Emission Inventory, Scenario, and Modelling

Recommendations for the Phase IV (May 2008 – May 2011) implementation of

Malé Declaration

1) Continuous improvement of inventories

Air pollutant emissions inventories are always in a sense 'work in progress' and are continually being improved and updated as better quality activity data, better emissions factors, more large point source information and so forth become available. **The baseline inventories for 2000 have been compiled** with data currently available but data gaps still exist and QA/QC procedures are on-going. As part of the Quality Assurance (QA) procedure, compilers from one country could examine the inventories, data sources, log books etc for a different country either remotely (via email) or (preferably) during a capacity-building workshops. Also, in the next phase, countries could compile a more up to date baseline **inventory choosing a year (probably 2005)** for which activity data should now be available.

2) Improvement of Malé emissions inventory preparation Manual and Workbook.

Temporal (monthly) and spatial disaggregation (e.g. to 1° x 1° grids) of the emission estimates will greatly improve the accuracy of subsequent atmospheric transfer and deposition modelling activities. The means to do this (allocation matrices) should therefore be incorporated into the workbook. Methodologies to help estimate activity variables for different sectors are required – they must be both developed and tested. This includes methods to estimate vehicle fleets and average speeds on different road types, to generate estimates of process emissions from SMEs, etc. The methodology for road transport emissions should be improved by making it more generic and based upon engine technology. **Further work is required to find suitable default emission factors, especially for PM$_{2.5}$.** Estimating the areas of vegetation burnt and the generation of realistic emission factors to apply is another important area of work, as is speciation of NMVOCs into reactivity classes. In essence, thorough assessments of the uncertainties and improvements that can be made to each part of the manual are needed.

3) Development of methodologies for specific sectors:

- Forest / vegetation fires

- Road transport

- Small industries (e.g. brick kilns)

- Natural emissions (modelling projects on biogenic NMVOCs from vegetation and soil dust uplift)

4) Projection/scenarios module

A new projections/scenarios **option module** should be developed and integrated within the workbook tool so that the impacts on future emissions of air pollution prevention and control options can be explored as each country seeks to implement more – and more sophisticated policy interventions. It is envisaged that a projections/scenarios tool should be modular but directly bound and integrated with the inventories tool and should have functionality in a number of areas in order to provide interactive decision support for air quality management. The tool would facilitate the computation of development trends for key pollutants from inventorised sources and generation of estimates for the impact of specific emission sources on ambient air quality under the influence of a wide range of relevant policy intervention options. It is envisaged that this function will also be provided with a top-down economic activity (e.g. GDP development) based module to support **calculation of underlying activity growth trends** in key sectors for each Malé country. Moreover, the tool should be linked to **key impact sectors** such as health, infrastructure damage, and crop losses in order to provide evaluation in economic terms. An optimisation model is also feasible to allow assessment of the best combination of policy interventions that can meet desired objectives (e.g. ambient air quality standards) subject to relevant constraints (e.g. available funds).

Assessment of existing emission reduction policies in the countries of Malé Declaration

5) Atmospheric Modelling

Continue improvement of IIAS including development of online version of IIAS

Continual improvement of both MATCH model inputs and atmospheric simulation runs will be required. Earlier test runs must now be refined and new simulations produced with the improved data and understanding of the region that has been obtained and is now emerging. **This will provide necessary and important inputs to the development of the IIAS.** Central to the advancement of atmospheric modelling is the development of local capacity and the continual updating and refinement of inputs in collaboration with participating countries. More training activities will be required within the region but with a shift from the present broad group to earmarked modelling specialists. A large group of participants has been introduced to the parameters and potentials of atmospheric modelling in the existing works but now the programme needs to **build specific skills in hand-picked people** in order to build specialist capacity for both each country, the region and the programme. Moreover, it is envisaged that the skills of such specialists will be developed to a sufficient extent that locally-developed, novel and specifically tailored solutions for the regional context emerge from this group.

It is envisaged that a number of **special projects** be undertaken (e.g. in areas of soil conditions, VOC production from vegetation etc.) – conducted by person(s) from the region. The documentation and compilation of data detailing vegetation cover, soil conditions, land-use etc. is vital to the ongoing tailoring and refinement of modelling and will allow for more sophisticated and reliable simulations.