ERNEST ORLANDO LAWRENCE
BERKELEY NATIONAL LABORATORY

Key China Energy Statistics 2012

Mark Levine, David Fridley, Hongyou Lu,
Cecilia Fino-Chen

China Energy Group
Environmental Energy Technologies Division
Lawrence Berkeley National Laboratory

May 2012

This work was supported by the U.S. Department of Energy under Contract No. DE-AC02-05CH11231.

The LBNL China Energy Group

The China Energy Group at Lawrence Berkeley National Laboratory (LBNL) was established in 1988. Over the years the Group has gained recognition as an authoritative source of China energy statistics through the publication of its China Energy Databook (CED). The Group has published seven editions to date of the CED (http://china.lbl.gov/research/china-energy-databook). This handbook summarizes key statistics from the CED and is expressly modeled on the International Energy Agency's "Key World Energy Statistics" series of publications. The handbook contains timely, clearly-presented data on the supply, transformation, and consumption of all major energy sources.

Gathering and analyzing data is one important function of the LBNL China Energy Group. The mission of the Group, located within the Environmental Energy Technolgoeis Division of the Lawrence Berkeley National Laboratory, is to:

- Develop and enhance the capabilities of Chinese institutions that promote energy efficiency;
- Better understand the dynamics of energy use in China; and
- Create links between Chinese, U.S., and international institutions.

Major achievements of the China Energy Group include:

- Introduced appliance energy efficiency standards to China
- Initiated pilot policy programs that led to the top 1000 enterprises program
- Analyzed long-term energy demand in China to 2020, 2030 and 2050
- Played a key role in creating the Beijing Energy Efficiency Center and the Energy Foundation Sustainable Energy Program with collaborators
- Leadership of the US-China Clean Energy Research Center – Building Energy Efficiency

Disclaimer

This document was prepared as an account of work sponsored by the United States Government. While this document is believed to contain correct information, neither the United States Government nor any agency thereof, nor The Regents of the University of California, nor any of their employees, makes any warranty, express or implied, or assumes any legal responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by its trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof, or The Regents of the University of California. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof, or The Regents of the University of California.

Ernest Orlando Lawrence Berkeley National Laboratory is an equal opportunity employer.

Table of Contents

Supply	5
Transformation	17
Consumption	22
Prices	30
Emissions	38
Economic and Demographic Indicators	41
International Comparison	44

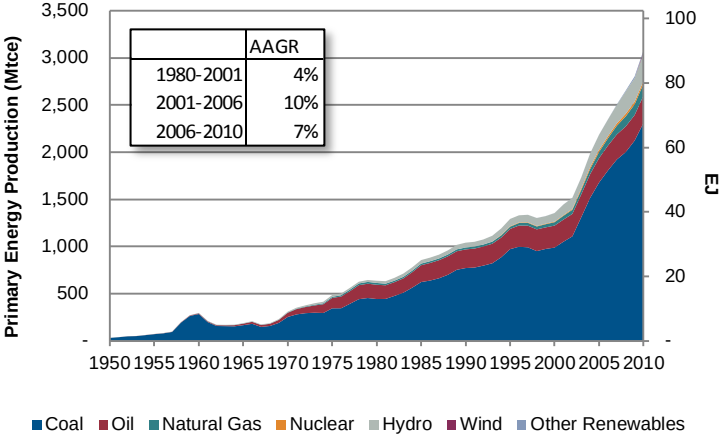
Appendixes

Table of Abbreviations and Glossary	49
Conversion Factors	51
Energy Balances (2010)	52
Data Sources	62

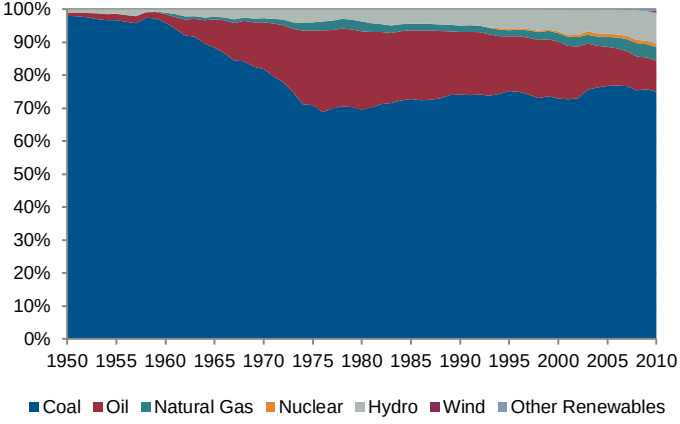
Supply

Maps of China

Growth of China's Total Primary Energy Production by Source (1950-2010)

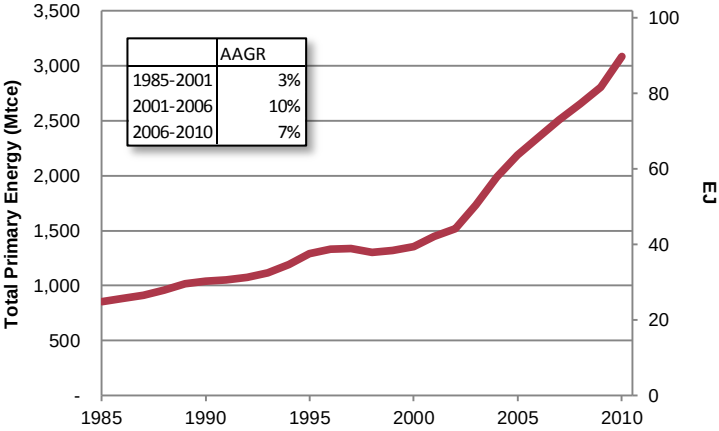


Total Primary Energy Production by Source Shares*

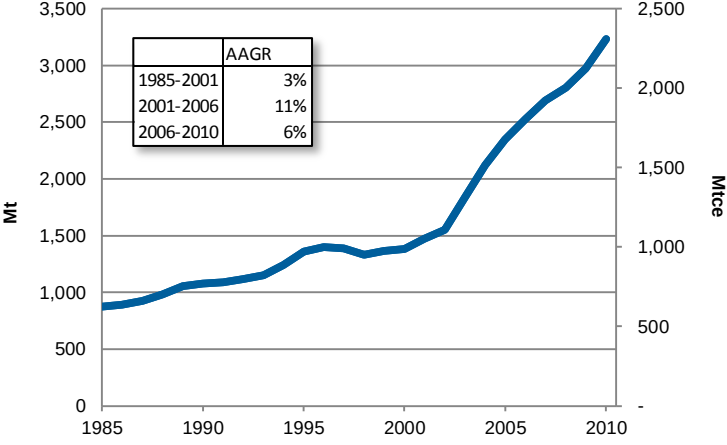


* Excludes international marine bunkers and trade.

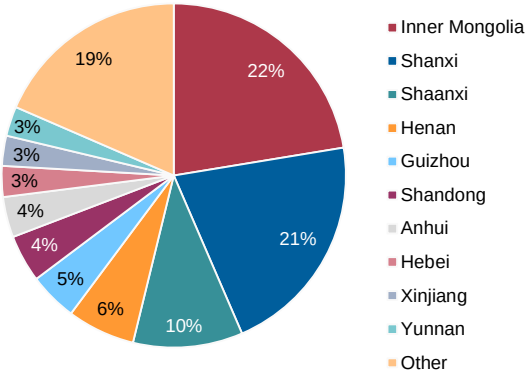
Growth of China's Total Primary Energy Production (1985-2010)



Coal Production (1985-2010)

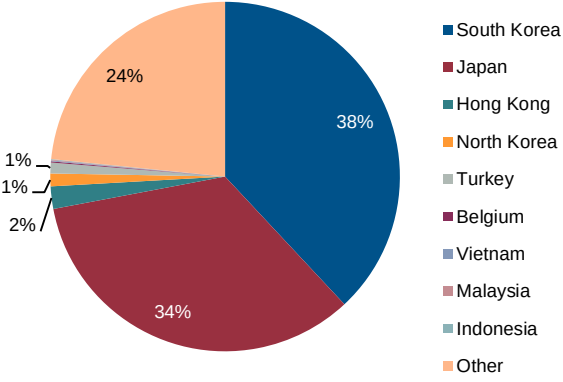


Coal Producing Provinces in China (2010)



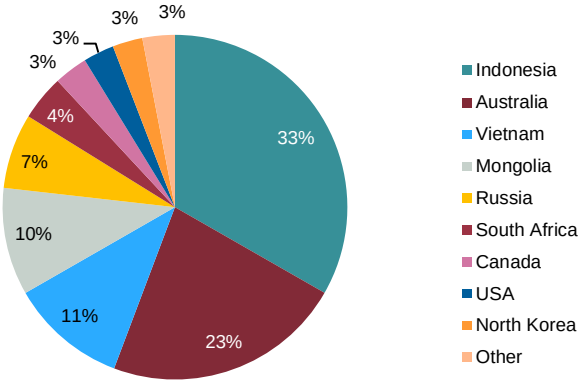
Total Coal Production: 3,235 Mt

China's Coal Exports (2010)



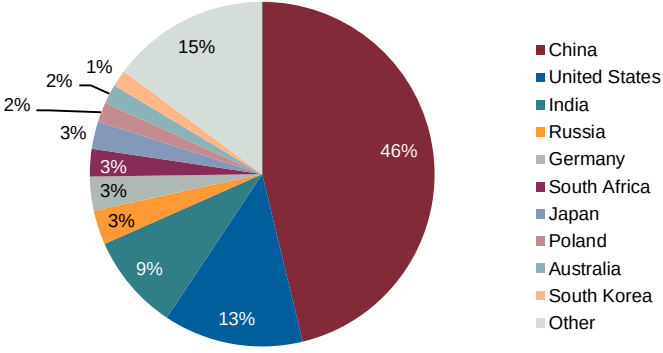
Total Coal Exports : 19 Mt

China's Coal Imports (2010)



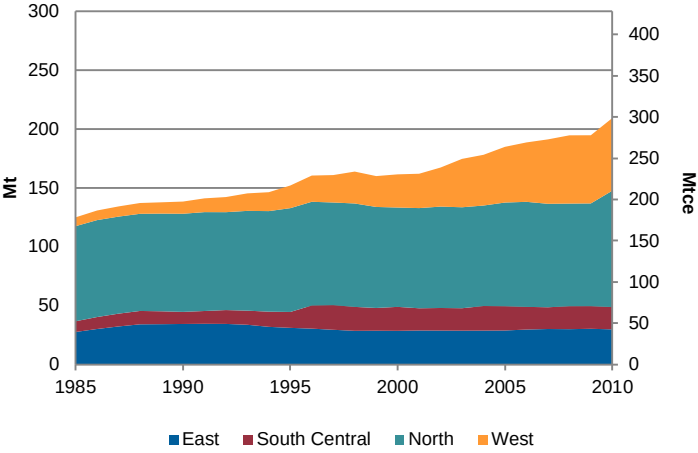
Total Coal Imports : 165 Mt

World's Coal Consumption (2010)

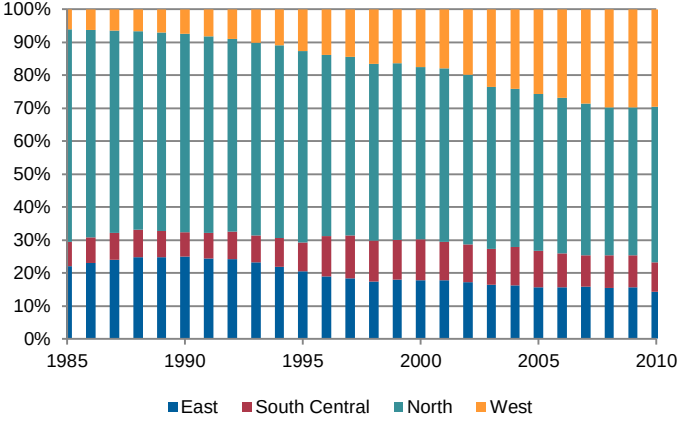


Total Coal Consumption : 7.25 Gt
Total China Coal Consumption 3.38 Gt

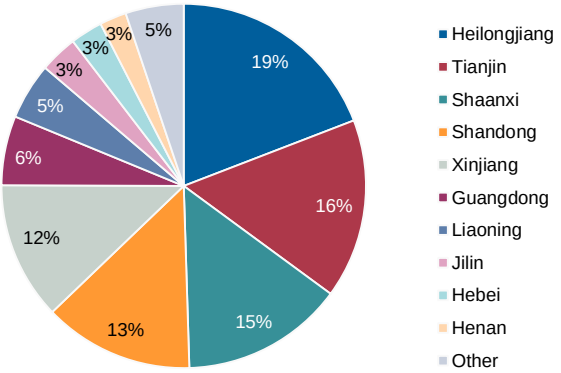
Crude Oil Production by Region (1985-2010)



Chinese Crude Oil Production by Regional Shares

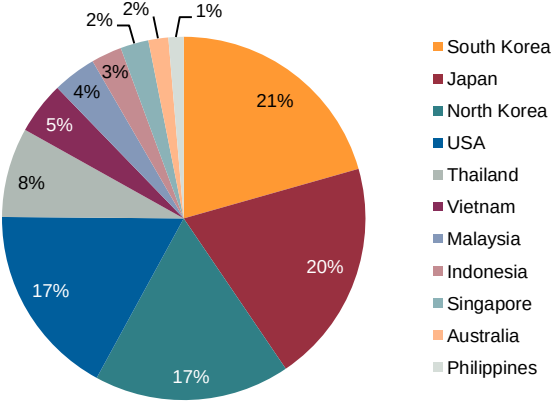


Crude Oil Producing Provinces in China (2010)



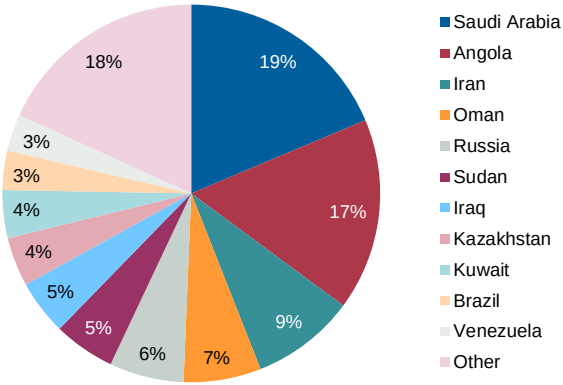
Total Crude Oil Production: 209 Mt

China's Crude Oil Exports (2010)



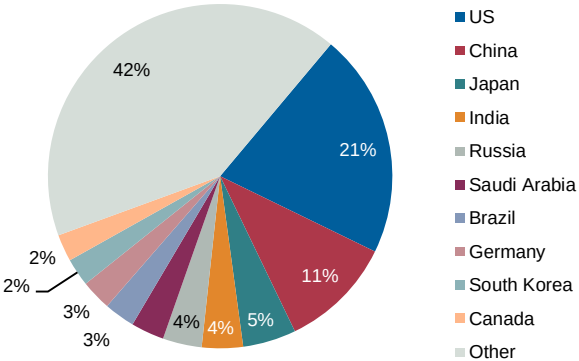
Total Crude Oil Exports: 3 Mt

China's Crude Oil Imports (2010)



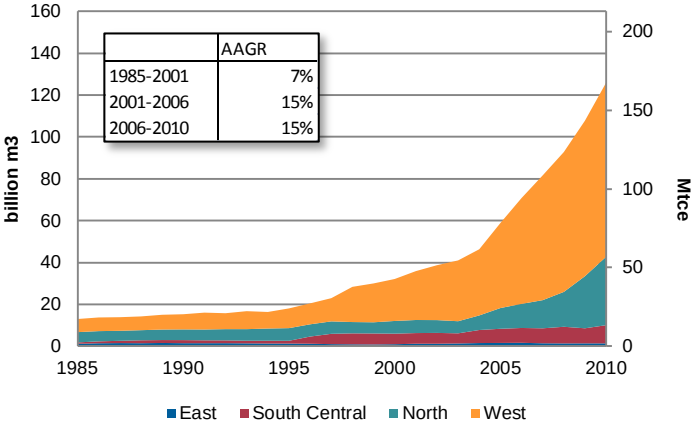
Total Crude Oil Imports: 239 Mt

World's Oil Consumption (2010)

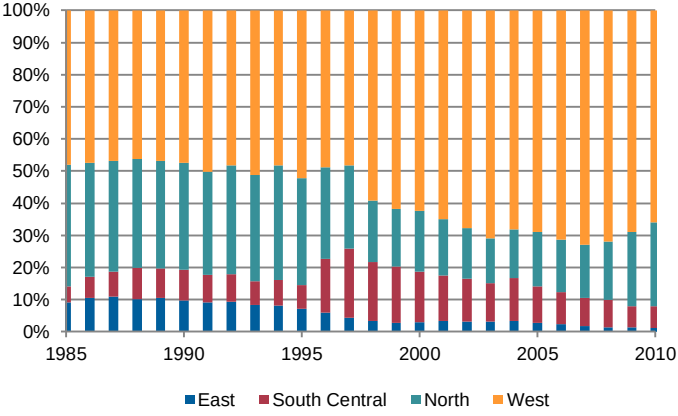


Total World Oil Consumption: 4,028 Mt
Total China Oil Consumption: 445 Mt

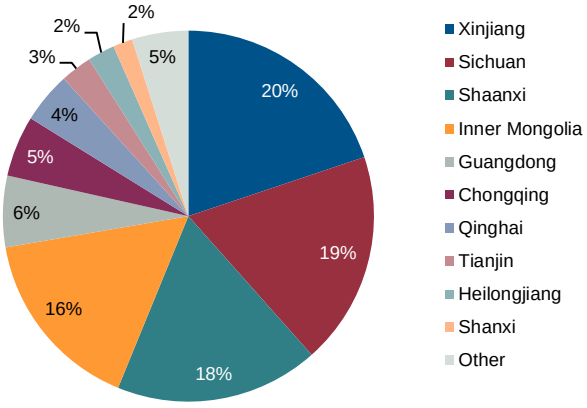
Natural Gas Production by Region (1985-2010)



Chinese Natural Gas Production by Regional Shares

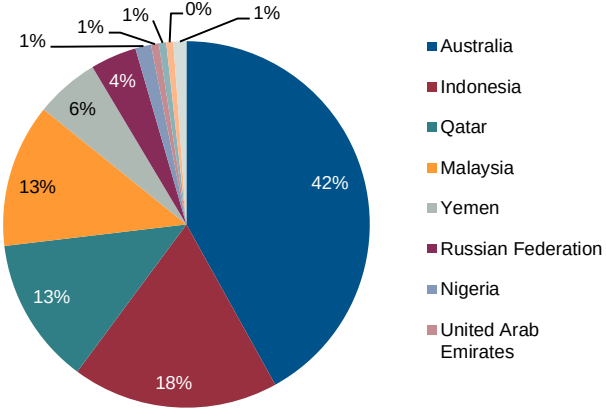


Natural Gas Producing Provinces in China (2010)



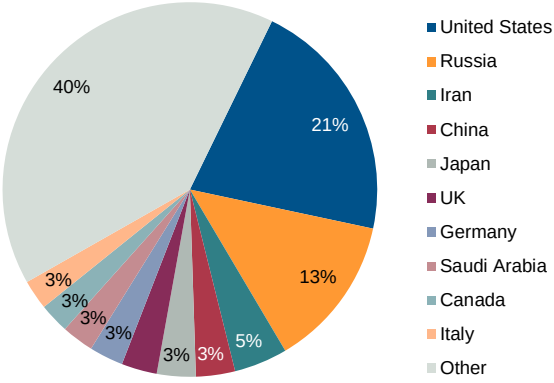
Total Natural Gas Production: 126 billion m³

China's Liquefied Natural Gas Imports (2010)



Total Liquefied Natural Gas Imports: 9.34 billion m³

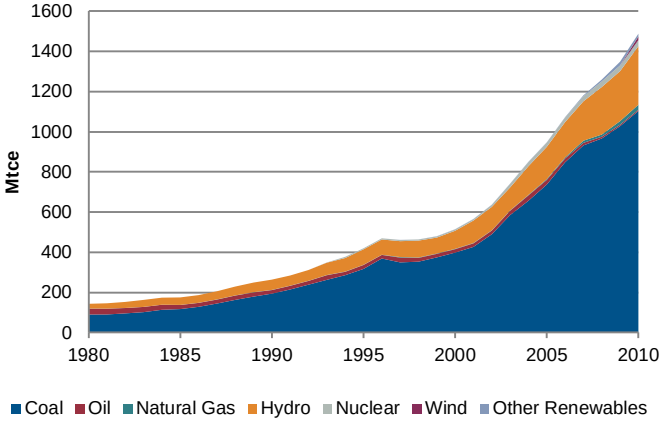
World's Natural Gas Consumption (2010)



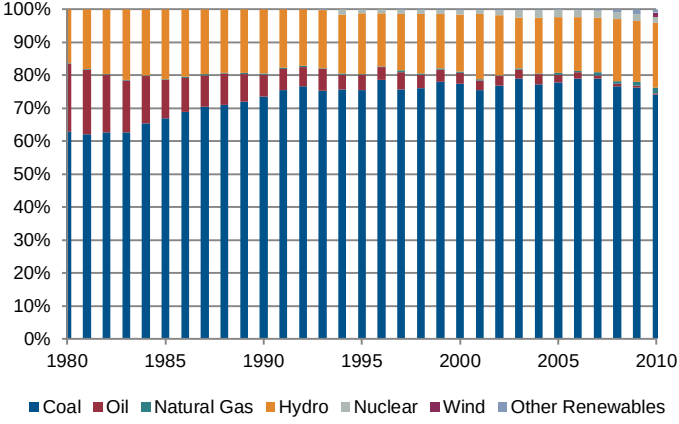
Total World Natural Gas Consumption: 3,160 billion m^3
Total China Natural Gas Consumption: 126 billion m^3

Transformation

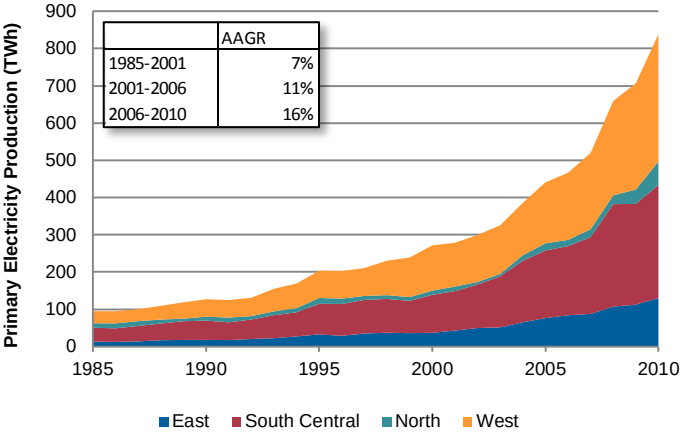
Electricity Production by Fuel Source (1980-2010)



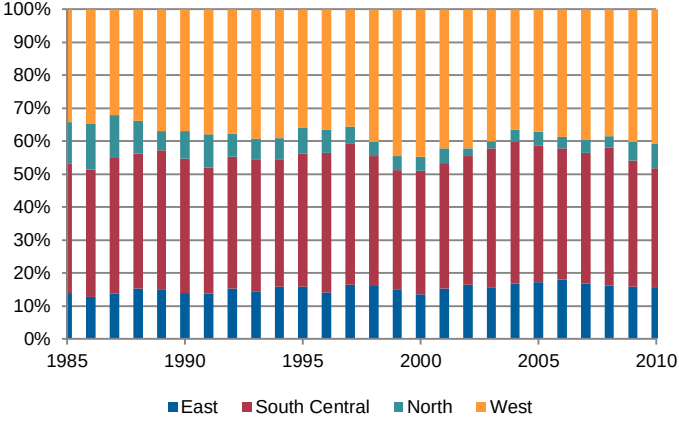
Electricity Production by Source Shares



Primary Electricity Generation by Region (1950-2010)



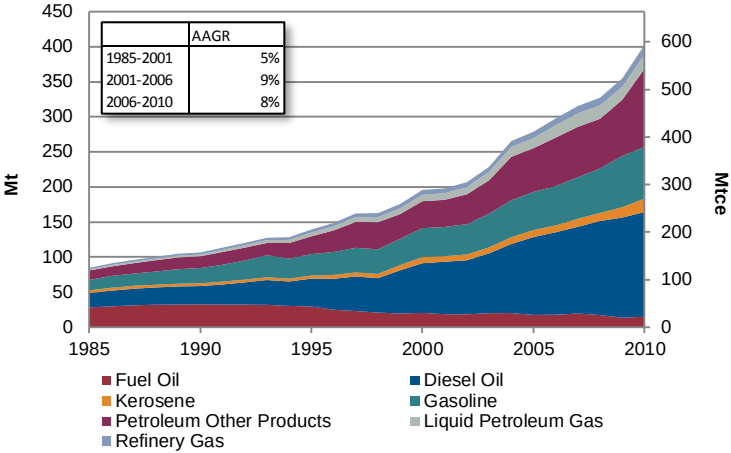
Primary Electricity Production by Regional Shares



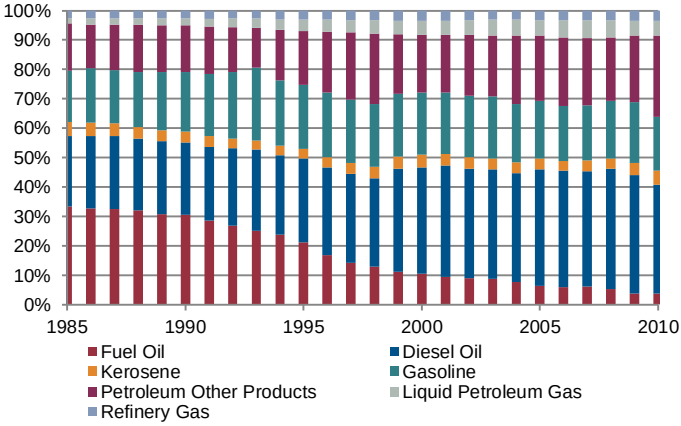
Top 10 Primary Electricity Producing Provinces (2010)

Region	Province	TWh	% of Total
South Central	Hubei	126	15%
West	Sichuan	114	14%
West	Yunnan	82	10%
South Central	Guangdong	61	7%
South Central	Hunan	50	6%
East	Zhejiang	49	6%
South Central	Guangxi	48	6%
East	Fujian	47	6%
West	Guizhou	42	5%
West	Qinghai	37	4%
	Others	184	22%
	Total	**839**	**100%**

Oil Refining by Product (1985-2010)

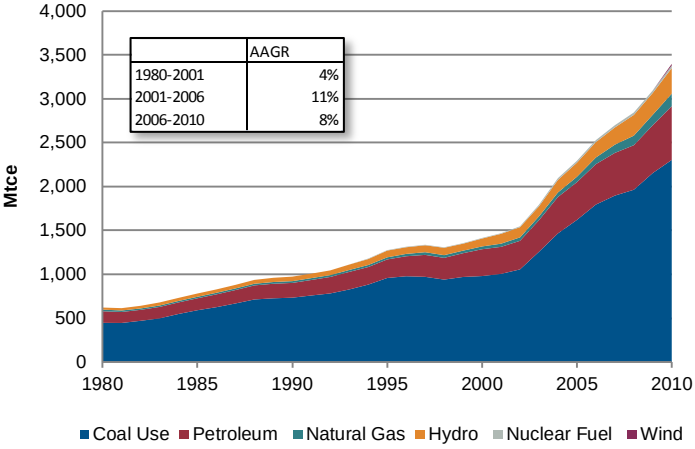


Refinery Production by Product Shares

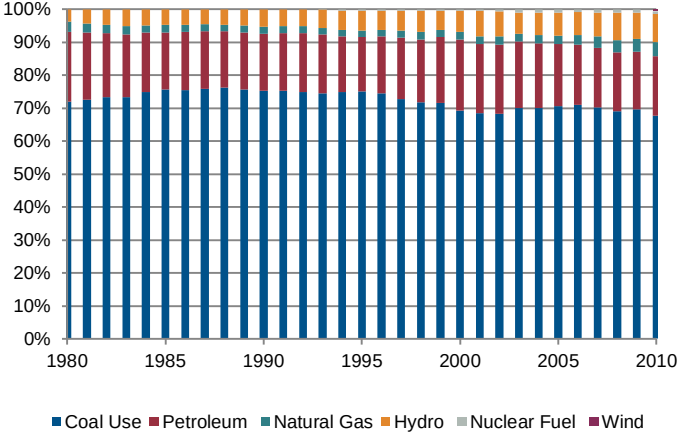


Consumption

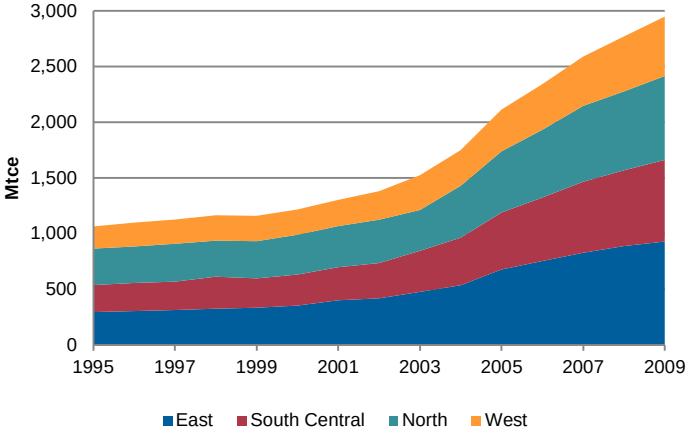
Total Primary Energy Consumption by Source (1980-2010)



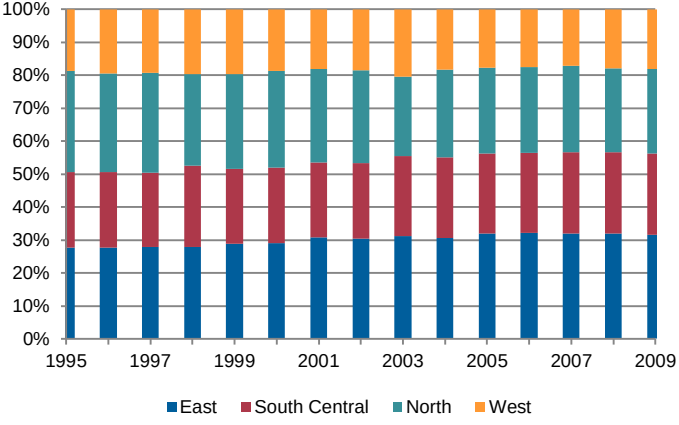
Total Primary Energy Consumption by Source Shares (1980-2010)



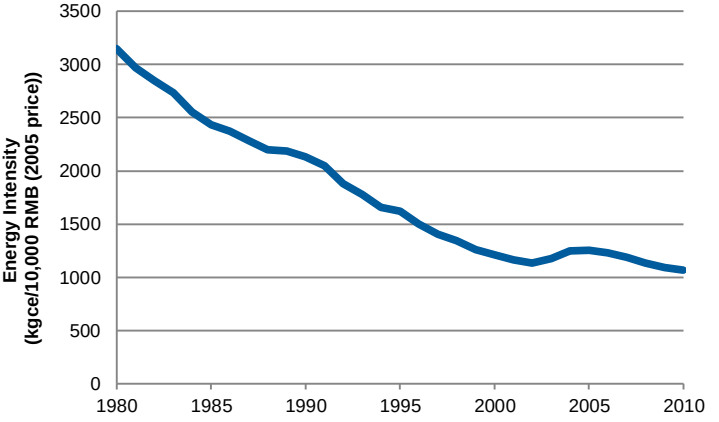
Total Final Energy Consumption by Region (1995-2009)



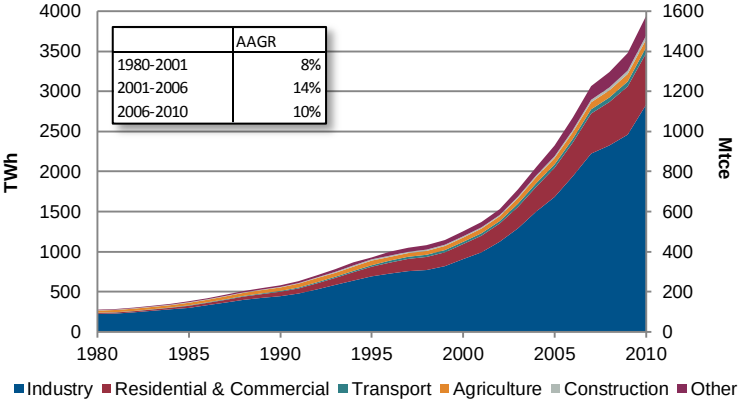
Total Final Energy Consumption by Regional Shares



China's Energy Consumption per Unit of GDP (1980-2010)

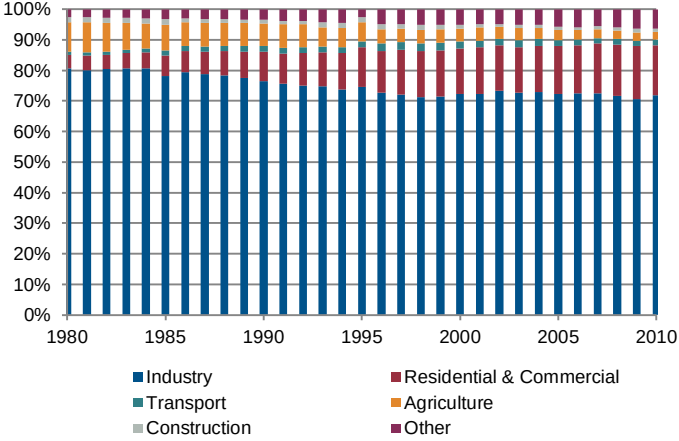


Electricity End-Use by Sector (1980-2010)

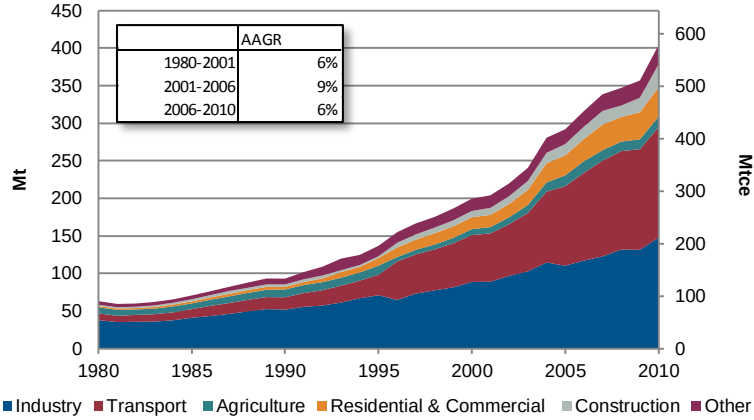


Note: Starting in 1991, energy use in the "Non-Material Sector" (government, schools, hospitals, etc.) was reclassified as "Other".

Electricity Consumption by Sectoral Shares

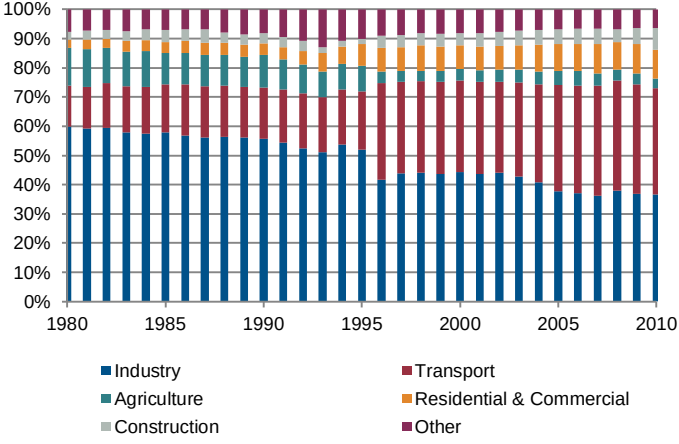


Oil Consumption by Sector (1980-2010)

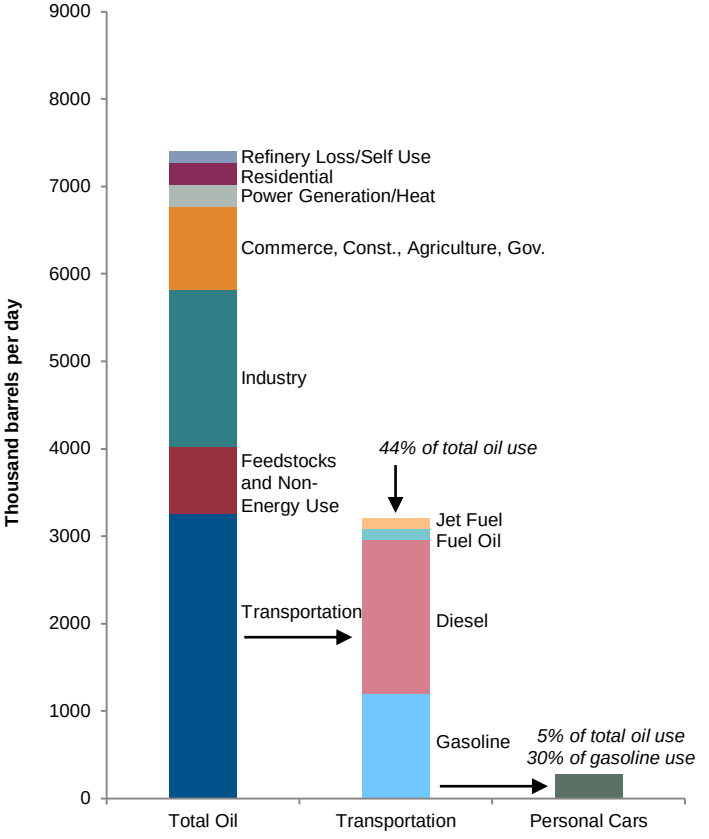


Note: Starting in 1991, energy use in the "Non-Material Sector" (government, schools, hospitals, etc.) was reclassified to "Other".

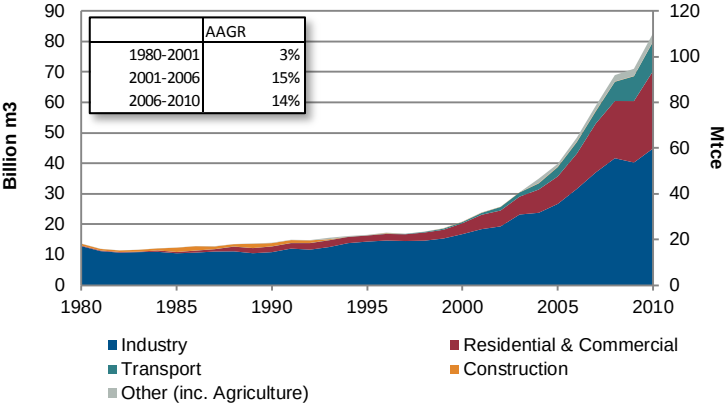
Final Oil Consumption by Sectoral Shares



Composition of 2007 China Oil Use

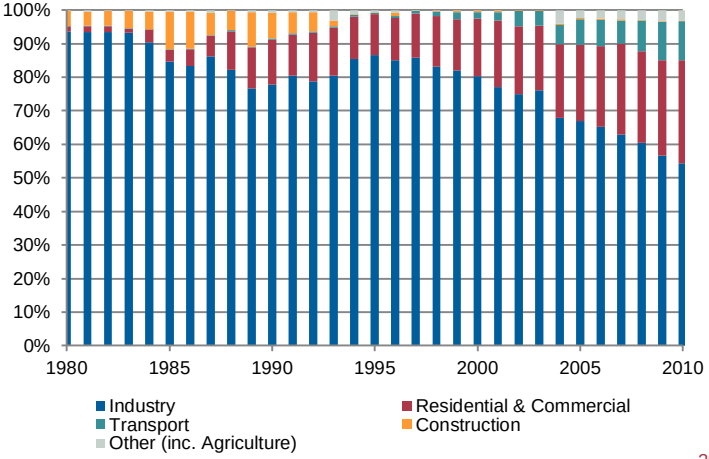


Natural Gas Consumption by Sector (1980-2010)



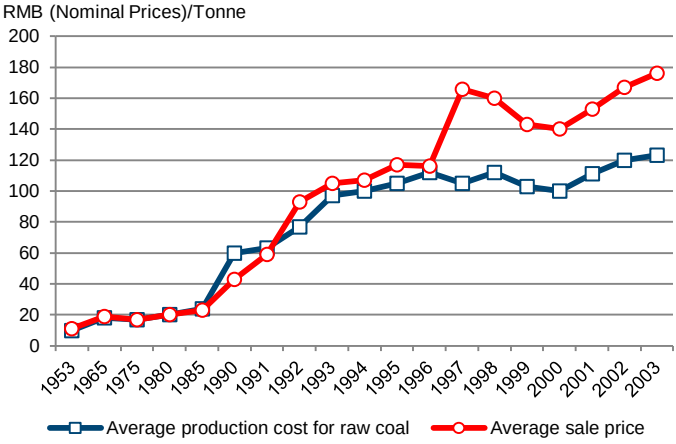
Note: Starting in 1991, energy use in the "Non-Material Sector" (government, schools, hospitals, etc.) was reclassified to "Other".

Final Natural Gas Consumption by Sectoral Shares

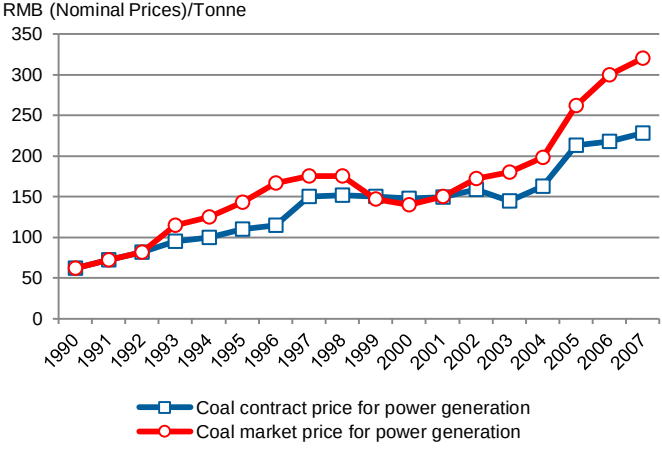


Prices

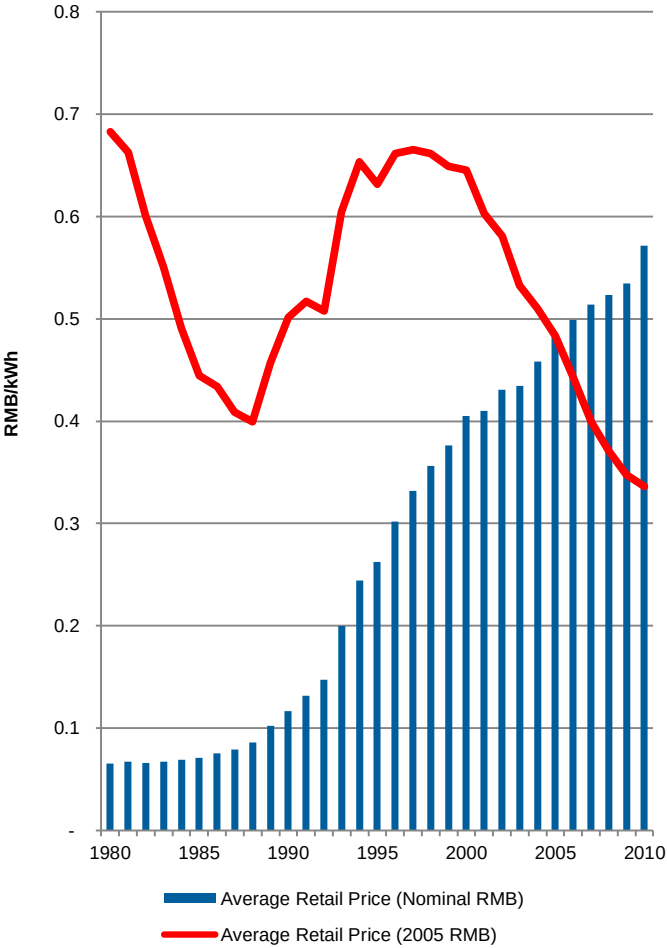
Production Cost and Average Sale Price of State-Owned Coal Mines



Average Coal Contract Price and Coal Market Price for Power Generation



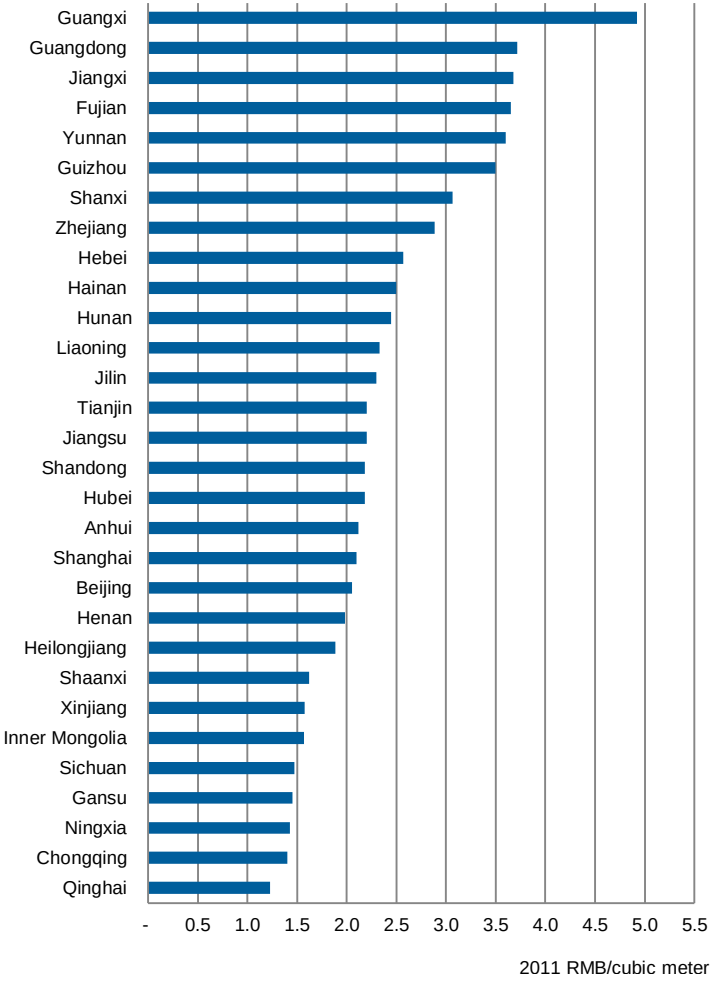
Average Retail Price of Electricity (1980-2010)



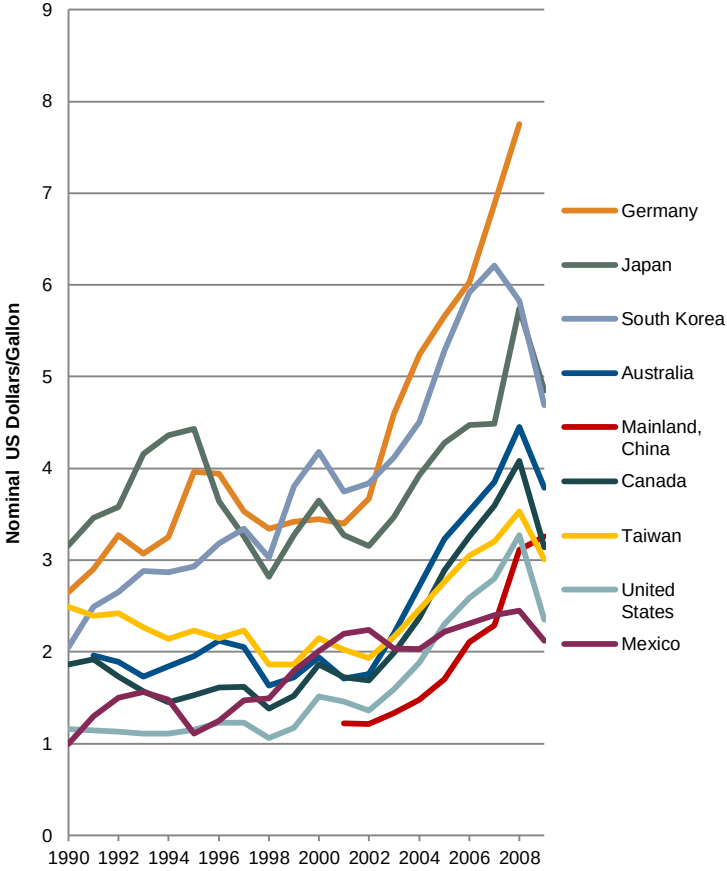
Average Residential Power Price by Province

Province	2008		2009		2010	
	(2005 RMB/kWh)	(2005 RMB/kgce)	(2005 RMB/kWh)	(2005 RMB/kgce)	(2010 RMB/kWh)	(2005 RMB/kgce)
Guangdong	0.445	1.102	0.408	1.01	0.37	0.91
Hainan	0.420	1.040	0.390	0.96	0.35	0.87
Jiangxi	0.424	1.050	0.389	0.96	0.35	0.87
Hubei	0.397	0.982	0.364	0.90	0.33	0.82
Henan	0.385	0.954	0.354	0.88	0.32	0.79
Anhui	0.392	0.971	0.357	0.88	0.32	0.79
Shanghai	0.385	0.954	0.351	0.87	0.32	0.78
Hunan	0.375	0.928	0.342	0.85	0.31	0.77
Zhejiang	0.374	0.926	0.342	0.85	0.31	0.77
Jilin	0.369	0.915	0.339	0.84	0.31	0.76
Shandong	0.357	0.884	0.338	0.84	0.31	0.76
Guangxi	0.348	0.861	0.334	0.83	0.30	0.75
Chongqing	0.366	0.907	0.336	0.83	0.30	0.75
Sichuan	0.359	0.889	0.329	0.81	0.30	0.74
Jiangsu	0.358	0.885	0.328	0.81	0.30	0.73
Xinjiang	0.350	0.867	0.324	0.80	0.29	0.73
Shaanxi	0.337	0.833	0.323	0.80	0.29	0.72
Tibet	0.399	0.988	0.346	0.86	0.29	0.72
Liaoning	0.351	0.870	0.322	0.80	0.29	0.72
Tianjin	0.346	0.857	0.317	0.79	0.29	0.71
Gansu	0.343	0.848	0.318	0.79	0.29	0.71
Hebei (South Grid)	0.346	0.855	0.315	0.78	0.29	0.71
Hebei (North Grid)	0.343	0.848	0.315	0.78	0.29	0.71
Fujian	0.334	0.827	0.307	0.76	0.28	0.69
Beijing	0.337	0.834	0.308	0.76	0.28	0.69
Shanxi	0.330	0.816	0.302	0.75	0.27	0.67
Heilongjiang	0.328	0.813	0.299	0.74	0.27	0.67
Yunnan	0.320	0.793	0.293	0.73	0.27	0.66
Ningxia	0.318	0.787	0.297	0.74	0.27	0.66
Inner Mongolia (East)	0.322	0.798	0.280	0.69	0.26	0.65
Guizhou	0.308	0.762	0.283	0.70	0.26	0.64
Inner Mongolia (West)	0.273	0.677	0.251	0.62	0.22	0.54
Qinghai	0.245	0.605	0.224	0.55	0.21	0.52

Residential Natural Gas Price by Province (2011)



Retail Gasoline Price (Including Tax) in Selected Countries and Regions (1990-2009)



Note: Prices are those actually paid (i.e., net of rebates), and include transport costs and non-refundable taxes. Prices in national currencies are converted to U.S. dollars using exchange rates published by the International Monetary Fund.

Commercial and Industrial Gas Prices in Major Cities (2011)

City	Province	Commercial		Industrial	
		2011 RMB/m3	2011 RMB/kgce	2011 RMB/m3	2011 RMB/kgce
Beijing		2.84	2.14	2.84	2.14
Tianjin		2.80	2.11	2.80	2.11
Shijiazhuang	Hebei	2.95	2.22	2.95	2.22
Hohhot	Inner Mongolia	3.56	2.68	2.00	1.50
Shenyang	Liaoning	3.90	2.93	3.90	2.93
Changchun	Jilin	3.20	2.41	3.20	2.41
Harbin	Heilongjiang	3.00	2.26	2.90	2.18
Shanghai		3.69	2.77	3.29	2.47
Nanjing	Jiangsu	2.95	2.22	2.95	2.22
Hangzhou	Zhejiang	3.50	2.63	3.50	2.63
Ningbo	Zhejiang	3.40	2.56	3.40	2.56
Hefei	Anhui	3.58	2.69	2.48	1.86
Xiamen	Fujian	4.20	3.16	3.81	2.86
Jinan	Shandong	3.61	2.71	3.61	2.71
Qingdao	Shandong	3.60	2.71	3.60	2.71
Zhengzhou	Henan	3.16	2.38	2.86	2.15
Wuhan	Hubei	3.68	2.77	3.00	2.26
Changsha	Hunan	3.00	2.26	3.00	2.26
Nanning	Guangxi	5.73	4.31	4.60	3.46
Haikou	Hainan	3.73	2.80	3.30	2.48
Chongqing		2.29	1.72	2.24	1.68
Chengdu	Sichuan	2.20	1.65	2.20	1.65
Xi'an	Shaanxi	2.60	1.73	2.30	1.73
Lanzhou	Gansu	2.17	1.63	1.90	1.43
Xining	Qinghai	2.07	1.56	1.70	1.28
Yinchuan	Qinghai	1.98	1.49	1.38	1.04
Urumqi	Xinjiang	2.11	1.59	2.11	1.59

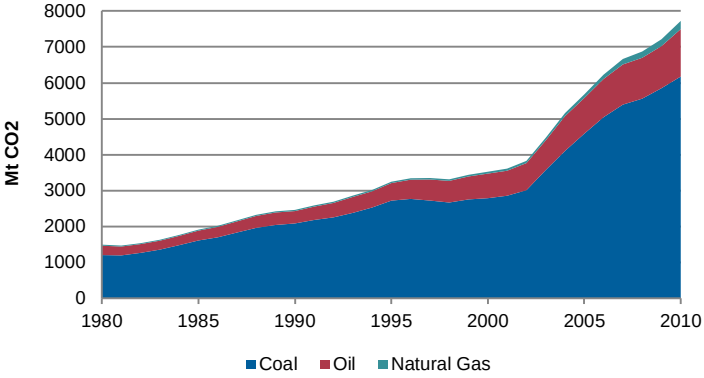
Price Cap on the Highest Gasoline and Diesel Prices by Province and Major City (March 19, 2012)

Province	90# Gasoline (II)		90# Gasoline (III)		0# Diesel	
	(RMB/t)	(RMB/tce)	(RMB/t)	(RMB/tce)	(RMB/t)	(RMB/tce)
Beijing			10,380	7,055	9,600	6,588
Tianjin	9,935	6,752			9,085	6,235
Hebei	9,935	6,752			9,085	6,235
Shanxi	10,005	6,800			9,140	6,273
Liaoning	9,935	6,752			9,085	6,235
Jilin	9,935	6,752			9,085	6,235
Heilongjiang	9,935	6,752			9,085	6,235
Shanghai			10,360	7,041	9,570	6,568
Jiangsu	9,990	6,789			9,125	6,262
Zhejiang	9,990	6,789			9,140	6,273
Anhui	9,985	6,786			9,135	6,269
Shandong	9,945	6,759			9,095	6,242
Hubei	9,960	6,769			9,110	6,252
Hunan	10,000	6,796			9,170	6,293
Henan	9,955	6,766			9,105	6,249
Hainan	10,080	6,851			9,220	6,328
Chongqing	10,150	6,898			9,295	6,379
Guangdong	10,015	6,806	10,245	6,963	9,155	6,283
Guangxi	10,080	6,851			9,220	6,328
Ningxia	9,940	6,755			9,085	6,235
Gansu	9,920	6,742			9,105	6,249
Xinjiang	9,715	6,603			8,980	6,163
City	**90# Gasoline (II)**		**90# Gasoline (III)**		**0# Diesel**	
	(RMB/t)	**(RMB/tce)**	**(RMB/t)**	**(RMB/tce)**	**(RMB/t)**	**(RMB/tce)**
Hohhot	9,950	6,762			9,100	6,245
Fuzhou	9,990	6,789			9,130	6,266
Nanchang	9,955	6,766			9,105	6,249
Chengdu	10,155	6,902			9,320	6,396
Guiyang	10,115	6,874			9,245	6,345
Kunming	10,145	6,895			9,275	6,365
Xi'an	9,920	6,742			9,095	6,242
Xining	9,900	6,728			9,130	6,266

Note: Except for Beijing and Shanghai, Gasoline (II) and (III) refer to vehicle gasoline that meets the quality requirements of the Chinese National Standard: GB 17930-2006 "Gasoline for Motor Vehicles". In Beijing and Shanghai, the quality requirements refer to the Beijing local standard (DB 11/238-2007) and Shanghai local standard (DB 31/427-2009, DB 31/428-2009).

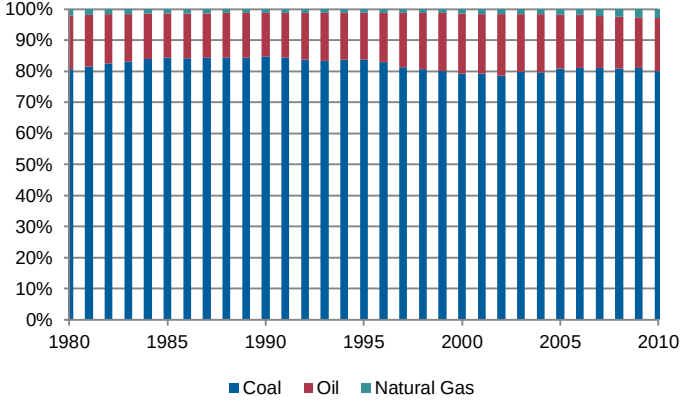
Emissions

China's Fuel Combustion CO_2 Emissions by Fuel (1980-2010)

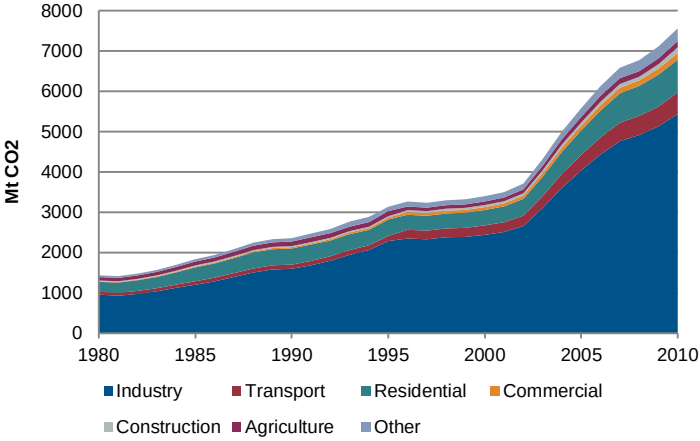


Note: Data based on total final consumption and energy used for energy transformation. CO2 emissions are calculated using 2006 IPCC carbon emission factors. Emissions data include the sequestered carbon in non-energy use petroleum products such as asphalt and lubricants.

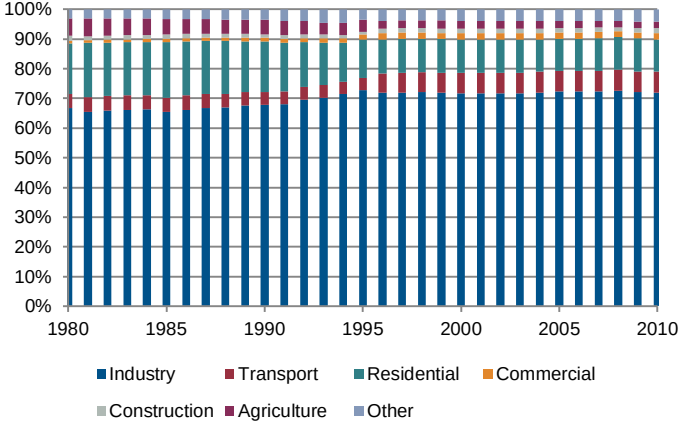
CO_2 Emissions by Fuel Shares



Energy-Related CO_2 Emissions by Sector (1980-2010)

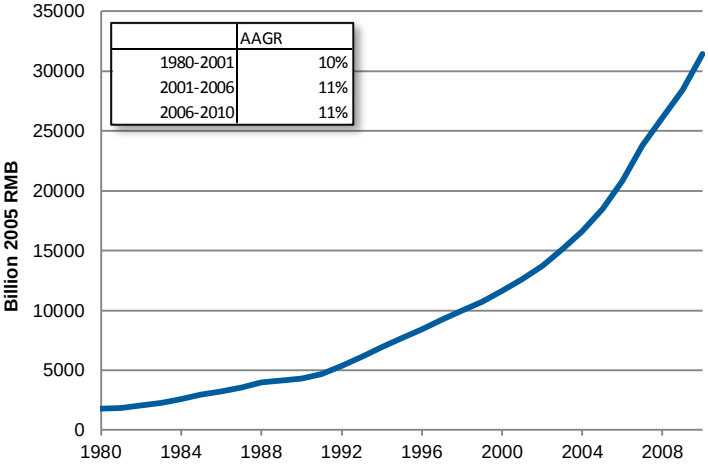


Energy-Related CO_2 Emissions by Sectoral Shares

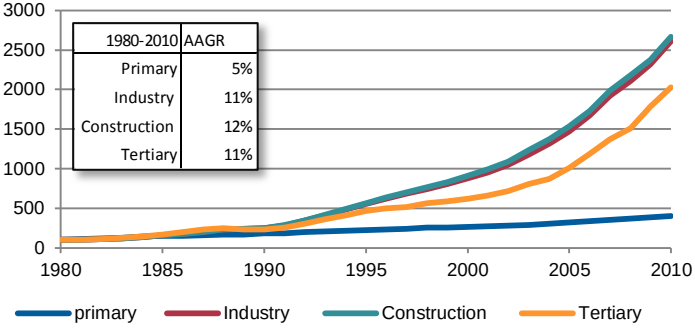


Economic and Demographic Indicators

China's Gross Domestic Product (1980-2010)



Chinese GDP by Sector (1980-2010)



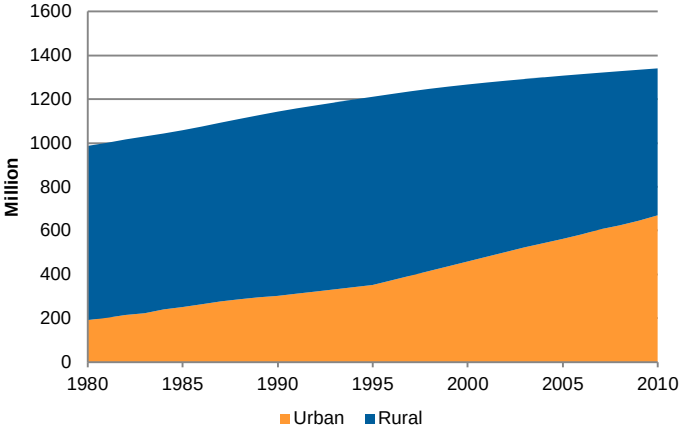
Primary --agriculture (farming, foresting, animal husbandry, sideline production and fishery).

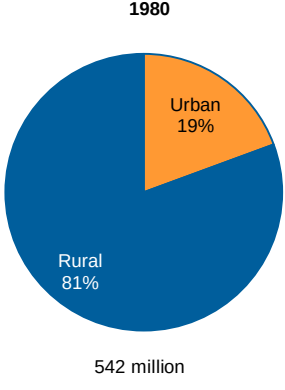
Industry --including mining and quarrying, manufacturing, water supply, electricity generation and supply, steam, hot water and gas.

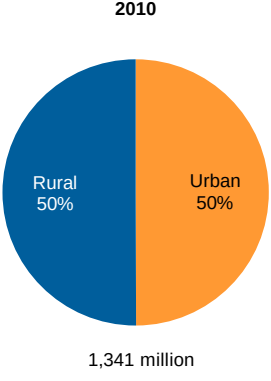
Construction -- including preparation of land and construction, alteration, and repair of buildings, structures, and other real property.

Tertiary--all the other industries not included in primary, industry, and construction. Residential and commercial building energy use is included in the tertiary sector. Energy use of buildings that belong to plants or factories is included in the industry sector.

Growth of Chinese Population (1980-2010)

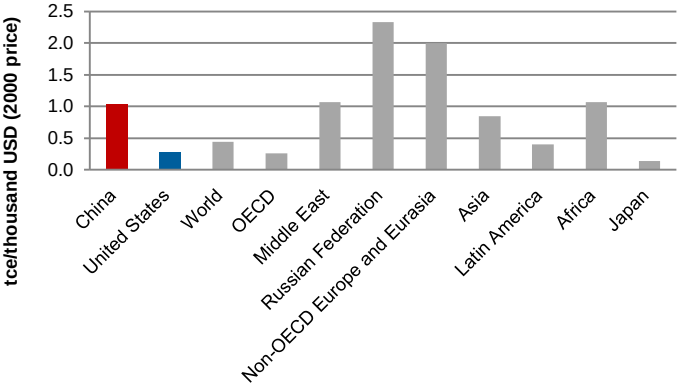






International Comparison

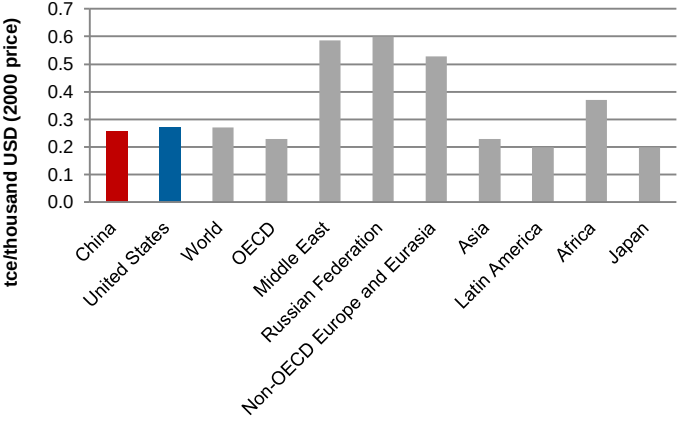
Total Primary Energy Production per GDP (MER*) (2009)



*Market Exchange Rates

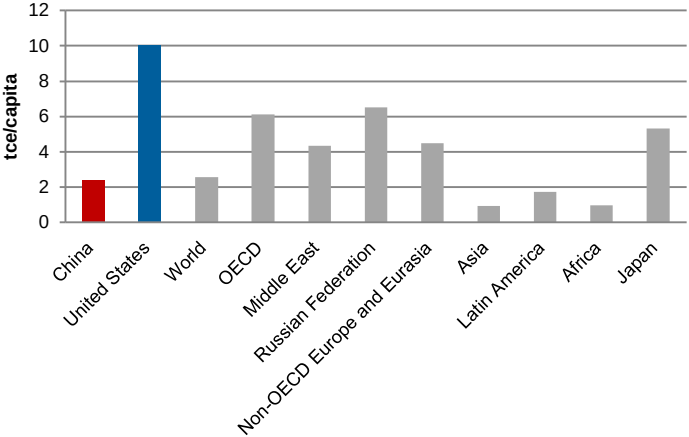
OECD: members of the Organization for Economic Co-operation and Development

Total Primary Energy Production per GDP (PPP**) (2009)

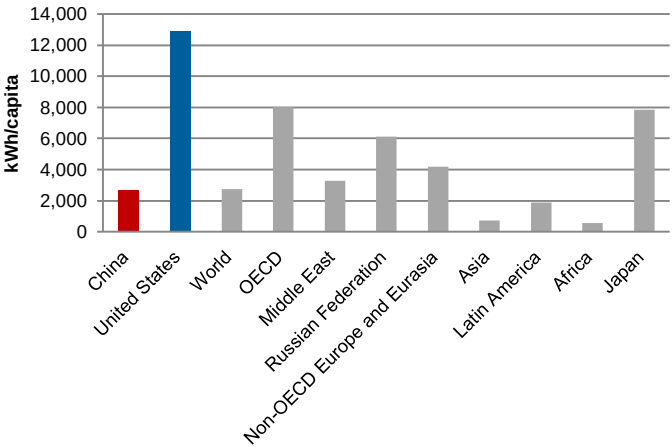


**Purchasing Power Parity

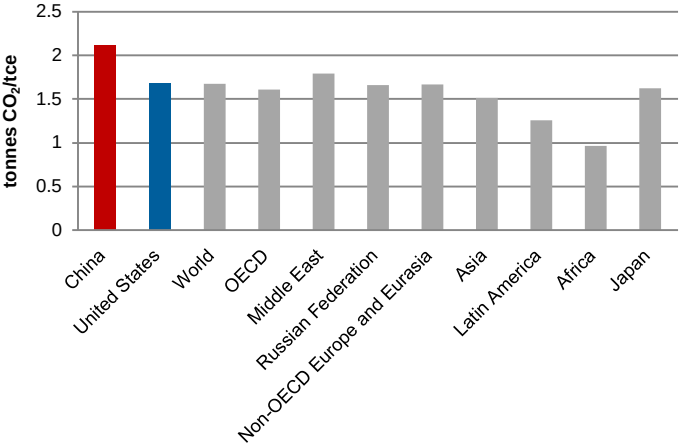
Total Primary Energy Production per Capita (2009)



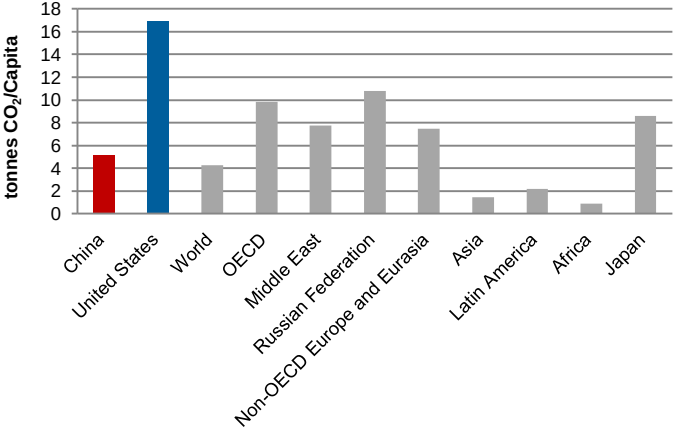
Electricity Consumption per Capita (2009)



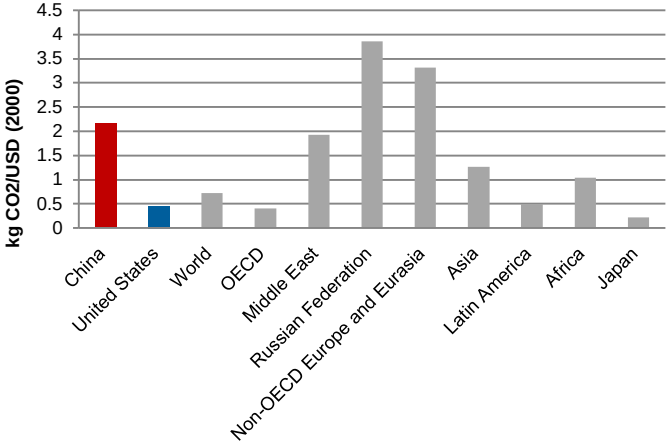
Energy-Related CO_2 Emissions per Total Primary Energy Supply (2009)



Energy-Related CO_2 Emissions per Capita (2009)

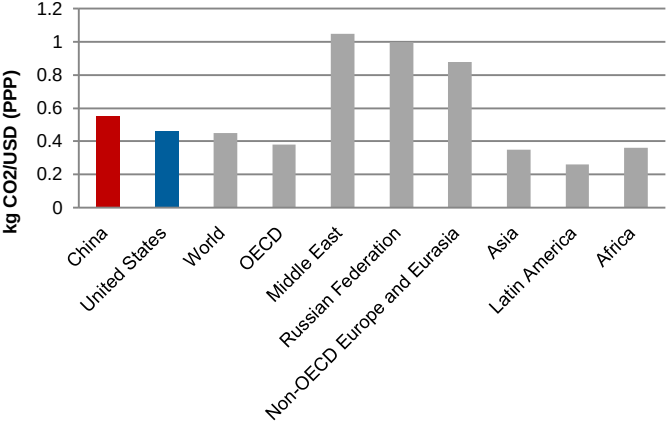


Energy-Related CO_2 Emissions per GDP (MER*)(2009)



* Market Exchange Rates

Energy-Related CO_2 Emissions per GDP (PPP**) (2009)



** Purchasing Power Parity

Appendix 1 – Table of Abbreviations

Abbreviation	Full Form
bm^3	billion cubic meters
bm^3/yr	billion cubic meters/year
Gt	giga (billion) tonnes
kgce	kilogram of coal equivalent
kgce/cap	kilogram of coal equivalent/capita
kWh	kilowatt-hours
kWh/cap	kilowatt-hour/capita
Mt	million tonnes
Mt/yr	million tonnes/year
Mtce	million tonnes of coal equivalent
Mtce/yr	million tonnes of coal equivalent/year
MWh	megawatt-hours
MWh/t	megawatt-hour/tonne
MWh/yr	megawatt-hour/year
RMB	renminbi (Chinese currency)
RMB/kWh	renminbi/kilowatt-hour
RMB/m^3	renminbi/cubic meter
RMB/tce	renminbi/tonnes of coal equivalent
tce	tonnes of coal equivalent
TWh	terawatt-hours

Glossary

Coal	Coal includes both primary (raw coal, cleaned coal, washed coal, briquettes) and derived fuels (coke, coke oven gas, and other coking products).
Crude Oil	Crude oil includes crude oil, natural gas liquids, refinery feedstock, additives and other hydrocarbon.
Petroleum Products	Petroleum products include gasoline, kerosene, diesel oil, fuel oil, LPG, refinery gas and other petroleum products.
Gas	Gas includes natural gas.
Nuclear	Nuclear shows the primary heat equivalent of the electricity produced by a nuclear power plant.
Hydro	Hydro shows the energy content of the electricity produced by a hydro power plant.
Indigenous Production	Indigenous production is the production of primary energy.
International Marine Bunkers	International marine bunker cover those quantities delivered to sea-going ships of all flags, including warships.
OECD	Organization for Economic Co-operation and Development, which includes 34 member countries.
Region – East	The east region of China is defined to include provinces of Anhui, Fujian, Jiangsu, Jiangxi, Shandong and Zhejiang.
Region – West	The east region of China is defined to include cities and provinces of Gansu, Ningxia, Qinghai, Shaanxi, Xinjiang, Chongqing, Guizhou, Sichuan, Tibet and Yunnan.
Region – North	The south region of China is defined to include cities and provinces of Beijing, Hebei, Inner Mongolia, Shanxi, Heilongjiang, Jilin and Liaoning.
Region – South	The south region of China is defined to include provinces of Guangdong, Guangxi, Hainan, Henan, Hubei and Hunan.
Stock Changes	Stock changes reflect the difference between opening stock levels on the first day of the year and closing levels of the last day of the year of stocks on national territory held by producers, importers, energy transformation industries and large consumers.
Total Primary Energy Supply	Total primary energy supply equals to the total of indigenous production and imports, and minus exports and international marine bunkers and add the stock changes.
Transfer	Transformation includes both interproduct transfer and products transfer.
Statistical Differences	Statistical differences is a category that includes the sum of unexplained statistical differences for individual fuels.
Distribution and Transmission Losses	Distribution and transmission losses are losses in gas distribution, electricity transmission and coal transport.
Total Final Consumption	Total final consumption is the sum of consumption by end-use sectors. Electricity is converted to primary energy, at 0.404 kgce/kWh.

Appendix 2 – Conversion Factors from Physical Unit to Coal Equivalent

For this energy form...	1 unit of	equals in Mtce
Coal Total	Mt	0.714
Raw Coal	Mt	0.714
Cleaned Coal	Mt	0.9
Other Washed Coal	Mt	0.525
Briquettes	Mt	0.6
Coke	Mt	0.971
Coke Oven Gas	Billion m^3	0.593
Other Gas	Billion m^3	0.288
Other Coking Products	Mt	1.107
Petroleum Products	Mt	1.43
Crude Oil	Mt	1.429
Gasoline	Mt	1.471
Kerosene	Mt	1.471
Diesel Oil	Mt	1.457
Fuel Oil	Mt	1.429
LPG	Mt	1.714
Refinery Gas	Mt	1.571
Other Petroleum Products	Mt	1.31
Natural Gas	Billion m^3	1.33
Heat	TJ	3.4×10^{-5}
Heat	PJ	0.034
Primary Electricity (source)*	TWh	0.404
Primary Electricity (source)*	GWh	4.04×10^{-4}
Primary Electricity (site)*	TWh	0.123
Primary Electricity (site)*	GWh	1.23×10^{-4}
Thermal Power	TWh	0.404
Thermal Power	GWh	4.04×10^{-4}
Total Power	TWh	0.404
Total Power	GWh	4.04×10^{-4}
Other Energy	Mt	1
Fuelwood	Mt	0.571
Crop Residues	Mt	0.43
Dried Dung	Mt	0.471

* In aggregate energy accounts, electricity can be counted two ways, i.e., as the energy content of electricity at the point of end use (site value), or as the energy value of the fuel needed to generate and deliver a given amount of electricity to the point of end-use (replacement or primary energy value). Unless otherwise noted, Chinese energy accounts typically convert electricity at its primary value, since most is generated by coal-fired plants.

Appendix 3: Energy Balance/China 2010

Mtce					
	Total Coal	**Coal Raw**	**Coal Cleaned**	**Coal Washed**	**Coal Briquettes**
Total Primary Energy Supply	**2,283.17**	**2,302.82**	**(8.45)**	**(9.48)**	**(0.05)**
Indigenous Production	2,309.79	2,309.79			
Indigenous Production - Hydro Power					
Indigenous Production - Nuclear Power					
Recovery of Energy					
Import	116.45	116.43			0.02
Chinese Vessels Refueling Abroad					
Export	(13.64)	(13.59)			(0.04)
Foreign Vessels Refueling in China					
Stock Change	(129.43)	(109.81)	(8.45)	(9.48)	(0.03)
Total Transformation	**(1,627.10)**	**(1,730.69)**	**37.37**	**48.66**	**6.53**
Thermal Power	(1,103.43)	(1,080.33)	(0.04)	(28.65)	
Heating Supply	(108.91)	(104.00)	(0.09)	(6.03)	
Coal Washing	(70.58)	(498.08)	413.54	89.37	
Coking	(336.65)	(41.71)	(371.27)	(0.30)	
Petroleum Refineries	(1.52)	(0.81)	(0.84)	(0.03)	
Gas Works	(7.43)	(4.31)	(3.93)		
Gas Works - Coke input					
Briquettes	(1.44)	(1.45)		(5.70)	6.53
Losses in Transformation					
Total Consumption	**602.27**	**527.40**	**22.07**	**36.25**	**6.23**
Agriculture	12.22	11.93		0.21	
Industry	486.56	425.11	22.76	29.76	2.46
Industry - NonEnergy Use	30.63	27.96	1.17	1.28	
Construction	5.13	5.05	0.01	0.05	
Transportation, Telecommunications, Postal	4.56	4.38	0.10	0.08	
Wholesale, Retail Trade, and Catering Service	14.06	13.55		0.21	0.20
Other	14.33	12.98		0.93	0.07
Residential consumption	65.40	54.40		5.02	3.51
Residential consumption - Rural	51.81	44.38		3.32	2.45
Residential consumption - Urban	13.59	10.02		1.69	1.06
Statistical Difference	**53.80**	**44.74**	**6.05**	**2.93**	**0.24**

Appendix 3: Energy Balance/China 2010 (cont'd)

Mtce					
	Coke	Coke Oven Gas	Coal Gas not Coke Source	Coke Other Products	Total Petroleum
Total Primary Energy Supply	**(18.94**		**72.76**		**631.75**
Indigenous Production					290.31
Indigenous Production - Hydro Power					
Indigenous Production - Nuclear Power					
Recovery of Energy			72.76		
Import	0.11				411.72
Chinese Vessels Refueling Abroad					9.23
Export	(3.25)				(48.01)
Foreign Vessels Refueling in China					(10.32)
Stock Change	(15.80)				(21.18)
Total Transformation	**352.76**	**3.34**	**(30.42)**	**7.56**	**(38.00)**
Thermal Power		(0.63)	(24.14)		(6.57)
Heating Supply		(0.43)	(11.31)		(8.48)
Coal Washing					
Coking	351.60	4.26		7.67	
Petroleum Refineries					(22.95)
Gas Works	2.41	0.14	5.03	0.50	(55.32)
Gas Works - Coke input	(1.25)			(0.12)	
Briquettes					
Losses in Transformation					**2.78**
Total Consumption	**325.86**	**3.27**	**41.98**	**7.45**	**577.63**
Agriculture	0.45				19.77
Industry	324.85	2.93	38.71	7.45	211.04
Industry - NonEnergy Use	13.00	0.03			60.73
Construction	0.06				43.55
Transportation, Telecommunications, Postal	0.00				210.35
Wholesale, Retail Trade, and Catering Service	0.05	0.00			6.88
Other	0.03	0.02	0.36		36.56
Residential consumption	0.42	0.32	3.27		49.49
Residential consumption - Rural	0.19		0.01		13.49
Residential consumption - Urban	0.23	0.32	3.26		36.00
Statistical Difference	**7.96**	**0.07**	**77.43**	**0.11**	**13.35**

Appendix 3: Energy Balance/China 2010 (cont'd)

Mtce					
	Crude Oil	**Gasoline**	**Kerosene**	**Diesel Oil**	**Fuel Oil**
Total Primary Energy Supply	**612.71**	**(6.56)**	**(2.31)**	**(3.24)**	**18.27**
Indigenous Production	290.11				
Indigenous Production - Hydro Power					
Indigenous Production - Nuclear Power					
Recovery of Energy					
Import	339.65	0.00	7.16	2.62	32.85
Chinese Vessels Refueling Abroad			3.52	0.15	5.66
Export	(4.33)	(7.61)	(8.90)	(6.76)	(14.15)
Foreign Vessels Refueling in China			(3.91)	(0.38)	(6.14)
Stock Change	(12.72)	1.04	(0.18)	1.13	0.04
Total Transformation	**(598.41)**	**108.27**	**28.27**	**215.73**	**16.89**
Thermal Power	(0.05)	(0.00)		(1.66)	(1.77)
Heating Supply	(0.05)			(0.06)	(2.88)
Coal Washing					
Coking					
Petroleum Refineries	(598.31)	108.27	28.27	217.45	21.54
Gas Works					
Gas Works - Coke input					
Briquettes					
Losses in Transformation	**2.74**				
Total Consumption	**11.52**	**101.29**	**25.62**	**211.50**	**34.34**
Agriculture		2.49	0.01	17.58	0.02
Industry	11.52	10.14	0.55	29.81	14.61
Industry - NonEnergy Use	1.53	0.33			
Construction		4.04	0.13	7.14	0.44
Transportation, Telecommunications, Postal		47.14	23.55	124.12	18.96
Wholesale, Retail Trade, and Catering Service		2.47	0.51	2.86	0.12
Other		17.16	0.57	18.75	0.19
Residential consumption		17.85	0.29	11.23	
Residential consumption - Rural		5.43	0.26	2.87	
Residential consumption - Urban		12.42	0.02	8.36	
Statistical Difference	**0.03**	**0.41**	**0.35**	**0.99**	**0.82**

Appendix 3: Energy Balance/China 2010 (cont'd)

Mtce				
	Liquid Petroleum Gas	Refinery Gas	Other Petroleum Products	Natural Gas
Total Primary Energy Supply	**3.97**		**8.09**	**141.96**
Indigenous Production				126.15
Indigenous Production - Hydro Power				
Indigenous Production - Nuclear Power				
Recovery of Energy				
Import	5.60		22.67	21.19
Chinese Vessels Refueling Abroad				
Export	(1.59)		(5.05)	(5.36)
Foreign Vessels Refueling in China				
Stock Change	(0.04)		(9.53)	
Total Transformation	**35.04**	**17.66**	**141.22**	**(29.02)**
Thermal Power		(1.16)	(1.88)	(24.46)
Heating Supply	(0.02)	(2.76)	(2.73)	(3.87)
Coal Washing				
Coking				
Petroleum Refineries	35.06	21.58	145.82	
Gas Works				(0.52)
Gas Works - Coke input				
Briquettes				
Losses in Transformation	**0.04**			**2.44**
Total Consumption	**37.37**	**17.32**	**140.93**	**109.96**
Agriculture	0.08			0.07
Industry	9.07	17.32	111.67	59.66
Industry - NonEnergy Use	0.99		53.18	14.92
Construction	0.12		29.26	0.15
Transportation, Telecommunications, Postal	1.01			12.81
Wholesale, Retail Trade, and Catering Service	1.24			3.62
Other	0.87			3.46
Residential consumption	24.97			30.18
Residential consumption - Rural	6.16			0.09
Residential consumption - Urban	18.81			30.18
Statistical Difference	**1.60**	**0.34**	**180.81**	**0.46**

Appendix 3: Energy Balance/China 2010 (cont'd)

Mtce				
	Electricity	**Heat**	**Other Energy**	**Total Energy**
Total Primary Energy Supply	**348.13**	**9.68**		**3,468.52**
Indigenous Production	353.59			3,079.84
Indigenous Production - Hydro Power	291.76			291.76
Indigenous Production - Nuclear Power	29.85			29.85
Recovery of Energy		9.68	5.58	88.02
Import	2.24			551.71
Chinese Vessels Refueling Abroad				9.23
Export				(70.27)
Foreign Vessels Refueling in China				(10.32)
Stock Change				(166.40)
Total Transformation	**1,346.10**	**91.58**	**(5.57)**	**71.23**
Thermal Power	1,346.10	(8.18)	(3.79)	174.90
Heating Supply		99.76	(1.74)	(34.98)
Coal Washing				(70.58)
Coking				26.88
Petroleum Refineries			(0.04)	(24.51)
Gas Works				(55.20)
Gas Works - Coke input				(1.37)
Briquettes				(1.44)
Losses in Transformation	**103.76**	**1.16**		**110.14**
Total Consumption	**1,590.40**	**100.10**		**3,358.91**
Agriculture	39.45	0.03		71.99
Industry	1,143.46	72.48		2,347.15
Industry - NonEnergy Use				119.30
Construction	19.52	0.22		68.64
Transportation, Telecommunications, Postal	29.68	0.56		257.96
Wholesale, Retail Trade, and Catering Service	52.20	1.33		78.14
Other	99.05	2.56		156.36
Residential consumption	207.04	22.92		379.03
Residential consumption - Rural	86.32			151.91
Residential consumption - Urban	120.72	22.92		227.20
Statistical Difference	**0.08**	**0.00**	**0.01**	**153.26**

Appendix 3: Energy Balance/China 2010

Physical Amount					
	Total Coal	**Coal Raw**	**Coal Cleaned**	**Coal Washed**	**Coal Briquettes**
Total Primary Energy Supply	**3,197.72**	**3,225.24**	**(9.39)**	**(18.05)**	**(0.09)**
Indigenous Production	3,235.00	3,235.00			
Indigenous Production - Hydro Power					
Indigenous Production - Nuclear Power					
Recovery of Energy					
Import	163.10	163.07			0.03
Chinese Vessels Refueling Abroad					
Export	(19.10)	(19.03)			(0.07)
Foreign Vessels Refueling in China					
Stock Change	(181.27)	(153.79)	(9.39)	(18.05)	(0.05)
Total Transformation	**(2,278.86)**	**(2,423.94)**	**41.52**	**92.68**	**10.88**
Thermal Power	(1,545.42)	(1,513.07)	(0.05)	(54.57)	
Heating Supply	(152.53)	(145.65)	(0.11)	(11.48)	
Coal Washing	(98.85)	(697.58)	459.49	170.22	
Coking	(471.50)	(58.42)	(412.52)	(0.56)	
Petroleum Refineries	(2.13)	(1.14)	(0.93)	(0.06)	
Gas Works	(10.40)	(6.03)	(4.37)		
Gas Works - Coke input					
Briquettes	(2.02)	(2.03)		(10.86)	10.88
Losses in Transformation					
Total Consumption	**843.51**	**738.65**	**24.52**	**69.05**	**10.39**
Agriculture	17.11	16.71		0.40	
Industry	681.46	595.39	25.29	56.68	4.10
Industry - NonEnergy Use	42.89	39.16	1.30	2.44	
Construction	7.19	7.07	0.01	0.10	
Transportation, Telecommunications, Postal	6.39	6.13	0.11	0.15	
Wholesale, Retail Trade, and Catering Service	19.70	18.98		0.39	0.33
Residential consumption	91.59	76.19		9.56	5.84
Residential consumption - Rural	72.56	62.15		6.33	4.08
Residential consumption - Urban	19.03	14.03		3.23	1.77
Other	20.07	18.18		1.77	0.11
Statistical Difference	**75.35**	**62.66**	**6.72**	**5.58**	**0.40**

Appendix 3: Energy Balance/China 2010 (cont'd)

Physical Quantity					
	Coke	**Coke Oven Gas**	**Coal Gas not Coke Source**	**Coke Other Products**	**Total Petroleum**
Total Primary Energy Supply	**(19.51)**		**252.65**		**441.78**
Indigenous Production					203.01
Indigenous Production - Hydro Power					
Indigenous Production - Nuclear Power					
Recovery of Energy			252.65		
Import	0.11				287.92
Chinese Vessels Refueling Abroad					6.45
Export	(3.35)				(33.58)
Foreign Vessels Refueling in China					(7.21)
Stock Change	(16.27)				(14.81
Total Transformation	**363.30**	**5.64**	**(105.63)**	**6.83**	**(26.57)**
Thermal Power		(1.05)	(83.82)		(4.59)
Heating Supply		(0.73)	(39.26)		(5.93)
Coal Washing					
Coking	362.10	7.18		6.93	
Petroleum Refineries					(16.05)
Gas Works	2.48	0.24	17.45	0.45	(38.69)
Gas Works - Coke input	(1.28)			(0.11)	
Briquettes					
Losses in Transformation					**1.94**
Total Consumption	**335.60**	**5.51**	**145.76**	**6.73**	**403.94**
Agriculture	0.47				13.83
Industry	334.55	4.95	134.40	6.73	147.58
Industry - NonEnergy Use	13.38	0.05			42.47
Construction	0.06				30.45
Transportation, Telecommunications, Postal	0.00				147.10
Wholesale, Retail Trade, and Catering Service	0.05	0.01			4.81
Residential consumption	0.43	0.53	11.36		34.61
Residential consumption - Rural	0.20		0.04		9.43
Residential consumption - Urban	0.24	0.53	11.32		25.17
Other	0.03	0.03	1.26		25.57
Statistical Difference	**8.19**	**0.13**	**268.84**	**0.10**	**9.33**

Appendix 3: Energy Balance/China 2010 (cont'd)

Physical Quantity					
	Crude Oil	**Gasoline**	**Kerosene**	**Diesel Oil**	**Fuel Oil**
Total Primary Energy Supply	**428.77**	**(4.46)**	**(1.57)**	**(2.23)**	**12.78**
Indigenous Production	203.01				
Indigenous Production - Hydro Power					
Indigenous Production - Nuclear Power					
Recovery of Energy					
Import	237.68	0.00	4.87	1.80	22.99
Chinese Vessels Refueling Abroad			2.39	0.10	3.96
Export	(3.03)	(5.17)	(6.05)	(4.64)	(9.90)
Foreign Vessels Refueling in China			(2.66)	(0.26)	(4.30)
Stock Change	(8.90)	0.71	(0.12)	0.78	0.03
Total Transformation	**(418.76)**	**73.60**	**19.22**	**148.07**	**11.82**
Thermal Power	(0.04)	(0.00)		(1.14)	(1.24)
Heating Supply	(0.03)			(0.04)	(2.01)
Coal Washing					
Coking					
Petroleum Refineries	(418.69)	73.60	19.22	149.24	15.07
Gas Works					
Gas Works - Coke input					
Briquettes					
Losses in Transformation	**1.92**				
Total Consumption	**8.06**	**68.86**	**17.41**	**145.16**	**24.03**
Agriculture		1.69	0.01	12.07	0.01
Industry	8.06	6.89	0.38	20.46	10.22
Industry - NonEnergy Use	1.07	0.22			
Construction		2.75	0.09	4.90	0.31
Transportation, Telecommunications, Postal		32.05	16.01	85.19	13.27
Wholesale, Retail Trade, and Catering Service		1.68	0.35	1.97	0.09
Residential consumption		12.14	0.19	7.71	
Residential consumption - Rural		3.69	0.18	1.97	
Residential consumption - Urban		8.45	0.02	5.73	
Other		11.66	0.39	12.87	0.14
Statistical Difference	**0.02**	**0.28**	**0.24**	**0.68**	**0.57**

Appendix 3: Energy Balance/China 2010 (cont'd)

Physical Quantity				
	Liquid Petroleum Gas	**Refinery Gas**	**Other Petroleum Products**	**Natural Gas**
Total Primary Energy Supply	**2.32**		**6.17**	**106.74**
Indigenous Production				94.85
Indigenous Production - Hydro Power				
Indigenous Production - Nuclear Power				
Recovery of Energy				
Import	3.27		17.31	15.93
Chinese Vessels Refueling Abroad				
Export	(0.93)		(3.86)	(4.03)
Foreign Vessels Refueling in China				
Stock Change	(0.02)		(7.28)	
Total Transformation	**20.45**	**11.24**	**107.80**	**(21.82)**
Thermal Power		(0.74)	(1.44)	(18.39)
Heating Supply	(0.01)	(1.76)	(2.08)	(2.91)
Coal Washing				
Coking				
Petroleum Refineries	20.45	13.74	111.32	
Gas Works				(0.39)
Gas Works - Coke input				
Briquettes				
Losses in Transformation	**0.02**			**1.84**
Total Consumption	**21.80**	**11.02**	**107.58**	**82.67**
Agriculture	0.05			0.05
Industry	5.29	11.02	85.25	44.86
Industry - NonEnergy Use	0.58		40.60	11.22
Construction	0.07		22.34	0.12
Transportation, Telecommunications, Postal	0.59			9.64
Wholesale, Retail Trade, and Catering Service	0.73			2.72
Residential consumption	14.57			22.69
Residential consumption - Rural	3.59			0.07
Residential consumption - Urban	10.98			22.69
Other	0.51			2.60
Statistical Difference	**0.94**	**0.22**	**138.02**	**0.35**

Appendix 3: Energy Balance/China 2010 (cont'd)

Physical Quantity				
	Electricity	**Heat**	**Other Energy**	**Total Energy**
Total Primary Energy Supply	**861.72**	**284.66**		**3,468.52**
Indigenous Production	875.23			3,079.84
Indigenous Production - Hydro Power	722.17			291.76
Indigenous Production - Nuclear Power	73.88			29.85
Recovery of Energy		284.66	5.58	88.02
Import	5.55			551.71
Chinese Vessels Refueling Abroad				9.23
Export				(70.27)
Foreign Vessels Refueling in China				(10.32)
Stock Change				(166.40)
Total Transformation	**3,331.93**	**2,693.56**	**(5.57)**	**71.23**
Thermal Power	3,331.93	(240.67)	(3.79)	174.90
Heating Supply		2,934.23	(1.74)	(34.98)
Coal Washing				(70.58)
Coking				26.88
Petroleum Refineries			(0.04)	(24.51)
Gas Works				(55.20)
Gas Works - Coke input				(1.37)
Briquettes				(1.44)
Losses in Transformation	**256.82**	**34.00**		**110.14**
Total Consumption	**3,936.63**	**2,944.18**		**3,358.91**
Agriculture	97.65	0.91		71.99
Industry	2,830.35	2,131.89		2,347.15
Industry - NonEnergy Use				119.30
Construction	48.32	6.62		68.64
Transportation, Telecommunications, Postal	73.45	16.38		257.96
Wholesale, Retail Trade, and Catering Service	129.20	39.02		78.14
Residential consumption	512.46	674.10		379.03
Residential consumption - Rural	213.66			151.91
Residential consumption - Urban	298.81	674.10		227.20
Other	245.18	75.26		156.36
Statistical Difference	**0.20**	**0.03**	**0.01**	**153.26**

Appendix 4: Data Sources

1. Supply

United Nations. *United Nations Commodity Trade Statistics Database*. New York: United Nations.

National Bureau of Statistics of the People's Republic of China, various years. *China Energy Statistical Yearbook*. Beijing: China Statistics Press.

2. Transformation

National Bureau of Statistics of the People's Republic of China, various years. *China Energy Statistical Yearbook*. Beijing: China Statistics Press.

3. Consumption

National Bureau of Statistics of the People's Republic of China, various years. *China Energy Statistical Yearbook*. Beijing: China Statistics Press.

4. Prices

Department of Price, National Development and Reform Commission, China.

State Electricity Regulatory Commission of the People's Republic of China, various years. *Annual Report of Electricity Regulation*. Beijing: State Electricity Regulatory Commission.

Energy Information Administration, United States. *International Energy Statistics*.

Ni, C. 2009. *China Energy Primer*. Berkeley, CA: Lawrence Berkeley National Laboratory (LBNL-2860E).

Appendix 4: Data Sources

5. Emissions

National Bureau of Statistics of the People's Republic of China, various years. *China Energy Statistical Yearbook*. Beijing: China Statistics Press.

National Bureau of Statistics of the People's Republic of China, various years. *China Statistical Yearbook*. Beijing: China Statistics Press.

Intergovernmental Panel on Climate Change (IPCC), 2006. *Revised 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Reference Manual (Volume 3).*

6. Economic and Demographic Indicators

National Bureau of Statistics of the People's Republic of China, various years. *China Statistical Yearbook*. Beijing: China Statistics Press.

7. International Comparison

International Energy Agency (IEA). 2011. *Key World Energy Statistics* 2011. Paris, France: IEA.

Appendices:

National Bureau of Statistics of the People's Republic of China, 2012. *2011 China Energy Statistical Yearbook*. Beijing: China Statistics Press.

Acknowledgements

The LBNL team responsible for this compilation of energy statistics of China consists of David Fridley, Mark Levine, Hongyou Lu, and Cecilia Fino-Chen. The team wishes to acknowledge the following institutions and individuals:

- The Dow Chemical Company for their financial support of the compilation and equally for their patience in accepting the long delay brought about by the decadal revision of energy statistics;
- The China Sustainable Energy Program of the Energy Foundation whose grants have enabled the China Energy Group to gain access to many data sources in China and to augment the expertise needed to understand the data.
- Our Chinese colleagues who provided valuable data.
- The International Energy Agency (IEA) whose compilation "Key World Energy Statistics" gave us the idea for this booklet and whose template served as a guide to our work. "Imitation is the highest form of flattery."
- Darren Verbout, for his wonderful sense of graphics presentation and layout and especially for his willingness to do whatever was needed when it was needed; and
- All members of the China Energy Group at LBNL for their assistance in data collection and review.

We also acknowledge most of these same parties for the support of the much more extensive China Energy Databook. Instructions for obtaining the databook can be found on our website http://china.lbl.gov.

We plan to publish updates to this compilation annually or biannually. We are thus eager to learn about any errors you may find, suggestions for improvement, and the most important data additions you would like to see.

This work was supported by the U.S. Department of Energy under Contract No. DE-AC02-05CH11231.

Notes

Notes

Notes

For more information about the LBNL China Energy Group, go to our website:

http://china.lbl.gov

China Energy Group

Environmental Energy Technologies Division

Lawrence Berkeley National Laboratory

DISCLAIMER

This document was prepared as an account of work sponsored by the United States Government. While this document is believed to contain correct information, neither the United States Government nor any agency thereof, nor the Regents of the University of California, nor any of their employees, makes any warranty, express or implied, or assumes any legal responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by its trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof, or the Regents of the University of California. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof or the Regents of the University of California.