

SINO-US International Workshop Concerning the Law on Atmospheric Pollution Prevention and Control

中美大气污染防治法国际研讨会

US Experience with Regional and Multi-Pollutant Strategies for Air Quality Control

美国在地区及空气质量控制中多种污染物策略方面的经验

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U.S. Air Quality Programs

General Overview

美国空气质量项目概述

- **Before 1970** – States set standards, plan, achieve compliance for single pollutants
- **1970-1980s** – US set standards, States plan, achieve compliance
- **1990s** – Regional focus
- **After 2000** – Increased regional planning and multi-pollutant approaches
- 1970年以前 – 由各个州负责制定相关标准、规划以及达到每种污染物的治理要求
- 二十世纪七十年代 – 由联邦政府制定相关标准，各个州负责进行规划并达到相关要求
- 二十世纪九十年代 – 注重区域规划
- 2000年以后 – 加强区域规划，并向采用多种污染物策略的趋势发展

Clean Air Act Amendments of 1990

1990年的清洁空气法案修订案

- Substantially strengthened CAA (P.L. 101-549)
- Classification system
- Prescriptive requirements for nonattainment areas
- 充分加强了CAA (P.L. 101-549)
- 分类系统
- 对非达标地区制定的具体控制要求

Clean Air Act Amendments of 1990

1990年的清洁空气法案修订案

- Operating permit system (Title V) for major sources
 - 对重大污染源实行运作许可证系统（第五章）
- Enforcement strengthened
 - Administrative penalty orders (\$20,000 per day)
 - 加强实施
 - 行政处罚 (2万美元每天)
- Criminal penalties toughened
 - Knowing violations became serious crimes
 - 加强了刑罚
 - 明知故犯的情况下构成重罪

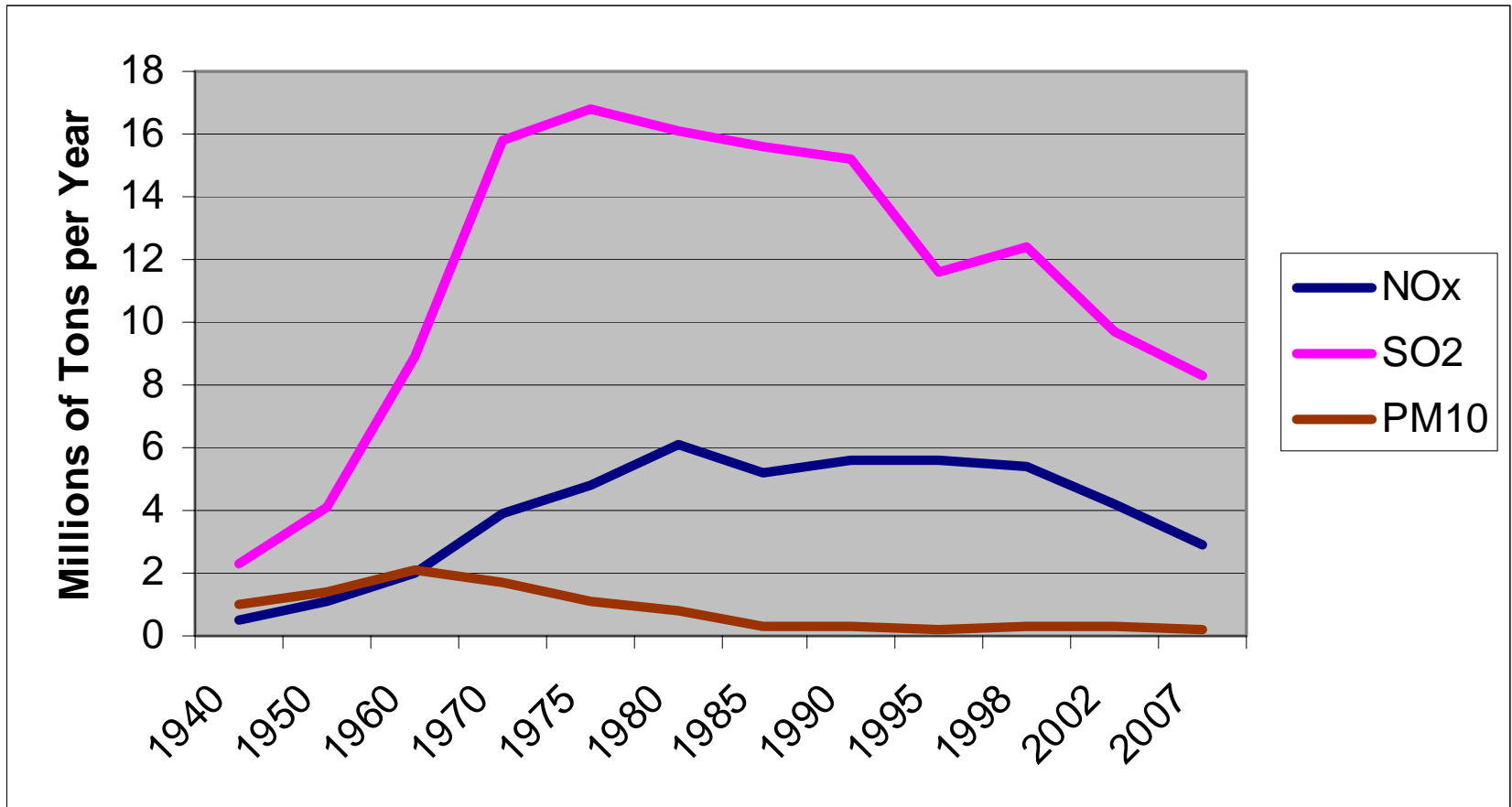
Results of Clean Air Act Amendments of 1990

1990年的清洁空气法案修订案的实施结果

- 8-hour ozone 9% < 1990
- Annual PM_{2.5} 14% < 2000
- Benzene levels < 17% from 2000 to 2005
- Toxics < 35% from 1990 to 2002
- From 1990 to 2005, sulfate deposition < 30% in Northeast and Midwest
- 8-小时臭氧浓度要比1990年低9%
- 年均PM_{2.5}浓度要比2000年低14%
- 2000 – 2005年间的苯水平降低了17%
- 1990 – 2002年的空气毒性排放降低了35%
- 从1990 – 2005年，东北部和中西部的硫酸盐沉积大约减少了30%

U.S. Coal-Fired Power Plant Emissions 1940-2007

美国煤电厂排放 1940 – 2007年





Current Clean Air Act

当前的清洁空气法案

- No significant changes since the 1990 CAA
- EPA periodically reviews and revises the NAAQS
- 2000-2008 - Congress failed to enact “Clear Skies” law
 - Focused on regional, multi-pollutant reductions (NO_x , SO_2 , and mercury)
- 与1990年的CAA相比没有什么重大改变
- 要求EPA定期进行检, 并对NAAQS进行修订
- 2000-2008 – 美国国会没有制定“清洁天空”法
 - 关注区减少域规、多种污染物的排放（氮氧化物、二氧化硫和汞）



Current Clean Air Act

当前的清洁空气法案

➤ EPA adopted:

- Clean Air Interstate Rule (CAIR) –large reductions of NO_x and SO_2 – 25 States/power plants/cap-trade
- Clean Air Mercury Rule (CAMR, mercury) – 50 States
- Clean Air Visibility Rule (CAVR, regional haze)

➤ U.S. courts struck down CAIR & CAMR in 2008

➤ EPA采用了:

- 州际清洁空气条例 (CAIR), 大量的减少氮氧化物与二氧化硫的排放量- 25个州/电站/限额与交易
- 清洁空气汞条例 (CAMR, 汞) – 50个州
- 清洁空气能见度条例 (CAVR, 区域性灰霾)

➤ 美国法院搁置了CAIR和CAMR。



Climate Change

气候变化

- No significant federal law
- Regional efforts
 - Frequently based on States' RPOs
 - Some cap and trade programs
 - Regional Greenhouse Gas Initiative (RGGI) in the northeast U.S.
 - Similar efforts by Western States and Mid-Western States
- 没有相关重大联邦法律
- 各区进行了一些努力：
 - 一般以各州的RPO为基础
 - 制定气候变化规划
 - 一些州采取了限额与交易计划：
 - 美国东北部的区域温室气体减排行动（RGGI）
 - 西部和中西部各州也采取了类似行动。



Direction of U.S. Air Quality Programs Over Last 45 Years

过去45年里美国空气质量项目方面的法令

- Increased regional focus
 - Multi-pollutant strategies
 - Integration of energy and environmental strategies
- 加强了区域规划和关注
 - 采用多种污染物策略
 - 把能源与环境策略相结合



The Clean Air Act - In Hindsight

清洁空气法案 – 后知之明

- Needed regional level focus
- Needed multi-pollutant focus
- 区域层次上需要的关注
- 解决多种污染物需要的关注

Clean Air Act Amendments of 1990

Regional Approaches

1990年的清洁空气法案修订案

区域措施

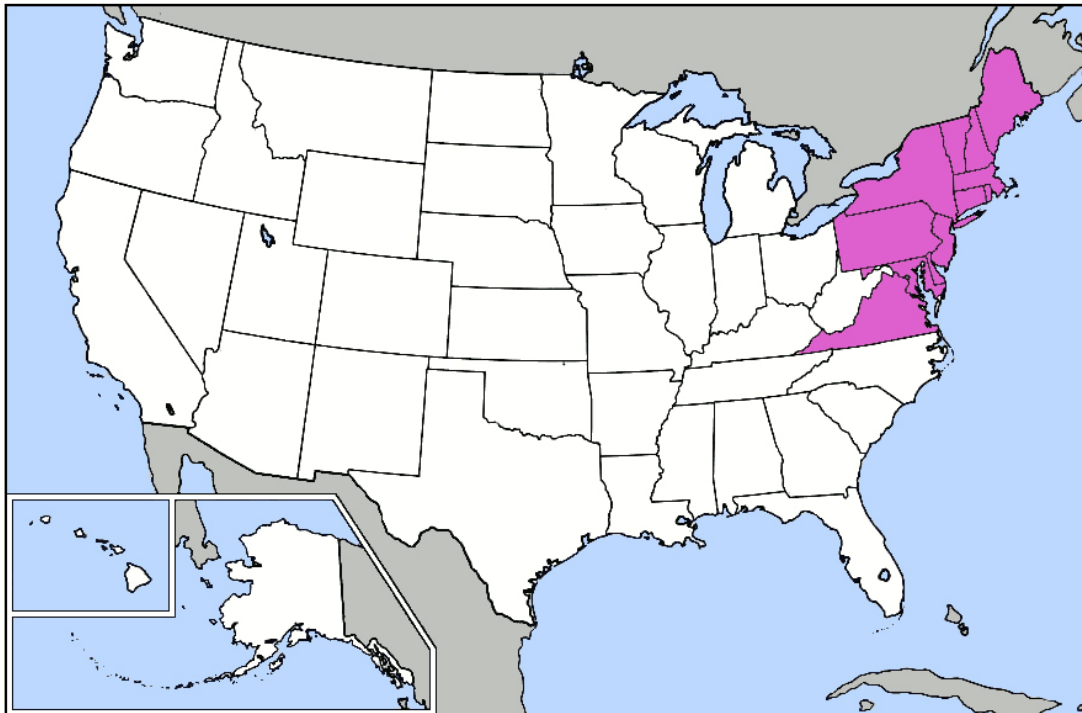
- **Ozone Transport Commission (OTC)** – created by law--ozone transport in 11 Northeast U.S. States and Washington D.C.)
- **Ozone Transport Assessment Group (OTAG)** - 1994 - 38 Eastern and Midwest States, industries, business, citizens and environmental groups—informal organization—led to 1997 Nox SIP call
- **臭氧运输委员会 (OTC)** - 负责美国东北部11个州和华盛顿特区的臭氧运输工作
- **臭氧传输评估研究小组 (OTAG)** - 1994 – 美国东部和中西部38个州、行业、商业、市民和环境团体（非正式组织）；并于1997年推动提倡开展氮氧化物SIP

Regional Study Groups

区域研究团体

Ozone Transport Commission States

建立了臭氧传输区委员会的州



Clean Air Act Amendments of 1990

Regional Approaches

1990年清洁空气法案修订案

区域措施

➤ Section 126 petitions

➤ 第126部分 请求

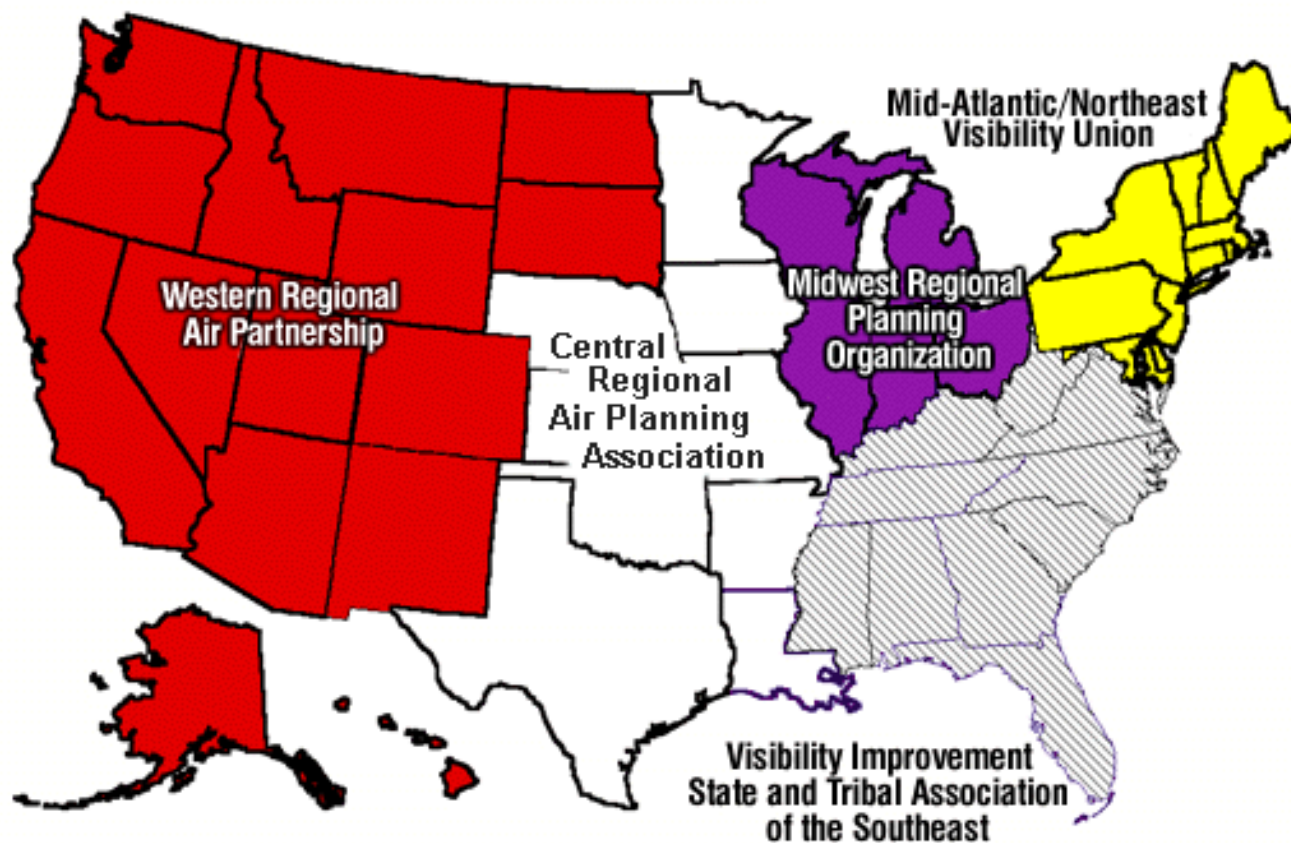
➤ Regional haze

- Improve > 60-year period
- Controls for particle-related emissions from 26 major sources
- Regional Planning Organizations (RPO's) established by States for strategy planning

➤ 区域性灰霾

- 在60年的时间里的改善
- 对26个重大污染类别的微粒相关排放进行控制
- 由各州成立区域规划组织进行策略规划

Regional Planning Organizations





A Multi-Pollutant Strategy

多种污染物策略

- Integrates emission reduction mechanisms for multiple pollutants
- Focuses on certain sources-coal-fired plants
- Defined time frame
- Significant emission reductions
- More effective than separate approaches
- 把针对多种污染物的各种减排机制集中集合到一起
- 重点放在特定的煤电厂上
- 规定一定的时间范围
- 实现大幅度的减排目标
- 集中执行比单独执行更有效

Outcome of Multi-Pollutant Approach for the Power Sector

在发电领域采取针对多种污染物措施的成果

- An emphasis on multi-pollutant approaches:
- Creates bias or preference for cleaner, non-coal fuel sources or cleaner coal facilities
 - Integrated Gas Combined Cycle (IGCC) facilities
- Leads away from investments in dirtier facilities
 - Traditional coal-fired power plants
- 强调采取针对多种污染物的措施
- 区分清洁的、不使用煤做燃料的污染源或清洁煤设施的优劣
 - 整体煤气化联合循环 (IGCC) 设施
- 不向污染设施投资
 - 传统煤电厂



State and Regional Initiatives

州和区域行动

- States, regions and urban areas - laboratories of innovation and act more quickly
 - 4 States (CT, MA, NH and NY), several regions and urban areas adopted multi-pollutant laws and programs to address 2-4 pollutants
 - Northeast U.S. initiatives
 - Enhanced connections between various State agencies
 - Developed cross-training workshops, pilot projects
- 州、区域和地区-创新实验室，能够更快速地采取行动
 - 有四个州（CT、MA、NH和NY）采用了针对多种污染物的法律和计划来解决2-4种污染物问题
 - 美国东北部倡议
 - 加强各个州立机构之间的联系
 - 开发交叉培训研讨会、示范项目

Challenges/Goals for Multi-Pollutant Strategies

多种污染物策略面临的挑战/目标

- Align agencies
- Metrics for effective, long-term measurement of relevant data
- Train staff on policies
- Open and transparent input data/ assumptions
- Adequately fund programs
- Pilot programs
- 让各个机构之间的相互联系
- 对相关数据进行有效的, 长期策略的信息
- 对工作人员进行政策培训
- 在输入数据和假设方面采用公开的透明性措施
- 为多种污染物控制措施提供适当的资金
- 进行示范项目

The Need to Establish New Regional Areas In China

中国划定新区域范围的必要性

- Air pollution science and information supports need to establish new regional areas
- Regions impacted by transport from other regions
 - Beijing-Tianjin-Tangshan Region
 - Yangtze River Delta Region
 - Pearl River Delta Region
- 中国的空气污染科学与信息明确显示出了划定新区域范围的必要性
- 受其他地区运输影响的地区包括
 - 京津唐地区
 - 长江三角洲地区
 - 珠江三角洲地区

Benefits to China from Multi-Pollutant and Regional Approaches

多种污染物与区域措施对中国的好处

- More cost effective
- More timely/ greater reduction of emissions
- More effective for environmental/public health issues
- 具有成本有效性
- 可以更加适时地减少污染排放
- 可以更加有效地解决环境与公众健康问题



Suggested Revisions to the Atmospheric Law

建议对大气法进行修订

- Be more specific
- Add new elements to improve enforcement
- Further integrate energy and air quality
- 规定要更加详细
- 为了加强执行力度，要添加新内容
- 进一步地把能源与空气质量法规结合在一起



Suggested Revisions to the Atmospheric Law 建议对大气法进行修订

- Give MEP authority to create regions and establish process
- Develop multi-pollutant approaches
- 授予MEP划定区域和制定其要使用的程序的权力
- 建立多种约束性污染物控制策略



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