

Team Project Guidance

Energy Choices Around the World:

Countries Covered:

1. China,
2. Germany,
3. Kazakhstan,
4. Nigeria,
5. Tanzania, &
6. USA

<i>Point for Consideration</i>	<i>Country</i>
	China
➤ What are the main sources of energy used in the country?	1 Total fossil fuels/ coal -,crude oil,natural gas liquids-natural gas
➤ Describe the breakdown of energy production versus consumption in the country.	2 They import 3,356.40 thousand more barrels per day than they export (WR 2) Gas + 108 billion cubic feet (WR 15) Coal + 2332.908 million short tons (1) Total Primary energy (- 3,864 Quadrillion BTU)
➤ Describe the per-person energy usage averages among the population of the country.	3 (1) 34.9 million Btus
➤ What types of renewable energy sources are available for public and for what purposes?	4 solid biomasses-ex. Fuel wood biogas, Note- no geothermal, solar or wind

<p>➤ Describe the breakdown of renewable versus non-renewable energy resources in the country.</p> <p style="text-align: center;">China</p>	<p><i>Oil: 18.3 billion barrels in reserve</i></p> <p><i>Produce: 3806.2 thousand barrels/day</i></p> <p><i>Consume 6899.6 thousand barrels/day</i></p> <p><i>Natural gas: 53.3 trillion cubic feet in reserve</i></p> <p><i>Produce: 1.4 trillion cubic feet</i></p> <p><i>Consume 1.350.5 billion cubic feet</i></p> <p><i>Coal 126,214.7 million short tons in reserve</i></p> <p><i>Produce 2156.4 million short tons</i></p> <p><i>Consume 2062.4 million short tons</i></p> <p><i>Nuclear: 11 nuclear power reactors in commercial operation with 6 under construction. Accounts for 2.3% of total energy production.</i></p>
<p>➤ Describe energy conservation plans under consideration in the country.</p>	<p><i>Increasing dependence on foreign oil & the need to restrict growth of pollution discharges has prompted recent revitalization of energy conservation efforts. There is much room for improvement because Chinese companies consume much greater amount of energy per unit of production than the world average. There is a national goal of reducing energy usage by 20% by 2010. Each province & provincial-level city has been assigned energy reduction targets ranging from 30% to 12%. Success or failure in achieving these goals is a component of the performance evaluation of local officials.</i></p>
<p>➤ Describe the current and future energy concerns for this country.</p>	<p><i>80% of electricity is generated through the use of fossil fuels mainly coal. Hydroelectricity accounts for 18%.</i></p> <p><i>Due to serious pollution concerns including acid</i></p>

<p style="text-align: center;">China</p>	<p><i>rain & deforestation, China is moving towards the greater use of nuclear energy to satisfy the rapidly growing energy needs of its commercial & industrial sectors. Country aims to become self-sufficient in reactor design & construction, but is reliant on imported uranium.</i></p>
<p>➤ Summarize the positive and negative aspects of the country's overall energy usage, production, policies, and plans</p>	<p><i>China's energy needs are among the most rapidly increasing in the world. It currently relies heavily on imported fossil fuels which has created serious pollution concerns. The Energy Conservation Law is being more strictly enforced to require communities to reduce energy consumption. China is moving away from the use of fossil fuels towards nuclear energy production with more nuclear plants currently under construction and many more being planned. Currently nuclear energy only accounts for 2.3% of total production.</i></p>

Team Members: Margaret, Candy, Ken, Katalin

<i>Point for Consideration</i>	<i>Country</i> Germany
➤ What are the main sources of energy used in the country?	Germany uses fossil fuels, nuclear energy, and hydro-electric; also renewable energy, which includes solar, wind geothermal and biomass.
➤ Describe the breakdown of energy production versus consumption in the country.	Germany is the 5th largest consumer of oil in the world. Energy consumption totals equal about 337196,(m. tons), vs. production totals of 134317(m. tons).
➤ Describe the per-person energy usage averages among the population of the country.	Coal production is largest in Europe, avg. of 232.7 tons per day; oil avg. is 2.6 barrels per/day, and electric avg. are 524.6 billion kilowatt hours per/day. Upwards of 80% usage /residential per/day.
➤ What types of renewable energy sources are available for public and for what purposes?	Renewable energy sources include solar, wind, geothermal, for use in heating, electricity; biomass used for fuel. As of 2006, Germany is the world leader in wind energy.
➤ Describe the breakdown of renewable versus non-renewable energy resources in the country.	Renewable resources totaling 2075 vs. non-renewable energy at a staggering 28,6465. Since coal is its only major resource, Germany is importing most of its major energy.
➤ Describe energy conservation plans under consideration in the country.	Germany is working towards ending all of its nuclear energy over the next 15 years. There is also a plan in place to cut CO2 emissions by 21% by 2012. Plans also include continuation of more renewable sources, especially wind.
➤ Describe the current and future energy concerns for this country.	Major concerns for Germany include finding solutions to its major pollution issues due to coal production. Germany is the 3rd largest CO2 emitter behind the U.S. and Japan. Acid rain is

	<i>damaging forests, hindering biomass production. Baltic Sea pollution from raw sewage is also a major concern.</i>
➤ Summarize the positives and negative aspects of the country's overall energy usage, production, policies, and plans	<i>Germany has excellent coal resources, and continues to lead the world in wind energy. They continue to develop hydro-electric, solar, and geothermal, however biomass is presently very limited. But Germany's #1 environmental agreement is to reduce pollution, which is a direct result of its high CO2 emissions. As stated previously, Germany also has decided to move towards ending all nuclear power within 15 years.</i>

Team Members: **Katalin, Candy, Ken, Margaret**

<i>Point for Consideration</i>	<u>Country</u> <u>Kazakhstan</u>			
<i>Red indicates focus of info.</i>				
➤ What are the main sources of energy used in the country?	Energy Consumption by Source, 1999 (in thousand metric tons oil equivalent)			
	Total Fossil Fuels			34581
	Coal and coal products			20113
	Crude oil and natural gas liquids			7484
	Natural Gas			6874
	Hydroelectric			527
	Renewables, excluding hydroelectric:			73
	Primary solid biomass (includes fuelwood)			73
➤ Describe the breakdown of energy production versus consumption	Energy Production and Consumption	Kazakhstan	Asia (excl. Middle East)	World
	(in thousand metric tons of oil equivalent) {a}			

in the
country.

Total Energy Production, 2000	78102	2435747	10077984
% change since 1980	X	108 %	37 %
Energy Imports, 1997	4673	1076015	9521506
Energy Exports, 1997	31038	392653	3419104
Total Energy Consumption {b}, 1999	35439	2919333	9702786
Electricity consumption, 1999	3143	260920	1040770
Energy consumption per capita, 1997	2	1	2
% change since 1990	-63 %	12 %	0 %
Energy Consumption per GDP {c}, 1999:	511	221	244
% change since 1990	X	-14 %	-13 %

Country

Kazakhstan

Energy Consumption by Source, 1999 (in thousand metric tons oil equivalent)

Total Fossil Fuels	34581	2175366	7689047
Coal and coal products	20113	1013218	2278524
Crude oil and natural gas liquids	7484	829930	3563084
Natural Gas	6874	277374	2012559
Nuclear	0	117291	661901
Hydroelectric	527	44424	222223
Renewables, excluding hydroelectric:	73	578643	1097889
Primary solid biomass (includes fuelwood)	73	561751	1035139
Biogas and liquid biomass	0	1276	14931
Geothermal	0	14658	43802
Solar	0	865	2217
Wind	0	94	1748
Tide, wave, and ocean	0	0	53

Energy Production and Consumption

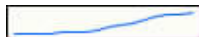
Petroleum (Thousand Barrels per Day)

Total Oil Production ⓘ



1,387.95 12,386 84,599 19 1,444.96

Crude Oil Production ⓘ



1,313.33 11,727 73,539 19 1,360.42

Consumption ⓘ

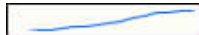
Country



243.08 5,547 84,705 51 ^F 252

Kazakhstan

Net Exports/Imports(-) ⓘ



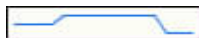
1,144.87 6,839 -- 14 ^F 1,193

Total Oil Exports to U.S. ⓘ



11 507 13,707 39 19

Refinery Capacity ⓘ



345 8,117 85,345 44 345

Proved Reserves ⓘ



9.000 78 1,293 17 30.000

(Billion Barrels)

[View History »](#)

2005

2006

15 year history Kazakhstan

Eurasia

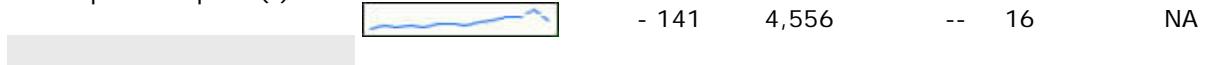
World Rank

Kazakhstan

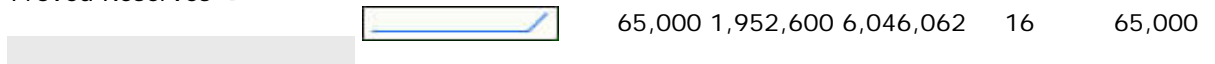
Natural Gas (Billion Cubic Feet)

Production ⓘ**Consumption** ⓘ

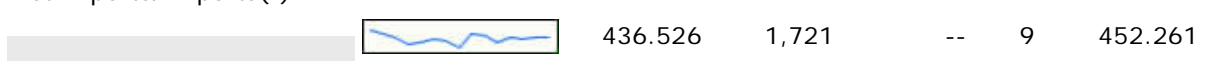
Net Exports/Imports(-) ⓘ



Proved Reserves ⓘ

[ry >](#)**Coal (Million Short Tons)****Production** ⓘ**Country****Kazakhstan****Consumption** ⓘ

Net Exports/Imports(-) ⓘ



(Trillion Btu)

[View History >](#)**Electricity (Billion Kilowatthours)****Net Generation** ⓘ**Net Consumption** ⓘ

Installed Capacity (GWe) ⓘ



17.157

345

3,872

35

NA

[View History >](#)

Country *Kazakhstan*

Total Primary Energy (Quadrillion Btu)

Production ⓘ



5.476

69

460

20

NA

Consumption ⓘ



2.839

46

463

28

NA

Energy Intensity ⓘ



14,207

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NA

(Btu per 2000 U.S. Dollars)

➤ Describe the per-person energy usage averages among the population of the country.

Energy Production and Consumption

Kazakhstan Asia (excl. Middle East)

World

(in thousand metric tons of oil equivalent) { a }

Total Energy Production, 2000

78102

2435747

10077984

% change since 1980

X

108 %

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Energy Imports, 1997

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Total Energy Consumption { b }, 1999

35439

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Electricity consumption, 1999

3143

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Energy consumption per capita, 1997

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% change since 1990

-63 %

12 %

0 %

Energy Consumption per GDP { c }, 1999:

511

221

244

	% change since 1990	X	-14 %	-13 %
➤ What types of renewable energy sources are available for public and for what purposes?	Hydroelectric 527 Renewables, excluding hydroelectric: 73 Primary solid biomass (includes fuelwood) 73			
➤ Describe energy conservation plans under consideration in the country.	<p><i>None known....they use half of the energy that they produce. Plus they are capable of producing even greater quantities of energy...by mining more and reselling it to the world markets.</i></p>			
<p><u>Country</u></p> <p><u>Kazakhstan</u></p>				
➤ Describe the current and future energy concerns for this country.	<p><i>They are mostly concerned with their economy being so heavily dependent upon selling oil, gas, and uranium to the rest of the world. As these non-renewable resources deplete what will the country then produce and sell to the world to sustain itself? They are more concerned with that than what energy they will use in the future.</i></p>			
➤ Summarize the positives and negative aspects of the country's overall energy usage,	<p><i>Right now they are still a developing country with a great number of natural resources—oil, gas, uranium. As a result they are counting on foreign investment to develop their infrastructure to mine, drill, process, and distribute these resources to their end customers. This takes a lot of money (investment), highly skilled labor—education, building relationships with other countries, and time. So their focus is developing their own reserves to build their country in other ways. However, they're a little short-sighted because they aren't planning for their own energy usage when those reserves are depleted. For several decades they seem to be in great shape but 100 years from now</i></p>			

production, policies, and plans

will they be in the same position as most other developed countries? Hmm....

Team Members: Ken, Candy, Margaret, & Katalin

<i>Point for Consideration</i>	<i>Country</i> Nigeria
➤ What are the main sources of energy used in the country?	<p>Nonrenewable: coal & coal products</p> <p><i>crude oil & liquid natural gas</i></p> <p><i>natural gas</i></p> <p>Renewable: hydroelectric</p> <p><i>biomass (wood)</i></p>
➤ Describe the breakdown of energy production versus consumption in the country.	<p>Total production (2000) 197,726 (thousand metric tons)</p> <p>Total consumption (1999) 87,286 (thousand metric tons)</p>
➤ Describe the per-person energy usage averages among the population of the country.	8.1 million BTUs
➤ What types of renewable energy sources are available for public and for what purposes?	<p>Industry 9035/81537 (10%)</p> <p>Transportation 5867/81537 (5%)</p> <p>Residential 64815/81537 (80%)</p> <p>Agriculture (0%)</p> <p>Commercial & Public Service 235/81537 (0.0025%)</p>

<p>➤ Describe the breakdown of renewable versus non-renewable energy resources in the country.</p> <p>Nigeria</p>	<p><i>Coal & coal products 37/14410 (0.003%)</i></p> <p><i>Crude oil & liquid natural gas 9349/14410 (0.6%)</i></p> <p><i>Natural gas 5261/14410 (30%)</i></p> <p><i>Nuclear 0%</i></p> <p><i>Hydroelectric 486/14410 (0.03%)</i></p> <p><i>Renewable (biomass) 72,390 (in thousand metric tons)</i></p>
<p>➤ Describe energy conservation plans under consideration in the country.</p>	<p><i>Energy conservation in products</i></p> <p><i>Energy efficiency & utilization</i></p> <p><i>Building codes for building designs that reduce energy consumption</i></p> <p><i>Manufacture of energy efficient equipment</i></p> <p><i>Expanding resource base for food production</i></p> <p><i>Expanding mass transportation to reduce energy consumption</i></p> <p><i>Increasing efficiency in energy storage & distribution</i></p> <p><i>Promote public awareness re: advantages of improved energy efficiency</i></p> <p><i>Institutionalizing water resources</i></p> <p><i>Controlling water pollution & minimizing waste</i></p>
<p>➤ Describe the current and future energy concerns for this country.</p>	<p><i>National Energy Policy establishes guidelines for protection of environment in exploitation of Nigeria's fossil fuels</i></p> <p><i>Exploration of renewable & alternative energy sources including solar, wind, & biomass</i></p>

<ul style="list-style-type: none"> ➤ Summarize the positives and negative aspects of the country's overall energy usage, production, policies, and plans 	<p><i>Nigeria is largest oil producer in Africa, 11th largest in world, & member of OPECC</i></p> <p><i>Political unrest has resulted in shutting-in of 20% of the total oil production.</i></p>
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Team Members: Ken, Candy, Margaret, Katalin

<i>Point for Consideration</i>	<i>Country Tanzania</i>
<ul style="list-style-type: none"> ➤ What are the main sources of energy used in the country? 	<p><i>Sources include fossil fuels(crude oil ,natural gas) and some hydroelectric</i></p>
<ul style="list-style-type: none"> ➤ Describe the breakdown of energy production versus consumption in the country. 	<p><i>In metric tons- consumption=15033 while Production=14601; consumption totals have continued to rise drastically in the last 20 years.</i></p>
<ul style="list-style-type: none"> ➤ Describe the per-person energy usage averages among the population of the country. 	<p><i>79% usage is residential, 12% is industry, the other 9% is transportation, commercial, and transportation.</i></p>
<ul style="list-style-type: none"> ➤ What types of renewable energy sources are available for public and for what purposes? 	<p><i>The only renewable energy source is solid biomass (14079) in fuelwood.</i></p>
<ul style="list-style-type: none"> ➤ Describe the breakdown of renewable versus non-renewable energy resources in the country. 	<p><i>Renewable is 14079 (thousand m. tons) vs. Non-renewable is 1577</i></p>
<ul style="list-style-type: none"> ➤ Describe energy conservation plans under consideration in the country. 	<p><i>Continue with hydroelectric production and renewable sources of biomass production; Tanzania also has plans to increase gas and coal by up to 7% per/year; however this process takes time to implement in Tanzania.</i></p>
<ul style="list-style-type: none"> ➤ Describe the current and future energy concerns for this country. 	<p><i>Tanzania's concerns are insufficient hydro-electric</i></p>

	<i>generators due to extreme power rationing in the country.</i>
<p>➤ Summarize the positives and negative aspects of the country's overall energy usage, production, policies, and plans</p> <p>Country Tanzania</p>	<i>Tanzania is an extremely poor country, that continues to struggle with consuming more energy than they are producing. Eighty % of the country is rural with an unemployment rate of 67%. Fifty-nine % of the population makes less than \$2.00per/day. Only 12% of their energy usage is in industry. Tanzania does have some production of natural gas coming from off shore in Zanzibar. Sixty % of their electric supplies are coming from hydro-electric power, but because of power rationing since 2006, there is a shortfall of generated power. Private participation in this country's future energy investments are now in excess of 32 million dollars.</i>

<i>Point for Consideration</i>	<i>Country</i>
	United States of America
➤ What are the main sources of energy used in the country?	<i>Petroleum, Natural gas and Electricity are our main sources of energy.</i>
➤ Describe the breakdown of energy production versus consumption in the country.	<i>We import or run a deficit of 12,356.95 thousand barrels of oil a day, Natural gas a daily deficit of 3,612 billion cubic feet daily . When looking at total energy we are in a deficit of about 30,000 Quadrillion BTU daily.</i>
➤ Describe the per-person energy usage averages among the population of the country.	<i>We use the equivalent of 8 thousand metric tons of oil yearly</i>
➤ What types of renewable energy sources are available for public and for what purposes?	<i>Our renewables include primary solid biomasses, liquid biomasses geothermal, solar power and wind.</i>

<ul style="list-style-type: none"> ➤ <i>United States of America</i> ➤ Describe the breakdown of renewable versus non-renewable energy resources in the country. ➤ 	<p><i>Our total fossil fuels are 854,743 metric tons oil equivalent and our renewable are 212,938 metric tons so we are in the deficit of about 6,111,805 million tons yearly</i></p>
<ul style="list-style-type: none"> ➤ Describe energy conservation plans under consideration in the country. 	<p><i>We need to increase our reusable resources.</i></p> <p><i>The development of solar and wind energy is mandatory. Go Green-reeducate consumers on the value of conservation and conversion .</i></p>
<ul style="list-style-type: none"> ➤ Describe the current and future energy concerns for this country. 	<p><i>A number of students had an interest in solar power for our homes, but the initial outlay cost is way to expensive. We need to make these affordable.</i></p>
<ul style="list-style-type: none"> ➤ Summarize the positives and negative aspects of the country's overall energy usage, production, policies, and plans. 	<p><i>The recent talk of off shore drilling for oil sounds great, except that we live in an area that would be greatly impacted should something happen.</i></p> <p><i>Nuclear power plants sound great except that they contain many hazard elements inside them.</i></p>