

CALIFORNIA'S AIR POLLUTION CONTROL PROGRAM: A SUCCESSFUL MODEL FOR CLEANER AIR

加利福尼亚州的空气污染控制：一个成功净化大气的案例

Air Quality in China: Accelerating Reform
Beijing, September 2014

空气质量在中国：加速改革
北京 2014 年 9 月

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California and China's Shared Air Quality Challenges

加利福尼亚州和中国共有的空气质量挑战



**Los Angeles Civic Center
January 1948**

洛杉矶市政中心 1948 年 1 月



**CCTV Building, Beijing
January 2013**

央视大楼，北京2013 年 1 月

The Catalyst for Change 推动转变的催化剂



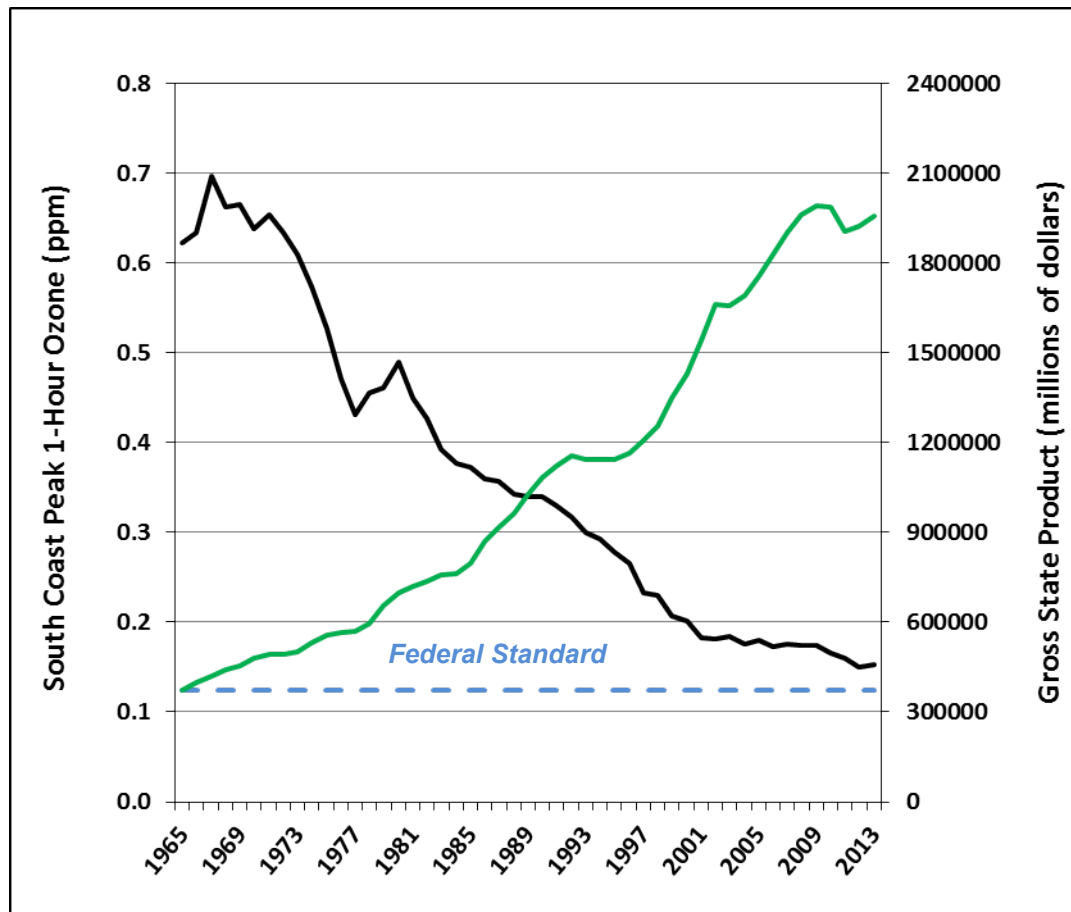
- Peak ozone levels reached nearly 700 ppb
- Significant health impacts
- Public outrage led to a demand for action



- 臭氧峰值高达近 700 ppb
- 显著地健康影响
- 公愤要求政府采取有效措施

California's Cleaner Air and Growing Economy

加州的空气净化与经济增长



1965-2013

Ozone levels in Southern California have decreased 80% even as:

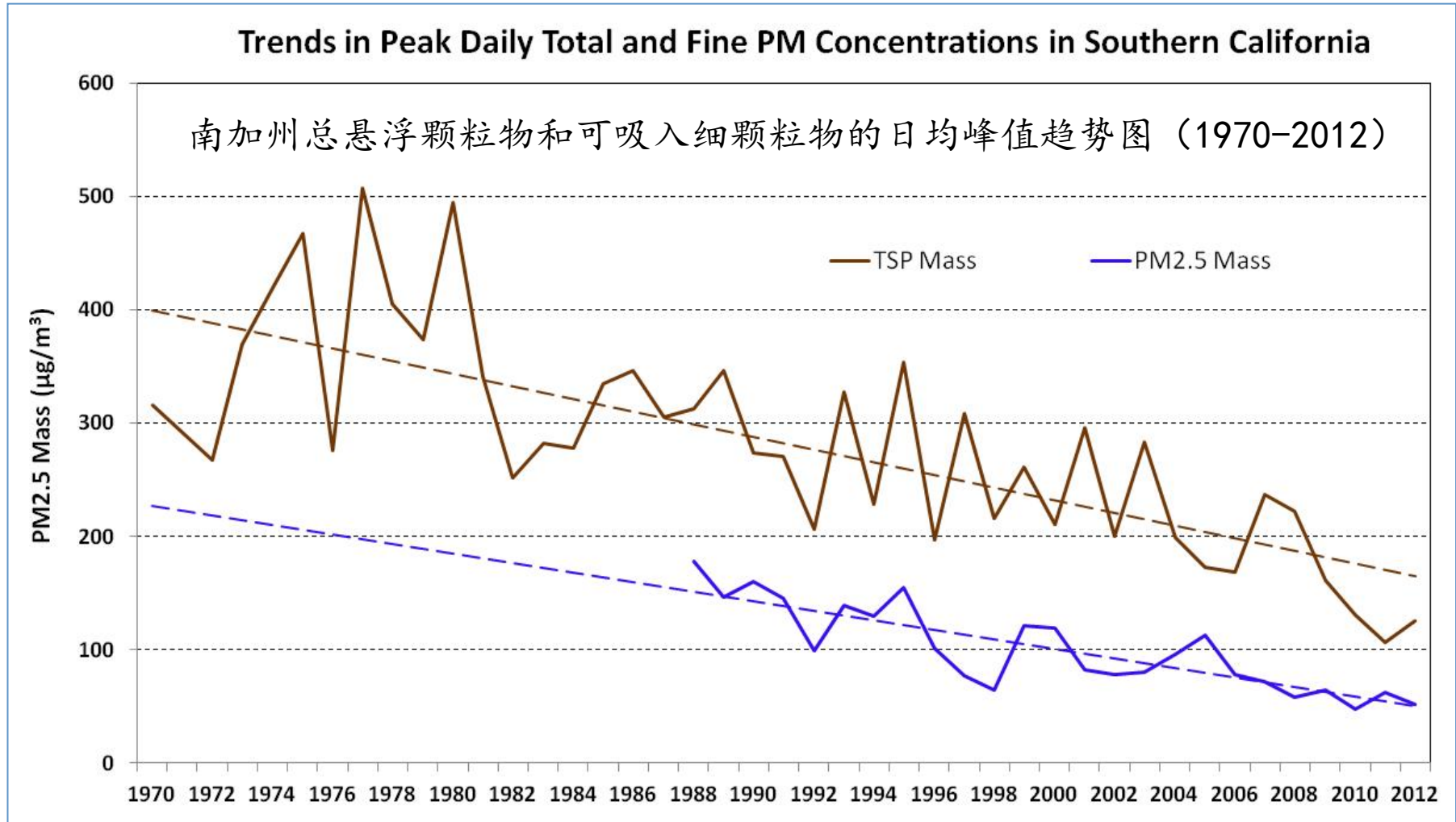
- Population has doubled
- Number of vehicles increased by factor of four
- Vehicle miles travelled increased by factor of five
- Economy grown by factor of five

南加州空气臭氧含量显著下降80%，于此同时：

- 人口翻倍
- 机动车数量增长4倍
- 车辆总行驶里程数增加五倍
- 经济增长五倍

Success of California's PM Control Programs

加州采取有效措施成功控制颗粒物排放



Framework for Addressing the Challenge

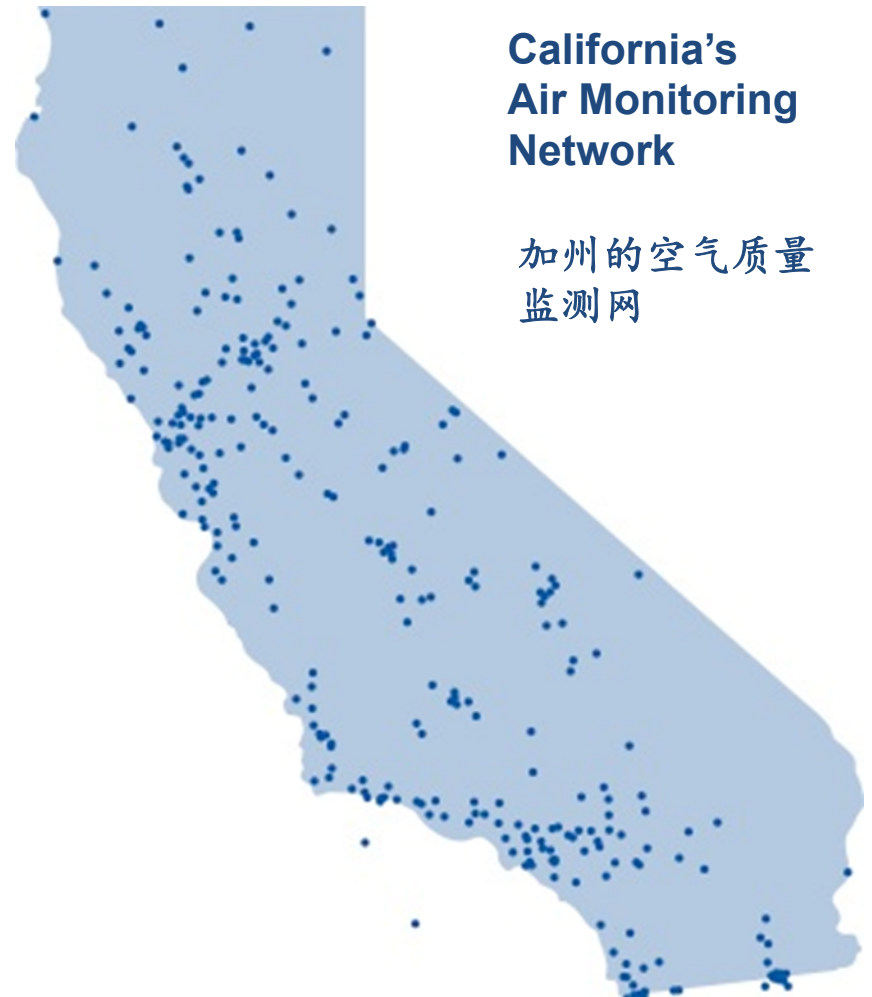
解决这一挑战的步骤

- First local air district established in 1947
- ARB established in 1967
- Federal Clean Air Act Amendments of 1970:
 - Establishment of national standards
 - Requirements for State Implementation Plans
 - Unique authority granted to California
- Adoption of air pollution laws (federal/state/local)
- 1947 年成立了第一个空气质量管理区
- 1967 年成立了空气资源管理委员会
- 1970 年颁布实施美国联邦清洁空气法修正案：
 - 制定国家标准
 - 要求各州制定达标计划
 - 授予加州特殊立法权
- 颁布空气污染法律法规（联邦，州，地方）

Science Based Planning

科学统筹计划

- Programs built on strong scientific foundation
- Investments in cutting edge tools and research:
 - Establish monitoring network
 - Develop comprehensive emissions inventory
 - Identify sources and causes of pollution
- 建立在坚实的科学基础之上
- 专注于前沿技术与科研的投入
 - 建立空气质量监测网络
 - 制定综合污染排放清单
 - 确定污染的来源与成因



Developing Successful Strategies

制定成功的战略

- Regulatory strategies targeted to nature of the air quality problem
- Investment in incentives to spur technology advancement
- Strong public process and stakeholder outreach
- 制定针对空气污染问题本质的策略
- 专注于投资与鼓励新技术进步与创新
- 强化公众参与和企业合作



Benefits of California's Regulations

加利福尼亚州法规的成果

- Today's new cars are 99% cleaner than 30 years ago
- New truck engine standards produce 90% less NOx and PM
- PM filter retrofits on in-use diesel vehicles result in at least 85% PM2.5 reduction
- Gasoline and diesel fuel is much cleaner (e.g., phased out lead, reduced sulfur & benzene)
- New requirements for ship fuels produce 80% less PM and 90% less SOx
- 目前小型车辆比30年前清洁99%
- 新型重型车发动机标准减排了90%的氮氧化物和颗粒物
- 在用柴油车加装颗粒物过滤器直接减少85%的PM2.5排放量
- 汽油和柴油燃料变得更加清洁（例如，逐步淘汰铅以及减少含硫和苯的含量）
- 要求船舶燃料减少80%的颗粒物和90%的硫化物的排放



The Importance of Incentives

奖励政策的重要性

- Incentives complement regulations
- Encourage early adoption of advanced technologies (e.g. ZEV)
 - Clean Vehicle Rebate Program
- Remove dirtiest vehicles from the road
 - Carl Moyer Program
- Reduce risks for highly-impacted communities (e.g. ports)
 - Goods Movement Emission Reduction Program
- 奖励政策有效辅助现有的法律法规
- 鼓励提早采纳先进技术（例如零排放车辆）
 - 清洁车辆退款项目
- 限制高标车辆的行驶
 - Carl Moyer项目
- 减少对高风险社区的影响（比如：港口）
 - 货物运输污染物排放减排项目

Keys to Effective Implementation

法律法规有效实施的关键

- Definition of clear jurisdictional responsibilities
- Collaboration with local/federal government to address full scope of air quality problem
- Strong permitting and enforcement programs
- Monitoring and reporting to assess progress
- Ongoing adjustments to strategies
- 明确的管辖权限
- 地方与联邦政府进行全方位空气质量控制的合作
- 强化许可与执法
- 准确监测和汇报实施进程
- 适时调整策略

Role of Enforcement

执法的重要性

- Provides mechanism to ensure emission reductions are achieved
 - Creates deterrence against non-compliance
 - Ensures level playing field amongst sources
 - Penalties are a tool to achieve these goals
- 确保减排措施的有效实施
 - 威慑不达标行为
 - 确保各方利益公平
 - 处罚是实现这些目标的必要措施



Summary of Lessons Learned

经验教训总结

- Importance of clear requirements, authority, and milestones
- Need for core science to inform effective control approaches
- Ongoing monitoring, enforcement and public reporting
- Coordination with local and federal agencies
- Recognition of economic benefits of improved health and climate co-benefits
- 明确要求，权限与阶段性的目标
- 有效控制方法是基于核心科学研究
- 持续监控，加强执法和信息公开
- 加强地方与联邦机构合作
- 经济利益与环保健康互惠互利