

### Vocab

Fossil Fuel Fuel that comes from the remnants of prehistoric organisms.

### Vocab (cont)

Commercial Energy Sources Sources th

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Vocab (cont)		Vocab (cont)		Vocab (cont)	
Subsistence Energy Sources	Sources gathered by individuals for their own use.	Conservation of Energy	Energy cannot be created or destroyed; it can only be changed from one form to another.	EROEI	Energy return obtained from the



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### Vocab (cont)

Cogene  
ration

Using a fuel to generate electricity and produce heat.

### Vocab (cont)

Coal

A solid fuel formed from the remains of 280-360 million yr old plant materials

### Vocab (cont)

Lignite, Sub-bituminous, bituminous, and anthracite.

The four types of coal r age, exposure to press

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Vocab (cont)		Vocab (cont)		Vocab (cont)	
Petroleum	A mixture of hydrocarbons, water, and sulfur that occur in underground deposits.	Oil	Uses heat to separate crude oil into gasoline, kerosene, fuel oil, and diesel fuel.	Natural Gas	Exists as a part of pe gaseous deposits se



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Vocab (cont)		Vocab (cont)		Vocab (cont)	
Oil	A slow-moving, viscous	Bitumen	A degraded kind of petroleum that forms when petroleum migrates	Hubbert	A graph that sh
Sands	deposit of bitumen mixed	(tar/p-	close to the surface where bacteria metabolize some of the light	Curve	production woul
	with sand, water, and	itch)	hydrocarbons and others evaporate.		point at which w
	clay.				



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Vocab (cont)	Vocab (cont)	Vocab (cont)
Fission A nuclear reaction in which a neutron hits a larger atomic nucleus, which then splits into 2+ parts.	Uranium 235 (U-235) The isotope of uranium that undergoes nuclear fission.	Fuel Rods The cylindrical tubes used in nuclear reactors.



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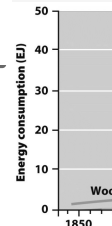
Vocab (cont)		Vocab (cont)		Vocab
Control Rods	Cylindrical devices that can be inserted between fuel rods to absorb excess neutrons, thus slowing/stopping the fission reaction.	Radioactive Waste	Nuclear fuel that can no longer produce enough heat to be used in a power plant, but still emits radioactivity.	High Radi Was



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Vocab (cont)		Vocab (cont)		The Hist United S
Low-Level	The protective clothing, tools, rags, and other things used in routine plant maintenance.	Nuclear	The reaction that occurs when lighter nuclei are forced together to produce heavier nuclei and release heat. This powers the Sun and other stars.	
Radioactive				
Waste				



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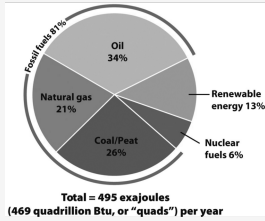
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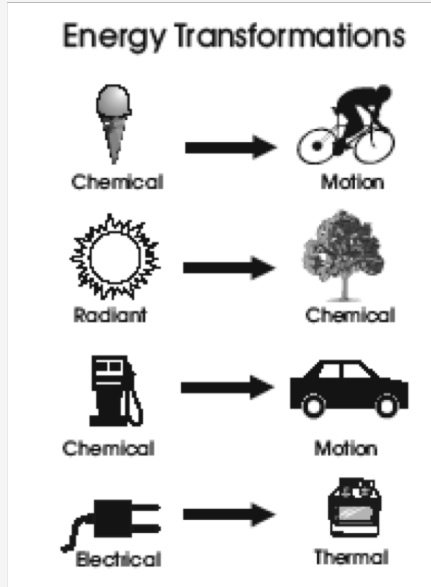
Figure 12.3  
Environmental Science  
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### Global Energy Use



### Energy Transformations



### Energy Use

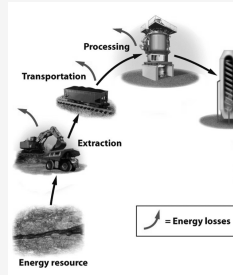


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### Pro/Con Coal

Advantages	Disadvantages
Energy-dense	Contains impurities
Plentiful	Release impurities into air when burned
Easy to exploit by surface mining	Toxic metals like mercury, lead, and arsenic are found in coal
Technological demands are small	Combustion leads to increased levels of sulfur dioxide and other air pollutants into the atmosphere.
Economic costs are low	Ash is left behind
Easy to handle and transport	Carbon is released into the atmosphere which contributes to climate change
Needs little refining	

### Pro/Con Petroleum

Advantages	Disadvantages
Convenient to transport and use	Releases carbon dioxide into atmosphere
Relatively energy-dense	Possibility of leaks when extracted
Cleaner-burning than coal	
Releases sulfur, mercury, lead, and arsenic into the atmosphere when burned	

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### Pro/Con Natural Gas

Advantages	Disadvantages
Contains fewer impurities and therefore emits almost no sulfur dioxide or particulates	When unburned, methane escapes into the atmosphere
Emits only 60% as much carbon dioxide as coal	Exploration of natural gas has the potential of contaminating groundwater

### Pro/Con Nuclear

Advantages	Disadvantages
No air pollution is produced	Possibility of accidents
Countries can limit their need for imported oil	Disposal of the radioactive waste

### Hubbert Curve

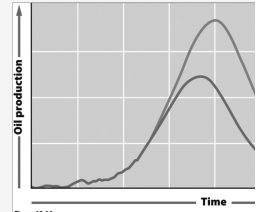


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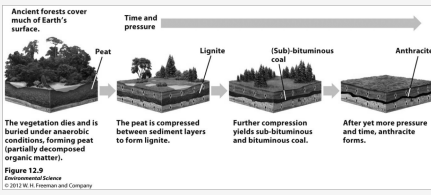
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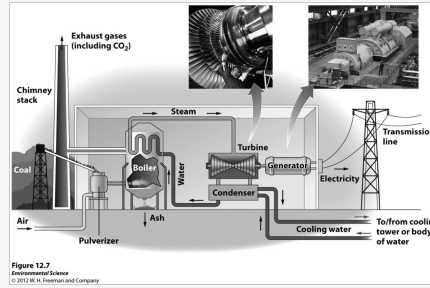
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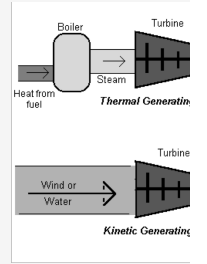
### Coal Formation



### Coal Plant Electricity Generation



### Electricity Generating P



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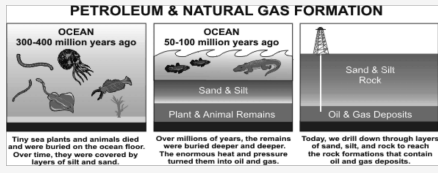
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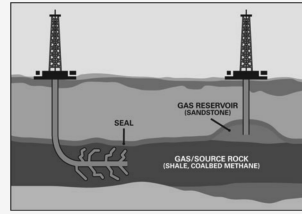
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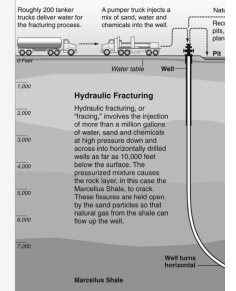
### Petroleum and Natural Gas Formation



### Hydraulic Fracking



### Fracking



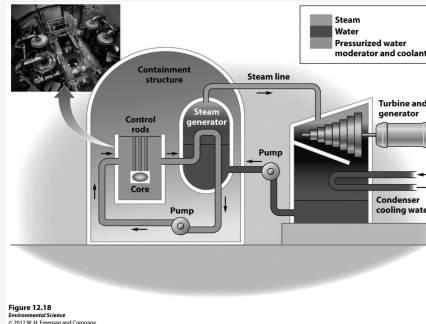
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### Nuclear Reactor



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