

推动产业转型升级是控制煤炭消费的根本途径

INTEGRATING COAL CAP WITH INDUSTRY TRANSFORMATION

杨宏伟 **YANG HONGWEI**

国家发展和改革委员会能源研究所

ENERGY RESEARCH INSTITUTE, NDRC

高耗能行业是控制煤炭消费的关键

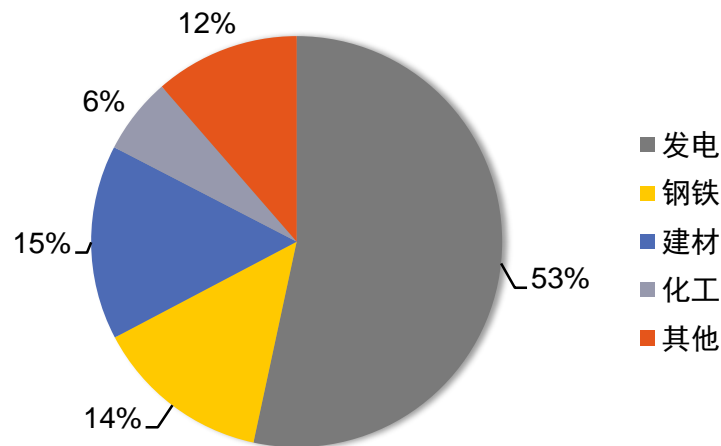
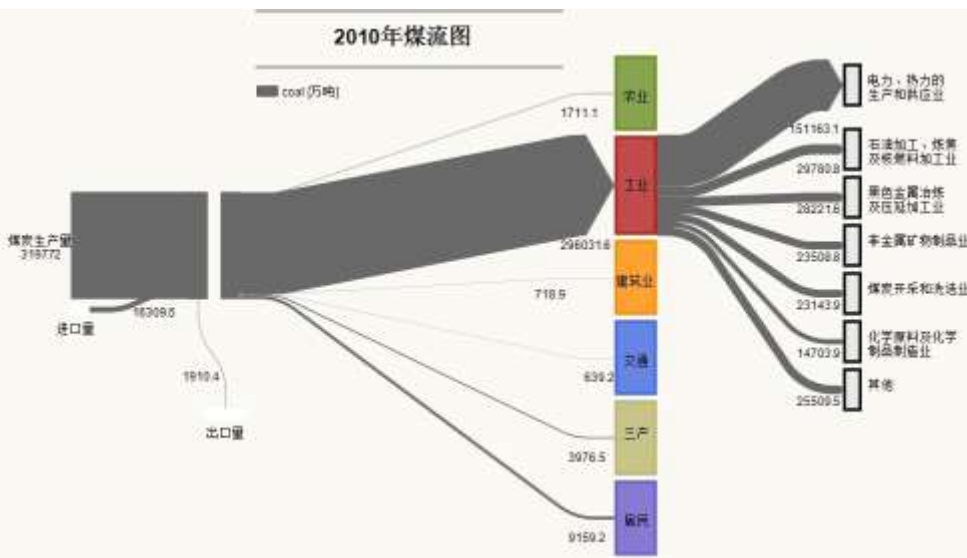
ENERGY INTENSIVE SECTORS ARE KEY FOR COAL CAP

我国煤炭消费90%集中在电力、钢铁、建材、化工、炼焦、建筑等行业

电力行业占工业部门煤炭消费一半以上

Power, iron&steel, cement, coke account for China's 90% coal consumption

Coal-fired power accounts for half of industrial coal consumption



高耗能行业控煤形势严峻

CHALLENGES FOR COAL CAP IN INDUSTRY SECTOR

产能产量过剩矛盾突出

- 钢铁产能过剩问题严重，大规模出口矛盾突出
- 火电发电利用小时数大幅下降；弃风、弃水、弃光问题突出
- 建筑空置率高，大拆大建问题普遍
- 煤化工发展形势复杂

体制机制等深层次改革矛盾凸显

经济增长下行压力加大

稳增长压力下扩大投资可能拉动煤炭需求

Pervasive over-capacity

- Over-capacity and export in iron & steel sector
- Decreasing utilization rate in coal-fired power sector
- Less-developed wind, solar and hydro power
- Mass demolition in building sector
- Mixed challenges in coal-chemical sector

Institutional barriers

Downward pressure of economic growth

Impacts from potential stimulus policies

重点行业总量控制是控煤的重要前提

CAPPING INDUSTRIAL CAPACITY IS A PREREQUISITE

高耗能行业整体步入峰值饱和阶段

- 钢铁、水泥等步入饱和发展阶段
- 部分高耗能产品已经达到峰值
- 电力消费增速明显放缓
- 房地产、基础设施建设增速放缓

中西部地区高耗能行业发展仍然较快

强化淘汰落后产能

严格控制高耗能产品出口

推进产业兼并重组结构优化

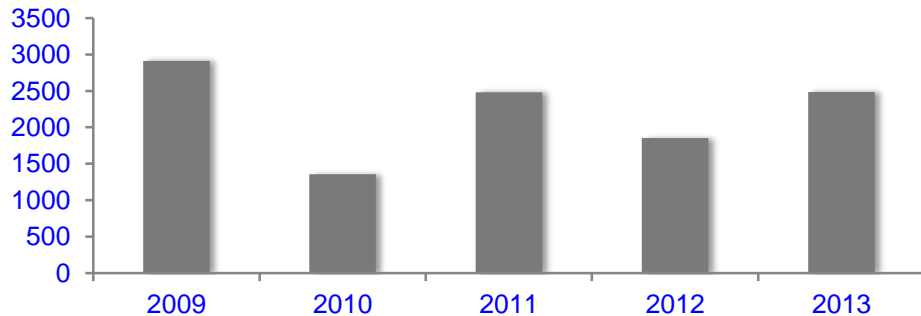
Energy intensive sector entering peak stage

Fast development in middle and western regions

Strengthen eliminating backward capacity and restricting export

新增粗钢产能（万吨/年）

Annual increased iron capacity



明确十三五重点行业煤炭消费总量控制目标

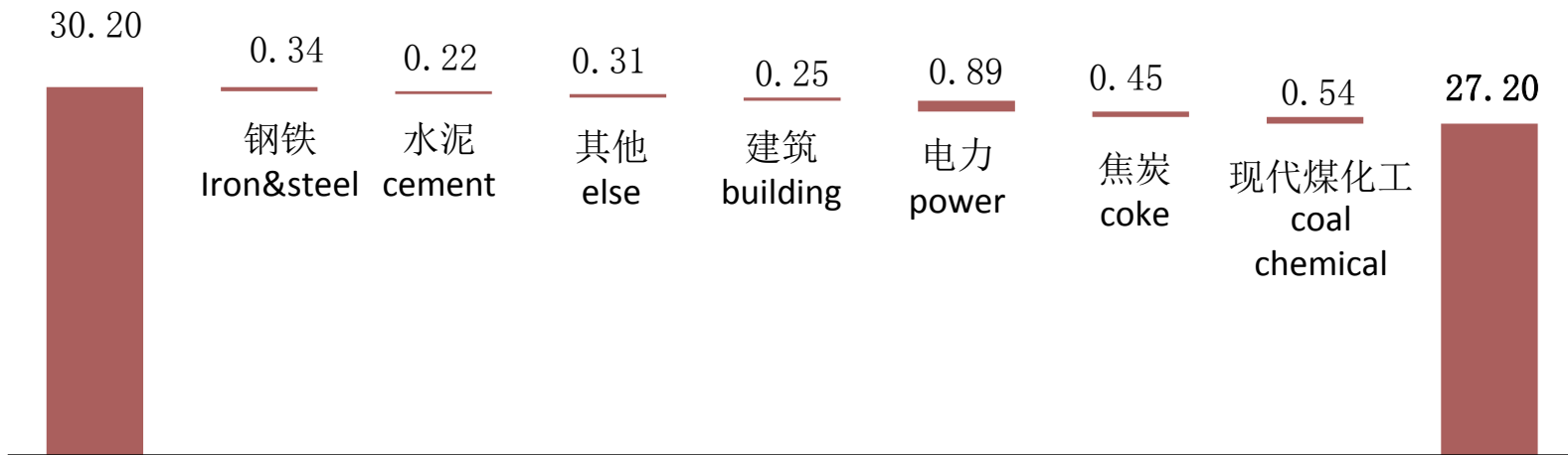
SPECIFY 13 FYP COAL CAP TARGETS FOR KEY SECTORS

综合行业发展、环境容量、水资源约束等，明确各行业煤炭消费总量控制目标

Set coal cap targets for key energy intensive sectors based on industrial development, environment constraints, and water resources

2020年煤炭消费总量控制在27.2亿吨标准煤

Coal consumption should be capped around 2.72 billion tce in 2020

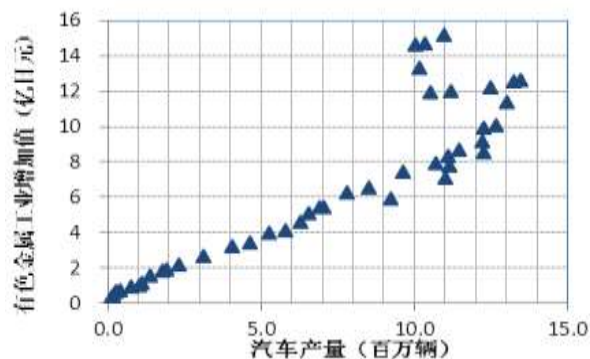
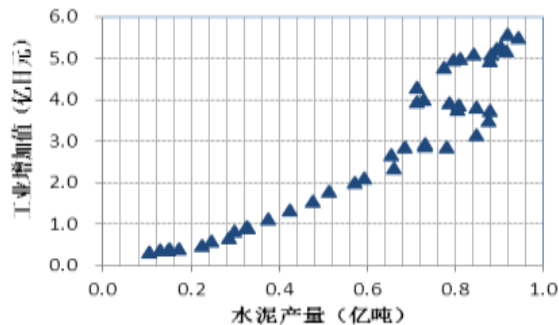
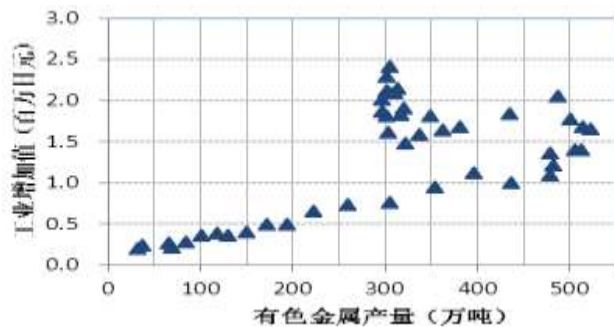
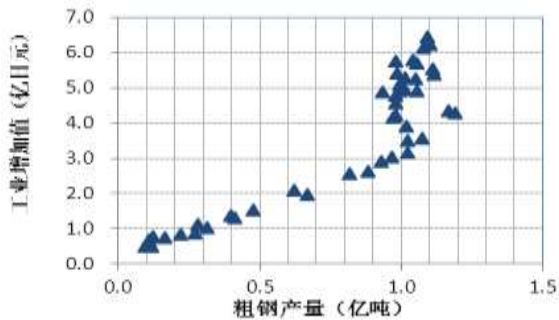


2020 基准情景
2020 Ref Scenario

2020 煤控情景
2020 Coal Cap Scenario

高耗能行业转型发展：增加值与产量增长“脱钩”

INDUSTRY TRANSFORM: DECOUPLING FROM ENERGY CONSUMPTION



日本主要工业行业产品产量与增加值关系
Value-added in industry sector and main products output in Japan

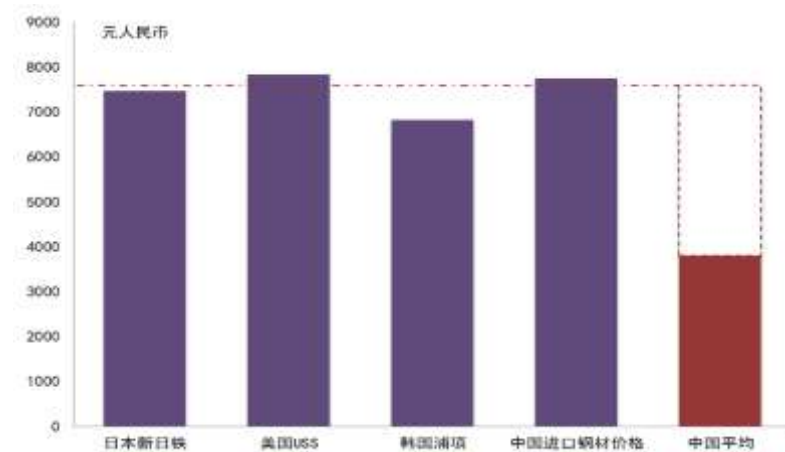
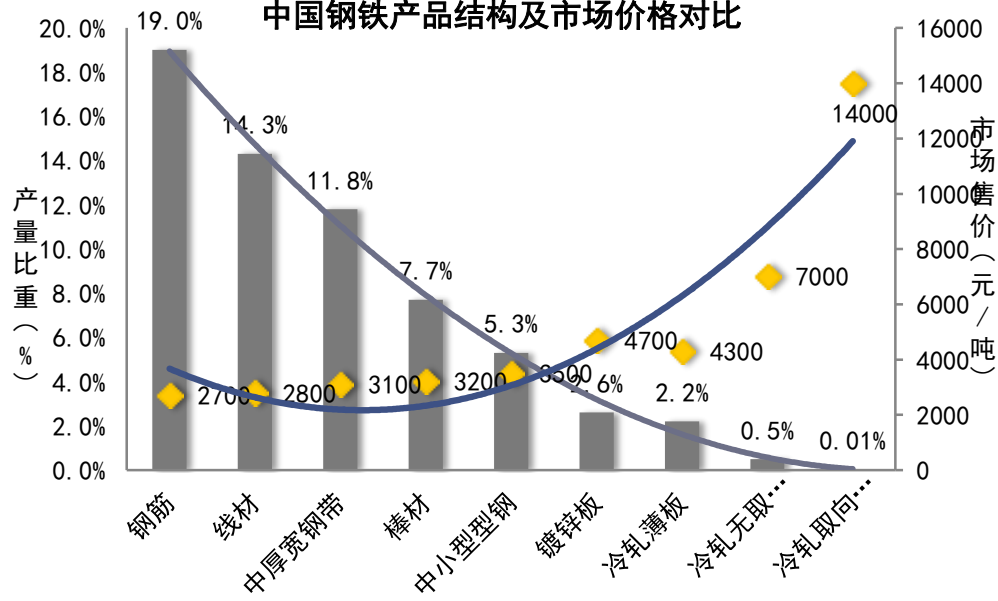
工业内部转型：结构优化和增加附加值

INDUSTRY TRANSFORM: STRUCTURAL CHANGE AND INCREASE VALUE-ADDED

我国主要高耗能行业普遍处于国际产业分工低端
 推动工业内部结构调整，延长产业链，增加附加值
 实现工业发展与产能扩张“脱钩”

Most energy intensive sectors are low value-added
 Promote sector structural change and optimization
 Achieve decoupling of industry development and output expansion

中国钢铁产品结构及市场价格对比



挖掘跨部门、跨行业节约煤炭潜力

TAPPING POTENTIALS FROM INTER-SECTOR AREAS

钢铁行业

- 利用城市中水及钢厂余热供热
- 冶金渣用于水泥建材行业
- 煤气资源化利用：发电、城市煤气、制氢气、甲醇等；

水泥行业

- 城市垃圾和污泥用于原燃料替代
- 粉煤灰作为建筑材料生产原料
- 电力行业沸腾炉渣用于水泥生产替代原料

电力行业

- 区域电力系统优化：跨区输电、优化调度
- 因地制宜发展可再生能源

Iron & Steel

- Waste heat in urban heating system
- Solid waste in cement sector
- Utilization of coal gas for power, H₂

Cement

- Raw material substitution by urban waste and sludge
- Solid waste for construction

Power

- Regional dispatch; electricity transmission
- Usage of new energy and renewable energy

推动工业复合增长、产城融合发展

PROMOTE INTEGRATIVE AND CITY-INDUSTRY DEVELOPMENT

我国大量工业产能集中在城市区域

- 城市钢厂占全国钢铁产能1/3;
- 大量水泥、电力产能布局在城市密集区
- 生态工业园区仍处于起步发展阶段

将控煤与城市转型、产业升级结合起来

- 重点地区治理雾霾既是压力，也是动力
- 推动工业生态化、园区化发展
- 控煤与产业布局调整、国土功能区划衔接起来

Most industry capacities concentrate in urban areas

- City iron plants account for 1/3 sector output
- Power and cement capacities close to populous regions

Coal cap and transform urban development

- Integrate coal cap with tackling fog haze
- Promote ecological industrial park development

加快工业能源结构升级优化

PROMOTE INDUSTRY ENERGY MIX ADJUSTMENT

替代工业部门煤炭利用

- 加快天然气利用
- 提高工业部门电气化率
- 因地制宜利用可再生能源
- 生活垃圾、污泥等替代

清洁高效利用煤炭

- 减少煤炭分散利用
- 提高锅炉、窑炉系统效率
- 提升终端污染治理水平

Substitute coal use in industry sector

- Promote natural gas use
- Increase electricity use
- Utilize renewable energy
- Substitute by urban waste

Clean and efficient use of coal

- Reduce disperse use of coal
- Increase system efficiency of boiler
- Reduce pollutants remarkably

主要结论和政策建议

KEY CONCLUSIONS AND RECOMMENDATIONS

加强重点部门节能降耗，能够实现全国煤控目标

严格控制高耗能部门产能增长和出口扩张是持续控煤重要前提

持续大幅提高能效是控煤的主要途径

加快转变发展方式与控煤互为前提、相互促进

重构绿色低碳能源体系是控煤的重要基础

跨部门、跨领域系统优化具有较大的控煤潜力

把用能权控制和交易作为煤控主要手段

- Strengthen energy conservation will support achieving national coal cap target
- Capping industrial capacity and export are prerequisites for coal cap
- Energy efficiency should be reinforced in industrial levels
- Coal cap should be integrated with industrial transforming and upgrading development
- Accelerating energy mix in industry sector is basis for coal capping
- Cross sector and industry potentials should be tapped
- Energy and coal quotas should be applied in major regions