China Energy Data 2021

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About the Author

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Introduction

Energy Data 2021 was authored by Mr. Wang Qingyi, one of China's leading energy experts, with research and editing assistance from innovative Green Development Program (iGDP). The Energy Data publication series, which has run since 2004, with English translations published since 2017 collates and organizes data published by China’s official statistics bureaus and industry associations covering key sectors, as well as authoritative international energy agencies. The goal is to facilitate access by researchers and policymakers to comprehensive, multi-dimensional, and long time-scale energy data that accurately captures China's energy profile. The English version of the 2021 Energy Data report contains 39 data energy indicator tables covering China's energy economy, energy production and consumption, energy efficiency and technology, energy prices, and energy-related pollutant emissions and carbon emissions.

Abbreviations

BERC	Building Energy Conservation Research Center of Tsinghua University
CAREI	China Association of Rural Energy Industry
CBMF	China Building Materials Federation
CCIA	China Coal Industry Association
CEC	China Electricity Council
CERS	China Energy Research Society
CISA	China Iron and Steel Industry Association
CNPC	China National Petroleum Corporation
CPCIF	China Petroleum and Chemical Industry Federation
CPEA	China Petroleum Enterprise Association
CSES	China Solar Energy Society
CWEA	China Wind Energy Association
GACC	General Administration of Customs China
IEA	International Energy Agency
IEEJ	Institute of Energy Economics, Japan
IMF	International Monetary Fund
MEE	Ministry of Ecology and Environment
MIIT	Ministry of Industry and Information Technology
MNR	Ministry of Natural Resources
MOA	Ministry of Agriculture and Rural Affairs
MOT	Ministry of Transport
MOHURD	Ministry of Housing and Urban-Rural Development
MWR	Ministry of Water Resources
NBS	National Bureau of Statistics
NDRC	National Development and Reform Commission
NEA	National Energy Administration
OICA	International Organization of Motor Vehicle Manufacturers
PBS	Provincial Bureau of Statistics
SERC	State Electricity Regulatory Commission
WB	World Bank
WSA	World Steel Association

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Table 1 **Key Energy and Economic Indicators**

	1949	1978	2000	2010	2015	2019	2020	2021
Population (10,000)	54167	96529	126743	133920	137462	140005	141178	141260
Proportion of city and town population (%)	10.6	17.9	36.2	49.7	56.1	60.6	63.9	64.7
GDP growth rate (%)		11.7	8.4	10.6	6.9	6.1	2.3	8.1
GDP (100 million Chinese yuan)	466	3650	99215	413030	689052	990865	1015986	1143670
Economic structure								
Primary industry (%)	68	27.9	15.1	10.1	9.0	7.1	7.7	7.2
Secondary industry (%)	13.0	47.9	45.9	46.7	40.5	39.0	37.8	39.4
Tertiary industry (%)	19.0	24.2	39.0	43.2	50.5	53.9	54.5	53.4
GDP per capita (USD)	23	149	949	4556	8007	10276	10507	12551
Primary energy consumption (Mtce)	26.0	571.4	1469.6	3606.5	4299.1	4860	4980	5240
Crude oil import dependency/%		-12.4	26.4	54.5	60.7	72.5	73.0	72.1
Urban resident disposable income per capita (Chinese yuan)	100	343	6280	19109	31195	42359	43834	47412
Rural resident net income per capita (Chinese yuan)	44	134	2253	5919	11422	16021	17131	18931
Civil vehicle ownership (10,000 vehicles)	5.1	135.8	1608.9	7801.8	16284.5	26150	28087	39500
Energy consumption per capita (kgce)	48	594	1160	2693	3128	3471	3527	3709
Electricity per capita (kWh)	8	218	1063	2752	4142	5157	5320	5885
Electricity production (TWh)	41.3	256.6	1355.6	4207.1	5814.6	7503.4	7779.1	8112.2
Steel output (Mt)	0.16	31.8	128.5	637.2	803.8	996.3	1053.0	1032.8
Cement output (Mt)	0.66	65.2	597.0	1881.9	2359	2350	2377	2362
Total value of export goods (USD 100 million)	5.5	97.5	2492.0	15777.5	22739.7	24982.5	25999.1	33689.5
Total value of import goods (USD 100 million)	5.8	108.9	2250.9	3962.4	16795.6	20752.6	20621.0	26917.9
PM2.5 ($\mu g/m^3$)			22	35	52	36	33	30
SO_2 emissions (Mt)			4723	7585	8822	9473	9534	10180
Chinese yuan/USD exchange rate		1.53	8.2785	6.7695	6.2284	6.8985	6.8974	6.4515

Notes: 1. The urbanization rate of household registered population in 2020 was 50.7%.

2. GDP is calculated at current prices and the growth rate is calculated at constant prices. 2020 is 174 times higher than 1952 at constant prices, with an average annual growth rate of 8.1%.

3. In 2020, the national GDP per inhabitant at constant prices was 70 times higher than in 1952.

Sources: NBS; GACC; CEC; MEE.

Table 2 **International Comparisons of Key Energy and Economic Indicators Per Capita (2020)**

	China	US	EU	Japan	Russia	India	World

Population (millions)	1411.8	331.4	443.1	126.2	146.2	1375.0	7585.2
GDP per capita (USD)	10507	63416	35748	40146	10037	1965	11033
Fossil fuel recoverable reserves per capita							
Coal (t)	195	751	148	3	111	81	142
Oil (t)	2.48	24.27	1.17	0.05	101.37	0.21	32.22
Natural gas (m^3)	6000	38020	1974	164	255814	970	24798
Primary energy consumption per capita (kgce)	3528	10103	4911	4615	6573	796	2508
Electricity production per capita (kWh)	5510	12935	6012	7962	7424	1135	3651
Steel output per capita (kg)	754	219	313	659	490	73	248
Vehicle ownership per thousand people	193	837	531	591	373	32	170
CO_2 emissions per capita (t)	7.54	13.45	5.76	8.14	10.14	1.67	4.26

Note: China's fossil fuel recoverable reserves data are from the Ministry of Natural Resources.
Sources: NBS; IEA; WB; IMF; BP Statistical Review of World Energy, June 2021; IEEJ, Handbook of Energy and Economic Statistics in Japan; WSA; OICA.

Table 3 Economic and Energy Consumption Disparity between Regions, Urban and Rural Areas, and the Rich and Poor

Economy	
GDP per capita (USD) (2020)	National average: 10530 Max: Beijing 23908 Min: Gansu 5225
Urban residents' disposable income per capita/Chinese yuan (2020)	National average: 43834 Max: Shanghai 76437 Min: Jilin 33396
Rural residents' disposable income per capita/Chinese yuan (2020)	National average: 17132 Max: Shanghai 34911 Min: Gansu 10344
Energy Consumption	
Regional	
Energy consumption per capita/kgce (2020)	National average: 3527 Max: Inner Mongolia 9747 Min: Tibet 1383**
Electricity consumption per capita/kWh (2020)	National average: 5320 Max: Inner Mongolia 16185 Min: Tibet 1891
Residential electricity consumption per capita/kWh (2020)	National average: 776 Max: Beijing 1278 Min: Gansu 461
Urban and rural	
Energy consumption per capita/kgce (2020)	National average: 3527 Urban: 4719 Rural: 1605
Electricity consumption per capita/kWh (2020)	National average: 5320 Suzhou: 14184 Rural: 1906
Residential electricity consumption per capita/kWh (2020)	National average: 776 Urban: Beijing 1118 Rural: Gansu 461
Rich and Poor	
Rich and poor disparity	In 2020, 1% of China's highest-income families possessed 30.6% of the nation's wealth, and ¼ of the lowest-income families owned only 1% of the nation's wealth.
Urban residents' disposable income per capita/yuan (2020)	20% high-income households: 96062 20% low-income households: 15597
Rural residents' disposable income per capita/yuan (2020)	20% high-income households: 38520 20% low-income households: 4681
Home computer ownership/100 households (2020)	National average: 54.2 Urban: 72.9 Rural: 28.3 Max: Shanghai 104.9 Min: Tibetan rural areas 5.3
Air conditioner ownership/100 households (2020)	National average: 117.7 Urban: 149.6 Rural: 73.8 Max: Shanghai 207.3 Min: Qinghai 1.0
Private car ownership/100 households (2020)	National average: 37.1 Urban: 44.9 Rural: 26.9 Max: Shenmu 100 Min: Hainan rural areas 10.5

Note: 1.*2019; **2017.
Sources: NBS; PBS; China Agricultural Yearbook; CEC; China Social Science Survey Center of Peking University; China's Report on the Development of the People's Livelihood 2019; Zeping Macro-economy; 2021 China Income Distribution Report.

Table 4 International Comparison of Living Standards of China's Most Affluent Cities (2020)

	Beijing	Shanghai	Shenzhen	Jiangyin	Shenmu	Tokyo (Japan)
Total population (10,000)	2154	2428	1344	127	49	1398
Urbanization Rate	86.6	88.1	100.0	78.0	70.3	
GDP per capita (USD)	23803	22802	29498	36071	40617	73100
Disposable income per capita (USD)	9826	10671	9073	8968	24862	37868
Housing area per capita (m^2)	39	41	40	65	38	35
Private cars (per 100 households)	54	39	75	34	90	46

Note: Jiangyin leads the country in GDP per capita.
Source: NBS; City Statistics Bureaus; Statistics Bureau of Japan.

Table 5 Urban and Rural Living Standards and Energy Consumption

	2000	2010	2015	2017	2018	2019	2020
Per capita GDP (USD)	949	4556	8007	8836	9750	10276	10507
Urban residents' disposable income per capita (Chinese yuan)	6280	19109	31195	36396	39251	42359	43834
Rural residents' net income per capita (Chinese yuan)	2253	5919	11422	13432	14617	16021	17131
Engel's coefficient, urban households (%)	39.4	35.7	29.7	28.6	27.7	27.6	29.2
Engel's coefficient, rural households (%)	49.1	41.1	33.0	31.2	30.1	30.0	32.7
Housing area per capita (m^2)							
Urban	20.3	31.6	33.5	36.9	39.0	39.8	40.9
Rural	34.6	37.9	43.4	46.7	47.3	48.9	50.3
Penetration rate of energy-consuming appliances (per 100 households)							
Indoor air conditioners							
Urban	30.8	112.1	114.6	128.6	142.2	148.3	149.6
Rural	1.3	16.0	38.8	52.8	55.2	71.3	73.8
Refrigerators							
Urban	80.1	96.6	94.0	98.0	100.9	102.5	103.1
Rural	12.3	45.2	82.6	91.7	95.9	98.6	100.1
Color TVs							
Urban	116.6	137.4	122.3	123.8	121.3	122.8	123.0
Rural	48.7	111.8	116.9	120.8	116.6	117.6	117.8
Home computers							
Urban	9.7	71.2	78.5	80.8	73.1	72.2	72.9
Rural	0.5	10.4	25.7	29.2	26.9	27.5	28.3
Private cars							
Urban	0.5	13.1	30.0	37.5	41.0	43.2	44.9
Rural	—	—	13.3	19.3	22.3	24.7	26.9
Energy consumption per capita (kgce)	1160	2693	3128	3230	3325	3471	3527
Electricity consumption per capita (kWh)							
Urban	2574	4519	6212	6587	7108	7399	7250
Rural	205	989	1496	1652	1659	1719	1763

Sources: NBS; CEC.

Table 6 Status of Electrification and Poverty in Rural China

	1978	2000	2010	2015	2017	2018	2019	2020
Rural population/million	790.14	795.63	671.63	590.24	556.68	541.08	525.82	509.79
Poverty standard/Chinese yuan /per capita	100	625	2300	2855	2952	2995	3747	4000
Population poverty/million	250.0	32.1	26.9	55.8	30.46	16.60	5.51	0
Population without access to electricity/million	450.0	35.0	5.3	0	0	0	0	0
Electricity consumption per capita/kWh	218	205	989	1496	1652	1659	1719	1906

Note: 1. The poverty standard after 2010 is calculated using constant prices 2300 Chinese yuan. It is 4000 yuan in 2020.

2. According to the World Bank poverty level (i.e., living on less than 1.25 USD a day per capita), there were 212 million people in China living below the poverty line in 2018**.**

3. In 2015, electricity was provided to the remaining 39800 persons without access to electricity.

4. On November 23, 2020, the last nine impoverished counties (Guizhou) achieved poverty alleviation in China.

Sources: NBS; CEC; NEA; SERC.

Table 7 Coal, Oil, and Natural Gas Resources and Reserves

Coal	
	The estimated total of coal resources is 3879.6 billion t. At the end of 2020, the proven reserves were 1.77 trillion t, and the remaining technically recoverable reserves were 274.6 billion t.
Petroleum	
	Crude oil: the amount of geological resources is 125.7 billion t, and the recoverable resources are 30.1 billion t. The remaining technically recoverable reserves are 3.6 billion t in 2020 . Oil sand: the amount of geological resources is 6 billion t, and the amount of recoverable resources are 2.3 billion t. Oil shale: the technically recoverable resources are 243.2 billion t, and the amount of shale oil that can be recovered is 12 billion t.
Natural gas	
	Conventional natural gas: the amount of the geological resources is 90 trillion m3, the volume of the recoverable resources is 50 trillion m3 .in 2020, the total proven geological reserves were 17.65 trillion m3, and the remaining technically recoverable reserves were 8.8 trillion m3. Coal bed gas: the amount of geological resources is 30 trillion m3, and the recoverable resources are 12.5 trillion m3. In 2020, the accumulated geological reserves were 600.1 billion m3, and the remaining technically recoverable reserves were 310.5 billion m3. Shale gas: the amount of geological resources is 122 trillion m3, and the recoverable resources are 22 trillion m3. In 2020, the proven geological reserves were 1805.9 billion m3, and the technically recoverable reserves were 390.7 billion m3.

Source: MNR.

Table 8 Energy Production by Source

Year	Raw coal (Mt)	Crude oil (Mt)	Natural gas (100 million m^3)	Electricity production (TWh)	Share of electricity production from hydropower (TWh)
1990	1080	138.3	153.0	621.2	126.7
1991	1087	141.0	160.7	677.5	124.7
1992	1116	142.1	157.9	753.9	130.7
1993	1150	145.2	167.7	839.5	151.8
1994	1240	146.1	175.6	928.1	167.4
1995	1361	150.1	179.5	1007.0	190.6
1996	1397	157.3	201.1	1081.3	188.0
1997	1388	160.7	227.0	1135.6	196.0
1998	1332	161.0	232.8	1167.0	198.9
1999	1364	160.0	252.0	1239.3	196.6
2000	1384	163.0	272.0	1355.6	222.4
2001	1472	164.0	303.3	1480.8	277.4
2002	1550	167.0	326.6	1654.0	288.0
2003	1835	169.6	350.2	1910.6	283.7
2004	2123	175.87	414.6	2203.3	353.5
2005	2365	181.35	493.2	2500.3	397.0
2006	2570	184.77	585.5	2865.7	435.8
2007	2760	186.32	692.4	3281.6	485.3
2008	2903	190.43	803.0	3495.76	637.0
2009	3115	189.49	852.7	3714.65	615.6
2010	3428	202.41	957.9	4207.16	722.17
2011	3764	202.88	1053.4	4713.02	698.95
2012	3945	207.48	1106.1	4987.60	872.10
2013	3974	209.92	1208.6	5431.64	920.29
2014	3874	211.43	1301.6	5794.46	1072.88
2015	3747	214.36	1346.1	5810.58	1130.27
2016	3411	199.69	1368.7	6133.16	1184.05
2017	3524	191.51	1480.3	6604.45	1197.87
2018	3683	189.11	1602.7	7166.67	1234.23
2019	3850	191.01	1761.7	7503.43	1304.44
2020	3900	194.77	1925.0	7779.06	1355.21

Source: NBS.

Table 9 Top 10 Oil Fields for Crude Oil Production (crude oil/10000 t)

	2018	2019	2020
1. PetroChina Changqing Oilfield	5641	5700	6000
2. PetroChina Daqing Oilfield	4167	4363	4303
3. CNOOC Bohai Oilfield	3000	3000	3064
4. PetroChina Tarim Oilfield	2673	2850	3003
5. PetroChina southwest oil and gas field	1812	2139	2534
6. Sinopec Shengli Oilfield	2383	2400	2385
7. CNOOC Nanhai Oilfield	1305	1000	1612
8. PetroChina Xinjiang oil field	1379	1480	1559
9. Yanchang oil group	1310	1120	1120
10. PetroChina Liaohe Oilfield	1040	1000	1062

Source: CPEA.

Table 10 Crude Oil Refining Volume and Main Products Output Unit: Mt

	2000	2010	2015	2016	2017	2018	2019	2020
Crude refining volume	210.8	426.8	522.0	541.0	567.77	603.57	651.98	674.41
Production of main products								
Total of Gasoline, kerosene and diesel	120.83	252.09	335.17	347.8	328.62	324.34	360.17	331.71
Gasoline	41.32	76.76	119.99	129.0	121.03	138.88	141.21	131.72
Kerosene	8.78	17.08	*35.19*	*39.8*	30.01	47.70	52.58	40.94
Diesel	70.73	158.25	179.99	179.0	177.58	173.76	166.38	159.05
Fuel oil	20.54	25.37	23.84	25.87	26.93	20.24	24.70	34.06

Sources: NBS; CPCIF.

Table 11 **Top 10 Largest Coal Companies** **Unit: Mt**

	2015	2016	2017	2018	2019	2020
1. National Energy Group	495.9	506.0	510.0	512.0	510	534
2. China Coal Energy Group	159.4	146.0	163.7	190.0	210	223
3. Shanxi Coal and Chemical Industry Group	127.0	106.3	144.0	160.2	176	195
4. Yankuang Group	108.0	114.0	135.0	161.5	166	120
5. Datong Coal Mine Group	173.5	117.9	126.2	137.2	149	179
6. Shandong Energy Group	133.0	120.2	141.3	145.4	125	270
7. Shanxi Coking Coal Group	105.3	91.2	96.1	100.1	104	156
8. Jizhong Energy Group	101.0	81.4	79.3	81.0	75	57
9. Jinneng Group	70.4	71.4	80.2	84.5	82	304
10. Yang Quan Coal Group	76.2	79.0	81.9	82.0	75	84

Note: In 2020, Jinneng Group combined with Datong Coal Mine and Jincheng Anthracite Group to form Jinneng Holding Group, with an output of 304Mt

Source: CCIA.

Table 12 **Installed Electricity Capacity and Electricity Generation**

	1990	2000	2010	2015	2017	2018	2019	2020
Installed electricity capacity by year-end/GW	137.89	319.32	966.41	1508.28	1777.03	1899.67	2010.66	2200.58
Hydropower	36.05	79.35	216.06	319.37	341.19	352.26	358.04	370.16
Thermal power	101.84	237.54	709.67	990.21	1106.04	1143.67	1189.57	1245.17
Nuclear power	—	2.10	10.82	26.08	35.82	44.66	48.74	49.89
Wind power		0.35	29.58	130.75	163.25	184.27	209.15	281.53
Electricity generation/TWh	621.32	1386.5	4207.2	5814.57	6495.14	7111.77	7503.43	7779.06
Hydropower	126.35	243.1	722.2	1130.27	1189.84	1232.90	1304.44	1355.21
Thermal power	494.97	1107.9	3331.9	4284.19	4662.74	4923.10	5220.15	5300.25
Nuclear power	—	16.7	73.9	170.79	248.07	294.40	348.35	366.20
Wind power			72.2	251.2	305.7	366.0	405.3	466.50

Note: In 2020, the share of coal power in the total electricity generation was 60.7%.
Sources: NBS; CEC.

Table 13 Top 5 Biggest Power Generation Groups (2020)

	National Energy Group	Huaneng Group	Datang Group	Huadian Group	China Power Investment Corp
Installed capacity (GW)	25713	18560	15900	16600	17600
Clean energy ratio (%)	26.6	37.3	38.2	43.0	56.1
Power generation (TWh)	9533	7407	5604	5937	5829
Net coal consumption (gce/kWh)	303.3	291.1	293.2	290.4	298.5

Note: The National Energy Group was founded by the reconstruction of China Guodian Corporation and China Shenhua Group on Nov. 28th, 2017.
Source: CEC.

Table 14 Key Indicators for the Power Industry

	2000	2005	2010	2015	2017	2018	2019	2020
Net coal consumption rate (gce/kWh)	392	370	333	315	309	308	306	305
Gross coal consumption rate (gce/kWh)	363	343	312	297	292	290	289	287
Power consumption rate of thermal power plants (%)	7.31	6.80	6.33	6.04	6.04	5.95	6.03	6.00
Line loss rate (%)	7.70	7.21	6.53	6.64	6.48	6.27	5.93	5.60
Utilization hours for power generating equipment	4517	5425	4650	3988	3786	3879	3825	3756
Hydropower	3258	3664	3404	3590	3579	3607	3697	3825
Thermal power	4848	5865	5031	4364	4209	4378	4307	4211

Source: CEC.

Table 15 Development and Utilization Amount of Renewable Energy

		2000	2005	2010	2015	2016	2017	2018	2019	2020
Hydropower	GW	79.4	117.4	213.4	319.4	332.1	341.2	352.0	358.0	370.2
	TWh	243.1	397.0	722.2	1126.4	1193.4	1194.5	1232.9	1304.4	1355.2
	Mtce	88.2	136.2	225.3	335.6	352.1	348.8	357.5	377.0	388.9
Of which: small-scale hydropower	GW	24.8	38.5	59.0	75.0	77.9	79.3	80.4	81.4	81.3
	TWh	80.0	120.9	202.3	240.0	268.2	247.7	234.6	253.3	242.4
	Mtce	29.0	41.5	63.1	71.5	79.1	72.3	68.0	73.2	69.6
Solar energy	Mtce	3.1	9.6	22.6	64.6	75.1	85.5	109.3	121.4	126.5
Photovoltaic power generation	10,000 kW	1.8	7.0	122.0	4318.0	7742.0	13025.0	17445.0	20468.0	25343.0
	100M kWh	0.19	0.74	12.9	392.0	662.0	967.0	1775.0	2243.0	2611.0
	Mtce	0.01	0.03	0.40	11.64	19.53	28.2	51.5	64.8	74.9
Water heaters	10,000 m2	2600	8000	18500	44200	46400	47780	48200	47240	47485
	Mtce	3.1	9.6	22.2	53.0	55.6	57.3	57.8	56.6	56.9
Wind power generation	GW	0.34	1.22	44.78	145.4	150.0	163.7	184.3	209.1	281.5
	TWh	0.5	2.0	72.2	168.1	211.3	269.5	325.3	357.7	414.6
	Mtce	0.2	0.7	22.5	74.6	74.9	85.8	96.6	103.4	119.0
Rural biogas	100M m3	23	86	145	168	174	184	188	198	207
	Mtce	1.6	6.1	10.4	12.0	12.1	13.1	13.4	14.1	14.7
Biomass and waste power generation	GW	0.8	2.0	6.7	17.7	18.2	27.4	30.3	32.5	29.6
	TWh	3.5	8.7	29.0	52.7	65.0	79.5	90.7	111.1	132.6
	Mtce	1.3	3.0	9.0	20.4	19.3	23.2	26.4	32.1	38.1
Geothermal utilization	Mtce	0.7	1.2	6.7	24.1	31.1	37.0	44.2	63.8	77.1
	Total	86.3	197.8	284.3	491.1	568.6	593.5	625.9	711.8	764.3

Note: 1. Small-scale hydropower refers to stations with an installed capacity of less than 50MW.

2. The energy provided by solar water heaters was 120kgce/m^2/a.

3. For geothermal energy, in every heating season, ground source heat pumps generated 25 kgce/m^2 of energy, and geothermal space heating generated 28 kgce/m^2.

4. Renewable energy power generation was converted to standard coal equivalent using coal consumed in thermal power generation for the same year, the gross coal consumption rate (gce/kWh) in 2000, 2005, 2010, 2015, 2016, 2017, 2018, 2019 and 2020 was 363, 343, 312, 297, 294, 292, 290, 289 and 287 respectively.

Sources: NBS; China Energy Statistical Yearbook 2019; NDRC; NEA; MWR; MOA; MOHURD; MNR; CEC; CSES; CAREI; China Resource Comprehensive Utilization Association; CWEA; National Geothermal Energy Center; BERC.

Table 16 Renewable Energy Use in Construction

	2015		2018		2019		2020	
	Physical quantity	Standard quantity /Mtce	Physical quantity	Standard quantity /Mtce	Physical quantity	Standard quantity /Mtce	Physical quantity	Standard quantity /Mtce
Solar water heaters	442 Mm^2	53.0	482 Mm^2	57.8	472 Mm^2	56.6	474 Mm^2	56.9
Photovoltaic power generation	687 GWh	0.2	5643 GWh	1.5	7550 GWh	2.2	8562 GWh	2.5
Ground source heat pumps	410 Mm^2	10.3	793 Mm^2	19.9	872 Mm^2	21.9	927 Mm^2	23.3
Geothermal space heating	494 M m2	13.8	87 Mm2	24.3	150 Mm2	41.9	161 Mm2	45.2
Rural biogas	16.8 BN m^3	12.0	18.8 BN m^3	13.4	19.8 BN m^3	14.1	207 BN m^3	14.7
Total		89.3		116.9		136.7		142.6

Note: 1. Solar water heaters provided 120kgce/m^2/a of energy, geothermal heating, 28kgce/m^2/heating season, and ground source heat pumps 25kgce/m^2/heating season.

2. Power generation was converted into coal equivalent according to the gross coal consumption rate of thermal power generation.

Sources: NBS; NDRC; NEA; Department of Education, Science & Technology, MOA; BERC; MOHURD; Solar Thermal Utilization Specialty Committee of CAREI; Energy Saving Stove Professional Committee of CAREI; CSES; MNR; Geothermal Specialty Committee, CERS; National Geothermal Energy Center.

Table 17 Primary Energy Consumption and Structure

Year	Total energy consumption (10,000 tce)	Share (total energy consumption =100)			
		Coal	Oil	Natural gas	Hydro, nuclear and wind power
1978	57144	70.7	22.7	3.2	3.4
1980	60275	72.2	20.7	3.1	4.0
1985	76682	75.8	17.1	2.2	4.9
1990	98703	76.2	16.6	2.1	5.1
1991	103783	76.1	17.1	2.0	4.8
1992	109170	75.7	17.5	1.9	4.9
1993	115993	74.7	18.2	1.9	5.2
1994	122737	75.0	17.4	1.9	5.7
1995	131176	74.6	17.5	1.8	6.1
1996	135192	73.5	18.7	1.8	6.0
1997	135909	71.4	20.4	1.8	6.4
1998	136184	70.9	20.8	1.8	6.5
1999	140569	70.6	21.5	2.0	5.9
2000	146946	68.5	22.0	2.2	7.3
2001	155547	68.0	21.2	2.4	8.4
2002	169577	68.5	21.0	2.3	8.2
2003	197083	70.2	20.1	2.3	7.4
2004	230281	70.2	19.9	2.3	7.6
2005	261369	72.4	17.8	2.4	7.4
2006	286467	72.4	17.5	2.7	7.4
2007	311442	72.5	17.0	3.0	7.5
2008	320611	71.5	16.7	3.4	8.4
2009	336126	71.6	16.4	3.5	8.5
2010	360648	69.2	17.4	4.0	9.4
2011	387043	70.2	16.8	4.6	8.4
2012	402138	68.5	17.0	4.8	9.7
2013	416913	67.4	17.1	5.3	10.2
2014	425806	65.6	17.4	5.7	11.3
2015	429905	63.7	18.3	5.9	12.1
2016	435819	62.0	18.5	6.2	13.3
2017	449000	60.4	18.8	7.2	13.6
2018	464000	59.0	18.9	7.8	14.3
2019	486000	57.7	19.6	8.3	14.4
2020	498000	56.8	18.9	8.1	16.2

Source: NBS.

Table 18 Final Energy Consumption and Structure by Sector

	2010		2015		2017		2018		2019	
	Mtce	%	Mtce	%	Mtce	Mtce	Mtce	%	Mtce	%
Agriculture	78.7	3.3	95.0	93.2	95.0	3.0	93.2	2.9	98.2	3.0
Industry	1610.9	67.5	1810.1	1805.5	1810.1	57.7	1805.5	56.5	1926.6	57.9
Transportation	330.2	13.8	532.9	576.2	532.9	17.0	564.7	17.7	573.2	17.2
Buildings	368.0	15.4	700.2	730.6	700.2	22.3	730.6	22.9	728.6	21.9
Total	2387.8	100.0	3138.2	3205.5	3138.2	100.0	3194.0	100.0	3326.6	100.0

Table 19 Oil Products Consumption by Source Unit: Mt

	2000	2005	2010	2015	2016	2017	2018	2019	2020
Gasoline	35.05	48.53	68.56	115.99	119.83	122.20	127.70	131.73	116.20
Diesel	67.74	109.73	146.99	174.07	164.69	166.70	173.53	166.38	140.48
Kerosene	8.70	10.77	17.65	27.90	30.23	33.45	37.42	38.70	33.07
Fuel oil	38.73	42.42	37.58	29.20	29.03	29.40	24.56	24.15	31.27

Sources: NBS; CPCIF; CNPC Economics &Technology Research Institute.

Table 20 Natural Gas Consumption and Structure

	2010		2015		2017		2018		2019		2020	
	100 million m^3	%	100 million m^3	%	100 million m^3	%	100 million m^3	%	100 million m^3	%	100 million m^3	%
Power generation	192.4	17.9	395	20.5	467	19.5	485	17.3	552	18.0	594	18.4
Chemicals	381.3	35.4	454	23.5	727	30.4	1022	36.5	1073	35.0	1173	36.2
Industry	187.3	17.4	245	12.7	273	11.4	286	10.2	307	10.0	321	9.9
Transportation	79.7	7.4	243	12.6	272	11.3	300	10.7	381	12.4	390	12.0
Buildings	235.1	21.9	594	30.7	655	27.4	710	25.3	754	24.6	762	23.5
Total	1075.8	100.0	1931	100.0	2394	100.0	2803	100.0	3067	100.0	3240	100.0

Sources: NBS; NEA; CNPC Economics &Technology Research Institute; Gas-consuming Industries.

Table 21 Electricity Consumption Per Capita **Unit: kWh**

	National	Urban	Rural
1978	218	1072	32
1995	535	1747	100
2000	1063	2574	205
2005	1624	2999	587
2010	2752	4519	989
2015	4142	6212	1496
2016	4321	6370	1566
2017	4538	6578	1652
2018	4905	7108	1659
2019	5157	7399	1719
2020	5320	7250	1762

Sources: NBS.

Table 22 Energy Consumption of the Manufacturing Industry (2020)

	energy consumption per unit of product	2020 production	2020 energy consumption (Mtce)
Steel	847 kgce/t	1064.8Mt	901.9
Electrolytic aluminum	13244kWh/t	37.08 Mt	140.9
Copper smelting	317kgce/t	10.03 Mt	3.2
Cement	128 kgce/t	2395 Mt	306.6
Building ceramics	6.5 kgce/m^2	8.47 billion m2	55.1
Wall materials	417 kgce/10,000 block standard bricks	12790 TN standard bricks	53.3
Building Lime	135 kgce/t	125 Mt	16.9
Sheet glass	11.5 kgce/ weight case	95.2 million weight cases	10.9
Oil refining	91 kgce/t	674.41 Mt (process load)	61.4
Ethylene	837 kgce/t	21.60 Mt	18.1
Synthetic ammonia	1422 kgce/t	51.17Mt	72.8
Caustic soda	850 kgce/t	36.74Mt	31.2
Sodium carbonate	326 kgce/t	28.12Mt	9.2
Calcium carbide	3075 kWh/t	27.58Mt	24.3
Paper and paperboard	306 kgce/t	127.0Mt	39.0
Total			1744.8 2492.6

Note: 1. The comprehensive energy consumption of products is industrywide. Wall materials' energy consumption is a weighted average of clay solid bricks and new wall materials.

2. Product power consumption is converted into coal equivalent according to the gross coal consumption rate.

3. The energy consumption of the 15 products of six industries shown in the above table accounts for about 70% of the energy consumption of the manufacturing industry.

Sources: NBS; NDRC; MIIT; China Iron and Steel Association; China Nonferrous Metals Industry Association; CEC; CBMF; China Petroleum and Chemical Industry Federation; China Chemical Energy Conservation Technology Association; China Ceramics Industry Association; China Carbide Industry Association; China Paper Making Association.

Table 23 **Energy Consumption of Transport**

	2005	2010	2014	2015	2016	2017	2018	2019	2020
Highways									
Gasoline (Mt)	46.08	67.5	101.7	112.0	118.0	120.4	122.9	128.6	117.9
Diesel (Mt)	54.60	77.9	108.0	105.3	90.2	108.6	107.6	111.7	110.8
Railways									
Diesel (Mt)	5.61	6.72	6.58	6.25	7.03	8.28	8.16	8.22	8.54
Electricity (100 million kWh)	198.1	307.0	478.0	507.7	571.2	595.0	603.0	607.0	691.0
Waterways									
Diesel and Fuel oil (Mt)	14.83	22.45	27.49	26.19	27.50	27.8	27.3	28.7	31.3
Civil aviation									
Kerosene (Mt)	9.52	16.01	23.4	25.6	30.3	33.45	37.41	36.84	32.92

Note: Fuel oil is used for water transport vessels. Diesel fuel is used for ships entering and leaving ports, entering and leaving narrow waterways, and in windy and rough weather. Diesel fuel is consumed independently of fuel oil and had a 2020 annual consumption of 3Mt.

Sources: NBS; NDRC; National Railway Administration; State Railway Administration; MOT; The National Civil Aviation Authority; Chinese Automotive Technology Research Center; CNPC Economics & Technology Research Institute.

Table 24 **Agricultural and Rural Energy Indicators**

	2000	2010	2015	2018	2019	2020
Total power of agricultural machinery (10,000 kW)	52574	92786	111728	100372	102758	105622
Effective irrigation area (10,000 ha)	5382.0	6034.8	6587.3	6827.2	6867.9	6916.1
Water-saving irrigation area (10,000 ha)	1639	2731	3106	3614	3706	3780
Chemical fertilizer application (10,000 t)	4145	5562	6023	5653	5404	5251
Installed capacity of small rural hydropower plants (10,000 kW)	698.5	5924.0	7588.0	8044.0	8144.2	8133.8
Rural electricity consumption (100 million kWh)	2421.3	6632.3	9026.9	9358.5	9482.9	9717.3

Source: NBS.

Table 25 Electricity Consumption of Household Electric Appliances (2020)

	Total ownership (100 million units)		Electricity consumption (100 million kWh)	
	Households	Whole society	Households	Whole society
Air conditioners	6.82	10.48	3683	5666
Refrigerators	5.03	5.09	1469	1486
Color TVs	5.97	6.64	752	834
Rice cookers	3.56	3.56	347	347
Electric fans	6.10	8.70	120	171
Electric shower water heaters	2.03	2.26	964	1074
Kitchen ventilators	3.01	3.34	364	405
Microwave ovens	2.03	2.06	91	102
Washing machines	4.78	5.30	191	190
Total			7981	10275

Note: 1. The ownership rate of households was calculated by multiplying the national average per 100 households by 494.2 million households.

2. The ratio of ownership of households to ownership of whole society: electric cooker, 100%; room air conditioner, 65%; electric fan, 70%; and all the other appliances, 90%.

3. The average power and annual utilization hours per appliance: room air conditioner 1200W, 450h; color TV 120W, 1050h; electric cooker, 650W, 150h; electric fan 55W, 360h; electric shower water heater 2500W, 190h; lampblack machine 220W, 550h; microwave oven 750W 60h; washing machine 400W, 100h; refrigerators had an average daily power consumption of 0.8kWh.

Sources: NBS; Average power and annual utilization hours of household appliances compiled by Wang Qingyi, Energy Data in 2014.

Table 26 Energy Saving (2020) Unit: Mtce

	Energy saving in 2020 compared with 2019	Share %
Technical energy saving	30.76	78.4
Manufacturing Industry	26.29	33.5
Transportation	-12.53	-16.0
Construction	17.00	21.7
Structural energy saving	9.54	21.6
Total energy saving	40.3	100.0

Table 27 Energy Saving in the Manufacturing Industry (2020)

	Product energy consumption						Production in 2020	Energy saving in 2020 compared with 2019 (Mtce)
	Unit	2010	2015	2018	2019	2020		
Steel	kgce/t	950	899	861	850	847	1064.8Mt	3.19
Electrolytic aluminum	kWh/t	13979	13562	13555	13257	13244	37.08Mt	3.73
Copper	kgce/t	500	372	342	335	317	10.03Mt	0.18
Cement	kgce/t	143	137	132	131	128	2395Mt	7.19
Building ceramics	kgce/m^2	7.7	7.0	6.7	6.6	6.5	8.47 billion m^2	0.85
Wall materials	kgce/10,000 standard bricks	468	444	425	421	417	1279 billion standard bricks	0.51
Building Lime	kgce/t	160	145	139	137	135	125 Mt	0.25
Sheet glass	kgce/ weight case	16.9	14.7	14.0	12.5	11.5	9.52 million weight cases	0.95
Oil refining	kgce/t	100	96	96	92	91	674.41 Mt (processing amount)	2.39
Ethylene	kgce/t	950	854	840	839	837	21.60Mt	0.43
Synthetic ammonia	kgce/t	1587	1495	1453	1418	1422	51.17Mt	-2.05
Caustic soda	kgce/t	1006	897	871	861	850	36.74Mt	0.40
Sodium Carbonate	kgce/t	385	339	331	328	326	28.12Mt	0.06
Calcium carbide	kWh/t	3340	3303	3208	3141	3253	27.58Mt	-0.33
Paper and paperboard	kgce/t	390	339	318	312	307	127.0Mt	0.64
Total								18.40
Total of manufacturing industry								26.29

Note: 1. In the product energy consumption column, electricity consumption was converted into standard coal equivalent by coal consumption in power generation.

2. Each product's energy consumption is the average of the whole industry.

3. In this table, the 16 products listed came from six industries whose energy consumption accounted for 70% of the aggregate consumption in manufacturing.

Sources: NBS; 2021 China Statistical Abstract; NDRC; MIIT; CEC; CISA; China Nonferrous Metals Industry Association; CBMF; China Cement Association; China Ceramics Industrial Association; China Petroleum and Chemical Industry Federation; China Chemical Energy Conservation Technology Association; China Soda Industry Association; China Carbide Industry Association; China Paper-making Association.

Table 28 Energy Saving in Transportation (2020)

	Unit workload energy consumption (kgce/10,000 conversion t-km)				Workload in 2020 (100 million converted t-km)	Energy-saving amount (10,000 tce) in 2020 compared with 2019
	2015	2018	2019	2020		
Highways	506.5	480.0	474.0	485.0	60361	-543
Railways	47.1	41.1	39.4	44.3	38781	-190
Waterways	41.3	40.1	39.2	40.3	105861	-106
Civil aviation	5152	4223	4193	4649	799	-364
Total						-1203

Sources: NBS; State Railway Administration; MOT; CEC; China Association of Automobile Manufacturers; China Automotive Technology Research Center; CNPC Economics & Technology Research Institute; Statistical Bulletin of Transportation Industry Development in 2020; Statistical Bulletin of China Civil Aviation in 2020; 2020 Railway Statistics Bulletin.

Table 29 Energy Saving in Construction (2020) Unit：Mtce

	2015	2016	2017	2018	2019	2020
New buildings	10.20	15.67	16.00	18.30	22.90	13.00
Existing residential buildings	1.67	1.32	1.60	2.38	3.88	4.00
Total	11.87	16.99	17.60	20.68	26.78	17.00

Note: 1. The indicator of new buildings in 2020 refers to the energy-saving capacity of the newly built buildings that adopted energy-saving building codes.

2. The indicator of existing residential buildings in 2020 refers to the energy-saving capacity of buildings, which was achieved through improvements by energy-saving technology in the north.

3. Energy-saving from lighting was achieved by the replacement of incandescent lamps with LED lighting.

4. Renewable energy applications include solar water heaters, photovoltaic power generation, ground source heat pumps, geothermal heating, and biogas in rural areas.

Sources: MOHURD; NRDC; MNR; MOA; China Association of Rural Energy Industry; China Association of Solar Energy; National Semiconductor Lighting Industry Development and Industry Alliance.

Table 30 **Physical Energy Efficiency** **Unit：%**

	2000	2005	2010	2014	2015	2017	2019
1.Mining efficiency	33.0	33.3	35.9	36.2	36.2	36.3	36.6
2. Intermediate efficiency	68.5	70.8	70.9	68.7	67.5	70.0	70.3
3. End-use efficiency							
Agriculture	32.0	33.0	34.0	36.2	36.5	36.6	36.9
Industry	46.0	47.3	50.5	53.8	54.0	54.8	56.5
Transportation	28.9	29.2	29.1	33.1	33.3	34.5	35.0
Residential and commercial	66.0	68.4	74.2	74.2	74.5	74.8	75.8
Total	46.7	48.3	51.0	53.5	54.8	55.2	55.6
4. Energy efficiency (2×3)	32.0	34.2	36.0	36.8	37.0	39.0	39.1
5. Overall efficiency of energy system (1×4)	10.6	11.4	12.9	13.3	13.4	14.1	14.3

Notes: 1. This table was calculated according to internationally accepted definitions of energy balance and calculation methods.

2. Intermediate refers to energy processing, conversion, storage, and transportation.

Table 31 **Energy Consumption Per Unit Of Product ForEnergy Intensive Products**

	2000	2010	2015	2017	2018	2019	2020	International advanced level
Gross heat consumption of thermal power generation (gce/kWh)	363	312	298	292	290	289	287	287
Net heat consumption of thermal power plants (gce/kWh)	392	333	315	309	308	306	305	275
Full energy consumption for steel (kgce/t)								
Whole industry	1475	950	899	890	861	850	847	
Large and medium-sized enterprises	906	701	663	670	634			
Comparable energy consumption for steel (kgce/t)	784	681	644	634	613	605	603	576
AC power consumption for electrolytic aluminum (kWh/t)	15418	13979	13562	13577	13555	13257	13244	12900
Full energy consumption for copper smelting (kgce/t)	1227	500	372	359	342	335	317	360
Full energy consumption for cement (kgce/t)	172	143	137	133	132	131	128	97
Full energy consumption for wall materials (kgce/10,000 standard bricks)	763	468	444	429	425	421	417	300
Full energy consumption for building ceramics (kgce/m^2)	8.6	7.7	7.0	6.8	6.7	6.6	6.5	3.4
Full energy consumption for building lime /kgce/t		160	145	143	139	137	135	120

Full energy consumption for sheet glass (kgce/weight case)	25.0	16.9	14.7	14.2	14.0	12.5	11.5	13.0
Full energy consumption for crude oil processing (kgce/t)	118	100	96	97	97	92	91	73
Full energy consumption for ethylene (kgce/t)	1125	950	854	841	841	839	837	629
Full energy consumption for synthetic ammonia (kgce/t)	1699	1587	1495	1463	1453	1418	1422	990
Full energy consumption for caustic soda (kgce/t)	1439	1006	897	875	871	861	850	670
Full energy consumption for sodium carbonate (kgce/t)	406	385	329	333	331	328	326	255
Electricity consumption for calcium carbide (kWh/t)	3475	3340	3303	3279	3208	3141	3253	3000
Full energy consumption for paper and paperboard (kgce/t)								
Whole industry	912	390	339	326	318	312	307	
Home made pulp and paper enterprises	1540	1200	1045	1006	981	962	947	506

Note:
1. The international advanced level is an average of the leading nations.
2. For full energy consumption in China and overseas for all years, electricity consumption was converted to coal equivalent by gross coal consumption.
3. The gross heat consumption rate and net heat consumption rate in China were calculated from generators above 6MW; the international advanced level is Japan, and net heat consumption is Italy. In 2020, in China, coal made up 63.2% of all thermal power stations, oil 0.1%; and gas 3.2%. In Japan those ratios were 29.7%, 4.1%, and 35.2%. In Italy, those were 5.9%, 3.4%, 48.2%.
4. The full energy consumption for steel in China is from large and medium-sized enterprises, whose production accounted for 80% of the whole country in 2020. The international advanced level was from Germany.
5. The full energy consumption for cement is split into the heat consumption of clinker and full electricity consumption for cement. Electricity consumption was calculated as standard coal equivalent. Here, the international advanced level was from Germany. In 2014, the substitution rate of alternative fuel (petrol coke, waste plastics, waste tire, city garbage, and so on) was 63.4%.
6. The international leader in energy efficiency for wall material production was the US.
7. Most ethylene in China is manufactured from naphtha. In the Middle East, classified as an international advanced leading country here, ethylene is manufactured from ethane.
8. The international leader in energy efficiency per unit of caustic soda is a German and Italian joint venture called Thyssenkrupp Industrial Solutions AGCorp.
9. Full energy consumption for synthetic ammonia was calculated from the average value of large-, medium-, and small-sized enterprises with coal, oil, and gas as raw materials. In 2020, 80% of China's synthetic ammonia production was from coal. The international leader was the US, which uses natural gas for 98% of ammonia production.

Sources: NBS; MIIT; China Coal Industry Association; CEC; CISA; China Nonferrous Metals Industry Association; CBMF; Sinopec and Chemical Industry Federation; China Ceramics Industrial Association; China Paper Association; China Chemical Fibers Association; Institute of Energy Economics, Japan, Handbook of Energy and Economic Statistics, 2016 version; The Germany Iron and Steel Enterprises Association; The Germany Cement Engineering Association.

Table 32 **Industrial Sector Capacity Phase-out**

	Production capacity elimination						2020 Production
	2006~2010	2015	2016	2017	2018	2020	
Coal/Mt	450.0	90	290	150	150	150	3902
Charcoal/Mt	10.38	19.35	40	16.8	19.2	67	471.1
Thermal power/GW	72.1	4.23	4	5.0	12.9	7.3	1254.2
Steel/Mt	68.6	17.1	65	50	30	30	1064.8
Electrolytic aluminum/Mt	0.80	0.34	0.88	2.4	2.72	0.44	37.1
Cement/Mt	403	39	0.11	50	84	29	2395
Sheet glass/ million weight cases	1.52	0.11	0.33	2.3	1.2	4.0	9.52
Calcium carbide/Mt	4.0	2.0	2.52	3.5	3.7	1.3	27.58
Paper and paperboard/Mt	10.3	5.90	10.0	3.0	1.6	30	127.0

Note: In 2020, the paper industry suffered the most serious crisis in its history, with nearly 30% of paper mills failing to open.

Sources: NBS; MIIT; CEC; CISA; CBMF; China Cement Association; China Ceramics Industrial Association; CPCIF; China Chemical Energy Conservation Technology Association; China Paper-making Association.

Table 33 Energy Import and Export

	2000	2005	2010	2014	2015	2016	2017	2018	2019	2020
Crude oil (Mt)										
Exports	10.44	8.07	3.04	0.60	2.87	2.94	4.86	2.63	0.88	1.64
Imports	70.27	127.08	239.31	308.36	335.49	381.04	419.97	461.90	505.72	542.39
Petroleum products (Mt)										
Exports	10.30	16.88	30.44	33.84	40.92	53.07	52.16	58.64	66.85	61.83
Imports	24.32	41.45	47.84	46.55	52.63	53.27	60.56	60.19	66.00	61.25
Natural gas (100 million m^3)										
Exports	31.4	29.7	40.3	25.7	32.0	33.3	34.0	34.0	34.8	53.8
Imports			164.7	583.5	603.2	736.2	943.6	1250.0	1323.0	1392.9
Coal (Mt)										
Exports	58.84	71.68	19.03	5.74	5.33	8.78	8.17	4.93	6.03	3.19
Imports	2.02	26.17	164.78	291.22	204.06	255.51	270.90	281.23	299.70	303.99

Note: 1. Coal imports include brown coal imports, which was 102.59 million t in 2019.

2. The sources of coal imports in 2020, Indonesia, Australia, Mongolia, Russia, and the Philippines accounted for 46%, 23%, 9%, 11%, and 6%, respectively, for a total of 95%.

3. China imported 139.3 billion m^3 natural gas, including 48.3 billion m^3 pipeline gas and 91.0 billion m^3 LNG.

4. China imported 39.0 billion m^3 pipeline gas from Central Asia, which takes up 80.9% of China's total pipeline natural gas import in 2020. China imported 41.48 billion m^3 LNG from Australia and 11.66 billion m^3 from Qatar.

Source: GACC.

Table 34 Energy Prices

		2017	2018	2019	2020
Steam coal for power generation	Yuan/t	536	528.6	556	565
No.92 gasoline retail price	Yuan/litre	6.37	6.42	6.78	6.90
Civil natural gas	Yuan/m3	1.34	1.62	1.80	2.08
Electricity for residents	Yuan/MWh	0.53	0.56	0.57	0.51

Note: 1. Steam coal prices are prices for June.

Sources: National Development and Reform Commission.

Table 35 R&D Expenditure for Companies in the Energy and Energy-Intensive Industry

Unit: 100 million Chinese yuan

	2010	2015	2016	2017	2018	2019	2020
Industry total	4015.4	10013.9	10944.7	12013.0	12459.8	13971.1	24671.5
Coal mining and washing	108.7	143.3	132.1	148.9	146.5	109.2	255.7
Petroleum and natural gas exploitation	88.1	62.5	63.9	57.3	89.3	93.8	138.3
Petroleum processing, coking and nuclear fuel processing	43.8	100.8	119.6	146.6	145.4	184.7	435.6
Production and supply of electric power and heating	31.9	81.4	81.6	85.8	96.9	113.0	430.8
Steel	402.1	561.2	537.7	638.7	706.9	686.3	1992.9
Non-ferrous metals	118.9	371.5	406.8	461.6	442.5	479.8	718.0
Building materials	81.3	277.6	323.1	362.8	415.9	520.1	822.7
Chemical industry	247.5	794.4	840.7	912.5	899.9	923.4	1318.4
Chemical fibers	41.0	78.5	83.8	106.1	112.1	123.7	161.9
Food, beverages and tobacco	98.8	246.2	274.8	267.7	298.4	294.2	563.4
Textile and apparel	101.2	297.8	236.9	343.7	358.4	371.5	494.6
Paper and paper products	36.7	107.6	122.8	144.6	167.8	152.7	232.2
Transportation equipment	582.2	1340.1	1348.3	1593.4	1712.9	1718.7	3210.5
Electrical machinery and apparatus	425.1	1012.7	1102.4	1242.4	1320.1	1406.2	2111.1
Communications equipment, computers and other electronic equipment manufacture	686.3	1611.7	1811.0	2002.8	2279.9	2448.1	4841.0
General and special machinery manufacture	472.2	1199.7	1242.8	1333.7	1461.4	1599.6	2574.2

Note: 2010 data was from large and medium-sized enterprises; 2011-2019 data was from enterprises above the designated size. Automobiles in the transportation equipment manufacturing account for 234.46 billion yuan.
Source: NBS.

Table 36 Clean Coal Technology (2020)

Coal preparation	Raw coal preparation rate in 2020 was 74.1%, 2890 Mt raw coal was washed and 300Mt of coal was saved, saving the equivalent of 214 Mtce. Saved coal was more than 10%.
Briquette	Industrial briquette saved 15% coal and civil briquette saved 25% coal. In 2020, 50Mt of coal was saved (36Mtce） .
Coal water slurry	Capacity in 2020 was 230Mt. Industrial boilers comprised 30Mt, with an energy saving rate of 20% and coal saving of 4Mt; 200Mt gasification was used in the kiln, with an energy saving rate of 15%, and coal saving of 67Mt. Total coal saved was 71Mt.
Industrial Boiler	Coal-fired industrial boilers saved 79.2Mtce in 2020. Coal was saved by: 1. Substitution of natural gas and biomass; 2. Combined heat and power, centralized heating of regional boiler rooms; 3. Improved boiler technology; 4. Coal washing and improved coal quality.
Ultra Critical Coal Power	In 2020, 116 million-kilowatt generating units were in operation, coal consumption for the power supply was 24gce/kWh less than the industry average, and coal was saved by 11.9Mtce.
Circulating fluidized bed boiler	In 2020, capacity was 130GW. Compared with conventional boilers, 10% of coal and 13.0Mtce were saved.
Coal gangue electricity generation	In 2020, coal gangue reduced 40Mt, and 29Mtce of coal was saved. In 2020, clean coal technology saved 454.1Mtce of coal and reduced CO_2 by 1230.6Mt.

Sources: China Coal Processing & Utilization Association; Coal Industry Clean Coal Engineering Technology Research Center; CEC; CPCIF.

Table 37 Comparison of Main Indicators of Coal Industry between China and the US (2020)

	China	US
Raw coal production (Mt)	3902	563
Coal exports (Mt)	3.19	77.95
Coal imports (Mt)	303.99	4.62
Coal consumption (Mt)	3963	433.0
Percentage of coal used in power generation (%)	51.3	91.5
Percentage of production in surface mines (%)	17.0	65.0
Average mining exploitation depth (m)	530	90
Average coal price on mine (USD/t)	61.7	32.0
Coal mines in operation	4700	978**
Coal industry employees (10,000 people)	340	3.95
Raw coal production efficiency (ton per capita each year)	1148	14253
Coal miners average wage (USD/year)	10907	84080**
Death number of mine accidents	228	22*
Death rate of mine accidents (person/Mt)	0.058	0.039*

Note: 1. Commodity coal takes up 86% of raw coal in the U.S.
2. * for 2019; ** for 2018.
Source: NBS; China Coal Industry Association; DOE/EIA; National Mining Association.

Table 38 Emissions of Major Pollutants

Year	PM2.5 (ug/m^3)	SO_2 (Mt)	NOx (Mt)	Chemical oxygen demand (COD) (Mt)
2000	22	19.95		14.45
2001		19.48		14.05
2002		19.27		13.67
2003		21.59		13.34
2004		22.55		13.39
2005		25.49		14.14
2006	28	25.89	15.24	14.28
2007		24.68	16.40	13.82
2008		23.21	16.25	13.21
2009		22.14	16.93	12.78
2010		21.85	18.52	12.38
2011		22.18	24.04	25.00
2012		21.18	23.38	24.24
2013	72	20.44	22.27	23.53
2014	61	19.74	20.78	22.95
2015	50	18.59	18.51	22.24
2016	47	17.55	17.77	21.66
2017	43	16.15	16.90	20.99
2018	39	15.07	16.07	20.17
2019	36	14.41	15.51	19.62
2020	33	13.55	14.71	19.47

Note: From the beginning of 2011, the COD statistics collection method has changed, thus post-2011 data cannot be directly compared with data collected before 2011.
Source: MEE.

Table 39 **CO2 Emissions in China and the World**

	Total emissions /Mt-CO_2						2020 Emissions per capita /t-CO_2
	2010	2015	2017	2018	2019	2020	
China	7585 (8197)	8822 (9697)	9036 (9997)	9257 (10242)	9473 (10481)	9534 (10549)	6.75
United States	5495	5066	5003	5166	5025	4457	13.45
India	1652	2152	2325	2449	2472	2302	1.67
Russia	1527	1550	1606	1551	1596	1482	10.14
Japan	1198	1207	1181	1158	1118	1027	8.14
Germany	783	756	761	735	682	605	7.33
South Korea	579	609	631	646	623	578	11.16
Iran	538	577	616	654	675	678	8.27
Saudi Arabia	472	592	600	581	580	571	19.55
Canada	550	570	566	576	580	518	13.63
EU	3386	3046	3115	3071	2937	2551	5.76
World	31291	33206	33727	34351	34357	32284	4.2

Note: China's emissions were calculated by fossil fuel consumption and its CO_2 emissions factors. CO_2 emissions related to coal consumption are based on commercial coal metrology, the number in the parentheses () represents CO_2 emissions based on raw coal. Commercial coal refers to coal on sale after the process of washing. In 2020, the washing rate of raw coal in China was 74.1%, the share of the removal of waste rock in washed raw rock was 18%. CO_2 emissions calculated by BP in 2010, 2015, 2016, 2017, 2018, 2019 and 2020 were 8146 Mt, 9280 Mt, 9138 Mt, 9466 Mt, 9653 Mt, 9811 Mt and 9899 Mt respectively.
Sources: BP Statistical Review of World Energy, June 2021.

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