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UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE

Ad Hoc Group on the Berlin Mandate
Fifth session
Geneva, 9-13 December 1996

IMPLEMENTATION OF THE BERLIN MANDATE

Proposals from Parties

Note by the secretariat

Addendum

The Ad Hoc Group on the Berlin Mandate, at its fourth session, invited Parties to submit further concrete proposals by 15 October 1996 (see FCCC/AGBM/1996/8, para. 37). Seven such proposals were received by 28 October 1996 and supplement the proposals already received (see FCCC/AGBM/1996/MISC.2 and Add.1).

In accordance with the procedure for miscellaneous documents, these submissions are attached and are reproduced in the language in which they were received and without formal editing.

FCCC/AGBM/1996/MISC.2/Add.2
GE.96- 64345

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Submission from Australia
Principal Elements of the Berlin Mandate Outcome

The attached proposal is submitted in response to the invitation of the Ad Hoc Group on the Berlin Mandate at its fourth session for parties to submit further concrete proposals on the features of a protocol or another legal instrument (FCCC/AGBM/1996/1.2/Add.1, paragraph 20).

This submission is provided in the interests of advancing the negotiations under the Berlin Mandate. In doing so, it should be understood in the context of previously stated positions and caveats by Australia relating to key policy features of the Berlin Mandate outcome. In addition, Australia reserves the right to submit further material on the attached elements and other elements of a Berlin Mandate outcome.

In developing the attached proposal, Australia has been guided by a number of key principles. First, the outcome of the negotiations should be consistent with the Framework Convention on Climate Change and give full expression to all components of the Berlin Mandate. Secondly, Australia is firmly of the view that the best prospects for achieving the ultimate objective of the Convention in the long term are in the development of a mechanism which enables the burden of abatement action to be shared as equitably as possible by properly taking into account the relevant circumstances of each country, including its stage of development, in the formulation of commitments. Thirdly, the Berlin Mandate outcome should be seen as a further step in an ongoing process towards achieving the ultimate objective of the Convention. Accordingly, it should provide a solid basis for achieving greater participation, over time, in global action to address climate change.

This proposal is not intended to be an exhaustive or final articulation of the contents of an instrument resulting from the Berlin Mandate process. Rather, it seeks to identify some principal elements of the outcome of that process.

Differentiation

A key element of the proposal is the provision for differentiated quantified emission limitation and reduction objectives (QELROs). This contrasts with the uniform QELRO approach advocated by some other participants in the Berlin Mandate negotiations.

There is a growing body of literature and analytical work which demonstrates that a uniform QELRO (in a form like the Convention's present implied target of returning emissions to a uniform historical level by a specified date) will have non-uniform consequences for the economic welfare of different countries due to differences in factors such as population and economic growth, industrial structure, resource bases and trade linkages. A uniform QELRO would result in inequitable abatement tasks and unfair reductions in economic welfare for individual countries undertaking such commitments.

Application of such an approach would therefore be inequitable, unfair and unlikely to attract the widest possible country participation and the level of commitment needed to sustain international abatement efforts over the long term.

Considered from a global perspective issues of equity have many dimensions, some of which are addressed in the Convention (such as developed country parties taking the lead in combating climate change). In the Berlin Mandate context, the equity principles which Australia is focusing on address equity among Annex I parties in respect of setting QELROs within specified time frames, such as 2005, 2010 and 2020.

The Convention and the Berlin Mandate make provision for differentiation. Both refer to the need for equitable and appropriate contributions by Annex I parties. It is therefore necessary for the Berlin Mandate negotiations to deliver an outcome that is both fair and effective in further contributing to the global effort to address climate change.

In elaborating the approach in the attached proposal, Australia has been guided by the need for the Berlin Mandate negotiations to develop a workable, realistic and achievable differentiation framework that will deliver:

- fairness and equity: Annex I parties would face similar percentage changes in per person economic welfare;

- environmental effectiveness: increased ability of Annex I parties to fulfil commitments would lead to a more effective global effort to address climate change; and

- efficiency and cost effectiveness: differentiation is compatible with market based approaches, such as emissions trading and activities implemented jointly.

Australia's approach to differentiation is aimed at achieving equity between Annex I parties by having the Berlin Mandate outcome result in those countries undertaking mitigation commitments facing similar percentage changes in per person economic welfare as a result of international emission abatement action.

Underlying this principle of equity is the fundamental concept of distributive justice. Broadly, this means that each Annex I party, in contributing fairly to the collective objective, should share equally, on a per person basis, in the consequent changes to national economic welfare. Having regard to the structure of Annex I economies, it is Australia's position that this underlying concept of equity can best be expressed in the form of differentiated contributions to the collective objective which equitably capture both production and trade implications. For example, Gross National Expenditure (GNE) is a widely accepted index of national economic welfare which incorporates production and trade impacts. A tangible expression of equitable differentiation could accordingly be that each Annex I party's contribution to a collective objective would be determined on the basis that each Annex I party incurs an equal percentage change in terms of its per person GNE.

It is proposed that differentiation be achieved through the use of selected core indicators which would be applicable to all Annex I parties in taking account of differences innational circumstances. Such indicators would be used to formulate rules that could be applied, in a practical way, in providing guidance on how and to what extent country differences could be taken into account in differentiating QELROs for those countries undertaking mitigation commitments under the Berlin Mandate.

Australia's approach to the selection of relevant core indicators has been guided by the need to capture the economic welfare impacts of international abatement action, cover all greenhouse gases, and be measurable using internationally accepted data. These core indicators are fully justifiable on the basis of common sense and economic literature and are broadly applicable to all parties.

The attached proposal identifies the two main components of economic welfare change as domestic production effects and international trade effects. It is suggested that the core indicators that relate to the magnitude of the domestic economy impacts would be:

- GDP growth,
- population growth, and
- emissions intensity of GDP.

Core indicators that relate to international trade impacts would be:

- fossil fuel trade, and
- emission intensity of exports.

This set of core indicators would be generally applicable but additional indicators may be developed in the negotiations. Such a process should initially concentrate on ensuring that the key differences between countries are adequately captured through describing the relevant elements of differentiation.

Australia considers it critically important that the key differences between Annex I parties are adequately addressed in the Berlin Mandate process through the use of selected indicators, including the interactions between such indicators in addressing the totality of their effects on the economic welfare of these countries, to ensure equitable QELRO outcomes.

Australia's approach to differentiation also provides an equitable basis for those non-Annex I parties who elect to undertake mitigation commitments under the Berlin Mandate to do so in line with their development situation and at a rate commensurate with their development needs.

Achieving a Berlin Mandate outcome involving differentiated QELROs for Annex I parties (and other Convention parties who elect to undertake commitments) will require agreement on what elements of differentiation need to be negotiated and the steps in the negotiation

process. Such a negotiation would be aimed at simultaneously balancing the interests and priorities of all parties undertaking mitigation commitments - individually as well as ollectively - within an agreed framework in which the interests of all negotiating parties are safeguarded.

The negotiating process could involve the balancing of a set of individual country interests within the parameters of a collective QELRO. The establishment of a collective QELRO would create the benchmark for the outcome of negotiated commitments under Part II of the attached proposal. This collective commitment and the explicit recognition of equity principles as the basis for determining each party's contribution to achieving it would improve the overall environmental outcome.

Flexibility

Fairness and economic efficiency are fundamental to achieving an environmentally effective outcome from the Berlin Mandate negotiations. Both considerations must be addressed to ensure the level of commitment and participation needed to sustain cooperative action to achieve the ultimate objective of the Convention. A cost effective outcome is essential to maximising the environmental outcome achieved (for a given global economic cost) and a recognition that all parties undertaking QELRO commitments would receive fair and equitable treatment will encourage parties to make greater contributions and hence achieve a more effective environmental outcome.

Market based approaches are important to enhance the cost effectiveness of the Berlin Mandate outcome. Thus mechanisms such as emission trading and emission budgets - which allow for countries to take advantage of lower cost abatement options in other countries and to devise optimal emission abatement paths - could contribute to improving the cost effectiveness of the Berlin Mandate outcome.

Important as these mechanisms are, they do not address the central issue of equity. While cost effective approaches work to equalise the marginal abatement costs across countries, they will not, in general, achieve equal percentage changes in per person economic welfare across Annex I parties. Ensuring a fair and equitable outcome depends crucially on the initial distribution of commitments. Thus, the initial distribution of commitments must explicitly address the need for equity. This is the case for both simple emission banking regimes and provision for a simple form of emissions trading, as well as for fully fledged tradable emission regimes which may evolve over the longer term. Differentiating QELROs or establishing trading regimes which take into account national circumstances is necessary to ensure basic fairness in the distribution of the costs of mitigating climate change. This points to the need for the negotiations to develop a set of rules on which any QELRO and any emissions trading regime would need to be based.

Time frames

Consideration of the appropriate time frame to apply to the Berlin Mandate outcome raises a range of complex issues, including uncertainties over short/long term trade offs and the importance of workability and arriving at realistic and achievable QELROs. This involves consideration of the appropriateness of a single short or medium time frame or, alternatively, whether a shorter term time frame combined with an indicative longer term

time frame would provide a more appropriate framework for long term planning, investment decisions and research and development of new technologies. While longer time frames might be judged conducive to better planning, full consideration needs to be given to dealing with the need for sufficient certainty concerning key variables within the planning horizon in assessing whether QELROs will be realistic, achievable and equitable.

Emission banking or budgets also have important implications for consideration of an appropriate time frame, by allowing countries to devise optimum abatement paths while achieving a given (cumulative) QELRO.

Transparency

Ensuring transparency and comparability of information provided by parties is a matter of fundamental importance to the Convention process. As the commitments resulting from the Berlin Mandate process are likely to be more complex than those encountered by the Convention to date, it will be necessary to ensure that the National Communications and in-depth review process is strengthened accordingly.

PRINCIPAL ELEMENTS OF THE BERLIN MANDATE OUTCOME

PART I: GENERAL OBLIGATIONS AND PRINCIPLES

1. The outcome should reaffirm the objective and principles in articles 2 and 3 respectively of the Framework Convention on Climate Change ("the Convention"), as well as the environmental, economic and equity objectives of the Berlin Mandate. It should explicitly acknowledge that parties assuming commitments in Part II are taking the lead in combating climate change, but that there remains an ongoing need for all parties to make equitable and appropriate contributions to the global effort to achieve the ultimate objective of the Convention.

2. A collective quantified emissions limitation and reduction objective ("QELRO") would establish the environmental outcome sought from the Berlin Mandate process and provide a basis against which specific commitments under Part II could be negotiated. Any collective QELRO should be realistic and achievable.

PART II: COMMITMENTS OF SPECIFIED PARTIES

(a) Quantified Emissions Limitation and Reduction Objectives

3. The negotiation of specific commitments of parties should result in differentiated QELROs within a specified time frame or time frames for the parties undertaking commitments under this Part ("Part II commitments"), which would be specified in an annex to the legal instrument (Annex A). These QELROs should cover anthropogenic emissions by sources and removals by sinks of all greenhouse gases ("GHG") not controlled by the Montreal Protocol.

4. The Berlin Mandate outcome should also ensure that the collective QELRO could be achieved at global least cost with parties undertaking Part II commitments being provided with sufficient flexibility to achieve their respective QELROs cost effectively.

Differentiation

5. The Convention and the Berlin Mandate respectively provide guidance on factors and individual country circumstances which should be taken into account in the implementation of emission abatement commitments and in the elaboration of new commitments under the Berlin Mandate process.

6. The process of negotiating commitments would be assisted through the elaboration of rules which would provide specific guidance on how and to what extent differences in starting points and approaches, economic structures and resource bases, the need to maintain strong and sustainable economic growth, available technologies and other individual circumstances, as well as the need for equitable and appropriate contributions by each of the parties undertaking Part II commitments to the global effort are to be taken into account to differentiate the commitments of parties equitably.

7. The formulation of appropriate rules for setting differentiated QELROs should be guided by the objective of ensuring that equitable contributions are made by each of these

parties to the global effort to mitigate climate change. Underlying this principle of equity is the fundamental concept of distributive justice. Broadly this means that each party undertaking Part II commitments, in contributing fairly to the collective QELRO, should share equally, on a per person basis, in any consequent changes to national economic welfare. An overarching rule for giving effect to this objective would be to require parties to aim to achieve an equitable distribution of the per person economic impacts associated with mitigation commitments, such that countries with similar per person income levels incur similar per person economic welfare impacts. Over the longer term, guidance will also be needed to better define appropriate contributions to the global effort to mitigate climate change. This could then be achieved in the context of a rule requiring countries' individual contributions to be determined according to their level of economic development.

8. These overarching rules describe the parameters of an equitable and appropriate outcome consistent with the provisions of the Convention. A Berlin Mandate outcome containing a set of equitable QELRO commitments would be achieved through use of a set of indicators for determining equal percentage changes in terms of per person GNE associated with mitigation commitments. These indicators would determine the key sources of economic impacts associated with international emission abatement action. In turn, these factors would be used to identify indicators of economic welfare changes which have universal applicability in taking account of differences in national circumstances for use in the differentiation of abatement tasks. The selection of such indicators should be guided by the availability of internationally accepted data.

9. A range of studies has shown that the economic impacts of international emission abatement actions can be split into two groups:

(a) domestic economy impacts; and

(b) international trade impacts.

10. Domestic impacts arise from changes to the composition and scale of economic activity associated with reduced GHG emissions. Trade impacts arise from shifts in international demand for fossil fuels, and other energy and emission intensive exports.

11. Core indicators which are universally applicable for domestic and trade related economic impacts are discussed below. Other countries may wish to propose additional indicators which they consider important in capturing the different sources of economic welfare impacts across countries.

I. Domestic Economy Impacts

12. Efforts to reduce GHG emissions in the economy beyond possible no-regrets measures will incur losses in economic welfare. The magnitude of economic welfare losses will, in general, depend on two key factors:

(a) the magnitude of the underlying rate of growth in GHG emissions, i.e. underlying business-as-usual ("BAU") growth; and

(b) the costs of reducing a unit of emissions.

13. Other things being equal, a higher underlying rate of GHG emission growth will be associated with a larger abatement task for any party attempting to meet a uniform QELRO and, therefore, will result in higher economic cost. As the emission reduction task increases, additional actions required to return emissions to pre-determined historical levels will become increasingly costly as low cost emission reduction opportunities are exhausted. Because of this, other things being equal, countries undertaking comparatively large emission reductions relative to BAU will face a higher average unit cost of emission reductions compared to other countries and consequently their per person costs of emission reduction will be comparatively greater.

14. The rate at which unit costs of emission abatement escalate with increases in emission abatement tasks will differ substantially from country to country owing to differences in economic structure.

15. The following gives a set of core indicators which identify the differential costs associated with the above two factors. The relative importance of each of these indicators for differentiation will depend on the national circumstances facing different countries.

Indicator: GDP Growth of the Economy

16. The growth of the economy is an important determinant of emissions growth for all parties. The importance of economic growth is recognised by the Convention and the Berlin Mandate, which require commitments to take into account the need to maintain strong and sustainable economic growth.

17. Other things being equal, faster economic growth would result in higher emissions growth and hence a higher economic welfare loss for any party attempting to meet a uniform QELRO.

18. Making allowance for different rates of economic growth will be important not only for OECD countries, but also for the Economies in Transition ("EIT"). It can be expected that the success of the economic reform process in the EITs would set the stage for a period of strong and sustained economic growth in these countries, with economic growth rates much higher than for the OECD average. This in turn would imply that the underlying growth in emissions in such fast growth economies will be higher than the average for countries undertaking Part II commitments and, consequently, result in a higher economic welfare loss in achieving a uniform QELRO. Accordingly, inclusion of an indicator of GDP growth to guide differentiation of party commitments will be essential to meet the requirements of the Berlin Mandate and the Convention in ensuring equity.

Indicator: Population Growth

19. Population growth is an important factor in determining the underlying emissions growth of an economy. Other things being equal, the higher the population growth, the higher will be the underlying rate of emissions growth.

20. The wide variation in population growth rates across parties undertaking Part II commitments and the long time frames required to achieve the Convention's objectives suggest that differences in population growth could prove an important consideration in achieving equitable outcomes. In particular, to achieve a uniform QELRO would require a country with high population growth to reduce emissions by a greater percentage than a country with low population growth. All else being equal, it would be expected that high population growth will result in a high abatement task and, due to increasing marginal costs, a high unit cost of abatement. Thus countries with high population growth could be expected to incur a relatively higher loss in economic welfare in meeting uniform QELROs. Using population growth as an indicator in the determination of country commitments will be an essential component of ensuring an equitable outcome.

Indicator: Emissions Intensity of GDP

21. The emissions intensity of an economy influences the economic welfare changes associated with international abatement action that that economy will experience in a variety of ways. The nature of the impact and its relative importance will depend on the economic structure and circumstances of individual economies.

22. A country with a relatively high emissions intensity of GDP will experience a higher magnitude of emissions growth for a given rate of economic growth than a similar economy with a lower emissions intensity of output. In the absence of subsidies and other market distortions, a relatively high emissions intensity of GDP is likely to reflect a country's comparative advantage in emission intensive goods and relatively high level of dependence on fossil fuels. Continued multilateral trade liberalisation will lead to further specialisation in areas of comparative advantage, driving economic growth in emission intensive activities in countries with a comparative advantage in these activities. In other words, other things being equal, the higher the emissions intensity of GDP, the higher the magnitude of the emissions reduction task and thus the higher the economic welfare cost of achieving a uniform QELRO.

23. Account should also be taken of circumstances where a country with a low emissions intensity of GDP would find it more costly to reduce unit emissions than an economy with higher emissions intensity of output. This stems from two factors. First, it is observed savings and greater energy efficiency, including through switching to non-fossil fuel sources and less GHG-intensive activities. Secondly, some of these countries with low emissions intensity of output would find it necessary to reduce emissions across a more limited range of activities than countries with a higher emissions intensity of output. These elements are captured in the need to take account of differences in starting points in the Convention and the Berlin Mandate. Other things being equal, these countries are likely to incur higher economic welfare losses in reducing emissions to achieve a uniform QELRO.

24. The relative importance of these different influences will depend on the economic structure and circumstances of individual economies. This indicator demonstrates the importance of correctly identifying the impacts of factors affecting economic welfare loss in different economies and the need for them each to be carefully accounted for in ensuring commitments are determined equitably.

II. International trade impacts

25. The importance of trade linkages between economies and the role of terms of trade effects in determining the magnitude of economic welfare losses arising from international emission abatement actions is a consistent and powerful theme in climate change policy literature.

26. All countries are affected by trade impacts arising from international abatement action to a greater or lesser degree depending on the product composition, direction and volume of their exports. In particular, it is widely recognised that international efforts to reduce GHG emissions will reduce the demand for and price of fossil fuels and energy and other emission intensive goods, thereby affecting the economic growth and economic welfare of countries dependent on such trade.

27. Article 4.2(a) of the Convention and paragraph 2(a) of the Berlin Mandate make provision for these impacts on economic growth and economic welfare to be taken into account in the implementation of commitments and to guide the elaboration of QELROs. Accordingly, the Berlin Mandate negotiations need to determine appropriate means of differentiating QELROs to reflect the adverse trade impacts on parties undertaking Part II commitments.

Indicator: Fossil Fuel Trade

28. As identified in article 4.10 of the Convention and paragraph 1(b) of the Berlin Mandate, parties particularly dependent on income generated from the production, processing and export of fossil fuels are particularly vulnerable to adverse terms of trade impacts and hence economic welfare losses. Action by parties undertaking Part II commitments to reduce emissions will tend to reduce the price and demand for fossil fuels. This will result in adverse terms of trade movements and resultant economic welfare losses for exporters of fossil fuels. In contrast, international efforts to reduce emissions will result in improvements in the terms of trade for importers of fossil fuels and, consequently, improvements in their economic welfare.

29. The significance of these terms of trade impacts on economic welfare will vary between parties undertaking Part II commitments depending on the relative importance of fossil fuels in the party's export and import profile. It is important that this source of loss in economic welfare of fossil fuel exporters is fully accounted for in setting differentiated and equitable QELROs. The Berlin Mandate requires such considerations to guide the elaboration of new commitments. An indicator based on the relative importance of fossil fuels in a party's exports and imports would meet this requirement.

Indicator: Emissions Intensity of Exports

30. The emissions intensity of a country's exports will be another important determinant of the extent of economic welfare losses it experiences in the context of international emissions abatement action. For any one country, the emissions intensity of its exports will be a product of its resource base and industrial structure. Article 4.2(a) of the Convention and paragraph 2(a) of the Berlin Mandate call for resource bases and

economic structures to be taken into account, as well as the need to maintain strong and sustainable economic growth. In addition, article 4.10 of the Convention and paragraph 1(b) of the Berlin Mandate recognise the vulnerability of parties particularly dependent on income generated from the production, processing and export of energy intensive products and the need for these considerations to guide the Berlin Mandate negotiations.

31. The Berlin Mandate outcome should provide a means for dealing with any economic welfare losses which derive from loss of international competitiveness flowing from the agreed abatement commitments, and the resultant displacement of emissions intensive activity to countries not undertaking Part II commitments (i.e. carbon leakage). Using the emissions intensity of a country's exports as an indicator of the extent to which it will experience such adverse economic welfare impacts and factoring this indicator into the determination of differentiated QELROs will be critical in achieving equitable differentiation.

32. The importance of international competitiveness and carbon leakage impacts for a country undertaking Part II commitments will depend on the relative importance of energy intensive and other emission intensive goods in that country's economy, the direction of that country's exports and the significance of market competition in the supply of such goods from countries which are not undertaking Part II commitments. The international competitiveness impacts will be particularly acute for countries with relatively high emission intensiveness of exports. The export sectors of countries with relatively high emission intensities will be more vulnerable to adverse economic impacts from the implementation of measures to respond to climate change. Other things being equal, for these countries this will translate into relatively high economic welfare losses due to loss of international competitiveness and carbon leakage.

33. The Berlin Mandate outcome should be flexible enough to work with, and not against, the rapidly changing trading structures occurring as a result of global economic integration and the liberalisation of trade across the world. Using this indicator would explicitly take account of the structure of national economies and hence address international competitiveness and carbon leakage impacts as required by the Berlin Mandate.

Negotiating differentiated QELROs using indicators

34. The Berlin Mandate outcome should contain a set of rules developed from the above indicators which would be applied in the negotiation of differentiated QELROs which satisfy equity requirements. Elaboration of the rules would address any interactions between indicators to ensure equitable differentiated outcomes. These rules would need to be applied as a package as it will be their combined effect which will be critical in achieving an equitable negotiated outcome.

35. The Berlin Mandate outcome should include elaboration of appropriate guidance about the application of the rules and the modalities for the negotiation of differentiated QELROs using these rules. Negotiation of other international agreements where equity principles have been recognised provide a number of possible negotiating models.

Flexibility

36. In the negotiations further consideration should be given to approaches which improve cost effectiveness for individual countries undertaking Part II commitments and for the global economy. This consideration should include approaches to enhance flexibility for countries to devise optimal emission abatement paths through emission budgets or banking, both of which are compatible with the approach to differentiation set out above.

37. Importantly, this consideration should include approaches such as emissions trading and joint implementation which provide for countries to take advantage of lower abatement costs in other countries. It is important that consideration be given to the range of issues involved in emission trading, particularly the basis on which it could be established and operate. Any emissions trading regime will need to address fully the need for equitable initial allocations for parties undertaking QELRO commitments. Such initial allocations would need to be differentiated on a basis which satisfied the same set of economic welfare indicators set out above.

(b) Policies and Measures

38. The outcome should be based on the existing obligations under articles 4.2(a), 12.1 and 12.2 of the Convention by requiring each party undertaking Part II commitments to adopt national policies and measures to implement their obligations under this Part. Each of these parties would undertake to submit a National Action Plan detailing their national policies and measures, together with performance indicators by which that individual party's performance in implementing policies and measures to limit or reduce GHG emissions could be made transparent.

(c) Communication and Review of Information

39. There will need to be a process for communication and review of information regarding performance of parties in implementing their commitments and the policies and measures that collectively constitute their National Action Plans. Consideration will need to be given to whether this should involve the creation of a separate communication process or the provision of additional information as part of meeting the existing commitments in article 12 of the Convention.

40. Following the model of the Convention, the Conference of Parties/Meeting of Parties (see paragraph 46 below) under the new instrument should have the capacity to consider information supplied in national communications/National Action Plans.

(d) Periodic Review of Commitments

41. The Berlin Mandate instrument will need some provision for review of commitments before its expiry, with a view to possible adjustment of both country and collective commitments. If commitments were set to 2010 or 2020 without scope for adjustment, changes in scientific knowledge, technological developments and the circumstances of individual parties could undermine the environmental objective and lead to inequities. The

modalities of the review process will depend on the nature of the commitments that parties undertake, e.g. setting a cumulative QELRO would require provision for a particular kind of review process.

42. Periodic review would be a separate process from communication and review of information. Provision for periodic review needs to be made to deal with the following cases:

(i) To take into account improved scientific understanding of climate change and technological developments.

(ii) To take it into account changes over time in the situation of parties implementing their commitments, including in respect of GDP growth, population growth, emission intensity of GDP, fossil fuel trade and emission intensity of exports.

(iii) To deal with the special circumstances of Economies in Transition and other countries which are undergoing rapid transformation and which are not listed in Annex I of the Convention, but which elect to undertake commitments under Part II. (In these cases, consideration should be given to providing for more frequent reviews at the option of individual parties in this situation. There should also be appropriate flexibility in approaching adjustments of such parties' commitments in line with their development situation and uncertainties associated with expectations regarding the growth in their emissions).

(iv) To allow individual parties to seek at any time a review of their commitments in the event of an unforeseen change in their circumstances. (The modalities of the review process in such cases will require further consideration.)

43. The outcome should provide that periodic reviews are to be undertaken by the parties, with appropriate technical assistance, at appropriate intervals. Provision will also need to be made for the basis on which any adjustment would be agreed. For instance, consideration would need to be given to the nature of that process, including means available for the acceptance or objection by individual parties of any adjustment affecting them.

PART III: INSTITUTIONAL ARRANGEMENTS

44. The Berlin Mandate outcome should include provision for the new regime's institutional arrangements and its relationship to the Convention's Subsidiary Bodies.

(a) Secretariat

45. The instrument should provide that the Convention secretariat service the new regime, it should list the functions to be performed by the secretariat in a general and brief way, and there should be a general provision that the cost of secretariat services for the new instrument is to be met only by its parties.

(b) Conference of the Parties

46. The instrument should make provision for the creation of a decision-making/governing body separate from the Convention's Conference of the Parties which, to maintain the independent identity of the new body, would have its own meetings. For reasons of administrative convenience and expense its sessions should be scheduled immediately before or after those of the Convention. To minimise the possibility of confusion, it should be called something other than a Conference of the Parties, possibly a Meeting of the Parties. The new body should be given a list of functions, including one corresponding to that provided in article 7.2 (a) of the Convention.

(c) Subsidiary Bodies

47. The instrument should provide that both the SBI (subject to resolving possible questions about its legal capacity to do so) and the SBSTA provide services to the new regime broadly similar to those provided to the Convention. The cost of undertaking additional work should be met by the parties to the new regime. The question of participation in the work of these bodies by representatives of countries not party to the new regime should be considered in the light of the precise role these bodies are given in the instrument.

(d) Settlement of Disputes and Multilateral Consultative Process

48. The formal dispute resolution mechanism provided in article 14 of the Convention should apply to the new regime, subject to any necessary technical modifications. The outcome should also provide that if and when the Multilateral Consultative Process provided for under article 13 of the Convention is developed, the Conference/Meeting of the Parties to the Berlin Mandate instrument be authorised to decide whether such a process be applied to the new regime and whether any modifications to that process would be necessary or desirable for its application. It could also decide upon any consequential financial arrangements.

(e) Relationship to other agreements

49. The relationship between the Berlin Mandate outcome and other existing international agreements will need to be addressed in the instrument, in particular how the rights and obligations derived by any party from any existing international agreement might be affected. The outcome should ensure that the instrument does not derogate from the provisions of the Agreement Establishing the World Trade Organisation (WTO) or affect the rights and obligations of Members of the WTO.

PART IV: FURTHER ACTION

50. The Berlin Mandate outcome should provide for the establishment of a process for further negotiations aimed at further contributing to achieving the ultimate objective of the Convention.

PART V: FINAL PROVISIONS

(a) Amendments

51. Amendment to parts of the instrument other than Part II commitments should take place in accordance with the procedure agreed to for article 15 of the Convention. Special provision should be made for adjustments to Part II commitments, as outlined above under Periodic Review of Commitments (paragraphs 41-43).

(b) Right to Vote

52. Consideration will need to be given to appropriate voting rights in respect of certain issues, such as those affecting commitments assumed under Part II.

(c) Provisional Application

53. The instrument should provide for individual parties to be able to apply its terms provisionally (i.e. before it enters into force). Such a provision could be useful if delay were expected in entry into force. It would also allow states to move to begin meeting their commitments when they faced long delays before joining the regime because of domestic processes.

(d) Entry into Force

54. The mechanism for entry into force could be important. Consideration will have to be given to whether it would be appropriate in the particular circumstances of this instrument for entry into force to be possible solely on the basis of a specified number of ratifications. It may be appropriate to include a further requirement of ratification by a certain number of countries which undertake Part II commitments.

(e) Other issues

55. Other final provisions would include Signature, Consent to be Bound (ratification etc.), Withdrawal and Authentic texts.

PAPER NO. 2: GAMBIA

Submission From The Gambia Government Relating to Discussions To Be Held During The FCCC Bodies Meeting In December 1996

Ad-hoc group on the Berlin Mandate (AGBM)

In outlining policies and measures (P&M) consideration should be given to varying the circumstances of different categories of Parties to the Convention, especially with respect to Quantified Emission limitation Reduction Objectives (QELROs)

In the light of new information emerging from Research and Systematic observation of Climate Change, there should be the possibility for Parties to amend their local policies and measures. Also global policies to be formulated should take into account local policies on a sub-regional or regional basis.

PAPER NO. 3: IRELAND (on behalf of the European Community)

ELABORATION OF THE EU DRAFT PROTOCOL STRUCTURE

ARTICLE 1

Article on necessary definitions to be developed

ARTICLE 2

Commitments by developed country Parties and other Parties listed in Annex X

a) General commitment regarding policies and measures

- Parties listed in Annex X shall adopt and implement policies and take measures within national[1] and where appropriate regional programmes referred to in Article 4.1(b) of the Convention to limit and reduce anthropogenic emissions of greenhouse gases not controlled by the Montreal Protocol from all relevant sectors, including renewable energies; energy efficiency standards, labelling and other product related measures; CO_2 emissions from the transportation sector; economic instruments in the field of climate change; energy policies; industrial sector emissions, including voluntary agreements; agriculture; emissions from waste; fluorocarbons and SF_6; municipal actions; and to protect and enhance sinks and reservoirs, including forests.

b) Further commitments regarding policies and measures

(i) Parties shall adopt and implement the policies and measures set out in Annex A.

(ii) Parties shall give high priority to the adoption and implementation of the policies and measures set out in Annex B, and shall work towards their early coordination, by applying the guidance set out in the Annex.

(iii) Parties shall give the policies and measures in Annex C priority for inclusion in national programmes, as appropriate to national circumstances.

c) Commitment regarding limitation and reduction objectives

- Each of the Parties listed in Annex X shall, individually or jointly, abide by quantified objectives to achieve significant overall reductions, after the year 2000 below 1990

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[1] This includes policies and measures adopted by regional economic integration organisations.

levels within specified timeframes,[2] of anthropogenic emissions by sources and enhancement of removals by sinks of greenhouse gases not controlled by the Montreal Protocol, as set out in Annex Y.[3]

d) Joint Implementation

- Parties may implement such policies and measures as set out in Article 2(b) above and attain such limitation and reduction objectives in greenhouse gases as set out in Article 2(c) above jointly with Parties listed in Annex X and Parties that have made a notification under Article 2(f) below of intention to be bound by commitments on emission limitation and reduction objectives under Article 2(c) above.

- The Conference of the Parties shall take decisions regarding criteria for joint implementation with other Parties at a future session[4].

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[2] such as 2005, 2010 and 2020

[3] To date, the following range of possible reductions have been proposed by some Parties, and further proposals will follow.

- each Annex I Party to reduce overall greenhouse gas emissions to 5–10% below 1990 levels by 2010 (UK);
- reduce CO_2 emissions to 10–20% below 1990 levels by 2010 (Belgium);
- each Annex I Party to reduce CO_2 emissions to 10% below 1990 by 2005, and 15–20% by 2010 (Germany, Austria);
- each Annex I Party to reduce CO_2 emissions to 20% below 1990 levels by 2005 (AOSIS);
- reduce CO_2 emissions by 20% of 1990 levels by 2005 and by 50% of 1990 levels by 2030 (Denmark);
- Annex I Parties together reduce total greenhouse gas emissions by an average of 1–2% per year (Netherlands);
- adopt greenhouse gas emissions paths converging eventually to similar levels of emissions per capita or per unit of GDP leading to an overall emissions reduction within specified timeframes (France, Spain);
- reduce/limit greenhouse gas emissions on the basis of emissions per GDP, in order to reduce overall Annex I emissions in the medium/long term (Japan).

[4] As soon as Parties to the Convention have taken a decision on the pilot phase of AIJ in accordance with Decision 5/CP.1

(Article 14 of the FCCC)
This Article is applicable. No need arises for a special provision in the Protocol, as paragraph 8 of Article 14 states that its provisions shall apply to any legal instrument which the Conference of the Parties may adopt, unless the instrument provides otherwise.

(Articles 15, 18 and 19 of the FCCC)
These should be made applicable mutatis mutandis.]

[PROVISIONS on amendments, including simplified procedures for amending the annexes.]

[FINAL CLAUSES (entry into force, etc).

(Article 17 of the FCCC)
Paragraph 4 needs to be reiterated.

(Article 20 of the FCCC)
Needs to be adapted to the new Protocol

(Article 22 of the FCCC)
Needs to be rewritten for the purposes of the Protocol. The reference to the requirements of Article 17 paragraph 4 of the Convention (only Parties to the Convention may be Parties to a Protocol) could perhaps be included here, viz:- The Protocol, as set out in Article 17 of the UN FCCC, shall be subject to ratification, acceptance, approval or accession by States and by regional economic integration organisations, which are Parties to the Convention.

(Article 23 of the FCCC)
The conditions for entry into force of the Protocol will need careful consideration later in the negotiating process in the light of the commitments which can be reached in the Protocol negotiations.

(Article 24 of the FCCC)
Needs to be explicitly repeated in a Protocol.

(Articles 25 and 26 of the FCCC)
Should also be repeated and adapted.]

ANNEX A

POLICIES AND MEASURES TO BE COMMON TO NATIONAL PROGRAMMES OF ALL ANNEX X PARTIES

ANNEX B

POLICIES AND MEASURES TO BE GIVEN HIGH PRIORITY FOR INCLUSION IN NATIONAL PROGRAMMES OF ANNEX X PARTIES AND FOR COORDINATION WITH OTHER PARTIES

ANNEX C

NATIONAL POLICIES AND MEASURES

ANNEX D

Containing the most recent Global Warming potentials (GWPs), as agreed by IPCC for greenhouse gases not covered by the Montreal Protocol

ANNEX X

List of countries to be bound by Article 2(a) to Article 2(e).

ANNEX Y

Quantified limitation and reduction objectives for Parties in Annex X.

e) Commitments regarding communication of information relating to implementation[5]

- Annex X Parties shall include in communications under Article 12 of the Convention a detailed description of the policies and measures adopted and implemented to meet the commitments under Articles 2(a) to 2(c) above, specific estimates of their effects and, as appropriate, their costs, and resulting projected anthropogenic emissions.

- Annex X Parties shall submit an initial communication within six months of the entry into force of the Protocol for that Party. Each Party not so listed shall make its initial communication within 3 years of the entry into force of the Protocol for that Party. The frequency of subsequent communications by all Parties shall be determined by the Conference of the Parties at its sixth session and subsequent sessions.

- Such communications shall include in particular the results of reviews of national policies and practices referred to in Article 4.2(e)(ii) of the Convention and any significant changes identified.

f) Voluntary application by non-Annex X Parties

- Any Party not listed in Annex X may, in its instrument of ratification, acceptance, approval or accession, or at any time thereafter, notify the Depositary that it intends to be bound by some or all of the commitments under Article 2(b) above to adopt and implement specific policies and measures in Annexes A, B and C, and/or that it intends to be bound by commitments on emissions limitation and reduction objectives under Article 2(c) above. The Depositary shall inform the other signatories and Parties of any such notification. Any Party not listed in Annex X making a notification in relation to Article 2(b) and/or Article 2(c) shall be bound by commitments regarding communication of information relating to implementation under Article 2(e) above, as relevant.

g) Possible annexes on methodological questions

- Annex D shall contain the most recent Global Warming Potentials (GWPs), as agreed by IPCC for greenhouse gases not covered by the Montreal Protocol.

ARTICLE 3

Commitments by all Parties

Provisions on continuing to advance the implementation of existing commitments by all Parties so as to facilitate reaching the ultimate objective of the Convention.

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[5] Since the new commitments would have to be accompanied by substantial and mandatory reporting commitments, appropriate parts of Article 12 of the Convention could be carried over into the Protocol as such. Additions to the "Guidelines for the preparation of National Communications by Annex I Parties" consistent with the control schedule will also have to be made.

[To be developed on the basis of Article 4.1 of the Convention, the Berlin Mandate and the EU submission to AGBM 4 (in FCCC/AGBM/1996/MISC.1/Add.3) and submissions from other Parties.]

ARTICLE 4

The Conference of Parties shall review the adequacy of these commitments on the basis of Article 2 of the Convention, of best available scientific information and assessment of climate change and its impacts, as well as relevant technical, social and economic information, and take appropriate action.

The first review and the appropriate action based on that review shall take place no later than 31 December 2002. Further reviews and appropriate action shall take place at regular intervals thereafter, to be decided by the Conference of the Parties.

The Conference of the Parties at its first session shall review the content and scope of all Annexes and shall update them regularly in the light of progress on the implementation of policies and measures by Parties, including progress on co-ordination of measures, the identification or elaboration of additional policies and measures, new scientific or technological advice, and other relevant developments.

ARTICLES 5 et seq of the EU Proposed Protocol Structure

[FURTHER PROVISIONS to deal with relevant Articles of the FCCC.

(Articles 7, 8, 9 & 10 of the FCCC)
The EU strongly supports the use of the existing Convention bodies to the greatest extent possible. There may be practical or legal reasons why this is not possible or desirable in all cases. In particular, the EU believes that there is a need for the establishment of a separate Conference of the Parties of the Protocol. It will in any event be necessary to ensure that Parties to the Convention, which are not Parties to the Protocol, will not be represented on the Protocol Conference of the Parties Bureau or be able to provide officers of the Protocol subsidiary bodies or to vote on Protocol matters.

(Article 11 of the FCCC)
The financial mechanism defined for the purposes of the Convention as well as the entity or entities entrusted with its operation shall serve as the financial mechanism and entity or entities for the purposes of the Protocol.

(Article 13 of the FCCC)
The Protocol shall contain a provision enabling the establishment of an Implementation Committee to review, at the request of a Party or Parties, the Secretariat, or a Party in respect of itself, compliance with its obligations under the Protocol. The Committee shall make regular reports to the Conference of the Parties, which shall take appropriate decisions in the light of such reports. The review procedure shall be simple, facilitative, cooperative, non-judicial and transparent.

PAPER NO. 4: NORWAY

United Nations' Framework Convention on Climate Change - Ad Hoc Group on the Berlin Mandate - Submission by Norway

The Berlin Mandate prescribes the process for advancing the international response to climate change. An identified priority in this process is the strengthening of the commitments of Annex I Parties to the Convention in Article 4.2 (a) and (b). In this context, the Ministerial Declaration at the second Conference of the Parties, advising "...quantified legally-binding objectives for emission limitations and significant overall reductions within specified timeframes..." to be set for Annex I Parties, represents an important step towards adoption of an adequate agreement at the third session of the Conference of the Parties in 1997.

Consistent with the Convention, the Berlin Mandate contains a set of principles which commitments must adhere to. Specifically, in the context of policies and measures and quantified limitation and reduction objectives for Annex I Parties, the Berlin Mandate emphasises that "...the differences in starting points and approaches, economic structures and resource basis, the need to maintain strong and sustainable economic growth, available technologies and other individual circumstances, as well as the need for equitable and appropriate contributions by each of these Parties to the global effort..." must be taken into account when setting objectives.

The operationalization of these premises for commitments in a protocol or another legal instrument has been and will continue to be a key issue for the Ad hoc Group on the Berlin Mandate (AGBM). The UNFCCC Secretariat's note "Review of possible indicators to define criteria for differentiation among Annex I Parties" provides an overview of various possibilities which have been presented to this end. It is the position of the Government of Norway that a differentiated approach is necessary according to the Berlin Mandate. In addition, a protocol or another legal instrument should be, as far as possible, cost-efficient across greenhouse gases, sectors and countries to achieve environmental objectives at least overall costs to the Parties.

This submission is a response to the invitation to Parties to "submit further concrete proposals on policies and measures, QELROs, and other possible features of a protocol or another legal instrument, by 15 October 1996". The attached note substantiates the reasons why uniform targets across Annex I Parties would be inconsistent with the premises of the Berlin Mandate, and discusses some criteria and indicators for differentiation contained in the secretariat note that provide for key factors to be taken into account while maintaining simplicity. In order to facilitate completion of the work of the AGBM by the third session of the Conference of the Parties, a thorough discussion of the elements and preconditions set by the Mandate remains indispensable.

The Government of Norway remains strongly committed to the process of developing and taking on new and legally binding commitments as evolving scientific findings require.

Possible criteria and indicators for differentiated commitments (QELROs)

1. Introduction

At the fourth meeting of the Ad hoc Group on the Berlin Mandate (AGBM) the Parties were invited to submit proposals regarding possible criteria and modalities for differentiation of quantified emission limitation and reduction objectives (QELROs). The present proposal is intended to contribute to the discussions on how to achieve an agreement on a structure of QELROs that will be in accordance with the Berlin Mandate and fulfil the intentions of the UN Framework Convention on Climate Change (FCCC). It is meant as a basis for further discussions on criteria and indicators for differentiated QELROs.

The point of departure for the discussion in the following sections is that a protocol or another legal instrument should be, as far as possible, cost-efficient across greenhouse gases (GHGs), sectors and countries. In this way, environmental objectives can be achieved at least overall cost to the Parties. In addition, a new and strengthened agreement should take into consideration an equitable sharing of burdens between Annex I Parties.

An agreement that takes into account both cost-effectiveness and an equitable sharing of burdens could be implemented in at least two ways. An internationally harmonised tax levied on GHG emissions could be combined with a financial mechanism to secure a fair sharing of burdens. Another possibility will be for the Parties to undertake commitments based on differentiated QELROs. In both cases a set of criteria for distribution is needed. Any system which distributes emission commitments among Parties, including a system with differentiated QELROs, will in addition require flexible instruments, such as activities implemented jointly or tradable quotas, to secure cost-effectiveness. Criteria and possible indicators for differentiated QELROs are discussed below.

2. The Berlin Mandate - a mandate for differentiated QELROs

The FCCC and the Berlin Mandate establish provisions for differentiation of commitments both between Annex I and non-Annex I Parties and among Parties within these categories. The Convention contains several principles and specific provisions that reflect such differentiation between Parties.

The general principle outlined in Article 3.1 shall guide the Parties in their actions to achieve the objective of the Convention and to implement its provisions, stating that "the parties should protect the climate system for the benefit of present and future generations of humankind, *on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities*" (italics added).

Specifically for Annex I Parties, Article 4.2(a) further reflects the intention that equity should be applied *not only* between developed and developing country Parties but among developed country Parties as well.[1] Article 4.2(a) states that in the Annex I Parties' joint effort to reach the objective of the Convention, account shall be taken of "*the differences in these Parties' starting points and approaches, economic structures and resource bases, the need to maintain strong and sustainable economic growth, available technologies and other individual circumstances, as well as the need for equitable and appropriate contributions by each of these Parties...*" (italics added).

These principles and provisions were incorporated in the Berlin Mandate as an explicit guidance for the AGBM process. In paragraph 2(a) the Mandate clearly underlines that the differences in Annex I Parties' starting points, economic structures and resource bases, as well as other country- wise individual circumstances, are recognised as a basis for the negotiations on QELROs.[2]

The IPCC/WG III in the *Second Assessment Report* also strongly underlines the importance of reflecting the substantial differences that exist among countries in any future agreement. A basic argument for this view is that countries are "unlikely to participate fully unless they perceive the arrangements to be equitable", and that "governments will find it easier to comply with international obligations if their citizens feel that obligations and benefits of compliance are distributed equally".[3] The IPCC/WG III further stresses that variations among developed country Parties, such as those referred to in Article 4.2(a), have to be reflected in the commitments to make the agreement both equitable and efficient.[4]

The above mentioned provisions of the FCCC and the Berlin Mandate, as well as the insight provided by the IPCC, should guide the ongoing elaboration on strengthened commitments, implying a need for the development of a system for differentiation of commitments on an equitable basis. A stringent flat rate approach should therefore in this respect *not* be seen as the "default value" in the present negotiations, but rather as being outside the mandate agreed to in Berlin. Clearly, a stringent flat rate approach for setting QELRO's would not take into account differences in Annex I Parties' starting points and approaches, economic structures and resource bases, the need to maintain strong and sustainable economic growth, available technologies and other individual circumstances, as well as the need for equitable and appropriate contributions by each of these Parties.

Most measures to reduce emissions of GHGs will involve costs to all Parties, but such costs will vary significantly among Parties. Differences in Parties' national circumstances, such as economic structure and energy profile, might lead to highly different burdens among Parties if the commitments were not distributed in a way that reflected these differences.

The present proposal does not enter into detailed elaboration on how a system of differentiation should be *implemented*. However, one possible solution is to strengthen the

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[1] See especially IPCC (1996), *Climate Change 1995 - Economic and Social Dimensions of Climate Change*, Contribution of Working Group III to the Second Assessment Report of the Intergovernmental Panel on Climate Change, chapter 3.

[2] Articles 4.1, 4.3, 4.6 and 4.10 of the Convention also reflect some degree of differentiation *vis-à-vis* the implementation of commitments by Annex I parties.

[3] IPCC, op.cit, page 83.

[4] Ibid, page 100.

commitments by setting an overall emission limitation or reduction objective for a group of Parties, e.g. the Annex I Parties, and then allocate QELROs to each Party within the group according to criteria and indicators as suggested below.

The proposal on a set of criteria and indicators for differentiation of QELROs is intended to form a basis for further discussions on a formula that may reflect different national circumstances and the need for equity.

3. Criteria for differentiation

The FCCC offers some guidance on national circumstances that should be given consideration when implementing the Parties' differentiated commitments under the Convention. For instance, Articles 4.6-4.10 elaborate on factors that could be relevant for an equitable sharing of burdens between Parties in responding to climate change.

Selecting one single criterion as a basis for differentiated QELROs might not be considered feasible. Instead a multi-criteria approach is suggested. With reference to the FCCC, three basic elements are here proposed to be reflected when establishing feasible and fair criteria for differentiation between Annex I Parties: a country's emission intensity - reflecting efficiency, a country's level of GHG emissions, and its level of economic development or "wealth".

It should be underlined that a *comprehensive approach* should be the basis for commitments. "Emissions" as used in the present proposal therefore in principle pertains to all GHGs, and includes removals by sinks. Although data for emissions of some GHGs may be uncertain, efforts should be made to include as many as possible of the GHGs in a formula for differentiation of commitments among Annex I Parties.

- Emission intensity

The FCCC underlines the principle of cost-effectiveness. For instance, Article 3.3 of the Convention states that precautionary measures shall take into account that "policies and measures should be cost-effective so as to ensure global benefits at the lowest possible cost". An important criteria to be included in a multi-criteria formulae for differentiation would therefore be the consideration of the overall cost-effectiveness of the arrangement.

A strictly cost-effective agreement would imply a distribution of commitments among Parties in a way that leads marginal costs of abatement of all GHGs to be equal among all Parties and keeps the overall abatement costs to a minimum. It should be stressed that a set of criteria for differentiated commitments does not add up to a fully cost-effective agreement. The distribution of commitments as suggested in the present proposal will not only be based on the costs of reducing emissions of GHGs, but also take into account other differences among countries. It may therefore lead to higher overall costs than an agreement based exclusively on the concept of cost-effectiveness. Thus, it is acknowledged that an agreement establishing differentiated commitments requires flexible implementation mechanisms (such as activities implemented jointly, trade in emission quotas or other instruments) to further cost-effectiveness and stimulate the achievement of overall targets and commitments at the lowest possible costs.

- *Level of GHG emissions*

The principle of common but differentiated responsibilities (Article 3.1) gives some guidance on how to implement the Convention on an equitable basis. One of the basic considerations underlying this principle is the fact that countries vary widely in the degree and nature of their contribution to climate change: variations span over both gases and sources, as well as in capacities of sinks for absorbing carbon emissions. The emission levels should therefore be taken into consideration when allocating commitments between Parties.

- *Level of economic development*

It is understood in the FCCC, e.g. by pointing to Parties' respective capabilities (Article 3.1), that Parties that have greater capacity, economic or otherwise, to deal with the problem should do more than other Parties to reduce emissions. Wealth is one of the most clearly marked and pervasive differences between countries. To a large degree wealth determines a country's "ability to pay" or capacity to bear the costs of abating GHG emissions. The welfare impacts of reductions in GHG emissions may therefore differ according to the wealth level.

An indicator for levels of economic development or wealth should thus be included in a formula for allocation of commitments among Annex I Parties to limit and reduce emissions. Used in combination with the criterion emphasising the level of GHG emissions, these two criteria may together reflect the equity and fairness issues in a balanced way.

4. Possible indicators for differentiation

It has been considered as an overall aim that selected initial indicators should be simple and transparent. Such indicators would be easier to negotiate, compile and use. In a longer term, the indicators can be developed further with the aim to increase their ability to reflect national differences and their potential to encourage even more equitable and efficient outcomes. By opening for such an iterative process, more complex indicators, or the way they are combined, can be developed and agreed as more knowledge becomes available.

The three indicators suggested below are commonly identified as potentially useful in differentiating among Annex I Parties, and have as such been elaborated in the document FCCC/AGBM/1996/7 ("Review of possible indicators to define criteria for differentiation among Annex I Parties") prepared by the secretariat.[5] The indicators have a high degree of simplicity and are relatively easy to calculate. The data/input needed to use the indicators are also relatively easy to compile and verify, and should be available in the Parties' national communications.

a) An indicator reflecting emission intensity

To select a simple indicator to take into account cost-effectiveness is not straightforward. Here, it has been assumed that the higher the carbon intensity in a country's economy is, the lower the marginal costs will generally be of reducing CO_2 emissions by one unit.

[5] See *FCCC/AGBM/1996/7*, 21 June 1996, para. 23-40.

Accordingly, the emission intensity, defined as *CO_2 equivalent emissions per unit of GDP (gross domestic product)*, has been selected as a rough indicator of the costs associated with emission reductions measures.[6]

Emissions per unit of GDP will vary, *inter alia*, according to national energy sources and energy efficiency, type of economic production and consumption of energy per unit of GDP. Countries might have a low emission intensity because they already have implemented measures to reduce emissions or because their energy supply system is based on low carbon intensive or carbon free energy sources. Generally, the cleaner the energy sources and the higher the energy efficiency, the lower the possibilities for substitutions to cleaner/renewable energy sources, and the higher the costs per unit emissions reduction. Although not perfectly revealing the costs of emission reductions, an indicator for emission intensity can still be considered an approximate measure for cost-effectiveness.

b) An indicator reflecting level of GHG emissions

An indicator which has frequently been proposed as a basis for the assignment of emission quotas is the share of emissions per capita. A similar indicator including all GHGs would be the share of *CO_2 equivalent emissions per capita.*

As an example, if a Party has higher emissions of CO_2 equivalents per capita than the average for the Annex I Parties, an exclusive use of this indicator would mean that the Party would have to reduce its emissions more than the average for the Annex I Parties, and vice versa.

c) An indicator reflecting a country's level of economic development

Several indicators may be used to reflect a Party's level of development or wealth as a basis for allocating emissions commitments among Parties. Among these, *GDP per capita* is a commonly used indicator of a country's level of economic development or wealth. An exclusive use of this indicator could for instance mean that Parties whose per capita GDP is above the average for the Annex I Parties should undertake more extensive commitments than the average of the Annex I Parties, and vice versa.

CO_2 equivalent emissions per capita and per capita GDP as indicators both reflect equity concerns, but differences in national circumstances may indicate that the two indicators could preferably be combined. For instance, if CO_2 equivalent emissions per capita were to be used as an indicator alone, countries with "economies in transition" might have come badly off because they have a relatively high level of CO_2 emissions per capita. If used in combination with GDP per capita, however, the special situation of these Parties can also be taken into account.

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[6] GDP is defined as the value of all goods and services provided in a country by residents and non-residents without regard to their allocation among domestic and foreign claims. An alternative measure would be *gross national product* (GNP), which is the sum of the domestic and foreign output of all residents of a country, including income received from abroad by residents for factor services rendered abroad, and after subtracting transfers to countries abroad of income by residents of other countries.

5. Calculation of emission quotas

In a formula, the weighted sum of the above indicators for individual Parties could be related to the average for a group of countries (e.g. the Annex I Parties). If it is assumed that the group agrees on a target for the group as a whole, the indicators suggested could be used to determine the specific targets for individual Parties. Such targets should be determined as annual emissions relative to the projected level for a specified year.

By attaching weights to the individual indicators the three indicators could be combined and constructed as a multi-criteria indicator. A Party might be above the average of the group for some indicators and below the average for other indicators. If a Party has an emission intensity which is higher than the average, the Party should reduce emissions more than the average as far as this indicator is concerned. Correspondingly, for the other indicators, if a Party has a level of GHG emissions per capita that is higher than the average, the Party should reduce emissions more than the average, and if a Party has a per capita GDP higher than the average, the Party should reduce emissions more than the average. By varying the values of the weights, one can attach varying importance to the different indicators. In order to stimulate cost-effective outcomes and reduce the overall international costs of implementing the agreements, the indicator for emission intensity should be given more weight than the two other indicators.

An example of a formula in line with this proposal is outlined in the box below. Such a formula might be particularly suitable for use in a long-term, dynamic perspective. When an agreed protocol or another legal instrument is to be renegotiated at a later time, the weights in the formula can be adjusted in line with new knowledge.

Example of formula:

The formula outlined below considers a Party's required percentage reductions of greenhouse gas emissions on basis of the indicators singled out in the proposal. CO_2 equivalent emissions/GDP is included in the formula as an indicator for emission intensity, while the GDP per capita and CO_2 equivalent emissions per capita are included to conduce to an equitable outcome.

This gives the following formula: $$Yi = A\left[x\left(\frac{Bi}{B}\right) + y\left(\frac{Ci}{C}\right) + z\left(\frac{Di}{D}\right)\right]$$

where Y_i is the percentage reduction of emissions for Party i. The relation of Bi to B is CO_2 equivalents to the GDP for Party i relative to the average in the Annex I Parties. The relation of C_i to C is the GDP per capita in Party i relative to the average in the Annex I Parties, while the relation of D_i to D is CO_2 equivalent emissions per capita in Party i relative to the average of the Annex I Parties. A is a scale factor to ensure that the desired overall reduction in emissions is achieved. The coefficients x, y and z are weights, which add up to a total of 1.

PAPER NO. 5: UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND

FRAMEWORK CONVENTION ON CLIMATE CHANGE: AD HOC GROUP ON THE BERLIN MANDATE

POSSIBLE FEATURES OF A PROTOCOL OR ANOTHER LEGAL INSTRUMENT

Comments from the United Kingdom

1. The draft report of AGBM 4 (paper FCCC/AGBM/1996/L.2/Add.1) sets out an invitation for Parties "to submit further concrete proposals on policies and measures, QELROs and other possible features of a protocol or another legal instrument by 15 October 1996." Ireland, as Presidency of the European Union, has submitted a response to the secretariat on behalf of the European Community and its Member States. The UK fully supports this submission.

2. As set out in the EU submission, the UK has proposed that reductions of greenhouse gas emissions by each Annex I Party to 5–10% below 1990 levels by 2010 would be a credible and appropriate target. Our view is that there is no longer any reason not to adopt a multigas, or "basket", approach. For some countries—although not the UK—non-CO_2 gases are very significant in the contribution they make to global warming. We should therefore ensure that the next stage of commitments gives countries the flexibility to address their overall greenhouse gas emissions in the most appropriate and cost-effective manner.

3. The Berlin Mandate states that the process to enable the Conference of the Parties to take appropriate action for the period beyond 2000, through the adoption of a protocol or another legal instrument, will, *inter alia*, "...reaffirm existing commitments in Article 4.1 and continue to advance the implementation of these commitments in order to achieve sustainable development, taking into account Article 4.3, 4.5 and 4.7." The UK considers that the advancement of existing commitments for all Parties is an important aspect of the Berlin Mandate process. The EU submission on possible features of a protocol or another legal instrument includes an outline Article to make provision for advancing the implementation of existing commitments, which the EU proposes should be developed on the basis of Article 4.1 of the Convention, the Berlin Mandate, the submission to AGBM 4 made by the Italian Presidency of the EU (set out in paper FCCC/AGBM/1996/MISC.1/Add.3) and submissions from other Parties. In this context, and associating itself with the EU submission to AGBM 4, the UK hereby submits an initial indicative list of ways in which existing commitments could be advanced by all Parties, which we hope could be developed to form a part of the protocol, or other legal instrument, to be agreed at COP 3.

n) strengthen arrangements for in-depth reviews of Annex I Parties' communications, along the lines of the OECD Country Environmental Performance Reviews (ie including a formal opportunity for other Parties to ask questions about the review findings);

o) introduce in-depth reviews of non-Annex I Parties' national communications, along the lines of existing arrangements for Annex I.

k Climate change

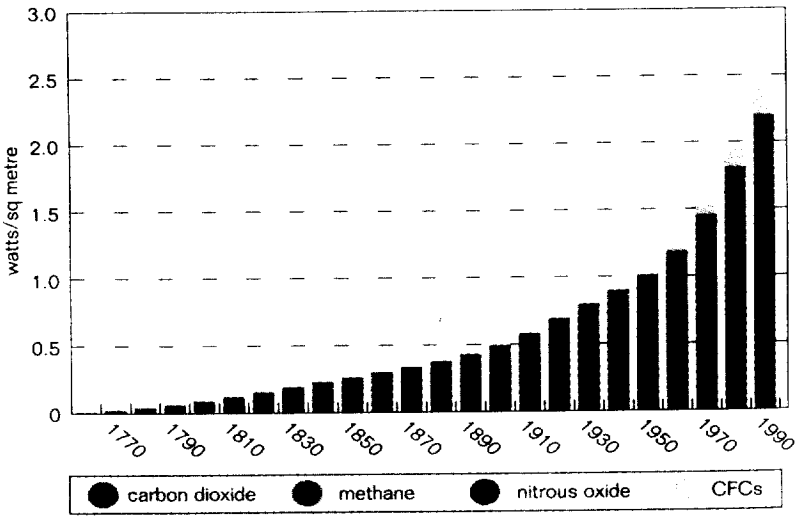
The key sustainable development objective is to limit emissions of greenhouse gases which may contribute to global warming and climate change. Indicators of relevance are greenhouse gas radiative forcing rates, global temperature change, and UK emissions of greenhouse gases.

Global greenhouse gas radiative forcing rates and global temperatures

Indicator k1: Global greenhouse gas radiative forcing rate

Total average greenhouse gas radiative forcing has increased steadily over the last 200 years, largely because of increases in atmospheric carbon dioxide concentrations and, to a lesser extent, methane and nitrous oxide. Since 1960, atmospheric concentrations of chluorofluorocarbons (CFCs) have contributed to the overall warming rate.

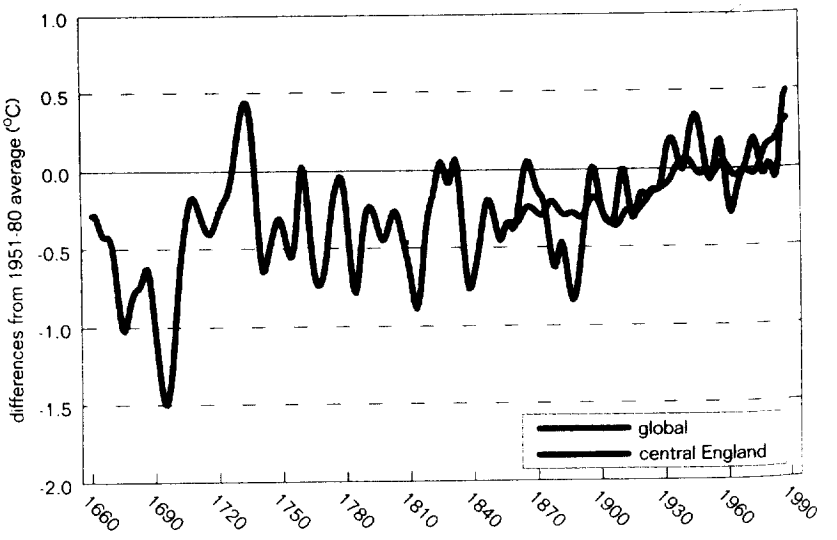
Global greenhouse gas radiative forcing rate



Indicator k2: Global temperature change

Observed global temperature increases are consistent with the expected increase estimated from enhanced levels of greenhouse gases.

Annual average central England and global temperature anomalies



Advancing the implementation of Article 4.1 of the Convention: options for development

Article 4.1(a): national inventories

a) [require/encourage] all Parties to move to use of full IPCC compatible methodology for preparation of inventories [as soon as possible after 2000/by a given date];

b) strengthen [requirement/commitment] for all Parties to provide annual inventory[data/updates] for [all/specified] greenhouse gases [within a given period/by a given date];

c) identify and agree to implement specific actions to foster bilateral, regional and global co-operation to facilitate development of national inventories.

Article 4.1(b): programmes to mitigate and adapt to climate change

d) strengthen commitment to update national programmes: to be provided [annually/on a given frequency], not only when a further communication to the Convention is due;

e) identify and agree to implement specific actions to foster bilateral, regional and global co-operation to facilitate formulation and implementation of national programmes of measures to mitigate and adapt to climate change.

Article 4.1(c): technologies, practices and processes

f) identify and agree to implement specific actions to foster bilateral, regional and global co-operation to increase the development, application and diffusion, including transfer, of technologies, practices and processes that control, reduce or prevent greenhouse gas emissions.

Article 4.1(e): adaptation

g) all Parties to participate fully in the work of international bodies (such as UNEP) in examining, assessing and developing strategies for adaptation to climate change.

Article 4.1(f): climate change considerations

h) identify and agree to implement strategy to ensure climate change considerations are taken into account in all relevant Government policy areas and initiatives.

Article 4.1(g): research and development/Article 4.1(h): exchange of information

I) all Parties to participate fully in the World Climate Programme and the Climate Agenda [currently being prepared by UN Agencies, led by UNEP].

Article 4.1(I): education, training and public awareness

j) all Parties to support and/or participate in the START initiative of the International Geosphere-Biosphere Programme and the educational programmes of WMO/UNEP.

Article 4.1(j): communications to the Conference of the Parties

k) all Parties should identify in their national communications any of their policies and practices which encourage activities that lead to greater levels of anthropogenic emissions of greenhouse gases not controlled by the Montreal Protocol than would otherwise occur.

Cross-cutting options

l) all Parties to be encouraged to ratify the Convention;

m) develop and implement indicators of climate change in the context of sustainable development, with particular reference to paragraph 4 of decision 4/5 of the Fourth Session of the UN Commission on Sustainable Development in 1996[1], and include in national communications (see attached examples of climate change and related indicators from *Indicators of Sustainable Development for the United Kingdom*, 1996);

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[1] "The Commission invites Governments to test, develop, and use the indicators of sustainable development based, *inter alia*, on the work done to date, as appropriate, on identifying the indicators and preparing the corresponding methodology sheets. In this regard, Governments are encouraged, as appropriate, to adopt indicators at the national level and to consider the advantages of working in partnership with other countries in the testing, further development and use of the indicators."

The earth absorbs solar radiation mainly at its surface and this energy is then redistributed by the atmosphere and the oceans and re-radiated to space. Some outgoing infrared radiation is absorbed by naturally occurring greenhouse gases and by clouds, and some of this is re-radiated to the earth's surface. The result of this, the *natural greenhouse effect*, is that the surface of the earth is some 33°C warmer than it would be without greenhouse gases in the atmosphere. Increases in the atmospheric concentrations of greenhouse gases, because of human activity, contribute to an *enhanced greenhouse effect*. *Radiative forcing* is the term given to the effect which greenhouse gases have in altering the energy balance of the Earth-atmosphere system - a positive radiative forcing caused by increased concentrations of greenhouse gases tends to warm the earth's surface and the lower atmosphere.

Indicator k1 shows the average greenhouse gas radiative forcing since 1760.

The main greenhouse gases emitted because of human activity are carbon dioxide, methane, nitrous oxide, and, since the 1960s, the halocarbons of which chlorofluorocarbons (CFCs) are the most significant. The human-induced greenhouse gas radiative forcing has increased from virtually zero in the pre-industrial era to around 2.5 watts per square metre today. Carbon dioxide contributes most to the overall warming rate at approximately 1.5 watts per square metre at present. Contributions from methane, nitrous oxide and CFCs are about 0.6, 0.1 and 0.3 watts per square metre respectively.

Ozone is also an effective greenhouse gas whose concentration is altered by human activity. Ozone in the lower atmosphere is probably increasing because it is generated by chemical reactions involving nitrogen oxide and hydrocarbons and emissions of these compounds are increasing. By contrast, ozone in the upper atmosphere is being destroyed as a result of emissions of CFCs and other halocarbons. Therefore, the net contribution of CFCs to greenhouse radiative forcing could be substantially reduced if the indirect effect of destroying ozone in the upper atmosphere is taken into account.

Indicator k2 shows global annual temperature variations since 1858 and annual temperature variations over central England since 1660.

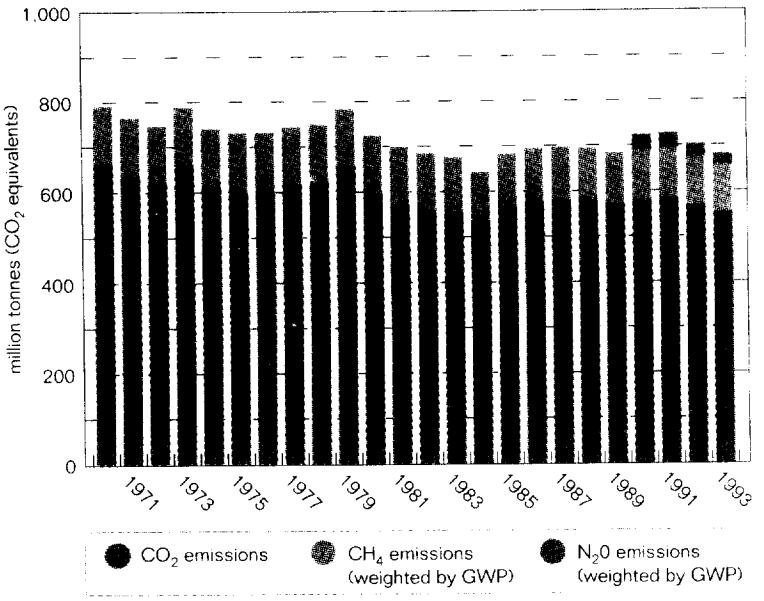
Global temperatures have been increasing over the last 130 years and this change is consistent with the expected increase in temperature estimated to result from increasing greenhouse gases. The Intergovernmental Panel on Climate Change (IPCC) estimates that if nothing is done to limit greenhouse gases, the global average temperature could increase by between 0.2°C and 0.5°C each decade over the next 100 years. The central England temperatures over the last three centuries show greater fluctuations, as would be expected for a small area. It is too soon to tell whether the recent warming over England is a reflection of global changes. Other temperature fluctuations are known, in part, to be due to changes in atmospheric circulation.

UK greenhouse gas emissions

Indicator k3:
Emissions of greenhouse gases

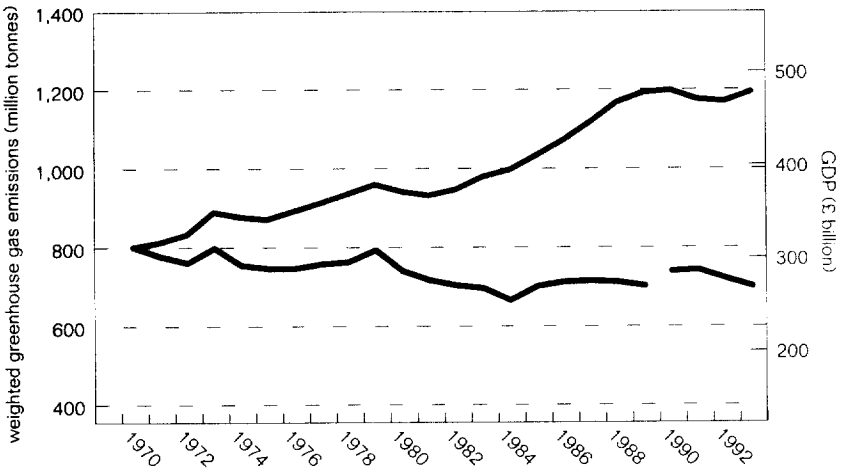
Target:
To return UK emissions of carbon dioxide and other greenhouse gases to 1990 levels by the year 2000.

CO_2, CH_4 and N_2O emissions (weighted by GWPs): UK



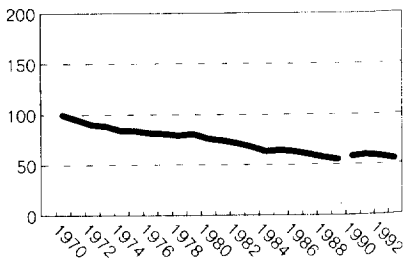
GWPs: Global Warming Potentials (over 100 years)
N_2O emissions included from 1990

CO_2, CH_4 and N_2O emissions (weighted) and GDP: UK



N_2O emissions included from 1990

Index of weighted greenhouse gas emissions per GDP (1970=100): UK



UK emissions of greenhouse gases have gradually decreased over the last two decades and are on course to meet the internationally agreed target to return emissions to 1990 levels by the year 2000 for each greenhouse gas. Carbon dioxide is by far the most significant greenhouse gas for the UK. Emissions relative to economic output have almost halved since 1970.

The major greenhouse gas is carbon dioxide and the UK contributes, largely through burning of fossil fuels, about 2 per cent to global man-made emissions. UK methane emissions arising mainly from landfilled waste, animals, coal mining, gas pipe leakage, and offshore oil and gas operations contribute about 1 per cent of global man-made emissions. UK nitrous oxide emissions, mainly from industry and agriculture, also contribute about 1 per cent of man-made emissions. CFCs, which are also powerful greenhouse gases with generally long atmospheric lifetimes, are being phased out under the Montreal Protocol because of their important role in the depletion of the ozone layer.

Indicator k3 shows the trends since 1970 in UK estimated emissions of greenhouse gases and total emissions in relation to the change in GDP.

Global Warming Potentials (GWPs) provide a relative index which allows the radiative effects of emissions of each greenhouse gas to be compared. Relative to carbon dioxide (GWP = 1.0), the latest GWP estimate for methane is 24.5 and for nitrous oxide 320 over a 100-year time horizon, although considerable uncertainty surrounds these figures. These weights have been applied to annual estimates of UK emissions of carbon dioxide and methane since 1970 and to nitrous oxide since 1990, the earliest year for which UK estimates are available, to give an overall UK global warming index. Although the GWP for carbon dioxide is lower than for other greenhouse gases, emissions of carbon dioxide are much larger so carbon dioxide has the greatest impact on global warming.

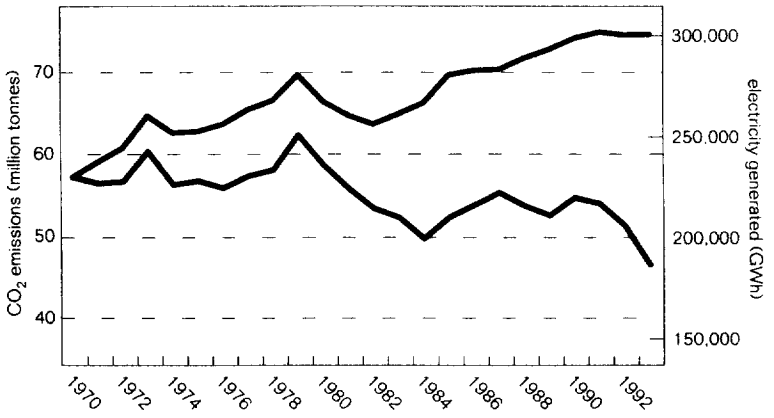
UK emissions of carbon dioxide have decreased from 664 million tonnes in 1970 to 554 million tonnes in 1993, a drop of 17 per cent. The UK's target is to return carbon dioxide emissions to 1990 levels by the year 2000; in 1993, emissions were already nearly 25 million tonnes below this target.

UK methane emissions have fallen from 126 million tonnes (CO_2 equivalent) to 102 million tonnes in 1993, a decrease of 19 per cent since 1970. The relative importance of UK nitrous oxide emissions is small at between 25 and 35 million tonnes (CO_2 equivalent) per annum.

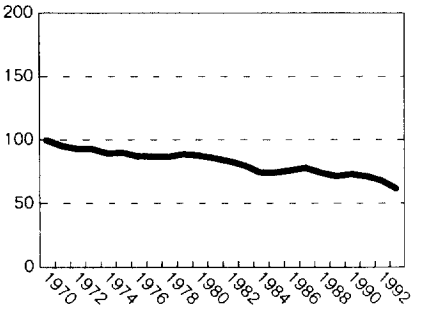
Whereas emissions of greenhouse gases have decreased since 1970, economic output as measured by GDP has increased by around 57 per cent in real terms over this period. The UK economy has become substantially more carbon efficient over the period, in terms of producing greater output without increasing carbon dioxide emissions. This is in part due to the use of less carbon intensive fuels, to changes in the structure of the economy (see Indicator a2 in *The economy* section) and in part because of other trends and measures affecting energy efficiency (see Indicators e4, etc in the *Energy* section).

Indicator k4:
Power station emissions of carbon dioxide

Power station CO_2 emissions and electricity generated: UK



Index of power station CO_2 emissions per electricity generated (1970=100) : UK



Carbon dioxide emissions from power stations have declined by around 20 per cent between 1970 and 1993 whereas electricity generated from all major power producers has increased by around 30 per cent over the period. The ratio of emissions to electricity output has fallen by almost 40 per cent since 1970.

In the UK, electricity generation from fossil-fuelled power stations, other industry and road transport are the major sources of carbon dioxide accounting for 31 per cent, 24 per cent and 20 per cent respectively of total emissions. Domestic emissions account for a further 16 per cent of total emissions.

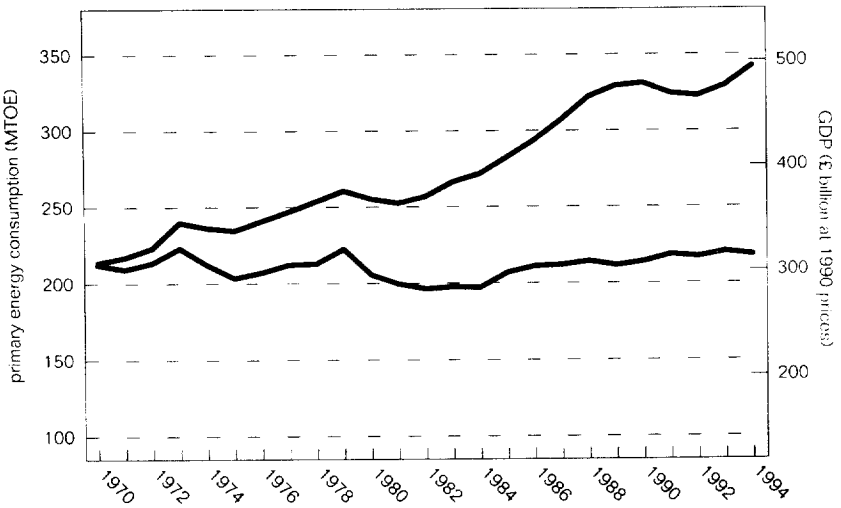
Indicator k4 shows emissions of carbon dioxide from power stations between 1970 and 1993 in relation to the amount of electricity generated from UK sources.

Carbon dioxide emissions from power stations and the amounts of electricity generated have fluctuated since 1970, reflecting demand for energy that can alter according to weather conditions but which has been partially offset by supply fuel switching, mainly from coal to gas. Overall, carbon dioxide emissions have declined to about 80 per cent of the 1970 level in 1993, whilst electricity generation has risen to about 130 per cent of the 1970 level. The ratio of emissions to the number of units of electricity generated has declined steadily to about 62 per cent of the 1970 level, as a result of switching from coal to other energy sources which produce less carbon dioxide.

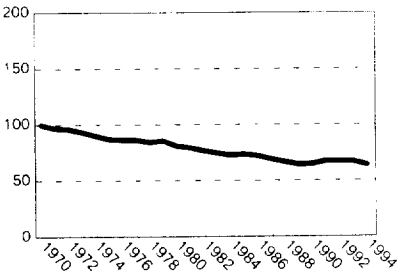
Energy trends for other industry, commercial, transport, domestic sectors and energy efficiency measures are given in the section on *Energy* (see Indicators e5, e6 and e7).

Indicator e4:
Energy consumption and output

Primary energy consumption and GDP: UK



Index of primary energy consumption per GDP: UK



Primary energy consumption has remained broadly stable while the economy has grown by 60 per cent. As a result the energy ratio has followed a generally downward trend since 1970.

Indicator e4 shows the relationship of primary energy consumption to GDP since 1970.

Despite real growth in the economy of over 60 per cent since 1970, the consumption of energy has hardly changed, showing that it is possible to uncouple energy growth from economic growth. A variety of factors, for example, have contributed to this - the increase in world oil prices in the 1970s and early 1980s, improvements in energy efficiency; saturation in the ownership levels of the main domestic appliances; the unresponsiveness of certain industrial uses, like space heating, to long run output growth; and a structural shift away from energy intensive industries, such as steel production, towards lower energy users, such as the service sector.

Indicator e5 shows industrial, commercial and public sector energy consumption since 1970 compared with the value added by the two sectors.

Industrial sector

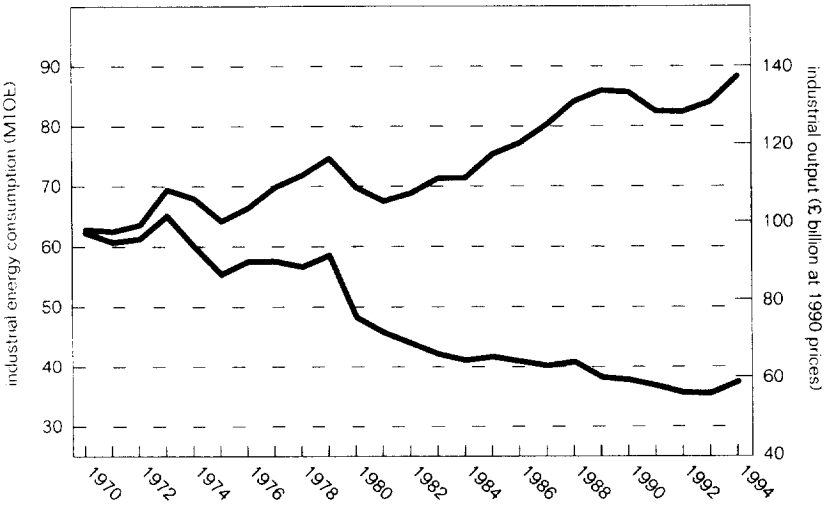
Despite the relative shrinking in the size of the industrial sector within the economy, particularly in manufacturing and mining industries, output has increased in real terms by around 40 per cent since 1970. At the same time, however, there has been a 40 per cent fall in the consumption of energy. Cuts have been made in operating costs, and more capital-intensive methods of production, higher levels of mechanisation and energy-saving technologies have been adopted. The switch away from heavy industry and energy efficiency measures were the main reasons for the improvement in the energy ratio.

Services sector

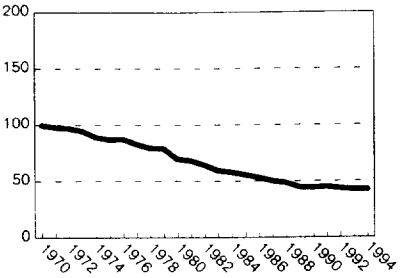
In contrast to the industrial sector, the commercial sector has been growing in terms of its size and contribution to the economy overall, and its energy consumption has increased by 15 per cent between 1970 and 1994. Although overall, the energy ratio has declined for the commercial sector, the decline is less marked than for the industrial sector.

Indicator e5:
Industrial and commercial sector consumption

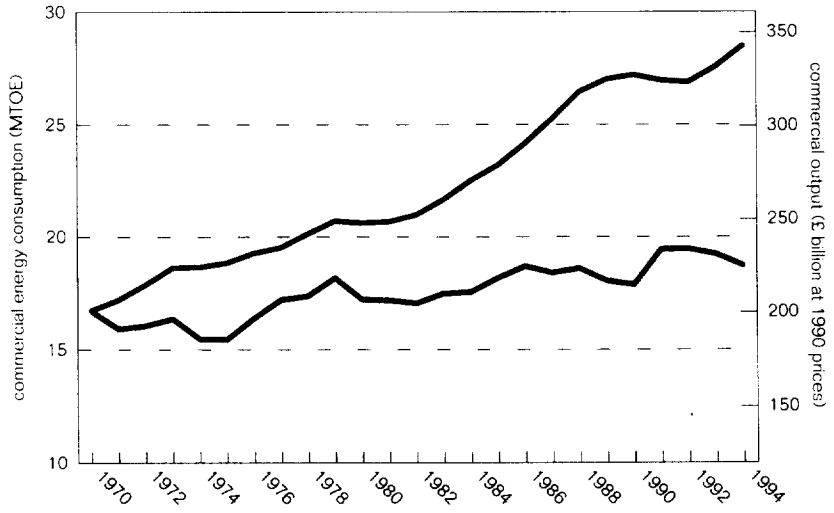
Industrial energy consumption and output: UK



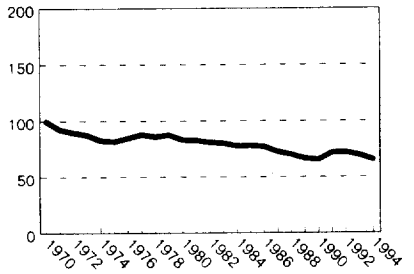
Index of industry energy consumption per industrial output (1970 = 100): UK



Commercial energy consumption and output: UK



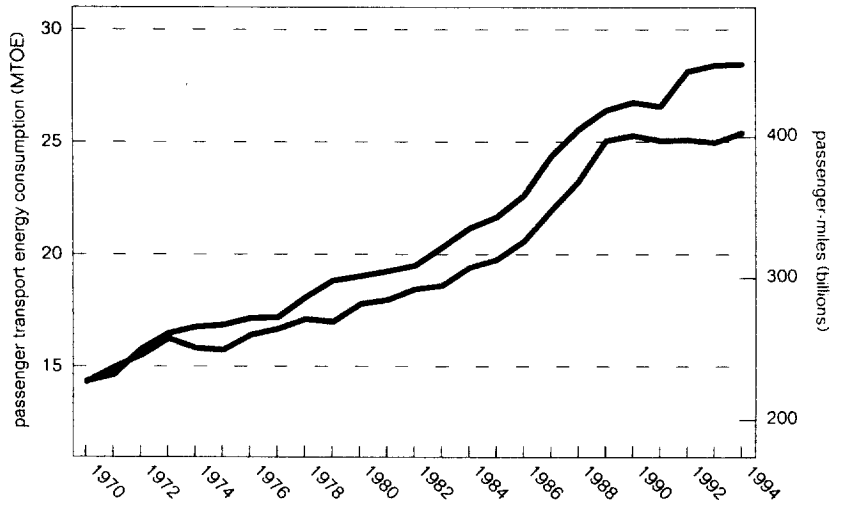
Index of commercial energy consumption per commercial output (1970 = 100): UK



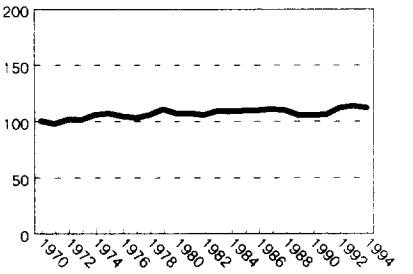
The amount of energy used by the industrial sector has decreased by 40 per cent since 1970 despite a 40 per cent growth in output. At the same time energy used by the commercial sector has increased by 15 per cent compared with a 70 per cent growth in output. In both sectors, the energy ratio has improved considerably since 1970.

Indicator e6:
Road transport energy use

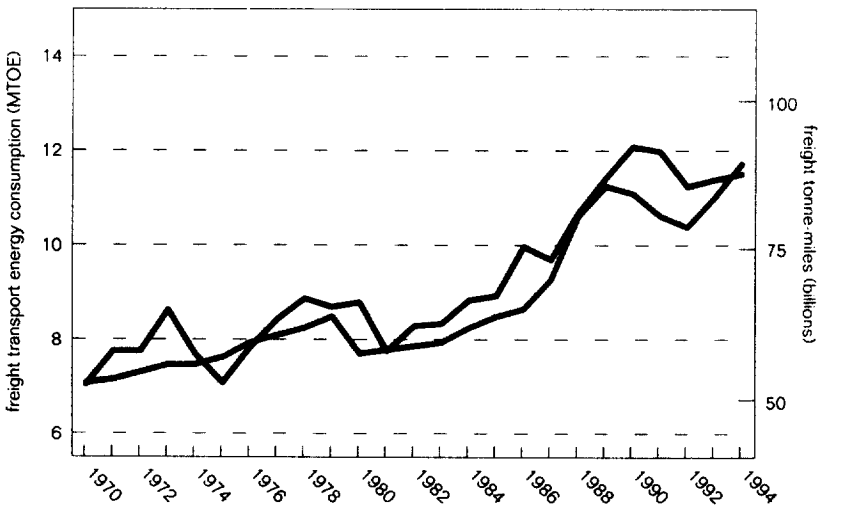
Passenger transport energy consumption and passenger-miles: UK



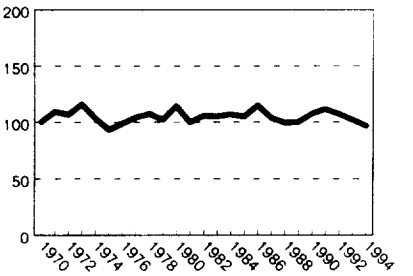
Index of passenger transport energy consumption per passenger-mile (1970 = 100): UK



Freight transport energy consumption and freight tonne-miles: UK



Index of freight transport energy consumption per freight-mile (1970 = 100): UK



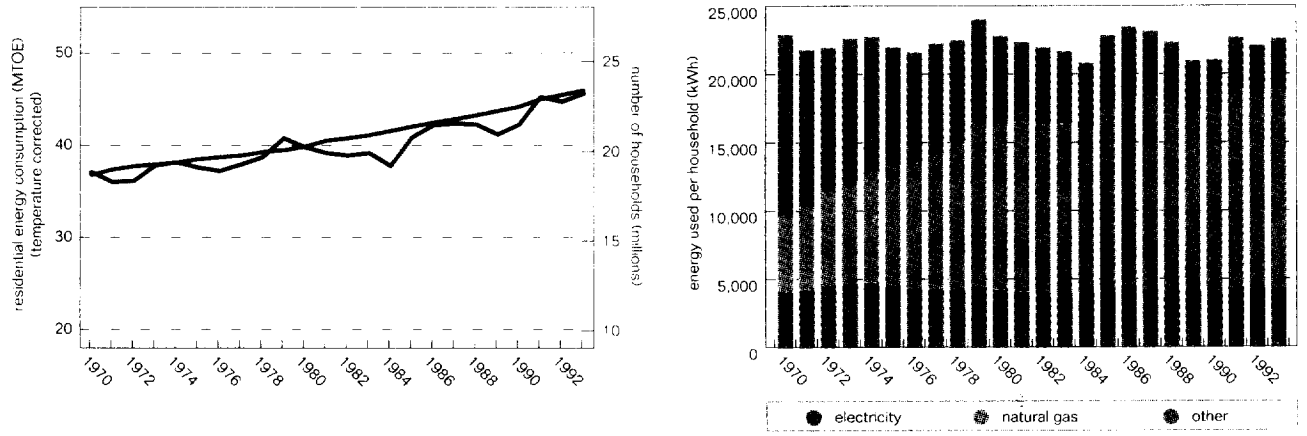
Road passenger energy consumption has nearly doubled since 1970 and road freight transport energy consumption has increased by over 60 per cent. The growth in energy consumption to a large extent has been mirrored by the growth in traffic with the result that there has been little, if any, improvement in energy efficiency over the period.

Indicator e6 compares road passenger vehicle fuel consumption with the number of passenger-miles travelled, and road freight vehicle fuel consumption with the number of tonne-miles moved since 1970.

Fuel use for road passenger transport has nearly doubled since 1970 and has increased by over 60 per cent for freight. The volume of traffic, measured in terms of passenger-miles and freight tonne-miles has increased by about the same amount, showing that there is little change in efficiency of fuel use, in marked contrast to the industrial and commercial sectors. For passenger traffic, vehicle engines are more fuel efficient than they used to be, but the advent of unleaded petrol, catalytic converters, higher safety standards, higher specifications and performance have all tended to counter the fuel efficiency gains from improved engine design. These factors, together with a fall in the average numbers of passengers per car and a fall in bus use, have decreased the overall fuel efficiency of road passenger transport. Similar factors have affected freight transport. Vehicles have become more fuel efficient but average loading for most freight vehicle types has fallen. Larger, more fuel efficient vehicles are now available and are being used for some types of operation, but economic conditions have led to an overall increase in the age of the fleet and consequently to lower overall efficiency.

Indicator e7: Residential energy use

Residential energy consumption and households: UK



Residential energy consumption has increased by over 20 per cent from 1970 to 1993. However, the amount used per household has remained relatively stable and the overall growth is driven more by the increase in number of households.

Indicator e7 contrasts the trends in domestic energy consumption with the number of households.

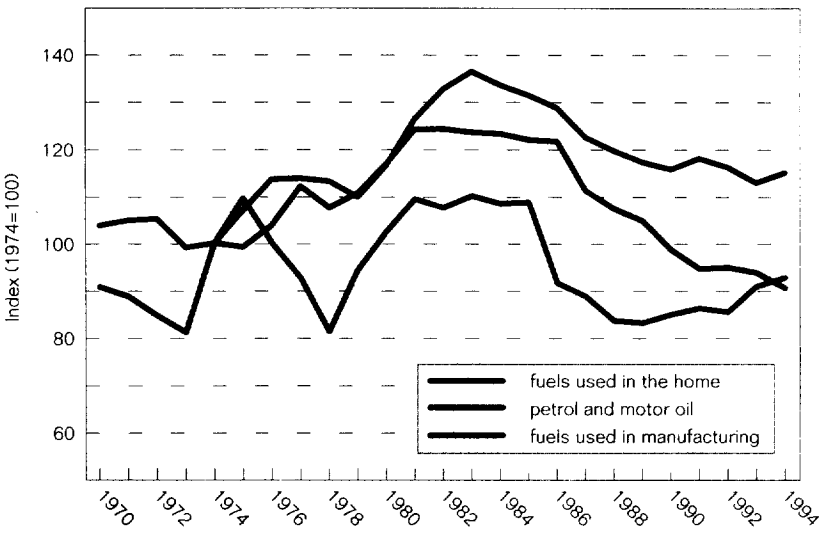
Annual energy consumption for domestic use, adjusted for yearly temperature fluctuations, has increased from 37 million tonnes of oil equivalent in the 1970s to nearly 46 million tonnes in 1993, a growth of over 20 per cent. However, per household energy consumption has changed little although there have been year to year fluctuations. Trends in domestic energy consumption also reflect other changes, such as the increasing use of natural gas for central heating and improvements in the energy efficiency of dwellings.

Fuel prices

Indicator e8:
Fuel prices in real terms

The real price of fuel in the UK has been largely influenced by trends in world oil prices. UK fuel prices peaked in the early 1980s but have subsequently fallen. More recently, Government policy has been to increase the level of road fuel duties in real terms to encourage greater efficiency of use.

Fuel prices in real terms: UK



Although the proportion of UK fuel consumption supplied from UK resources has increased during the last 25 years, the prices of fuel have largely been influenced by trends in world oil prices and, in particular, the sharp rises in 1974 and 1979.

Indicator e8 shows the trends in fuel prices since the early 1970s.

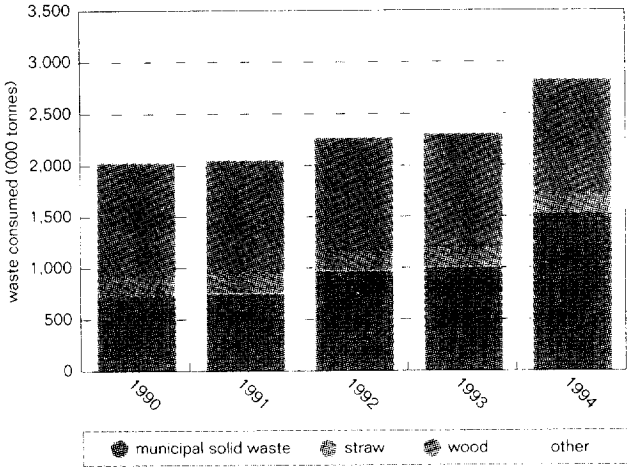
In real terms, the prices of fuels used in the home during the early 1980s were 30 per cent higher than in 1970. Following a series of world oil price shocks they have generally fallen since then, but remained 11 per cent higher in 1994 than in 1970. VAT at 8 per cent was imposed on domestic fuel and power in 1994. The price of fuels used in manufacturing has followed a similar pattern but the price falls over the last decade have been somewhat stronger, as added competition between energy suppliers has exerted downward pressure on prices. Petrol and motor oil prices in real terms in 1994 were similar to those in 1970. As part of the UK Climate Change Programme, road fuel duties are being increased by 5 per cent on average in real terms each year to encourage reduced consumption and improved fuel efficiency.

specifications for products manufactured can all constrain the levels of recycling achieved. For example, more ferrous metal is recovered in the UK than all other materials combined, but in the UK the production of high quality steel limits the use of ferrous scrap, which is therefore exported to countries producing lower grade iron and steel products. Length of product life also influences the availability of recycled materials.

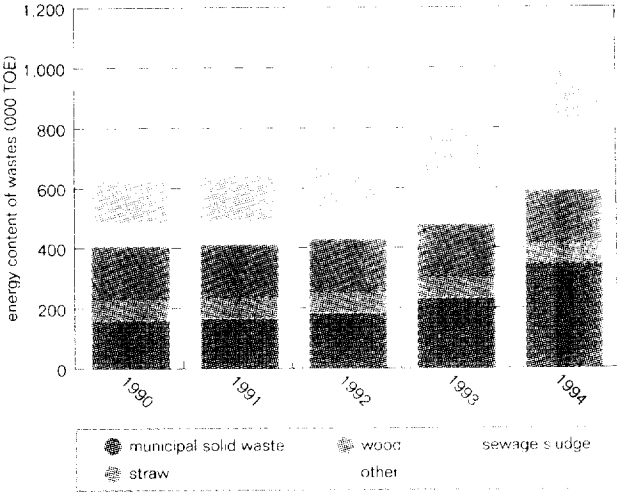
Aggregates from wastes are covered under Indicator u2 in the *Minerals extraction* section.

Indicator v6: Energy from waste

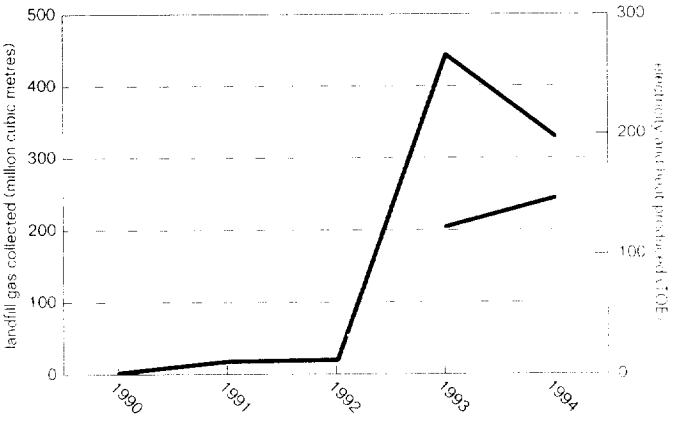
Energy recovery from waste disposal and treatment processes: UK



Energy recovery from waste disposal and treatment processes: UK



Energy recovery from landfill gas projects: UK



There have been sharp increases in the amount of energy recovered from wastes and from landfill gas under the non-fossil fuel obligation (NFFO) in England and Wales and the Scottish renewable obligation (SRO) arrangements. The amount of wastes producing energy via combustion or digestion remains small.

Where the environmental and economic costs of recycling are high, it may be better to recover energy from waste, either by burning it or by using the methane-rich gas which is generated as organic wastes decompose in landfill sites. Incineration of waste has a number of environmental advantages: it reduces emissions of methane which is a potent greenhouse gas, it reduces by up to 90 per cent the volume of waste which then has to be disposed of, and it converts waste into a material which is less biologically active and poses fewer potential risks for the environment. Using the gas produced in landfill sites reduces emissions of methane, a potent greenhouse gas, reduces local risks of explosion and enhances the restitution of landfill sites to other uses. The Government encourages waste to energy from both incineration and landfill by means of financial support through the non-fossil fuel obligation (NFFO) in England and Wales and the Scottish renewable obligation (SRO) in Scotland.

Indicator 06 shows since 1990 energy recovery from waste disposal and treatment processes and energy recovery from landfill gas projects.

Emissions of methane from landfill sites account for 46 per cent of total UK emissions of methane - around 2 million tonnes per year. It is estimated that in 1994, around 118,000 tonnes of this was recovered and used, generating an amount of electricity and heat equivalent to that produced by burning 146,000 tonnes of oil. Around 1.6 million tonnes of waste was incinerated with energy recovery in 1994.

Indicator 07:

Waste going to landfill

Landfill remains the predominant route for waste disposal in the UK and for some time yet will continue to account for the majority of UK waste disposal.

A wide range of waste types can be landfilled safely and landfill may remain the only option for some inert wastes and for wastes which are difficult to burn or recycle. However, landfill sites do have the potential to release pollutants into the water and soil, and generate significant quantities of methane which is a greenhouse gas. The Government's policy is therefore to reduce as far as possibly the amount of waste going to landfill. It has set a target for England and Wales of reducing the amount of controlled waste going to landfill to 60 per cent of arisings in 2005. It will also be introducing a landfill tax from 1 October 1996.

At present, about 124 million tonnes of controlled waste, excluding sewage sludge and dredged spoils, go directly to landfill annually. This is 70 per cent of all controlled waste going for final disposal and recovery. Controlled wastes, excluding sewage sludge and dredged spoils, account for about 40 per cent of all wastes arising in the UK.

h Forestry

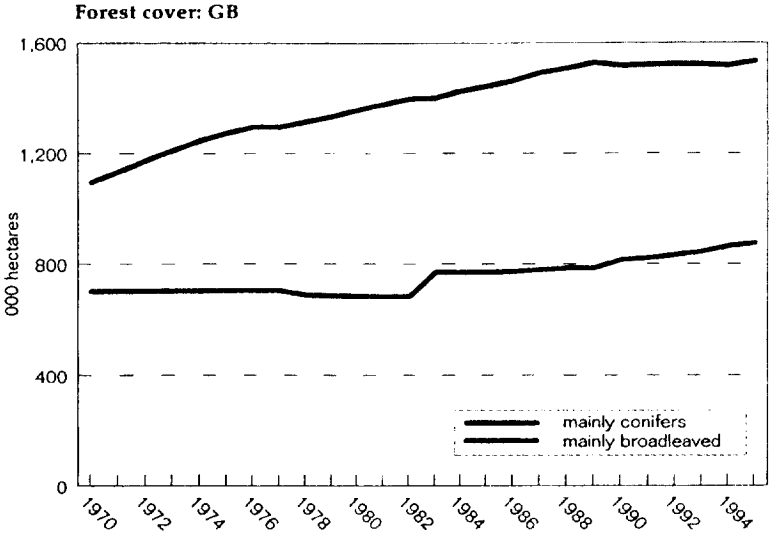
The key sustainable development issue for forestry is to manage forests in a way that sustains their environmental qualities as well as their productive potential.

This means that UK forests should be valued not only for their commercial potential, which currently produce some 7 million cubic metres of wood each year - about 15 per cent of our total consumption, but also for recreation, nature conservation and landscape enhancement. Indicators relevant to this objective are therefore the extent of forest cover and timber production in the UK, the areas of ancient semi-natural woodland remaining, the health of trees, and indicators of whether forests are being managed in an environmentally beneficial way.

Forest cover and timber production

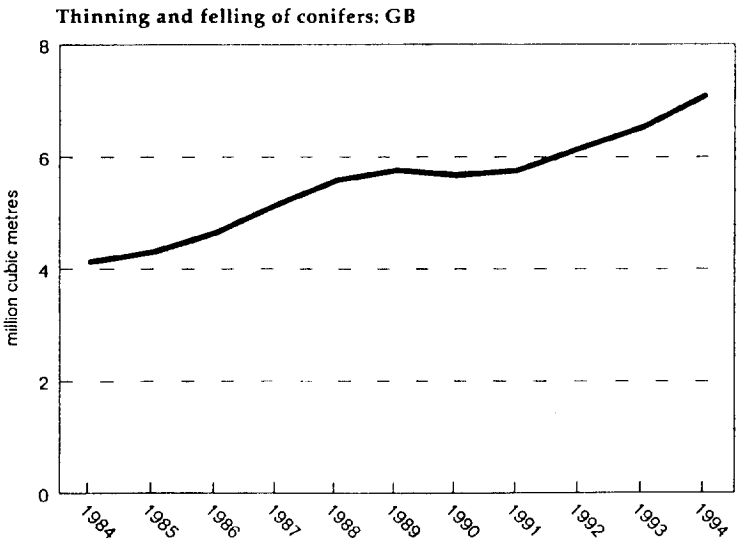
Indicator h1: Forest cover

The area of forest and woodland cover in GB has increased by one third since the early 1970s. Coniferous species have been favoured in increasing forest cover particularly in the uplands although now there is greater emphasis on broadleaved species and planting on better quality land.



Indicator h2: Timber production

Post war forestry expansion in the UK has created conifer forests which are now of an age to contribute a rapidly increasing component of home grown timber to the British market. The thinning and felling of conifers in GB has increased by 72 per cent since 1984.



Forestry makes a small (almost 0.2 per cent) but growing contribution to GDP and around 35,000 people are employed in the forestry sectors. However, only around 15 per cent of UK consumption of timber is met from our own resources (see also Indicator d1 in the *Overseas trade* section). Growing trees also remove carbon dioxide from the air and store the carbon in wood.

Over many centuries there has been a gradual loss of forest cover in the UK, which fell to its lowest level of 5 per cent of the UK's area at the start of this century. These losses led to an overdependence on imported timber which was the catalyst after the first world war for the initiation of a UK forest expansion programme. Today, 10 per cent of the UK land area is covered by forests but this is significantly less than the 25 per cent average for the EC. Most of these new forests have been established on land of low agricultural quality in the remoter upland areas of the UK, and non-native coniferous species have generally been favoured because of their high productivity.

Concerns about the impact on the landscape and on the ecology of semi-natural habitats have led to greater emphasis on securing multiple benefits by planting "down the hill" on better quality land and increasing the amount of broadleaved planting and new native woodlands. Felling is regulated through licences which require that felled areas be replanted, implementing the principle that woodland that is currently broadleaved is expected to remain so.

Indicator h1 shows trends since 1970 in the area of GB covered by coniferous and broadleaved species.

Forest cover in GB has increased from 1.8 million hectares in 1970 to 2.4 million hectares in 1995, 64 per cent of which is mainly conifer. Broadleaved cover remained stable at about 0.7 million hectares up to the early 1980s but has risen gradually since then to a level of 0.87 million hectares in 1995, reflecting an increase in new planting each year of broadleaved species from a few hundred hectares to nearly 11,000 hectares over the same period. The marked increase in new broadleaved plantings since 1985 follows introduction of the Broadleaved Woodland Grant Scheme to provide incentives for private forestry and its successor the Woodland Grant Scheme (WGS) in 1988. The Farm Woodland Scheme and its successor the Farm Woodland Premium Scheme (FWPS) have also contributed to encourage a productive alternative use of farmland and to the increase in the new planting of broadleaved woodland.

In the Rural White Paper launched in October 1995, the Government has indicated that it would like to see a doubling of woodland in England over the next half century, and that achieving this will depend on securing changes in the Common Agricultural Policy (CAP) to allow forestry to compete more effectively with agriculture for land use.

Future indicator development:

A key aim of woodland policy is to encourage the regeneration and extension of native woodland. While most of the UK's native tree species are broadleaved, native Scots Pine forest is a particularly important habitat in the Scottish Highlands. The Forestry Commission has introduced a new system for an inventory of all types of woodland which, together with the Countryside Surveys carried out by the Department of the Environment (CS1990), will provide detailed information about woodlands and their management. Woodland plant species richness could be monitored in future using sample plots comparable to those in CS1990, taking particular account of species characteristic of different woodland types or conditions.

Indicator h2 shows trends since 1984 in the volume of conifers thinned and felled in GB.

The post war expansion of forest area has created conifer forests which are now of an age to contribute a rapidly increasing component of home grown timber to the British market. This has allowed a rapid expansion and modernisation of the wood processing industry with major investment in sawmills, pulp, paper and panel board mills in the UK. Thinning and felling of conifers in GB has increased by 72 per cent since 1984 and softwood production from these forests is expected to double over the next 20 to 25 years. The rate of production of hardwood timber from broadleaved forests has been steady but may increase if more profitable markets can be found for the timber much of which it is in stands of high environmental value but low quality for timber production.

PAPER NO. 6: UNITED STATES OF AMERICA

U.S. Submission on Elements of a New Legal Instrument

(October 21, 1996)

General

In the U.S. view, the new legal instrument should respond effectively to the serious threat posed by global climate change; should reflect outcomes that are real and achievable; should be consistent with economic prosperity; should allow for maximum flexibility and cost-effectiveness in its implementation; and should lay the foundation for continuing progress by all countries.

Meeting the ultimate objective of the Convention will require concerted, long-term efforts by all Parties. While it is important for developed countries to take the lead, it is also essential that the Kyoto agreement recognize the growing contribution of developing country emissions and begin to plan for appropriate, cost-effective ways to address these emissions in a sustainable manner. In this connection, at COP-2 the United States called for continued work toward a longer-term concentration goal (e.g. for the next 50-100 years), recognizing that scientific understanding and technology will improve over time.

In putting forward these suggestions for a new legal instrument, the United States has rejected proposals by some countries calling for short-term targets that we believe are neither realistic nor achievable. We have also rejected the use of inflexible, internationally harmonized policies and measures. In the spirit of providing individual countries greater flexibility in meeting any agreed upon limitations, we believe that it is critical that flexibility in implementation be accorded all countries, including through emissions trading and joint implementation among nations.

We believe that the following elements would serve as a useful basis for the consideration of topics that would need to be included in a new legal instrument. Given the continuing uncertainties surrounding the form of such an instrument, we have noted particular aspects of these issues that may differ depending on whether the Parties choose a protocol or an amendment to the Convention to codify their agreement.

Preamble

If the legal instrument takes the form of a protocol, it might include a preamble. If it takes the form of an amendment, it would not, although the decision adopting the amendment could.

Definitions

A protocol would need to incorporate some or all of the definitions in Article 1 of the Convention, include its own definitions, or some combination of the two. An amendment, to the extent it introduces new terms, might also require amendment of Article 1.

Objective

We do not believe that it is either necessary or desirable to develop a separate objective for this legal instrument, whether an amendment or a protocol. The Convention's Article 2 would apply to an amendment. A protocol should incorporate Article 2 of the Convention.

Level and Structure of the Target

The Geneva Declaration calls for quantified, legally-binding objectives within specified timeframes. This is consistent with the U.S. call at COP-2 for a shift in the negotiations away from unrealistic, near-term proposals to legally-binding, medium-term targets that are both realistic and achievable.

A number of ideas and approaches regarding the structure of the target have been suggested thus far in the discussions within the Ad Hoc Group on the Berlin Mandate (AGBM). Many of these ideas and approaches have focused on a single-year target, but we believe it will be important to consider a broader range of possibilities (e.g., cumulative or aggregate targets covering a number of years, multiple-year rolling average targets, flexibility over time through banking and borrowing, etc.) We anticipate that more such ideas and approaches will be tabled and considered as we work toward a new legal instrument for adoption at COP-3.

The Berlin Mandate calls for adoption of the protocol/other legal instrument at COP-3, making calls to date for differentiated commitments in this timeframe impracticable.

In addition to being realistic and achievable, it will be important that the target/timetable be sufficiently specific (to facilitate compliance), flexible in terms of its implementation (to encourage cost-effectiveness and broad participation) and straight-forward (to ensure negotiation and adoption by COP-3). As we noted at COP-2, as a general proposition, the United States opposes mandatory, harmonized policies and measures. However, we are open to the possibility of exploring consensus on agreed procedural measures, for example, those that might be necessary to implement an international trading regime or ensure enhanced reporting.

The United States is continuing its domestic analysis and assessment efforts so as to contribute to this discussion in upcoming negotiating sessions.

Advancing Article 4.1 Commitments

"Continuing to advance the implementation of Article 4.1 commitments" will be a critical component of next steps and must be reflected in the Kyoto agreement. Given the global nature of this problem, we must work together toward a global solution, recognizing our common but differentiated responsibilities and capabilities. A number of assumptions underlie U.S. views on next steps:

- Article 4.1:
  - -- applies to all Parties;
  - -- speaks to commitments ranging from inventories of emissions, to reporting, to adopting measures to mitigate climate change;
  - -- speaks to the requirement to promote the development and diffusion of technologies;
- The Convention anticipates that the status of countries will evolve over time (e.g., Article 4.2 (f))
- Paragraph 2.b of the Berlin Mandate governs what will be included on this issue in the Kyoto agreement

Bearing in mind these assumptions, there are a number of approaches that can be taken through a new legal instrument. For example, the Parties could agree to:

- continued and more systematic support for efforts to develop national action plans (particularly in developing countries) following the revised Annex I Guidelines for National Communications and the newly adopted Non-Annex I Guidelines for Initial Communications

- redoubled efforts to adopt and implement "no-regrets" measures

- expanded programs aimed at developing, diffusing and deploying climate-friendly technologies (including through systematic efforts to identify and remove barriers to technology diffusion and to enhance the role of international financial institutions in responding to the threat of global climate change)

- further consideration of thresholds at which the status of countries would change, and the process involved in such a change in status

- further consideration of future steps (post-Kyoto) toward the objective of the Convention

International Emissions Trading and Joint Implementation

In the U.S. view, flexibility will be an essential element of the Kyoto agreement, including international emissions trading and joint implementation; it will therefore be a priority task to establish the guidelines for a credible emissions trading and joint implementation regime by December 1997.

Properly designed emissions trading and joint implementation regimes will motivate parties to achieve and strengthen national commitments to limit or reduce greenhouse gas emissions, because the cost savings potential in these types of programs can achieve more environmental protection than less flexible, less cost-effective regimes.

A number of principles must underlie an emissions trading and joint implementation regime. At a minimum, such a regime must be credible, efficient, transparent and verifiable.

Various design questions need to be addressed, and we intend to present our further thinking in this regard in the near future.

Institutions

For reasons of administrative efficiency and in light of budgetary constraints, a new legal instrument should utilize existing institutions to the maximum extent practicable.

A protocol would need to specify its institutions. In the case of an amendment, the institutions established under the Convention would apply. (Note: We do not believe it would be appropriate for non-Parties to a protocol to be officers of an institution serving the protocol.)

Compliance

The term "compliance" is used in this context to refer to the cluster of processes/mechanisms that provide incentives for the Parties to abide by their legal commitments.

Ensuring effective compliance will be critical for environmental as well as economic competitiveness reasons. Unless Parties comply, there will be little incentive for each Party to act and we will not achieve our environmental objectives. Uneven compliance will undermine confidence in the new legal instrument and encourage "free-riding."

A key means of promoting compliance will be to ensure that commitments are realistic and achievable (as noted above). In addition, it will be important to consider supplementary means for promoting compliance, including ways to ascertain whether Parties are meeting their obligations. In this context, we will need to consider elaborating existing reporting and review mechanisms.

Unless otherwise provided, an amendment to the Convention would be covered by the Convention's reporting requirements, as well as dispute settlement provisions and any multilateral consultative process that might be established. A protocol would need to specify whether any of these Convention mechanisms would apply, as well as any additional compliance-related provisions.

Decision-Making

Only the Parties to the protocol or amendment should have decision-making authority with respect to that instrument.

Final Clauses

A protocol would need to contain several final clauses, including, for example, provisions on entry into force and amendment. An amendment's final clauses are already set forth in the Convention.

PAPER NO. 7: ZAIRE

Zaire

Texte

En rapport avec la prochaine session de l'AGBM/5, nous vous prions de trouver ci-après les premieres propositions du Zaire sur les éléments devant figurer dans le Protocole ou dans l'instrument juridique contraignant à la Convention-Cadre sur les Changements Climatiques.

Mesures et politiques

Les annexes au Protocole ou instrument juridique contraignant devront comprendre, par pays et par secteur, des indicateurs sur les grandes sources d'emission des gaz à effet de serre, leur nature, leur volume, les caracteristiques des anciennes technologies utilisées, plus leur âge, ainsi qu'un calendrier opérationnel de renouvellement des anciennes technologies. A toutes ces sources, devraient également être accompagnées des mesures de lutte contre les émissions de GES, le rendement des dispositifs de reduction et les coûts pour les différents secteurs.

Objectifs

En parcourant le tableau se trouvant à la page 5 du numero 11, 2ème trimestre 1996 du Bulletin "Changements Climatiques", il apparaît que d'ici l'An 2000, la plupart des pays figurant à l'annexe I ne vont pas atteindre l'objectif que la Convention s'était assigné, celui de ramener les émissions des GES à leur niveaux de 1990. Ainsi donc, les concentrations de GES qui devraient être balayées de l'atmosphere durant cette période ne disparaîtront pas de sitôt et iront en grandeur croissante. Ce qui représente une accumulation supplémentaire des GES. Face aux projections des émissions de GES d'ici l'An 2000 et en tenant compte des responsibilités communes et différenciées, le Zaïre propose les scénarios contraignants ci-après:

1. Tous les pays de l'Annexe I qui auront atteint d'ici l'An 2000 l'objectif de la Convention se verront appliquer les mesures suivantes : réduction de 10% de GES à l'An 2005, réduction de 15% de GES à l'An 2010, réduction de 20% de GES à l'An 2020.

2. Tous les pays de l'annexe I qui n'auront pas atteint cet objectif d'ici l'An 2000 se verront, quant à eux, appliquer les mesures suivantes : 15% à l'An 2005, 20% à 2010 et 25% à l'An 2020.

3. Quant aux pays d'économie en transition et ceux en développement, ils devront mettre en place des mesures et politiques nationales qui limiteront les émissions de GES.

Préalables

Avant l'adoption d'un instrument juridique contraignant (Protocole ou Amendement), le Zaïre voudrait s'assurer de certains préalables, à savoir:

- le respect des principes d'équité et de responsabilité différenciée;

- les garanties relatives aux moyens à mettre à la disposition des pays en développement en vue de renforcer leurs capacités à mettre en application la Convention-Cadre sur les Changements Climatiques;

- les garanties s'imposent également pour le transfert des technologies appropriées vers les pays en développement;

- l'assurance que les mesures environnementales relatives aux changements climatiques ne serviront