AUGUST 2021

CHINA ENERGY POLICY
NEWSLETTER

Boosting Renewable Energy as Part of China's Energy Revolution

1. Project activities

DEA launched the latest flexibility research report in China

On 28 June 2021, the Danish Energy Agency (DEA) launched the report *Development and role of flexibility in the Danish power system – Solutions for integrating 50% wind and solar, and potential, future solutions for the remaining 50%* at the International Dialogue on Energy Transitions in Suzhou, China. The Deputy Director of DEA, Mr. Stig Uffe Pedersen, presented the main results in a video speech. The Chinese energy experts highlighted the report as a valuable contribution during the Q&A session: "Denmark has referrable experiences on the integration of renewable energy, power system flexibility and power market with cross-country interconnectors. It also inspires the importance of demand side management and digitalization as future source of flexibility", the experts commented. The full **English** and **Chinese** reports are available for download now.

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Danish Energy Agency

可再生能源推动能源革命研究
Boosting Renewable Energy
As part of China's energy revolution

国家发展和改革委员会
能源研究所
Energy Research institute, NDRC, P.R.C

2. China energy transition updates

NDRC officially issues the 14th FYP for the development of circular economy

The National Development and Reform Commission (NDRC) issued the *14th Five-Year Plan Circular Economy Development* in July 2021, with the goal of reducing energy consumption per unit of GDP by 13.5% and water consumption per unit of GDP by about 16% from 2021 to 2025. The document emphasizes several points in the energy sector, including the promotion of the development and utilization of biomass energy in rural area, as well as promoting the cascade utilization of energy in parks zones[1], including the utilization of exhaust heat and pressure resources, combined heat and power (CHP), distributed energy, and integrated solar PV energy storage applications. In addition, with the large-scale development of new energy vehicles, the government is gradually improving the standard system of power battery recycling, and promoting the establishment of standardized recycling service facilities by new energy vehicle manufacturers and waste power battery cascade utilization enterprises through self-construction, joint construction and authorization.[2]

NEA publishes the 2020 Renewable Power Monitoring and Assessment Report

In July 2021, the National Energy Administration (NEA) released the *2020 Renewable Power Monitoring and Assessment Report*.[3] The results are consistent with the figures released by the China Electricity Council (CEC) and the NEA earlier this year. For the complete data table, please refer to the newsletter of March 2021. In 2020, the installed capacity and power generation of non-hydro renewable energy based mainly on wind power, solar PV and biomass, has increased steadily, and the proportion of installed capacity of coal power has for the first time accounted for less than 50%.

In the electricity mix, renewable energy accounted for 29.1% of the total power generation, of which non-hydro renewable energy accounted for 11.2 percentage points, a year-on-year increase of 1.1 percentage points. From a geographical point of view, on the grid connection side, not all provinces within the key renewable power developing regions[4] achieved the mandatory target of purchasing minimum hours of wind and PV power required by NEA. Same as 2019, Gansu and Ningxia still neither complete wind nor solar PV targets although both of them maintained the wind and solar curtailment rates under low level. The Shanxi province failed to complete the wind power target this year, while Qinghai did not complete the solar PV target instead of Shaanxi and Xinjiang. Nevertheless, China's overall renewable power utilization efficiency continued to improve. All key regions achieved the 2020 utilization rate targets of hydro, wind and solar PV power issued in the *Clean Energy Consumption Action Plan (2018–2020)*.

Regarding the renewable power consumption status, renewable energy accounted for 28.8% of the national electricity consumption, of which non-hydro renewable energy accounted for 11.4 percentage points, an increase of 1.2 percentage points year-on-year. All provinces have completed the 2020 minimum non-hydro renewable energy consumption target, of which Qinghai and Zhejiang completed the target through the surplus consumption quotas transferred (or purchased) from other provinces.

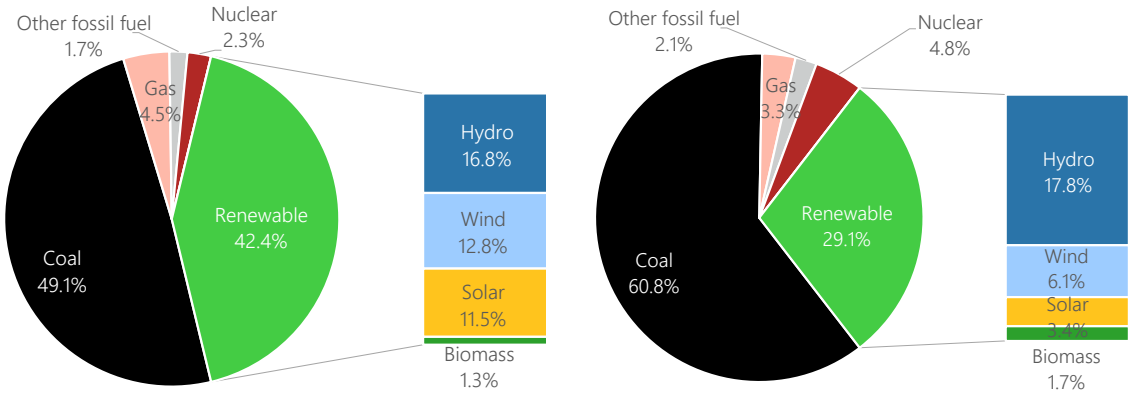
[1] Parks refer to the centralized and unified planning of designated areas by the government to specifically set up enterprises of a certain type of industry and form for unified management, such as industrial parks, science and technology parks, and free trade parks.

[2] "国家发展改革委关于印发"十四五"循环经济发展规划的通知," 1 July 2021, accessed at **https://www.ndrc.gov.cn/xxgk/zcfb/ghwb/202107/t20210707_1285527.html**.

[3] "关于2020年度全国可再生能源电力发展监测评价结果的通报," National Energy Administration, 2 July 2021, accessed at **http://zfxxgk.nea.gov.cn/2021-07/02/c_1310039970.htm**.

[4] Key regions include Inner Mongolia, Xinjiang, Gansu, Hebei, Ningxia, Heilongjiang, Jilin, Liaoning and Shanxi.

2020 Power installed capacity (left) and power generation (right) by fuel



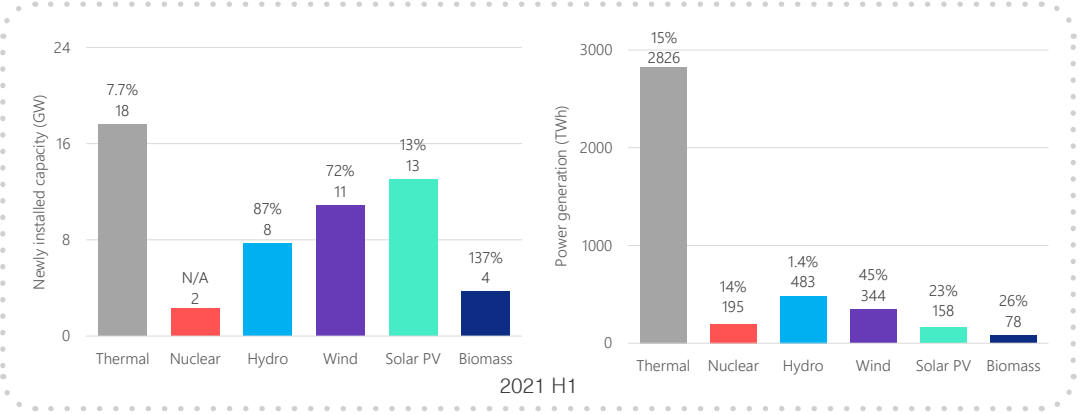
Source: Coal, gas and nuclear data from China Electricity Council (CEC), January 2021; hydro, wind, solar and biomass data from National Energy Administration (NEA), July 2021

Renewable power capacity remained rapid expansion in 2021 H1

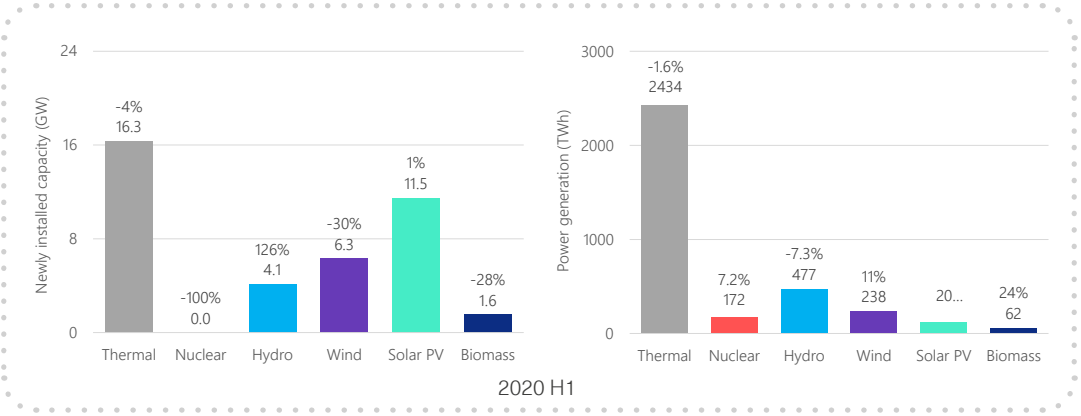
In the first half of 2021, the newly installed power generation capacity of China was 55 GW, with a year-on-year increase of 49%. Among them, renewable energy accounted for 64%, the same as last year. With the good control over the COVID-19 epidemic, the construction pace of renewable power projects has recovered. The newly installed capacity of wind power was 11 GW, and offshore wind power accounted for nearly 20%, a year-on-year increase of more than 100%. Therefore, more than half of the newly added wind power installed capacity is concentrated in the central-eastern and southern regions. The newly installed solar PV capacity was 13 GW, of which distributed solar PV accounted for 59%, a year-on-year increase of more than 70%. In terms of distribution, North China has the largest proportion of 44%, followed by East China (22%) and Central China (14%). The newly installed biomass power capacity was 4 GW, making Shandong, Guangdong and Zhejiang the top three provinces in terms of cumulative installed capacity. In addition, thermal power installed capacity increased by 18 GW, a year-on-year increase of 1.7%.

The overall efficiency of power generation has improved, and the average utilization hour of power generation projects nationwide has increased by 119 hours year-on-year. Among which, thermal power (+231 hours), nuclear power (+286 hours) and wind power (+88 hours) increased significantly, solar PV remained stable (-3 hours), and hydropower decreased by 33 hours year-on-year. In the first half of 2021, the national average wind curtailment rate was 3.6%, of which the curtailment rate in Xinjiang decreased by 4.2 percentage points to 8%, Hunan and Gansu both decreased by more than 3 percentage points and fell below 5%; the national average curtailment rate of solar PV was 2.1%, the solar curtailment rate in Northwest and North China, where the problem of solar PV consumption is respectively prominent, dropped to 4.9% and 2%.[5]

Newly installed capacity (left) and power generation (right) by fuel in 2021 H1 and 2020 H1



[5] "2021年1-6月全国电力工业运行简况," China Electricity Council, 19 July 2020, accessed at https://cec.org.cn/detail/index.html?3-298756; "国家能源局举行新闻发布会介绍2021年上半年能源经济形势等情况," National Energy Administration, 29 July 2021, accessed at http://www.nea.gov.cn/2021-07/29/c_1310093667.htm.



Source: data of thermal and nuclear from China Electricity Council (CEC), July 2021; the rest data from NEA, July 2021

New residential solar PV projects can still get subsidies in 2021

The NDRC issued a document clarifying the subsidy policy for residential solar PV projects connected to the grid in 2021. The feed-in premium is RMB 0.03/kWh, which is a decrease of RMB 0.05/kWh compared to 2020.[6] So far, the feed-in tariff and feed-in premium policies for all renewable energy sources in 2021 have been clarified.

Summary of subsidy policies for renewable energy power projects in 2021

Power source	National subsidy	Note
Onshore wind	N/A	Adopt local coal power baseline tariff (RMB 0.25~0.453/kWh), encourage to participate spot power market as alternative
Offshore wind	N/A	Local governments sponsor the subsidy, but it is not mandatory, tendering process allowed
Utility-scale PV and distributed industrial and commercial PV	N/A	Adopt local coal power baseline tariff (RMB 0.25~0.453/kWh), encourage to participate spot power market as alternative
Residential PV (FiP)	RMB 0.03/kWh	A total of RMB 500 million of subsidizing budget, adopt first come first served principle; life-time output can receive the FiP
CSP (FiT)	RMB 1.15/kWh	Should achieve full-capacity grid connection by 2021; Output within 25 years can receive the FiT subsidy
Agriculture and forestry biomass (FiT)	Up to RMB 0.75/kWh	The subsidizing budget of 2021 is yet to publish but tendering process is required; A total of 82,500 utilization hours of output within 15 years can receive the FiP
Waste incineration (FiT)	Up to RMB 0.65/kWh	
Biogas (FiP)	RMB 0.25/kWh	

Source: National Development and Reform Commission (NDRC), accessed in July 2021

[6] "关于落实好2021年新能源上网电价政策有关事项的函," National Energy Administration, 11 June 2021, accessed at http://guangfu.bjx.com.cn/news/20210611/1157996.shtml.

Newly built market-oriented wind power and solar PV projects need to be equipped with peak shaving projects

The market-oriented[7] wind power and solar PV projects approved in 2021 need to meet the preconditions for grid connection through the construction or purchase of energy storage and peak shaving capacity. The NDRC clearly stipulates that each new power generation project needs to be equipped with a minimum energy storage or peak shaving capacity of 4hr/15% of rated power, and the projects with an equipped ratio of more than 20% has the priority in grid connection.

They can implement energy storage/peak shaving capacity through self-construction, joint construction or purchase, and projects that choose to purchase peak shaving services are encouraged to sign long-term contracts for more than 10 years. Pumped hydro storage, chemical energy storage power stations, gas power plants, concentrating solar power (CSP) plants, or flexible retrofit of coal power plants can all be included in energy storage/peak shaving projects. The equipped projects should be in the same province as the power generation project, and should be commissioned and connected to the grid simultaneously with the power generation project. At present, the equipped ratio of energy storage/peak shaving project to power generation project is unified throughout the country, while each province can make appropriate dynamic adjustments based on actual conditions. From 2022, the NDRC will update this ratio every year.[8]

The NEA requires local governments to coordinate the development of rooftop solar PV

China has abundant building roof resources, characterized by scattered distribution and small project scale, which to some extent restricts its scale-up development process. As a consequence, the NEA requires local governments to voluntarily initiate the county-wide (city and district) rooftop solar PV pilot project. This requires the county (city and district) government to lead projects and corporate with power grid companies and project developers in determining construction scale, operation mode, income distribution and policy support plans of the rooftop solar PV system. This must happen in accordance with the principle of "building as much as possible within the areas that have suitable conditions". For areas selected in the rooftop solar PV pilot program, more than 50% of the total rooftop area of government buildings should be able to install solar PV system; 40% and above for schools, hospitals, village committees and other public buildings; 30% and above for industrial and commercial factory buildings; and 20% and above for rural household rooftops.[9]

The NEA specifically stated that this is not an administrative order, and whether or not to conduct pilots and how many pilots are to be conducted is determined by local governments based on their actual conditions. The final plan needs to be reported to – however, not approved by - the NEA. Regarding the concern of potential monopoly of installation contracting, the NEA has clarified that the market of project construction is to be open to all eligible engineering and equipment companies and determined through marketization principles. In addition, the approval and grid connection of utility-scale and distributed solar PV projects being processed in the region shall not be suspended because of the pilot.[10]

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[7] In May 2021, the NDRC published the Wind Power and Solar PV Project Construction Rules in 2021, clarifying the newly approved wind and solar PV installed capacity will be classified as guaranteed capacity and market-oriented capacity. Guaranteed capacity refers to the newly-added grid-connected capacity required to complete the provincial consumption target. The market-oriented capacity refers to projects that exceed the guaranteed capacity, yet the developers still want the project to be connected to the grid. These projects should be connected to the grid under the premise of sufficient dispatchable power sources and loads.

[8] "国家发展改革委　国家能源局关于鼓励可再生能源发电企业自建或购买调峰能力增加并网规模的通知，　发改运行〔2021〕1138号," National Development and Reform Commission and National Energy Administration, 29 July 2021, accessed at **https://www.ndrc.gov.cn/xxgk/zcfb/tz/202108/t20210810_1293396_ext.html**; Shi Jingli, "权威解读！刚刚发改运行〔2021〕1138号文发布," China Energy Daily, 10 August 2021, accessed at **https://baijiahao.baidu.com/s?id=1707710817653495244&wfr=spider&for=pc**.

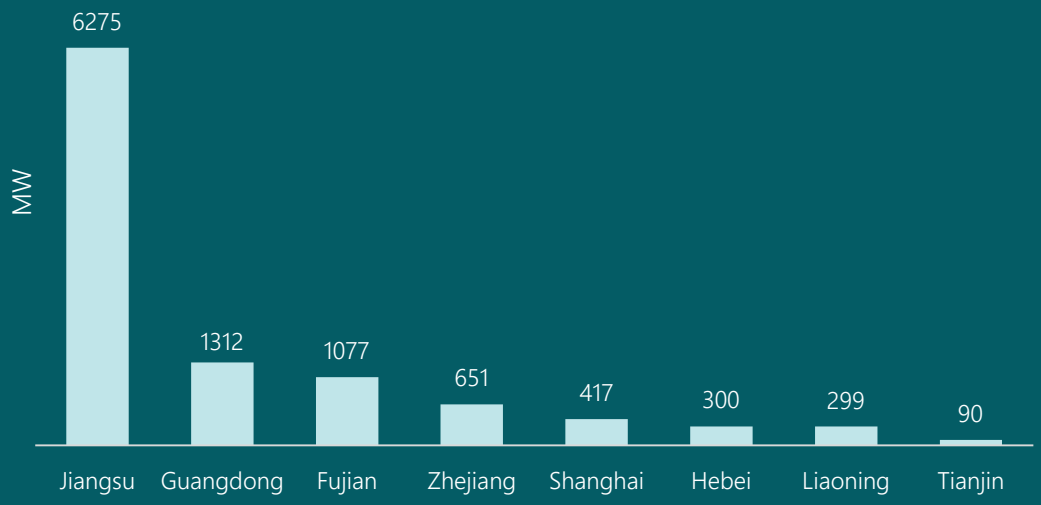
[9] "国家能源局：《关于报送整县（市、区）屋顶分布式光伏开发试点方案的通知》," National Energy Administration, 20 June 2021, accessed at **http://www.chic.org.cn/home/index/detail?id=1100**.

[10] "对分布式光伏电站整县推进政策的疑问？对分布式光伏电站整县推进政策的疑问？," National Energy Administration, 9 July 2021, accessed at **http://www.nea.gov.cn/2021-07/09/c_1310051436.htm**.

China will accelerate the development of deep-sea offshore wind power

As of April 2021, the cumulative installed capacity of offshore wind power in China reached 10.4 GW, of which Jiangsu, Guangdong and Fujian each exceeded 1 GW. Next, the NEA will focus on promoting layout optimization and demonstration projects of deep-sea offshore wind. This includes researching and formulating deep-sea offshore wind power planning and management methods, exploring the model of unified project development and power transmission, accelerating the organization of demonstration projects, planning and deploying a batch of deep-sea offshore wind power bases in areas where conditions permit, as well as forming a pattern of large-scale development.[11] This will also help promote the construction of "offshore energy islands."[12]

Cumulative installed capacity of offshore wind by province in April 2021



Source: Guangxi Energy Bureau, June 2021

[11] "权威声音 | 国家能源局王大鹏：加快研究制定全国深远海海上风电规划和管理办法," National Energy Administration, 9 July 2021, accessed at https://www.thepaper.cn/newsDetail_forward_13524351.

[12] Offshore energy island: an offshore energy system that collects tidal, wave, offshore wind and solar, and other forms of energy at sea, and comprehensively utilizes these renewable energy resources to generate electricity, desalinate seawater, and produce salt and hydrogen, so as to serve islands that far from the mainland, offshore platforms and mariculture industry.

3. Policy monitoring

2021-07-26
https://www.ndrc.gov.cn/xwdt/tzgg/202107/t20210729_1292068_ext.html

The NDRC updates the time-of-use electricity pricing requirements

Notice on Further Improving the Time-of-use Electricity Price Mechanism, NDRC Pricing [2021] No.1093

With consideration of the increase in renewable power installations and current peak shaving capacity, the government has refined the time-of-use electricity pricing mechanism of end-use consumers in favor of price signals. In a specific region, if the maximum peak-valley difference of the past year or is expected to exceed 40% in the current year, the ratio of peak-and valley price should not be less than 4:1; and the ratio should not be less than 3:1 in other regions. Local governments can also introduce a sharp-peak price[13] upon the peak electricity prices, the price raise should be no less than 20%. This principle can also be used to formulate valley electricity prices. In addition, the local governments are required to refer to signal changes in spot power markets to establish a dynamic adjustment mechanism for time-of-use electricity prices, and to adjust the time period division and floating ratio in a timely manner.

2021-07-15
http://www.gov.cn/zhengce/zhengceku/2021-07/24/content_5627088.htm

The government clarifies the key tasks for the development of new-type energy storage till 2030

Guiding Opinions on Accelerating the Development of New Energy Storage, NDRC Energy Regulation [2021] No.1051

By 2025, the total installed capacity of new-type energy storage[14] aims to reach more than 30 GW, and by 2030, to achieve full market development. The energy storage industry should be demand-oriented and carry out research and application of innovative technologies such as hydrogen storage and heat storage. The government plans to lay out a batch of large-scale energy storage supporting projects for new energy power stations, exploring the use of decommissioned thermal power plants including its sites, grid connection lines, and power substations to develop energy storage facilities or wind-PV-storage integrated projects. Grid-side energy storage and wind-PV-storage facilities in remote areas is another focus area. The government will also improve the supporting measures of "new energy + energy storage", and give appropriate policy incentives in terms of bidding, approval, grid connection, dispatching and ancillary services.

2021-07-04
http://www.gov.cn/zhengce/zhengceku/2021-07/14/content_5624964.htm

MIIT releases 2021-2023 *Data Center Development Action Plan*

Three-year Action Plan for the Development of New Data Centers (2021-2023)

The policy emphasizes the need to build a new type of green and low-carbon data centers to increase the utilization rate of renewable energy. Both distributed power sources and energy storage will play an important role, including the construction of distributed solar PV and distributed gas-fired combined cooling, heating and power (CCHP) systems to guide the data center to consume new energy on-site; and the use of lithium batteries, hydrogen storage and flywheel as energy storage and backup power sources to strengthen the application of power battery cascade utilization products. The government will study and formulate comprehensive energy evaluation standards for data centers, including

[13] Time period of 95% and above of the highest load in the previous two years.

[14] New-type energy storage refers to energy storage technologies other than pumped storage.

renewable energy utilization indicators, and will encourage data centers to formulate carbon emission reduction roadmaps, and conduct carbon verification and management.

2021-06-29
https://zfxxgk.ndrc.gov.cn/web/iteminfo.jsp?id=18184&code=&state=123

NDRC determines the scope of energy infrastructure involved into the REITs

Notice on Further Promoting the Pilot Work of Real Estate Investment Trust Funds (REITs) in the Infrastructure Sector, NDRC Investment [2021] No.958

In 2020, the NDRC and the China Securities Regulatory Commission (CSRC) jointly launched a pilot program for publicly offered real estate investment trust funds (REITs) in China's infrastructure sector, and recently clarified the pilot areas and industry scope. Among which, the energy infrastructure includes wind, solar PV, hydro, biomass, natural gas, and nuclear power generation projects, as well as distributed CCHP projects, Ultra-High-Voltage (UHV) transmission lines, incremental power distribution grids, microgrids, and EV charging infrastructure.

2021-06-20
http://www.nea.gov.cn/2021-06/25/c_1310027930.htm

NEA will certify national energy R&D centers and laboratories

Notice on Organizing the Certification Work of the First Batch of National Energy R&D and Innovation Platforms in the 14th Five-Year Plan Period

According to the 14th Five-Year Plan for technological innovation in the energy sector, the NEA will certify a number of national energy research and development (R&D) centers and national energy key laboratories. The key fields involved include (but are not limited to) advanced renewable energy power generation and comprehensive utilization technology[15], advanced nuclear energy utilization technology, grid technology adapted to high proportion of renewable energy and distributed power sources, new-type energy storage technology equipment and system integration, and key technologies of efficient hydrogen energy production, storage, transportation and filling, key technologies for the coordinated development of hydrogen energy and renewable energy, and key technologies for fuel cells. The fields of carbon capture, utilization and storage (CCUS), digital and intelligent energy systems, and energy system security are also covered.

2021-06-07
https://www.ndrc.gov.cn/xxgk/zcfb/tz/202106/t20210611_1283163.html

NDRC promotes 5G applications in the energy sector

Notice on issuing of the 5G Application Implementation Plan in the Energy Field, NDRC Energy [2021] No.807

In the next three to five years, China will expand a number of typical 5G application scenarios around smart power plants, smart grids, smart coal mines, smart oil and gas facilities, integrated energy utilization, smart manufacturing and construction, and explore and form a group of replicable, easy-to-promote and competitive business models. The related supporting products, technical standards, technological innovation platforms, public service platforms, and security protection systems will all be important supports for the development of the 5G industry in the energy sector.

[15] Including new-type solar PV generation, offshore wind power, geothermal power generation.

2021-06-07
https://www.ndrc.gov.cn/xxgk/zcfb/ghxwj/202106/t20210609_1282912.html

NDRC issues pricing mechanism for natural gas pipeline transportation

Notice on Issuing the Measures for the Administration of the Price of Natural Gas Pipeline Transportation (Interim) and the Measures for the Supervision and Examination of the Cost of Natural Gas Pipeline Transportation (Interim), NDRC Pricing Regulation [2021] No.818

The government emphasizes the need to improve the pricing mechanism for natural gas pipeline transportation in the 14th Five-Year price mechanism reform plan released in May 2021. The NDRC has issued two regulations on the price management of natural gas pipeline transportation, and the supervision and review of pricing costs. The regulations propose to consolidate PipeChina's[16] 15 price zones by freight rate into four: northwest, southwest, northeast and central and eastern price zones. This will help promote the PipeChina to increase investment in pipeline construction and realize national pipeline interconnection.

2021-05-31
https://www.ndrc.gov.cn/xwdt/tzgg/202107/t20210705_1285400.html?code=&state=123

The NDRC allows new energy power projects to construct grid connection projects

Notice on Matters Related to the Investment and Construction of New Energy Grid Connection Supporting Projects, NDRC Operation [2021] No.445

Grid connection project refers to the interconnection engineering project between a new energy power plant and the transmission grid, including the construction of lines and substations. In principle the grid company should take the responsibility of construction and bear the costs of this project. However, due to excessive number of newly commissioned new energy power plants, grid connection projects have been facing delays in construction, which restricts the consumption of new energy. Therefore, the NDRC will now allow the developers of new energy power plants to independently or jointly construct grid connection projects on a completely voluntary basis, and then the grid companies will repurchase them in accordance with regulations.

[16] PipeChina, i.e. National Petroleum and Natural Gas Pipeline Network Group. In the past, China's oil and gas pipeline network was mainly monopolized by the three state-owned enterprises of China National Petroleum Corporation (CNPC), Sinopec Group and China National Offshore Oil Corporation (CNOOC), and their pipeline networks generally only served their respective entities. In December 2019, the National Petroleum and Natural Gas Pipeline Network Group was established. It coordinates the national construction, operation and dispatch of oil and gas trunk pipelines, as well as the construction of some gas storage facilities for peak shaving.