

# **Effective Air Quality Planning**

## **有效的空气质量规划**

**Catherine Witherspoon, Consultant**  
**凯瑟琳**

Former Executive Officer,  
California Air Resources Board  
前加州空气资源委员会行政长官

# Three Priorities

- 制定正确的规划过程
- 采纳正确的控制措施
- 对效果进行跟踪

- Get the process right
- Get the controls right
- Track actual progress

# Getting the Process Right

**Who is responsible?**

**Who are your planning partners?**

**How will you coordinate?**

**Whose approval is needed?**

# Who is Responsible?



- 谁来写规划?
- 规划者是否足够了解?
- 有没有足够的资源和时间?

- Who is actually writing the plan?
- Do they understand what's required?
- Do they have enough resources and time?

# Who Are Your Partners?



## In Your City They Are:

- ?
- ?
- ?

## In California They Are:

- Energy Commission
- Finance Dept.
- Transportation Dept.

# Coordination?



## State Council guidelines:

- Establish a coordination mechanism
- Conduct meetings with relevant departments
- Develop joint strategies

## US Process:

- Initial scoping meeting
- Quarterly check-in
- Final sign-off by key partners

# Who Approves?



## In China:

- Each province combines city action plans into a regional strategy
- MEP/CRAES/CAEP review for completeness
- State Council approves provincial plans

## In the US:

- Each state approves local plans for inclusion in its overall SIP
- EPA regional offices review for completeness
- EPA headquarters approves State Plans

# Getting the Control Measures Right

**How bad is the air pollution now?**

**How will it change over 5, 10, 15 years?**

**What are the largest emission sources?**

**What are the most cost-effective controls?**



# How Bad is it Now?



## 美国定义:

- 轻微, 一般, 严重, 很严重, 极严重

## 中国定义:

- 一级, 二级, 三级, 主要城市, 重点区域

## US definitions:

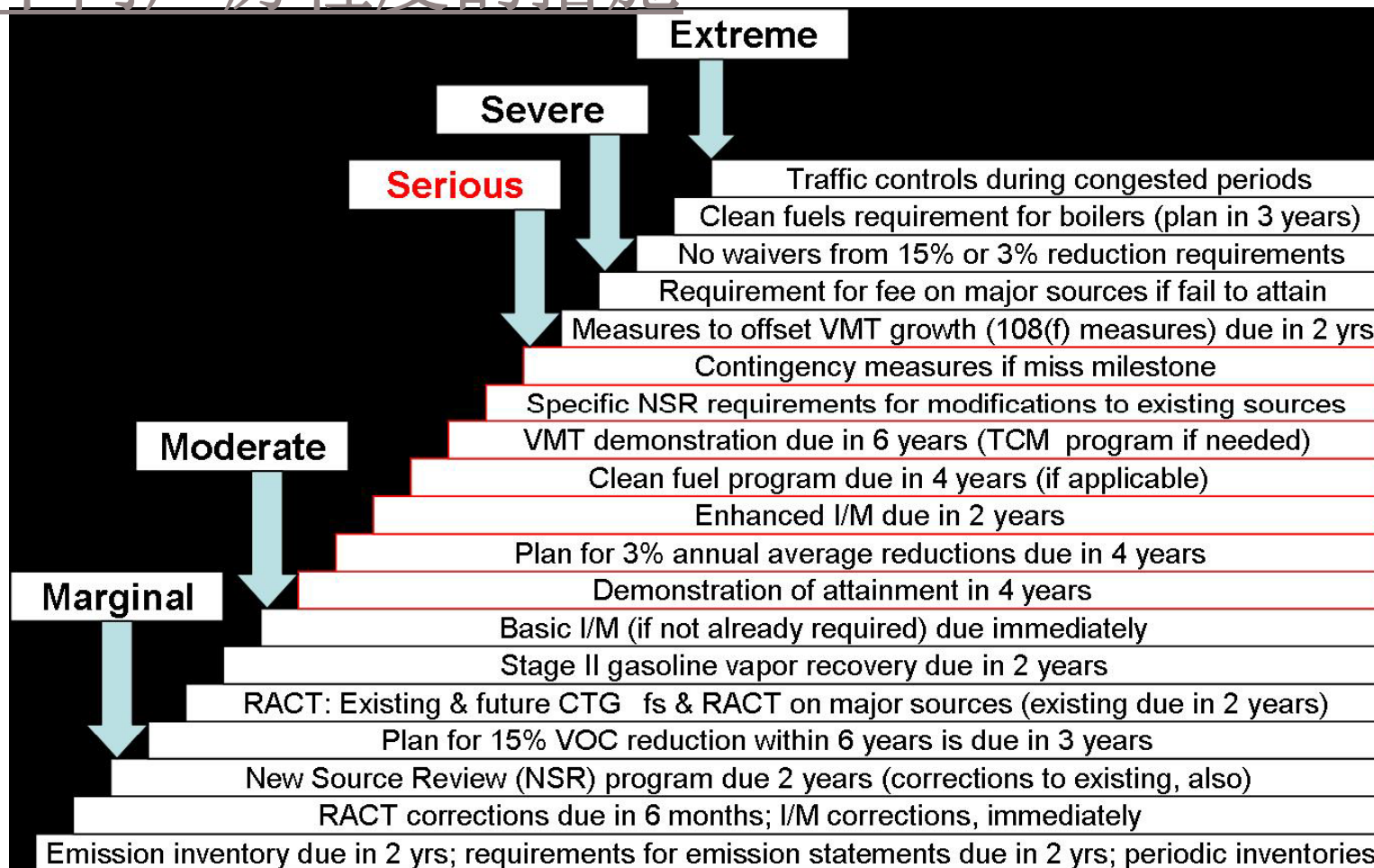
- Marginal, moderate, serious, severe, extreme

## China definitions:

- Grade I, II, III, major cities, key regions

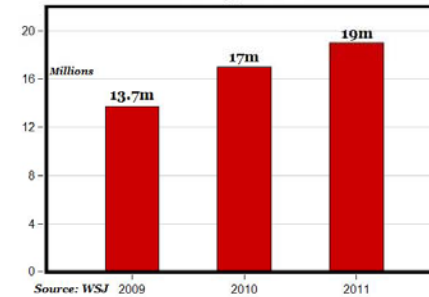
# 根据不达标情况分级采取不同严厉程度的措施

## Controls Staggered



# How Will it Change?

Vehicle Sales in China  
2009-2011



- 人口增长
- 新的商业
- 能源使用量（及结构）
- 机动车保有量
- 上风向污染

- Population growth
- Business starts
- Energy use (and type)
- Vehicle ownership
- How about upwind?

It is impossible to achieve air quality targets without an accurate forecast of how society is changing

# What the Future Holds

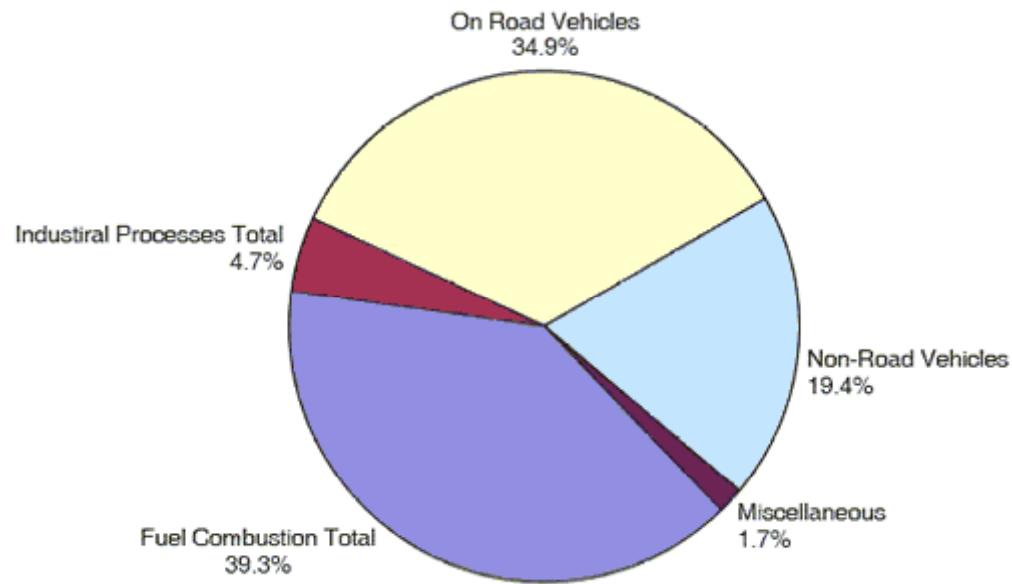
## 未来情景



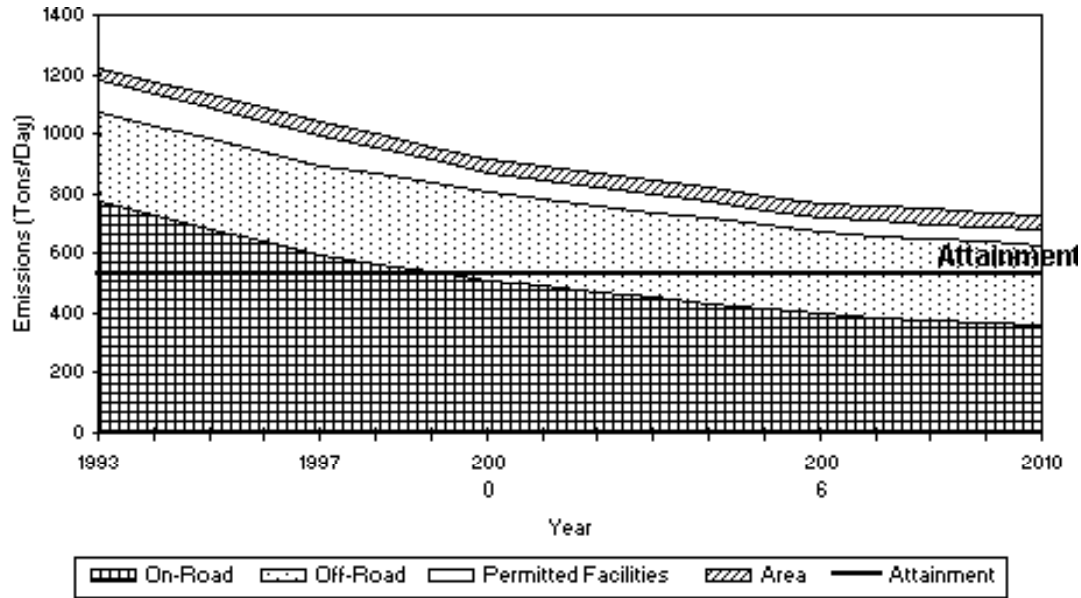
- 移动源迅速增加
- 面源污染稳步增长
- 工业点源有所降低

- Rapidly growing mobile source emissions
- Steadily increasing area source emissions
- Modest reductions in industrial emissions

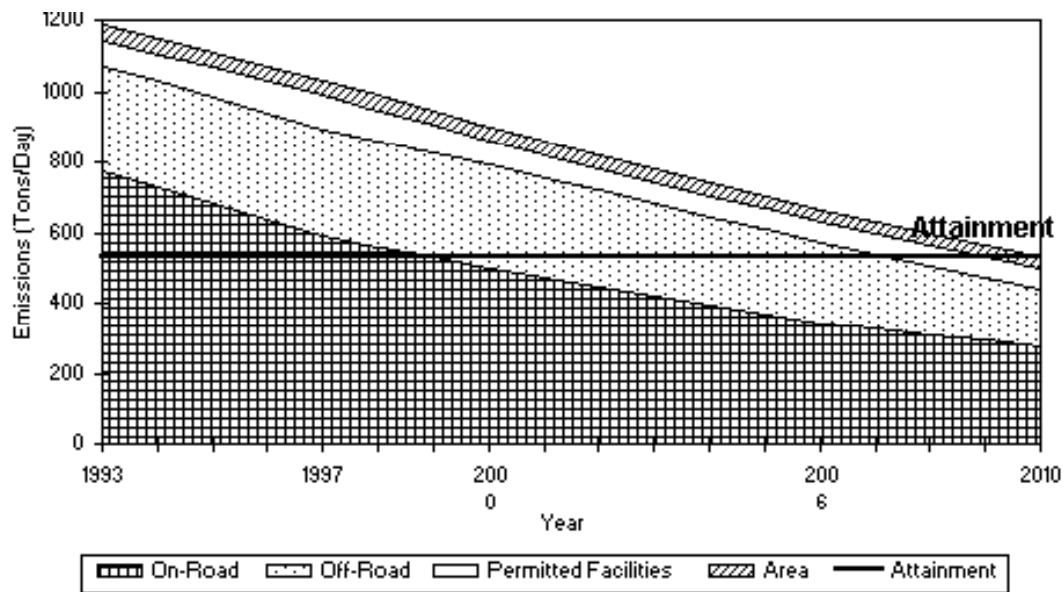
# Identifying the Largest Emitters



US Nitrogen Oxide (NOx) Emissions, 2002



Baseline Forecast  
Of NO<sub>x</sub> Emissions  
1993 - 2010



2010 NO<sub>x</sub>  
Emissions With  
Clean Air Plan

# Choosing Cost-Effective Controls

## 选择经济的（成本有效）的措施

- 经济的（成本有效的）并不是指最便宜的措施
- 而是指在合理成本范围内所能取得的最大污染减排量

- Cost effective does not mean the cheapest measures
- It means the greatest emission reductions possible within a reasonable cost



# How US Defines “Cost Effective”

## The “going rate” of necessary controls

If Selective Catalytic Reduction (SCR) is needed to reach NO<sub>x</sub> targets, and SCR costs \$30,000 per ton reduced, all other NO<sub>x</sub> controls  $\leq$  \$30,000 are also cost effective 如果要达到控制NO<sub>x</sub>的目标需要采用SCR技术（所有其它治理技术都利用也不能达到减排目标），而SCR技术治理成本是每吨3万美元，那么所有小于等于每吨3万美元的技术都是经济的

## Less than or equal to the value of lives saved

US diesel controls generate \$10 in public health benefits for each \$1 invested 美国控制柴油每1美元的投入能带来10美元的公共健康效益

# Most Powerful Controls

## 最强有力的控制措施



- 清洁燃料
- 燃烧后处理
- 节能和能源效率提高
- 蒸汽控制
- 先进机动车技术
- 禁止直接燃煤或露天焚烧

- Cleaner fuel
- Combustion after-treatment
- Energy efficiency
- Vapor controls
- Advanced vehicle technologies
- Bans on open burning

A word about pollution  
from upwind areas



# Tracking Actual Progress

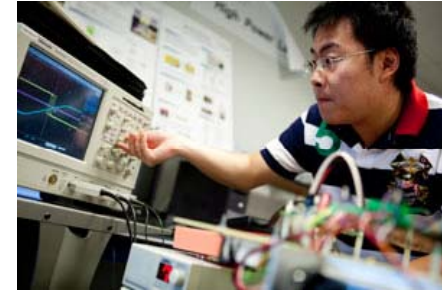
**Performance indicators that matter**

**Transparency and accountability**

**Sanctions and enforcement**

# Indicators that Matter

## 重要的指标体系



- 空气污染情况
- 年排放污染物量
- 能源变化
  - 可再生能源百分比
  - 集中供热百分比
- 交通变化
  - 机动车出行率
  - 老旧机动车淘汰量/比率
- 工业变化
  - 关闭落后产能量

- Ambient pollution levels
- Annual emissions
- Energy use changes
  - % renewables
  - % of district heating
- Transportation changes
  - Transit ridership
  - # of vehicles scrapped
- Industrial changes
  - # of backward facilities closed

# Being Accountable

- 让公众知道你在做什么，为什么这么做
- 尽量共享数据
- 这些都能让你获得更多支持

- Let the public know what you are doing and why you are doing it
- Share as much data as possible
- The support you receive will make it worthwhile

# 加大执行力度

- 在计划无法奏效的地方，实施“SIP 呼叫”
- 对未能执行已核准计划者予以制裁
- 对未能提交计划者予以制裁
- 对制造固定污染源者做出直接处罚

# Sanctions and Enforcement

- ▶ Applies to plans that are late, incomplete or not fully implemented
- ▶ Federal highway funds are withheld
- ▶ Construction ban is imposed
- ▶ Federal government may also take over

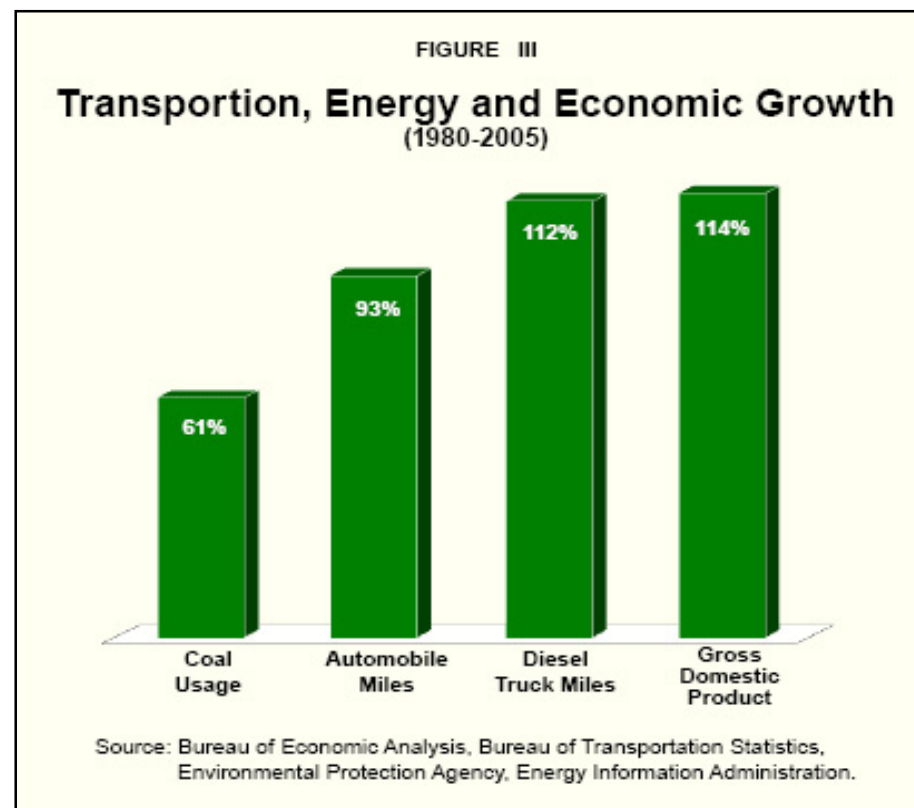
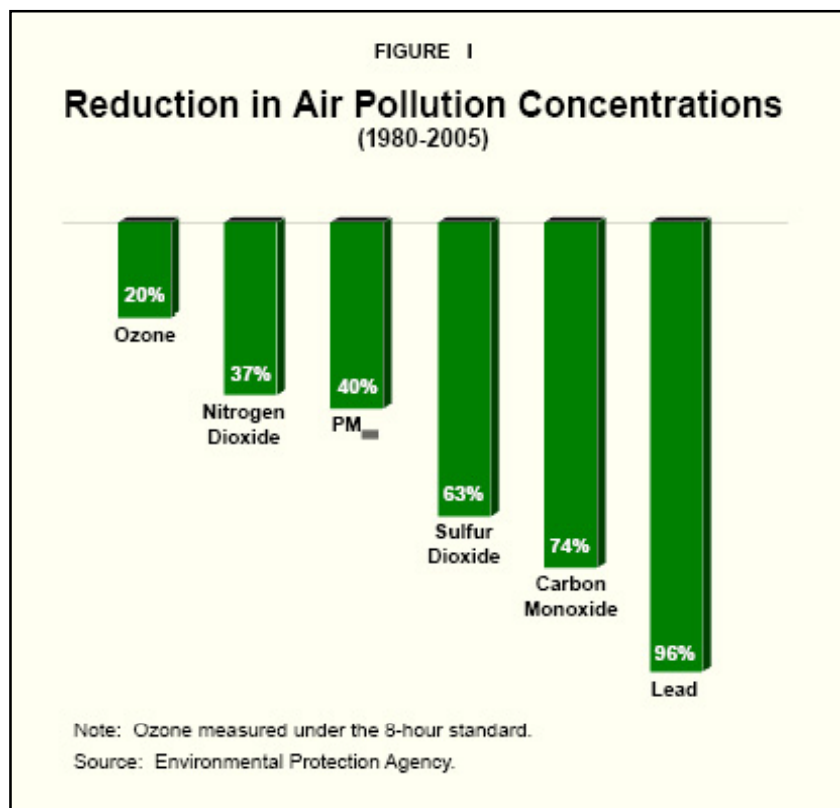


Good Air Quality Plans Work

# US Air Quality Progress

## 美国空气质量进展

### 1980 - 2005



Thank you for listening  
and  
Good luck with your plans!