

Study on the Environmental Costs of Coal and Oil Production and Consumption

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- The Action Plan for Air Pollution Prevention and Control
- The Action Plan for Water Pollution Prevention and Control
- The Action Plan for Soil Pollution Prevention and Control

➤ Environmental Policy Research

- Green GDP
- Environmental Taxes and Fees
- Ecological Compensation

➤ Environmental Risk Management

- Pollution damage identification
- Economic loss assessment

➤ Environmental Project Assessment

Topics

- I. Why do we study on the environmental costs of coal mining and consumption?
- II. What are the environmental costs of coal use?
- III. What are the comprehensive benefits of coal consumption control?
- IV. What's the research framework for environmental costs of oil utilization?

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I. Studying the environmental costs of coal utilization helps to form a consensus on coal control

- ❑ China's current coal price seriously underestimates the environmental and health costs of coal consumption, which creates **the illusion that coal is "cheap"**.
- ❑ Companies and residents also tend to ignore the environmental and health impacts of coal use, leading to market failures and **overuse of coal**.

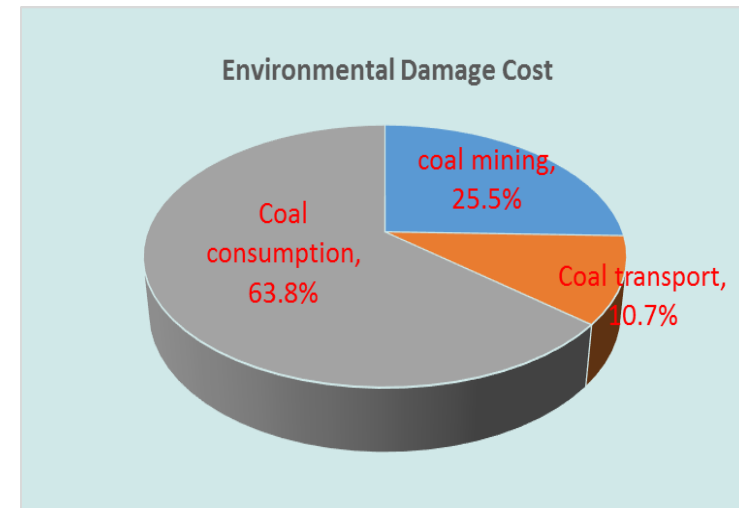
II. What are the environmental costs of coal use?

- **Water Resources Damage:** underground funnels, water level decline caused by coal mining
- **Water Pollution:** suspended solids, heavy metals, minerals and special pollutants.
- **Impacts on Human Health:** deaths and occupational injuries during coal mining; air pollution from coal consumption.
- **Greenhouse Gases Emission:** CH₄ emissions during coal mining, traffic emissions during coal transportation, CO₂ and black carbon emissions during coal consumption.

The environmental damage cost during coal mining and utilization in China is about 260 RMB / ton of coal.

- Physical accounting: waste water, waste gas and solid wastes discharged in coal mining, transportation and consumption;
- Value accounting: estimation based on cost, loss or shadow price.

process	Category	Cost (RMB/ton)
Coal mining	Coal resources waste	11.00
	Water resources damage	27.65
	Water pollution	5.81
	Ecological destruction	21.30
	Health losses of miners	0.58
	Sub-total	66.34
Coal transport	Accidents, noises, environmental pollution, etc.	27.8
Coal consumption	Premature death and related illness	166.2
Total		260.3



The external cost of coal use is much higher than the current environmental tax.

- The current environmental tax in China's coal price is only 30-50 RMB/ ton, most of which is concentrated in the mining process.
- The environmental cost of coal use is 166 RMB/ ton, only a small part of which is reflected in the environmental tax.
- We could set **reasonable environmental tax rates** to internalize the external costs during coal mining and utilization, and promote the reduction of coal production and consumption

III. Total coal consumption control can bring significant comprehensive benefits: 110 billion, 570 billion, and 670 billion RMB respectively in 2020, 2030, and 2050.

Water resources

- ▣ Reduce water consumption
- ▣ Reduce soil erosion and water ecological degradation
- ▣ Reduce water pollution

Public health

- ▣ Reduce medical costs and loss of life

Energy System Transformation

- ▣ Increase investment in non-fossil energy (negative benefit)
- ▣ Reduce investment in the coal industry and coal-fired power plants

Greenhouse gases emission reduction (largely uncertainty)

Technological progress in the coal industry

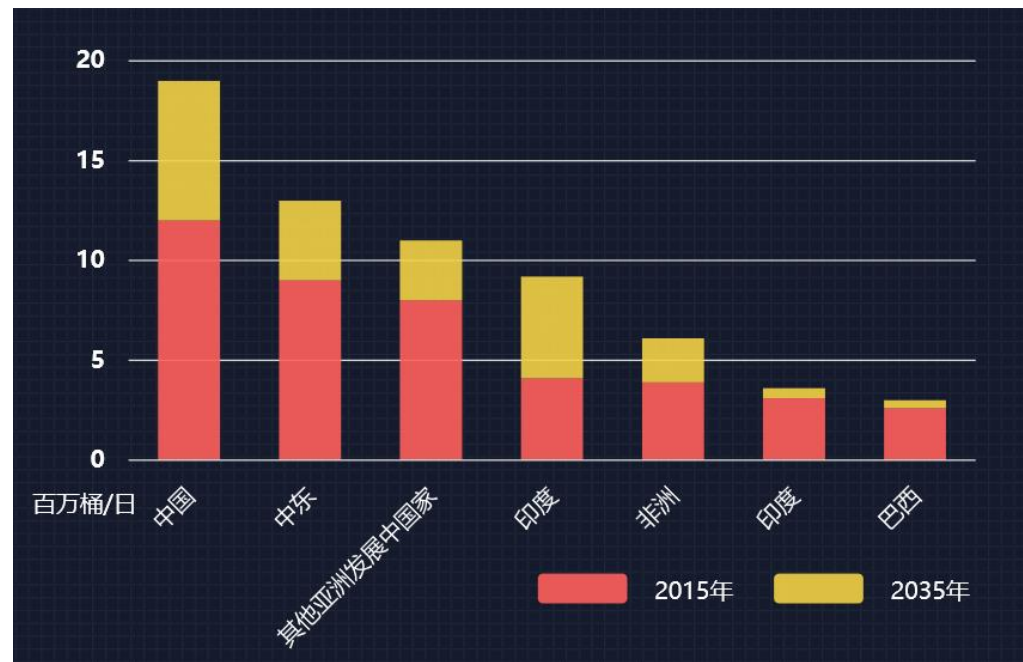
- ▣ Reduce deaths of miners
- ▣ Reduce occupational diseases
- ▣ Improve ecological environment

Policy recommendations

- ❑ Control total coal consumption, forcing coal production capacity reduction.
- ❑ Determine the “ecological red line” based on water resources and environmental capacity, and constrain the layout and scale of coal-related industries.
- ❑ Improve the coal pricing mechanism and incorporate the environmental and external costs of coal production and consumption.

IV. Research on environmental costs of oil utilization can help curb the trend of oil consumption growth.

- During 2000-2016, China's total energy consumption nearly tripled, and oil consumption increased by 150%.
- In 2017, China's dependence on foreign oil grew to 69%, breaking through the psychological barrier of experts.
- According to World Energy Outlook 2017 (IEA) :
 - China's oil demand growth accounts for 53.8% of global growth.
 - By 2035, China's oil demand will increase by 58.3% compared with 2015.
 - By 2040, China's oil import dependence will reach more than 80%.



Environmental impacts of oil exploitation, processing and consumption

- **Environmental impacts of oil exploitation**
 - Undermining natural water circulation systems
 - Resulting in water resources overload and groundwater overdraft
 - Water pollution
 - Air pollutants produced during oil exploration
 - Emission of oil associated gases (i.e., CH₄)
- **Environmental impacts of oil processing**
 - High water consumption industries (petrochemical industry) aggravate the contradiction between water supply and demand in the region
 - Waste water, waste gas and solid waste are discharged during petroleum processing
 - CO₂ emission
- **Environmental impacts of oil consumption**
 - Human health effects of air pollution

Content of environmental cost accounting

Item of accounting	Accounting index
Cost of water resources	Water intake, groundwater overdraft
Cost of water pollution	Drainage treatment
Cost of air pollutants emission control	Emission reduction costs of SO ₂ , NO _x , VOCs and particles
Environmental cost of waste solids emission	land occupied and disposal cost
Cost of human health	medical cost and loss of life
Cost of ecosystem damage	Cost of soil erosion and ecological restoration



Thanks for listening!

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