



中国新能源产业发展 与安全报告 (2011~2012)

ANNUAL REPORT ON CHINA'S NEW ENERGY INDUSTRIAL
DEVELOPMENT AND SECURITY (2011-2012)

主 编 / 李孟刚



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产业安全蓝皮书

BLUE BOOK OF
INDUSTRIAL SECURITY



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主编简介

李孟刚 男，1967年4月出生，山东省博兴县人，中共党员；经济学博士、交通运输工程和理论经济学双博士后；北京交通大学教授、博士生导师、国家社科基金重大招标项目首席专家、新华社特约经济分析师、国家社科基金评审专家、中国博士后科学基金评审专家。

现任北京交通大学中国产业安全研究中心（CCISR）主任、北京市哲学社会科学北京产业安全与发展研究基地（省部级科研平台）负责人、首席专家；兼任中国产业安全论坛秘书长、《管理世界》常务编委、《管理现代化》编委会副主任、《中国国情国力》编委会副主任、《中国流通经济》专家指导委员会委员、《北京交通大学学报》（社科版）编委委员。2009年12月入选教育部新世纪优秀人才支持计划。

博士学位论文《产业安全理论的研究》入选“2009年全国优秀博士学位论文提名论文”；专著《产业安全理论研究》（经济科学出版社，2006）先后获得2008年第十届北京市哲学社会科学优秀成果奖（省部级）二等奖、2009年高等学校科学研究优秀成果奖（人文社会科学）二等奖；主编《产业经济学》并由高等教育出版社作为研究生教材出版，2011年被评为“北京高等教育精品教材”。

在《光明日报》（理论版）等权威学术报刊发表论文80余篇，多篇被《新华文摘》、人大报刊资料复印中心全文转载；主持或参与撰写的高水平内参报告获得党和国家领导人的专门批示，相关政策建

议多次被有关部委采纳。

作为首席专家主持国家发改委“十二五”规划前期重大研究课题“我国‘十二五’粮食安全保障体系构建研究”；2008年作为首席专家中标国家社科基金重大招标项目“应对重大自然灾害与构建我国粮食安全保障体系对策研究”；主持的国家级、省部级科研课题还包括国家社科基金重点课题、中国博士后科学基金特别资助项目、国家商务部部级课题、教育部重大研究专项课题、国家保险监督管理委员会部级课题等。

摘 要

在低碳时代背景下，面对新一轮国际竞争，新能源被赋予了抢占未来战略制高点的重任。新能源成为世界各国在哥本哈根气候峰会谈判过程中的重要筹码，大力发展新能源已成为世界大多数国家的共识。由于石油危机、环境危机、气候危机，国际社会对新能源的发展更加关注。伴随着世界能源储量分布集中度的日益增大，对资源的争夺将日趋激烈，争夺的方式也更加复杂，由能源争夺而引发冲突或战争的可能性依然存在，从而对新能源的开发利用也成为各国的焦点。

我国作为能源使用增加最快的国家，最有条件也最有必要使用更多的新能源。目前，我国能源消耗过高、能源结构扭曲状况突出，这是实现节能减排面临的巨大难题，加快新能源开发利用是突破瓶颈的关键一环。我国新兴能源资源丰富，具有大规模发展的资源保障。从可利用资源的角度看，风能、太阳能、生物质能和海洋能等都具有发展到每年数亿吨标准煤的水平。从整体上看，目前我国新兴能源利用技术与国外差距不大，在有些领域处于国际领先水平。

2010年，我国新能源产业发展现状是：①新能源增量在多个领域取得长足发展。我国风电装机容量连续4年成倍增长，2010年底新增和累计风电装机容量均居全球第一位；太阳能光伏发电产业发展迅速，产量已占全球四成；沼气年产量约130亿立方米，列居世界前列。②“十一五”以来，我国在新能源发展的关键技术方面获得许多突破，一系列产业化推广示范工程的启动加速了新能源技术及产品的应用，尤其在风电、太阳能光伏发电等领域。③新能源发电并网瓶



颈难题未破，尤以风电最为典型。④新能源产业法律法规和政策不断深化并出现结构性调整，从总体宏观目标的制定到细分产业发展的路径规划相继出台。

2010年，我国新能源产业面临的安全形势和问题是：①我国风电产业由于受国家多年的政策保护，在风电技术方面取得了长足的进步，特别是带动风电产业持续发展，基本形成了完整的产业链，为我国风电市场提供大部分的装备。但存在国产风电机组设备质量难以保障，电网建设滞后等问题。②太阳能光伏产品的国内市场还没有完全放开，尽管我国晶体硅太阳能电池的产量已达到世界第一，但是国内的光伏产品90%以上都销往国外，生产和需求过度依赖国外市场使国内的光伏企业难以应对市场波动带来的风险。我国光伏产业电池技术具有国际竞争优势，但与国际先进水平相比，我国光伏产业在很多方面仍存在较大差距，如多晶硅关键技术仍落后于国际先进水平，晶硅电池生产用高档设备仍需进口，薄膜电池工艺及装备水平明显落后等，国际竞争压力也在不断升级。③我国生物质能产业的大多数技术尚处于初期，缺乏核心技术和设备，过度依赖国外进口；产业化和商业程度低，缺乏持续发展能力；产业成本过高等。④长期以来，我国没有把地热的位置摆到应有的地位，对地热能的开发利用并未给予足够重视；在跨入市场经济后，由于没有市场需求，技术上未取得新的进步；人力资源缺乏、研究力量薄弱，缺乏既懂地面技术、又懂地下勘探的高层次、复合型的地热人才。

未来中国新能源开发利用的战略目标是：到2020年，风能、太阳能等新兴能源要成为能源总需求中增量部分的主力军，加上水能共提供约6亿吨标准煤，占一次能源消费总量的15%；到2030年，新兴能源要成为主流能源之一，加上水能共提供20%以上的一次能源消费量。我国大力发展新能源，对于改善我国能源结构、抢抓世界新一轮能源革命先机、降低二氧化碳排放、增加就业、培育新的优势产



业、转变经济增长方式、实现经济的科学和可持续发展，具有重大意义。

本报告共分三大部分：

第一部分，新能源产业概况。主要介绍 2010 年世界与中国新能源产业发展形势及面临的问题和挑战。

第二部分，对新能源产业发展状况进行分析研究。对风能、太阳能、生物质能、地热能等产业就其国内外环境、产业竞争力、控制力、依存度、发展力等方面进行研究分析，并提出相应对策建议。

第三部分，新能源产业发展趋势。分别对风能、太阳能、生物质能、地热能等产业发展趋势进行预测分析。

本书整体框架与章节提纲由李孟刚设计，第一、二、三、六章由郭艳红撰写，第四章由李天舒撰写，第五章由李霞撰写。

中国产业安全研究中心的工作人员王沁、徐柠杉、李然等为教材的出版、编辑等环节做出了不小的贡献，在此一并致谢！

在本书的编写过程中，我们借鉴了有关著者的大量专著、教材和其他资料，在此谨表示诚挚的谢意！

本报告通过分析近年来的数据，揭示了中国新能源产业发展与安全的变化趋势，在定量分析的同时，本报告补充了一些相应的案例分析，提出了一些对策建议。

Abstract

In the context of low – carbon era, the new energy is given the heavy task to seize the strategic high ground in the future, in the face of a new round of international competition. The new energy has become an important bargaining chip of various countries in the world in the negotiations process at the Copenhagen climate summit and the vigorous development of new energy has become the consensus of most countries in the world. Due to the oil crisis, the environmental crisis and the climate crisis, the international community begins to pay more attention to the development of new energy. Along with increasing concentration in the distribution of the world's energy reserves, the competition for resources will become increasingly fierce and the competition is revealed in more complicated ways, the possibility of conflicts or wars triggered by an energy contention still exists and thus the development and utilization of new energy has become the focus of various countries.

As the country with the fastest growth in energy use, China has the best conditions to use new energy. It is also most necessary for China to do so. At present, China's energy consumption is too high, with prominent energy structure distortions which is a huge problem for realizing the energy conservation and emission reduction. Accelerating the development and utilization of new energy is the key to break through the bottleneck. China's emerging energy resource is rich with resources supporting for the large-scale development. From the point of view of the resources available, the wind, solar, biomass and ocean energy, etc. have developed to the level of a few million tons of coal per year. Overall, China's emerging energy technology's gap with foreign countries is not large, with some remaining at the international advanced level in certain areas.



In 2010, China's new energy industry development status: ① New energy incremental progress has been made in many areas. China's installed capacity of wind power remained doubled for four consecutive years, new and cumulative installed wind power capacity topped in the world at the end of 2010; solar photovoltaic industry has developed rapidly with the production accounting for four percent of the world and biogas annual production was about 13 billion cubic meters, ranking front row in the world. ② Since the "Eleventh Five-Year Plan" period, many breakthroughs have been made in the key technologies in the new energy development and the start of a series of industrial promotion and demonstration projects has accelerated the application of new energy technologies and products, particularly in the fields of wind power, solar photovoltaic power generation. ③ the new energy power generation and network bottleneck problems still remained, especially for the wind power which is the most typical. ④ new energy industry laws and regulations and policies continue to deepen and structural adjustments have been made, the formulation of the overall macro objectives and the segments industrial development path planning were introduced.

In 2010, China's new energy industry faces the following security situation and problems: ① China's wind power industry protected by the state policy for many years has made great strides in wind power technology, especially in the field of driving the sustainable development of the wind power industry, basically formed a complete industry chain, providing most of the equipment for China's wind power market. However, there are problems, for example, the quality of domestic wind turbine equipment is difficult to guarantee; the grid construction is lagging behind and so on. ② The domestic market for solar photovoltaic products has not yet fully liberalized, although the production of crystalline silicon solar cells in China has reached the top level in the world, more than 90% of the domestic photovoltaic products are sold abroad. The production and demand has over-reliance on foreign markets so that domestic PV companies are difficult to deal with the risks of market fluctuations. China's PV



industry battery technology has international competitive advantages; compared with the international advanced level, there are still a large gap in China's PV industry in many ways, such as polysilicon key technologies, which are still lagging behind the international advanced level. The high-end equipment used in the production of crystalline silicon cells still needs the imports, the film battery technology and equipment level remains significantly behind and the pressure of international competition is also escalating. ③ Most of the technologies of biomass energy industry in China is still in its infancy, such as lack of core technology and equipment with over-reliance on foreign imports; the low degree of industrialization and commercialization, lack of sustainable development capability and too high industry cost. ④ For a long time, our country has not placed the geotherm in its rightful place and the development and utilization of geothermal energy has not been given enough attention; after entering the market economy, because there is no market demand, no new progress is technically made, there is the lack of human resources, weaknesses in research force, with no more high level complex geothermal talent mastering the terrestrial technologies and understanding the underground exploration,.

The strategic objectives of China's new energy in terms of development and utilization in the future: By 2020, the wind, solar and other emerging energy will become the main force of the incremental part of the total energy demand, coupled with hydro energy, providing a total of approximately 600 million tons of standard coal and accounting for 15% of the total consumption of the primary energy; by 2030, the emerging energy will become one of the mainstream energies, coupled with hydro energy, providing a total of more than 20% of primary energy consumption. Our development of new energy is of great significance to improve China's energy structure, seizes the opportunities of a new round of energy revolution in the new world, reduce the carbon dioxide emissions, increase employment, foster new competitive industries, changes the mode of economic growth and achieve the scientific and



sustainable development of the economy.

The study is divided into three parts:

The first part includes the overview of the new energy industry. It mainly introduces new energy industry development situation and the problems and challenges faced by China and the world in 2010.

The second part provides the analysis and research of the new energy industry development. The research has been made on the industries such as the wind, solar, biomass, geothermal energy in terms of the environment both at home and abroad, industrial competitiveness, dominance and dependence and development force and also put forward suggestions.

The third part outlines the new energy industry development trend. Forecast analysis has been made on the industry trends such as wind, solar, biomass and geothermal energy respectively.

The book's overall framework and the chapter outlines are designed by Li Menggang and the first, second, third and sixth chapters are written by Guo Yanhong, the fourth chapter by Li Tianshu and the fifth chapter by Li Xia.

I would like to express my sincere thanks to Wang Qin, Xu Ningshan and Li Ran, the staff of the Center for Studies in Chinese Industry Security who have made great contributions to publish and edit the textbook!

Thanks also for those authors of monographs, textbooks and other materials we learned from in the writing process of the book!

By analyzing the data in recent years, the report reveals the trend of China's new energy industry development and security; while making the quantitative analysis, the report complements the corresponding case analysis and puts forward some suggestions.