

Fossil Fuels

Mr. Skirbst

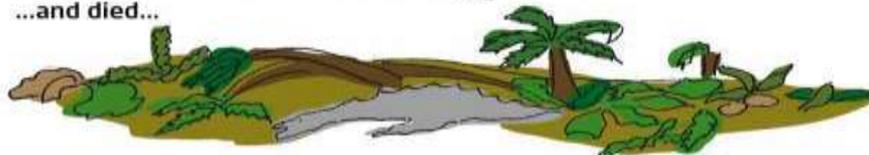
Fossil Fuels

- energy from remains of plants and animals

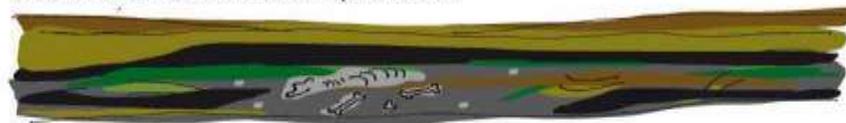
Ancient forests lived...



...and died...



...and were buried and compressed...



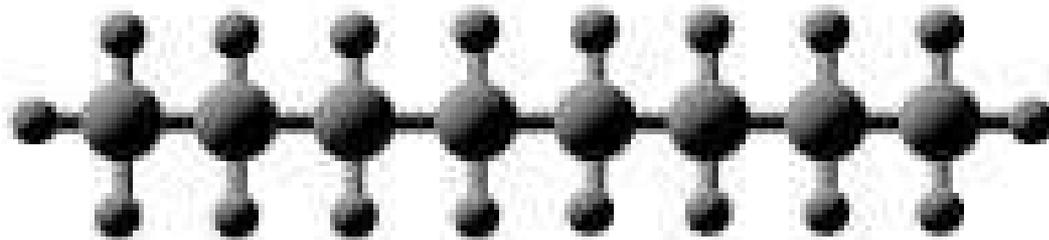
...to form coal.



Hydrocarbons

*- substance that contains
hydrogen and carbon*

Hydrocarbon



Key:



carbon

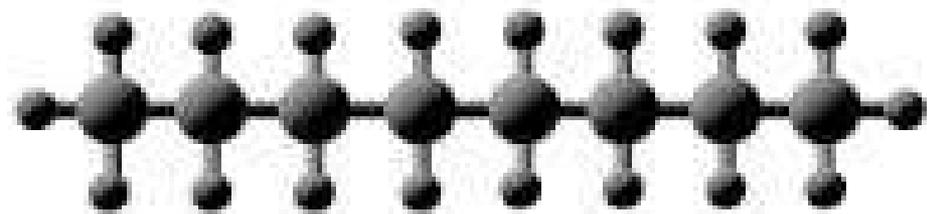


hydrogen

Hydrocarbons

- *substance that contains hydrogen and carbon*

Hydrocarbon



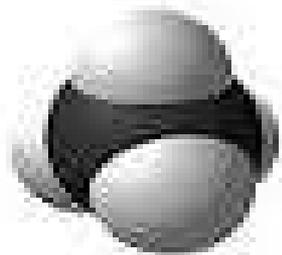
Key:


carbon


hydrogen

Combustion

*- burning hydrocarbons and
producing heat*



+



+



CH_4

+

2O_2

CO_2

+

$2\text{H}_2\text{O}$

3 Types of Fossil Fuels

1. Coal



3 Types of Fossil Fuels

1. Coal

2. Oil



3 Types of Fossil Fuels

1. Coal

2. Oil

3. Natural Gas



1. Coal

Solid fossil fuel (4 types)



1st Stage:
Peat
(decay of
vegetative material)

2nd Stage:
Lignite
(compressed peat)

3rd Stage:
Bituminous Coal
(compressed lignite)

4th Stage:
Anthracite Coal
(considered by some
to be a type of
metamorphic rock)

1. Coal

Solid fossil fuel

**- Formation depends on heat,
pressure, and time**

1. Coal

1. Peat – soft material made of decayed plant fibers



1. Coal

2. Lignite – “brown coal” soft with woody texture, formed from pressure to peat



1. Coal

**3. Bituminous coal – “soft coal,”
dark brown or black, most
abundant type of coal**

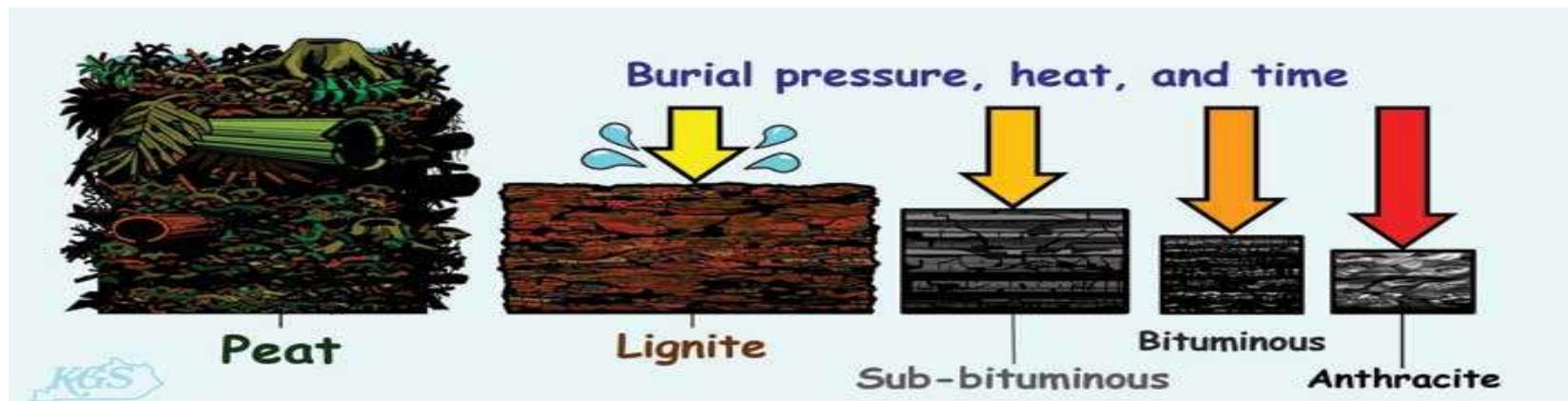
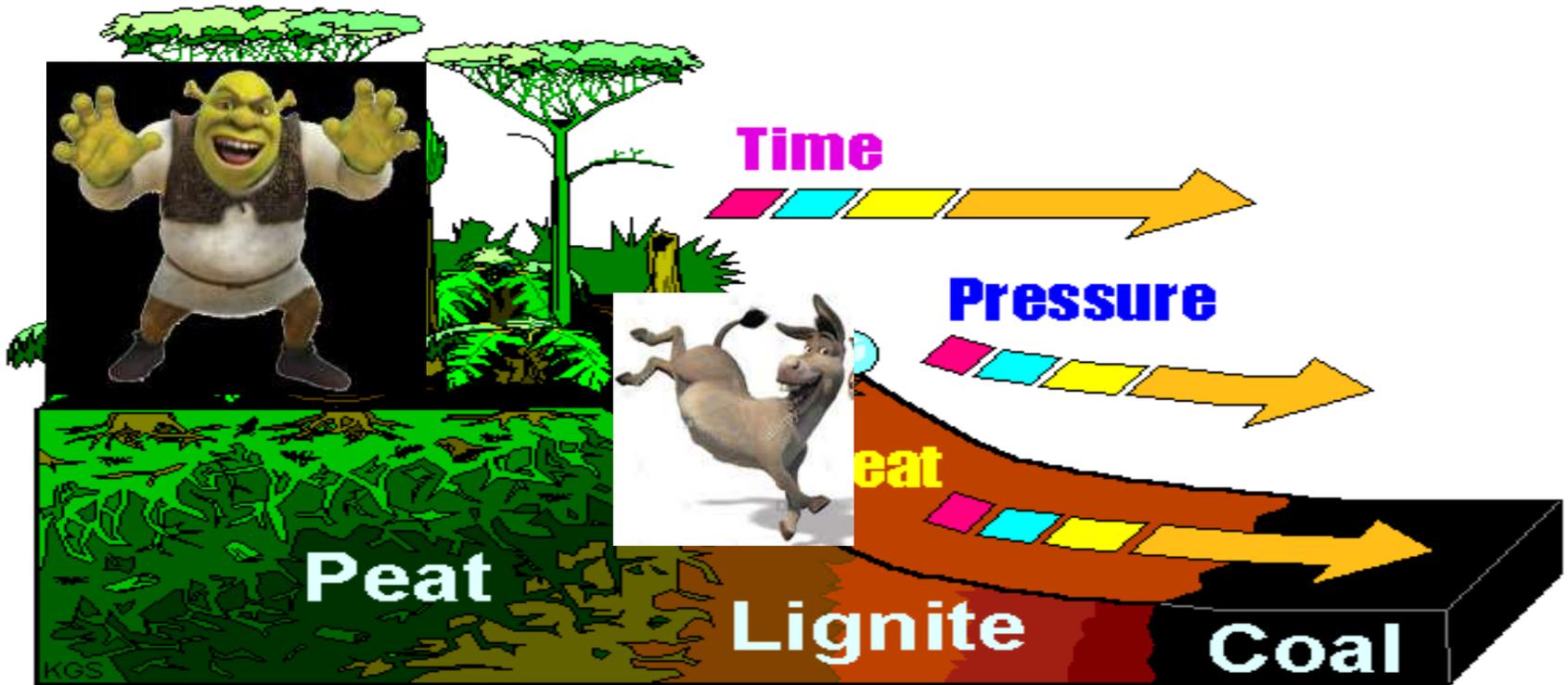


1. Coal

4. Anthracite coal – “hard coal,”
extremely hard and brittle,
almost pure carbon, burns most
efficiently



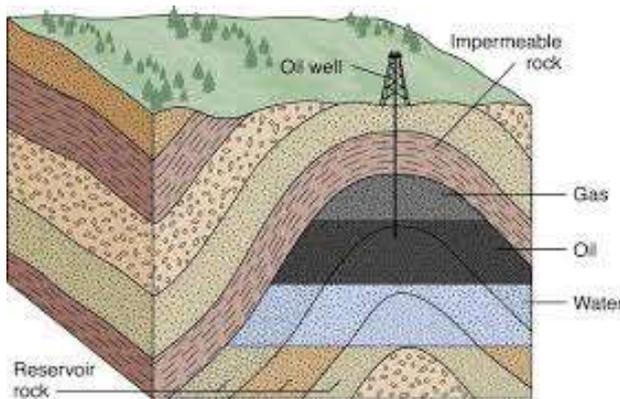
Stages of Coal Formation



2. Oil

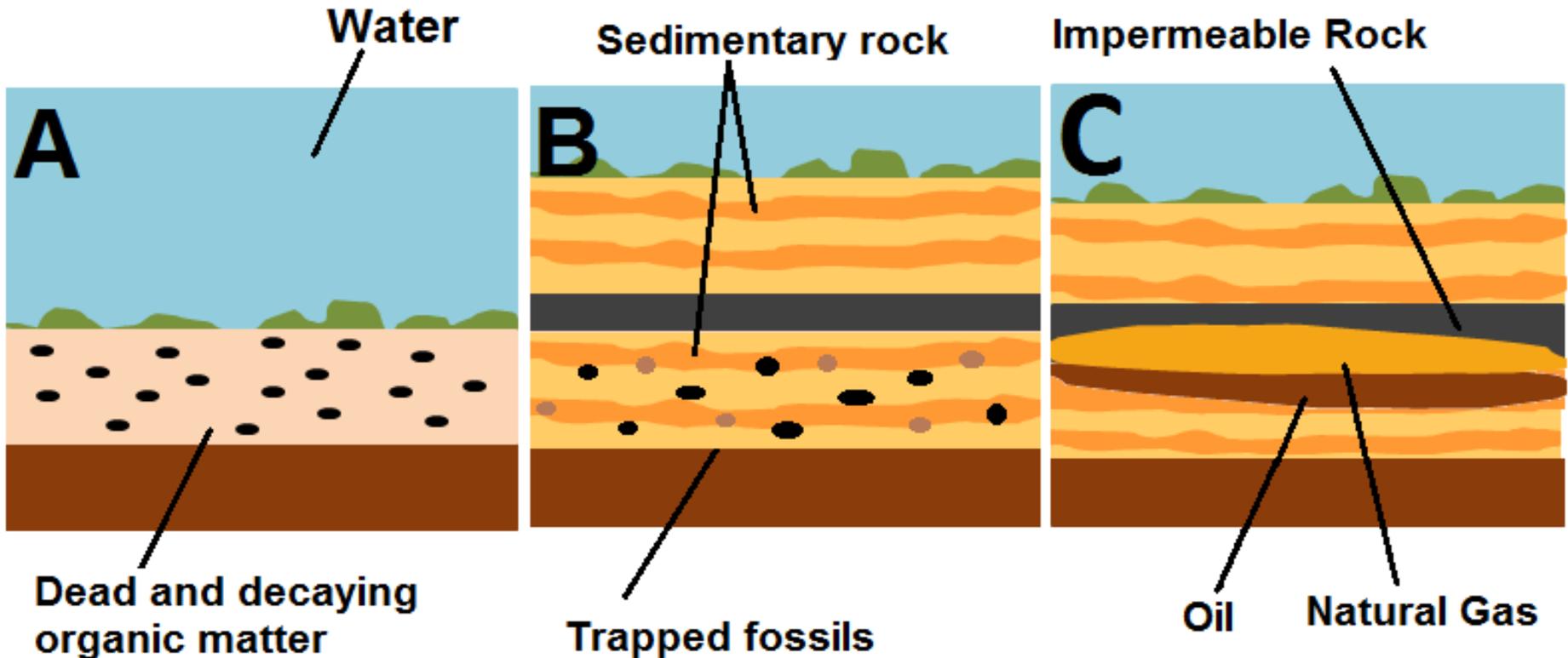
Liquid fossil fuel, also called

petroleum



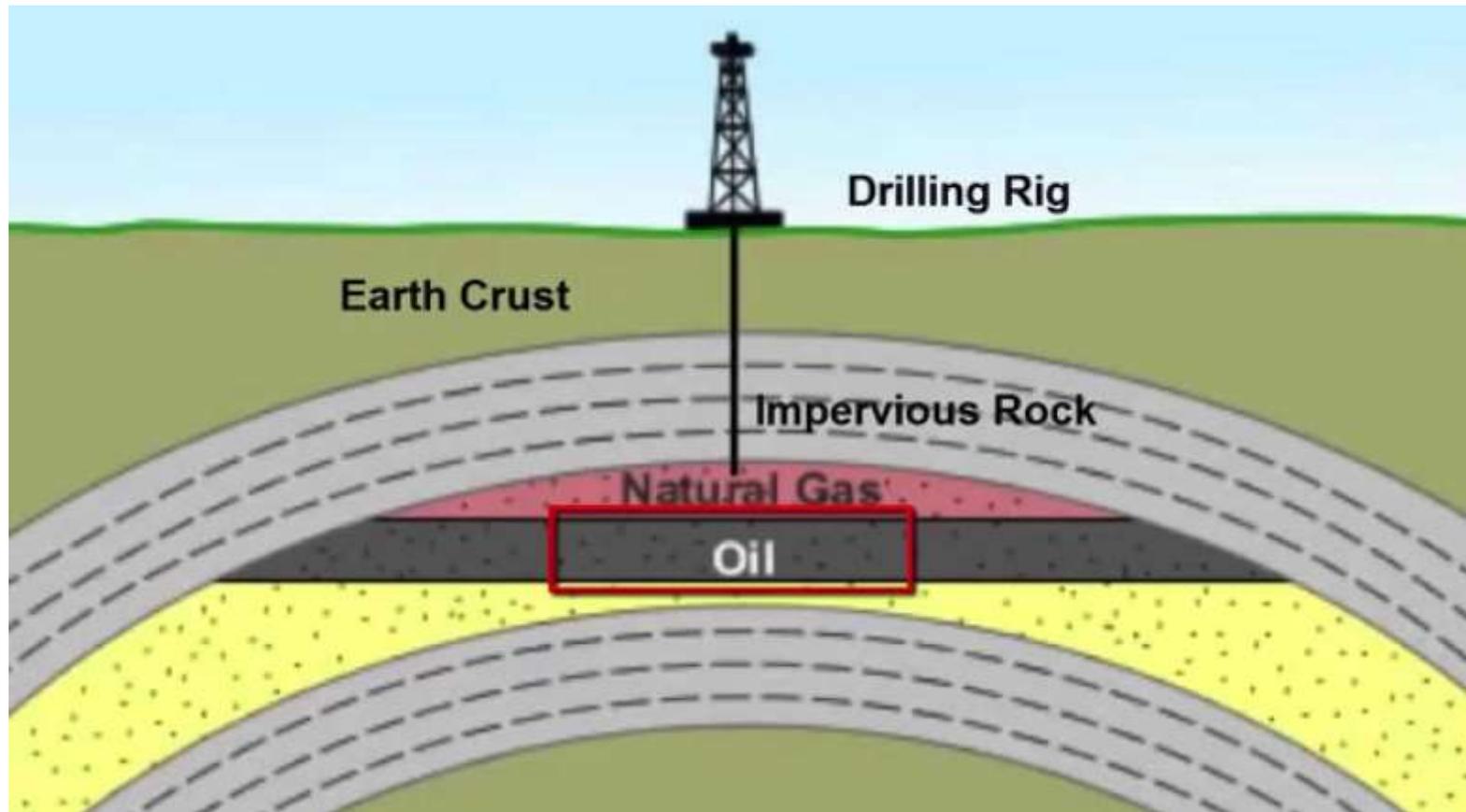
2. Oil

- Formed from plant and animal remains under pressure and heat



2. Oil

- Pumped from underground wells



3. Natural Gas

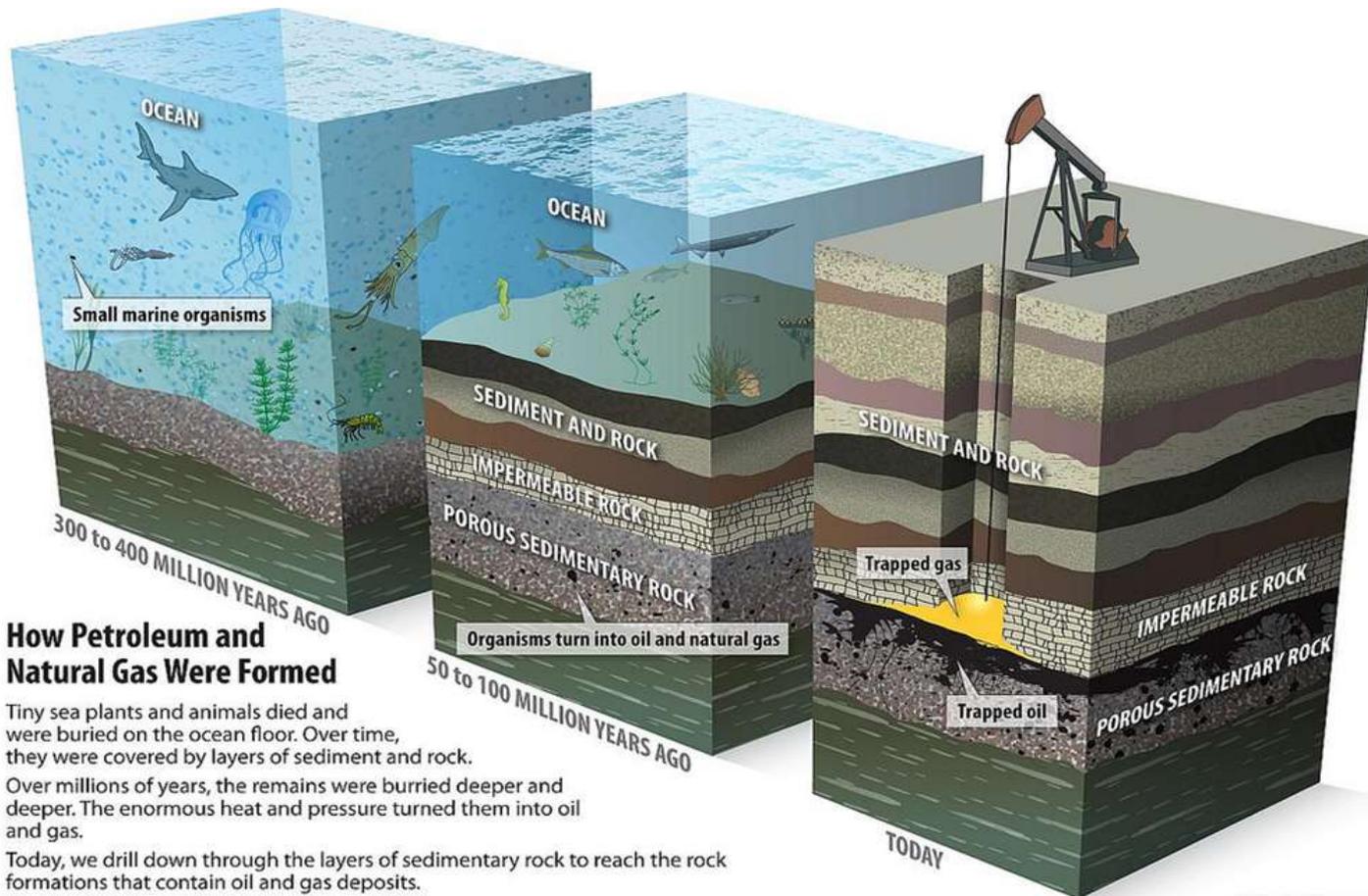
Gaseous fossil fuel

NATURAL GAS



3. Natural Gas

- Usually formed with oil deposits



How Petroleum and Natural Gas Were Formed

Tiny sea plants and animals died and were buried on the ocean floor. Over time, they were covered by layers of sediment and rock.

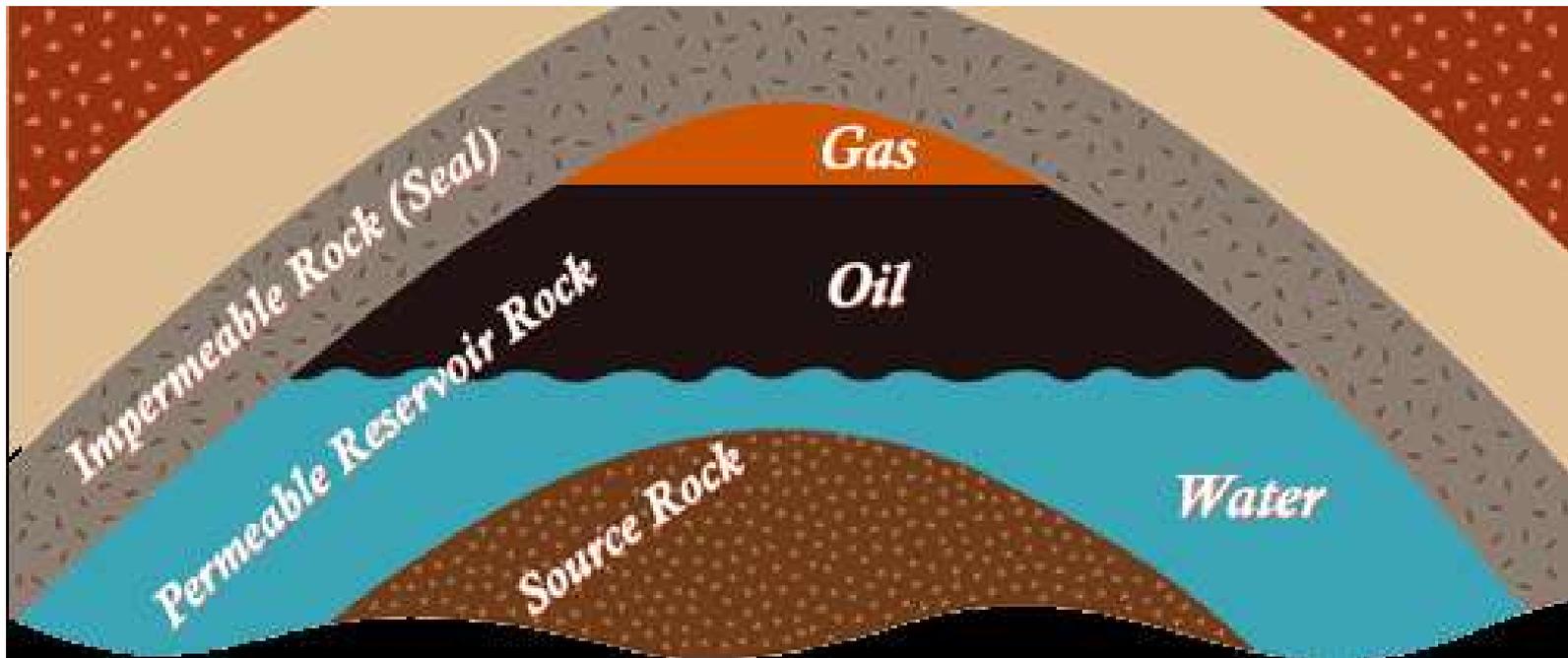
Over millions of years, the remains were buried deeper and deeper. The enormous heat and pressure turned them into oil and gas.

Today, we drill down through the layers of sedimentary rock to reach the rock formations that contain oil and gas deposits.

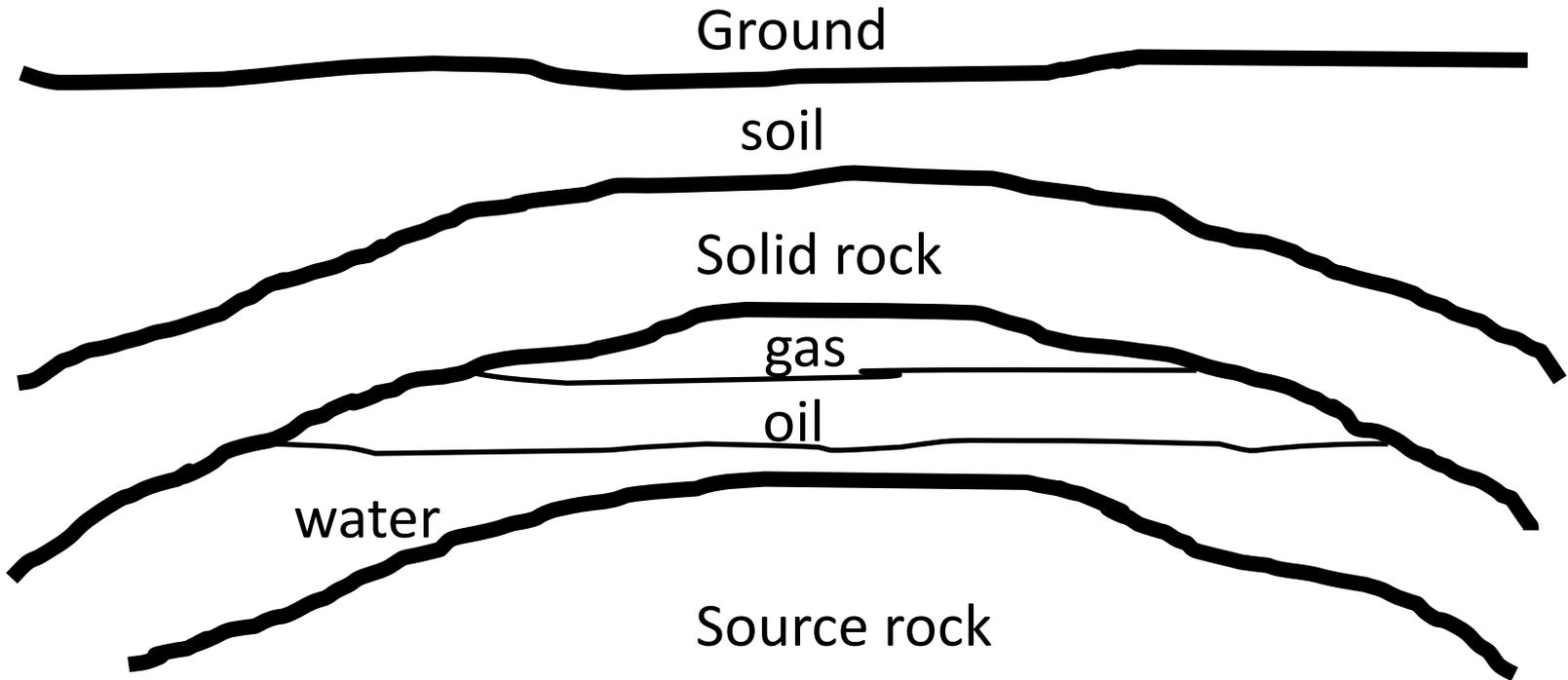
Note: not to scale

3. Natural Gas

- *Less dense than oil*
- *Rises into pockets above oil*



2. Oil



2. Oil

Soil

Gas

Oil

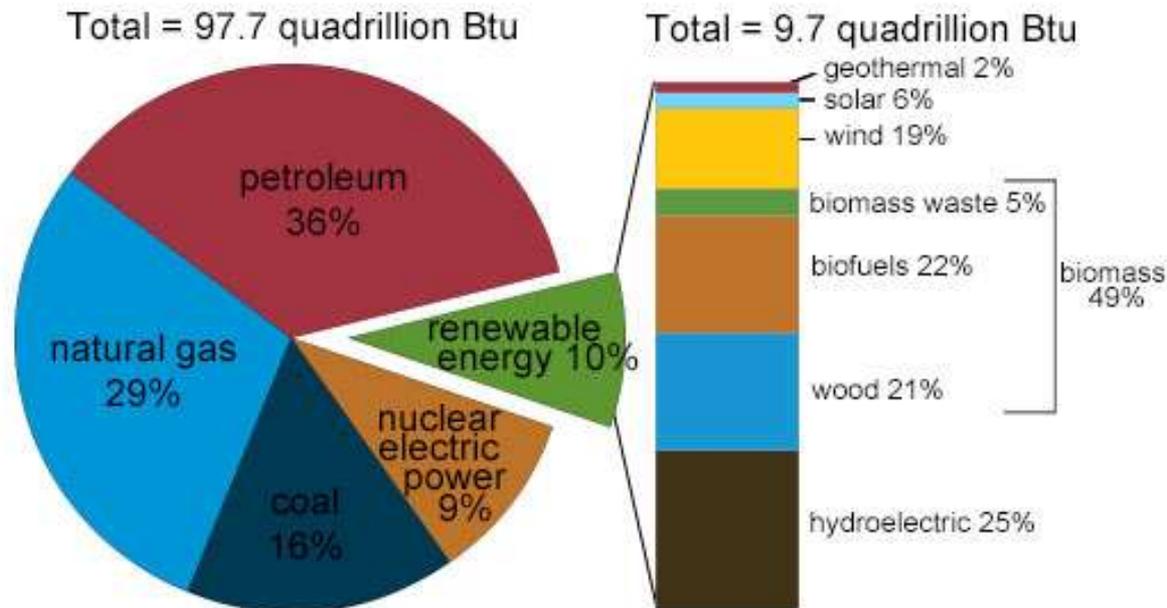
Water

ROCK

Fossil Fuel Use

- *Main source of energy for:*

U.S. energy consumption by energy source, 2015



Note: Sum of components may not equal 100% because of independent rounding.

Source: U.S. Energy Information Administration, *Monthly Energy Review*, Table 1.3 and 10.1 (April 2016), preliminary data

Fossil Fuel Use

- *Main source of energy for:*
- *Industry*



Fossil Fuel Use

- *Main source of energy for :*
- *Industry*
- *Transportation*



Fossil Fuel Use

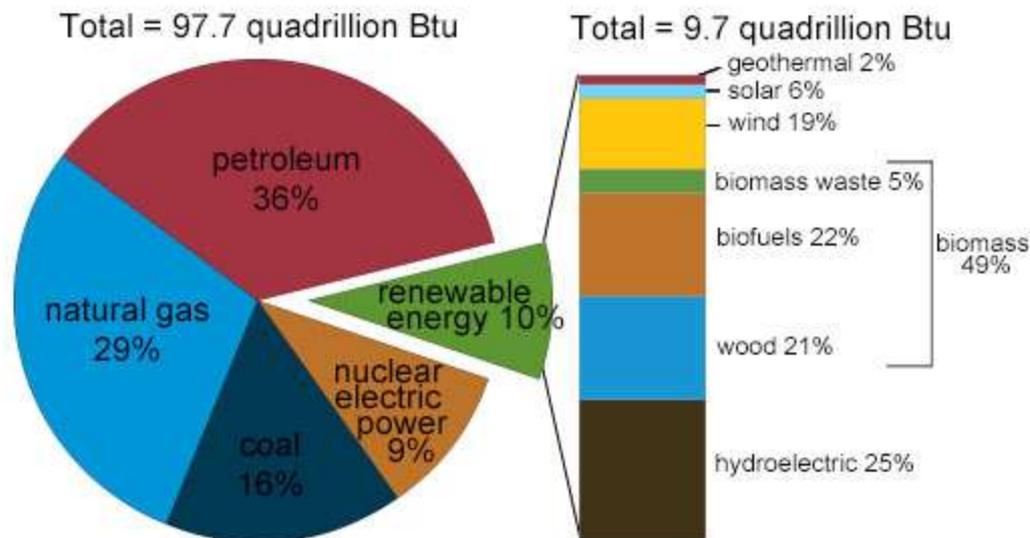
- *Main source of energy for :*
- *Industry*
- *Transportation*
- *Homes*



Fossil Fuel Use

Fossil fuels = >75% of energy!

U.S. energy consumption by energy source, 2015



Note: Sum of components may not equal 100% because of independent rounding.

Source: U.S. Energy Information Administration, *Monthly Energy Review*, Table 1.3 and 10.1 (April 2016), preliminary data

Petrochemicals

- *Substances made from oil or gas*

Adhesives



Carpeting



Cosmetics



Fertilizers



Paints



Rubber



Fabrics

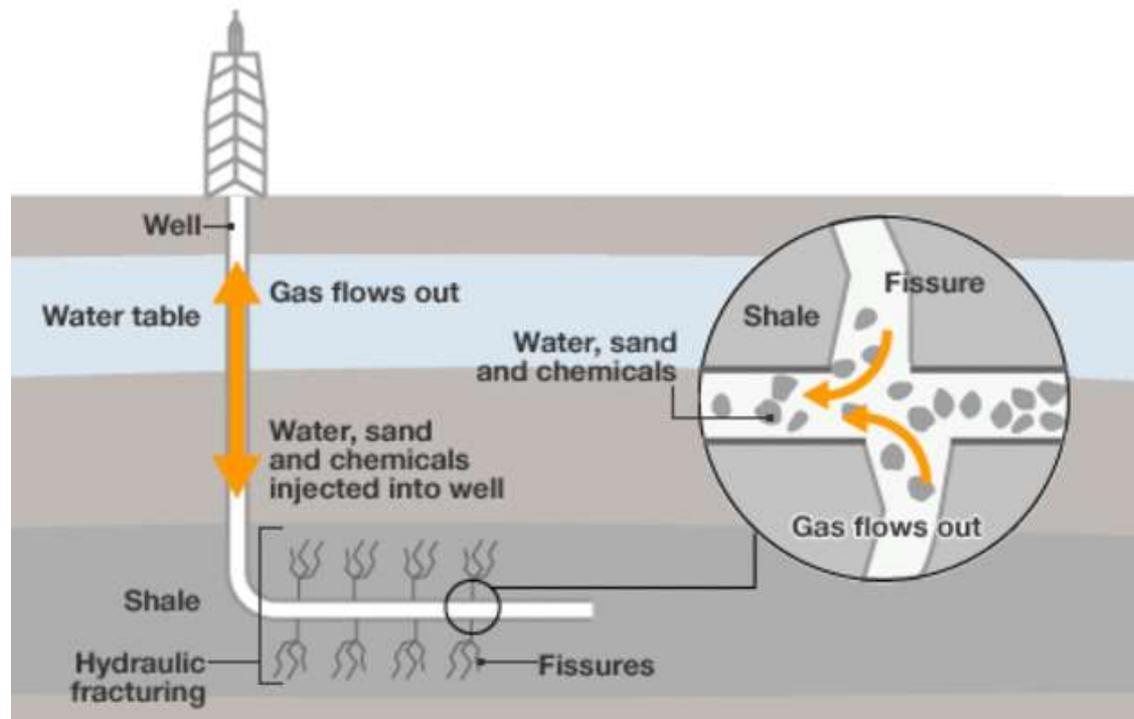


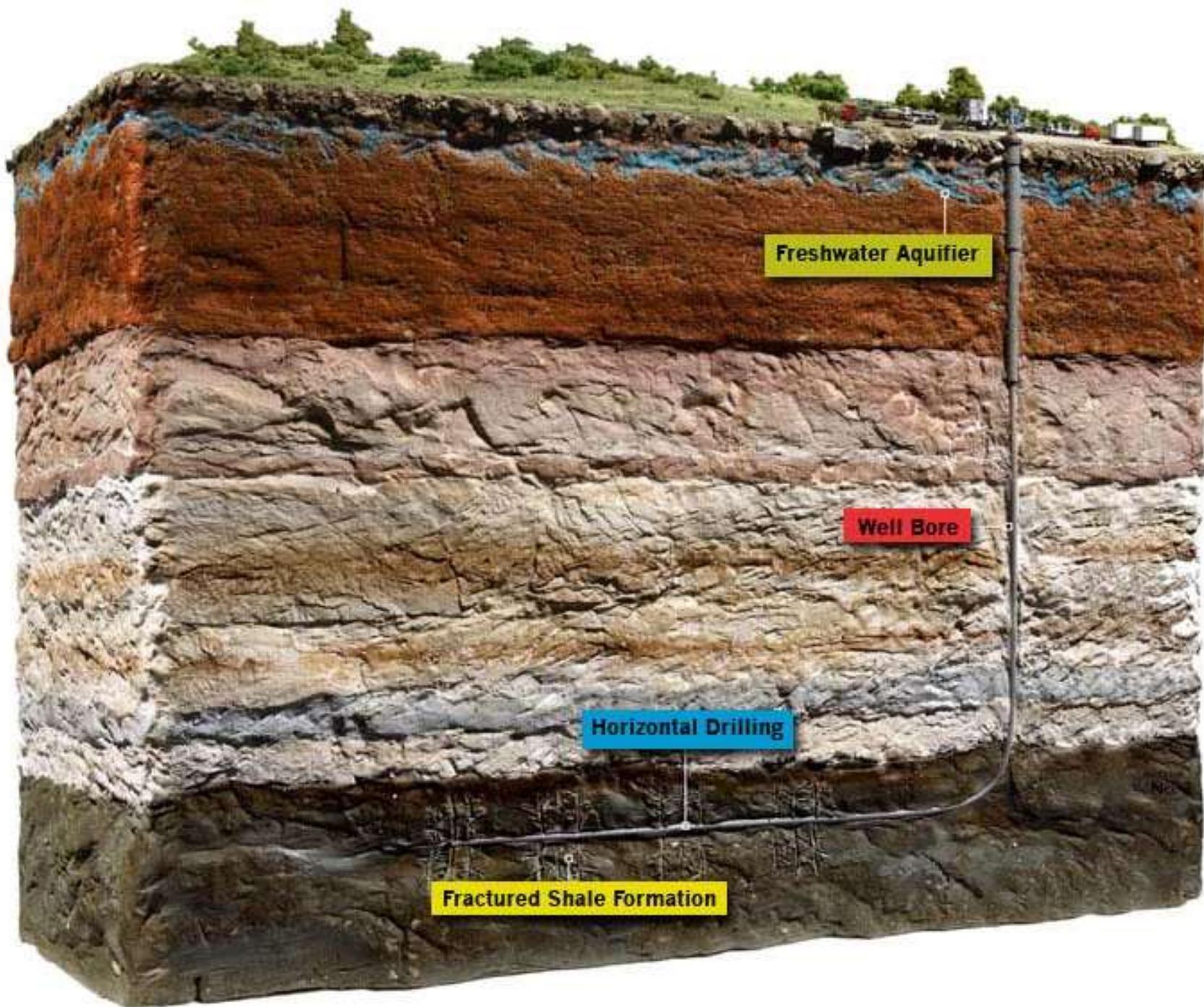
Plastics

Fracking

- *Process of removing natural gas from cracks in rock deep beneath surface*

Shale gas extraction





Freshwater Aquifer

Well Bore

Horizontal Drilling

Fractured Shale Formation

