



Clean Air Reporting in Chinese Cities And Internationally

国内国际城市空气质量信息发布介绍

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CAI-Asia

7th Air Quality Management City Workshop of CAI-Asia China Network

第七届CAI-Asia中国城市空气质量管理研讨会

Dalian, P.R. China

30 June – 1 July 2011



Presentation Outline

- Clean air reporting in Chinese cities
- 中国城市空气质量信息发布
- Basics of clean air reporting
- 空气质量信息发布基本情况
 - Why, what, who, to whom?
 - 为什么发布，发布什么，谁发布，发布给谁
- How to report
- 如何发布
 - Focus on (a) general public and (b) policymakers
 - 关注公众/政策制定者
 - Annual air quality status reports
 - 年度空气质量报告
- Sustainability of clean air reporting
- 空气质量信息发布的可持续性



Clean Air Reporting in Chinese Cities (1)

中国城市空气质量信息发布



重点城市空气质量发布系统

当前时间: 6/28/2011 10:49:39 AM
空气质量日报
空气质量监测系统介绍
重点城市空气质量数据

更新时间: 10点
单位: 毫克/立方米

中华人民共和国环境保护部 数据中心
 Ministry of Environmental Protection of the People's Republic of China

2011年06月20日 星期一 14:29

重点城市空气质量日报

重点城市空气质量日报

2011年06月19日, 共120个城市

重点城市空气质量状况统计

城市	API	级别	状况
乌鲁木齐	39	I	优
克拉玛依	36	I	优
唐山	71	II	良
太原	81	II	良
保定	61	II	良
青岛	75	II	良
包头	61	II	良
本溪	39	I	优
德州	79	II	良
吉林	69	II	良
大庆	77	II	良
无锡	35	I	优
徐州	83	II	良
宜昌	47	I	优
嘉兴	24	I	优
台州	66	II	良
马鞍山	37	I	优
威海	52	II	良
沈阳	133	III	轻度污染
安阳	108	III	轻度污染
焦作	77	II	良

2011年06月19日重点城市空气质量日报前十名

Clean Air Reporting in Chinese Cities (2)

中国城市空气质量信息发布



空气质量状况	是否发布	空气质量状况	是否发布
实时空气质量水平	√	空气污染指数与上年比较	√
每日空气污染指数	√	年度PM ₁₀ , SO ₂ , NO ₂ 与上年比较	√
每日PM ₁₀ , SO ₂ , NO ₂ 水平	√*	5年空气污染指数分析	√
		5年年度PM ₁₀ , SO ₂ , NO ₂ 水平分析	√
空气污染指数预报	√		
PM ₁₀ , SO ₂ , NO ₂ 水平预报	√*	空气质量检测站信息	
空气质量警告		质量监控与保证信息	
每年蓝天数	√	排放清单	
空气质量低于二级天数	√	PM ₁₀ 排放源分配	
		PM ₁₀ , SO ₂ , NO ₂ 水平地理制图	



Reporting and Communication in Air Quality Management

Management

空气质量管理工作中的沟通与信息发布

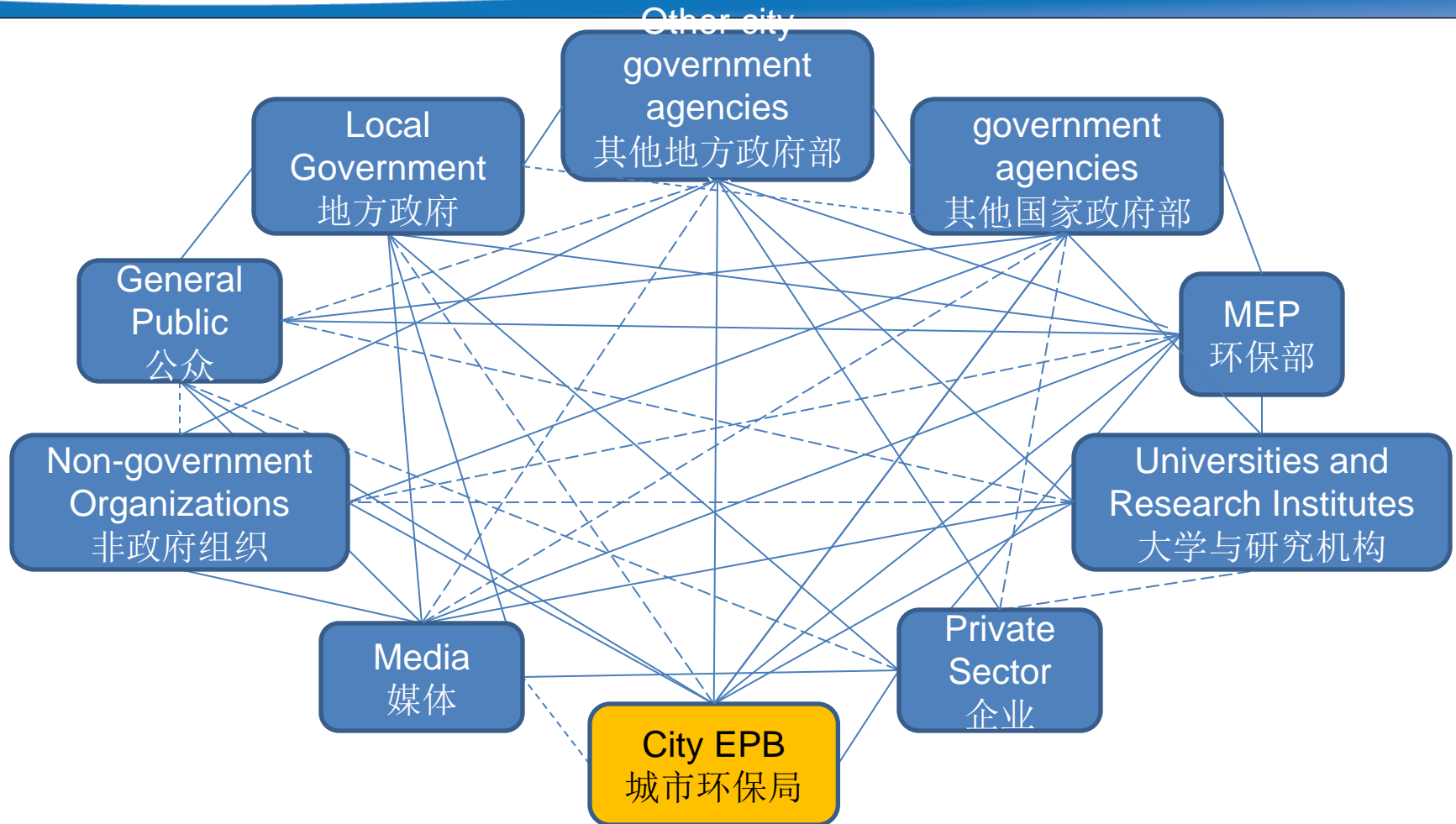


Adapted from Bachmann, 2007.



'Who reports?'

谁来发布，发布给谁



Communication lines exist among different city stakeholders 城市不同相关方之间都存在沟通

City EPB = mandate to communicate AQM 城市环保局是负责空气质量管理沟通的部门

Before starting... 开始之前



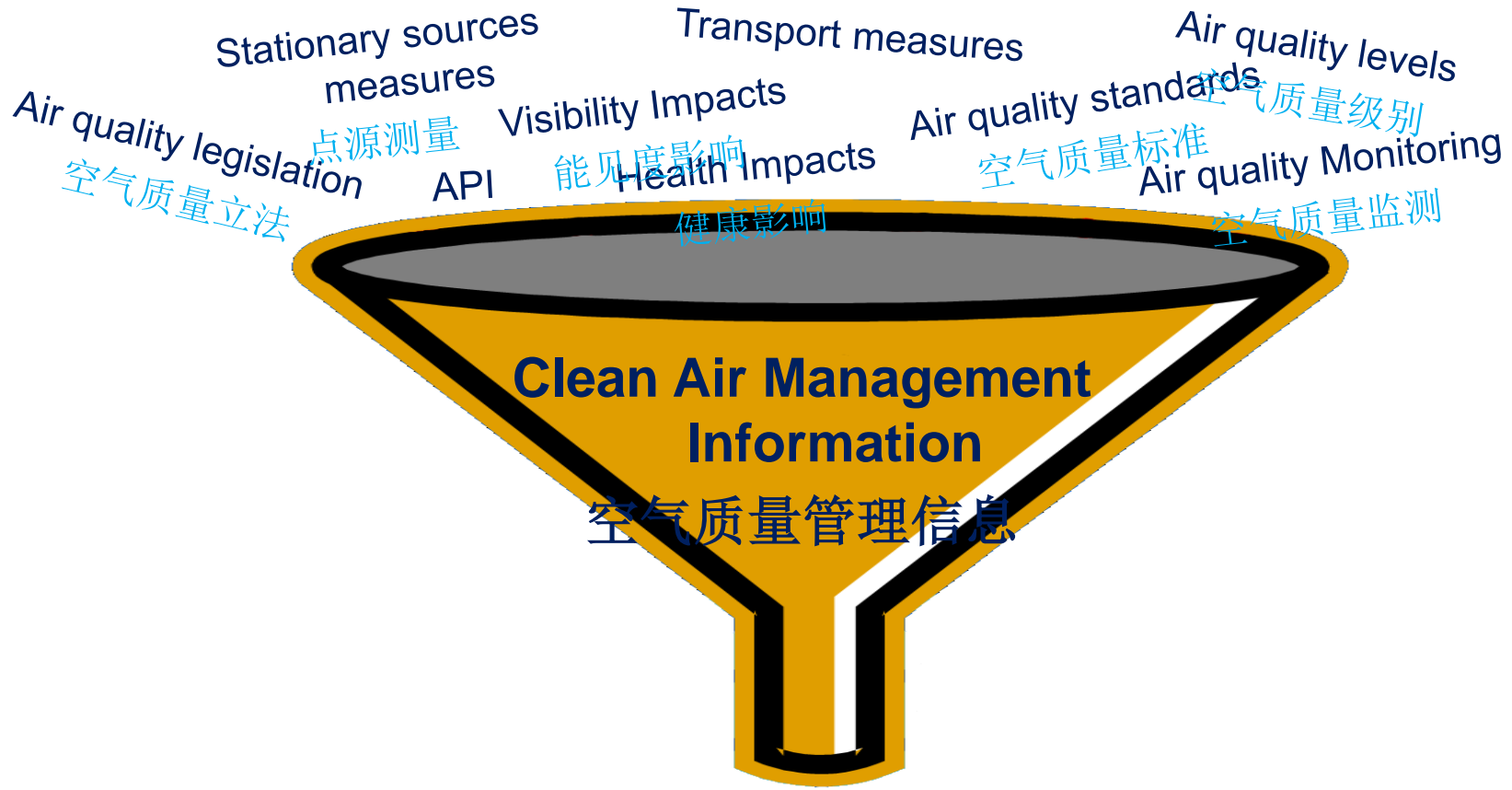
1. Define purpose 确定目标
2. Identify target audience / stakeholders 识别受众与相关方
3. Determine needs of target audience / stakeholders 确定受众与相关方的需求

Basic Requirements of Clean Air Reporting 空气质量信息发布的基本要求

- ✓ Timely 时效性
- ✓ Accurate 准确性
- ✓ Understandable 可理解
- ✓ Addresses the needs of stakeholders 满足相关方需求



Tailoring information to users-needs 根据用户需求量身定做



General Public/Residents



Researchers/Scientists



Policy-Makers



'Why report'

为何发布

General Public 公众

- To inform residents of the quality of air they are breathing and its corresponding risks 告知空气质量及相应风险
- To warn residents of high air pollution episodes 高污染
- To encourage residents to participate in reducing emissions 鼓励公众参与到降低排放的行动中

Researchers/ Scientists 研究人员

- To engage further air quality research, which supports local clean air quality management 鼓励空气质量深入研究，作为本地空气质量管理的支撑

Policymakers 政策制定者

- To motivate action and help make informed decisions by providing clear and understandable information and knowledge on air pollution issues 以清晰易懂的信息和知识推动决策和行动



‘What to Report’ 发布什么 (I)

	General Public 公众	Researchers 研究人员	Policymakers 政策制定者
General city information (population, GDP) 城市基本信息 (人口, GDP)	√	√	√
City planning developments in industry, energy, transportation 城市规划 (工业、能源、交通)		√	√
Real-time air quality levels, daily API 实时空气质量水平, 每日空气污染指数	√	√	√
Air quality forecast 空气质量预报	√	√	
Number of days where standard is exceeded 超标天数	√	√	√
Air quality trend and tendency analysis 空气质量趋势分析		√	√
Air quality warnings 空气质量预警	√	√	
Health impacts 健康影响	√	√	√

‘What to Report’ 发布什么 (II)

	General Public 公众	Researchers 研究人员	Policymakers 政策制定者
Costs of air pollution (health, economic, etc) 空气污染代价 (健康, 经济)		✓	✓
Other impacts (visibility, tourism, others) 其他影响 (能见度, 旅游业)	✓	✓	✓
Legislation and regulations on air quality 空气质量立法与相关规定	✓	✓	
Annual achievements on clean air management 空气质量年度成就	✓	✓	✓
Status of implementation on control measures 控制措施的实施效果			✓
Planned air pollution control measures 空气污染控制措施计划	✓	✓	✓
Yearly budget for clean air management 空气质量年度预算			✓

For General Public: 'How to report'

对公众，如何发布

- **Published (printed) report** – reports, brochures, papers 印刷报告
- **Print media** – newspapers 纸媒 – 报纸
- **Broadcast media** – television and radio 电视与广播
- **Website** – online database 网站 – 在线数据库
- **Email or mobile alerts** 邮件或手机提醒
- **Public display screens** or booths / information boards 城市信息公告栏
- **Internal communication** 内部通讯
- **Upon request** 按需索取

**Information should be simple
and easy to understand
信息简单易懂**

***language used: In Chinese
and English?**



Communicating air pollution to public: APIs

与公众沟通：空气污染指数



Our Environment - Sustain and Enjoy

Department of Environment Ministry of Natural Resources and Environment

Air Pollutant Index Management System (APIMS)

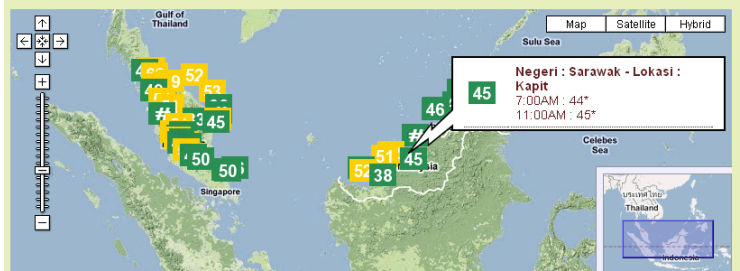
Laman Utama Arkib Lokasi Agensi Remote Sensing Malaysia (ARSM) Hotspot (HIS) Guest [Login]

Latest Updated : 20 June 2011 | 19 June 2011 | 18 June 2011 | 17 June 2011 | 16 June 2011 |

AIR POLLUTANT INDEX (20 June 2011)

AIR POLLUTANT INDEX (API)
INDEKS PENCEMAR UDARA (IPU)
20 June 2011 (Monday)

Maklumat Titik Panas (NOAA18)/Hotspots Information (NOAA18)



24-hr PSI Readings At 4 PM on 19 Jun 2011

Region	24-hour Sub-Index at 4 PM on 19 Jun 2011					PSI*	Air Quality Descriptor	Responsible Pollutant
	Sulphur Dioxide	PM10	Ozone	Carbon Monoxide	Nitrogen Dioxide+			
North	5	35	13	7	-	35	Good	PM10
South	6	32	19	4	-	32	Good	PM10
East	12	33	21	10	-	33	Good	PM10
West	19	34	22	6	-	34	Good	PM10
Central	7	32	12	8	-	32	Good	PM10
Overall Singapore*	19	35	22	10	-	35	Good	PM10

中华人民共和国环境保护部 数据中心

Ministry of Environmental Protection of the People's Republic of China

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2011年06月19日重点城市空气质量日报前十名

Air Korea

Real-Time Air Quality / Data Retrieve / Information / What's CAI / About AIRK

Real-Time Air Quality

- Comprehensive Air-quality Index (CAI)
- Particulate Matter (PM-10)
- Ozone (O3)
- Nitrogen Dioxide (NO2)
- Carbon Monoxide (CO)
- Sulfur Dioxide (SO2)

Comprehensive Air-quality Index (CAI)

The CAI is a way of describing ambient air quality based on health risk of air pollution.

The index aims to help the public easily understand air quality level and protect the health of people from air pollution.

Of values of the five air pollutants, the highest is the CAI value.

Paris, France: "Air de Paris" balloon

法国巴黎



Very low



Low



Medium



High



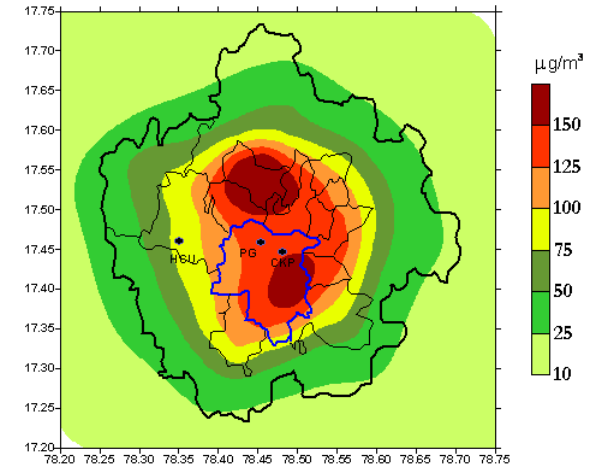
Very high



Helsinki, Finland: Green lasers showing industrial air pollution 芬兰，赫尔辛基



Seoul, South Korea: Living light sculptures of air quality 韩国汉城



Beijing, P.R. China: Photo Diary of Air Quality

中国北京



LONGING FOR BLUE SKIES ROOM WITH A VIEW STATISTICALLY SPEAKING NEWS FEED

A photo diary of Beijing's Air



← Previous Next → March 10, 2011 pollution index ? **64**

◀ March 2011 ▶

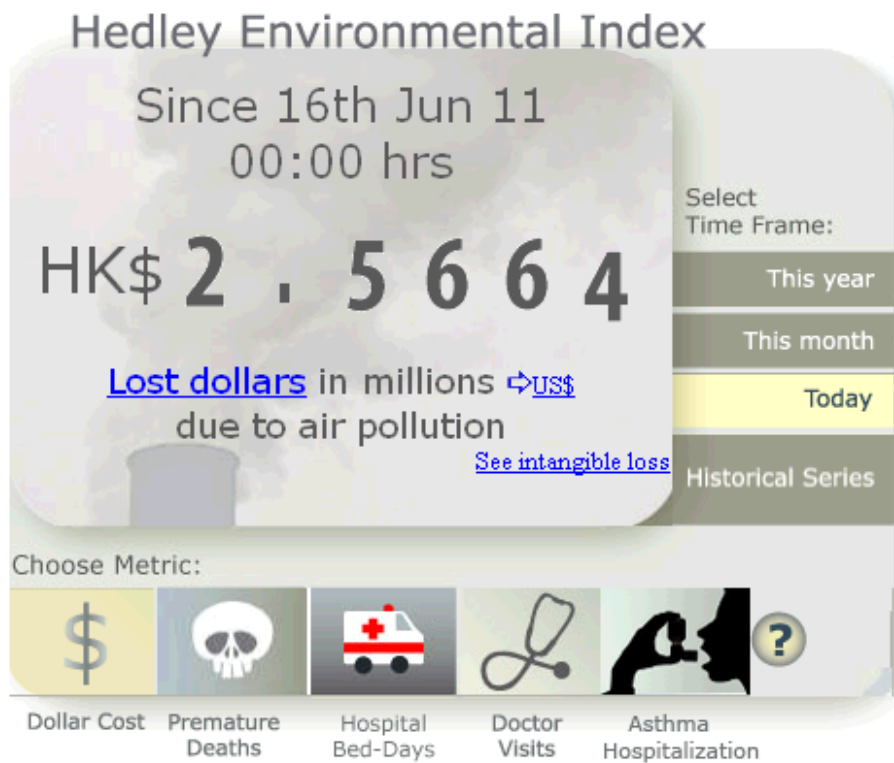
78.3 avg pollution, 23 blue sky days

		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

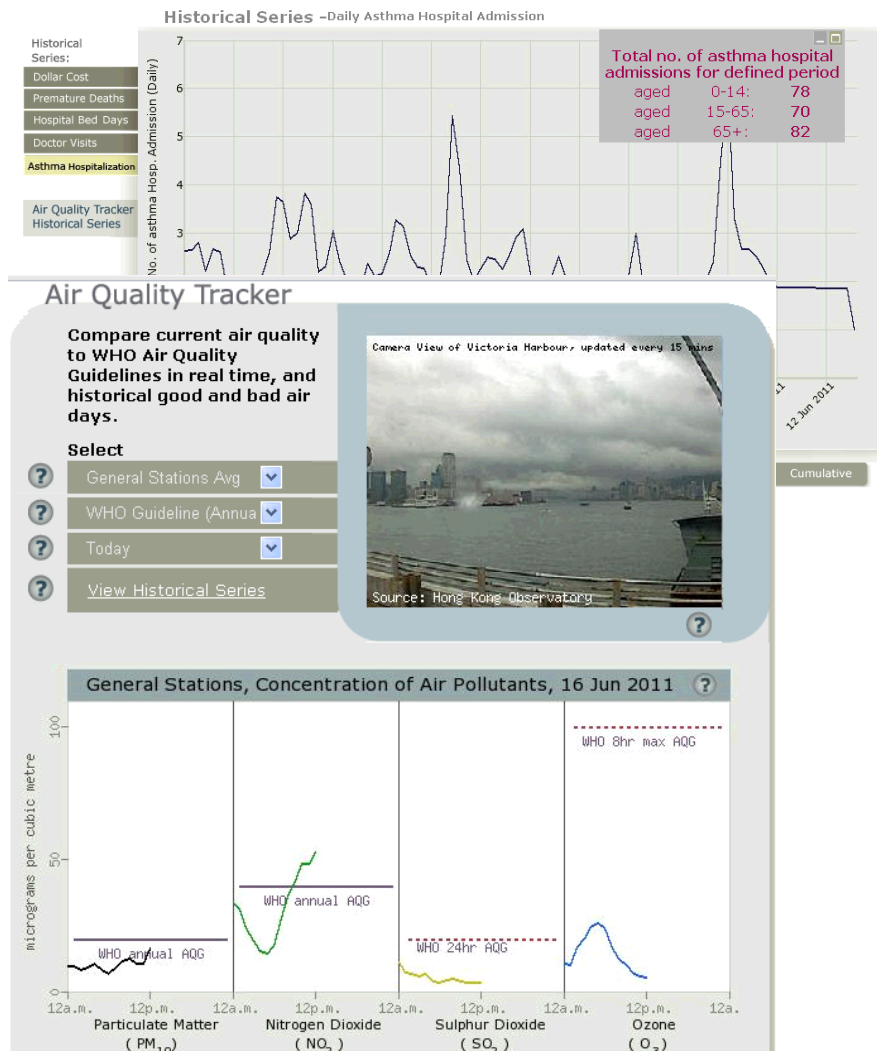
- ▶ Best air quality
- ▶ Worst air quality
- ▶ Greatest daily change

Hong Kong SAR: Hedley Environmental Index

香港特别行政区



Measuring air pollution costs



For Policymakers: 'How to report'

对政策建议者，如何发布

- Written reports 报告
- Summary tables 汇总表格
- Visual presentations 视觉展示
- Interpretation of information
信息解读
- Pie chart and map chart
饼图与地图
- Satellite imagery 卫星图像

Information should be condensed; provided in relation to other information or in the context of socio-political issues.

信息精炼，在社会政治背景下提供相关信息与建议

Recommendations for action should be clear.



Summary Tables 汇总表格



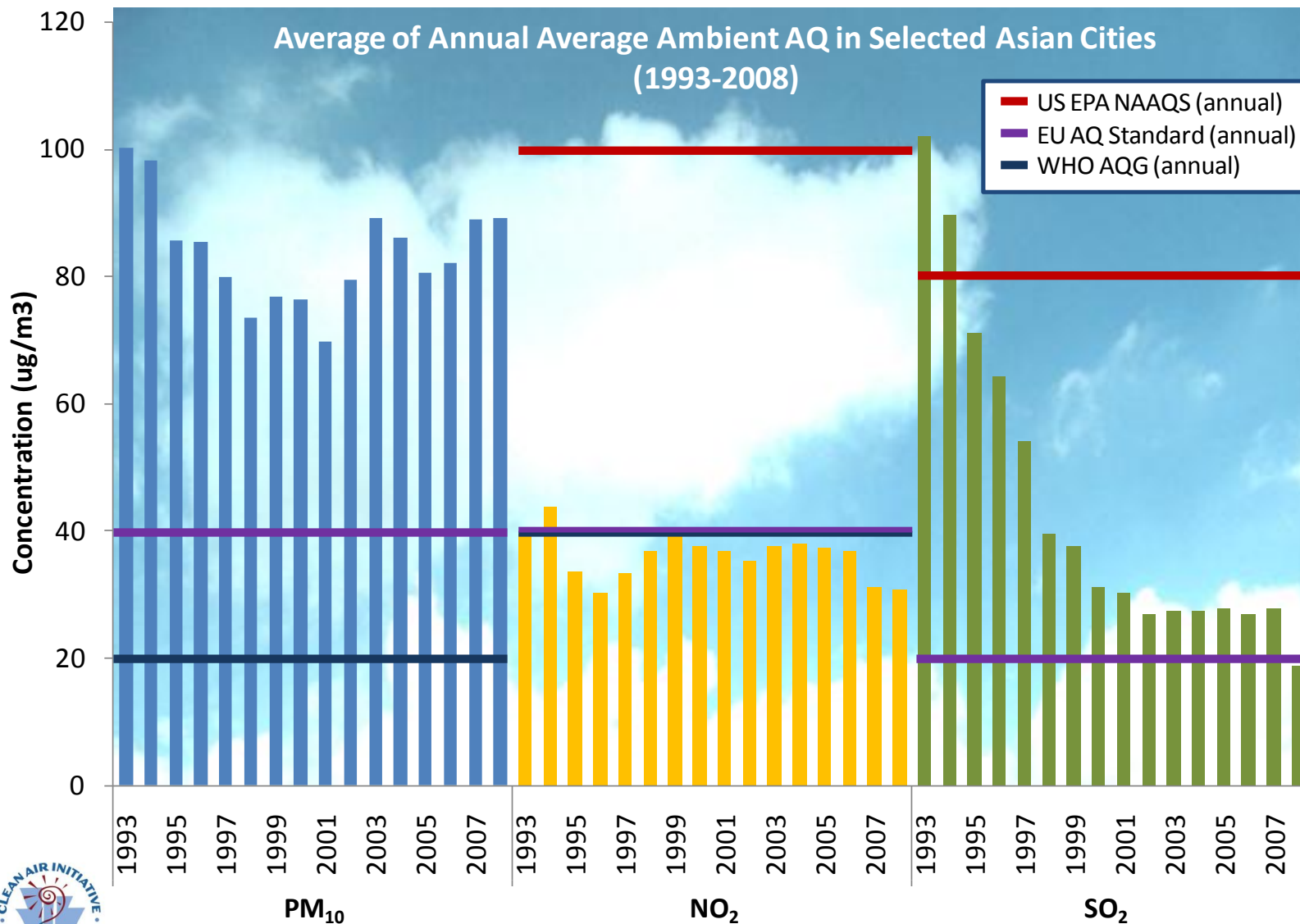
Global Burden of Disease Due to Air Pollution 全球范围因空气污染导致的死亡

Air Pollution 空气污染	Impact 影响	
	Premature Deaths	Morbidity 死亡率 (DALYs)
Urban Outdoor 城市室外	1.152 million = 2.0% of deaths worldwide • 8% of lung cancer deaths 肺癌 • 5% of cardiopulmonary deaths 心肺 • 3% of respiratory infection deaths 呼吸系统	8.7 million DALYs
Indoor Air 室内空气	1.965 million = 3.3% of deaths worldwide • 21% of lower respiratory infection deaths • 35% of chronic obstructive pulmonary deaths • 3% of lung cancer deaths • nearly 900 000 deaths due to pneumonia among children under five years of age.	41 million DALYs
Total Air Pollution 总共	3.1 million = 5.3% of deaths worldwide	49.7 million DALYS

Source: WHO, 2009. 来源: 世界卫生组织, 2009

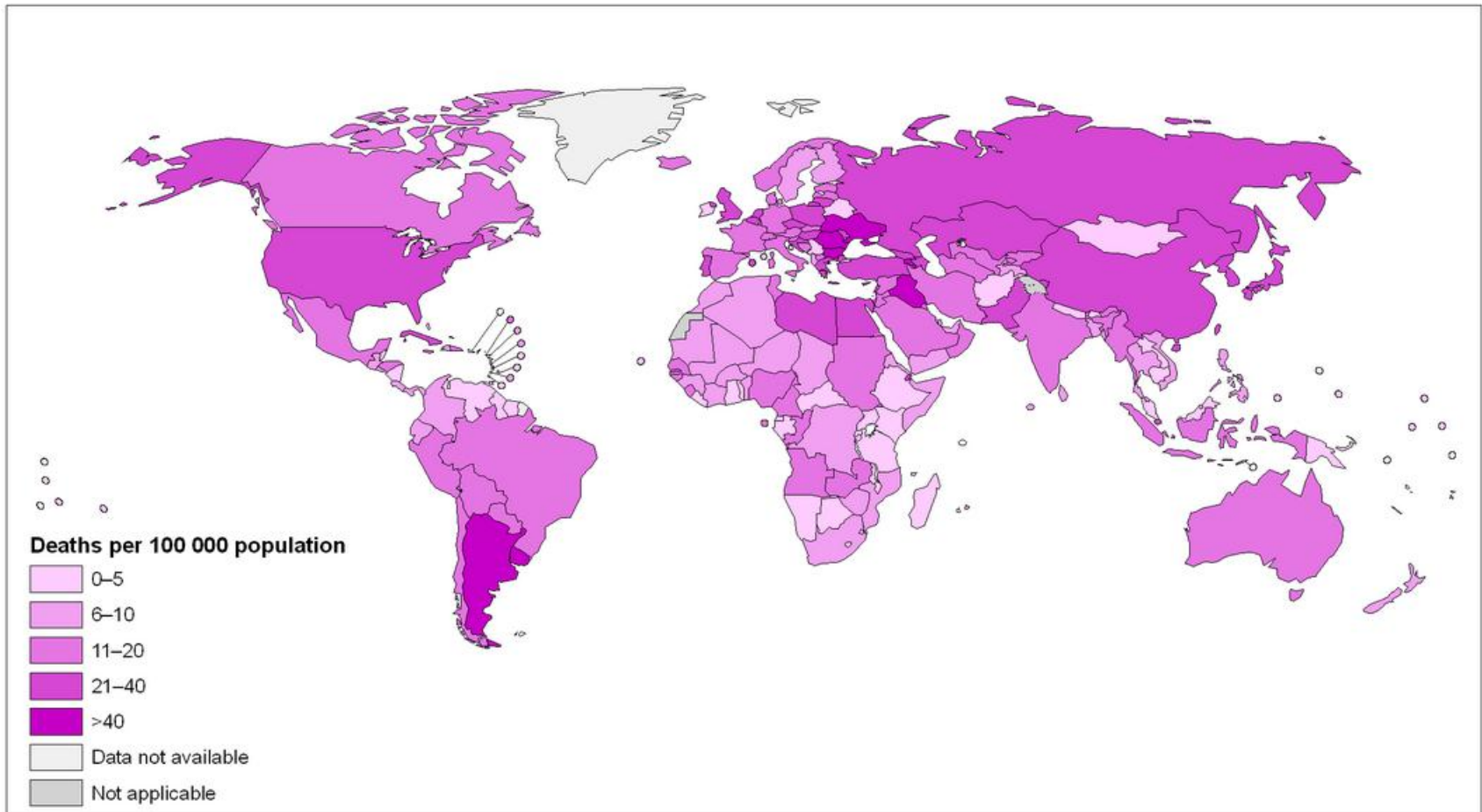


Interpreted Data 数据解读



Visual Presentations 视觉展示

Deaths attributable to outdoor air pollution (2004)



The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.

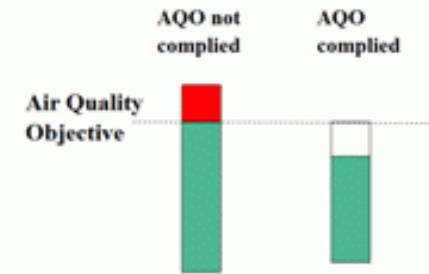
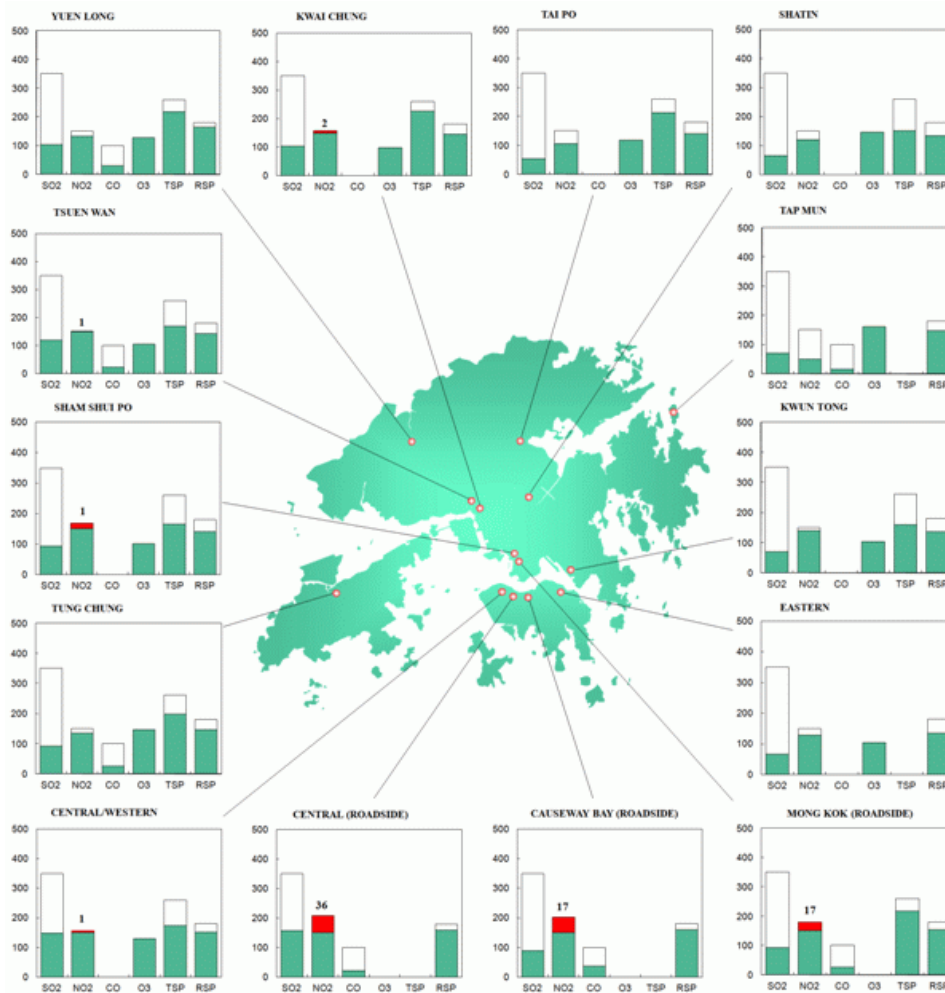
Data Source: World Health Organization
Map Production: Public Health Information and Geographic Information Systems (GIS)
World Health Organization



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Maps and Pie Charts 地图与饼图

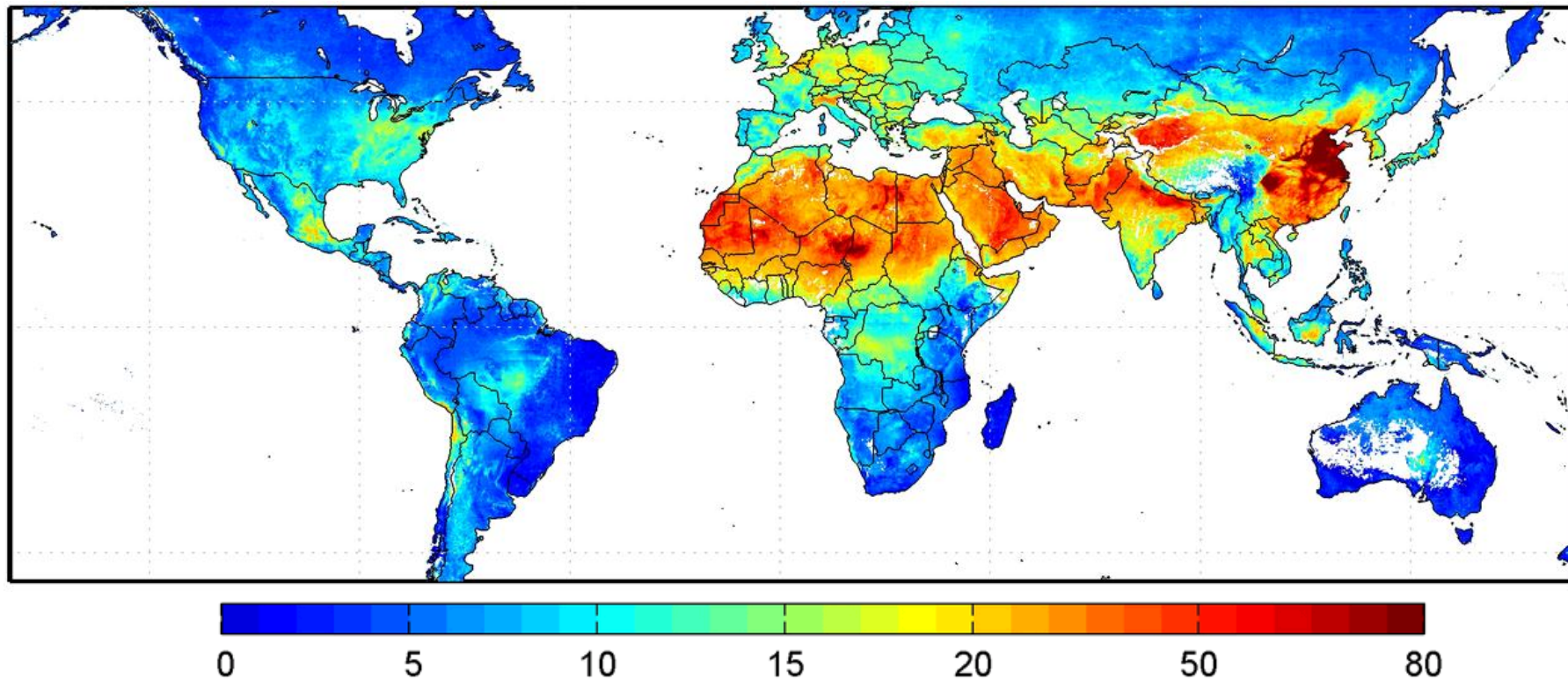
Hong Kong: Maximum Daily Pollutant Concentrations and Objectives in 2008



- Figures shown are maximum daily concentrations, except CO which is the maximum 8-hour concentration. (No. of violations of AQO limit value shown above each column.)
- All concentrations are in micrograms per cubic meter except CO which is in hundred micrograms per cubic meter.
- Maximum daily concentrations are in grey.
- Non-compliance of daily AQO value shown in red.

Satellite Imagery 卫星图像

Global satellite-derived map of PM_{2.5} averaged over 2001-2006 ($\mu\text{g}/\text{m}^3$)



Source: NASA, 2010.



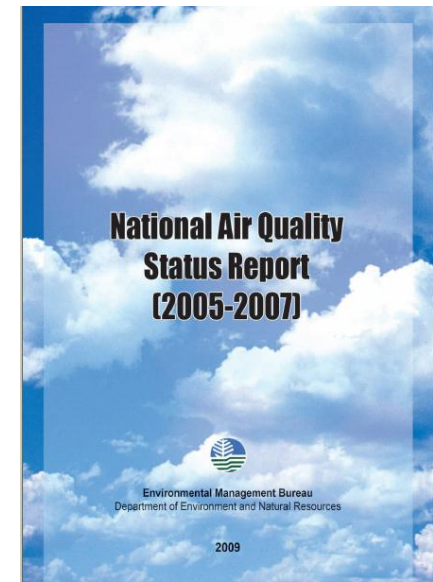
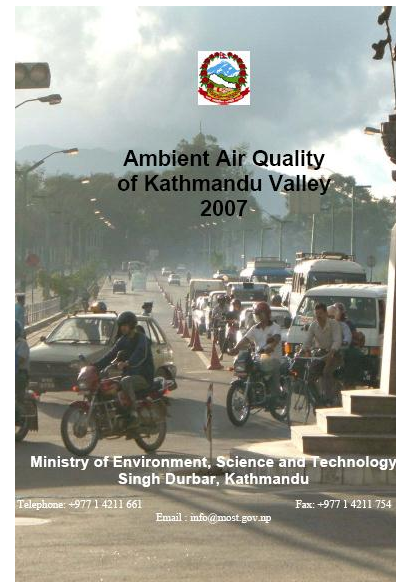
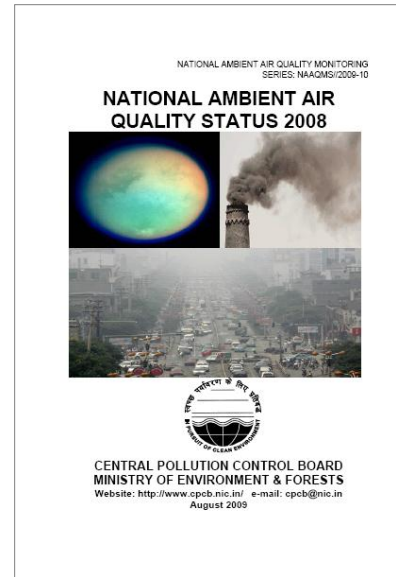
Annual Air Quality Status Reports in Asia (1)

亚洲范围内的空气质量年度报告



Common Pitfalls 通常的缺陷

- Usually focus on air quality monitoring data analysis
- 关注监测数据分析
 - Limited analysis conducted 分析
 - Rarely provides spatial distribution 空间分布
 - Concentrations averaged for whole country 全国平均浓度
 - Limited/ No information on quality assurance/ quality control 质量验证与控制
- Late releases/ discontinuity 延迟发布，不连续发布



Annual Air Quality Status Reports in Asia (2)

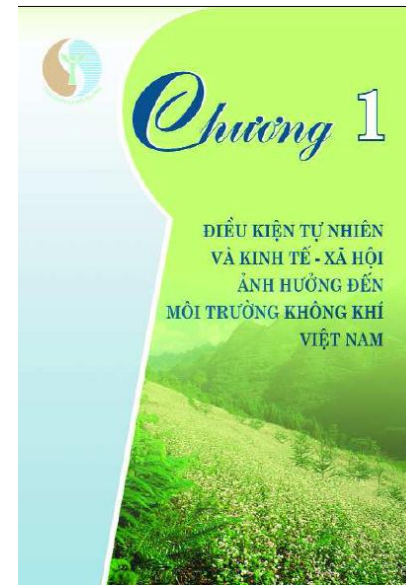
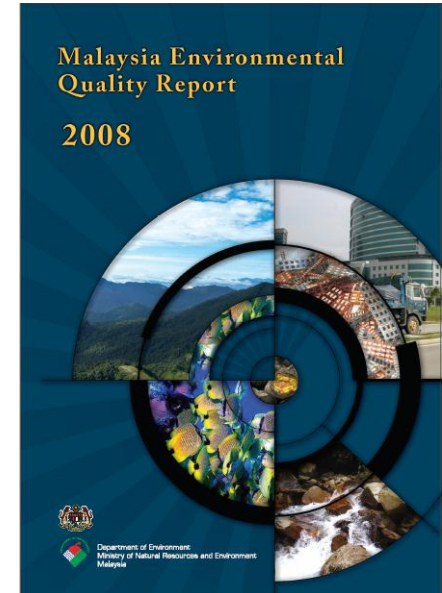
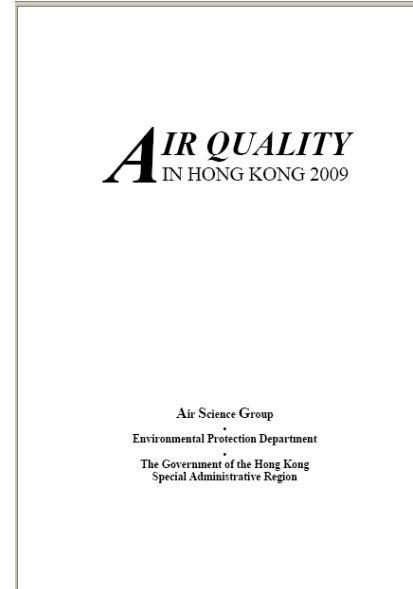
亚洲范围内的空气质量年度报告



Common Pitfalls

通常的缺陷

- Rarely includes local studies/ information on impacts to health, economy, visibility, etc
- 包括健康，经济等影响
- Limited information on air quality management policies and measures
- 空气质量管理相关政策措施信息
 - Limited information on air quality management achievements and planned activities 成就与计划
- Usually does not provide recommendations / priority areas to improve air quality
- 改进建议



How to sustain clean air reporting in cities?

如何使城市空气质量信息发布可持续



Institutionalize a clean air reporting system , including:

- Assign resources 分配资源
 - Who will prepare? 谁负责准备
 - Is budget and time allocated? 时间经费分配
 - Is the current communication infrastructure enough? *i.e.*, website 现有沟通发布渠道是否够用
- Establish: 确立
 - Frequency of reporting 发布频率
 - Form of reporting 发布形式
 - Content 发布内容
- Language considerations, depending on your target audience 根据受众，考虑语言



Main Points 要点

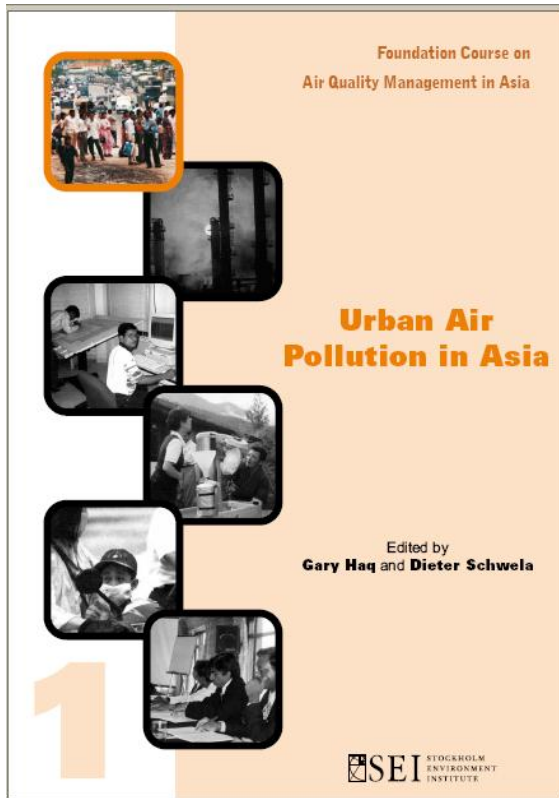


- In developing an clean air management reporting system 在设计空气质量信息发布系统时
 - it is necessary to identify the purpose of reporting and who are the users of the information 要识别发布目的与目标受众
- Clean air reporting should be done in a timely manner, providing accurate and understandable information, which addresses the needs of stakeholders 时效性、准确性、易懂、满足需求
- Clean air reporting needs to be linked with corresponding actions for its users 需要与下一步行动建立联系
 - Ex. Annual air quality reports should contain recommendations on policy/ local management measures 比如对政策制定者的建议
- #

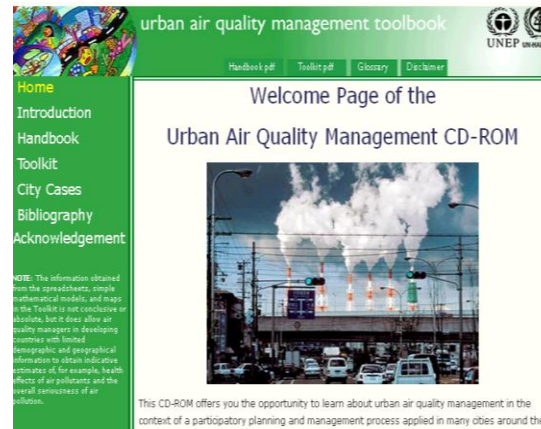


Some References on AQM, including Reporting and Communication

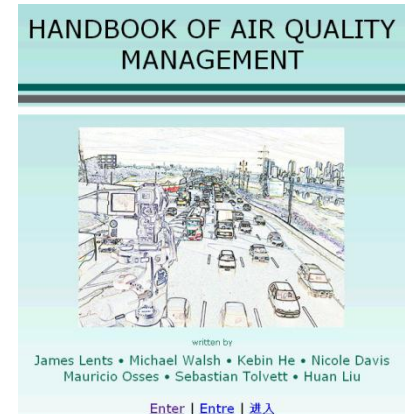
空气质量管埋, 信息发布与沟通方面的参考资料



Foundation Course on Air Quality Management in Asia by SEI



URL: <http://ww2.unhabitat.org/wuf/2006/aqm/index.htm>



URL: <http://www.aqbook.org/>



URL: <http://www.epa.gov/air/aqmportal/index.htm>

For more information



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CAI-Asia Country Networks

China, India, Indonesia, Nepal, Pakistan, Philippines, Sri Lanka

