



CAFE Position Paper on Particulate Matter

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background



- **PM regarded as key pollutant in 6th Environmental Action Programme**
- **CAFE WG on PM established in spring 2002**
- **Members: Experts from 12 European countries, Industries, NGO's, WHO, ETC/ACC, Commission, consultant to EC**
- **Chaired by Germany /UK**



Terms of reference



- With the aim of supporting the European Commission's review of the First Daughter Directive (DD) 1999/30/EC the group should:
- assess the air quality situation with regard to the PM limit values set in the DD;
- review the content of the Position Paper on PM published in 1997 with regard to information obtained since;
- collect together information on predictive studies on the attainability of the limit values, considering at the same time contributions from long-range transport and local sources.



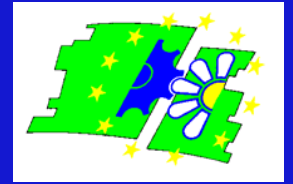
Terms of reference



- With the aim of supporting the production of the CAFE thematic strategy the group should:
- consider the WHO work on health effects of PM with the aim of giving recommendations for targets for integrated assessment;
- review the results of the integrated assessment modelling work on PM.



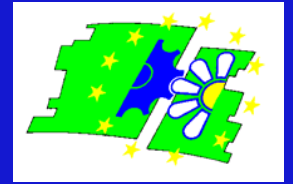
Process



- Group established in spring 2002
- Six meetings in 2002/2003
- Draft Position Paper (PP) sent to CAFE SG members August 2003
- published on CAFE web site
- Stakeholder Workshop 20 & 21 October 2003, Stockholm



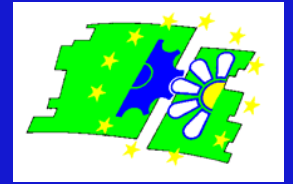
Process



- CAFE SG also provide comments on PP
- Working Group revises PP in light of discussion at the workshop and comments received from members of the CAFE SG
- final presentation, discussion and endorsement in CAFE SG, May 2004



Content of the PP



- Characterisation of PM
- *Air quality assessment methods*
- Current concentrations and exposure
- Emissions
- Source apportionment
- Trends and projections
- Abatement
- Attainability
- Conclusions of WHO
- *Recommendations concerning PM metric and PM levels*



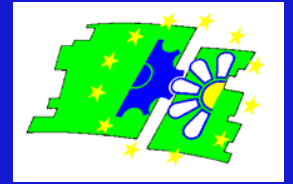
WHO conclusions



- “There is strong evidence to conclude that fine particles ($PM_{2.5}$) are more hazardous than larger ones (coarse particles) in terms of mortality and cardiovascular and respiratory endpoints in panel studies.
- This does not imply that the coarse fraction of PM_{10} is innocuous”



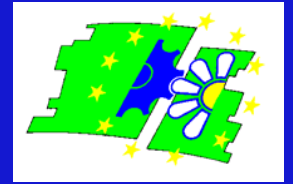
WHO conclusions



- Epidemiological studies on large populations have been unable to identify a threshold concentration below which ambient PM has no effect on health.
- WHO developed new exposure response relationship for PM_{2.5}



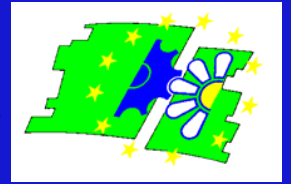
Particulate Matter Working Group



- Conclusions and Recommendations



Information availability



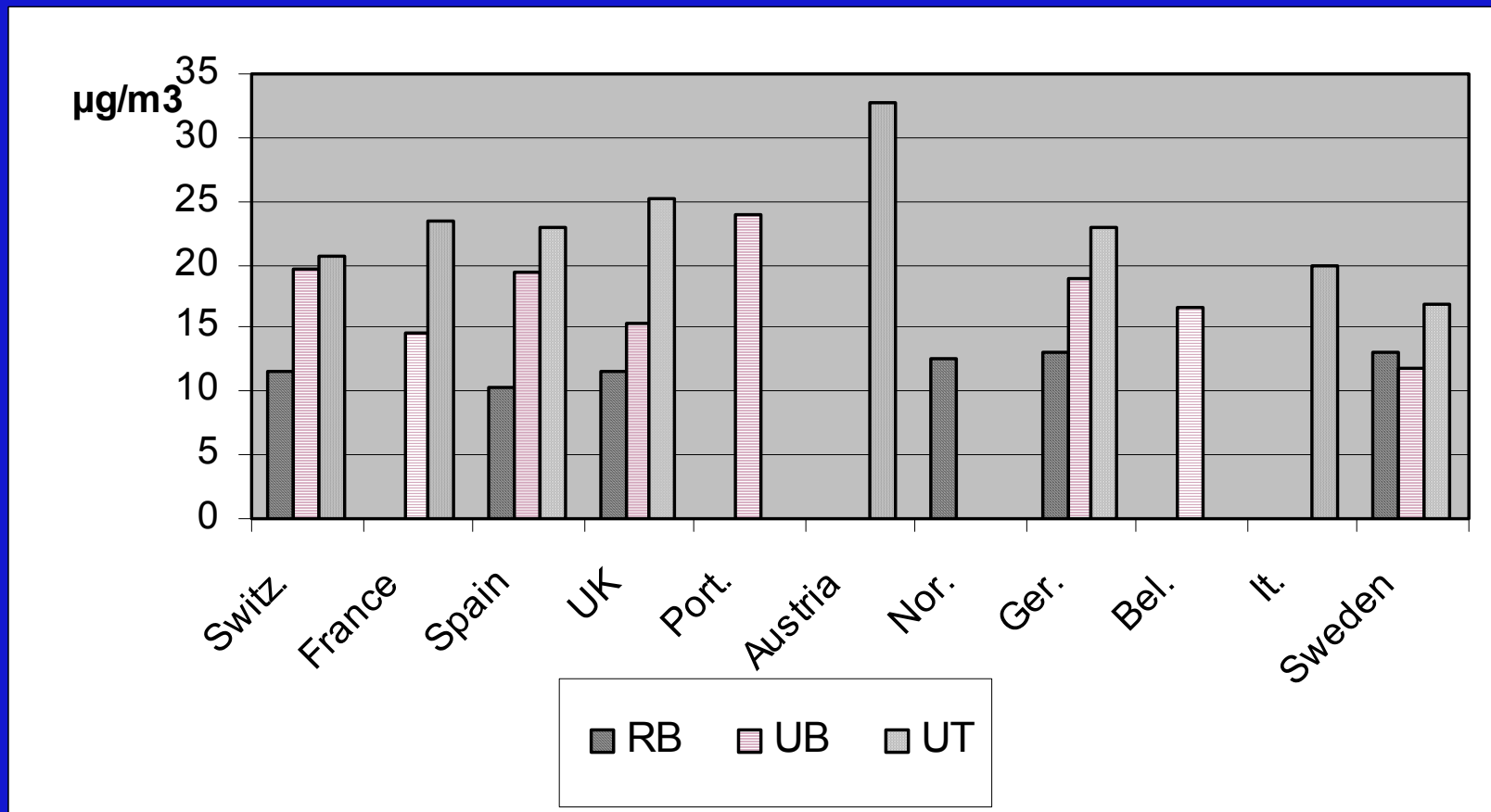
- Greatly improved information since the first Position Paper in 1997 on PM_{10} characteristics, ambient concentrations, historic trends and projections
- Comparatively little information on $PM_{2.5}$



Annual mean PM_{2,5} concentrations in 2001

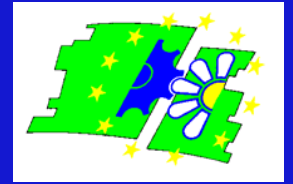


RB: rural background; UB: urban background
UT: Urban traffic





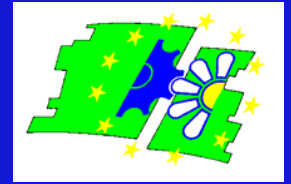
Trends



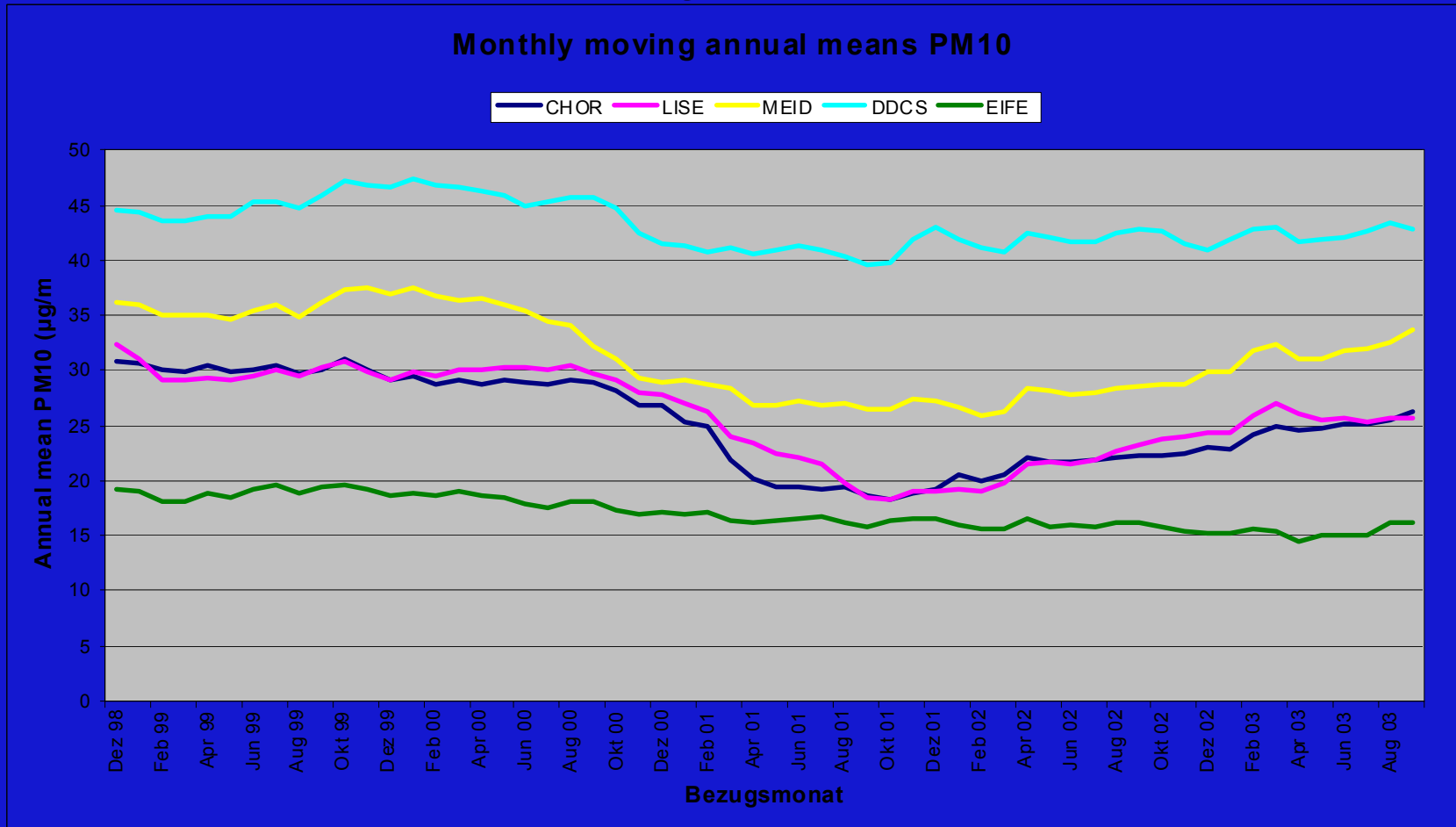
- Primary PM_{10} emissions reduced by 18% across Europe between 1990 and 2000
- Precursor emissions also decreased significantly
- Annual average PM_{10} concentrations decreased by 15 to 20% on average since 1997 (up to 2001). Not uniform.



example for PM10 'trends' (German monitoring stations)

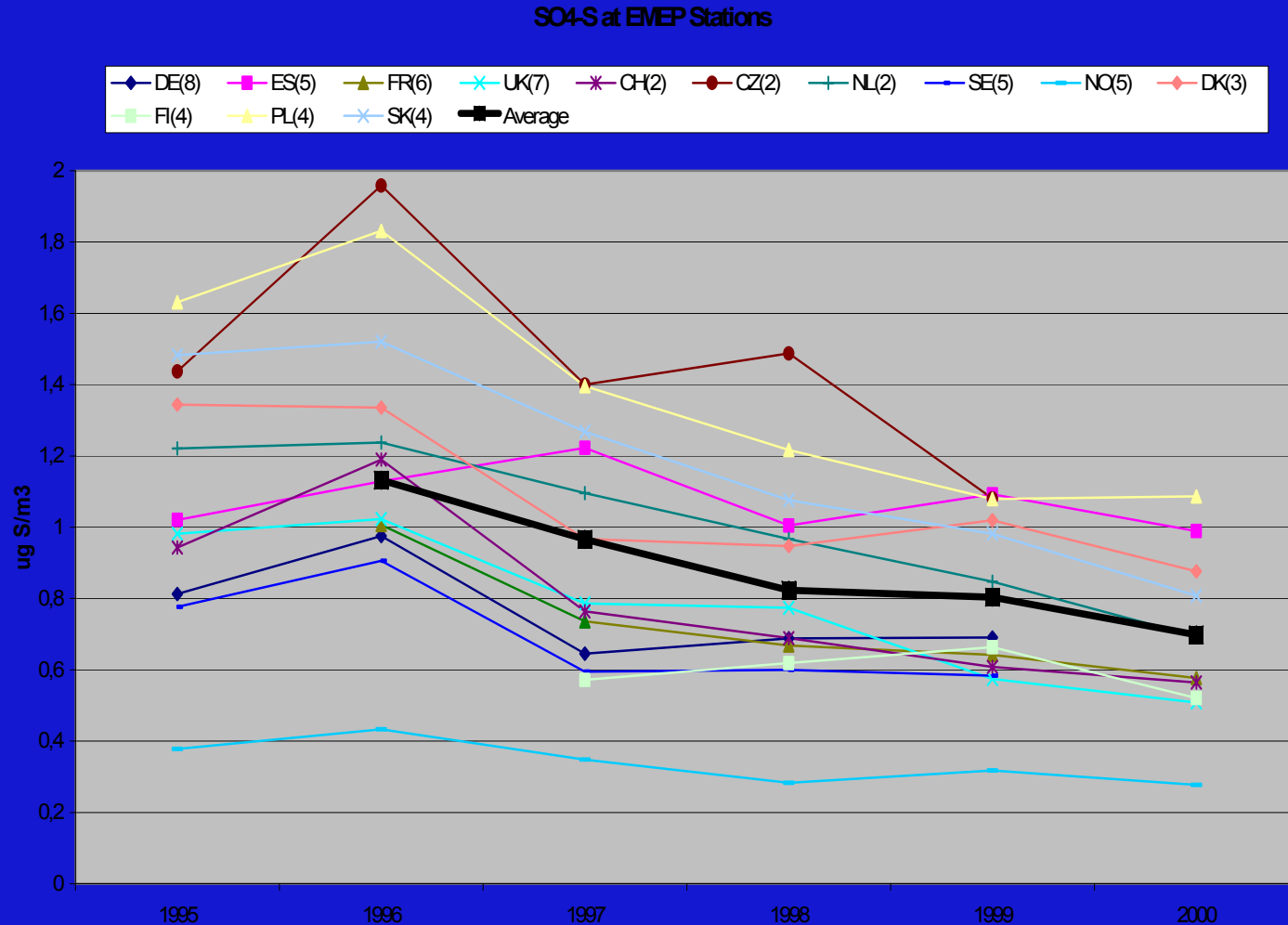


CHOR, LISE, MEID: urban background; DDCS: traffic; EIFE: rural



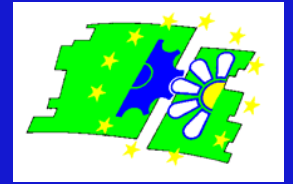


SO₄-S measurements at EMEP stations, average: 27 station, 5 countries





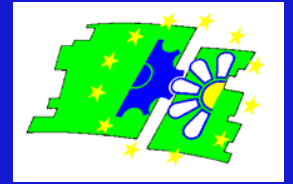
Monitoring



- Considerable high risk of uncertainties for PM mass concentrations. Loss of semi-volatile particles one of the major problems
- conflicting requirements of “public information” and “compliance checking”
- beta gauge and TEOM instruments still most commonly used. Some examples of combined use of reference and non-reference methods



Monitoring



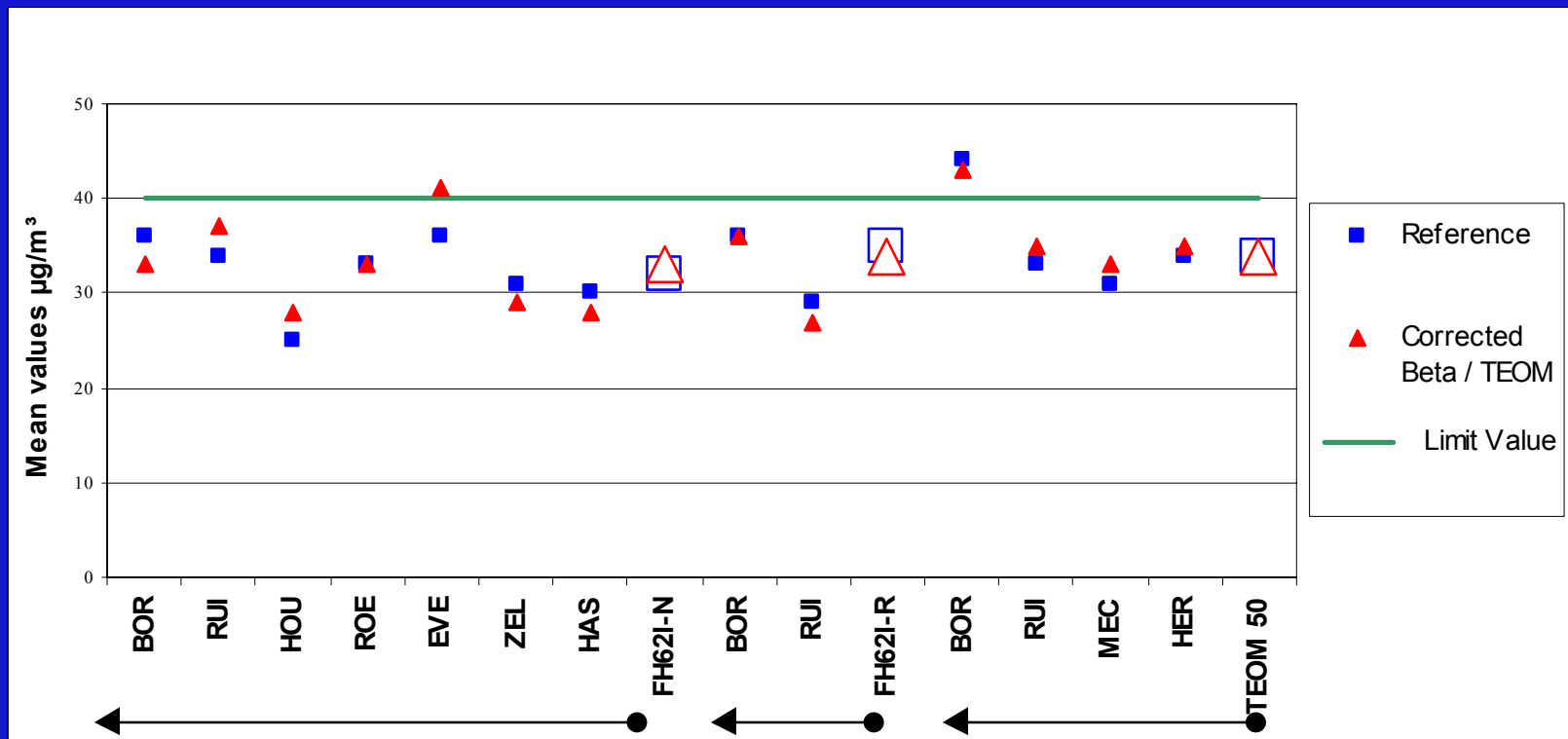
- Commonly used non-reference methods still tend to underestimate PM concentrations. For harmonisation throughout the EU: need to correct results at all stations were necessary.
Despite a lot of effort and some progress, this objective is not yet achieved!
- Use of non-reference require rigorous application of QA/QC procedures !



Monitoring



Annual mean PM₁₀ concentrations obtained by the reference and corrected non-reference methods (Belgian stations)





Monitoring



- In view of considerable concentration gradients around industrial sources, guidance needed, in particular on the size of representative area assessed
- Need to harmonise the “station mix”
- Need to better develop uncertainty requirements for models.



Monitoring



station mix”:

type of stations in different Member States

Station type	MS1	MS2	AC	MS3	MS4	EU
rural	16	3	19	0	8	97
urban	13	45	29	6	84	417
traffic	66	8	6	3	24	293
industrial	23	4	1	1	19	77
not defined	8	0	0	0	2	32
‘hot spot’ stations	71%	20%	13%	40%	31%	40%



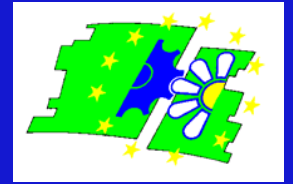
Monitoring



- Changing from PM₁₀ to PM_{2,5}:
 - changing sampling head
 - increase of uncertainty? unclear at present
 - number of monitoring stations necessary to cover the area of a Member State in a representative way might be lower for PM_{2,5}



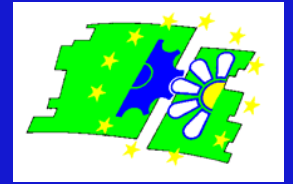
Monitoring; recommendations



- Review CEN EN 1234, reference method for PM10
- strengthen harmonisation of PM measurement
 - encourage MS to use ‘Guidance on Equivalence’
 - encourage MS to intensify QA/QC exercises within their State and between MS’s
 - encourage ERLAP to intensify their efforts to support harmonisation; involving AQUILQ
 - address different requirements in the Directive (public information versus compliance checking)



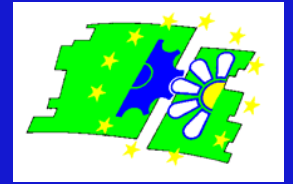
Monitoring; recommendations



- address different requirements in the Directive (public information versus compliance checking)
- in case of proposing new limit values (e.g. PM_{2,5}): carefully consider appropriate monitoring and assessment strategies
- review siting criteria, harmonise requirements under EoI Decision and AQ Directives
- Strengthen the reporting of “meta data” (e.g. description of monitoring sites).
- Member States should clearly document and report any correction factors applied to the data



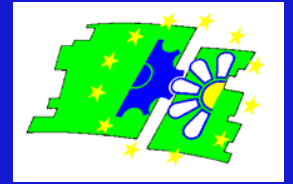
Attainability



- “Without additional policies and measures there will be widespread non-attainment of the Stage 1 and indicative Stage 2 limit values in the EU.”
- Stage 1 24h limit value more stringent than the Stage 1 annual average limit value



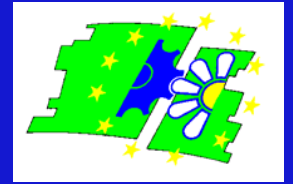
Attainability



- Less stringent Stage 1 annual average limit value likely to be attained in 2005 in most MS with some exceptions at urban background and hotspots
- With current policies, PM levels at many locations across the EU likely to exceed the Stage 1 24h limit value in 2005



Attainability



- Even with ambitious measures, indicative limit values seem unattainable in the most polluted locations by 2010
- Attainability largely outside control of individual MS's because of transboundary nature of PM_{10} pollution. Also Europe-wide action needed.



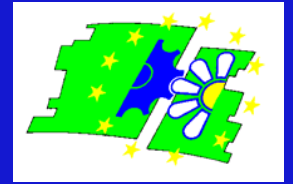
PM metric



- WG PM recommends the use of $PM_{2.5}$ rather than PM_{10} as the principal metric for assessing exposure to PM.
- Reclassify indicative Stage 2 target values as target values with the aim to help control the coarse fraction, $PM_{2.5-10}$.



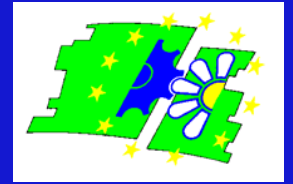
Targets



- Recommends that the Commission consider the use of alternative approaches, such as gap closure or targets, to supplement the use of limit values.



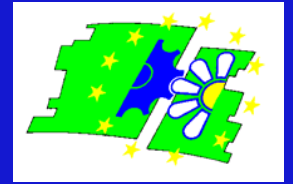
Annual average limit value



- Recommends a range of values (12 to 20 $\mu\text{g}/\text{m}^3$ - derived from current Stage 1 LV) for the integrated assessment procedure to identify an appropriate $\text{PM}_{2.5}$ annual average limit value. Position Paper provides rationale.



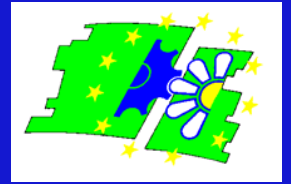
24-h average limit



- Recommends a value for $PM_{2.5}$ around $35 \mu\text{g}/\text{m}^3$ (not to be exceeded more than 10% of the days of the year) as a starting point for consideration.



Other recommendations



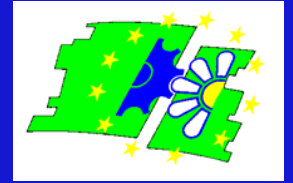
- 34 other recommendations from individual chapters
 - Research
 - Measurement
 - Important to address contradiction between reference method and daily reporting requirements
 - Characterisation
 - Modelling
 - Abatement strategies
 - Attainability
 - Strategy for setting targets



Position Paper URL



**[http://europa.eu.int/comm/environment/
air/cafe/pdf/working_groups/
2nd_position_paper_pm.pdf](http://europa.eu.int/comm/environment/air/cafe/pdf/working_groups/2nd_position_paper_pm.pdf)**



***Thank you for your
attention***