95
Nuclear	0.30	0.32	

Source: UNEP, ILO, ITUC, IEO, (2008;) Nuclear figures: Greenpeace (2009)

* One can assume that Greenpeace figure is exaggerated

** The job intensity of coal processing is negligible, around 0.39 job per gigawatt (Greenpeace, 2009).

The decline in jobs in the coal sector cannot be easily offset by the booming employment in renewables as the occupation profiles related to operation and maintenance in both

renewable and fossil-fuel power plants are quite distinct. Indeed, operating a wind farm requires different skills than operating a coal fired power station. Geographic location of wind power plants and coal or gas-fired power plants are likely to differ a lot as well.

The prospect of Carbon Capture and Storage deployment has led some unions and governments to expect that such job losses could be avoided. The Syndex study for the ETUC shows that the deployment of CCS as from 2020 would allow jobs losses in conventional coal power plants to be partly offset by new jobs in power plants equipped with CCS. About 10.000 jobs could be maintained in the coal power plants in 2030, in addition to jobs that will be maintained in the mining sector. However, even in this scenario, the deployment of CCS will not reverse the decline in employment in coal production. Importantly, the study highlights that most of the jobs induced by CCS are linked to the construction and building sector, and the capture, sequestration and storage processes do not involve the same jobs as those linked to electricity production. This raises the issue of jobs evolution and training for workers.

In addition, it should be noted that new evidence that global warming is accelerating faster than had been forecast by the IPCC calls may require to move away from coal faster than predicted by the models. Leading IPCC-linked climate scientists, among whom J. Hansen, director of the NASA Goddard Institute for Space Studies, call for a moratorium on new coal-fired power plants that do not capture and store CO2 (Hansen J. et al., 2008; Hansen J., 2009).

Other employment opportunities in utilities could arise from the provision of demand management services to domestic and industrial users and the development of smart grids, although figures are lacking[7].

However, in the case of the former, the quality of the jobs raises concerns among the trade unions. The way utilities have developed such services is often through outsourcing. Outsourced energy services are often carried out under more precarious conditions, workers being covered by poorer collective agreements or no collective agreement at all. The growing number of semi-independent “energy efficiency auditors” are too often unsustainable jobs. In the UK, where government is training domestic energy assessors, trade unions Unison and GMB call this sector a “labour market ghetto”, pointing to unsecure income and non decent wages (Green Alliance, 2009). EDF in France has set up a subsidiary for energy services where workers do not enjoy the same status as EDF’s employees.

EPSU has recognized the importance of organizing workers in its 2009 Congress. Issues of skills and qualifications have gained importance in the electricity and gas sector and have also been recognized by the relevant European employers organizations such as Eurogas and Eurelectric.

5.8. Waste management

Adaptation

The solid waste management sector is not sensitive to climate change (IPCC, 2007). Higher temperature can even have a positive effect by increasing the rates of biological processes. Uncontrolled disposal (open dumping & burning) however is highly vulnerable as warmer temperature can promote pathogen growth and disease vectors.

Mitigation

In 2005, greenhouse gas emissions from waste incineration and landfilling represented about 2 % of the total emissions in the European Union (EEA, 2008b). Other negative impacts include health effects attributable to air pollutants such as NOx, SO2, dioxins and fine particles and contamination of water bodies.

[7] Greenpeace estimates those jobs to 700 000 in 2020 and 1 million in 2030 worldwide (Greenpeace, 2008). An analysis of grid management jobs associated with ‘Intelligent Grid’ operation estimated 280,000 new jobs created in the US during the implementation phase (Kema, 2008).

The EU faces a growing problem of waste management, as total waste generation, especially municipal waste, increases faster than GDP growth (19% between 1995 and 2003).

Waste prevention, re-use and recycling will play a key role to reduce the greenhouse gas emissions from municipal waste (EEA, 2008b).

The introduction of lifecycle analysis in waste policy is a trend

Future policy developments

The new Waste Framework Directive (WFD) adopted on November 2008 is the primary route map for municipal waste policy across Europe.

The WFD importantly establishes the waste hierarchy as follows (in order of priority): waste generation should be prevented or reduced, and that which is generated should be recovered by means of re-use, recycling and other recovery operations (such as methan recovery from landfilling and incineration with energy recovery in municipal incinerators), thus reducing disposal operations. EPSU has supported this waste hierarchy and argues that protecting the environment and promoting public health are important to the health and safety of workers as well

The position of waste incineration in the hierarchy is a subject of intense debate. Environmental organizations are concerned that incineration, which is allowed by the new Directive if it produces energy, will be seen by municipal authorities responsible for planning as profitable options despite the facts that it is a low labour-intensive technology and the CO2 emissions are higher than a coal fired power station (EEB, 2009). The EEA foresees an increase in waste incineration of municipal waste from 17 % in 2004 to about 25 % by 2020.

For the first time, WFD establishes waste prevention objectives, although firm targets were not set. But countries could set targets, such as Flanders which has set a target of 150kg per capita residual waste generation. The WFD also sets the first ever general recycling targets for households (50% by 2020) and demolition waste (70%)

Importantly, the directive introduces a life-cycle approach in the waste policy. In order to reduce waste, and more generally the environmental impact of products, the early and final phases of the life cycle should be taken into account and not simply the waste phase. This approach is also known as “cradle to grave”.

The Commission is also considering a Directive on biodegradable waste. A green paper has been published in 2008: “Green Paper on the management of bio-waste in the European Union” Com (2008) 811. A preliminary impact assessment is available (COWI A/S, 2004).

The implementation of a variable household waste charging system has been considered by the European Commission among the possible economic tools for reducing waste and increasing recycling. However, there is a lack of consensus among the EU member states. Nevertheless, more and more municipalities are implementing ‘pay as you throw’ (PAYT) schemes", notably in the UK and the Netherlands. Such schemes introduce the “polluter pays principle” in the sense that variable household waste is charged based on volume or weight discarded. Variable household waste charging has been described as making the public service of domestic waste management switch from a tax model to an economic model. It entails adaptation to the technical and managerial organisation of the municipality, for the whole process of waste management is affected by the change in the charging system. The management of the organisation requires suitable human and material means, and the relationship between the public authorities and the consumers needs to be adapted.

Effects on employment and health and safety

The waste management and recycling sector has a high growth rate and has an estimated turnover of over €100 billion for EU-25. It is labour intensive and provides between 1.2 and 1.5 million jobs in municipalities, private companies and associations (European Commission, 2004). Reuse and recycling also provide work and training to 40 000 persons in

the social economy organizations in Europe, and the majority of the workforce in these social economy organizations consist in groups excluded from the labour market (RREUSE).

As pointed by a report on future skills in the waste sector commissioned by DG employment, substitution towards recycling will affect jobs in the waste sector (TNO et al., 2009). A study from Friends of the Earth found that 320.000 direct jobs could be created in the waste sector if the whole of Europe recycled 70% of its waste (Friends of the Earth, 2010). In the UK, for instance, employment in recycling increases yearly with 7%, while employment in waste disposal decreases with 5%. In total a small increase of 1-2% is seen.

On the one hand, waste reduction might entail job losses in the traditional waste collection services, and particularly in machine operators and drivers.

On the other hand, employment in recycling (from curbside collection to the sorting and reprocessing of recyclables) will increase. Recycling is labor intensive and creates more jobs than incineration and landfilling. Estimates in the literature available give figures of 241 jobs for recycling 10 000 tonnes, 19 to 41 jobs for incineration and 8 to 12 for landfill (European Commission, 2004).

Figures available show that composting is a more labour intensive activity than incineration and landfilling. Separate collection of bio-waste may be three times more labour-intensive than collecting mixed waste. Composting requires more skilled workers due to the need for more monitoring and control with the composting processes (European Commission Green Paper on biowaste).

In addition, jobs will be created in local authorities to help and encourage households and workplaces to recycle or sort and use recycle services and to use more goods made from recycled materials. In France, a study estimated that recycling 45% of households waste could create 14.000 jobs in the recycling industry in addition to the 30.000 existing today.

Often, the re-use and repair workshops are operated by social integration enterprises working with disadvantaged groups such as the long-term unemployed, who are trained in technical repair skills, thus also providing a social function.

Occupational health and safety

Poor attention has been paid so far in the European waste policy to occupational health and safety risks that may arise as waste streams are increasingly diverted from landfill to recycling and recovery.

Regrettably, the green paper on biowaste does not address OHS despite the fact that EPSU has drawn attention to the possible health and safety issues related to bio-wastes. It fails to provide a serious insight on the health impacts of various waste management options, despite some research showing “small risks of birth defects in families living near landfill sites and of bronchitis and minor ailments for residents living nearby (especially open) composting plants”. Still, the preliminary impact assessment of biological treatment of biowaste argues that “biological treatment of municipal waste may have occupational health effects associated with it. However, these effects are uncertain” (COWI A/S, 2004).

Additional research could be required to ascertain the absence of risks to human health from such facilities.

6. Conclusions and recommendations

The literature reviewed in the previous sections shows that the transition to a low carbon, sustainable future will not be achieved without new policies and strong government intervention. It entails significant opportunities for quality job creation in public services, but also brings new challenges. Furthermore, EPSU's views is that collective, public provision of quality services are more effective and efficient means of providing answers to climate change and other sustainable development challenges than market and competition.

Recommendations for EPSU policy work focus on six areas:

- Public investment and government intervention, accompanied with appropriate sources of revenues, to achieve the transition to a low carbon economy and exit from the economic crisis
- Just Employment Transition to a low carbon economy
- Rethinking the economic growth paradigm
- Tackling energy and environment-related poverty
- Biodiversity protection as a public service
- Sustainable consumption and production, including green and social public procurement

6.1. Public investment and policies to achieve the transition to a low carbon economy and exit from the economic crisis

Member states are facing the challenge posed by these three policy imperatives: how to exit from the crisis while developing an effective response to climate change and other pressing environmental challenges and preserving the welfare state and public services.

We are emerging from the most devastating economic and financial crisis seen in the continent since 1920. Unemployment is still growing yet. At the beginning of 2010, public deficits reached 7% of GDP and debt levels increased to over 80%, even though the run-up to the crisis had been marked by a growing economy and higher standard of living in much of the EU (European Commission, 2010).

At the same time, we need to invest massively in climate change adaptation and mitigation, both in Europe and by assisting the developed countries' own efforts to adapt to climate change impacts. Nicholas Stern estimated that the transition to a low carbon economy calls for substantial investment of the order of at least one point of GDP (Stern, 2008) in green infrastructure (transport, intelligent electricity grids, alternative energy, etc.).

The Europe 2020 strategy for smart, sustainable and inclusive growth published by the Commission on 3 march 2010[8] to replace the Lisbon strategy, can be seen as the EU exist strategy from the economic crisis. Although it does not provide any insights on how to solve the fiscal dilemma, it clearly puts sustainability at the heart of the EU future strategy, while keeping the objective of high employment. More efficient use of resources, energy, and the application of new, greener technologies are expected to stimulate growth, create new jobs and services and help the EU meet its environmental and climate goals. The potential of green investment to sustain and create quality jobs and social progress has been demonstrated by the European Economic Recovery Plans which have been widely devoted to green measures (HSBC, 2009).

Three of the seven Flagships initiatives of the Europe 2020 strategy are relevant for workers and their unions in the utilities. EPSU can build on them to demand that workers and their unions be seen as crucial players with whom the European Union must engage in a dialogue

[8] COM(2010) 2020

and negotiate the transition to a low carbon economy that will provide sustainable jobs and social progress.

- 'Resource efficient Europe': The aim is 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, modernize our transport sector and promote energy efficiency". It is clearly argued that decoupling growth from energy use is beneficial not only for the environment, but will also create jobs and promote energy security. The Communication underlines that meeting the EU's objective of 20% of renewable sources of energy alone has the potential to create more than 600 000 jobs in the EU.
  This flagship initiative also acknowledges the need to strengthen our economies' resilience to climate risks, and our capacity for disaster prevention and response, but does not foresee any regulatory initiative in this respect.

- "An industrial policy for the globalization area": this Initiative aims at supporting industrial sectors adjust their production processes and products to a low-carbon economy. The impact of this challenge is acknowledged to differ from sector to sector, with some sectors having to "reinvent" themselves and others drawing benefits from it. The European Commission commits to work closely with stakeholders in different sectors, including trade unions, to establish a new industrial policy that should support the transition of manufacturing sectors to greater energy and resource efficiency. The Commission will also promote the restructuring of sectors in difficulty towards future oriented activities, including through quick redeployment of skills to emerging high growth sectors and markets and support from the EU's state aids regime and/or the Globalisation Adjustment Fund. A renewed EU strategy to promote Corporate Social Responsibility is announced.

- The Initiative "An agenda for new skills for new skills and jobs" seeks to modernise labour markets and empower people through the acquisition of new skills to enable the workforce to adapt to new conditions and potential carriers shifts, reduce unemployment and raise labour productivity. Although the idea of 'just employment transition' promoted by the unions in Europe and elsewhere (see 6.2) is not explicitly mentioned, this flagship initiative can be seen as a general framework to advance the just transition agenda.

Importantly, the Europe 2020 Strategy is not only relevant inside the EU, it is meant to expand the area where the EU rules are applied, "offering considerable potential to candidate countries and our neighbourhood and better help anchor their own reform efforts".

6.1.1. Climate change Adaptation

As said in section 5 of this study, Climate Change Adaptation is probably the environmental policy area with the most relevance for public sector workers and their unions. Adaptation – enhancing societies' resilience to the impact of climate change - offers numerous opportunities for public services unions to make the case for enhanced governments' regulatory capacity and stronger public services with reinforced skills and workforce. Reversing the trend of liberalisation and privatisation and under investment in public services in Europe (and worldwide) is critical if we are to avoid the worse effects of climate change for society.

However, compared to climate mitigation, climate adaptation tends to receive little attention from policy makers. Although the opportunities of the European Economic Recovery Plans have been widely used to support climate change mitigation, adaptation has been hardly addressed by those plans. UNISDR report warns that regional and local levels are not yet fully prepared and equipped to address climate change risks. The TUC report on adaptation reports that flood response plans have been developed by only around half of the local authorities surveyed.

Still, the Adaptation White Paper presented by the European Commission in April 2009 includes a number of entry points for the public services unions, with both opportunities and challenges. Importantly, it recommends EU and member states to assess the impacts of climate change and adaptation policies on employment and on the well-being of vulnerable social groups, and recommends consultation with civil society representatives. Among the challenges, is the concern that the adaptation agenda is a new Troyan Horse for public private partnerships (PPP).

Recommendations : Climate change adaptation

- Adaptation to climate risks requires enhanced governments' regulatory capacity and the strengthening of public services, recruiting new staff and equipping public sector workers with the skills required, so as to ensure risk preparedness and management strategies will be designed and implemented in a timely manner, addressing the needs of the most vulnerable. This should not be delayed, as climate risks are already being felt by public services. Public private partnership, market based instruments and private insurance will not deliver on adaptation, because the costs are likely to be high, some people are not able to pay and private actors are risk adverse.
- Given that shortage of adequately-trained personnel is affecting almost all services in the area of disaster preparedness and response, and given the general decline in the number of volunteers, reported by the UN International Strategy for Disaster Reduction (UNISDR), adequate staff, along with financial and technical capacities, should be granted.
- The Commission should undertake without delay, the assessment of the impact of climate change and adaptation policies on employment and vulnerable social groups, as stated in the Adaptation White paper. It should include a sector-by-sector dimension and address the impacts on occupational health and safety and working conditions in those sectors. Measures to address the negative impact and maximize the benefits should be proposed, including the use of EU funds to support skills and occupational health and safety programmes.
- The EU member states and regional governments should prepare adaptation strategies to address climate change risks, with adequate human and financial resources.
- New short and long term, guaranteed EU funding for both EU and international adaptation should be made available, with dedicate funding for public-public partnerships. In addition, climate risk prevention should be integrated in the next financial perspectives so that the EU funding instruments can be used for funding risk prevention. The possibility of using revenue generated from auctioning allowances under the EU greenhouse gas emission allowance trading system (the EU ETS) for adaptation purposes should be utilized, but the volatility of carbon prices makes it a non reliable source of financing.
- Trade unions must be associated in the work of the Impact and Adaptation Steering Group (IASG). Composed of representatives from the EU Member States, this group was established to develop the recommendations of the Adaptation White paper and consult with representatives from civil society and the scientific community.

6.1.2. Climate change mitigation

The EU 2020 strategy reaffirms the climate change targets to be met by 2020 set by the 2008 Climate and Energy package: a 20% reduction in EU greenhouse gas emissions below 1990 levels, 20% of EU energy consumption to come from renewable resources and 20% improvement in energy efficiency.

Achieving these objectives will require additional regulatory instruments and substantial new public investment in utilities, especially in the energy, waste and water sectors, but also in sustainable transport and housing. Decarbonising Europe's electricity supply, along with the

transport sector, has been announced as a priority for the 2010-2015 Commission by President Barroso in his bid for re-election as Commission president[9].

The high transaction costs arising from the integration of energy efficiency, decentralized generation and energy conservation measures in the liberalised electricity market, alongside the need to ensure an equitable access to energy services, support the view that government should intervene in the design of public service solutions for energy efficiency and the development of a green electricity sector that is publicly regulated and predominantly publicly owned.

Public intervention should aim at reducing energy demand and at ensuring a sustainable mix of energies, which will prioritise renewable energies, which are highly labour-intensive, employ local workforce and are environmentally friendly.

New evidence that global warming is accelerating faster than had been forecast by the IPCC may require moving away from coal faster than predicted by the models. Leading IPCC-linked climate scientists, among whom J. Hansen, director of the NASA Goddard Institute for Space Studies, in an article co-written in 2008, call for a moratorium on new coal-fired power plants that do not capture and store CO2 (Hansen et al., 2008).

Recommandations : Climate change Mitigation

Internal market

- Evidence show that the electricity market liberalization makes carbon mitigation a more expensive task to achieve. Governments should ask the European Commission to assess how the restructured energy markets have actually performed with respect to cutting carbon emissions. Governments should stop policies that rely on vagaries of market.
- Provisions on social energy tariffs should be included in the energy directive.

Public investment

- The most efficient and cost-effective way to meet the renewable and energy efficiency targets is government intervention in the development of publicly regulated and publicly owned renewable and energy efficiency sectors. Market-based solutions for energy efficiency in particular white certificates trading and independent energy efficiency auditors, are ill-suited to the pace and magnitude of energy efficiency improvements required to address climate change.
- Massive public investment are needed in renewable generation, smart electric grids and infrastructure allowing for the development of sustainable electricity usages such as charging infrastructure for electric cars. Public procurement through public electric utilities has also a huge role to play. Public energy research and development should be doubled and redirected towards energy conservation, environmental friendly renewable and electricity grid improvements.
- Public service solutions for energy efficiency combine a greater local control over supplier obligation income, a more structured domestic energy auditor system and government-led programs for energy retrofitting of social-housing homes.
- EPSU support to the Mediterranean Solar Plan should be conditioned on the guarantee that it will deliver long term social and environmental benefits, including for the host country population.

Coal-fired power

- EPSU should consider supporting a moratorium on new coal-fired power stations not equipped with Carbon Capture and Storage (CCS), in view of the recent evidence that we have less time to reduce emissions. As there is no power station running with CCS today, this implies a moratorium on new coal-fired power stations.

[9] "Political guidelines for the next Commission", September 2009,
Available at: http://ec.europa.eu/commission_2010-2014/president/about/political/index_en.htm

6.1.3. Energy conservation should be a priority

The EU goal to reach 20% energy saving by 2020 (relative to Business As Usual level) is essential to meet the targets for the reduction of greenhouse gas emissions at a reasonable cost. Given the insufficient results of the Action Plan for Energy Efficiency adopted in 2006, which establishes national indicative energy savings targets, the European Commission is considering reinforcing the action plan.

A communication outlining the priority issues was published in 2009 and an updated Action Plan for Energy Efficiency will be submitted to the 2011 Spring European Council.

The Communication considers the following measures:

- moving towards binding energy efficiency targets;
- encourage the public sector to lead in energy efficiency by directing its spending power in the most energy-efficient ways;
- create 'adequate framework conditions' for support the role of energy utilities in developing energy efficiency services in a liberalized electricity and natural gas markets;
- developing EU-wide white certificate scheme.

While the first two proposals should be supported by EPSU, the third and fourth ones should be opposed and instead, the character of public service of energy efficiency services should be affirmed. At present, policymakers are increasingly focusing on energy utilities as a potential vehicle for energy efficiency investments. The Energy Services Directive provides incentives for energy utilities to deliver energy efficiency services (see 5.7). Member states can impose a legal obligation to the energy suppliers (called Energy Efficiency Obligations (EEO)) to promote and stimulate investment in customers' premises or households, in various areas such as insulation, energy efficient heating systems and electrical appliances. When this obligation can be met by buying or selling the energy saving credits, it is usually called White Certificates. In a number of Member States, white certificates have been introduced (UK, Italy, France).

However, several studies point to the fact that energy utilities are not best suited to undertake and finance energy efficiency actions. The European Commission recognizes that energy utilities have insufficiently invested in energy efficiency and promoted an energy efficient behavior of their customers[10]. There is an evident conflict of interest between traditional utilities seeking to increase energy volumes sold and the energy efficiency obligation.

For these reasons, the role of local/regional authorities in delivering services to support domestic energy efficiency should be acknowledged and promoted. Public energy efficiency services would also ensure better quality jobs compared to jobs in Energy Services Companies (ESCO) or independent energy auditors many unions consider as of poor quality.

If white certificates were to be maintained or made compulsory in all member states, the priority should be to define credible energy savings obligations for each energy supplier, and not to make the certificates tradable, be it within or between EU countries. In countries implementing white certificates schemes, the Energy Efficiency Obligations have largely operated without significant trading of their energy savings (Ademe and WEC, 2007).

In any case the setting of a white certificate trading system cannot be considered as an alternative to regulation and it could be acceptable only if complementary to a clear regulation (energy labelling, minimum energy performance standards, norms etc.).

[10] Background Information Paper for the Public Consultation on the Evaluation and Revision of the Action Plan for Energy Efficiency.

Recommendations: Energy conservation

- Support binding energy efficiency targets for 2020, broken down into national targets, in line with recent studies showing significant energy consumption reduction potential in 2020 (19% for industry, 20% for transport and 30% for the households and services sector)[11]. Targets should be set in terms of absolute reduction in energy consumption compared to current levels, and not relative target.
- Follow the Spring Alliance recommendation to "Launch a renovation programme for the total housing stock which rapidly and significantly decreases energy consumption for heating and cooling, and ensures professional training and retraining of builders and installers, while providing targeted support to housing for people in poverty and promoting compact cities
- Promote the responsibility of public authorities, notably municipalities, in delivering services that promote energy efficiency behavior by final customers, ensuring that jobs created are quality jobs. Use public procurement to lay down criteria for quality, health and safety and collective agreements to follow.
- Oppose the possibility to trade Energy Efficiency White Certificates between EU countries, as the benefit of trading has not been demonstrated and energy efficiency targets are not credible at the moment.

6.1.4. Carbon pricing should be part of a tax justice reform

The EU 2020 strategy is disappointing on taxation in general and green taxation in particular. It makes no mention of alternative sources of revenue such as the taxation of financial transactions, dividends, the highest incomes. The green taxation is expected to contribute to reduction of the debt and reduction of contributions on labour and not, as one might have expected, to accelerate change by devoting these new resources to medium and long-term sustainable investments such as public transport networks and smart energy grids, or for making our societies more resilient to climate related risks.

Still, tackling the sustainable development challenge, including climate change, requires that public authorities should have important budgets available, at the European, territorial and sectoral levels. Fair, progressive and sufficient taxation, as called for by the EPSU Tax Justice Charter[12], is essential to provide these revenues while tackling public sector deficits.

Key elements of a fair taxation reform are a tax on all financial transactions and a EU common strategy to increase tax on corporate profits. Also, the Spring Alliance Manifesto, which EPSU and the ETUC has contributed to, presses for a revision of the public revenue basis by "working towards EU harmonisation of capital gains taxation, including corporate and other business taxes, to avoid fiscal, social and environmental dumping"[13].

Shifting tax from labour to capital and environmental taxes is a key component of a fair tax regime as well as an essential answer to the sustainable development challenge. It is a recurrent demand from the ETUC and EPSU, along with the green NGOs. In 2000, the EPSU Tax Charter pressed for fair and progressive taxation including shifting tax from labour to capital, environmental taxes. The Spring Alliance Manifesto proposes to "Achieve by 2020 a shift of at least 10% of the revenue or tax-base away from labour to environmental pressures, resource use and capital, by applying the Open Method of Coordination combined with Enhanced Cooperation. This would encourage more efficient resource use, taxing what we want less (resource depletion and pollution) instead of taxing what we want more (income and employment)".

[11] see footnote 9
[12] Adopted by the EPSU executive committee on 27-28 May 2010
[13] http://www.springalliance.eu /

Energy, waste and water are key areas where environmental taxes or pricing schemes are currently implemented or considered as a means to encourage a more efficient use of these resources by the consumers.

In the water sector, the Water Framework Directive (WFD) obliges member states to introduce water pricing policies and water savings measures, as described in the section 5.6. In the waste sector, although a growing number of municipalities are implementing variable household waste charging schemes, there is a lack of consensus among the EU member states on a EU regulation on waste charging. As underlined previously, it is essential to take into account the social issues related to water and waste pricing, in particular ensuring access to all to basic water and waste services.

In the energy area, while the EU Emissions Trading Scheme (EU ETS) has been introduced in 2005 for power generators and large industries, attempts to establish a carbon tax at the European level or to harmonise the CO2 taxes existing in some EU member states have failed so far. Yet, compared to a few years ago, more member states today support a EU carbon tax. Also, the EU taxation Commissioner, Algirdas Šemeta, plans to table fresh proposals on harmonised minimum carbon tax rates on fuels at EU level.

EPSU could support the EU ETS and a EU carbon tax on the conditions that equity and employment implications are fully taken into account:

- Carbon tax: In a position of 1-2 June 2010, the ETUC outlines the conditions that must be met for the introduction of a carbon tax. This includes that the tax should be introduced ideally at the global or European level, be part of a global approach aiming at pursuing fiscal and social justice, and that sustainable alternatives must exist, such as effective, regular and outstanding public transport systems, energy-efficient housing, etc. and must be available at accessible prices.
- EU Emissions Trading Scheme: Despite its revision in 2009, the EU ETS is flawed with speculation, price volatility, and with uncertain environmental benefits due to a significant share of carbon permits being distributed for free and a high rate of international carbon crediting (see section 4.2.1). Auctioning the carbon permits for all the sectors covered by the EU ETS, regulating the carbon market and transparent recycling of the auctioning revenue for climate protection and social accompanying measures, are essential to make the EU ETS work for sustainable development. According to a research commissioned by the European Climate Foundation, free allocation in the energy intensive industries exposed to international competition – an option foreseen by the Commission to tacke the risk of carbon and jobs leakage– would stimulate both carbon leakage and windfall profits, without governments benefiting from revenues and hence pass on the benefits to citizens (de Bruyn et al, 2010). Implementing a “border compensation mechanism” based on the carbon content of imported goods, as recommended by the ETUC resolution of March 2008 (ETUC, 2008), is the more efficient instrument to address carbon and jobs leakage.

Recommendations: carbon pricing as part of a tax justice reform

- Support the Spring Alliance call to achieve by 2020 a shift of at least 10% of the revenue or tax-base away from labour to environmental pressures, resource use and capital, by applying the Open Method of Coordination combined with Enhanced Cooperation.
- Support the EU carbon tax for sectors not covered by the EU ETS, provided conditions as set out by the ETUC position of 1-2 June 2010 (ETUC, 2010). Importantly, the introduction of a carbon tax should be part of a global approach aiming at reducing emissions while pursuing fiscal and social justice.
- Call on the Commission to assess the potential impact of water and waste pricing both for vulnerable consumers and for achieving environmental objectives.
- Support auctioning of the CO2 permits for all the sectors covered by the EU ETS as from 2013, with earmarking of revenues for internal investment measures to reduce emissions, on climate support for the developing countries and to finance the necessary compensating measures for low income households.

- Support proposals from ETUC to regulate the European carbon market, including the establishment of a EU regulating agency.
- Support the establishment of strict environmental and social conditions for the projects generating "carbon credits" within the EU ETS so as to incentivize the modernization of the power plants in Europe and promote sustainable, labour intensive carbon emissions projects in developing countries.
- Support the setting of a 'border compensation mechanism' to address the risk of carbon leakage, as stated in the ETUC resolution on climate change of March 2008.

6.1.5. EU leadership in the international negotiations on climate change

The international negotiations held under the UN Framework Convention on Climate Change (UNFCCC) aim at giving a successor to the Kyoto Protocol, which expires in 2012. The international trade union movement, which is recognized as a major group to the UNFCCC, supports a fair, ambitious and binding international climate change agreement and a Just Transition policy framework aimed at reducing greenhouse gases while improving people's living standards and creating quality jobs (ITUC, 2009).

The Copenhagen Accord agreed in December 2009 clearly falls short of the unions' expectations, as it is not legally binding and lacks emissions reduction targets. The pledges that have been tabled so far by developed countries amount to between a 12 and 18% reduction below 1990 levels by 2020, well below the 25-40% reduction the IPCC said is needed to ensure temperature rise is kept at a safe level.

The European Union made a unilateral commitment to cut greenhouse-gas emissions by 20% by 2020 and to scale-up this target to 30% provided that other industrialised nations commit to making comparable cuts, and the more advanced developing countries agree to make an adequate contribution to the global effort.

In May 2010, the Commission published a Communication to examine the costs and benefits of moving to 30% emissions cut. It found that the absolute costs of meeting the 30% target is lower than the estimations two years ago when the 20% target was adopted, due to a reduction in EU emissions as a consequence of the economic crisis and higher energy prices (EC, 2010). Increasing the emissions reduction target from 20% to 30% would cost an additional 0,2% of GDP but reduce air pollution and drive innovation in green technologies.

It also should be noted that even if it is not reflected in the final Copenhagen Accord, the governments, including the EU member states, have shown a growing understanding of the Just Transition issues advocated by trade unions. This is a political momentum unions in the EU should build on to advance their demands at the EU level.

Against this background, the EU position in the continuing international negotiations should be driven by the following principles:

- The EU should lead in the international negotiations on climate change and increase its unilateral emissions reduction target from 20% to 30%. This is in accordance both with the United Nations Framework Convention on Climate Change's principle that countries must commit to emissions reductions on the basis of their "common but differentiated responsibilities", and with the IPCC scenario for reducing global emissions to 85% by the year 2050. The 2010 Congress of the International Trade Union Confederation (ITUC) emphasized the need for a reduction of at least 25%-40% by developed countries by 2020, compared to 1990 emissions (ITUC, 2010).
- The EU should deliver fast start finance to help developing countries cope with climate change, in addition to the 0,7% development aid target. The EU has decided to contribute with €2-15 billion a year by 2020. The ETUC supports this decision but considers that this will not be sufficient to forge an ambitious agreement.
- The EU should stop pushing for a global cap and trade system in the international negotiations, as there is no evidence that a global cap-and-trade regime would be more

efficient than a global carbon tax; most economists believe a carbon tax would be a superior policy instrument.
- The EU should push for a Just Transition framework to be included in the global climate change agreement, which provides new green jobs opportunities, anticipates potential losses of economic activity, employment and income in certain sectors and regions, and protects the most vulnerable throughout the economy and the whole world.

Recommendations: EU's position in the International climate negotiations

EPSU, working with the ETUC and PSI, should promote the following priorities:

- The EU should unilaterally increase its emissions reduction target from 20% to 30%. The IPCC recommends 25-40% emissions reduction from developed countries. As the 20% target includes the possibility to use flexibility mechanisms, the actual reduction to be achieved through domestic efforts is less than 20%. Public services which are at the front line of dealing with the impact of environmental degradation will directly benefit from a cleaner environment.
- Fast start finance should be launched as soon as possible, so as to build confidence of developing countries. Part of the funding should be earmarked for public-public partnerships in the key areas of water supply and sanitation, energy, disaster prevention and health care.
- The EU should commit to long term, guaranteed finance. This should be public money and additional to the 0,7% aid target, The 0.7% development aid target gets under increasing pressure due to austerity plans and budget cuts. EPSU should support efforts to keep this target.
- The EU should stop supporting a global carbon market; this is unrealistic. Instead press for a global carbon tax, building on the EU support for a Tobin tax expressed by the European council in December 2009.
- Push for a Just Transition framework to be included in the global climate agreement, encompassing trade union involvement, social dialogue, the provision of adequate social protection, skills development and vocational training and other measures to re-employ any workers made redundant across all sectors.

6.2. Ensuring Just Employment Transition to a sustainable economy

While a shift to a lower carbon economy is absolutely necessary, the support for climate policies are conditional on a fair distribution of the costs and benefits of those policies across the economy, and on the creation of opportunities for active engagement by those affected in determining the future wellbeing of themselves and their families.

For this reason, trade unions have long advocated for a 'Just Transition' to a low carbon economy that results in more and better jobs for all and improved livelihoods for those who depend on them.

Attempts to define the key provisions of a Just Transition strategy have been made by trade unions across the world including in the USA, the UK, Germany, Spain and Denmark. A report commissioned by the TUC, "A green and fair future: for a Just Transition to a low carbon economy", outlines seven elements of Just Transition strategy (TUC, 2008):

- A national framework or mechanism to ensure long term planning and representative decision making on environmental transition
- Education and training to aid sustainable employment
- Decent jobs
- Greening the workplace
- Flexible transition packages for workers
- Support for communities

- Funding
- Monitoring and further research

This section develops three sets of recommendations for EPSU policy strategy on Just Transition that are appropriate in the public services context.

6.2.1. Just Employment Transition policies in the EU

The 2009 Employment report issued by the European Commission identifies two aspects of employment policies that are particularly relevant in the context of climate change: easing the transitions and supporting the workers during the transitions, to avoid an increase in structural unemployment due to job losses, and invest in education and training systems to avoid labour supply shortages in the new green technologies. The report also recommends viable tools for identifying and anticipating future labour market needs, in line with the 'New Skills for New Jobs' initiative.

The report recommends that policies for managing the transition should focus on low skilled workers. It also underlines that there is already a gap between the qualifications the workforce has today and those it will need in the future, due to societal and environmental demands and the restructuring of existing sectors of work.

The report underlines that current EU funding, particularly the Structural Funds, can play an important role in supporting investments both directed at raising human capital and available skills and at supporting companies in the creation of jobs in the growing sectors of the low carbon economy, as well as speeding up the process of greening existing workplaces.

Socially Responsible Investment (SRI) is also an area where unions can play a role to support companies shift to a low carbon, sustainable economy. As unions in some European countries are engaged in the management of retirement savings and pension funds, EPSU could support such responsible investment schemes that seek to actively promote practices respectful of environmental, social and governance criteria (ESG) in the companies in which workers hold shares. The example of the Comité Intersyndical de l'Epargne Salariale (CIES) in France shows that unions can collectively influence, though a committee where they jointly assess and approve savings products, the investment choices of the employee savings plans in a way which promote employment and local development[14].

[14] http://www.eurofound.europa.eu/eiro/2004/05/feature/fr0405103f.htm

Recommandations: Just employment transition policies

The recommendations made by the ETUC in its resolution on 'climate change, new industrial policies and the way of out of the crisis' (ETUC, 2009) for a socially fair and negotiated transition to a low-carbon economy should be supported, especially the following :

- National, regional and sectoral studies on the policies linked to climate change and their impact on employment and labour markets need to be systematically conducted, by consultation with the social stakeholders, and based on widely accepted criteria for assessing the vulnerability of workers, countries and regions.
- Creation of a permanent instrument to ensure the anticipation of socio-economic transition is urgently needed, to coordinate existing instruments such as sectoral councils and reinforce dialogue between the social partners and public authorities. It will be made up of the social partners and the public authorities, and would receive sustainable development impact studies and will be able to participate in the definition of the specification of legislation as well as the implementation and follow-up.
- Systematic analysis should be performed of how existing European policies and instruments to support the just transition can be mobilized (including structural funds), of the resulting gaps between needs and available resources and institutions, and of the added-value of additional European instruments and institutions.

In addition, as unions in some European countries are engaged in the management of retirement savings and pension funds, EPSU could support such responsible investment schemes that seek to actively promote practices respectful of environmental, social and governance criteria (ESG) in the companies in which workers hold shares.

6.2.2. European social dialogue around climate change in EPSU sectors

The 2009 employment report stresses that social dialogue should be reinforced in order to ensure that structural change in relation to climate change is achieved in a way that is efficient and acceptable from both an economic and social perspective.

The European social partners ETUC, BusinessEurope, CEEP, UEAPME have decided to work in 2009 and 2010 on the development of a joint approach to the social and employment aspects and consequences of climate change policies with a view to maximising opportunities and minimising negative effects and to identify possible joint actions. EPSU's Congress also called for developing collective bargaining objectives around climate change.

The present study has highlighted that addressing climate change will imply major changes in the way public services are produced, financed and delivered. Further developing social dialogue around climate change in these sectors is therefore highly relevant, and should focus on the issues identified in section 5 of this study.

The issues dealt with by social dialogue will vary according to the specificities of the sector. Energy utilities will be essentially concerned by the need to ensure a Just employment transition while reducing carbon emissions and more marginally by adaptation. The joint project on Just Employment transition principles in the electricity sector is an example. http://www.epsu.org/r/536. EPSU's Standing Committee on public utilities is following and supporting this work. In contrast, central and local administration, health and water utilities are potentially affected by both adaptation and mitigation.

In general, however, there is a need to develop dialogue around climate change adaptation and horizontal issues such as impacts on occupational health and safety and other working conditions. They are particularly relevant for the following sectors: central and local governments, waste management, firefighters and health care.

EPSU should also undertake joint work with the bodies representing the local and regional authorities in Europe. Eurocities, which includes 33 major European Cities, has established a group working on climate change, air quality and energy efficiency.

Recommendations: Social dialogue on sustainability issues

- Raise awareness among employers and employees about how climate change policies affect their sector. The trade union movement has developed work mostly on the way emissions reduction policies (mitigation) can affect employment. However, there is still a lack of understanding about the distinction between adaptation and mitigation, which affects the way that employers are developing their responses. To date, the mitigation agenda has had much higher profile and greater public awareness than adaptation.
- Research the potential implications of the Climate change adaptation agenda for health and safety, skills and working plans in the workplace. There is still relatively little information available about this, especially in different national and regional contexts. So first steps should include stakeholder-led research to identify the issues and skills gaps. This should inform the formulation of EU skills policy and could be built into the work of the New skills for new jobs initiative.
- Gather good practice on how employees can be engaged in workplace projects on adaptation and mitigation;
- Make common recommendations to the European institutions on ways to increase the resilience of public sector to climate change risks.

6.2.3. New rights for employees representatives on environmental issues

Substantial evidence exists that environmental transition happens fastest and most efficiently when workers are involved in the planning of environmental measures. At workplace level, employers, employees and trade unions can work together to set and meet environmental targets. These goals could relate to simple environmental measures (e.g. basic energy saving practices) to more complicated schemes such as efforts to increase the sustainability of production processes.

One key example in this area is the Greenworkplace project run in the UK by the TUC and its affiliates. The 2006-7 pilot phase of this scheme involved six workplaces and included the training of “green reps”, support for negotiations with management on environmental issues, and the organisation of open events with outside speakers from environmental organizations. The project successfully achieved an unusually high level of engagement from members and potential members, the creation of new bargaining structures and the identification of energy and carbon savings (TUC, 2007).

To expand the role of Green Workplaces in providing for a Just Transition, however, governments should offer new rights for union workplace environment representatives, including right for time off for training and environmental activity at work, as demanded by the ITUC and the ETUC in recent resolutions (ITUC, 2010; ETUC, 2009).

It is also essential that enhanced rights for information and consultation on environmental issues be granted to employees representatives, both at the member state and EU levels. The European Works Councils Directive 2009/38/CE should be amended to reflect the need to expand this provision which already exists for national companies in some member states.

Recommendations: New rights for workplaces representatives

- EPSU should raise awareness among its affiliates about the potential of union-led initiatives, such as Green workplaces project, in building membership and achieving environmental improvements at their workplaces.
- EPSU could consider running a European wide campaign in favour of new or enhanced rights for information and consultation on environmental issues for employees representatives including in European Works Councils, involving also the ETUC and other European industry federations.

6.3. Rethinking the economic growth paradigm

While the concept of green growth is particularly attractive in its capacity to reconcile the positive effects of growth, such as job creation, with the protection of the environment, this section argues that the transition to a green economy necessarily involves some reconsidering of the significance of economic growth.

The approach in terms of "green growth" is fundamentally limited in the sense that it fails to fully acknowledge two crucial issues: the limits of the resources of the planet and the social injustice stemming from the fact that the poorest countries can not achieve the material prosperity of industrialized countries without causing tremendous damage to the ecological health of the planet. In that sense, the green growth concept remains enshrined in the belief that we can keep the economy continually growing manufacturing more products for ever – provided they are increasingly resource-efficient. This can be described as "greening capitalism" (Pochet, 2008).

In the wake of the crisis, more people are questioning the primacy of growth at all costs. The Nobel Prize-winning economist Joseph Stiglitz is among those now arguing that prosperity is possible without GDP growth, and indeed that prosperity will soon become impossible because of GDP growth. As the economy expands, so do the resource implications associated with it. These impacts are already unsustainable. In the last quarter of a century the global economy has doubled, while an estimated 60% of the world's ecosystems have been degraded. Significant scarcity in key resources – such as oil – may be less than a decade away (Millennium Ecosystem Assessment (MEA), 2005).

A ground breaking report by the UK Sustainable Development Commission, entitled 'Prosperity without Growth?: the transition to a sustainable economy'[15], provides an important basis for trade union reflection on the low-growth economy as it also looks at far reaching implications for work issues. The report demonstrates that it is highly improbable that transition to a sustainable, low-carbon future can be achieved solely, or even largely, through advances in technology, particularly increases in efficiency. The historical record is not encouraging. For instance, despite annual declines in energy and carbon intensities, carbon dioxide emissions from fossil fuels have increased by 80% since 1970, and emissions today are almost 40 per cent higher than they were in 1990. Simply put, the surge in demand – the product of population and economic growth – continues to far outpace efficiency improvements and other influences on the emissions intensity of economic activity. Absolute decoupling[16], the conventional response to the dilemma of growth, is therefore unrealistic.

The report then suggests that an economy not predicated on growth can be sustainable if total and average working hours are reduced, and work is shared more equally amongst the

[15] http://www.sd-commission.org.uk/publications.php?id=914

[16] "Absolute decoupling" refers to the idea that improvements in resource use per unit of output allow you to grow while reducing the overall amount of resources or pollution generated.

population. Less working hours will mean less pay, but developing a set of more general green skills – *Do It Yourself* , horticulture, cooking, keeping animals, and a whole host of others to exchange with those of our neighbors, through time banks or Local Exchange Trading schemes (LETs) – will balance out our budgets, and even help us save. This is a profound shift from our current system and implies a re-evaluation of jobs more in line with a realistic contribution to general welfare. This UK sustainable development commission report echoes insights from recent reports on 'green jobs' that while 'green' jobs will help cut unemployment, new job creation fall a long way short of the numbers needed to make any significant decrease (Bird and Lawton, 2010).

Questioning the notion of continuous growth is particularly relevant to public services unions. It is an opportunity to trigger social change by shifting away from products to services, away from private goods to public goods (e.g. are cars public goods or is it mobility a public good?), away from profit-driven services to community-based services, away from 'consumerism' to social needs. It emphasizes the potential of quality job creation in collectively provided services such as energy efficiency, waste recycling and protection of biodiversity

EPSU could initiate a reflection and debate on this issue both within the ETUC, the Spring Alliance and with the support of research work. This work could be supported by the European Trade Union Institute (ETUI) which organised a workshop on the Prosperity Without Growth report in 2010.

Unfortunately, there is a lack of interest from the European Commission for this debate. An exception was the conference "beyond GDP" organized by the European Commission in 2009 following the adoption of a Communication entitled "GDP and beyond: Measuring progress in a changing world" (European Commission, 2009e).

Recommendations : "Rethinking the economic growth paradigm"

- Initiate, with the ETUC and industry federations, the EEB/Social Platform and with the support of research work, a reflection on the shift of paradigm implied by a real move towards sustainability, and its implications for labour.
- Support and argue for new instruments that measure growth and the value of GDP differently based on social and environmental considerations

6.4. Tackling energy poverty and environment-related poverty

The role energy prices play in the economic and social crisis is overlooked. As world oil prices are expected to be on the rise again in 2010 and 2011[17], as a result of economic recovery in non OECD countries, energy poverty is likely to rise for the millions of people who are already hit by the economic crisis.

Efforts to improve energy efficiency are insufficient, and the goal of reducing energy consumption by 20% (below business as usual) will not be met (European commission, 2009). Public services, which are big consumers of energy, could be affected by rising energy prices, given the constraints on public budgets.

This calls for clear priorities to energy efficiency overall, and in particular to increase energy efficiency in households most at risk of energy poverty, and to enhance the energy efficiency of public buildings.

The revised directives for the internal electricity and gas market directives (2009/72/EC and 2009/73/EC) adopted in 2009 require to refrain from disconnection (see below). INFORSE

[17] Crude oil is expected to raise from $62 per barrel in 2009 to $80 and $84 per barrel in 2010 and 2011 (US Energy Information Administration, Short term energy outlook, Jan 2010)

(International Network for Sustainable Energy network) rightly stresses that more long term solutions than prohibition of disconnection are needed to tackle energy poverty[18].

"*Member States shall define a concept of vulnerable customers which may refer to energy poverty and, inter alia, to the prohibition of disconnection of such customers in critical times*".

Finally, EPSU should make the case that poverty has many other dimensions, in addition to income and energy. The conference organized in 2009 by DG employment on the links between social and environment policy provided many interesting contributions in that regard. EPSU should build on this momentum to alert on the growing social inequalities associated with some rising environment degradation (e.g. air pollution), explore how public services can improve their capacity to address these needs and provide recommendations on how the EU policies can help in this direction.

Recommendations: tackling energy poverty and environment-related poverty

- Countries should support increased efficiency in households, through public investment, provision of low-rate loans, and regulation. Countries should focus their use of EU Structural Funds (which can fund energy efficiency in buildings) on vulnerable households.
- Countries should make use of the new rules adopted as part of the European economic recovery plan (EERP) [19], allowing the use of structural funds to support energy efficiency measures in social housing[20].
- The countries should support measures that limit energy price increases, through increase of energy efficiency of heat network and heating stations, substituting local biomass combustion to fossil fuels, and introduction of combined heat and power (CHP). This can also include changing of heat network structure, to avoid too long transmission lines, but interconnect nearby heat supply to increase efficiency in supply. Structural funds can be used for that purpose.
- Joint ETUC-EEB-Social Platform demand for a new EU investment initiative to support social energy saving programmes are still valid. It is regrettable that Union financial assistance in the frame of the EERP did focus on energy projects having less obvious benefits for social inclusion and people's well-being, namely CCS, offshore wind energy and gas and electricity interconnections.

  ETUC-EEB-SPF Manifesto to the European Council march 2008: "*An initiative by the European Investment Bank to mobilise capital - up to 1% of European GDP - to lend to EU governments investing in sustainable priorities (i.e. renewable energy production, energy efficiency including combined heat-power production and social energy saving programmes).*

- The European Commission should further assess the social inequalities associated with the quality of the environment in the EU and propose initiatives to address them, building on the conference organized by DG employment on the links between environment and social policy.

6.5. Biodiversity protection should be recognized as a public service

Biodiversity has never featured on the trade union agenda. Still, protecting biodiversity creates jobs, especially in the public sector, and plays a crucial role in the social and economic development. This should therefore be a focus of the public service unions.

[18] http://www.inforse.org/europe/pdfs/INFORSE-on-EU-energy-poverty_09.pdf
[19] A European Economic Recovery Plan - COM (2008) 800
[20] CECODHAS-IUT joint press release on the Recovery package (November 2008)

Natura 2000 is already protecting thousands of natural areas in Europe. An international Panel on Biodiversity has been set up, which mimics the IPCC.

The issue of the type of government intervention that should be applied for nature conservation is a controversial issue. The approach in terms of 'Payments for environmental services' (PES) is attracting increasing interest. The core idea of PES is that external environmental services beneficiaries make direct, contractual and conditional payments to local landholders and users in return for adopting practices that secure ecosystem conservation and restoration.

As mentioned earlier, the European Commission is strongly promoting PES in his climate adaptation strategy as a means to conserve natural spaces offering protection against climate change impacts. The Commission does not mention alternative policy instruments, such as conventional regulation, involving for instance restrictions on access and land use, or Integrated Conservation and Development (ICDP), whereby rural communities are encouraged to maintain or provide environmental services by being provided with alternatives to environmentally damaging activities.

Once again, as in the case of Public Private Partnerships, The European Commission fails to undertake a comprehensive and objective assessment of the working PES mechanisms. Still, there is a wide body of literature arguing that while the PES concept is attractive at first sight, its conceptual foundation are weak. A study by Engel et al. (2008) underlines that: "despite considerable interest in the use of PES worldwide, however, few PES mechanisms have been carefully documented. Discussion of PES mechanisms has remained confined largely to the grey literature (in which, moreover, proposals for PES mechanisms are more common than assessments of actual working mechanisms)".

The study further adds: "It is important to note that PES is not intended as a silver bullet that can address any environmental problem. Ecosystems may be mismanaged for many reasons, not all of which are amenable to PES as a solution".

Recommendations: Biodiversity

- EPSU should make the case for the recognition of the character of public good of biodiversity and the need for government intervention to protect biodiversity, as well as democratic overview and public participation.
- In the context of the EU Adaptation strategy, a comprehensive, objective assessment of how Payments for Environmental Services mechanisms have performed in developed countries should be undertaken.
- An assessment of the jobs generated by the protection of biodiversity, especially Natura 2000 network, should be undertaken.

6.6. Sustainable consumption and production, including green and social public procurement

Trade unions have not been much involved in the Commission's Sustainable Production and Consumption agenda. It develops approaches in terms of life-cycle analysis, 'cradle to grave' and sustainable products. In this area, the EU has adopted several tools to improve the environmental performance of products and increase the demand for more sustainable goods and production technologies, among which the Eco-design Directive, the EU Eco-label requirements, the Eco-Management and Audit Scheme (EMAS) Regulation, and a directive on Green Public Procurement (for an assessment of the Integrated Product Policy, see EC 2009c).

Trade unions in Europe have been somehow suspicious of these approaches as they basically prioritise voluntary measures over a right- and regulatory-based approach that trade unions usually favor. The 'cradle to cradle' system of certification referred to in the above mentioned TNO study on future skills in the waste sector, which is a model for the design of

systems that are efficient and waste free, can be criticised for beeing a private certification system. Nevertheless, it includes a 'social responsibility' requirement which refers to fair labour practices. There might be an interest for unions in exploring how these tools can be used to help assess the performance of their enterprise in terms of sustainability, using a life-cycle approach.

Trade unions have been more active on the issue of sustainable public procurement. The new public procurement directives adopted in 2004 allow public procurement to promote environmentally sound products and services and, to a certain extent, production as well. The main environmental merit is that ecolabels are now recognised as selection criteria. And the Directives do not reduce the freedom of public authorities to play a progressive role as important consumers.

At that time, EPSU and EPSU members, joined forces with green organizations and other fair trade organisations, disability fora and cities' organizations, to ensure member states take full advantage of the opportunities created by the EU public procurement Directives and to transpose them into national law in a way which promotes sustainable development.

Recommendations: sustainable public procurement

- Promote quality jobs and sustainable enterprises through public procurement that rewards companies that uphold social, labour and environmental policies. Set EU target on green public procurement: the EEB asks for achievement of 100% green public procurement by 2012.
- Make the link with social procurement (social and green jobs).
- Monitor the implementation of the new directives in the member states.
- Run a campaign to raise awareness among the public services employees.

Annex 1

Recent evidence on acceleration of climate change – The Copenhagen Diagnosis: Climate Science Report

The full report is available at:
(http://www.copenhagendiagnosis.com/executive_summary.html)

The purpose of this report is to synthesize the most policy-relevant climate science published since the close-off of material for the last IPCC report. The most significant report's findings are:

Surging greenhouse gas emissions: Global carbon dioxide emissions from fossil fuels in 2008 were 40% higher than those in 1990. Even if global emission rates are stabilized at present –day levels, just 20 more years of emissions would give a 25% probability that warming exceeds 2^{o}C. Even with zero emissions after 2030. Every year of delayed action increase the chances of exceeding 2^{o}C warming.

Recent global temperatures demonstrate human-based warming: Over the past 25 years temperatures have increased at a rate of 0.190C per decade, in every good agreement with predictions based on greenhouse gas increases. Even over the past ten years, despite a decrease in solar forcing, the trend continues to be one of warming. Natural, short- term fluctuations are occurring as usual but there have been no significant changes in the underlying warming trend.

Acceleration of melting of ice-sheets, glaciers and ice-caps: A wide array of satellite and ice measurements now demonstrate beyond doubt that both the Greenland and Antarctic ice-sheets are losing mass at an increasing rate. Melting of glaciers and ice-caps in other parts of the world has also accelerated since 1990.

Rapid Arctic sea-ice decline: Summer-time melting of Arctic sea-ice has accelerated far beyond the expectations of climate models. The area of summertime sea-ice during 2007-2009 was about 40% less than the average prediction from IPCC AR4 climate models.

Current sea-level rise underestimates: Satellites show great global average sea-level rise (3.4 mm/yr over the past 15 years) to be 80% above past IPCC predictions. This acceleration in sea-level rise is consistent with a doubling in contribution from melting of glaciers, ice caps and the Greenland and West-Antarctic ice-sheets.

Sea-level prediction revised: By 2100, global sea-level is likely to rise at least twice as much as projected by Working Group 1 of the IPCC AR4, for unmitigated emissions it may well exceed 1 meter. The upper limit has been estimated as – 2 meters sea-level rise by 2100. Sea-level will continue to rise for centuries after global temperature have been stabilized and several meters of sea level rise must be expected over the next few centuries.

Delay in action risks irreversible damage: Several vulnerable elements in the climate system (e.g. continental ice-sheets. Amazon rainforest, West African monsoon and others) could be pushed towards abrupt or irreversible change if warming continues in a business-as-usual way throughout this century. The risk of transgressing critical thresholds ("tipping points") increase strongly with ongoing climate change. Thus waiting for higher levels of scientific certainty could mean that some tipping points will be crossed before they are recognized.

The turning point must come soon: If global warming is to be limited to a maximum of 2^{o}C above pre-industrial values, global emissions need to peak between 2015 and 2020 and then decline rapidly. To stabilize climate, a decarbonized global society – with near-zero emissions of CO_2 and other long-lived greenhouse gases – need to be reached well within this century. More specifically, the average annual per-capita emissions will have to shrink to well under 1 metric ton CO_2 by 2050. This is 80-90% below the per-capita emissions in developed nations in 2000.

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