Labour/Management Programme

CLIMATE CHANGE AND EMPLOYMENT

Report on a meeting of management and trade union experts held under the OECD Labour/Management Programme

Paris, 12 October 2001

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FOREWORD

Under the OECD Labour/Management Programme for 2001, a meeting of management and trade union experts on "Climate Change and Employment" was held in Paris on 12th October 2001. The meeting was prepared in collaboration with the Business and Industry Advisory Committee to the OECD (BIAC) and the Trade Union Advisory Committee to the OECD (TUAC).

Below you will find the Agenda for this meeting, along with the Discussion Paper and the overall report of the discussions of the meeting of experts, which were both prepared by Professor John H. Chesshire, designated as General Rapporteur for this activity.

THE OPINIONS EXPRESSED AND ARGUMENTS EMPLOYED IN THIS REPORT ARE THE RESPONSIBILITY OF THE AUTHOR AND DO NOT NECESSARILY REPRESENT THOSE OF THE OECD
AGENDA

1. SETTING THE SCENE:
   - Opening by the Chair
   - Nils-Axel Braathen: Overview of envisaged OECD work on climate change & employment
   - John Evans, TUAC
   - Douglas Worth, BIAC
   - John Chesshire: Brief overview of the discussion paper

   General Discussion

2. ECONOMY-WIDE EMPLOYMENT IMPACTS
   - Margo Thorning, American Council for Capital Formation
   - Andrew Hoerner, Center for a Sustainable Economy
   - Paul J.G. Tang, CPB Netherlands Bureau for Economic Policy Analysis
   - Janina Scheelhaase, The European Centre for Economic Research and Strategy Consulting on “Employment of Climate Protection Policies - Germany”

   Issues to be addressed:
   - studies carried out on the effect of mitigation policies on employment
   - transition policies required

   General Discussion

3. SECTOR-SPECIFIC CASE STUDIES
   - Hubert David, European Insulation Manufacturers Association (EURIMA)
   - Mary Novak, DRI-WEFA Energy Group
   - Willy Bjerke, International Aluminium Institute (IAI)

   General Discussion
4. **ISSUES FOR THE FUTURE**

- Nils-Axel Braathen – Comment on previous presentations and discuss how recommendations could be included in the OECD work programme

Responses by:

- Stephen Pursey, ILO
- Janos Pasztor, UNFCCC
- Michel Biart, EC Sustainable Development Unit, Brussels
- TUAC -- Bernt Fallenkamp, (LO-Denmark)
- BIAC -- Geir Hoibye, Confederation of Norwegian Business and Industry

*Issues to be addressed:*
- Research to be undertaken by the OECD in co-operation with other organisations
- Transition policies
- Policy framework

- Philip Bagnoli -- Implications for the OECD Work Programme

**General Discussion**

5. **CONCLUDING SESSION**

Observations by:

- BIAC -- Tom Vant, Syncrude Canada
- TUAC -- Reg Green, ICEM

Summary of the results of the meeting by the Rapporteur
1. INTRODUCTION AND CONTEXT

The OECD Labour/Management Programme hosted a meeting of management and trade union experts on Climate Change on 2 October 2000. It was attended by some 45 management and trade union representatives, including members of the Business and Industry Advisory Committee to the OECD (BIAC) and the Trade Union Advisory Committee to the OECD (TUAC); 15 observers from OECD Member States’ Permanent Delegations; and other experts drawn from the ILO, UNFCCC, Climate Network Europe and from the OECD and IEA secretariats. BIAC and TUAC considered the OECD’s work on climate change to be very important; and appreciated that this work was taking place within the broader context of sustainable development. Climate change was recognised to be a very complex issue. But mitigation of possibly catastrophic climate change due to greenhouse gas emissions was a major challenge that no one could afford to ignore. Substantive progress would not be achieved without the active contribution of key stakeholders.

The meeting in October 2000 offered an opportunity for discussion ahead of COP6 of the impact of climate change measures/policies on employment, the importance of voluntary approaches as part of a broader policy mix, the responsibilities of the various stakeholders for greenhouse gas emissions and the importance of sustainable economic growth. The meeting also sought to identify (i) how industry and trade unions could facilitate co-operation measures to address climate change, whilst promoting efficient solutions, innovation and technological change; and (ii) areas where further work was needed. By common consent, this meeting was judged to have been most successful. But it was seen essentially as a first step towards further BIAC/TUAC initiatives involving the OECD, ILO, UNFCCC (and hopefully the EU).

Considerable impetus for more work on employment and climate change was generated at the first LMP meeting in October 2000; and further encouraged by the G8 Environment Ministers at their meeting in Trieste in early March 2001. The OECD Environment Policy Committee has also outlined a work programme on environment and employment to update earlier studies published in 1978 and 1997.

1 The report of this meeting was published as Climate Change, PAC/AFF/LMP(2000)10, Public Affairs Division, OECD, Paris, November 2000, pp. 54.
2 Communiqué from the G8 Environment Ministers’ Meeting in Trieste, Italy, 2-4 March 2001.
The purpose of the meeting on 12 October 2001 is to review the progress of the current OECD programme of work on employment and climate change; and to discuss the priorities, terms of reference, methodologies and assumptions for an eventual research programme on the employment implications of climate change policies in OECD countries and beyond. The meeting is also intended to obtain feedback from, and discuss future roles for, the OECD but also the ILO, EU, relevant researchers and institutions (government or otherwise) related to such a research programme. One element will be to improve understanding of the possible consequences for employment of climate change mitigation and adaptation policies; and how any undesirable consequences of these might be addressed. The Agenda identifies sessions on:

- Setting the scene on the employment effects of mitigation policies at the macro and micro level, together with elements on the successes and failures of adaptation policies and on the wider effects of climate change (e.g. flooding, loss of agricultural land, impact on tourism);
- Economy-wide employment impacts;
- Sector-specific case studies;
- Issues for the future; and concluding summary of the meeting.

This short Issues Paper, together with papers to be tabled by BIAC, TUAC and other participants, seeks to inform the discussion by reviewing (i) recent scientific and policy developments on climate change and sustainable development; (ii) some major policy challenges which arise and the need for burden sharing across a wider range of sectors than just power generation, energy-intensive industry and transport; (iii) and elements of environmental taxation and the alleged existence of a ‘double dividend’; (iv) briefly examining the economic and employment implications of climate change mitigation, and suggesting an enhanced role for major stakeholders in modelling exercises to define more precisely the employment implications and possible winners and losers; and (v) concludes with some questions to focus the debate and follow up work.

2. CLIMATE CHANGE: RECENT SCIENTIFIC AND POLICY DEVELOPMENTS

Developments in the scientific assessment of climate change -- and the policy responses to this -- since the last LMP meeting on climate change in October 2000 have included:

- The COP6 negotiations in The Hague in November 2000, which failed to reach agreement on implementation of the 1997 Kyoto Protocol.
- The election of a new US Administration, which has expressed its opposition to the Kyoto Protocol, but argued that the broad objectives should be achieved by other means.
- Publication in May 2001 of a report by the US National Academy of Sciences on climate change, broadly supporting the conclusions of the IPCC but also noting that there remained significant areas of uncertainty in the science of climate change and the use of climate models.
- Publication by the IPCC in July 2001 of its latest study, the Third Assessment Report, entitled *Climate Change 2001: The Scientific Basis*.
- COP6-(2) met in Bonn in July to seek to maintain momentum with global climate negotiations. The Bonn Agreement has paved the way for ratification of the Kyoto Protocol. The Protocol could enter into force when 55 countries have ratified it, including developed countries accounting for at least 55% of developed countries' CO2 emissions in 1990 - despite opposition from the USA to it.

As was recognised at the October 2000 LMP meeting, climate change is but one dimension of sustainable development. Effective and ‘joined up’ policy responses require the development of a framework of organising principles which acknowledges the complex interactions between three essential pillars:
PAC/AFF/LMP(2002)1

(i) economic growth, (ii) the environment and (iii) wider, mainly social, policy considerations (e.g. employment, and equity between different stakeholders and across generations).

Policies for sustainability must pay simultaneous attention to a wide range of other issues such as primary resource depletion, economic growth, employment, investment, social cohesion and equity, international competitiveness, energy import dependence, energy supply reliability and national security. If this is not done, policy and market signals will become very confused. In turn, this will lead to failure to secure the essential requirements for sustainable development: a clear policy framework and widespread societal support to permit consistent responses and cost-effective and equitable sharing of responsibilities over the long term. Crucially, policy responses must be developed across a wide front -- using numerous policy measures to allocate burdens equitably whilst seeking the most cost-effective responses. In addition, climate change response strategies ultimately require the effective engagement of all countries and stakeholders.

3. THE CONTINUING POLICY CHALLENGE

Water vapour is the dominant GHG. CO₂ emissions derive from natural cycles and human activities. CO₂ presently comprises some 82% of total manmade GHGs; and 96% of total manmade CO₂ emissions arise from fossil fuel use - hence the great emphasis placed upon energy-related responses. More focus is now being placed upon the response of the wider energy ‘system’, including final end users and other actors (e.g. architects, equipment and vehicle manufacturers) as opposed to the historic emphasis placed upon the role of the much narrower energy ‘sector’. This implies policy responses to mitigate climate change and to support more sustainable development will be more complex and subtle; and need to be much more inclusive and co-operative.

As the recent OECD Environmental Outlook states: ‘It is often difficult to design a single policy instrument that will successfully provide the right incentives for a total reduction in resource use or in pollution and waste generation. Instead, it will generally be necessary to employ a mix of policy instruments. The policy mix … involves the combination of a robust regulatory framework with a variety of other instruments, such as stronger pricing mechanisms to influence the behaviour of consumers and producers, voluntary agreements, tradable permits, eco-labels and information-based incentives, land use regulations and infrastructure provision. In particular the Outlook recommends the removal of environmentally harmful subsidies and a more systematic use of environmental taxes, charges and economic instruments to get the prices right’.

Environmental economists favour an approach based upon accurate and consistently applied price signals, and attempts to internalise external costs. However, politics is the art of the possible. In some instances (e.g. solid waste disposal in some OECD countries), prices have indeed been adjusted relatively easily to reflect costs by the imposition of modest taxes. In other areas, policy has been constrained by strong public opposition to proposed higher charges or taxes (e.g. road pricing experiments); at least in short run, by the relatively low price inelasticity of demand (e.g. road fuels, often exacerbated in some countries by tax relief on travel to work, the provision of company cars and subsidised fuel use); or by socially regressive effects (e.g. the impacts of higher residential fuel prices upon the poor).

Under current policies, far from meeting Kyoto Protocol targets, OECD countries are likely to increase CO₂ emissions by a further one-third to 2020. Given growing scientific consensus about climate change

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5. Ibid., p. 19.
and the need for more sustainable development, the intensity of policy intervention - especially in liberalised markets - may need to increase, not diminish. Price-based solutions might be preferable to economists, but in many cases broader packages of policy instruments will be required. An imperative for effective mitigation responses is the engagement of a wide range of stakeholders:

- **Within the energy sector,** the key stakeholder groups clearly include consumers; the fossil fuel producers (coal, oil and natural gas); petroleum refining; the nuclear industry, including fuel cycle services and decommissioning; and the emerging renewable energy and energy efficiency industries. Despite significant rationalisation in the global oil industry, liberalisation of energy markets has tended to increase the number of companies active in the sector - many of which are now multi-utilities.

- **The energy supply sector** is capital intensive. Its investment programmes thus have a large ‘footprint’ upon many other industrial sectors, especially electrical and mechanical engineering and construction (e.g. power plant, boilers, mining machinery, offshore equipment, pipelines, high voltage transmission and low voltage distribution, and pollution control).

- **Amongst industrial users,** the 10 most energy-intensive process sectors across the OECD are aluminium, cement, ceramics, chemicals, food & drink, glass, iron & steel, metal foundries, non-ferrous metals and paper. Most of these are also capital-intensive sectors.

- **The transport sector within (and without) the OECD** is experiencing a continuing increase in energy demand and emissions. This sector also has a large ‘footprint’ in terms of direct employment in road freight distribution and warehousing, railways, buses, metro systems etc.; but also indirectly via infrastructure maintenance and road building, retail fuel distribution, vehicle repair and vehicle manufacture. Crucially, the transport sector is perhaps the sector where the direct choices of individuals (e.g. ownership of large v. small cars; multiple private vehicle ownership, etc.) are most closely linked with policy decisions of governments (e.g. promotion of cheap v. expensive auto fuels; provision of quality public transport; subsidies for less GHG producing alternatives v. taxation on GHG producing technologies etc.).

- **The service sector** embraces public services (such as central and local government, education, some hospitals) and private services (such as banking, finance, insurance, leisure, retailing and restaurants). Both energy use and energy intensity have risen, especially given increased use of IT and the installation of more air conditioning. In most OECD countries, this sector is experiencing rapid growth in energy demand and emissions.

- **The domestic (or residential) sector** is characterised by its heterogeneity; a move towards smaller (and older) households; the longevity of the housing stock; the scope for retro-fitting higher levels of insulation and improved controls e.g. ‘smart’ homes; increased electricity demand from appliances and IT; and large energy efficiency opportunities by replacement of the existing appliance stock via market transformation programmes.

Soundly based policies to address climate change and sustainability require a wider front – across all sectors (e.g. the roles of the services and domestic sectors in waste recycling and water conservation). If the energy sector and energy-intensive manufacturing sectors are not responsible for the whole problem, they cannot be expected to provide the complete solution. The OECD/EU database on environmentally related taxes and charges shows that environmentally related taxes are, as yet, levied almost exclusively on households and the transport sector.6

To date, many governments have focused their initial efforts to mitigate GHGs on ‘win-win’ options -- those that make sense for other reasons (such as energy market reforms, waste reduction and recycling strategies, and energy efficiency in residential buildings) -- as opposed to taking new measures in energy-

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intensive sectors. However, voluntary agreements are becoming more widely adopted; and some governments have introduced new taxation upon industrial energy use.

Inevitably, some policy instruments may well have undesirable side effects, such as on income distribution, employment and personal choice. These side effects must be evaluated with care. In some cases, compensation might be required to achieve social acceptability. Packages of measures should aim to ensure that side-effects are as low as possible and that adjustments are smoothed wherever this is feasible. Abruptness in policy implementation imposes higher costs than when individuals, companies and markets are given adequate time to anticipate and to adjust. In particular, there is a need for fuller appraisal of the efficacy of alternative policy packages upon the economy, employment and the environment.

4. ENVIRONMENTAL TAXATION -- IS THERE A DOUBLE DIVIDEND?

One important element of green tax reform pursued in some countries has been to raise taxes or duties on fossil fuels whilst lowering them upon ‘green’ energy sources (e.g. electricity derived from renewable sources). This has been justified by (i) the need to internalise external costs and (ii) to provide an ‘infant industry’ boost to renewable energy sources.

Even more important, at least in scale and breadth of sectoral impact, have been the efforts made in recent years by OECD Member States - particularly those within the European Union - to explore the merits of shifting taxation from labour to environmental emissions and waste. Historically, the road transport sector has been most heavily taxed (in terms of fuel, initial car purchase and annual vehicle licence taxes). But, as yet, the incremental shift towards new environment-motivated taxation across OECD member countries since the Kyoto Protocol has been really quite small. In Denmark some 10% of public tax receipts now arise from green taxes. The LO states that whilst this is high compared with other countries, it is unlikely to radically affect life styles and consumption structures in the direction of greater sustainability.

Given the relatively recent introduction of such measures, their longer term efficacy -- ex post -- has yet to be fully evaluated. BIAC has emphasised this point in commenting on an earlier OECD draft paper on environmentally related taxation; and also commented that the OECD research inadequately discusses the scepticism in the USA about such taxation. BIAC have stated that the respective roles of governments, companies, employees and other stakeholders vary by country and region. Thus, the composition of policy packages and the emphasis given to individual components of such packages will vary: there is unlikely to much merit in a ‘one size fits all’ approach. In particular, the US administration is placing emphasis upon research-oriented measures to accelerate climate friendly technological change, upon demand-side management and voluntary commitments. BIAC has also pointed to several academic studies that cast serious doubt on the existence of any double dividend (see below).

Some analysts have argued that such shifts in tax burdens could provide a ‘double dividend’ in terms of (i) desired environmental improvements and (ii) a boost to employment. The OECD published an analysis of green taxation in March 2001. It concluded that the existence of such a double dividend was not conclusive (either from theoretical or empirical perspectives) and any dividend was likely to be achieved only if a number of fairly restrictive conditions were met. Key conditions for the realisation of a double dividend include:


The initial structure of the tax system. If this was sub-optimal a dividend could arise from removing sub-optimal tax provisions.

The tax incidence: If the burden of pollution taxes finally falls upon consumers through higher prices of the taxed commodities, the reduction of the tax on labour will be less effective, and the employment effect reduced or eliminated.

The degree of substitutability between factors of production is important. If it is possible to use more labour instead of energy and capital, increased employment is more likely to occur.

The degree of mobility of production factors is crucial, especially whether capital is mobile enough to relocate abroad to avoid the additional energy or environmental taxation.

The extent of wage rigidities. If wages are rigid then a fall in social security contributions will reduce labour costs, leading to higher employment. If wages are flexible, the resulting higher employment could bid up real wages, thus cancelling out employment gains.

The environmental effectiveness of the tax. The more effective the environmental tax is, the more rapidly the tax base will erode. This could lead to the imposition of higher environmental or other taxes to maintain revenue, eroding some or all of the double dividend.9

Amongst the main conclusions from the OECD review were that employment effects would be more significant if: (i) revenues were used to reduce labour taxation, especially employer/employee social security contributions; (ii) if these cuts in contributions were targeted at the unskilled labour force; (iii) and if the use of earmarking of revenues was reduced.10 The OECD study of green taxation focused on the possible overall, macroeconomic employment effects of a potential ‘double dividend’ (with a survey of model simulations suggesting a small positive effect upon employment), rather than identifying likely ‘winners and losers’ at a sectoral level.

Nevertheless, it is clear that the ‘distortionary’ and regressive effects depend upon the detailed design of the tax shift -- in terms both of revenue raising and revenue recycling. For example:

- Is the higher environmental taxation aimed to reduce carbon emissions, or energy use as a whole? If the former, then the impact upon the most carbon-intensive fuel (coal) would be greater. In some schemes specific renewable (but not usually nuclear) energy sources are exempted from higher taxation.
- Whether higher environmental taxes are imposed upstream (on energy producers) or downstream on some/all energy consumers, what can be said about their incidence?
- Is the additional taxation levied on (a) large, energy-intensive firms only; (b) all commerce and industry; or (c) households, too; or (d) on transport (only or too)? The broader the tax base, the more equitable the impacts; although regressive effects might be greatest upon specific sub-groups such as energy-intensive industries and poorer households (for which energy consumption comprises a higher proportion of household budgets).
- How are the additional revenues to be spent? Several schemes identified in the OECD report on green taxation aim at overall revenue neutrality. However, some countries are reducing green tax rates on companies/sectors that enter voluntary agreements with governments to reduce emissions

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9 Ibid. pp. 31-32.
10 Ibid., Taken from Box 5 on Main conclusions from existing studies on the double dividend, pp. 32-33.
(e.g. an 80% rebate from the Climate Change Levy for qualifying energy-intensive companies in the UK). Other countries are recycling revenue via additional capital allowances for some industries or specified equipment (e.g. new Combined Heat and Power plant). Yet others are recycling revenue via reductions in employees’ and/or employers’ social security payments. This recycling method assists labour-intensive employers (often in the public sector, such as public administration, education and health) but does not assist energy- and capital-intensive process industries, which employ few staff. For them, overall net tax contributions are higher.

As ever, the ‘devil is in the detail!’ This suggests that (i) overall assessments of emerging national experience at the macro-economic level should be updated regularly; and (ii) more work should be undertaken at the micro-economic, sectoral level – both in terms of the impacts of revenue raising on specific sectors and sub-sectors, and of different mechanisms for recycling the environmental tax revenues. BIAC and others (e.g. the Danish LO) have also suggested that the possible employment impacts on developing countries of OECD members’ climate change policy options should be given due consideration.

Yet fiscal policies and shifts in taxation are not the only approaches being considered by OECD Member States to mitigate climate change. Therefore some analytical resources should perhaps be committed to examining in more detail the possible employment implications of other instruments -- or packages of instruments. This point has been emphasised by BIAC in their comments upon the first draft of this Issues Paper. BIAC has suggested that an evaluation of effectiveness and costs of carbon/energy taxes compared to other instruments would be extremely useful. BIAC has also proposed that the case for incentives (or ‘carrots’, such as accelerated depreciation allowances, investment tax credits or low cost loans) needs to be evaluated against the ‘stick’ of higher environmental taxation. More broadly, other measures could include:

- Voluntary agreements, which were discussed at some length at the last LMP meeting on climate change in October 2000.
- The removal of inappropriate existing subsidies. Energy market liberalisation has assisted in identification (and usually) removal of pre-existing subsidies, such as those to coal and nuclear power. But considerable obstacles exist to the removal of remaining subsidies. Recent OECD work on environmental taxes has identified the large number of tax exemptions granted to the manufacturing sector and the effective exclusion of air transport from such taxation. What are the employment and wider social impacts of the removal of direct and indirect energy-related subsidies? The meeting might choose to examine these more fully.
- Accelerated energy efficiency programmes (especially in the less efficient parts of the housing stock; or by means such as building, vehicle and appliance efficiency standards/labelling); and
- The Kyoto flexibility mechanisms (emissions trading, joint implementation and the Clean Development Mechanism).

5. THE IMPACTS OF MITIGATION POLICIES ON EMPLOYMENT

Effective policies to mitigate climate change, however sensitively introduced, will lead to both winners and losers.\[^{11}\] Several recent studies have examined the possible economic costs of climate change mitigation. Amongst them are those of the OECD itself, the European Commission, some governments, research

\[^{11}\] This section draws upon a similar section in Climate Change, op. cit., pp. 12-13. This is because these issues were not fully addressed at the LMP meeting in October 2000 and are likely to be more relevant to the LMP meeting in October 2001.
institutions and specific stakeholder groups. Most models reviewed by the OECD suggest the total economic cost by 2010, as a percentage of GDP or total real income, might be 1% or less. The OECD’s own world general equilibrium model (GREEN) suggests the amount of labour reallocation induced by the Kyoto emissions reductions could be as low as 0.2% of the total labour force in 2010, assuming flexible labour markets and real wages. This estimate would be lower with permit trading but higher with greater rigidity in labour markets.

Some of those who commented upon the first draft of this Issues Paper suggested it should review, in some detail, the recent literature on the employment effects of climate change mitigation policies. However, the Rapporteur considers that this task is a central component of any research activity likely to arise from the LMP meeting. A brief review of the literature confirms the following:

- Whilst some model results indicate the net effects on employment could be modest, specific countries and specific sectors will be effected much more significantly -- as both ‘winners’ and ‘losers’. Especially for the latter, more detailed analysis would be valuable to inform transition and adjustment measures.
- Most global economic models assume ‘smooth’ reallocation of capital and labour in response to GHG mitigation, thus leading to under-estimation of economic costs and employment losses. But, in reality, such changes are rarely ‘smooth’ for those stakeholders most seriously effected. The active opposition of those most adversely affected, if they believe that their interests are simply being ignored, may compound this problem.
- Even if revenues from carbon taxes, levies or permit sales are used to reduce other taxes (e.g. those on employment), or in other ways policies are claimed to be ‘revenue neutral’ in their effects, the impacts on specific sectors could be considerable. This is particularly so for energy- and/or capital-intensive sectors with relatively small, but highly skilled and highly paid, labour forces.
- Different models employ different methodological approaches (e.g. ‘top down’ or ‘bottom up’); use different -- and not always transparent -- input assumptions; and do, or do not, take into account the Kyoto flexibility mechanisms.
- Some models have a limited sectoral coverage (e.g. focusing only upon the transport or housing sectors or on some specific renewable energy technologies).
- Many microeconomic studies with limited sectoral coverage tend to suggest unambiguous ‘win win’ outcomes, or highlight job losses. Some of these studies appear to have been encouraged or financed by likely ‘winners’ or ‘losers’ as part of a wider process of advocacy for a specific set of policies. Macroeconomic models tend to suggest a negative impact upon employment but usually fail to identify the winners and losers with any precision. This is at the crux of the concern for both BIAC and TUAC. Both organisations clearly consider that necessary measures must be based on the best possible information, evidence and experience -- given the serious implications for their respective constituencies.
- Few, if any, models are developed in association with the appropriate range of key stakeholders and -- perhaps most important of all -- relevant stakeholders are not engaged effectively in the modelling process itself via steering groups, modelling clubs or other consultative mechanisms. This suggests that BIAC and TUAC might wish to consider cost- and time-effective forms of joint participation in some well-chosen future modelling exercises.

It has to be accepted that, in general, opposition to GHG abatement measures has been strongest from well-organised industrial trade associations and highly unionised labour forces in potential ‘loser’ sectors. There are numerous enlightened and honourable exceptions to this, as the BIAC and TUAC contributions to the last LMP meeting demonstrated very clearly. GHG mitigation is likely to stimulate new markets and employment opportunities (e.g. energy efficiency, building materials, renewable energy, combustion control and instrumentation). Some of these are more labour intensive than the capital-intensive energy supply and energy-intensive production sectors. GHG abatement is bound to cause dislocation of labour markets, as have the recent ‘dot.com’ implosion and the more recent shakeout in financial markets. Policy measures to smooth the transition for displaced workers warrant further discussion at the meeting. These could be one important focus for new OECD work in this field.

6. SOME ISSUES TO DISCUSS

The other papers to be tabled for the meeting will, no doubt, identify other topics to expand those suggested below:

1. What are the major strengths and weaknesses in existing research on the economic and employment impacts of climate change mitigation measures?

2. As much existing work has focused at the macro-economic level, would it be fruitful to focus some effort on selected sectoral case studies at the micro-economic level? To be really useful, the case studies should examine: (a) economic sectors of likely employment growth, as well as contraction; and (b) the distribution of impacts upon specific socio-economic groups.

3. The shift to green taxation is relatively recent in most OECD countries. How can the emerging national experience be evaluated on a regular basis?

4. In particular, which specific forms of revenue raising and revenue recycling appear most effective for employment creation, the environment and the economy?

5. Is there a case for examining the relative merits of higher environmental taxation and broader policy packages in terms of the three pillars of the economy, employment and the environment?

6. Can this emerging experience provide useful insights into what additional policy measures and packages are required to smooth the transition in labour markets? In particular, there is a need for fuller appraisal of the efficacy of alternative policy packages upon the economy, employment and the environment. How can BIAC and TUAC engage effectively with the OECD and others in exploring these?

7. What are the employment and wider social impacts of the removal of direct and indirect energy-related subsidies? What are the likely environmental and economic impacts?

8. Which specific climate change mitigation policy measures do BIAC and TUAC wish to explore further in collaborative research with other organisations?

9. How do key stakeholders, such as BIAC and TUAC, wish to contribute to the further analysis of the economic and employment consequences of climate change response strategies?

10. What progress is being made by BIAC, TUAC and the OECD to raise the profile of employment issues on international climate change and sustainable development agendas? In particular, since the last LMP meeting, what progress has been made in discussions with bodies such as the ILO and UNFCCC?
11. How can the focus be shifted beyond the OECD, to examine the impacts of climate change mitigation policies upon the economic and employment situation in non-OECD countries?

12. Finally is there a demonstrated commitment to fund and to staff a research programme in these fields? In concrete terms, what are the next steps to be agreed?
1. BACKGROUND AND INTRODUCTION

The purpose of the meeting was to review the progress of the current OECD programme of work on employment and climate change. In addition, it discussed the priorities, terms of reference, methodologies and assumptions for an eventual research programme on the employment implications of climate change policies in OECD countries and beyond. The meeting was also intended to obtain feedback from, and discuss possible future roles for, the OECD but also the ILO, EU, UNFCCC, relevant researchers and institutions (government or otherwise) in such a research programme. One element was to improve understanding of the possible consequences for employment of climate change mitigation and adaptation policies; and how any undesirable consequences of these might be addressed.

Some 80 participants attended the meeting, drawn mainly from BIAC, TUAC, the OECD and IEA Secretariats, the European Commission, ILO and UNFCCC as well as representatives of Member States’ permanent delegations. A list of participants is attached as an Annex.

2. SETTING THE SCENE

Mr Ken Ruffing, Deputy Director of the OECD Environment Directorate, chaired the meeting and extended a warm welcome to all participants. He said climate change and employment issues had achieved a high-profile political status but also posed a challenge to the OECD Secretariat in terms of the analysis required to underpin the policy process and to advise Member States. The approach adopted by the Secretariat had been to understand the scientific consensus about climate change and to appreciate the long-term perspectives required to stabilise greenhouse gas emissions during the next 50-75 years. To assist both analysis and policy-making, one approach was to break up this time horizon into (say) decade long commitment periods. In this context, the initial Kyoto Protocol commitment period to 2008-12 should be seen as the first step in a longer journey and a period in which lessons would be learnt as governments accumulated policy experience. The methodologies available to assist analysis differed depending upon the time horizon under review. For example, general equilibrium models (useful for some purposes such as establishing the range of overall impacts on levels of GDP and changes in the composition of output and employment) assume full employment and that, over time, the economic system would remain in market clearing equilibrium. Such models did not offer any guidance regarding short-term transition costs to GDP or employment. In practice the impacts on specific sectors would be significant, requiring well-designed measures to mitigate their short-term impacts on households and communities. A wider range of analytical tools was required to address different issues over different time horizons, such as macroeconomic, sectoral, regional, community and firm-level impacts. The objective was to assist the development of effective policy packages to achieve
desired outcomes, addressing the environmental and social dimensions whilst minimising economic costs. As a result, the OECD Secretariat welcomed the meeting and the insights it would give rise to.

Mr Ruffing then invited Mr Herwig Schögl, Deputy Secretary-General of the OECD, to make the introductory presentation. Mr Schögl also offered a warm welcome to participants. He thanked BIAC and TUAC for proposing the topic and for their assistance in preparing the meeting. Recent OECD work on sustainable development and climate change had sought to examine the three core economic, environmental and social ‘pillars’. One important issue facing Member State governments was the weight to be given to these three pillars over time. Without doubt complex analytical issues and, perhaps, policy trade-offs were involved. It was now widely recognised that the mitigation of climate change posed challenges and opportunities. He hoped participants would share their considerable experience in a constructive fashion.

Mr Nils Axel Braathen (OECD Environment Directorate) then provided an overview of recent and possible future OECD work on climate change and employment. He referred to a newly-published report on environmentally related taxes which examined issues such as evolving experience of environmental taxation; use and recycling of revenues; evidence for the so-called ‘double dividend’; econometric assessments of the economic impacts of environmental tax reforms; and evaluations of their environmental effectiveness. He also reminded participants of an earlier, wide-ranging OECD study of environmental and employment issues published in 1997. Current work was underway at the OECD on a scoping study on the economy-wide employment impacts of environmental policies, including a review of the latest academic and policy literature and model results; and specific aspects such as revenue neutral tax reform. He judged that environmental policies were likely to have only a minor impact upon employment in the long term but not in the short to medium term. Other elements of the new work were an examination of possible ‘bottom up’ approaches to reconcile environmental and employment issues; the employment impacts of adaptation strategies; and possibly on skill composition. Given the constraints imposed by limited financial resources the OECD would (i) co-operate with outside modellers working on environment and employment issues and (ii) need to be selective in the choice of topics.

Mr John Evans (General Secretary, TUAC) said recent terrorist events had emphasised the need for renewed vigour in multilateral approaches to many global issues, including climate change. To secure the necessary public and political support for climate change mitigation measures it was imperative to undertake further analysis to improve understanding of the impacts upon employment and to identify policy packages to smooth labour market transitions. In this regard he considered the OECD could play a crucial co-ordinating role in advancing analysis and hoped it would be possible to engage other organisations (such as the ILO and UNFCCC) and individuals in this task. TUAC intended to hold a workshop at the COP-7 meeting in Marrakech in November to raise the profile of employment and wider social issues. Efforts would also be made to ensure that employment issues featured centrally at the World Summit on Sustainable Development in Johannesburg in September 2002.

Mr Douglas Worth (Secretary General, BIAC) said that BIAC sought to represent not merely a narrow management perspective but the wider interests of companies and their work forces. He wished the focus to be upon realities, especially of sustainable development leading to healthy economic growth and employment. He emphasised the need to secure an appropriate balance between different objectives and to focus upon rigorous analysis and facts. He encouraged the OECD to use its well-regarded analytical resources to assist this process.


Prof. John Chesshire (Rapporteur) said his background Issues Paper provided a brief contextual review of the present debate upon climate change and employment. The paper implicitly assumed the scientific consensus about climate change, its causes and its likely consequences. As with any other scientific consensus, that on climate change should be kept under constant scrutiny. He called for realism in several respects. First, even with concerted political action, the shift to a low- or zero-carbon economy would take very many decades. Second, the shift would have profound consequences, but also generate many opportunities, at the sectoral, regional, national and global levels. Third, at a macroeconomic level, changes in output and employment would be overlaid (or masked) by many confounding variables, e.g. in the short term by the rise and fall of the dot.com revolution, or the after affects of the tragic events of 11 September on financial optimism and on the aviation, tourism and many other sectors. For this reason he judged that ‘top down’ macroeconomic analysis should be complemented by well-chosen ‘bottom up’ micro-economic, sectoral and social analysis – both in sectors expected to grow and those likely to be disadvantaged. Finally, he said that the issues posed by climate change mitigation were quite profound and posed severe challenges for the policy process. Effective responses required careful analysis, the engagement of many stakeholders and recognition that politics was the art of the possible. Even though most economists strongly favoured some specific market-based instruments (such as carbon taxation), the policy process and the requirement to secure support from stakeholders meant that a wider range of policy instruments might need to be deployed in selected packages. He very much hoped the meeting would contribute constructively to this endeavour.

3. ECONOMY-WIDE EMPLOYMENT IMPACTS

The first presentation in this session was by Dr Margo Thorning (Chief Economist and Senior Vice President, American Council for Capital Formation). She said a review of results of numerous models used to analyse the impacts of climate change mitigation had identified severe impacts on the US economy. This was particularly so if the Kyoto target (a 7% reduction in 1990 greenhouse gas emissions by 2008-12) was to be met, partly because US emissions had risen since 1990 and there was now little time to meet the deadline. The principal impacts revealed by the model runs were a reduction in GDP, much slower employment and wage growth, lower living standards, a worsening of income distribution and a large fall in federal tax receipts. Estimated US job losses arising from implementation of the first stage of the Protocol ranged from 1.5m to almost 5m by 2010. Model results of the impact of (say) a 60% reduction in CO₂ emissions by 2050 were not yet available. But she judged the consequences would be very serious for all fossil fuel dependent economies. Even though EU Member States supported the Kyoto process, some states would have severe difficulty in achieving their agreed targets. Whilst international emissions trading had been widely advocated by specialists, numerous obstacles to an effective trading system remained. These included allocating CO₂ emission rights, the policy process and the requirement to secure support from stakeholders meant that a wider range of policy instruments might need to be deployed in selected packages. He very much hoped the meeting would contribute constructively to this endeavour.

The second contribution was by Mr Andrew Hoerner (Center for a Sustainable Economy, a non-profit research institution based in Washington DC). He summarised the results of recent research on competitiveness and employment in which he had been engaged, using input-output and macroeconomic modelling techniques. The input-output model had estimated the impact of
environmental tax reform, together with a package of energy-efficiency measures, on the price of services and manufactured goods. The results revealed that a substantial majority of industries would see net cuts in their total production costs; but that both the energy sector and energy-intensive industries would face significant cost increases and employment losses (e.g. some 75% of US coal mining jobs might be lost in 20 years). Targeted policies, such as border tax adjustment, were needed to assist the competitiveness of the latter sectors. The macroeconomic modelling was of a comprehensive climate and energy policy package including a carbon/energy tax, a cut in payroll tax, border tax adjustments on fuels and energy-intensive products, measures to promote low-carbon technologies and a generous package of transitional assistance for negatively affected workers and their communities. The model results showed a decline of US carbon emissions by 27% in 2010 and by 50% in 2020 compared to the baseline projection; an increase in GDP of 0.24% by 2010 and 0.6% by 2020; an additional 666,000 jobs by 2010 and 1.4 m. by 2020; reductions in unemployment, US oil imports and in household energy bills; and a slightly progressive impact upon income distribution. He concluded by stating the results indicated that the economic costs and benefits of a climate and energy policy depended critically upon policy design. In particular, revenue from carbon/energy charges should be recycled by cuts in other taxes and by stimulating the more rapid deployment of low-carbon technologies.

The next presentation was by Mr Paul J G Tang (CPB, the Netherlands Bureau for Economic Policy Analysis – part of Government, but an independent policy research unit). He said that since the early 1990s the Netherlands had sought to reduce energy use and curb greenhouse gas emissions. But the existing system of energy taxes, voluntary measures and subsidies on energy-efficient technologies appeared unlikely to reduce CO₂ emissions sufficiently. As a result the CPB was now analysing a more market-based approach including broadening the range, and raising the level, of energy taxes; and the efficacy of introducing some form of emissions trading. As yet only tentative, and not final, results were available. These suggested that the selected, enhanced package would have a slightly negative impact on income (less than 0.5% of GDP by 2010); and that, if a sensible policy package was developed (such as lowering taxes on low-skilled labour), the long-run employment effects would be slightly positive. Crucially, the overall effect on national income was small because energy expenditure was a small fraction of GDP and to a large extent households carried much of the adjustment burden. He emphasised that this research needed to be taken further, especially to examine several remaining uncertainties such as the distortionary impact of labour and corporate taxes; the transaction costs of emission trading; and the opportunities to ‘outsource’ emissions reductions in Eastern Europe and Russia. The objective was to identify the fairest, most efficient and most acceptable means of allocating climate change mitigation burdens.

The final presentation in this session was by Dr Janina Scheelhaase (Head of Economics, Prognos Consulting AG, Cologne). This was on the employment effects of climate protection policies in Germany, based upon a large study recently undertaken for the Federal German Department of the Environment. Two broad cases had been examined: (i) a 25% reduction in 1990 German CO₂ emissions by 2005 and 40% by 2020; and (ii) a 20% reduction by 2005 and 30% by 2020. Given time constraints, her presentation focused upon the first, so-called 40% reduction scenario over the time period to 2020. The analysis suggested the package of climate mitigation measures including higher carbon/energy taxation would lead to a relatively small, but positive, effect upon employment of nearly 200,000 jobs by 2020. The main beneficiaries would include construction (via insulation of buildings, new public transport schemes etc.); machinery manufacturing (via more energy-efficient equipment and renewable energy plants); and transport (rail, metro and bus schemes). Sectors likely to lose jobs included the wholesale and retail trade (via lower sales of petrol, cars and spare parts); transport equipment manufacturing (fewer cars); and mining and chemicals. The detailed analysis undertaken by Prognos suggested two principal conclusions: (i) ambitious climate change mitigation policies could be implemented without a net loss of jobs; and (ii) there appeared to be broadly positive ‘synergy’ effects between environmental goals and employment.
The following points were made in the subsequent discussion.

Mr Brian Kohler (Communications and Paperworkers of Canada, on secondment to TUAC) said that much of the debate had focused upon the three traditional pillars of the economy, environment and employment. However, he favoured the inclusion of wider social considerations in policy development to address not merely the ‘just transition’ in employment but other, wider social effects. The impact upon communities was particularly important, as these were the basis of electoral registration and thus political representation.

Mr Joaquin Nieto (Confederation Sindical de Comisiones Obreras - CC.OO) welcomed the opportunity provided by the meeting to examine the employment and wider social effects of climate change, a topic the European trade union federations had sought to have properly discussed for 10 years. A starting point would be to collect and analyse carefully the growing number of relevant research studies. Many of these had a national focus, so some additional work on a wider regional basis (e.g. the EU, the LDCs) would be useful. Future research should examine topics such as the likely employment effects of the Kyoto flexibility mechanisms; and the ‘ideal mix’ of packages of policy instruments to minimise the negative, and maximise the positive, effects of climate change mitigation.

Mr Geir Hoibye (Confederation of Norwegian Business and Industry) said he appreciated that the earlier speakers had been given only a short time for their useful presentations. However, he requested that the detailed policy packages being analysed in modelling work should be made fully explicit (especially by Dr Thorning and Dr Scheelhaase). It was difficult to accept or evaluate the significance of the results, especially where these conflicted, as it was quite likely that different packages of instruments were being examined. Mr Reg Green (International Federation of Chemical, Energy, Mine and General Workers’ Unions - ICEM) also asked about model assumptions, in particular whether the Prognos study had taken account of underlying, baseline trends, such as the steady erosion of jobs in the capital-intensive chemical industry. Mr Shaun Cleary (UK Delegation to the OECD) considered that the choice of time frame for adjustment was important, as many more measures could be implemented over longer time horizons via the normal rhythms of capital stock scrapping and replacement. Conversely, abrupt change imposed over a very short period inevitably led to greater dislocation and higher costs.

In response Dr Thorning said the model results she had summarised had all been based upon the assumed imposition of a carbon tax but they differed in some other respects – e.g. the extent of carbon trading. She suggested that the difference between her presentation and that of Mr Hoerner was that his broad approach could be characterised as a ‘bottom up’ one, with (in her judgement) rather optimistic assumptions about the speed and scale of deployment of best-practice, low-carbon technologies. In contrast the models she had summarised were of the ‘top down’ type and made no ‘heroic’ assumptions about technological change especially over short time periods.

Dr. Scheelhaase said the Prognos study had examined some 160 different policy measures. Apart from the well-known ones such as tax, investment incentives, lower social security payments etc., these had included measures to stimulate R&D, education and information campaigns, and low-cost loans for energy efficiency investment. The Prognos study had ‘netted out’ the expected underlying shifts in the economy and had adopted well-accepted, conventional investment time horizons for the scrapping and replacement of equipment.

Mr Richard Herd (OECD Economics Department) said that the OECD’s evaluation of different model results had revealed the need for great care in understanding model input assumptions and structure. Examples included (i) the extent of recycling of higher carbon/energy taxes, whether these were earmarked for particular measures (e.g. R&D) or whether they were used to reduce public debt, social security contributions etc.; and (ii) the assumed degree of flexibility in labour markets. Mr Philip Bagnoli (OECD Environment Directorate) said that claims for the existence of a ‘double dividend’ should be subject to careful appraisal and were often very country and context specific. More empirical evidence was now emerging but the results remained somewhat ambiguous.
Finally, Mr Horst Heuter (German Confederation of Trade Unions - DGB) said many modelling exercises tended to be ‘asymmetric’ in character. That is to say they were often used to identify the national or sectoral costs of climate change mitigation (such as lower GDP or employment). But he hoped future work by the OECD and others would identify the additional external costs (e.g. from sea level rises, loss of agricultural output from drought, and storm damage from greater weather variability) which could be *avoided* by the effective mitigation of climate change. This would permit more balanced perspectives to be taken by the public and policy makers. Professor Chesshire agreed, saying that key players such as insurance companies might be able to contribute to such analyses.

4. SECTOR-SPECIFIC CASE STUDIES

The first contribution in this session was by Mr Hubert David (European Insulation Manufacturers Association - EURIMA) on the topic of the potential employment opportunities arising from better insulation of the building stock. He said some 600 m/tonnes/yr. of CO₂ emissions arose from heating the EU’s 160 million commercial and residential buildings. Some 28% of these had been constructed since 1975; 45% between 1918-39; and 27% before 1918. About 3% of the stock was renovated to some extent each year. But most building regulations only applied to new buildings, and there was much evidence to suggest that these regulations were rarely properly enforced. Yet applying best building insulation practice to the existing stock might halve existing CO₂ emissions from buildings, creating many jobs in building renovation and insulation (roof, pipe and cavity insulation and double glazing). This large and cost-effective potential had been carefully quantified by very many studies and yet it was still not being exploited. Major reasons were the split incentives between building owners and occupiers in the rented housing and office sectors; and the lack of market transparency about building performance. The situation could be addressed by ‘no regret’ policies such as energy audits and building labelling schemes (similar to those introduced in the EU and USA for many domestic appliances). Some progress to implement such a framework was reflected in the draft EU Directive on the energy performance of buildings, but this was seen as unambitious by many specialists. He said the building sector was a classic example of where ‘no regret’ policies should be implemented more forcefully, improving comfort and increasing building sales values whilst reducing running costs and CO₂ emissions.

The next presentation was by Ms Mary Novak (Senior Vice President, DRI-WEFA Energy Group). She had considerable modelling experience and the US DoE used the DRI model for several exercises. She summarised the results of a recent study examining the impacts upon the US economy of adopting the Kyoto Protocol targets by 2008-12, which assumed no international carbon trading. Given growth in US energy consumption and CO₂ emissions since the Kyoto 1990 baseline, the US would now be required effectively to achieve a 35% cut in emissions in a period as short as 8-12 years under the terms of the Protocol. This was widely recognised as impossible, explaining the USA’s opposition to ratification. The model runs showed there would be no winners from such an approach but some 2 m. job losses located in every industry for every year. This reflected the fact that the USA was a very energy, electricity and transport intensive economy and would also suffer heavy job losses in the large indigenous energy supply sectors. The model took explicit recognition of capital stock vintages and was disaggregated by region and by sector. Energy intensity (energy costs as a share of total production costs) varied considerably by sector, e.g. 30-34% in mining, 25% in refining, 5% in food, and 4-5% in general manufacturing though most services were generally much less energy intensive (with energy costs typically 0.5% of total costs). Partly as a result of low energy prices, the US had evolved as a highly specialised economy with a distribution system that reflected this fact. As a result of the character of the existing energy using capital stock and inevitable inertia in its replacement, the US would need many decades to shift significantly towards a low-carbon economy. As one example of plant longevity, she said all US coal-fired power plants had been built before 1975.
The final presentation in this session was by Mr Willy Bjerke (Environmental Officer, International Aluminium Institute). He said the aluminium industry’s annual global output was some 32 m. t., of which 24 m. t. was new aluminium and 8 m. t. recycled metal. Production from bauxite was energy intensive, accounting typically for 25% of production costs for new metal; whilst its use (e.g. as a substitute for heavier materials in vehicles) and reuse saved energy and raw materials. Technological progress had enabled the industry to reduce its specific energy consumption by a third since 1970 and by more than 70% over the last 100 years. Significant reductions in emissions of perfluorocarbons (PFCs) had also been achieved, partly via voluntary agreements. Whilst continuing technical progress was anticipated, the nature of the electrolysis process meant that further incremental improvements in energy efficiency were much harder to secure. Greenhouse gas emissions would be further reduced by the use of inert anodes to replace carbon anodes, but this would not reduce process electricity use. Some three-quarters of new and planned aluminium production capacity would occur in countries not yet covered by the Kyoto Protocol. Climate change mitigation measures (such as carbon or energy taxes) adopted in OECD countries could lead to further migration of production facilities with no net environmental gain. These realities required careful attention by governments as such measures had harmful economic and social consequences, especially for employment prospects in energy-intensive industries located in OECD countries. He would therefore strongly support further research in this field under the OECD’s auspices.

Among the points made in the subsequent discussion were the following.

Mr Ruffing noted that the model results pointed to some severe impacts at a sectoral level if adjustment time periods were very short, highlighting the need to commence the adjustment process as soon as possible, with more demanding policy targets set for successive commitment periods. Given large impacts upon the competitiveness of energy-intensive sectors, there was a need for parallel moves across similar industries in all countries, underpinned by industry level agreements. Many econometric models were less useful for analysing microeconomic impacts -- requiring the use of a suite of models to analyse economic, environmental and social dimensions. As regards time scales, Ms Novak agreed that -- if longer adjustment periods were allowed and carbon trading introduced -- the DRI model runs projected the cost to US GDP would be some 2% rather than 4% and the loss in employment some 1.0-1.5 million, rather than 2.0-2.5 million in the rapid adjustment case she had outlined in her presentation. She also drew attention to longer-term modelling work in Canada by CERI that was adopting a 30-year model time horizon. Mr Hoerner said that most of the differences in the results of his modelling work and those presented by Dr Thorning and Ms Novak were much less dramatic if similar input assumptions were adopted (e.g. time horizons, border adjustments and the assumed pace of technological change).

Mr Chris Boyd (Lafarge, and Chairman of BIAC’s Environment Committee) wondered what the impacts upon the USA’s longer-term competitiveness might be if the US took little action to mitigate climate change when the rest of the OECD acted more decisively. He noted that Lafarge’s US cement plants were some 40% less energy efficient than those it operated in the EU. This could mean that future efforts would focus on securing more costly incremental emission reductions in the EU plants whilst being unable to harness lower-cost reductions available in the USA. Mr Guiseppe D’Ercole (Conféderation Italienne des Syndicats des Travailleurs - CISL) hoped that the events of 11 September might lead to a more global and less isolationist stance by the USA in some fields, including climate change.

Mr Tahar Hadj-Sadok (Deputy Executive Secretary, UNFCCC) asked that greater attention be paid to the opportunities for carbon trading and for carbon sequestration. Similarly, Mr Hoibye was disappointed by the narrow focus of many models upon taxation. Efforts should be increased to examine the least-cost set of policy measures in different sectors and countries, reflecting the different structures of their economic and energy systems.
Mr Tang agreed that one of the big uncertainties was the cost of adjustment to a lower or zero-carbon economy. This varied greatly, given that some sectors had capital equipment with much shorter lives than was the case for capital- and energy-intensive industries. Investment behaviour was also influenced by the future outlook e.g. if a climate ‘shock’ was anticipated this might well accelerate adjustment processes. Mr Manfred Bergmann (European Commission Directorate for Economic and Financial Affairs) noted that some earlier environmental challenges such as acid rain had been tackled by ‘end of pipe’ technologies, allowing modifications to be made to the existing capital stock in shorter adjustment periods. Replacement of capital stocks inevitably required a much longer time.

Mr Alain Mestre (Société d’Expertise Comptable - Syndex) noted that, in some cases, the US had taken a bold lead in environmental policy and cited the Californian Clean Air Act. This had led the US vehicle industry to spend heavily on clean car technologies. He wondered whether such ‘first mover’ advantages would be significant, and in which sectors such advantages might be greatest.

Mr Ruffing noted that technical change led to greater responses over long time horizons, which was why short-run price elasticities were lower than longer-run ones. He also thought that some sectors and countries could exploit non-CO\textsubscript{2} greenhouse gas reductions quite cost effectively (e.g. methane from landfill waste sites, or N\textsubscript{2}O from adipic acid production). Given the inertia inherent in OECD economies, because of their large, historically accumulated capital stocks, it was important to exert strong and permanent policy pressure to trigger the required responses. Any prolonged period of lower energy prices might make subsequent adjustment more difficult. This was why it was important to ‘synchronise’ policy and market messages.

Finally, and somewhat mischievously(!), Mr Kohler mused why it was possible for energy-intensive industries’ assets to be long lived and fixed, and yet also subject to rapid international relocation if incentivised by the uneven application of green taxation.

5. ISSUES FOR THE FUTURE

This session comprised seven brief presentations. It was introduced by Mr Braathen, in the form of a reflection upon the preceding presentations and some of their possible implications for a future OECD work programme. Amongst the numerous points he made were:

- The focus of most of the presentations had been upon the severe impacts on some industries, the economy, government revenue and employment. However, much less (if any) emphasis had been placed on the environmental benefits of mitigation measures such as taxes. The net impact on society was the balance between these two very different sets of costs.

- Clearly, the issues of inertia and the required time horizons for adjustments were important. Different analytical tools were required to address longer time horizons.

- To what extent was the functioning of the labour market well represented in models? Substitution possibilities might not be fully represented in some models, e.g. some tended to assume rather rigid labour markets, whereas the reality was for quite large movements over time between sectors and even localities.

- It was not easy to use models to examine all possible policy instruments or combinations of them, e.g. some policies were so ‘micro’ in character that they were impossible to incorporate effectively in many models.

- A joint group of OECD Member State environment and taxation experts was at present considering whether to undertake some sectoral case studies including employment implications. Final decisions had yet to be reached.
Mr Stephen Pursey (ILO) said it was inevitable that a significant effort to reduce greenhouse gas emissions would have a major employment effect. The net effect might be small, but large in overall terms. There remained considerable ignorance about the scale and timing of these employment changes, within the wider context of all other labour market developments. ILO estimates suggested some 500 m people were earning less than $1 a day, supporting 1-2 bn dependants. Some 500 m people would enter the global labour market of some 3 bn over the next 10 years, 97% of whom would be in LDCs. Business as usual policies would not be sufficient. Higher economic growth was essential in LDCs but this must be de-coupled from heavy resource dependence to reduce its environmental footprint. Key sectors here were energy, transport and agriculture. The ILO was holding a conference on employment in November 2001 in preparation for the International Labour Conference in June 2002, which in turn would bring proposals to the World Summit on Sustainable Development in Johannesburg in September 2002. The ILO was developing a long-term strategy which recognised the need to embrace the implications of climate change as well as technological developments in several sectors (e.g. communications, biotechnology), trade liberalisation, demographics and the functioning of labour markets. He hoped that the summary Report of this OECD LMP meeting could be used partly to inform a UN inter-agency meeting, including the ILO, UNFCCC, UNDP, UNEP and the World Bank. In stark terms, the longer-term objective of work on climate change and employment was quite clear: to avoid a crisis for politicians in choosing between tomorrow’s jobs and the future of the planet.

Mr Tahar Hadj-Sadok said both the background Issues Paper and the preceding discussion had neglected the importance of the spatial planning dimension in urban design. Failure to reflect with care on such a crucial issue for long-term sustainability would lead to heavy energy and transport dependence. In addition, issues such as sequestration (especially in agriculture and forestry) and the challenges of adaptation (as well as mitigation) must be addressed by the international agencies. To a degree these were of prime importance to national governments but it was important to share best practice at the international level.

Mr Michel Biart (Sustainable Development Unit, European Commission) said he would await with interest the summary report of this meeting. A task force of the Unit was examining the economic and social dimensions of sustainable development and climate change mitigation, and the possible trade-offs between these two dimensions. It was also examining the role of a wide group of stakeholders, such as final consumers and public agencies, and not just industry and employees. The theme of Sustainable Development would be receiving some 2 bn of the total 17 bn € funding under the EU’s sixth R&D Framework Programme. This would finance numerous further studies, including: an experimental study analysing the contribution of Community policies to employment generation; pollution abatement strategies at the level of the individual firm; qualitative as well as quantitative aspects of employment; and the range of policy instruments available to stimulate employment creation and improve the quality of jobs.

Mr Bernt Fallenkamp (Danish Confederation of Trade Unions, LO-DK) said a revolution was under way in the global ‘eco-business’ sectors. As but one illustration, not long ago interest in the role of wind generators had been dismissed as bizarre. Now they were one of the fastest growing global industries. A key issue for analysis of climate change and employment was a balanced perspective: to examine opportunities, not just constraints and problems. As for future research he suggested:

- Continuing the existing research activities but with greater emphasis on longer-term issues, which might present difficulties for some econometric models. Research issues should be determined by what mattered, and not constrained by what could be modelled.
- Work should develop from ‘passive’ modelling of trends towards more ‘active’ research to guide policy design, especially of least-cost, socially acceptable policy packages.
• The scope for collaboration between international agencies must be explored and exploited. Such agency partnerships would foster creative activity, shared insights, improved methodologies and better policy design.

• As for specific topics for a future research agenda he proposed examining: the social consequences of green taxation; new policy instruments; the issue of ‘free riders’ operating in competitive markets; the development and sharing of best practice in handling labour market transitions, including economy wide and work level studies; and the linking of sustainable development measures to financial indices such as the Dow and FTSE as this would influence behaviour in the corporate, financial and pension fund communities.

Mr Hoibye (Confederation of Norwegian Business and Industry) said the meeting had usefully identified some work priorities. These included: continuing evaluation of the rapidly developing experience of green taxes, voluntary agreements and emissions trading; analysis of ‘second best’ policies, especially in a world of uneven national mitigation responses, and how mitigation policy might advance if some countries were not moving in parallel; and examination of the impacts upon competitiveness of companies facing uneven mitigation burdens.

Finally Mr Bagnoli (OECD Global and Structural Policies Division, in place of Mr Tom Jones) concluded by saying he had found the meeting most useful. As regards labour market issues, economists assumed the supply curve for labour was inelastic except for variations in the wage level; but, in the short run, wages did not adjust but the number unemployed did. This was asymmetrical. He said the OECD was planning a range of future studies, but time constraints prevented a full review of these. Models needed to incorporate adjustment mechanisms. In addition more work was required on compositional effects in the longer term, such as winners and losers at the sectoral level. For shorter-term work the OECD planned to use one or more external and internal models. Work on greenhouse gas mitigation policies would cover several GHGs, not just CO₂.

The following points were made in the subsequent discussion.

• The costs of policy inaction should be identified, and at the national -- not only the global -- level, as this would focus the minds and the efforts of policy makers and stakeholders.

• Policy analysis should not be constrained by what modellers can accommodate. Evaluation of comparative experience of policy packages, not single instruments (such as green taxes or emissions trading), was a priority. Useful insights could be gained by means of well-considered scenarios. International agencies could usefully collaborate in developing some such scenarios to ‘paint pictures’ in a more easily understood form than was true of the results of many modelling exercises.

• The social dimensions of sustainable development merited a higher profile in research agendas by all international agencies. The OECD, in particular, could explore development of its earlier work on social indicators as a means of identifying policy measures for a ‘just transition’ in labour markets and communities. Again the need to examine spatial planning and land use issues was emphasised.

• Insufficient attention was being given to the role of LDCs in climate mitigation, and to the very severe challenges they faced in stimulating sustainable economic growth. LDCs did not have the resources to satisfy basic needs, or to adapt their economies to a lower/zero carbon future. In particular, the issue of exploiting sequestration opportunities in LDCs to permit business as usual in the OECD bloc was graphically described as a form of ‘carbon colonialism’. In response Mr Ruffing said the OECD always sought to work within the context of a general global model.
• It was said that, whilst the attitude of the USA to the Kyoto Protocol had been criticised, it had the merit of being based on rigorous analysis and political reality. It was reported that many US analysts doubted whether most EU Member States would - in the event - be able to meet their own Kyoto commitments. In response it was said that the EU had at least commenced mitigation efforts; and was employing an approach based upon ‘credible gradualism’ to initiate the necessary changes and to maintain momentum.

• The Kyoto process had not had much to say about international policy co-ordination. It might be an area where the OECD could play a useful and constructive role.

• The IEA had recently published a new study of relevance to participants. The IEA was also undertaking much work on domestic emissions trading and on the need, in due course, to integrate national schemes seamlessly at the international level. In addition, a new book on emissions trading would be published by the IEA in late October.

• As part of its future work programme, the OECD should consider co-ordinating international work on environment-related taxes; preparing ‘guideline’ studies, such as the guidelines it had already produced for sustainable transport, or for sustainable urban design; and evaluating growing experience of ‘win win’ cases which had benefited the environmental, economic and social dimensions.

• It was stated that, as intended, the meeting had been most useful in identifying many key questions for further research on the theme of climate change and employment. It was hoped that the OECD, ILO, UNFCCC, European Commission and others -- having reflected on the goodwill and constructive suggestions raised in the meeting -- would be able to identify synergies and create fruitful research partnerships.

6. CONCLUDING SESSION

The final session comprised the concluding observations by BIAC, TUAC and the Rapporteur.

Mr Tom Vant (Syncrude Canada) said he considered the meeting an important step forward. He welcomed the constructive support of the OECD and the mutual engagement of BIAC and TUAC in climate change policy issues. As was evident, mitigation policies would create winners and losers. There was thus a need for concerted efforts at the international level to analyse employment issues. Whilst models had a role, he hoped the research would be led by the real world questions to be answered, and not by the capabilities of modelling tools. He proposed initially a narrow and well-focused study of a few sectors in different countries including some energy-intensive industries. If this work was found useful it could be extended in future research. The objectives should be to gain better insights into the employment and wider social costs of transition; to learn lessons from contrasting national experience; and to provide evidence and guidance to develop credible and effective policies. The aim should be to identify opportunities, not just problems. Depending on the research results it appeared that a broad policy mix might be suitable, including voluntary agreements. He hoped the useful ideas that had emerged during the meeting could be fed into future OECD work; and, on behalf of BIAC, he looked forward to continuing dialogue on climate change and employment issues with the OECD and other international agencies.

Mr Reg Green (ICEM) also judged the meeting to have been most useful. Within the broader framework of sustainable development he felt a strong consensus had emerged during the day on the need for in-depth analysis of climate change and employment issues. Policy makers and opinion leaders

should be honest with those affected by transition and aim to ease the costs of change in labour markets and for the wider social agenda. The approach should be anticipatory: planned change in phased stages was preferable to the greater disruption caused by panic responses. Stakeholders must be engaged, as those who were excluded from such dialogue usually became the victims of change. The narrow, focused agenda proposed by Mr Vant had great merit as a first step. But he stressed that the OECD should seek to work with other agencies. He hoped the constructive suggestions made by Mr Pursey (ILO) could be followed up quickly, and that both BIAC and TUAC would be involved in any joint scoping meeting.

Prof. Chesshire said the atmosphere of constructive dialogue throughout the meeting encouraged him. It was of great intellectual interest, but a cause of very considerable confusion for policy makers, that the modelling results presented earlier should vary so very significantly. Clearly some of this variation stemmed from different input assumptions (e.g. the extent of emissions trading), and some from model structure. But he hoped future work by the OECD and other international agencies would continue to ‘look inside the black box’ to establish whether there were other causes for such dramatically different results. Reliable analysis was a prerequisite for the design of robust policy. Numerous worthwhile suggestions for future work had been made, as well as a proposal for some collaborative activity by international agencies. He very much hoped these would be taken forward soon.

Concluding the meeting Mr Ruffing thanked BIAC and TUAC for proposing a challenging and timely topic; and participants for attending and for their presentations. The potential research agenda was large, but in-house OECD resources were limited. The proposals for research co-operation would be considered most carefully.

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### ANNEX -- LIST OF PARTICIPANTS

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