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DG INTERNAL POLICIES OF THE UNION

Policy Department: Economic and Scientific Policy

EMPLOYMENT POTENTIAL OF RENEWABLE FORMS OF ENERGY AND INCREASED EFFICIENCY OF ENERGY USE

Briefing Note

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Introduction

Goals have been set by the European Commission concerning the shift to 20% renewable energies by 2020 in the light of achieving CO2 reduction targets[1], following the publication of a series of policy communications and green papers[2].

These documents are mainly concerned with energy production and use, but some also refer to the potential benefits of such policy changes in terms of employment[3,4].

References to employment benefits – which are rather scrappily presented - are intended, no doubt, to make the energy policy more appealing, given the technical nature of these communications. However, they risk creating a misleading, and ultimately disappointing, impression in so far as they:

a) Exaggerate the contribution that the development of renewable energy sources can make to raising employment levels in the EU, given the 15 million job gap that currently exists compared with the original Lisbon target of a 70% employment rate

b) Underestimate the employment challenge involved in changing the balance of the energy production sector given that the contribution of 'modern' renewable energies (wind, solar, geo-thermal etc) is currently less than 1% of total energy production (the bulk of renewable output coming from biomass in six of the smaller Member States)

c) Overlook the extent to which employment in some sectors – notably heavy uses of energy such as steel production – are likely to be affected negatively and may need support, and the probability that regions and Member States could be very differently affected

d) Fail to help EU citizens understand the sort of changes they will need to make in the ways they work, live and travel in order to adapt to the implications of tackling climate change, and do little to appeal to the most willing and flexible, namely the young and better educated

e) Fail to acknowledge the full economic consequences, notably the scale of additional public and private investment needed in order to progressively renew much of the Union's existing 'capital stock' in order to make it compatible with new energy use standards

f) Fail to address the related human resource investment needs in terms of the education and training inputs required in order to match the new technologies, and the higher technical performance standards.

More generally, it is important to recognise that, in situations of uncertainty – which is certainly the case here – the EU and its governments can play a particularly important role in pooling and sharing information and experiences, and mobilising support among those most likely to be affected – regional and local authorities, social partners, etc.

[1] European Commission : An energy policy for Europe, COM (2007) 1fina1, 10.1.2007

[2] European Commission: Green paper on Energy Efficiency, or Doing More With Less COM (2005) 265 final, 22.6.2005; followed by Action Plan for Energy Efficiency COM (2006) 545 final. Commission Green paper on A European Strategy for Sustainable, Competitive and Secure energy COM (2006) 105 final, 8.3.2006 leading to the Energy policy communication above.

[3] European Commission: Renewable energy road map SEC (2006) 1720 of 10.1.2007 reports macro-economic estimates that a shift to 20% renewable energy could increase employment by 2020 by 0.3%, some 650,000 jobs.

[4] European Commission: Impact Assessment Summary SEC(2007)7/2 on limiting global climate change to 2 degrees Celsius: refers to Biomass Action Plan (COM(2005) 628final of 7.12.2005 estimates of 250,000-300,000 additional jobs, and 120,000 people currently employed in Germany, Denmark and Spain in Wind energy

Part 1: Facts and Figures

1) Employment in the energy sector

a) Employment in the energy sector (all 15-64), 2005

	Total Energy Sector		NACE Code: 10	NACE Code: 11	NACE Code: 12	NACE Code: 13	NACE Code: 14	NACE Code: 23	NACE Code: 40	NACE Code: 41
	N employed	% of Total Employment								
EU25	**2 686 310**	**1.4**	**0.2**	**0.1**	**0.0**	**0.0**	**0.1**	**0.1**	**0.7**	**0.2**
BE	51 245	1.2	0.0	0.0	0.0	0.0	0.1	0.2	0.6	0.2
BG	112 725	3.8	0.6	0.0	0.0	0.4	0.3	0.4	1.5	0.7
CZ	130 366	2.8	0.8	0.0	0.0	0.0	0.2	0.1	1.3	0.3
DK	19 121	0.7	0.0	0.1	0.0	0.0	0.0	0.0	0.5	0.0
DE	474 011	1.3	0.2	0.0	0.0	0.0	0.1	0.1	0.8	0.1
IE	23 147	1.2	0.1	0.0	0.0	0.0	0.3	0.0	0.6	0.1
EE	18 397	3.1	0.3	0.6	0.0	0.0	0.1	0.1	1.7	0.3
GR	65 909	1.5	0.2	0.0	0.0	0.1	0.2	0.2	0.7	0.2
ES	184 893	1.0	0.1	0.1	0.0	0.0	0.2	0.1	0.4	0.2
FR	255 740	1.1	0.0	0.0	0.0	0.0	0.1	0.1	0.6	0.2
IT	231 551	1.0	0.0	0.0	0.0	0.0	0.1	0.1	0.6	0.1
CY	3 531	1.0	0.0	0.0	0.0	0.0	0.2	0.0	0.7	0.1
LV	23 830	2.4	0.2	0.0	0.0	0.0	0.0	0.0	1.8	0.4
LT	34 248	2.4	0.1	0.0	0.0	0.0	0.1	0.3	1.3	0.5
LU	1 251	0.6	0.0	0.0	0.0	0.0	0.1	0.0	0.5	0.1
HU	84 364	2.2	0.2	0.1	0.0	0.0	0.1	0.1	0.9	0.7
MT	3 586	2.4	0.0	0.3	0.0	0.0	0.2	0.0	1.0	1.0
NL	60 888	0.8	0.0	0.1	0.0	0.0	0.0	0.1	0.5	0.1
AT	44 981	1.2	0.0	0.1	0.0	0.0	0.2	0.1	0.7	0.1
PL	466 928	3.4	1.3	0.1	0.0	0.1	0.2	0.1	1.3	0.3
PT	48 152	1.0	0.0	0.0	0.0	0.0	0.3	0.1	0.4	0.1
RO	328 398	3.8	0.5	0.7	0.0	0.1	0.1	0.2	1.8	0.4
SI	15 441	1.7	0.5	0.1	0.0	0.0	0.1	0.0	0.9	0.1
SK	61 159	2.8	0.3	0.1	0.0	0.1	0.2	0.2	1.5	0.5
FI	26 556	1.1	0.1	0.0	0.0	0.0	0.1	0.1	0.6	0.1
SE	34 015	0.8	0.0	0.0	0.0	0.1	0.0	0.0	0.5	0.1
UK	323 001	1.2	0.0	0.2	0.0	0.0	0.1	0.2	0.4	0.2

NACE codes:

10 – Mining of coal and lignite; extraction of peat
11 – Extraction of crude petroleum and natural gas; service activities incidental to oil and gas extraction, excluding surveying
12 – Mining of uranium and thorium ores
13 – Mining of metal ores
14 – Other mining and quarrying

23 – Manufacture of coke, refined petroleum products and nuclear fuel

40 – Electricity, gas, steam and hot water supply
41 – Collection, purification and distribution of water

Employment data is not available in relation to energy consumption, but in relation to secondary use, for example in the production of electricity[5]. On this basis, employment in the energy sector is estimated at 2.69 million jobs – some 1.4% of total EU employment, half of whom are employed in producing electricity, gas, steam and hot water.

The proportions vary considerable between Member States, mainly dependent on the extent to which they rely on imported energy, and the energy mix.

[5] Eurostat

b) Employment and renewable energies

A variety of studies have been carried out in order to assess the impact of changes in environmental and energy policies on employment, although they information they provide is not very illuminating:

- Some provide overall, economy-wide, figures – which are generally considered sound from a methodological point of view since they are generated by macro-economic, or input-output models, that take full account of feed-backs in the economy - but they are not very useful for the development of specific policies
- Other estimates are very precise – for example, concerning the employment created by energy saving/building insulation projects – but they commonly fail to take account of off-setting factors elsewhere in the economy (especially if these are being funded publicly) .
- And some are simply not believable – for example estimates by the European Renewable Energy Council[6] that renewables could account for over 2 million jobs in 2020, bearing in mind that the entire energy production sector in the EU currently employs only 2.7 million.

2) Economy-wide estimates

The 10 January EU energy policy communication, and the associated impact assessment documents, refer to macro-economic simulations of the impact of a shift towards renewable energy sources on employment. These suggest[7] that, if renewable energies were able to meet 20% of the European Union's energy needs by 2020, it would lead to an increase in employment of 0.3% (650,000 jobs).

The annex to that document[8] also refers, somewhat randomly, to the Biomass Action plan estimate of additional 250,000-300,000 jobs[9], and to 120,000 people currently employed in wind energy in Germany, Denmark and Spain.

The macro-economic simulation from the European Commission largely replicates (although with more precise policy inputs) earlier analyses and simulations concerning the impact of changes in environmental policies on employment, and which have been studied and reported at length by expert working groups of the OECD[10].

The OECD work concludes that, all other things being equal (which essentially means no changes in fiscal stance by governments, and no change in global trading relationships), 'the estimated employment impact of policies in Europe to limit CO2 emissions is rather uncertain…..and remain small'[11].

This is not unexpected since all energy supply sources – coal mining, nuclear energy, the production of wind turbines, or anything else – create jobs. The same is true regarding energy use – wasteful energy use creates jobs, just as energy saving activities will create jobs. In other words, changes in energy supply or energy use will, like any other changes, tend to be compensated elsewhere in the economy.

[6] Renewable energy target for Europe 20% by 2020, no date, plus other documents
[7] European Commission SEC(2006)1720 Renewable energy road map
[8] European Commission SEC(2007)7/2 Impact Assessment Summary
[9] European Commission COM(2005)628 final, 7.12.2005 Biomass action plan
[10] OECD Environment and Employment: an assessment 17 May 2004
[11] OECD op. cit. p73

This judgement is shared in other parts of the European Commission with the assessment in a recent joint working paper from the Employment and Environment Directorate-Generals that 'the biggest impact of environment policy is likely to be on the composition of the labour market rather than its size'[12].

Such statements are helpful in responding to those who might claim that actions to raise environmental standards, or to raise the cost of using fossil fuel energy, should be resisted because they risk leading to a loss of jobs. On the other hand, they also demonstrate that the linkages between employment creation and energy use are complex and indirect, and that policy action in this area is not simple or straightforward.

Attempts to highlight potential employment benefits of energy policy changes are somewhat reminiscent of the 'double dividend' taxation debate, from more than a decade ago[13]. At that time, the environment policy focus was on the damaging effects of increasing levels of pollution rather than the potentially catastrophic long term consequences of climate change, but the basic reasoning was similar – namely that it should be possible to create a win-win situation for the environment and for jobs, by simultaneously raising the cost of energy use and reducing the cost of employing labour.

These arguments are intuitively appealing, and parts of the European Commission appear to maintain an open mind[14]. However, the OECD has tended to be more sceptical[15] referring to the 'lack of a mature debate'[16] on the subject, noting that the *final* incidence of taxation and tax changes are often very different from their *initial* impact, so that the ultimate outcomes of tax changes may also be very different from those that are originally intended.

3) Structural changes in employment

Adapting to changes in energy supply and use on the scale envisaged implies significant structural adjustments in the economy. Since the European economies are highly capital-intensive, this will inevitably require massive investment over several decades in the renewal of our existing 'capital stock' – whether this be in the form of energy production and distribution systems, buildings of all kinds, plant and equipment, means of transport, infrastructure generally etc.

This is necessary because our existing capital stock, in all its above forms, embodies the energy technologies and use arrangements that were in place at the time they were created, and which were based, for the most part, on the assumption that cheap fossil fuels would be available for ever, with little or no constraints on their use.

Of course not all of the European Union's capital stock can or should be replaced immediately, and other short terms solutions will also have to be adopted alongside – such as retro-fitting power production plants in order to reduce CO2 output, or insulating existing buildings in order to improve energy efficiency. However, there are clearly limits to what can be achieved in this way.

Improvements in energy efficiency through the better insulation of the existing housing stock has the potential to generate significant job opportunities for medium and low-skilled workers, as has been demonstrated in the German Alliance for Employment programmes.

[12] European Commission SEC(2005)1530 Employment policies and environmental policies 17.11.2005 page18
[13] European Commission 2007, op. cit. page 45-51
[14] European Commission, Euratom 5th framework programme, op. cit. page 8
[15] European Commission 2007, op. cit., page 45-61
[16] OECD op. cit. p 71

These, it is claimed, have created, or could create, some 200,000 jobs in refurbishing some 300,000 apartments, and similar initiatives have been undertaken or proposed in Belgium and Spain[17].

These examples are important in demonstrating the practicality of undertaking such work, and the experiences could usefully be replicated elsewhere. However, it is disingenuous to use such evidence in developing renewable energy policies, without mentioning that:

- Most of the jobs created in this way are of relatively low productivity, and therefore likely to be either costly, or to generate only low incomes
- Most such projects involve substantial public funding, which (unless they are undertaken as part of an expansionary economic programme) will normally involve diverting expenditure from other activities, which are also job creating.

Such actions are best seen as useful but short-term responses compared with creating new energy-efficient capital stock, using new knowledge and new technologies (most of which is available, or very close to being available) in order to, for example, reduce the heating requirements of new houses to close to zero, cut vehicle emissions to a fraction of their present levels though the use of hybrid vehicles or hydrogen fuels, etc.

This trade-off between the short-term and the longer-term is, as always, at the heart of any debate on employment, and the EU has to strike an appropriate balance, which may vary between Member States and between regions.

The attraction of instant jobs is understandable, especially if they can employ the relatively unskilled or unemployed, but this has to be set against the long term benefits of investing in high quality jobs in factory-based production facilities related to the development of renewable energy sources and use for the future, as well as in the research and design centres where they are conceived and developed. It should also be recognised too that, as the quality and reliability of equipment such as wind-turbines increases, the less need there will be for labour-intensive maintenance and servicing activities[18].

This is not to underestimate the employment benefits that will come with the partial replacement of fossil fuels by bio-energy fuels in transport, which could clearly create relatively large numbers of jobs, especially in low income and rural areas[19]. However, that is unlikely to become a central plank of EU employment policy over the coming decades.

4) Investment in renewable energies as part of an economic and employment growth strategy

So far as we are aware, no work has been done in the EU to assess the potential for using the climate change agenda as an opportunity to promote investment-led economic growth and a much-needed improvement in employment opportunities across the EU.

Some indications of the potential for such a programme can be gleaned, however, from a proposal developed in the US two years ago[20] which was presented as an alternative strategy to the tax-cut programme that was actually adopted by the Bush government.

[17] Reported in the contribution of workers and trade unions to the 1-12 meeting of the Commission on Sustainable Development of the UN Economic and Social Council

[18] Putting renewables to work: how many jobs can the clean energy industry generate, Kammen, Kapadia and Fripp, Renewable and Appropriate Energy Laboratory, University of California, Berkeley, April 2004.

[19] European Commission: An EU strategy for Biofuels COM (2006) 34 final, and related documents

[20] The Apollo Jobs Report: for good jobs and energy independence., January 2004, presented by The Apollo Alliance c/o The Institute for America's Future, Washington.

That programme proposed a 10 year $300 billion investment based on the expansion of renewable energy, energy saving in high performance buildings, and the rebuilding public infrastructure and transport in the US.

This growth package was estimated to generate close to an additional 2 million jobs sustained over 10 years (the report speaks of 20 man-years of employment), with a total yield of 3.3 million jobs, and to be self-financing through the higher tax revenues it generated from increased incomes and expenditures.

5) Differential impact on sectors

A soon to be presented study[21] by the Social Development Agency will report on the possible employment impact of tackling climate change in four broad sectors – energy production, buildings, transport and industry, especially steel. This major study is much needed in the EU, and it is hoped that it will begin to throw more light on the types of changes that are likely to occur, and on the methods that can be used to assess them.

One of the research partners to the US Apollo project[22] has also looked at the potential differential impact on both sectors and regions, using their own analyses as well as studies undertaken by other research centres. Their most general finding regarding sectors was that, while the majority of jobs in the fossil fuel industry are in fuel processing and operations and maintenance, the majority of jobs created in renewables are in manufacturing and construction (with the exception of biomass which is closer to fossil fuels).

Beyond that, the potential impact depend crucially on the energy-intensity of the sector, industry or firm, with the main losers being in mining, fossil fuels, and 'smokestack' industries. It reports one calculation for the US[23] that foresaw job losses of 90,000 in oil, gas and coal mining and refining, and a loss of 60,000 jobs in electricity and gas utilities in the period up to 2020, but against a background of an overall increase in US employment of 10 times that amount, rendering the labour market adjustment process so much easier.

6) Differential impact on regions

In terms of regions, the same US study also suggests that the impact of changes in energy policy can have a large differential impact on regions – with, for example, Texas gaining 70% more jobs than West Virginia in relative terms, and with states in the Midwest being particularly well suited for wind energy development..

More generally, it is obvious that not every region and locality is equally well placed to exploit wind or solar power any more than they have been able to develop hydro in the past. Hence job gains and losses are unlikely to be evenly distributed. Yet nothing seems to have been done to address these concerns, no overall review has been carried out across the EU, although individual localities have begun to consider their options and possible responses[24].

[21] The Social Development Agency, SDA, is located within the ETUC. Its first report is due to be presented in late February, 2007.

[22] Kammen, Kapadia, Fripp, University of California, op. cit.

[23] World Wildlife Fund study 2001, conducted by Tellus Institute and MRG Associates

[24] For example, an imaginative set of proposals (Nov, 2006) from a peripheral EU region – the Border, Midland and Western Regional Assembly of Ireland - in response to their Government's Green paper, in a country heavily dependent on imported energy.

The US study also raises other regional policy issues, including the potential positive benefits of moving regions away from their traditional dependency on polluting industries in decline, and well as the possibility of winning regions helping to compensate losing ones.

In this respect, climate change adjustments will inevitable change the current 'geographical pattern of settlement'. In the long run it is difficult to image, for example, that the current patterns of urban commuting are compatible with the reduction of CO2 emissions.

Part 2 - case studies

1) Employment and renewable energy sources

These studies look at the impact of new forms of energy, in terms of both job creation and job displacement. These studies offer detailed estimates of employment impact, practically all of which is positive – notably in relation to biomass.

Study 1: Renewable and Appropriate Energy Laboratory (RAEL) report, University of California Berkeley, on 'Putting Renewables to Work: How many jobs can the clean energy industry generate? By Kammen, Kapadia and Fripp, April 2004[25]

Summary findings

- The renewable energy industry sector generates more jobs than the fossil fuel-based energy sector per unit of energy delivered, under a variety of scenarios.
- Achieving 20% of US production from renewables by 2020 would produce between 190,000 and over 240,000 extra jobs in the US economy, depending on the mix of energies used. These results compare with scenarios of 'fossil fuel use as usual' to 2020, which result in employment creation of around 85,000.
- The employment impact of investing in renewable energies creates jobs in construction, manufacturing and installation work, on the one hand, and in processing fuel and in operations and maintenance, on the other.
- Renewable technologies create more jobs at the launch stage than coal and natural gas, but the distinction is less clear later. For example, wind turbines require fewer jobs to operate than coal and gas plants.
- Supporting renewables within a comprehensive and coordinated energy policy that also includes energy efficiency and sustainable transport will yield far greater employment benefits than actions that support one or two sectors separately.
- The distribution of employment benefits across regions can vary considerably. Some regions may gain little, and certain sectors may be net losers. In all cases, however, losers can be compensated from the gains made by others through policy interventions.
- In the US, very few job losses in extractive industries (coal and oil) are considered to be due to stronger environmental regulation – estimated at less than one tenth of 1%.
- Renewable energy systems provide broader economic benefits through investment in innovation, and by protecting the domestic economy from external dependency and risks.

[25] http://rael.berkeley.edu/old-site/renewables.jobs.2006.pdf

Study 2: Renewable Energy Sector in the EU: the Employment and Export Potential; A Report by ECOTEC Research and Consulting Ltd, for the European Commission, DG Environment, 2001/2 [26]

Summary findings

- The employment estimates in the report are based on the 1998/9 ALTENER study that estimated that renewable energy has the potential to create over 900,000 jobs by 2020 (including over 500,000 from biomass fuel production).
- Even when subsidies are required to enable renewable energies to compete in the market, the net job creation is positive (i.e. greater than would have resulted from those subsidies being spent or invested elsewhere in the economy).
- Employment opportunities are seen in terms of:
    - Manufacturing - design, manufacture, refurbishment
    - Project development – planners, architects, surveyors etc
    - Construction and installation of plant and sites
    - Operation and maintenance of plant, servicing, collection and supply
- Job creation estimates for 2010, derived from trade association estimates:

Wind	190,000-320,000
Solar PV	100,000
Biomass	1,000,000
Solar	250,000

Study 3: Renewable energy target for Europe: 20% by 2020 [27]***; Energy and Cohesion; Renewable energy in Europe*** [28]***: two publications and a book from EREC (the Brussels based European Renewable Energy Council) 2002-4?***

Summary findings

- These documents – presented by the trade associations of the different sub-sectors – indicate that renewable energy already provides 200,000 jobs in Europe with an annual turnover of 10 billion euros.
- Renewable energy creates employment at much higher rates than many other energy technologies, with opportunities for new industrial and craft jobs through the production, installation and maintenance of renewable energy systems.
- Estimates of employment growth (direct and indirect) relative to 2000 resulting from the 2020 20% renewable energy target are over 1 million extra jobs by 2010 and over 2 million by 2020 (net of any job losses in the conventional energy sector).
- Biomass and bio fuels are estimated to contribute more than half the increase in jobs, but with a strong growth of wind, photovoltaic and solar thermal over time

[26] http://ec.europa.eu/environment/enveco/industry_employment/ecotec_renewable_energy.pdf
[27] http://www.erec-renewables.org/documents/Berlin_2004/targets/EREC_Targets_2020_def.pdf
[28] http://www.erec-renewables.org/documents/RES_in_EUandCC/ExecutiveSummary.pdf

Study 4: Annex to Commission Biomass Action Plan, Impact assessment SEC (2005) 1573, 7.12.2005 [29]

Summary findings

- The direct employment effects of achieving the EU targets for biomass production are nearly 270,000 additional jobs by 2010 (measured as full-time equivalents) compared with the business-as-usual scenario that gives 85,000 extra jobs – a gain of over 180,000 jobs.
- Of the 270,000 jobs created, approximately 100,000 would be in bio-fuels, 100,000 in bioelectricity, and 70,000 in bio-heat.
- The direct employment effects cover production, processing, logistics and the operation of installations. Any imported biomass would create additional employment.
- Most additional job opportunities would be created in rural areas.
- Various studies have been carried out on the impact of different bio-energy supply systems - bio fuels for transport, bioelectricity, bio heat. In terms of employment effect, the highest results appear to come when bio-energy is used as bio-fuels for transport.
- Indirect effects are difficult to estimate because positive and negative effects reverberate around the economy, and need to be analysed within an input-output model. One such model (ASTRA used by Price Waterhouse Cooper) provides estimates of over 300,000 additional jobs (in FTEs). Another study – by the International Energy Agency – estimates over 400,000.
- The report does not draw definitive conclusions, but notes that indirect effects are commonly estimated to be 'of a similar order of magnitude as the direct effects'. This would increase the estimated positive employment impact to well over 500,000 – an improvement of 350,000 over current prospects.
- Such high net employment creation figures result from the fact that biomass systems are highly labour intensive – whereas any the job losses in the capital-intensive fossil fuel industries as a result of displacement would be relatively small. The downside of being labour intensive is that bio-energy tends to be relatively expensive.
- Renewable energy is seen to be more employment-intensive than fossil fuel production, but reflecting the impact of biomass production rather than that from 'new' renewable technologies like wind, solar, hydrothermal etc.

[29] http://ec.europa.eu/energy/res/biomass_action_plan/doc/sec_2005_1573_impact_assessment_en.pdf

2) Employment consequences of energy efficiency

Study 5: Research reported in Annex 5 of Green Paper on Energy efficiency or Doing more with less [30]

Summary findings

- Investments in cost-effective energy efficiency improvements almost always have a positive impact on employment:

1. The direct effect – which accounts for a third of employment benefits – comes from the labour required to implement the initial energy-saving investment
2. The indirect effects – which come from re-investing the savings generated by energy efficiency measures – account for two-thirds of the total impact on employment

- Advantages of many energy-savings investments include the fact that they tend to be:

3. labour intensive – especially the retro-fitting of buildings
4. impact directly on local and regional economies
5. low import content

- Investments in energy efficiency generate as much or more employment as investments in traditional infrastructures – road, bridges, or energy transmission
- Improvements in energy efficiency create 3 or 4 times the number of jobs created by investments in additional energy supply.
- It has been estimated that an energy efficiency increase of 1% a year, sustained over a 10-year period, creates 2 million man-years of employment i.e. 200,000 additional jobs sustained over the 10 years.

3) Employment, energy, investment and growth

Study 6: The Apollo Jobs Report: Good Jobs and Energy Independence: from the Apollo Alliance Jan 2004, The Institute for America's Future & The Centre on Wisconsin Strategy, US

This US 'action programme' report considers the potential benefits of a major investment programme – presented as a macro-economic alternative to the programme of tax cuts actually adopted by the US government. It outlines a programme of $300 billion (approx 235 billion euros) over 10 years in four areas of activity:

- increased energy diversity;
- investment in industries of the future;
- promoting high performance buildings;
- rebuilding public infrastructure

[30] http://ec.europa.eu/energy/efficiency/doc/2005_06_green_paper_book_en.pdf

The following results are foreseen by the macro-economic model:

- Support for renewable energy sources is projected to create some 460,000 jobs, while the total investment is projected to yield 3.3 million jobs (2 million jobs come directly from the initial investment, with an additional 1.3 resulting from the stimulus to the economy).
- The project is kick-started by the $300 billion investment, which generates a $1.4 trillion increase in GDP, with the investment more than repaid by increased tax revenues from increased earnings over 10 years.
- The potential environmental benefits include reducing national energy consumption by 16% and reducing carbon emissions by 23%.

The 10-point action plan outlined in detail in the report covers:

- Promoting advanced technology and hybrid cars
- Investing in more efficient factories
- Encouraging high performance building
- Increasing use of energy efficient appliances
- Modernising electrical infrastructure
- Expanding renewable energy development
- Improving transportation options
- Reinvesting in smart urban growth
- Planning for a hydrogen future
- Strengthening regulatory protection

4) Vocational training support for energy change

Changes in energy use and production will inevitably mean changes in education and training arrangements so as to ensure that the skills to positively manage the new complex of circumstances are fully developed across society, within the workforce, and in business. However, while individual Member States appear to have taken a variety of detailed actions, there is little recent evidence of any EU-wide actions to match potential changes in job-content or across different sectors.

Synthesis report. Vocational training and innovation practices in the environment sector - comparison of ten EU Member States with specimen cases. April 2000, CEDEFOP – European Centre for the Development of Vocational Training[31]

This report dates from 2000, and addresses the overall state of environmental vocational training in 12 countries as well as innovations in environmental vocational training, specific vocational training initiatives in relation to solar and geothermal energy, and environmental education and training initiatives targeted on the low skilled, unemployed and disadvantaged

Evidence is collected from a network of researchers covering Germany, Austria, Denmark, the Netherlands, Luxembourg, Spain, Sweden, Greece, Portugal, and Finland

[31] http://www2.trainingvillage.gr/etv/publication/download/panorama/5106_en.pdf

Summary findings:

- The structure of vocational training in the environmental sector varies across countries, and countries with strong apprenticeship/training arrangements – Germany, Denmark, Austria – have tended to incorporate environmental skill directly into their core systems
- Countries without such arrangements operate in a variety of ways that the study does not really summarise, although some country-by-country details are provided
- Interdisciplinary training is becoming more important in relation to environmental issues – examples given include the need to mix different scientific and engineering disciplines.
- Increased education and training standards have been partly driven by rising environmental standards, often as a result of EU legislation.

The report specifically addresses some of the vocational training and education issues relating to the growth of renewables – notably solar and geothermal – and offers some illustrative examples, but, given its date (2000) it does not address current concerns about the possible impact of across-the-board changes in energy use and production.

It should be noted that the report is mainly addressed to vocational training specialists, and provides no synthetic summary – despite the title – and only the moist basic of conclusions. Moreover, there is virtually no quantitative information – about numbers undergoing such training, or costs – and no analysis of the issue of public and private provision of education and training, although the authors acknowledge the important role played by the social partners in relation to the development and implementation of vocational training

5) Social partner support for energy change

The positive impact on total employment that emerges from practically all of the studies reviewed is soundly based in terms of technical and cost considerations. However, the structural changes that they imply need to take place in a smooth and systematic way, so that there are no negative 'shocks' to upset the workings of the economy overall

There is every reason to be optimistic about the European Union's capacity to manage change. The rate of labour turnover in the EU is high in most Member States – which eases the process of adaptation - and the Union's historical record in handling major run-down in large sectors – coal, steel, agriculture, textiles – is impressive. On the other hand, successful changes in the past have often relied on social dialogue and co-operation between social partners, as well as extensive public policy interventions and financial support. If social partnership is weakened, and if financial or other support less likely to be forthcoming, then the processes could be subject to disruption or even costly social strife.

Such risks have been indicated at times by the social partners at European level. On the whole – as the following documents indicate - they have been very supportive of the European Union's move towards sustainable energy regimes, and mindful, not only of the need to take account of European concerns, but also of those of the less developed regions of the world, who, it is widely estimated, would be most adversely affected if the worst global climate change predictions were allowed to become a reality.

Study 7: Contribution of workers and trade unions to the May 2006 session of the Commission on Sustainable Development of the United Nations Economic and Social Council, as distributed 29 November 2005

The report – prepared by the then ICFTU (International Federation of Free Trade Unions), the Trade Union Advisory Committee (TUAC) to the OECD, and the global union federations, GUFs – addresses the issues of energy use, sustainable development and climate change in the context of massive global inequalities, poverty and unemployment, including in relation to the ILO's 'decent work' agenda.

The employment evidence is essentially drawn from national studies – notably from Germany, Belgium, Denmark, Spain, Norway as well as Japan and Russia – involving TU co-operation with government and others in promoting job-creating initiatives in relation to environmental issues, and work leading up to the launch of a study (in progress) on the impact of CO2 reduction policies on employment in 25 EU countries, being co-ordinated by the European Agency SDA, associating the ETUC, SYNDEX, the Wuppertal Institute and ISTAS

The report also includes evidence of collective agreements containing clauses incorporating 'sustainability' clauses and evidence of co-operation on other issues, notably public health, health and safety.

Summary findings

- 'Trade unions support the transition to clean energy for environmental reasons as well as for the promise it holds for revitalizing national economies and employment.
- Investing in global markets of the future, rebuilding the infrastructure of our communities and increasing efficiency and productivity should be priorities for Governments that can be achieved through clean energy economy, and unions are prepared to support the process.
- The development of new technologies and renewable energies will inevitably translate into new jobs, but there must be a recognition that decent jobs must be created, in the context of a well-developed social and physical infrastructure, provided through a strong, well-financed public sector.'
- 'Workers, employers and families have become more responsible personal consumers of energy and other resources where joint workplace action has served as a springboard to change consumption patterns at the community level'

It also indicates that 'sectoral and regional analyses point to possible massive disruption in the short term as the world adjusts to climate change, with many workers who lose their jobs having little access to the new ones that will be created' although this appears to relate more to workers outside the European Union.

The paper reports various cases of positive action by trade unions, mainly in co-operation with governments, employers, NGOs:

- German unions and the DGB are co-operating with government, environmental NGOs and employer federations in a programme to renovate buildings. The Alliance for Work and Environment aims to renovate 300,000 apartments and create 200,000 jobs. This is financed by the German government with a budget of $1.8 billion over 5 years, plus low-interest rate credits of $8 billion

- In 2005 the Ministry of Environment and Pensions in Belgium agreed a plan - proposed by the FGTB trade union centre - to establish an energy conservation fund for the housing sector, along similar lines to those in Germany.
- In 2005, the United Federation of Danish Workers (3F) issued a report – Environment, Energy and Employment – demonstrating how a series of initiatives by local and national authorities (with a budget of nearly 20billion Danish crowns) could create 35,000 new jobs – see Research file for details.
- A March 2005 agreement between the Spanish government, employer organizations and the two central trade union organizations - CCOO and the UGT – created a tripartite dialogue to strengthen compliance with the Kyoto Protocol.
- The two Spanish Trade Union confederations are co-operating with local environmental councils and local government to raise awareness about urban transport – including promoting 'car-free' days, and to generate worker and workplace-centred solutions
- The Swedish Confederation of Professional Employees (TCO) has promoted environmental and quality labelling of office and electronic equipment, now used by all major manufacturers
- Collective agreements are beginning to incorporate 'green' or sustainability clauses concerning sustainable production and consumption.
- Other cases are quoted of TU co-operation with respect to wider environmental concerns, including with relation to pesticides and food, and the classification and labelling of chemicals

The main conclusions for policy are that

- More coherent approaches are needed from Governments in addressing the social, environmental and economic dimensions of sustainable development, within appropriate and supportive international frameworks
- Workers and their representatives need to be more closely involved in workplace action since this is the focal point of industrial development – underlining the need for good industrial relations, and respect for trade union rights
- Appropriate provisions need to be in place to deal with the transition of workers and communities wherever sustainable development plans put jobs at risk
- A clear commitment is needed to the ILO 'decent work' goal, and to the ratification and implementation of international covenants and agreements on public healthy, safety etc.

Study 8: The Trade Union Statement to the United Nations Framework Convention on Climate Change in Nairobi 6-17 November 2006 in preparation of the 2007 12th Conference on Climate Change (COP 12). It was presented by the new ITUC, the ETUC and TUAC.[32]

The statement addresses:

- A first objective is to see how best '*to promote research that can yield a true picture of the long-term net employment effects through sector-by-sector and regional employment analyses*'
- A second objective is to ensure trade union participation in decision making – so as to address the issue of the transition to green job creation (through 'employment transition programmes') - and the extent to which bilateral or trilateral agreements can best address social and employment impacts.
- A third objective is to address concerns at the workplace – where energy is consumed and waste produced – including the respect for issues such as participation and access to information, and the right to refuse to undertaken work that is environmentally damaging.
- A fourth concern is to encourage public investment in order to ensure a long-term shift in energy policy towards sustainable and labour-intensive energy solutions through energy saving, energy efficiency, and investment in a mixture of clean, green and sustainable energy sources.

In the main, the Statement draws on the evidence outlined in the workers and trade unions' submission to the UN Commission on Sustainable Development (see Research file 14)

The report argues that:

- The success of implementation strategies for climate change will depend in large measure on public policies and nationals regulations that engage workers, trade unions and employers in workplace-based programmes designed to achieve specific CO2 and other environmental targets.
- The UN (Framework Convention on Climate Change) and national governments must encourage more research co-operation between the ILO, UNEP, OECD, European Union and other bodies to address employment issues related to climate change. A clear focus is needed on employment, education, poverty eradication and the social dimension as a whole.
- Social dialogue that involves Civil Society must ensure that all affected groups, including workers, are involved in decision-making on climate change.
- Support for capacity building amongst workers and trade union is a prerequisite for full and meaningful workforce engagement in climate change initiatives, particularly through comprehensive training and education programmers, where trade unions are a significant provider of adult education and training around the world.
- Collective agreements are the basis for workplace rules, many of which can serve in relation to climate change. The effect of focusing on workers, work and their communities could lead to the creation of a new workplace culture for climate

[32] http://66.102.9.104/search?q=cache:H_KXlDT1wTYJ:www.global-unions.org/pdf/ohsewpP_8Bh.EN.pdf+Trade+Union+Statement+to+the+United+Nations+Framework+Convention+on+Climate+Change+in+Nairobi+6-17+November+2006&hl=de&ct=clnk&cd=1&gl=lu

change, with workers and their representatives becoming involved with employers in identifying where performance can be improved.

- Public funding for research and development in the areas (of new technology and technology transfer) must serve to predict and prevent negative social and environmental impact. Nevertheless, technological progress will not be enough to challenge climate change. A vast societal change, focused on behaviour changes and citizen commitment is needed.

The report concludes:

- At a European and International level, trade union are heavily and positively committed to addressing issues of climate change in a positive and forward-looking way
- In this context, there is a strong emphasis on building on social dialogue mechanisms and collective agreements, which are more prevalent in some areas of the economy, and in some Member States than in others
- The importance of good quality research into the likely employment effects of changes in energy policy to combat climate change is underlined, (although experience in other fields of structural economic forecasting suggest that the results may be less detailed or clear-cut than the authors might hope).
- The focus on joint trade union-employer action at the workplace – if it proves successful and effective on a broader basis – could provide an important breakthrough in getting the climate change message across, and in changing behaviour.
- The importance of comprehensive education and training is underlined, but there is no detailed evidence of training schemes or work-based practices that have been, or could be, transferred between firms, across sectors and between Member States.

Conclusions

1) Promote employment in a sustainable energy regime:

- A more rapid switch to renewable appears to have an unambiguous benefit in terms of overall employment, quite apart from environmental benefits. [33]
- The growth of a particular segment of the clean energy business – renewable energy, energy efficiency or sustainable transport – is often partly dependent on growth in other parts of the business because the markets for products and technologies are linked.[34]
- Measures to support and promote renewable energy technologies include financial instruments like tax credits, environmental standards and support for R&D.
- Workers who lose their jobs in the fossil fuel industry should have the opportunity to retrain for employment in the clean energy industry through training and certification, financial/tax incentives, support for local educational institutions. The benefit of taking a broad, popular, approach in 'selling' the new environmental approach – demonstrating the overall benefits, and the mutually re-enforcing links between the different types of energy-related activities as the economy and society move from one energy use regime to another one.
- Given the acknowledged difficulty of making precise quantitative prediction concerning the future impact on employment (whether in terms of skills, location, or types of responses) it is important that policy responses remain flexible, and developments are monitored and supported by all the parties concerned.

Energy efficiency is an important area of employment creation, with visible direct effects – notably in the building sector – as well as the larger indirect benefits that flow from the re-investing of financial savings throughout the rest of the economy.

Such benefits would more than off-set any job losses that can come through the rationalisation and improved efficiency of energy distribution.

- Finally, while much of the responsibility for global success is in the hands of developing countries, one of the main concerns of EU policy must be with the plight of the emerging and developing economies, that could face very serious difficulties, and without the scientific and technological capacity to tackle them.

2) Encourage the European Commission and the Council to develop their policies:

- Develop more coherent polices encompassing the various energy policies and initiatives and environment, employment, education and training implications and concerns.

  The latest European Commission energy policy proposals in the areas of renewables and energy savings are positive and encouraging, but they make little or no links to employment, vocational training, or industrial relations concerns – all of which are important for ensuring their ultimate success

[33] based on: *Renewable and Appropriate Energy Laboratory (RAEL) report, University of California Berkeley, on 'Putting Renewables to Work: How many jobs can the clean energy industry generate? By Kammen, Kapadia and Fripp, April 200433*

[34] idem

- Undertake much more research into the possible structural employment changes, and education and vocational training implications of new energy policies, while recognising that it will not be possible to derive precise indications of where and when specific jobs will be gained and lost, but rather to identify the key factors that could guide the development of these policies within the individual Member States as the industrial and market consequences of energy change unfold
- Exploit the experiences of the different Member States, some of whom have gone much further than others in developing renewable energies and promoting energy savings. Particular attention should be given to the role of higher environmental standards in promoting new employment; the importance of workplace-based actions in ensuring that theory is put into practice; and the need for improved education and training standards.
- Develop and communicate clear messages to the public, as well as to the social partners, concerning the positive economic and employment implications of tackling climate change, including the fact that even the UK's Stern Commission findings – that the use of 1% of global GDP growth a year would be sufficient to ensure long-run success in tackling climate change – could turn out to be too pessimistic if the efficiency of the new energy technologies being developed could be further improved, and put into practice on a massive scale.

3) Welcome the positive support of the social partners. In particular

- Social partner involvement is part of the key to accepting, facilitating and supporting the process of change.
- Encourage the European trade unions to ensure that their high profile support for action to combat climate change at EU, OECD and UN level is carried through at the level of the workplace, where many actions will succeed, or fail, as they acknowledge themselves.
- Encourage Europe's businesses to wholeheartedly embrace a new energy regime – as many firms, notably the larger ones – have been quick to do in relation to buildings, transport, product development etc. They should equally be encouraged to ignore misleading arguments that such actions could, in some way, damage their 'competitiveness'.

4) Investment

- The importance of using new investment – both public and private - to improving the efficiency of the existing energy-use system since most improvements or changes in energy-use are built into new investment and therefore creating jobs.[35]
- This message is particularly relevant for the EU given that the current low growth expectations of the EU Member States and the cautious approach of the ECB have resulted in a slow-down in the rates of EU investment, which is slowing the pace of transformation of energy use.[36]

[35] based on *: The Apollo Jobs Report: Good Jobs and Energy Independence: from the Apollo Alliance Jan 2004*
[36] idem