

Agora
Energiewende



德国地方煤炭转型案例对山西低碳能源转型的启示

Low-Carbon Energy Transition in Shanxi:
Experience and Lessons from Regional
Coal Transitions in Germany

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北京 Beijing | 2022年11月30日 November 30th, 2022



研究背景 Background of the research

报告概览与背景 Overview & background of the report

四个德国转型案例 Four German cases

总结 Closing remarks



2019 11月 Nov 2019
Field trip with Chinese partners to visit Shanxi

Agora高层拜访山西

2020
Partnership building with Shanxi
与山西省重要利益相关方建立合作关系

2021年9月 Sep 2021
The 1st Europe-China Workshop on Clean Energy Transition
第一届中欧清洁能源转型国际论坛

2022年9月 Sep 2022
The 2nd Europe-China Workshop on Clean Energy Transition
第二届中欧清洁能源转型国际论坛



2021年4月 Apr 2021
Europe-China dialogue: Transition of Coal Regions to Low Carbon
中欧对话：煤炭产区的低碳转型

2021年9-11月 Sep-Nov 2021
Three Europe-China Dialogues on Just Transition in Coal Regions
三次中欧对话：产煤地区的公正转型

2022年5月 May 2022
Summary report of Europe-China Dialogues
报告：“中欧煤炭公正转型系列对话”

2022年11月 Nov 2022
Report on cases of regional coal transitions in Germany
报告：德国地方煤炭转型案例对山西低碳能源转型的启示

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德国地方煤炭转型案例对山西低碳 能源转型的启示

中德能源转型研究项目



一、山西能源发展与转型回顾

二、山西与德国进行比较研究的重要意义

三、德国能源转型案例

四、总结

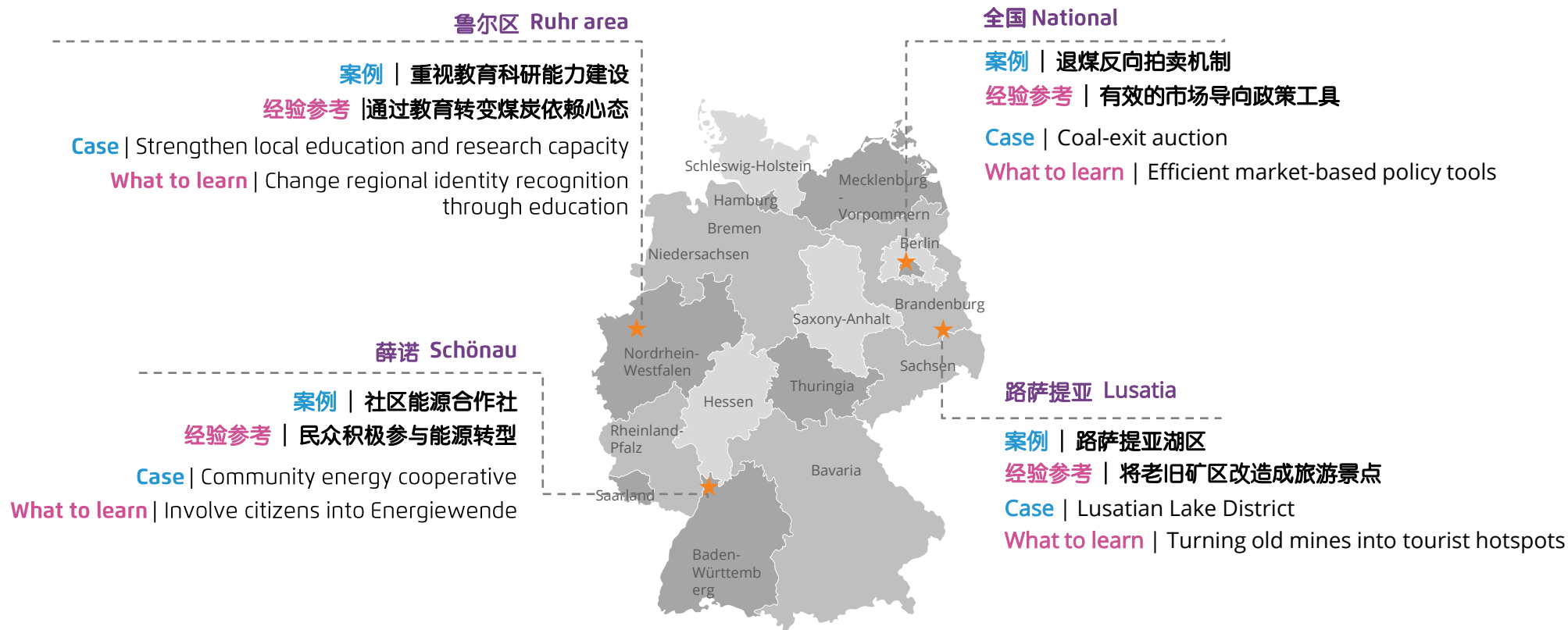
I. Overview of the Energy Development and Transformation in Shanxi

II. Importance of the Comparative Study between Shanxi and Germany

III. The German Cases of Regional Energy Transition

IV. Conclusion

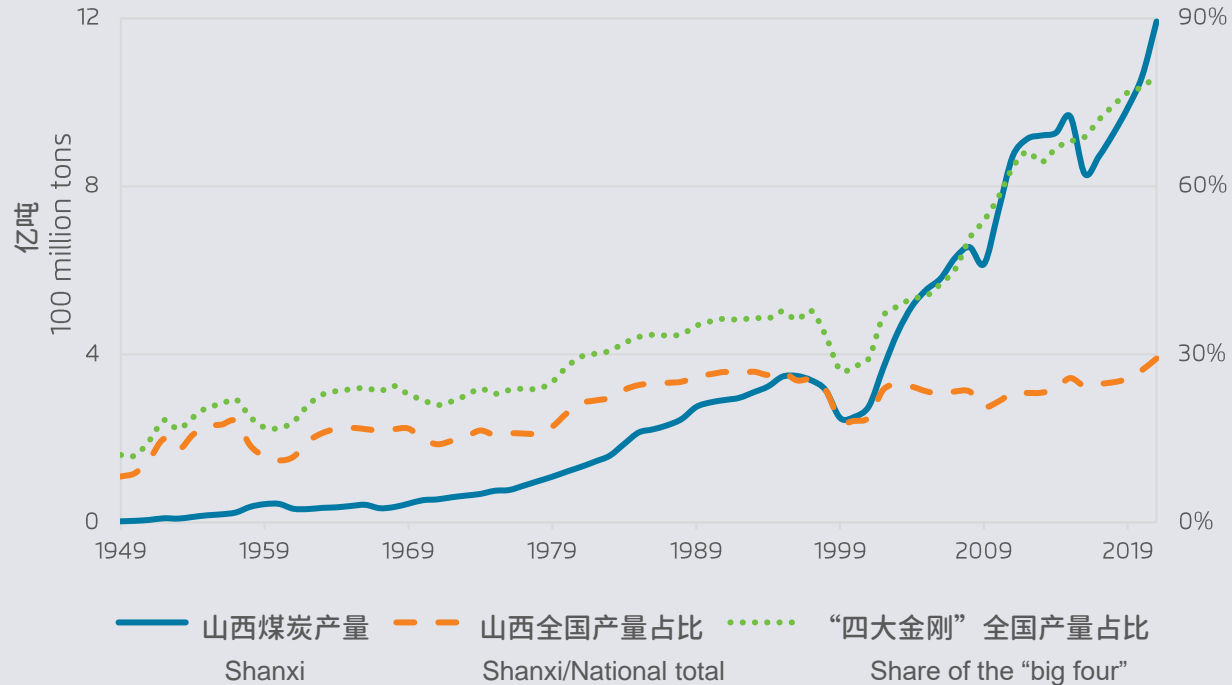
四个德国案例 Four case studies from Germany



山西：“煤老大”的华丽转身说易行难

Shanxi: Transformation of the “giant coal miner” is easy to say but hard to do

建国以来山西煤炭历年产量以及在全国总产量占比变化情况
Changes in coal production in Shanxi and its share in the national total



国家统计局、山西统计局 National Bureau of Statistics, Shanxi Bureau of Statistics



近年来山西煤炭生产的增量大部分是由本省消化吸收

Most of the incremental coal production was consumed by Shanxi itself in the recent years.



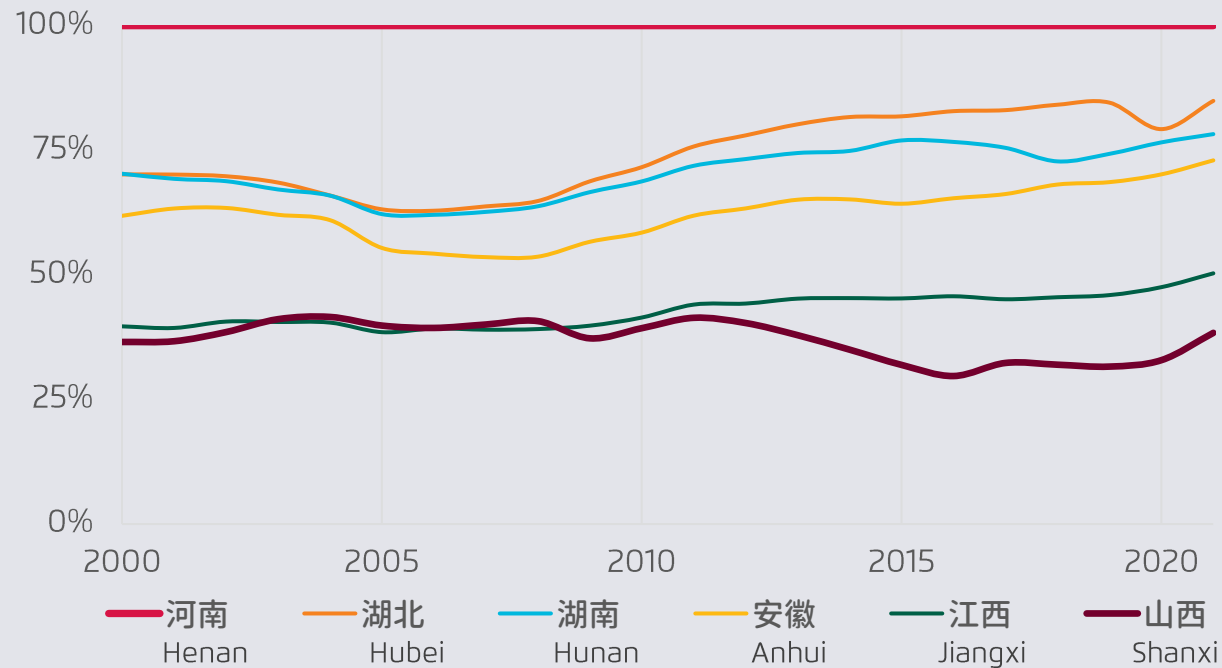
发电与炼焦是山西煤炭消费增长的两大驱动行业

Power sector and coking coal industry are two largest drivers of Shanxi's growing coal consumption

因煤而兴，因煤而困

Coal, which used to drive the economic growth, now becomes a drag on development

中部六省GDP差异 2000-2021
GDP of the six provinces in Central China, 2000-2021



国家统计局在线数据库 National Bureau of Statistics online database



山西与德国对比研究

Comparison study of Shanxi vs. Germany

Dimensions 评估维度	Key index 关键指标	Shanxi 山西	Germany 德国
Economic 经济	Share of industry in GDP (excl. construction) 工业占GDP比重 (不含建筑)	45% (2021)	24% (2021)
Social 社会	Coal employment share 煤炭就业占比	5% (2019)	0.07% (2018)
Technical 技术	Renewable capacity share 可再生装机占比	34% (2021)	60% (2021)
Cultural 文化	Regional identity 地区身份认知	China's coal hub 中国产煤大省	The well known "Energiewende" 以“能源转型”著名
Policy 政策	Short-term focus 短期政策关注	Lack of quantified target 缺乏约束性目标	Challenged by energy crisis 受到能源危机的挑战

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1994

薛诺居民成立了“电厂合作社” (EWS)

Schönau citizens established a community energy cooperative EWS

2012

全德国第一家100%可再生能源发电的电力供应商
EWS was the first power operator to supply 100% renewable electricity in Germany

2021

成员 Members: 650 → 6,500

客户 Clients: 1,700 → 185,000



CASE 1

EWS创始人 Founders of EWS

德国能源合作社现状 Energy Cooperatives in Germany



成员 Members

220,000



可再生能源投资
Investments in renewables

33亿欧元
3.3 billion Euros



减少碳排放
CO2 emissions prevented

3 million tons
300 万吨



可再生能源发电
Renewable power generation

8 Twh



占全德可再生发电比重
Share of total renewable generation in Germany

3.5%



薛诺 EWS
EWS in Schönau

整县推进
Rooftop distributed PV pilot
projects in Chinese counties

打破垄断
Break the monopoly



打破央企国企的垄断
Break the monopoly of SOEs

中小企业参与
SME participation



鼓励民企参与到竞争中
Encourage the involvement of
private companies

消费者→产消者
Consumers → Prosumers



让民众收益
Benefit the residents

法律保护
Protected by law



出台政策，确保公平竞争
Develop policies to ensure fair
competition



Lusatia 路萨提亚

CASE 2

过去 Before

德国第二大褐煤产区

The **second largest** lignite producing region

1980s褐煤产量占全国

Share of lignite production over national total in the 1980s

48%

现在 Now

23个由矿区改造的湖区

14,000 公顷
欧洲最大人工湖区

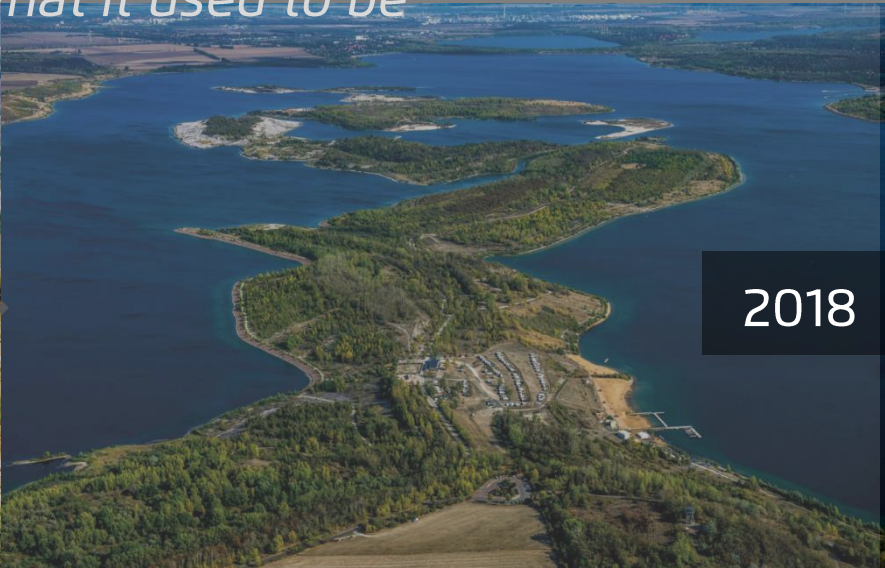
23 post-mining lakes

14,000 hectares
Europe's largest artificial body of water



路萨提亚今非昔比

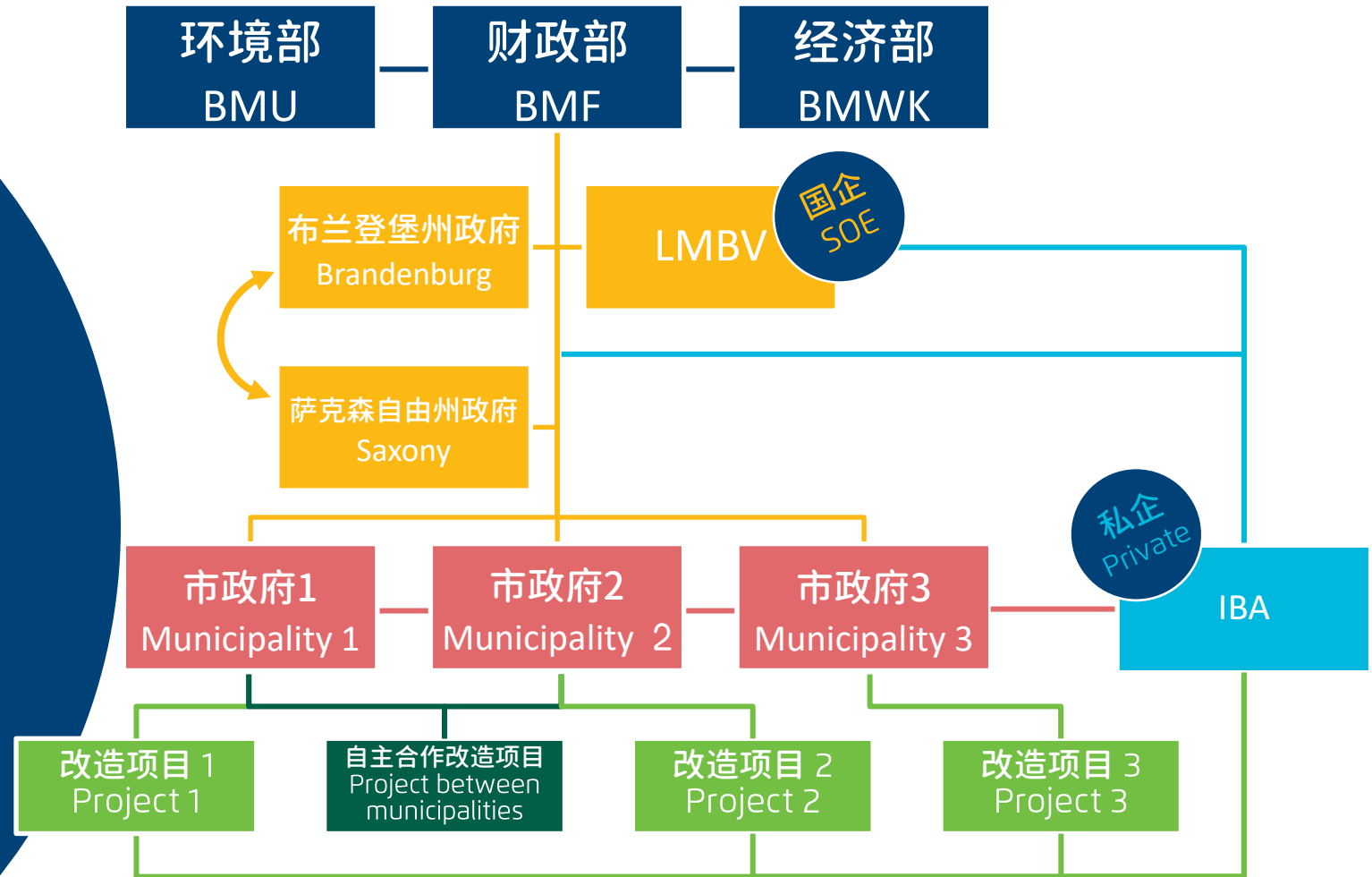
Lusatia is not what it used to be



CASE 2

政府部门分工明确，政策制定方、出资方与执行方各司其职

Clear roles of different departments and layers of government ensure that policy makers, sponsors, and implementers do their own part effectively.





鲁尔区转型： 教育重振经济

**Transition of Ruhr:
Education to revive
economic growth**

CASE 3

Photo credit: www.rvr.ruhr

1962

鲁尔区建成第一座大学

First university was founded in Ruhr area

2021

22座高校坐落于鲁尔区

22 universities and colleges
in Ruhr area

超过25万在读学生

More than 250,000 students

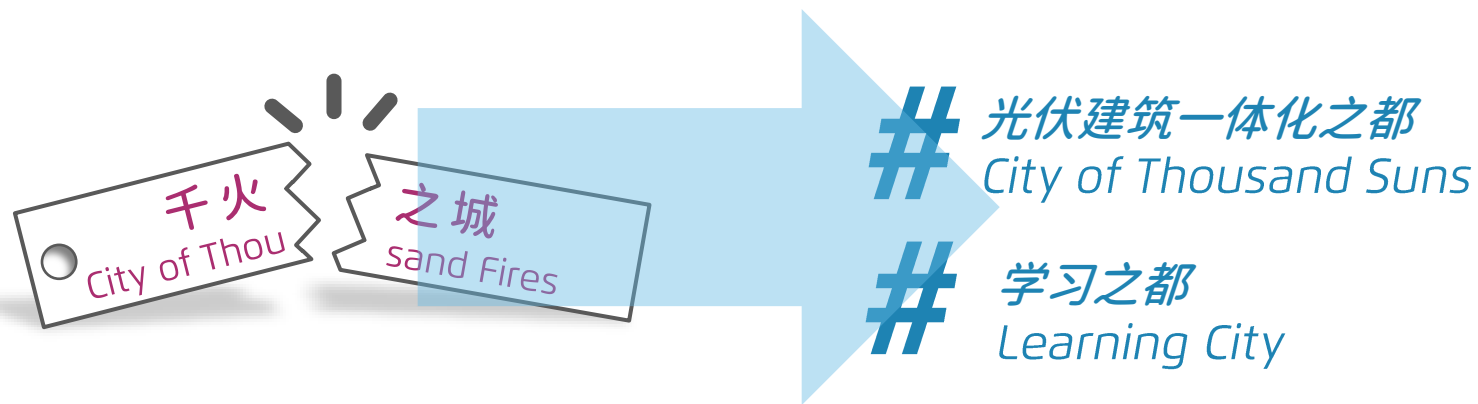
70%的学生在非工程专业就读

70% of the students enrolled in non-engineering majors



撕去标签 重新定义

Tear off the **OLD** label and **Re-define** your city



提高高等教育
Improve higher education



启蒙年轻一代
Empower younger generation

2020.9 - 2022.10

累计中标 Total volume accepted: **10.4 GW**

第1-6轮竞标
Round 1 - 6

目标完成 Target achieved: **95%**

退煤反向竞拍机制

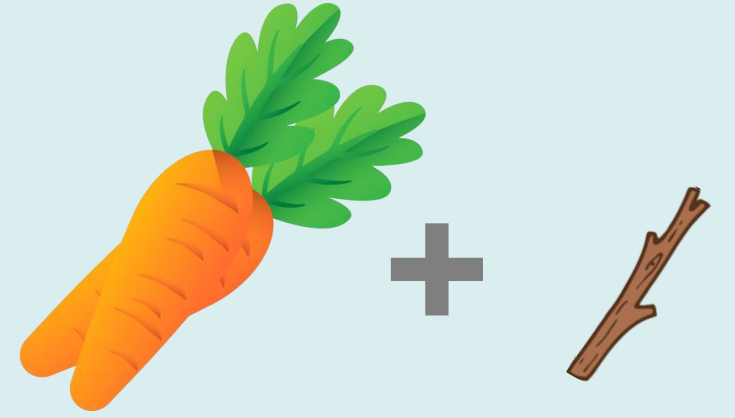
Coal exit reverse auctions

“胡萝卜加大棒” 推进转型

"Carrot and stick" to promote transformation

保障能源安全是退煤持续推进至关重要的前置条件
Ensuring energy security is a vital prerequisite for
consistent implementation of coal phase out.

市场的“无形之手”与政府的“有形之手”缺一不可
The "invisible hand" of the market and the "visible hand"
of the government are indispensable.



CASE 4

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中国煤炭地区能源转型政策建议框架
An energy transition policy framework
proposed for Chinese coal regions

	煤炭削减 Coal reduction	建设新型电力系统 Construct a new electricity system	矿区转型 Transformation of mining regions	降低负面影响 Alleviate hardship
政策 Policy				
技术 Technology				
经济 Economy				
社会 Society				
文化 Culture				

政策建议

Policy recommendations

政策 Policy

成立常设的转型发展协调机制，并设立专门的转型基金

Establishment of a permanent coordination mechanism for transformation development and a specific transformation fund

技术 Technology

提前部署可再生能源与低碳相关技术，完善交通和网络通讯的基础设施建设

Early deployment of renewable energy and low-carbon technologies, and improvement of infrastructure construction for transportation and IT

经济 Economy

增加在创新研发领域的经费，建立产学研对接机制

Increase funding in innovation and R&D and establish of a mechanism for translating research findings into practice and policy

为中小企业与民营企业提供公平竞争的机会

Create opportunities for SMEs to participate in fair competition

社会 Society

规划地方能源转型战略时，纳入人力资源部门

Incorporate HR department when planning regional energy transition strategies

文化 Culture

转变思路，越早行动，成本越低

Change of coal-dependent mentality as soon as possible. The earlier a region acts, the lower the costs of transformation will be.



报告全文下载
Download the
full report

博众智合能源转型论坛
Agora Energy Transition China

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German Centre, Chaoyang District, Beijing, PRC.

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如果您有任何问题，欢迎与我联系。
If you have any questions, please feel free to contact me at:

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