Air Quality Management in the Jingjinji Region: Formalizing a Collaborative Framework

Prepared for The World Bank China
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1. BACKGROUND 背景介绍
2. LAND USE 土地使用
3. INDUSTRY 工业
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Air Quality in Jingjinji
京津冀的空气质量
Air Quality and Target

PM$_{2.5}$ Emissions ($\mu$g/m$^3$)

<table>
<thead>
<tr>
<th></th>
<th>Beijing</th>
<th>Tianjin</th>
<th>Hebei</th>
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<tbody>
<tr>
<td>2013</td>
<td>25.6%</td>
<td>18.7%</td>
<td>14.7%</td>
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<td>2017</td>
<td>60</td>
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Target = 35

CAAC, Tsinghua University, 2014
Problem Statement

- Land Use
- Transportation
- Industry
- Energy

PM2.5
**Health Impact**

- Death > 150,000 in 2013 (Fang et al., 2016)
- Reduced life expectancy
- Diseases

**Economic Loss**

- GDP Loss GDP 损失
  6.5% or 8,227 trillion dollars (RAND, 2012)
- Productivity Loss 生产力损失 (Chang, 2016)
- Health Costs 健康成本
  290 billion dollars 2900 亿美金 (Daly, 2013)
Land Use
土地使用
The waste management transportation process and garbage incineration contribute to urban air pollution.

Current Garbage Recycle System in Beijing
Low income household concentrated in suburban areas. (Dang et al., 2014)

- Households in suburban area: Poor Centralization, Home Community
- Housing Fund System
- 城郊区域的家庭: 低集中化, 家庭社区住房公积金制度
• The agriculture industry contributes to PM 2.5 due to ammonia found in the fertilizer.

• 因为化肥存在氨，农业同样产生了PM2.5

Red area shows concentration of black carbon aerosols in China (Mukai, 2015).
Recommendations

1. Implement in-home recycling system in youth communities
2. Integrating plant life on building roofs
3. Use Housing Fund to Incentivize Movement to the Suburban Areas
4. Upgrade air pollution monitoring systems to measure ammonia level
Recommendations

1. 在青年社区公寓中实行家庭内的回收系统
2. 将植物和建筑物屋顶结合 – 绿色屋顶建筑
3. 通过住房公积金刺激入住郊区
4. 升级空气污染监测系统去监测氨的水平
Industry
Air Pollution for Industries

Current Industry Regulations

Three cites are not coordinating the regulations and policy

Beijing: Relocated factories

北京: 搬迁工厂

Hebei: Industry targets for air pollution

河北: 制定工业减排标准

Tianjin: Closure of enterprises subject to State Council approval

天津: 关闭经国务院批准的企业
Recommendations

1. **Restructure and Upgrade Industry**
   1.1 Enforcement on upgrading manufacture oriented to service oriented
   1.2 Create “Green Industry District”
   1.3 Job re-training programs for workers to qualify for new jobs

2. **Align Regional Governmental Collaboration in Economy and Environment Incentives**
   2.1 Enhance the transaction of the volume of cap and trade
 Recommendations

1 重建和升级产业

1.1 从制造业为主向服务业导向升级转型

1.2 建立绿色产业园区

1.3 为适应产业新趋势而提供就职再培训项目

2 对政府在经济和环境上的协作给予激励

2.1 提高区域内碳交易的交易限额和交易量的流通
Transportation
Current Status

High congestion from private vehicle use
Drivers in Beijing spend 2.56 times longer on the road during rush hour

Lack of inter-city rail connections
Railways account for 11% of intercity trips in Jingjinji

Inefficient freight network
87% of freight volume was delivered on highways
Case Study

SF Park 三藩市停车
Real-time parking management to reduce urban congestion 实时停车费机制以减少城市道路拥堵

HOV in Chengdu 成都多乘员车专道
High-occupancy vehicle lanes incentivize carpooling 通过建立多乘员车辆专用道来增加车辆使用效率

WMATA 华盛顿地铁交通金融
Multi-regional transit finance model for sustainable O&M funding 单纯依赖联邦和地方政府拨款
Recommendations

1. Increase multi-modal connectivity to surrounding Beijing areas
2. Pilot traffic demand management strategies in urban center
3. Improve efficiency and coordination of freight network
4. Expand EV ownership and use through more convenient charging stations
Recommendations

1. 丰富京津冀地区的出行方式，创新融资机制
2. 在城市中心试行交通管理试点区域
3. 增强货物运输网络的效率和协作
4. 扩大电动车保有量，保障电动车配套设施
Energy

能源
Current Status

Increasing Energy Demand

2001-2015 Beijing’s energy consumption increased 138%.

Coal to Clean Energy

• Energy Structure
• Beijing versus Hebei disconnect

煤炭到清洁能源的转化
能源结构
北京与河北的断层
Potential for Energy Structure Transformation

- Wind energy in Hebei and Inner Mongolia is not being used efficiently.
- 2014-2016 wasted wind in Country = 2015 Beijing electricity consumption
- Hebei only uses 20% of geothermal energy reserves

Barriers to Clean Energy

- Lack of collaboration between energy sources results in wasted energy capacity.
- Economic incentive to keep coal factories open.

什么阻碍能源发展？
地区能源壁垒而造成的能源产能浪费
煤炭是经济的命脉
Recommendations

1. Collaboration - Renewable Energy Certificates and Regional Transmission Organization
2. Investment in Research and Development
3. Phasing Out Coal Plants and Replacing with Clean Energy
Recommendations

1. 增加协作 - 市场化的清洁能源交易体制及区域间能源的统筹管理机构
2. 对研究和发展的投资 - 核能与储电电池
3. 逐步淘汰燃煤电厂并用清洁能源进行取代
Environmental Governance

政府治理
Historical focus on **vertical collaboration** for multi-region projects in China will not work for long-term successful air quality management.  

尽管京津冀地区尝试过多种区域合作方式，但现行管理办法并不利于加强组织间的平行合作

Despite the intent to use a different collaboration model for the Jingjinji region, the current plan does not properly facilitate strong horizontal coordination.

尽管京津冀地区尝试过多种区域合作方式，但现行管理办法并不利于加强组织间的平行合作

**Goal:** to create the necessary governance mechanisms to support collaboration to achieve regional air quality goals.  

目标：创建有效的政府合作机制，促进区域协作以实现京津冀地区的环境治理目标
California Case Study

**Similar historical struggle**
加州—相同的困境

- Created an open and collaborative model with independent regulators through national standards (Clean Air Act)
- Created agencies that were shielded from direct political influence
- Had an ability to regulate beyond National Standards
- Had a body that coordinated across sectors

统一国家标准，通过国家层面，建立单独的、开放、协同的管理运行机构
机构的独立性可以降低行政干扰，建立独立于国家标准外的区域协同管理体系。成立委员会等机构进行跨部门和跨领域的协调工作。
Recommendations

1. Create an Independent Regulator for the Region
2. Develop a Regional Air Quality Grant Fund
3. Promote Open Government and Open Data
4. Build a Scenario Planning Tool
Recommendations

1. 设立京津冀地区空气质量独立管理部门
2. 创设区域环境污染治理基金
3. 促进政府事务的透明度及数据的及时公开
4. 建立京津冀地区环境治理的场景规划模型