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The IPIECA Toolkit -Guiding Air Quality Management Programmes Towards Cost Effective Local Solutions

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The IPIECA Toolkit: What is it ?

It is an emission inventory model addressing all sources of emissions: mobile, stationary, natural

It has also the capability to calculate the cost-effectiveness of emission control measures

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Toolkit Design Criteria

Provides Historical and Future Perspectives
Has the ability to assess Impact of Control Strategies
Is readily Adaptable to Local Situations in terms of populations,emission factors & economics
Is capable of representing macro and micro environments (from a country to a city sector)
Can Build "Populations" from available data bases or from interpolation of Socio-Economic Indicators

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Toolkit Design Criteria – (cont.d)

Addresses all sources of Emissions
Gives Access to broad Spectrum of Internationally accepted Emission Factors and Cost Data
Offers alternative approaches to cost effectiveness assessment
Has Emission Outputs usable by Air Quality Models
Provides an adequate balance between model complexity, data accuracy, good science and credible outputs for decision makers
Predicts the emissions of CO, VOC, NOx, PM10, SOx, Lead and more than 50 species of HC, aldehydes, etc.

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Toolkit Design Features

Microsoft Excel 97 based: runs on a standard PC
is user friendly (after training)
Utilises nearly 100 individual worksheets
Driven by a controlling VBA Macro
Worksheet Design features fully Transparent
Transparency facilitates customisation to chosen area
Base Case/ Scenario conditions calculated in 2-3 minutes
Virtually unlimited choice of control scenarios

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Mobile Emission Approach

- **AVERAGE SPEED APPROACH, including the following parameters:-**
  - **Average speed and driving mode**
  - **Vehicle type and emission control technology**
  - **Vehicle maintenance**
  - **Vehicle age and degradation with mileage**
  - **Altitude and temperature**
  - **Enforced scrapping of older vehicles**
  - **Impact of importation of used vehicles**

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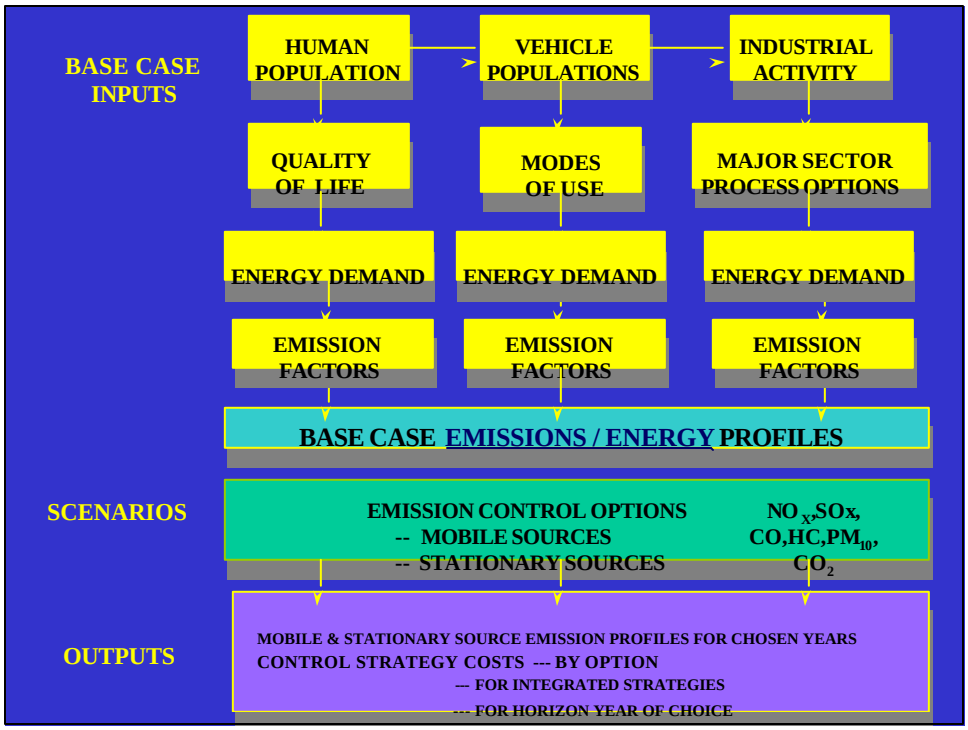
Stationary Emission Approach

- **The Toolkit has the ability to assess the impact of stationary sources, including a range of emission control options:**
- **Emission Factors are based on the fuel used for each**
- **process and application for:**
  - **Domestic sector**
  - **Commercial & Downtown sectors**
  - **Power Generation**
  - **Broad Range of Industries**

The impact of natural sources can also be simulated



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COST- EFFECTIVENESS CALCULATION

The Toolkit provides information on the costs directly associated with the chosen emission control technology

- **The cost-effectiveness is presented in terms of $/Tonne of**
- **pollutant removed**

- **To be realistic, it must be based on appropriate, local financial valuations**

TOOLKIT DEFAULT COST DATA

The Toolkit contains a base set of consistent cost data derived from the following sources -

- vehicle technologies: European Union

- fuel reformulations: European Union

- Stationary source controls: European Union, USA, JICA

Comments:

- Vehicle technology costs may be assumed globally generic and applicable - similarity of modern vehicle design worldwide

- Fuel quality costs valuations are very specific to refinery configurations and fuel quality base case - Local data here is essential

- Stationary sources: use of local data is advisable, particularly for fuel switching case studies

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USE OF LOCAL COST DATA

- **The Toolkit is designed to accept locally available cost data (on top of emission data) instead of the default cost data**
- **In this case it is essential to ensure that:-**
  - **cost studies for all emission control measures have been carried out (or adjusted) to strictly comparable economic and financial criteria i.e.**
    - **investment discount rate**
    - **allocation of capital, fixed and variable costs**

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Major Toolkit Applications :-

World Bank C.A.I. -- Lima Callao

Petrobras --- Rio de Janeiro

Shell & New Zealand Gov't -- Nation Wide Study

World Bank – Fuel Quality Improvement Study in Sri Lanka

Recommended by E.U. consultants for use in Mediterranean Region

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The Toolkit is based on a structured, global approach to Urban Air Quality management that gives the guarantee that:

- **The analysis of the problem is rigorous and totally objective**
- **The solutions identified are relevant to the problem and will fulfil a vision of clean air shared among key stakeholders of air quality plans**
- **Clean air will be achieved without wasting scarce financial resources**