
山西省实现绿色、低碳和包容转型的挑战与机遇

Opportunities and Challenges of Shanxi's Green, Low-carbon and Inclusive Transition

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山西省主要特征/Overview of Shanxi Province

- 3729.22万人口 (2019)
- 行政区划: 11个城市
- 2020 GDP: 17651.93亿人民币, 同比增加3.6%
- 中国资源大省, 能源供应基地 (58年的“煤老大”)
- 国家资源型经济转型综合配套改革试验区 (2010年) (首个全省域、全方位、系统性的国家级综合配套改革试验区)
- 能源革命综合改革试点
- 经济增速低于全国平均水平

图1 2016-2020年全省地区生产总值及其增长速度



山西省经济结构 (2010-2019)



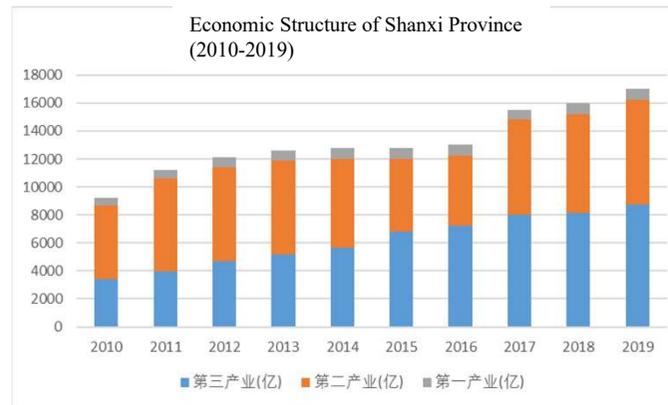
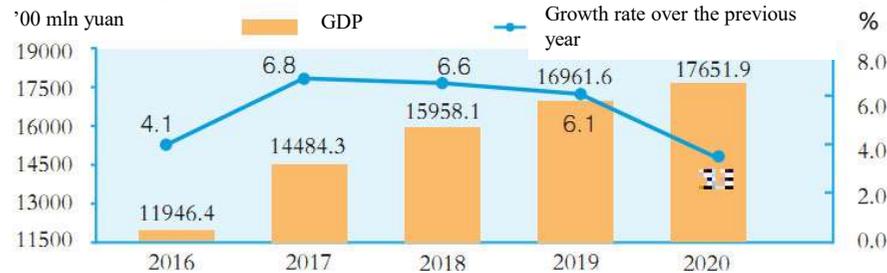
山西与全国人均GDP (2010-2019)



Overview of Shanxi Province

- **Population: 37.2922 mln (2019)**
- Administrative division: 11 cities
- GDP in 2020: RMB1765.193 bln, up by 3.6% on year-on-year basis
- China's leading province of resources and base of energy supply (the "coal giant" for 58 years)
- **A national pilot zone of comprehensive reform for the transformation of resource-based economy (2010)** (the first province-wide, all-round and systematic national pilot zone of comprehensive reform)
- A pilot province of comprehensive reform for energy revolution
- With an economic growth rate lower than the national average

Fig.1 The Province's GDP and its growth rate in 2016-2020



The tertiary industry ('00 mln yuan) The secondary industry ('00 mln yuan) The primary industry ('00 mln yuan)



Per-capita GDP of Shanxi (yuan/person) Per-capita GDP of China (yuan/person)



在绿色低碳领域，国际与国内形势和政策正在发生“百年未见”的巨大变化

Global and domestic momentum towards decarbonization

应对气候变化领域国际形势发生了深刻变化

Global momentum in combating climate change

- 新冠肺炎疫情与公共卫生行动、绿色复苏
- 各国先后宣布2050/2060碳中和目标
- 各国政府、开发性金融机构与机构投资者加速退出煤炭行业
- 绿色科技成为未来最重要的国际竞争领域

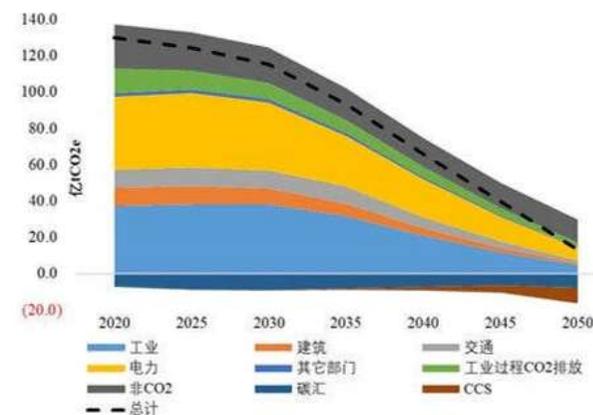
中国绿色低碳发展的新趋势与挑战并存

New trends and challenges in China on green and low-carbon transition

- 碳中和目标明确了中国经济长期去碳化趋势
- 中国构建“双循环”新发展格局战略为可再生能源发展带来新动力
- 生物多样性保护成为未来新的重点
- 我国环境问题依然严峻、气候变化与生态环境保护协同是“十四五”期间的重点

中国、韩国、日本、欧盟、英国、南非、美国等29个国家和经济体承诺在2050-2060年间实现碳中和或温室气体净零排放。

法国、英国、意大利、加拿大等24个国家计划到2030年实现“无煤化”，德国政府和英国政府已公布全面退出煤电的时间表。巴基斯坦表示将不再新建煤电。



来源：清华大学气候变化与可持续发展研究院

Global and domestic momentum towards decarbonization

Global momentum in combating climate change

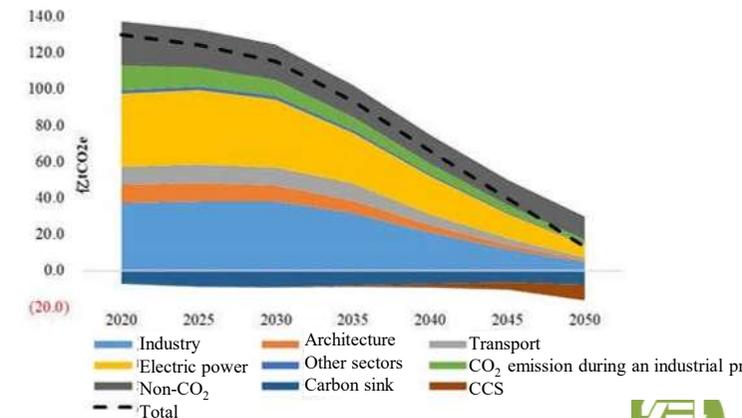
- Actions in the COVID-19 pandemic and public health for green recovery
- **Various countries announced their 2050/2060 carbon neutrality goals successively.**
- **Governments, development-oriented financial institutions, and institutional investors** are retreating from the coal industry faster.
- Green technology will become the most important area of international competition in the future.

New trends and challenges in China on green and low-carbon transition

- China's goal of carbon neutrality is a clear sign of long-term trend of economy toward decarbonization.
- China's strategy to establish a "dual circulation" development pattern gives a new impetus for the development of renewable energy.
- Biodiversity conservation becomes a new focus for the future.
- Environmental problems remain severe in China. The synergy between the fighting against climate change and the protection of ecological environment is a focus in the 14th FYP.

29 countries and economies including China, South Korea, Japan, EU, UK, South Africa and USA have committed themselves to carbon neutrality and net-zero emission of greenhouse gases by 2050-2060.

24 countries including France, UK, Italy and Canada plan to be "coal-free" by 2030. The governments of Germany and UK have announced their timetables of full exit from the coal power. **Pakistan** stated that it would not build new coal power projects any longer.



Source: the Institute of Climate Change and Sustainable Development (ICCS) of Tsinghua University



山西省绿色低碳发展的机遇与挑战

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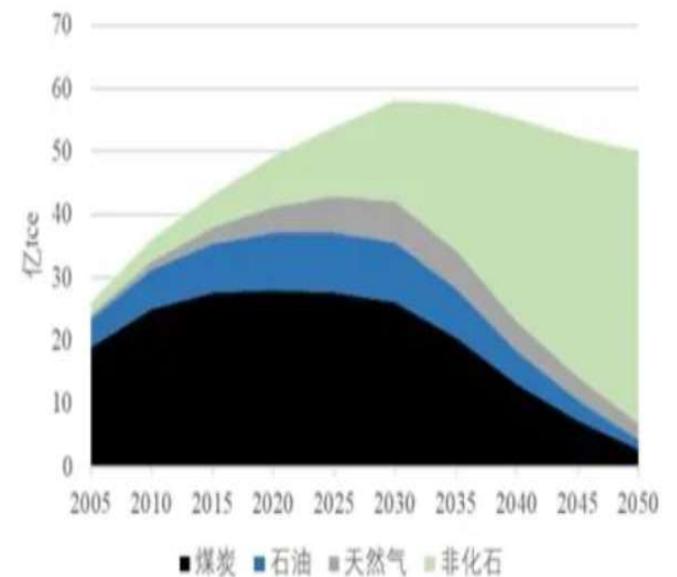
机遇 Opportunities

- “十三五”时期山西资源转型综合配套改革试验区建设全面推进，为高质量转型发展奠定坚实基础
- 以“转型出雏形”为目标，“十四五”时期是山西实现高质量绿色低碳可持续转型的关键窗口期
- 绿色产业发展方兴未艾

挑战 Challenges

- 环境污染严重态势尚未根本扭转
- 产业结构向绿色低碳高质量转型面临突出的现实困难
- 对碳中和缺乏深刻理解可能导致对煤炭产业未来布局的战略失误
- 金融体系尚不能有效支持以碳中和为目标的经济转型

图3 2016-2020年全省规模以上原煤产量



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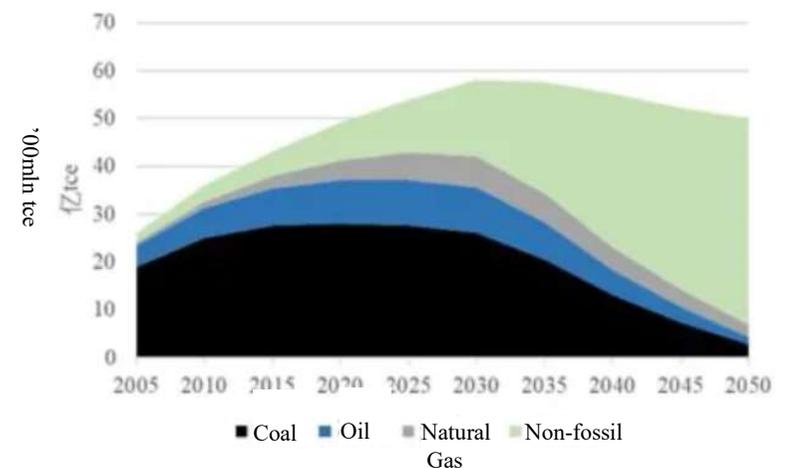
Opportunities

- The Province's all-round construction of the pilot zone of comprehensive reform for the transformation of resource-based economy during the 13th FYP has laid a solid foundation for a high-quality transition.
- With a target of "contributing to an early form of transition", the 14th FYP is a critical window period for Shanxi's high-quality, green, low-carbon and sustainable transition.
- Green industries are in the ascendant.

Challenges

- The situation of severe environmental pollution has not been fundamentally reversed.
- There are obvious hard realities for the industrial structure's high-quality, green and low-carbon transition.
- **The lack of profound understanding of carbon neutrality may lead to a strategic mistake in the future deployment of coal industry.**
- The financial system cannot effectively support the transition to a carbon-neutral economy.

Fig.3 2016-2020 Crude Coal Output of Enterprises Above Designated Size



“十四五”期间是山西加速低碳转型的关键窗口期 14thFYP is a critical moment for Shanxi to accelerate the transition

围绕30·60目标，结合“十四五”规划及疫后复苏计划，制定省级碳中和规划，为加速山西省低碳包容性转型提供明确的政策信号

明确绿色低碳转型重点领域，加速退出高排放产业

加强财税金融对于低碳转型的支持

14th FYP is a critical moment for Shanxi to accelerate the transition

Recommendations:

Develop the provincial carbon neutrality plan based on the 30·60 goals as well as the 14th FYP and post-pandemic recovery plan, to send a clear policy signal for decarbonisation

Identify key areas of green and low-carbon transition for accelerated exit from high-emission industries.

Provide stronger financial and fiscal support for low carbon transition.



明确绿色低碳转型重点领域，加速退出高排放产业

Identify key green and low-carbon areas, and accelerate carbon-intensive industries

重点支持清洁能源和电动车等绿色低碳产业和绿色科技项目

重点支持可再生能源增长、消纳与源网荷储智慧电网建设

- 光伏、风电的开发利用，打造国家级光伏产业基地及风电基地建设
- 风电地热能供能项目与示范区
- 支持智慧电网建设

重点发展氢能及储能技术，关注产业布局方向，开展与前沿储氢、运氢技术的企业的合作

支持新能源汽车布局，重点发展用于大型客运、货运重卡的氢能汽车，发展绿色物流

支持数字技术在绿色产业中的应用

有序退出高排放产业，推动棕色项目转型，支持循环利用

有序退出高碳产业

“十四五”期间，原则上不投资新煤电项目
有序支持现役煤电机组的清洁高效改造和落后煤电机组的退出

支持煤炭产业的有序、公正转型

- 建立有序退出传统煤炭产业的金融支持机制，确保现有煤矿和煤电企业的公正转型，防范由于无序退出可能导致的失业等社会风险和不良资产等金融风险
- 积极引入政策、金融、科技和人才资源，促成有潜力的产业与技术向绿色低碳转型

支持资源循环利用

加大对绿色农业、绿色旅游和绿色消费的支持力度

支持绿色农业发展
以全域旅游及“旅游+”为发展战略，发展绿色旅游
落实山西省绿色消费理念，支持绿色消费发展

建立健全绿色金融发展体制机制
加强气候投融资及碳绩效



Identifying key areas of green and low-carbon transition for accelerated exit from high-emission industries

Priority given to green and low-carbon industries and green technology projects such as clean energy and EVs

Priority given to renewable energy growth and consumption, and smart grid featuring integration of power source-grid-load-energy storage

- Developing and utilizing PV and wind power to create a national PV industry base and wind power base.
- Wind power and geothermal energy supply projects and demonstration areas
- Supporting the construction of smart grids

Priority given to hydrogen energy and energy storage technologies, focusing on industrial layout, cooperating with enterprises with leading-edge technologies of hydrogen storage and transportation

Supporting the development of new energy vehicles, focusing on hydrogen energy vehicles used for large-sized passenger transport and heavy trucks, and developing green logistics

Supporting the application of digital technology in green industries

Orderly exit from high-emission industries to advance the transition of brown projects and support recycling

Orderly exit from carbon-intensive industries

During the 14th FYP period, there will be no investment in new coal power projects in principle.

Support is given to the clean and efficient transformation of current coal-fired power generation units and the exit of outdated units.

Supporting the orderly and just transition of coal industry

- Establishing a financial support mechanism for orderly exit from traditional coal industry, ensuring the just transition of existing coal mines and coal power enterprises, preventing any social risk such as unemployment and any financial risk such as bad assets that may be caused by orderless exit.
- Actively introducing policy, financial, technological and human resources to facilitate the potential industries' green and low-carbon transition

Supporting resource recycling

Greater support given to green agriculture, green tourism and green consumption

Supporting the development of green agriculture
Embracing the strategy of region-wide tourism and “tourism+” to develop green tourism
Implementing the green consumption philosophy in Shanxi Province to support green consumption

Establishing and improving the development system and mechanism of green finance, promoting the climate investment and financing and carbon performance

