

TECHNICAL ANNEX

SERVICE CONTRACT FOR CARRYING OUT COST-BENEFIT ANALYSIS OF AIR QUALITY RELATED ISSUES, IN PARTICULAR IN THE CLEAN AIR FOR EUROPE (CAFE) PROGRAMME

1. INTRODUCTION

On 4 May 2001, the European Commission launched the Clean Air for Europe (CAFE) programme – a knowledge based approach with technical and scientific analyses and policy development that will lead to the adoption of a thematic strategy on air pollution fulfilling the requirements of the Sixth Environmental Action programme.¹

The thematic strategy will outline the measures required at various administrative levels to improve air quality and to meet environmental objectives in Europe, to be followed later by legislative proposals for those measures to be taken at Community level.

In addition, the United Nations Economic Commission for Europe (UN ECE) Convention on Long Range Transboundary Air Pollution (CLRTAP) is presently developing further policy objectives in the area of air pollution, objectives similar to those of the European Commission. To a large extent the policy development of CAFE builds on the basic information obtained through the Convention working groups also applying similar concepts for effect based policies to reduce emissions of air pollution. Throughout the work of this assignment the CAFE programme and the Convention working groups need to support and complement one another, and duplication of work should be avoided.

It is equally important that the information obtained within this assignment may be used in the framework of the CLRTAP to improve the effectiveness of pan-European air pollution policies. The future development of air quality as well as implications of the policy options are analysed with the aid of indicators for important aspects of economy, development of the various sectors and environmental impact related to atmospheric pollutant emissions. A tentative set of indicators to be used for the development of the CAFE programme is available on the CAFE web-site².

The CAFE programme aims at developing a baseline scenario and variants as well as policy scenarios to meet environmental targets in Europe in a cost-effective way. Also considerations of costs and benefits (and dis-benefits) of different policy options play an important part in making policy proposals, such as in the development of different EC directives. Such cost-benefit analyses are expected to continue to play an important role for the thematic strategy for air pollution. In order to carry the analytical work rigorously following a knowledge-based approach, the Commission has established several inter-linked contracts and lines of development to carry out the work required. These, as well as related projects funded by DG Research, are given at the CAFE web-site³. The main contracts are the “Systematic Review of Health Aspects of Air Quality in Europe” (WHO), the “Development of the baseline and policy

¹ For further details on CAFE programme, see <http://europa.eu.int/comm/environment/air/cafe/index.htm>

² See http://europa.eu.int/comm/environment/air/cafe/working_groups/wg_target_setting.htm

³ See <http://europa.eu.int/comm/environment/air/cafe/activities/activities.htm>

scenarios and integrated assessment modelling framework” (using the RAINS model of IIASA) and the “Further development and application of the TREMOVE transport model” (University of Leuven).

The RAINS model will be reviewed by a group of international scientific experts. Most likely the review will give recommendations for further improvement of the RAINS model, with possible implications to the cost-benefit analysis of the present assignment. Later, a model comparison between various integrated assessment models in Europe may give some additional information that also can influence the cost-benefit analysis.

In addition, in the CAFE programme a “multi-criteria analysis”⁴ framework needs to be designed to cope with all those aspects of air quality that are either difficult or impossible to quantify.

In essence, the analytical capacity to be established needs to respond to the following question:

What would be the impacts, as well as the costs and benefits of cleaner air on health and environment (e.g., increased life expectancy, better health status, better soil and water quality, better preservation of buildings and cultural heritage) following from the different policy options (as compared to the CAFE baseline)?

To answer this question, a service contract is required to:

- i) establish the analytical capability and
- ii) conduct the analysis on the basis of around ten main scenarios, each with around ten variants, to be generated during the integrated assessment process.

2. OBJECTIVE

The objective of the assignment is to have completed all analyses of the impacts as well as the costs and benefits of different policy options for improving air quality in the enlarged EU mainly as part of the CAFE programme.

The influence of climate and other policies on air pollution and *vice versa* (i.e. ancillary benefits and dis-benefits) needs to be taken into account. In order to carry out the cost-benefit analysis in a transparent manner, the impacts of air quality policies need to be demonstrated, and both quantitative and qualitative information needs to be presented through a multi-criteria framework. This is particularly important in areas where quantification or monetisation of benefits is either difficult or impossible.

Further, if required by the client, an interim objective is to have analysed the costs and benefits of specific *ad hoc*⁵ policies to reduce air pollution or to improve air quality.

⁴ See e.g. <http://www.dtlr.gov.uk/about/multicriteria/index.htm>

⁵ Such requests relate to possible policies developed concurrently by DG Environment while the CAFE programme and the Thematic Strategy on air pollution are being developed. The additional workload due these kinds of assignments is restricted to 1-2 person months.

3. SCOPE

The benefits of reducing emissions of air pollutants in all scenarios need to cover all those countries and international areas (maritime/international aviation) whose emissions are relevant for the air quality in the enlarged EU. The scope of the analysis should thus – in principle – include all European countries.

The assignment must include the current EU Member States, and relevant European Economic Area and accession countries as well as Switzerland.

The analysis of the CAFE baseline and policy options scenarios need to address the years 2010, 2015 and 2020.

The following air pollution problems need to be covered under the service contract: primary and secondary particles, sulphur dioxide, nitrogen oxides, and tropospheric ozone and their effects on human health and the environment. The tenderer needs to specify what PM sizes (10, 2.5, 1 and/or 0.1) will be used in the analysis. However, at least PM₁₀ and PM_{2.5} originating from human activities need to be covered. The Commission will address the other pollutants (benzene, CO, heavy metals, POPs etc.) separately (i.e. not part of this assignment).

The tenderer needs to quantify priority or critical health effects, including increased mortality⁶ due to ozone and particulate matter, and increased morbidity (such as hospital emergency admissions and asthma exacerbation) due to ozone, particulate matter and nitrogen dioxide. The basis for the quantification of health effects should be the ongoing WHO systematic review of health aspects of air quality in Europe, which will produce new air quality guidelines in 2003. The tenderer is invited to propose quantification of health effects of other pollutants, as well as additional types of health impact.

The tenderer needs to quantify the environmental effects on forests and (semi-) natural ecosystems (at least acidification, eutrophication and ozone), agricultural crops (ozone), on waters (at least acidification and eutrophication), on material and cultural heritage (at least corrosion by gases and wet deposition by acids, and soiling by particulate matter). The tenderer is also invited to propose other environmental effects of air pollution such as visibility and nitrate leaching to groundwater.

The tender must include the multi-criteria analysis (MCA) and cost-benefit analysis (CBA) of the health and environmental effects of improved air quality.

The tenderer also needs to make estimates of the environmental impact in relation to the critical loads and levels that are used for the development of environmental targets within CLRTAP.

The sectors to be included in the source analysis are transport (all modes), energy production and combustion, industry and agriculture.

Air quality and deposition of air pollutants as well as the associated costs from alternative emission control scenarios will be provided by the EMEP and RAINS models with a spatial

⁶ As the RAINS model includes mortality assessment of particulate matter (life expectancy or life years lost) this information will be used as an input by the contractor.

resolution of 50x50 km², complemented with assessments of the air quality in urban background in some selected cities (the CITYDELTA project).

While the RAINS model will provide air quality related indicators of environmental effects (e.g., ecosystems area with acid deposition above their critical loads, AOT40 values, number of days exceeding certain (WHO) threshold values, etc.), the scope of this technical annex is to quantify the actual physical effects of the CAFE baseline and policy options scenarios in commonly used terms (e.g., crop loss, loss in timber production, cases and severity of health symptoms, etc.) that can subsequently be used for an economic benefit assessment.

The tenderer needs to document the methodology for quantifying the impacts in a solid scientific manner, respecting the recommendations of limitations specified by the international expert groups on environmental and health effects, such as WHO and CLRTAP Working Group on Effects.

The analysis needs to consider air quality problems within each grid to the extent that the results will be available for the EMEP-RAINS models. However, many of the air quality problems are linked with the urban/local scale air pollution, issues also to be addressed in the CAFE programme. The tenderer needs to demonstrate to what extent it can carry out impact assessment as well as cost benefit and multi-criteria analysis at this scale.

Finally, the interaction with greenhouse gas emissions (in view of the importance of corresponding ancillary benefits and dis-benefits) needs to be included in the analysis as the balance of costs and benefits is likely to be influenced by this. Most, if not all, of the information concerning ancillary benefits and dis-benefits comes from the team lead by IIASA⁷.

4. METHODOLOGY

The methodology applied in the cost-benefit analysis needs to be transparent. Therefore, based on the input from team lead by IIASA and from other sources, an impact assessment needs to be carried out both in qualitative and quantitative terms. This impact assessment is formally carried out through a multi-criteria criteria analysis, which demonstrates both those impacts that could be quantified and those for which only qualitative information is available. For those quantified impacts, which can be monetised, the benefits need to be calculated and compared with the costs. The cost data will be given mainly by the team lead by IIASA.

5. TASKS

The tasks need to be performed in a transparent way and the findings must be of high quality and sufficiently robust so that European stakeholders can accept the outcome of the analyses with confidence for the considerations in the policy development. The analyses should include assessment of the influence of critical assumptions through sensitivity and uncertainty analyses.

⁷ The other two organisations are the National Technical University of Athens as well as Norwegian Meteorological Institute.

In order to fulfil the objective the contractor will undertake the two phases of execution. Also, the work to be carried out by the contractor shall be made outside Commission premises (extra muros).

5.1. Phase 1: Development of the analytical framework for carrying out impact assessment as well as multi-criteria and cost-benefit analysis

5.1.1. Development of a conceptual framework for the quantification of the impacts of the baseline scenario as well as the alternative scenarios

As part of the first phase a conceptual framework needs to be developed to comprehensively assess the impact of the air pollutants in the enlarged EU.

In this conceptual framework it needs to be demonstrated how the (physical) impacts of air pollution are quantified, how the costs and benefits of reducing emissions are calculated and how other non-quantifiable impacts are taken into account through a multi-criteria analysis. The costs of policy-options of emission-reduction scenarios will be provided by the team lead by IIASA.

The analytical framework needs to include the monetisation of the direct benefits of improved air quality. These direct benefits need to be complemented by assessment of impacts and benefits on other policy areas. Such indirect impacts, or ancillary benefits or dis-benefits, are considered important at least in climate change, energy, transport and agricultural policies, taking into account that many conventional air pollutants are also greenhouse gases, and that water and soil quality are affected by air pollution.

The tenderer needs to demonstrate how its work will build on the work lead by IIASA to assess the ancillary benefits and dis-benefits in a scientifically solid and credible manner.

The tenderer also has to specify how the interface between the EMEP-RAINS model and other models (CITYDELTA, TREMOVE, models used for hot-spots) is to be created to ensure compatibility.

5.1.2. Development of multi-criteria analysis

Through multi-criteria analysis it is possible to summarise both quantitative and qualitative information in a systematic manner. Such analysis is a step preceeding cost-benefit analysis. The value added of multi-criteria analysis is apparent when:

- i) We lack knowledge of the physical impact of some pollutants. For instance, while we know that emissions are harmful to health we do not always know the dose-response functions of each pollutant e.g. per age class.
- ii) We do not know how to value in practice the impact of some air pollutants, for instance we know that the very old buildings/constructions are degraded by bad air quality, but it is difficult to give a value to “cultural heritage”. We also know that bad air quality is of concern because it smells or reduces visibility. However, we may not have the unit values to be included in the analysis of benefits of improved air quality.

Therefore, multi-criteria analysis is needed to fill in the gaps of knowledge and to cope with all those aspects of air quality that are either difficult or impossible to assess in quantitative terms. As some of the unquantifiable impacts can be sizeable, the framework of carrying out multi-criteria analysis needs to be developed concurrently with the development of the tools to carry out the quantitative analysis. Furthermore, it is essential that the assumptions and results of multi-criteria analysis are well integrated and presented when the results of the cost-benefit analysis are reported so that the reader/policy maker clearly understands the whole picture.

The tenderer is requested to demonstrate its knowledge of multi-criteria analysis and has to propose how such a multi-criteria analysis could be carried out.

5.1.3. Ensuring that the costs and benefits are measured with the same metric

The methodology proposed needs also ensure that the costs and benefits are assessed in comparable manner. As the methodological basis for estimating the costs in the RAINS (and TREMOVE or any other model) is different from the basis for estimating the (marginal) damage⁸ that is the basis for the valuation of the benefits of improved air quality, it is important to ensure that the costs and benefits are measured with the same metric. For instance, if one measure excludes taxes while the other values include them, their comparison of costs and benefits would be inconsistent. The tenderer is requested to demonstrate how it will ensure that definitions of costs and benefits in different models are comparable. The main difficulties of establishing the same metric should to be highlighted, and to the extent possible, as well as possible remedies.

This work needs to be carried out in very close co-operation with IIASA because if divergencies are found in how costs or benefits are derived, changes might need to be made either how costs are calculated in the RAINS model and/or in the way benefits are estimated outside the RAINS model. It is acknowledged that it is difficult to estimate how much work is needed to ensure that the costs and benefits are measured with the same metric before it is known how different the metrics are. The tenderer is requested to give its approach to address the issue.

5.1.4. Review and consultations on the key monetary unit values used in the benefit analysis

There are three basic areas where the key monetary values need to be reviewed:

- i.) values relating to mortality and morbidity due to changes in air quality,
- ii.) values relating to changes in ecosystems and
- iii.) values relating to material damage, including cultural heritage.

⁸ To clarify the terminology: Marginal damage (or marginal damage cost) is the same as marginal benefit when emissions are reduced. Marginal benefit is the difference between two marginal damage cost functions. Both are measured monetary terms.

Within the Network of Experts on Benefits and Economic Instruments (NEBEI)⁹ two workshops have been organised to cover the first and second issue. The tenderer is invited to propose how to use the finding of these workshop, and other related information to improve the key values. Further, the tenderer should propose how to carry out uncertainty analysis given the inherent difficulties in obtaining point estimates.

Also other streams of work such as the study of “stock at risk of cultural heritage” prepared by the newly formed *Sub-centre on Cultural Heritage* (established under the CLRTAP Working Group on Effects and hosted by ENEA in Rome) may be used. The tenderer needs to specify how it intends to include information air quality impact on cultural heritage as part of the cost-benefit analysis or multi-criteria analysis. At minimum this is likely to include a literature review of the subject, but it is not excluded that some original valuation work be carried out for this purpose.

It is envisaged that the contractor hold workshops, where the critical key unit values used will be reviewed with the experts in the field of valuation. As a starting point for the review, the BeTa database of the European Commission could be used¹⁰, the marginal damage of different pollutants is given for the reference year 1998. Given the fact that the emissions of NO_x, SO₂, VOC, primary PM and ammonia are likely to decrease by 2010 due to i.a. the National Emissions Ceilings Directive, it is likely that the marginal damage estimates would change from 1998 (unless the marginal damage functions are linear).

The tenderer is requested to specify its approach to the review and stakeholder involvement process including the number of workshops, the number of participants and the budget. The tenderer is expected to pay for the travel and daily subsistence allowance to some the workshop participants. If substantive work is requested from the workshop participants, the tenderer needs to specify these as part of the budget. Specifically, in order to ensure that the experts of non-governmental organisations can contribute in it is recommended that the tenderer specify a budget for this purpose. The consultations need to have been completed by the time the cost-benefit analysis framework needs to be ready, i.e. by mid 2004.

Analysis based on workshops and other means is expected to identify the need of new or improved values to cost-benefit analyses. The tenderer is invited to propose a method or procedure to obtain such information or handle the lack of sufficient quality of the input values.

The Commission will work closely with the contractor to ensure that the review and the stakeholder consultations are carried out in such a way that they add value. It is also expected that the Commission will chair the sessions of the stakeholder consultations.

The outcome of this task will be a set of state-of-the-art monetary unit values and functions of marginal damage from air pollution for 2000. As these values may depend on the level of pollution, special care needs to be paid that the values are representative also in 2010, 2015 and 2020.

⁹ For further information, see <http://www.unece.org/env/nebei/>

¹⁰ <http://europa.eu.int/comm/environment/enveco/studies2.htm#Marginal%20external%20costs%20air%20pollution>

5.1.5. *Estimation of the marginal damage of different pollutants for 2010, 2015 and 2020*

Given the fact that the emissions of NO_x, SO₂, VOC, primary PM and ammonia are likely to decrease by 2010 due to i.a. the National Emissions Ceilings Directive, it is likely that the marginal damage estimates would change from 1998 (unless the marginal damage functions are linear).

Thus, based on the consultations with experts, the findings of related work in Europe (e.g. the contract between the Commission and WHO as well as the work carried out by some Member States) and elsewhere (e.g. in the US) the contractor needs to update the marginal damage estimates established in BeTa. Furthermore, the estimates may need to be disaggregated, given the fact that the effects of air quality will be made at 50x50 km² grid squares, and the fact that further analysis is needed at urban and hotspot/street canyon level. Finally, given the fact that SO₂, NO_x and particulate emissions from ships are of major concern in the EU, the contractor is requested to give its approach to estimate the marginal damage costs of these emissions.

The assumptions for the CAFE baseline will be specified as part of the service contract with IIASA. Among other things it is assumed that all accession countries will have implemented all air quality related *acquis communautaire* at the latest by 2010. Thus, the contractor needs to have established the marginal damage values for the accession countries in the same fashion as for the current Member States.

As an outcome of this task the marginal damage (or functions) will be established for the base year (i.e. 2000) and for 2010, 2015 and 2020. In addition, the uncertainty bands or other techniques to demonstrate the levels of uncertainty of the marginal damage need to have been established.

The tenderer is requested to give its approach to carry out this task, including its recommendation on if, and how, to carry out a stakeholder consultation to build consensus for the estimates of marginal damage of air pollution.

The tenderer needs to demonstrate that it has the conceptual model as a tool available within the time frame established in this technical annex to be able to assess impacts, analyses the costs and benefits and carry out multi-criteria analysis. It needs to be highlighted that as this work will be carried out in very close co-operation with the team led by IIASA the tenderer can assume full co-operation of these institutions to carry out its work.

5.1.6. *Inclusion of the costs and benefits of the impacts of local scale*

A spatial resolution of 50x50 km² is considered adequate to analyse air pollution at regional scale. However, the CAFE programme will also address air pollution at local level. It is expected that the RAINS model will be able to incorporate particulate matter and NO_x concentrations¹¹ at the urban background level. It is recognised that the inclusion of local scale (i.e. areas smaller than 50x50 km² grid) and street canyons (very localised pollution) is inherently difficult at EU-level and it is not obvious how such issues would be included in the

¹¹ See the Systematic Review of Health Aspects of Air Quality in Europe carried out by WHO.

assessment of the CAFE programme and the policy options analyses. Presently an additional study or service contract is under consideration to consider the local scale air pollution and the assessment of impact at that scale.

The tenderer is invited to demonstrate how it would be able to contribute in the analysis of the impacts, benefits or costs of reducing emissions in regional and local scale. Further, the tenderer is invited to demonstrate its approach how it would estimate the benefits of such action, including the monetisation of the benefits. It is likely that interaction with the REMOVE model will be particularly helpful in this work.

5.1.7. Developing the framework to carry out the analysis of social and macro-economic impacts of improved air quality

According to the communication on Impact Assessment (COM(2002)276¹²) the European Commission will implement an impact assessment of all major initiatives¹³. It is likely that the legislative proposals prepared during and based on the thematic strategy on air pollution fall into this category and therefore the i) environmental, ii) economic and iii) social impacts of the initiatives need to be assessed. Environmental and health impacts and the costs and benefits are the core of the analysis and discussed earlier.

Apart from the analysis of economic effects as part of the cost-benefit analysis, it would be helpful to have the macro-economic impact assessed. For this work, it would be necessary to apply either macro-economic model or an applied general equilibrium model that covers the EU Member States and accession countries. The aim is to estimate how the improved air quality would change welfare, employment and, to the extent possible, cohesion.

The assessment of social impact could include possible significant positive or negative impacts to a particular social group, economic sector or region (inside or outside the enlarged EU).

The tenderer is invited to suggest with what tools it would carry out the macro-economic assessment and to describe how the social impact would be to be addressed in the analysis. Further, the tenderer is invited to demonstrate how he/she would develop and use the capability of analysing the possible changes in employment levels (and/or job quality) due to different options to improve air quality. Also, the tenderer should demonstrate how it will include distributional implications such as effects on the income of particular sectors, groups of consumers or workers within each Member State. Also the distributional implications between Member States in the enlarged EU should to be analysed. Finally, it would be desirable to address some of the following issues: changes affecting gender equality, social exclusion and poverty, safety, consumer rights, social capital, security, education, training and culture.

¹² <http://europa.eu.int/comm/environment/eia/2002276communication.pdf>

¹³ According to COM(2002)276 it needs to be answered whether the proposal will result in substantial economic, environmental and/or social impacts on a specific sector or several sectors, and whether the proposal will have a significant impact on major interested parties.

5.1.8. *Creation of a modelling tool, and reporting of the methodology of the impact assessment as well as multi-criteria and cost-benefit analyses in the CAFE programme*

Accomplishment of the tasks described above will result in the development of an analytical framework to carry out the impact assessment, as well as cost-benefit and multi-criteria analyses in the CAFE programme. A quantitative modelling tool will be developed as an outcome of Phase 1. The tenderer is invited to give its views/suggestions on this.

One of the final tasks of Phase 1 will therefore be documentation of all issues discussed in the previous tasks. In addition, this report needs to include a thorough description of those open issues that could not be solved. Thus, the report needs to contain a section on further research to satisfy the needs of MCA and CBA on air quality policies.

The tenderer needs to describe how the methodology and findings (*inter alia* the impact assessment, the cost-benefit and multi-criteria analyses) are to be documented, published and reported to the Commission.

5.1.9. *Carrying out first assessments*

Using the methodologies established in Phase 1 the contractor needs to carry out the impact assessment of the CAFE baseline, as prepared by IIASA. Further due to time constraints, the first IA, MCA and CBA need to be carried out so that the results are ready for the thematic strategy on air pollution. Therefore, the first assessments need to be ready and reported by the end of 2004. The level of ambition reflected in the thematic strategy on air pollution will depend upon updated evidence concerning the effects of air pollution and evolving political priorities, and may be different for different pollutants. The policy mixes chosen will depend not only on the required level of ambition in relation to air quality but also on other factors relating to the measures envisaged.

In order to be able to assess the various possibilities adequately, the Commission will identify about ten policy scenarios to be analysed within the IAM framework, representing a fairly wide range of policy options and ambition for improving air quality in Europe by 2020. Given the fact that the CAFE programme is developing a thematic strategy for many pollutants, it is also possible that different mixes of air quality improvement could be analysed in a “multi-gas approach”. The social and macroeconomic impacts (see task 4.1.9) need to be reported as well. The tenderer is invited to give a preliminary view on the main policy options that could be analysed.

The corresponding IAM model runs – including full details – needs to be reported in technical background reports. The contractor will be given immediate access to all model results, including the uncertainty ranges. Based on this, the contractor will carry out the impact assessment, as well as cost-benefit and multi-criteria analyses.

5.2. Phase 2: Carrying out Impact Assessment as well as Cost-Benefit and Multi-Criteria Analyses in Policy Scenarios of improved air quality

5.2.1. Carrying out the bulk of the assessments

In early 2005 those assessments that were not carried out in 2004 will be done. This task is similar to task 4.1.12 but consists of a very large number of model runs with the aim of finding the most promising options to improve air quality in the enlarged EU. Throughout Phase 2, the fundamental methodological and preparatory work of Phase 1 will enable the analysis in Phase 2 to be rapid and cost-effective (per model run). The tenderer is requested to demonstrate how it intends to use the preparatory work of Phase 1 to enable reap the efficiencies during Phase 2.

When Phase 2 starts, the CAFE baseline (or business-as-usual) scenario would have been completed for the years 2010, 2015 and 2020 and most policy scenarios would have been estimated with the RAINS model. Some of the corresponding impacts, benefits etc. would have been evaluated (see task 4.1.12). In Phase 2, the contractor will carry out the analyses by comparing the CAFE baseline and policy options scenarios of those scenarios that were not carried out in Phase 1. The analyses needs also include a sensitivity analyses and should for some critical key parameters also include an uncertainty analysis. Due to time constraints the analyses need to be carried out immediately after finishing Phase 1.

Clearly the costs of reaching different levels of ambition of air quality depend, perhaps critically, on the choice of policy instruments. Also the benefits may be affected because of the choice of the instruments. Therefore, it is possible that for each scenario reported by RAINS, there could be several cost-benefit calculations depending on how the policy is determined.

5.2.2. Reporting of the results

Phase 2 corresponds mainly to “Lot 2” and “Lot 3” of the “*Service Contract for the Development of the Baseline and Policy Scenarios and Integrated Assessment Modelling Framework for the Clean Air for Europe (CAFE) programme*”

As part of Phase 2, the policy relevant results of the variants will be reported. It is expected that up to some 20 variants will be reported and commented upon. The purpose of the report of Phase 2 is to identify what kinds of policy packages would bring the most promising results to improve air quality in the EU. The report of Phase 2 could be written in such a way that it adds on the report that will be prepared by IIASA for “Lot 2” and “Lot 3”. Ideally the report would be prepared jointly to ensure that they are comprehensible to the policy makers.

In addition, a final report will be prepared. This report will include a summary description of Phases 1 and 2 conclusions from the IAM and recommendations for main options to improve the analysis of costs and benefits of improved air quality in the enlarged EU up to 2020. Also, the conceptual model (see task 5.1.8) with the parameters used for the impact assessment and cost-benefit analysis is to be made available to the Commission.

6. EXPERIENCE OF THE CONTRACTOR

The contractor must have good knowledge of the environmental, technological and economic aspects of preparing air quality scenarios and the use integrated assessment models. It should

also have experience in giving advice to policy makers to reduce air pollution, including “success stories”. Familiarity with the RAINS model and knowledge of the Auto-Oil I or II processes is an advantage. The leader of the impact assessment as well as cost-benefit and multi-criteria analyses team must have a proven track record in economic assessment of air quality control strategies, understanding the issues related to ancillary benefits and dis-benefits and disseminating the results in a non-technical manner. Tenderers must be independent entities with no conflict of interest with interested parties nor stakeholders in the area of air quality policies.

7. ORGANISATION OF THE WORK

The contractor will work exclusively for the Commission, represented by the Directorate-General for the Environment. In its work, the Commission will be assisted by different groups in the CAFE programme. The Working Group of Target Setting and Policy Assessment will give guidance to DG Environment on what scenarios should be analysed, including which instruments would be used to reach the environmental targets. In its day-to-day work the contractor will work closely with the Integrated Assessment Model team lead by IIASA and the development team responsible for the TREMOVE model.

Since the CLRTAP is developing air pollution policies for Europe as well, sharing of information between the CAFE programme and CLRTAP is essential to ensure coherence between the two lines of work. To coherence of work should also be reflected in the work plan of the assignment.

8. VALIDITY OF THE OFFER

The offer has to be valid from the date of submission of the tender and valid for six months thereafter.

9. DELIVERABLES

The contractor will prepare the following main reports:

Phase 1 (16 months)

- (1) The workplan. Detailed work plan for the development of the framework of the comprehensive impact assessment as well as the multi-criteria and cost-benefit analyses to cover the enlarged EU. The inception report is to be delivered within two months of the signing of the contract.
- (2) The methodology report. Description of the approach and methodology to carry out the impact assessment, multi-criteria and cost-benefit analyses. To be delivered within 12 months after the signing of the contract.
- (3) The Phase 1 final report. An analysis of the CAFE baseline and its variants corresponding to Lot 1 of the service contract with IIASA including specifically the impact assessment. This draft report has to be delivered within 16 months after signing the contract, under the assumption that the service contract with IIASA delivers the

valid information for the impact assessment. This report should also document all main work undertaken under Phase 1.

Phase 2 (12 months)

- (4) The Phase 2 and project/contract final report. Technical background notes on the costs and benefits (including multi-criteria assessment and impact assessment) of main alternative policy scenarios and the most important variants. The exact reporting format needs to be decided in conjunction with the reports of “Lot 2” and “Lot 3” of the service contract with IIASA. It is likely that several (short) notes will be prepared. At the end of Phase 2, the most important notes will be presented as a Report of Phase 2, including a report of the option (or options) that are chosen by the Commission to be presented as legislative proposal(s). In addition, this report needs to include a section of “lessons learned and suggestions for further work” based on the cost-benefit and multi-criteria analysis carried out as part of the CAFE programme.
- (5) In addition, the contractor will need to prepare progress and other *ad hoc* reports based on the requests of the CAFE Secretariat. All reports should be delivered to the European Commission in Word, Excel and pdf formats. The reports will be made public on the DG Environment web-site as well as the web-site on IAM set up and maintained by IIASA. For the purpose of contract management interim reports will be required for the interim payment.

All reports/notes need to contain a **well-written executive summary** (max 10 pages) showing the main findings of the work. It is expected that the contractor would present the draft reports and findings in CAFE working groups as well as in the Steering Group.

In addition, the contractor will have to produce interim or progress reports related to the interim payments at a time corresponding to two thirds of the time of each lot. These reports must give a brief overview of the time and resources used and the achievements accomplished as well as obstacles. The interim report should also give a forecast and any necessary changes to the work plan to finish each lot within the time limits of the contract.

10. DISSEMINATION OF INFORMATION

The contractor needs to set up a web-site devoted to the development and application of impact assessment as well as the cost-benefit and multi-criteria analysis in the CAFE programme. This web-site needs to be designed in close co-operation with IIASA, as it may be more appropriate to include all issues relating to cost-benefit and multi-criteria analysis on **one** web-site. The tenderer is requested to demonstrate how it would disseminate information through the web-site to the Member States, accession countries, experts of industry organisations, non-governmental organisations and the citizens of Europe. The Commission will work in close co-operation with the contractor in the development of the web-site in order to satisfy the needs of the CAFE programme.

11. METHOD OF PAYMENT

The assignment will result in a 16 month contract with the possibility of renewal once (**after successful completion of Phase 1**), i.e. the possibility of two phases of execution. Both phases of execution of the contract will be paid as lump sums.

A pre-financing payment for each phase of execution of 30% will be paid upon signature of the contract or renewal.

An interim payment of 40% will be paid upon acceptance by the Commission of an interim or progress report at a stage corresponding to two thirds of the contract time of each phase of execution.

A final payment of 30% will be paid upon acceptance by the Commission of the final report for each phase of execution.

The Commission is exempt from all taxes and dues, including value added tax, pursuant to the provisions of Articles 3 and 4 of the Protocol on the Privileges and Immunities of the European Communities with regard to its financial contribution under the contract.

12. SCHEDULE

The tenderer is requested to prepare a schedule for both Phases. The deadlines of different Phases as considered applicable at the time of writing this technical annex, are given below:

Phase 1 (16 months):

- Kick-off meeting (within 1 month from the signing of the contract)
- Consultations according to the tender (finalised by month 16 from the signing of the contract)
- The capability of carrying out impact assessment as well as, multi-criteria and cost-benefit analyses needs to be partly operational within 12 months of the signing of the contract, and fully operational within 16 months of signing the contract. The full the impact assessment, multi-criteria and cost-benefit analysis of 1-2 main scenarios needs to have been completed by the end of 2004.

Phase 2 (12 months):

- Once the main alternative policy scenarios are ready, the contractor needs to carry out the impact assessment and full cost-benefit analysis of these scenarios. These analyses need to be complemented by multi-criteria analyses. The numerical analysis of each main scenario should not take more than 1 week while the writing of the report for each scenario could take up to 1 month, depending on the complexity of the issues involved.
- After the most promising scenarios have been selected partly based on the results of the analysis carried out by the contractor, IIASA will run several (about 10 each) variants. The impact assessment as well as full cost benefit analysis will be carried out

for the most promising variants. The timing required for the analysis is the same as above.

- Phase 2 is likely to be carried out in 2005.

13. EXCLUSION CRITERIA

1. Contractors or tenderers shall be excluded from participation in this procurement procedure if:

- a) they are bankrupt or being wound up, are having their affairs administered by the courts, have entered into an arrangement with creditors, have suspended business activities, are the subject of proceedings concerning those matters, or are in any analogous situation arising from a similar procedure provided for in national legislation or regulations;
- b) they have been convicted of an offence concerning their professional conduct by a judgement which has the force of *res judicata*;
- c) they have been guilty of grave professional misconduct proven by any means which the Commission can justify;
- d) have not fulfilled obligations relating to the payment of social security contributions or the payment of taxes in accordance with the legal provisions of the country in which they are established or those of the country of the contracting authority or those of the country where the contract is to be performed;
- e) they have been the subject of a judgement which has the force of *res judicata* for fraud, corruption, involvement in a criminal organisation or any other illegal activity detrimental to the Communities' financial interests;
- f) following another procurement procedure or grant award procedure financed by the Community budget, they have been declared to be in serious breach of contract for failure to comply with their contractual obligations.

Candidates or tenderers must certify that they are not in one of the situations listed above:

i) by signing the declaration form page 7, Annex C, of this invitation to tender,

and

ii) by submitting the following evidence:

Satisfactory evidence that the candidate or tenderer is not in the situations described in points (a), (b) or (e) by producing a recent extract from the judicial record, or failing that, a recent equivalent document issued by a judicial or administrative authority in the country of origin or provenance showing that those requirements are satisfied.

Satisfactory evidence that the candidate or tenderer is not in the situation described in point (d) by submitting a recent certificate issued by the competent authority of the State concerned.

Where no such certificate is issued in the country concerned a sworn or solemn statement made by the contractor or tenderer before a judicial or administrative authority, a notary or qualified professional body in his country of origin or provenance.

2. Contracts may not be awarded to candidates or tenderers who, during the procurement procedure:

a) are subject to a conflict of interest;

b) are guilty of misrepresentation in supplying the information required by the contracting authority as a condition of participation in the contract procedure or fail to supply this information;

14. SELECTION CRITERIA

a) Tenderers should be individuals or legal entities (giving registration numbers from official registers).

b) Evidence of a tenderer's financial standing, by furnishing (extracts from) financial statements of the last three years.

c) Tenderers should have demonstrable experience in the areas that are part of this call for tender.

d) Experience as evidenced by the composition of the proposed team (curriculum vitae of team members including a reference list of relevant previous projects). This should also show that the team is technically capable of carrying out the work as described in the technical annex.

15. AWARD CRITERIA

The award criteria are the following:

(1) Understanding: This criterion is intended to assess whether candidates have taken into consideration all the aspects of the tasks required by the contract, such as they appear above, as well as the contents of the proposed end product.

(2) Methodology: The degree to which the methodology shows the capacity to resolve the questions underlying the tender in a realistic and well-structured way as well as to whether the methods proposed are in conformity with the need of the Commission expressed in the technical annex.

(3) Project management and availability: The offers will be assessed as regards the quality of the team organisation and the time share attributed to each of the members, which should clearly be outlined in the tender.

Points: A maximum of 20 points will be attributed to the criterion 'understanding', a maximum of 50 points will be attributed to the criterion 'methodology' and a maximum of 30 points is awarded to the criterion 'Project management and availability'. To be selected

the companies will have to obtain a minimum of 15 points for the criterion 'understanding', a minimum of 40 points for of the points for the criterion 'methodology and a minimum of 20 points for of the points for the criterion 'project management and availability', which gives a total minimum of 75 points to be achieved.

16. BUDGET

The budget is fixed at a maximum of €500.000 (including fees and all other costs) to be split as follows:

Phase 1: €300.000 for the development of the of the methodology, modelling tools and ensuring the integration of the multi-criteria and cost-benefit analysis with the integrated assessment modelling framework, performing the impact analysis of the CAFE baseline and its variants.

Phase 2: €200.000 for the multi-criteria and cost-benefit analysis and reporting of about ten main alternative policy scenarios and up to 10 variants of each main alternative policy scenarios, as well as for preparing the final report.

The tenderer is requested to make a comprehensive bid for both Phases. Both Phases will be covered by a separate contract. Phase 2 will be issued on following satisfactory completion of Phase 1 and on budgetary availability. In case of failure to complete the previous Phase satisfactorily, the Commission reserves its right not to issue Phase 2.

Price: The bid offering the best value for money will be chosen, providing the minimum number of points is achieved. This is calculated by dividing the price by the number of points awarded.