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Energy and Urban Air Quality: Lessons from case study cities

能源与城市区域空气质量：得自案例研究城市的经验教训

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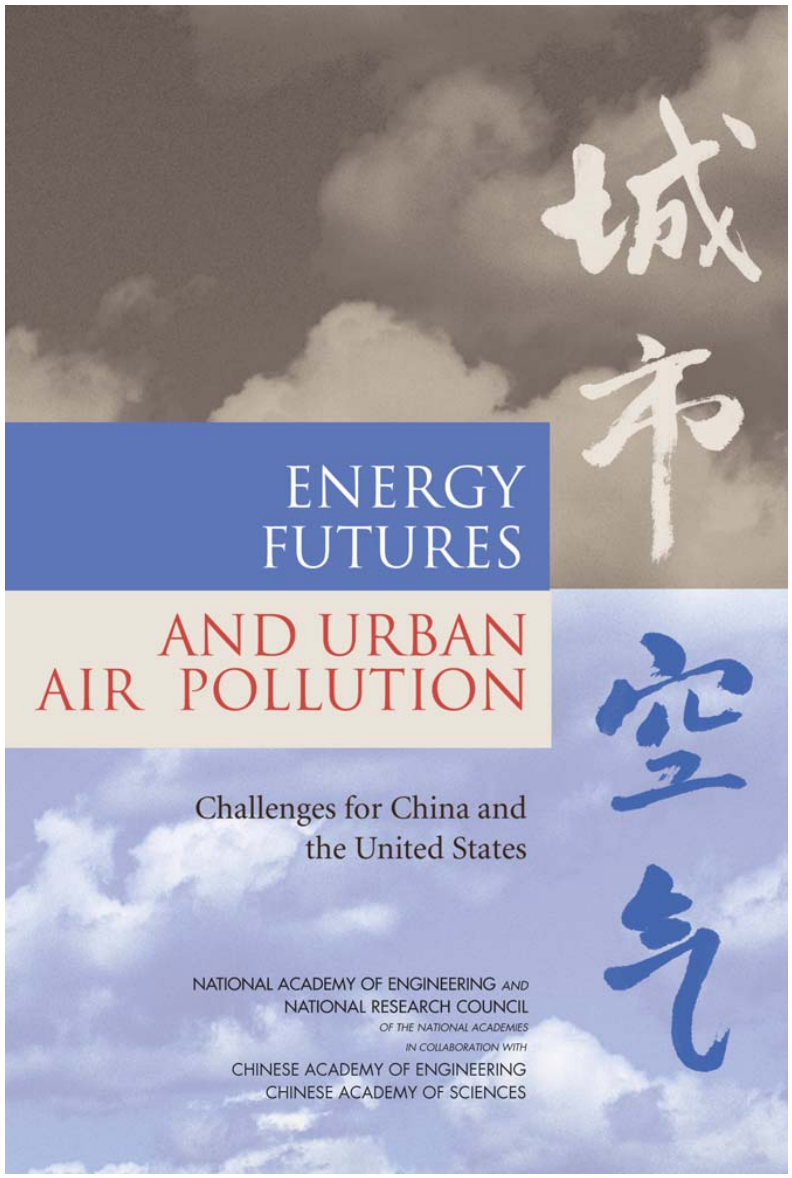

Evaluates historical, current, and projected energy use and air quality in both countries

Recently released report from U.S. and Chinese Academies of Science and Engineering

Identifies lessons learned and provides recommendations to help cities meet energy and air quality goals

美国工程院，中国工程院和科学院最近发布的报告评价了中美两国的能源使用历史，现状和展望，揭示了从中得到的经验教训，提供了帮助城市达到能源和空气质量目标的建议

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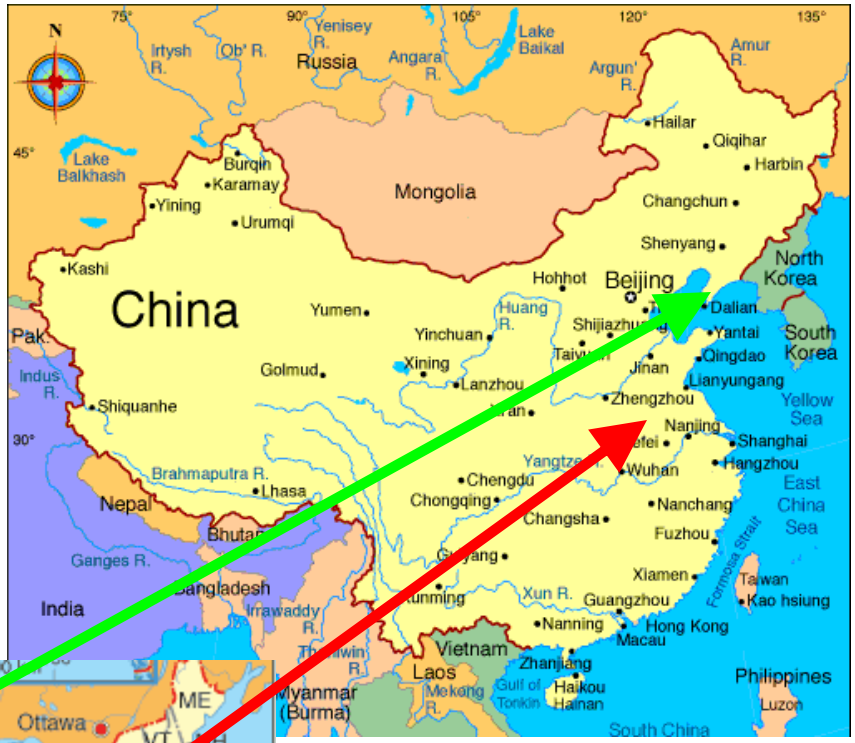
Cities were paired to narrow the scope

两对城市被挑选出来作比较研究

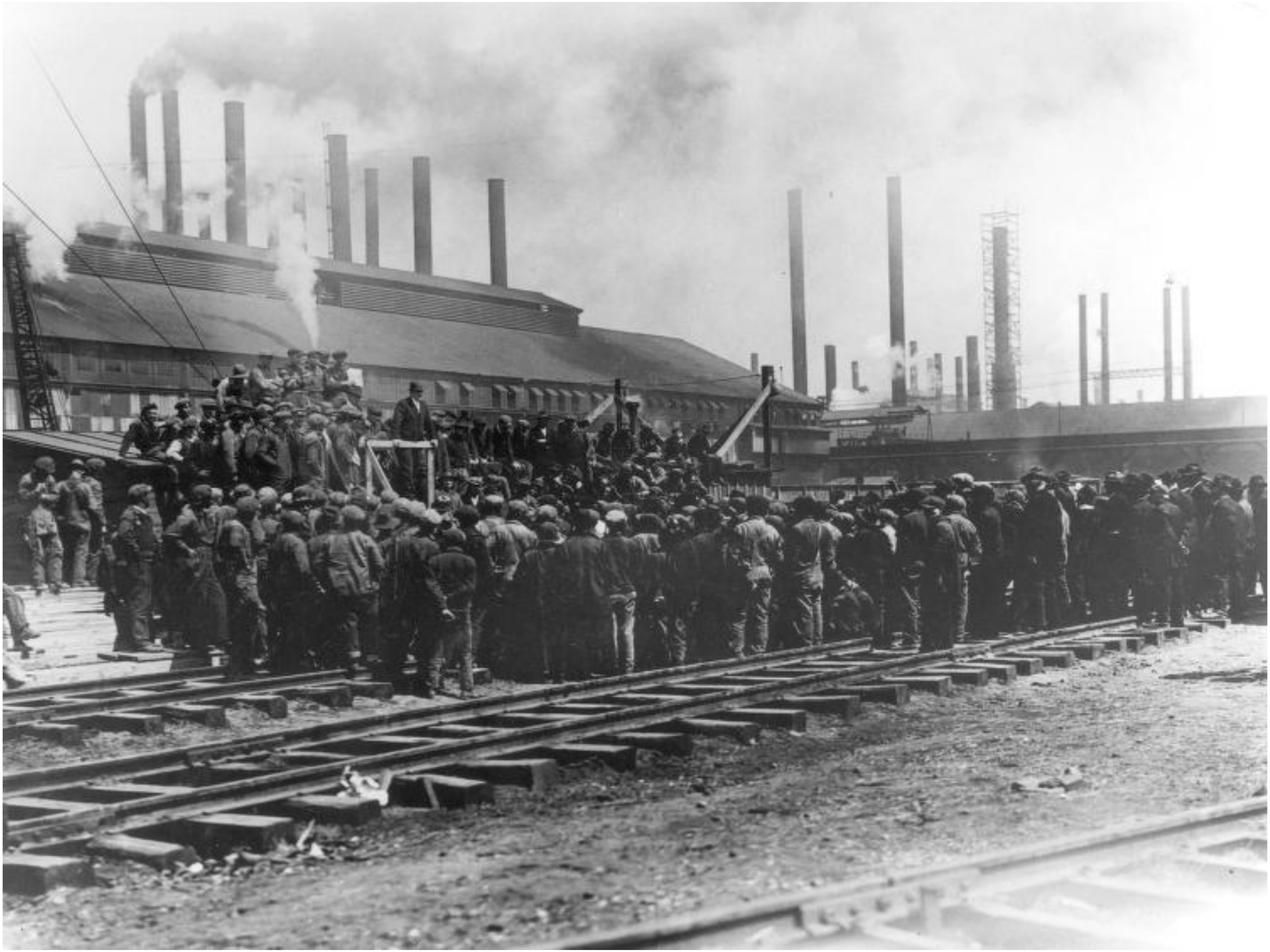
Dalian-Los Angeles

大连－洛杉矶



Huainan-Pittsburgh

淮南－匹兹堡

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CREDIT
CLOTHING
LACE CREDIT
40 WEEKS TO PAY
73-HIGHLAND
KING'S
FTIS
DIAMONDS
WATCHES
On Credit
616
LOFTIS
BROS & CO
DRAKE-KAPPHAN
PIANOS
LOFTIS

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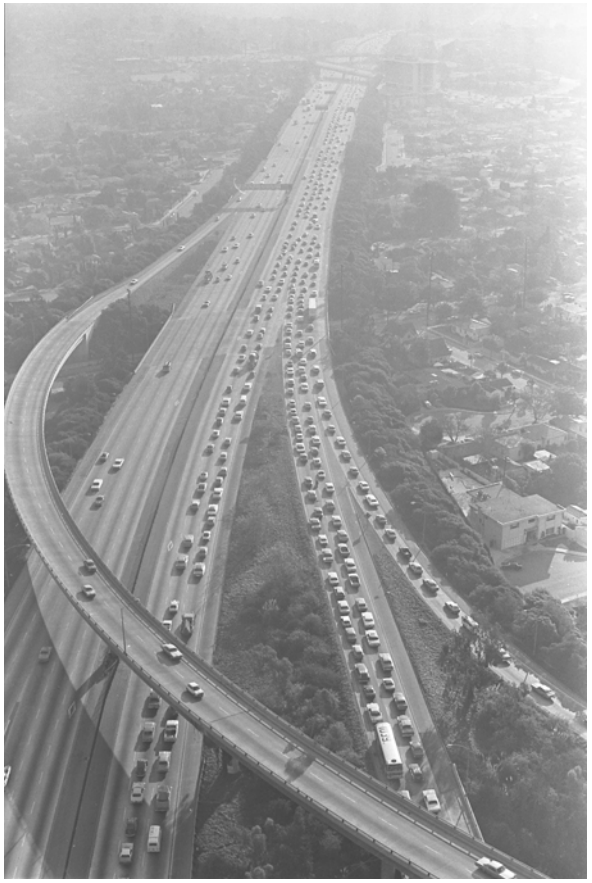
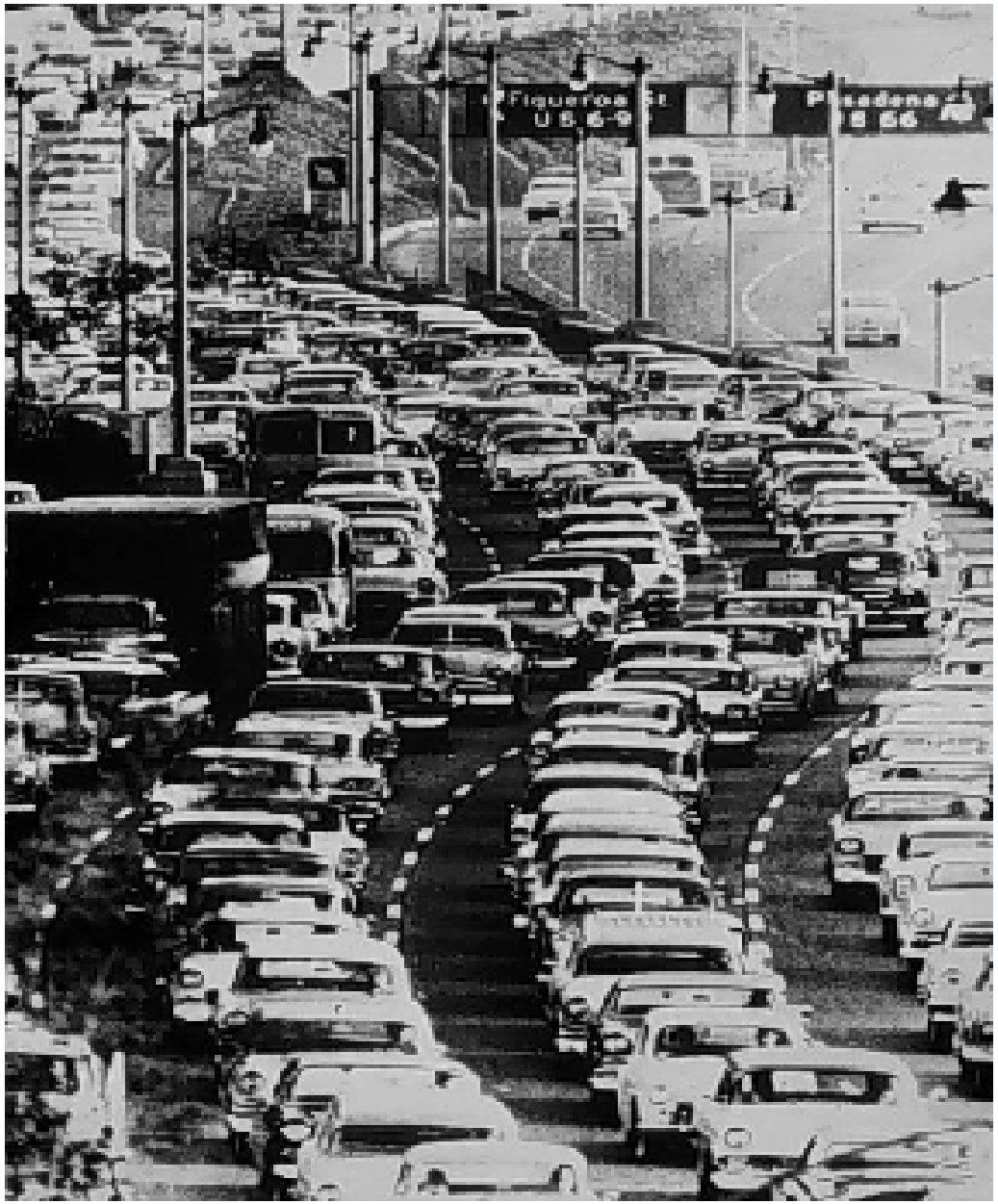
Traffic on World's First Freeway

世界上第一座高速公路交通状况





Current framework

- Important interactions between federal, state, and local government, as well as:
  - Citizen involvement
    - Groups educating the public on air pollution, clean transportation and energy alternatives
  - University research
    - Research on pollution sources/impacts, clean energy, green building, etc.
  - Complimentary local initiatives on clean energy and climate protection
    - Alternative energy targets
    - Climate Protection Initiatives

当前概况

- 联邦，州和地方政府间的重要互动，例如：
  - 公民的参与
    - 对公众进行空气污染，清洁交通和替代能源方面的教育
  - 大学的研究
    - 开展污染源及其影响，清洁能源和绿色建筑等方面的研究
  - 州和地方关于清洁能源和气候保护方面的补充动作
    - 替代能源的目标
    - 气候保护的动作

Lessons learned from U.S. cities

- Retrofits are costly but necessary to mitigate costs of pollution impacts
- Stricter standards yielded results without detriment to the economy
- Energy efficiency (particularly in existing buildings) is still not being fully realized
- Personal vehicles now a major energy consumer and air pollution source
- Transit-oriented design, urban infill create opportunities to slow sprawl and decrease vehicle use

从美国城市得到的经验教训

- 设备改造花费高昂但却是减轻污染影响代价的必要之举
- 更严格的标准起到了效果并且并未损害经济
- 建筑，尤其是现有建筑的能效并未完全实现
- 私人车辆现已成为一个能耗大户和主要空气污染源
- 针对客运的城市设计和城区回流创造了减缓城市扩张和减少车辆使用的机会

COSTS OF CONTROL

<0.1% GDP per year

BENEFITS OF CONTROL

~$44 in health benefits for each $1 of control (1970-1990)

~$4 in health benefits for each $1 of control (1990-2010)

>0.1% GDP in revenues for air pollution control

污染控制代价

少于国内生产总值的0.1%

污染控制利益

污染控制上每1美金花销带来约44美金在健康方面的收益 (1970-1990)

污染控制上每1美金花销带来约4美金在健康方面的收益 (1990-2010)

空气污染控制为全国带来的岁入大于国内生产总值的0.1%

Lessons and opportunities for Huainan

- Closing down highly polluting and inefficient industries yielded substantial improvements
- Adopting advanced pollution controls and cleaner coal conversion technologies
- Need for expanded monitoring and access to data
- Need to examine PM2.5 and additional sources of pollution, including waste and agricultural burning

经验教训和机遇

- 关停高污染低能效工业企业收效显著
- 采用先进的污染控制措施和清洁煤转化技术
- 需要更广泛的监测和数据获取
- 需要检查PM2.5和其他污染源，包括废物和农业的焚烧还肥

Pollution control benefits exceed costs

Benefits include improvements in health, medical costs, workdays, and material and crop damage

Economic opportunities are created for control devices, professional services, and efficient processes and designs

Costs of no pollution control are often borne by the population at large, not by the polluters

污染控制效益大于花销

效益体现在增进健康，降低医疗开支，提高有效工作时间，减少建筑设施损坏和农作物损害等

经济契机可创造在污染控制设备制造，专业服务提供和有效的处理和设计方面

无污染控制带来的后果和代价往往由大众而非排污者承担

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Full report available as free download at http://www.nap.edu

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Thank you! 谢谢！

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