

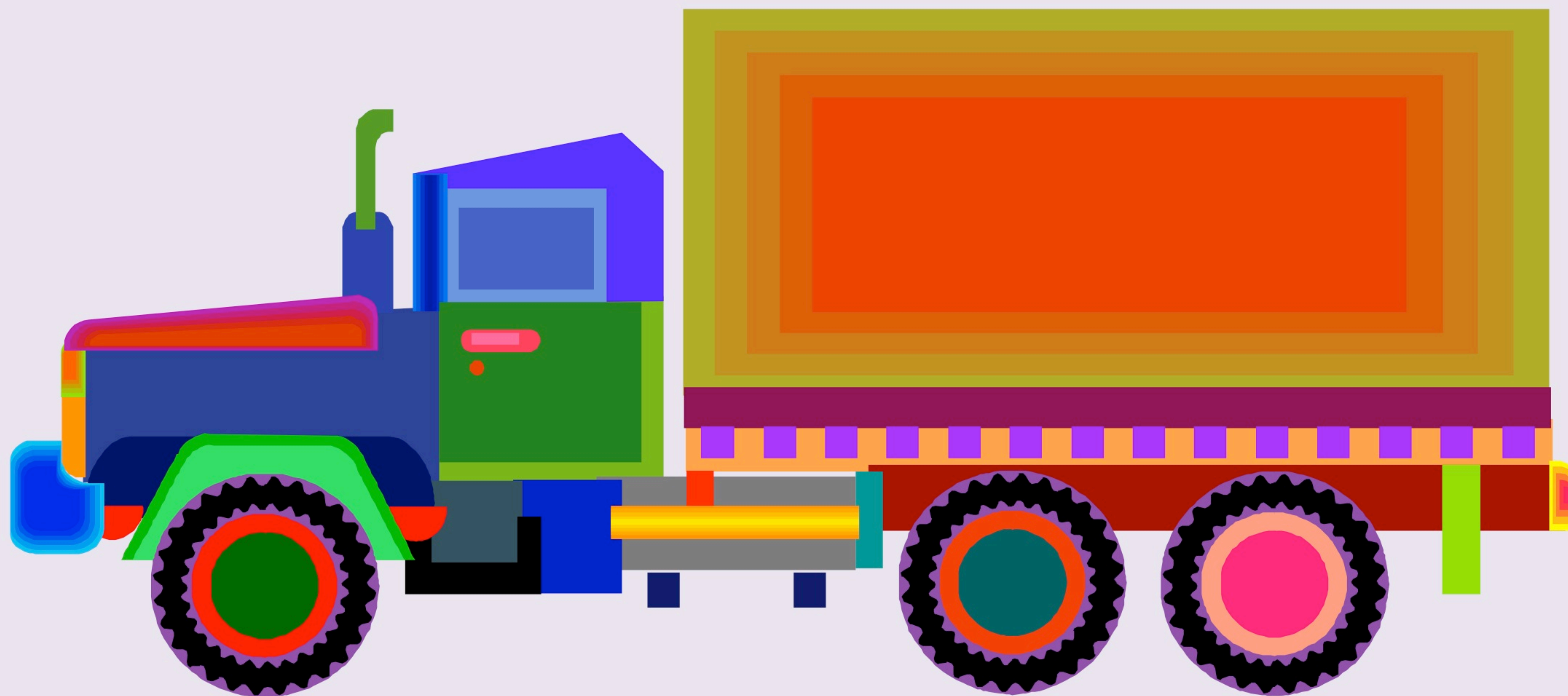
Plants



Farming practices



Feedstock Transport



Refining



Plant Operation

Fermentation

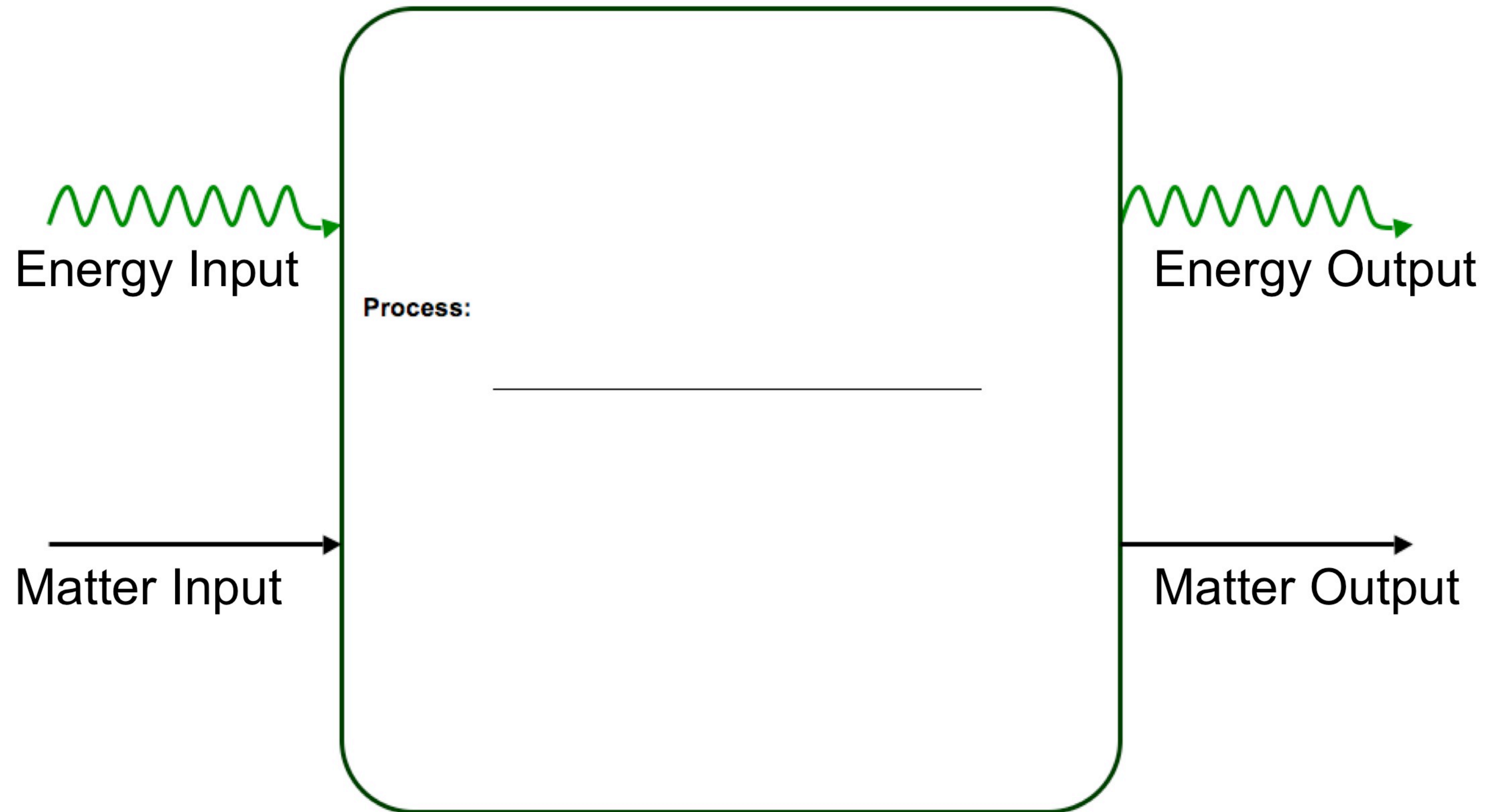
Product Transport



Car



PROCESS TOOL



Process Tool Choices

Energy Inputs and Outputs



Electricity



HEAT

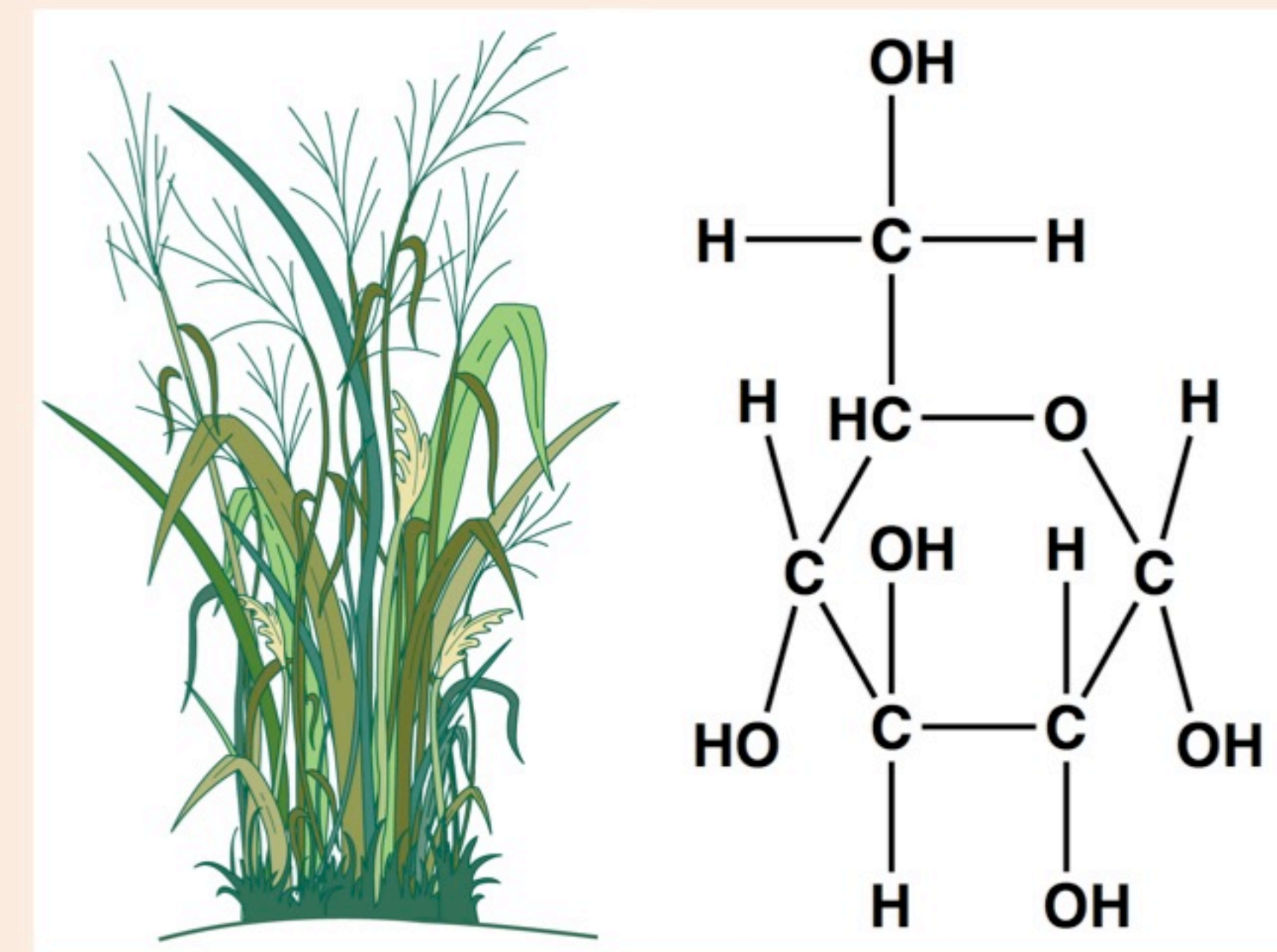
Chemical
Energy

Kinetic Energy
(motion)

Matter Inputs and Outputs

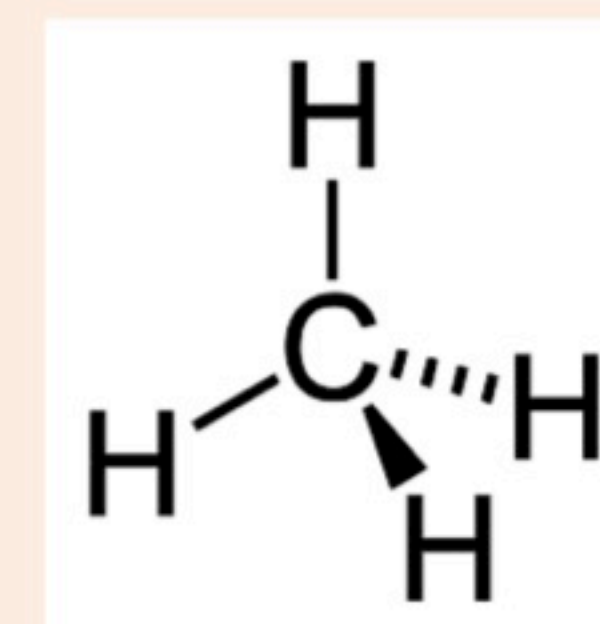
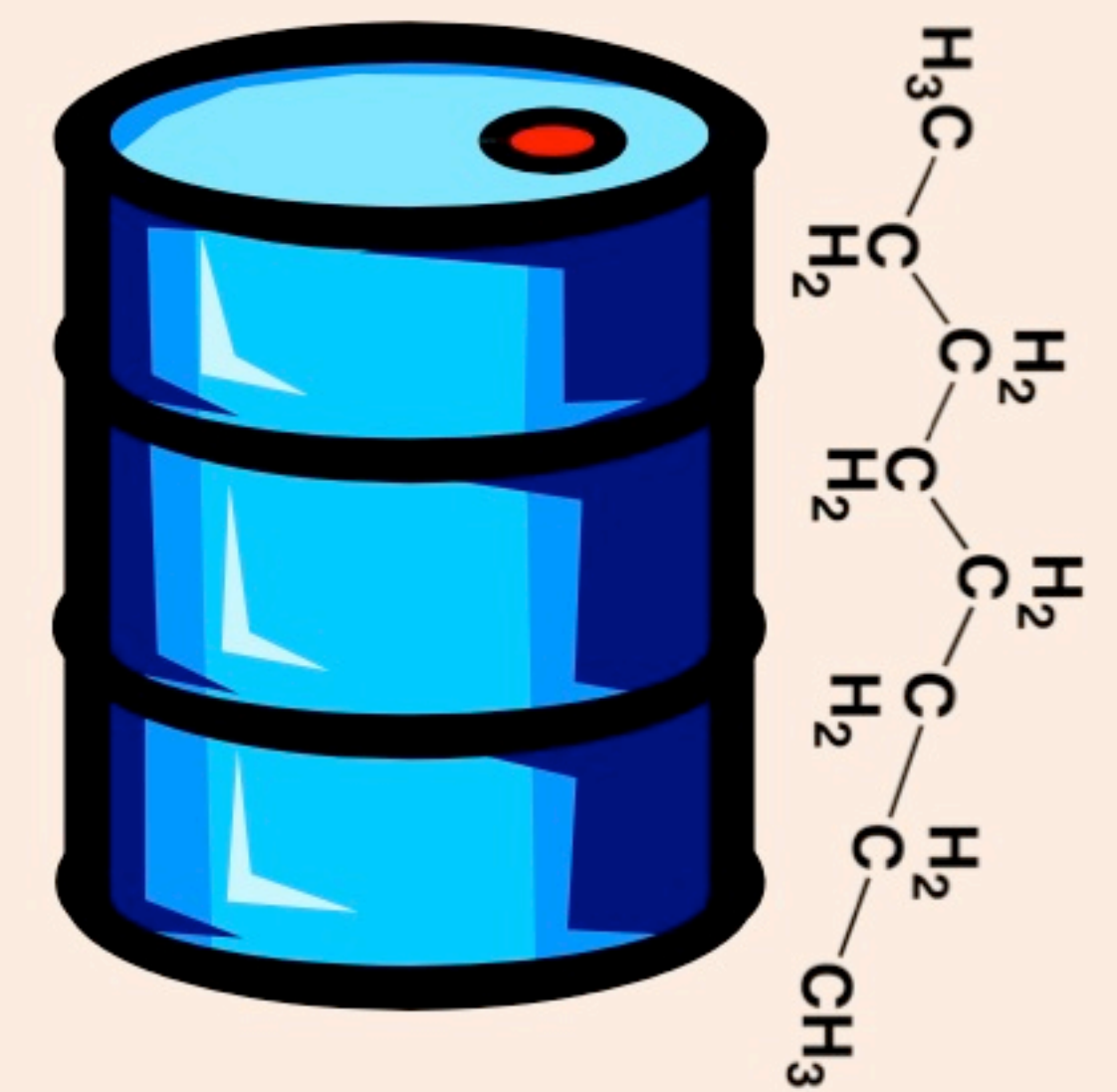


Natural Gas

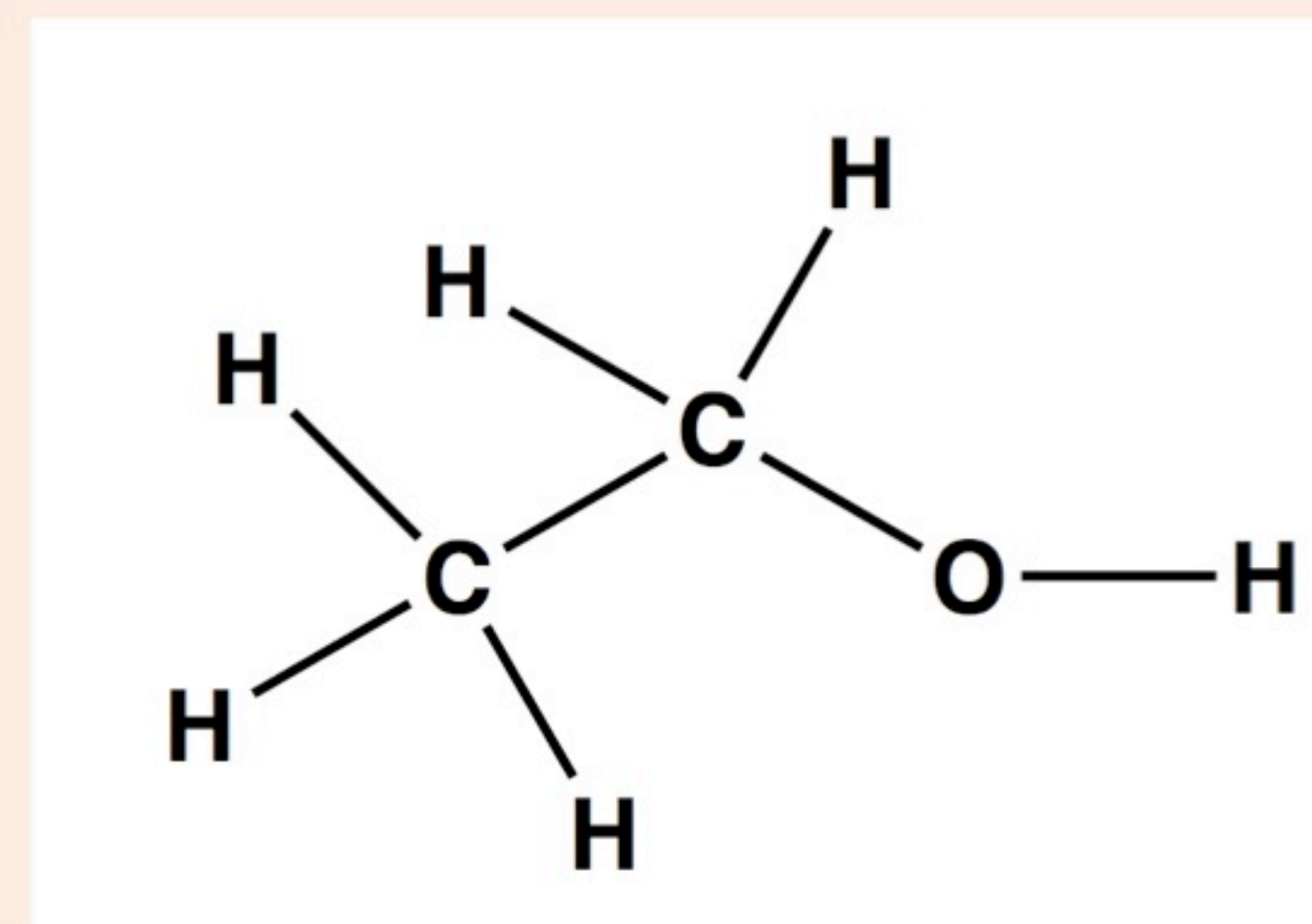


glucose

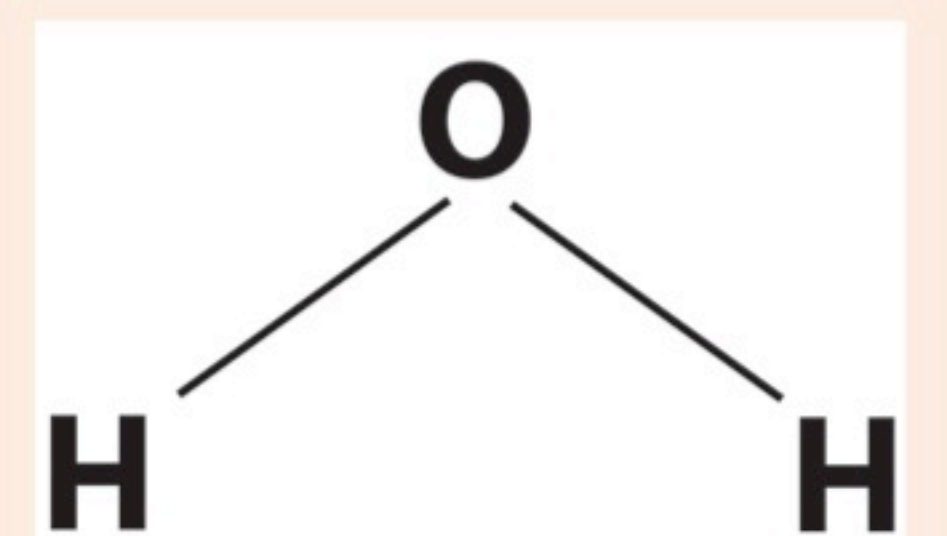
petroleum



carbon dioxide



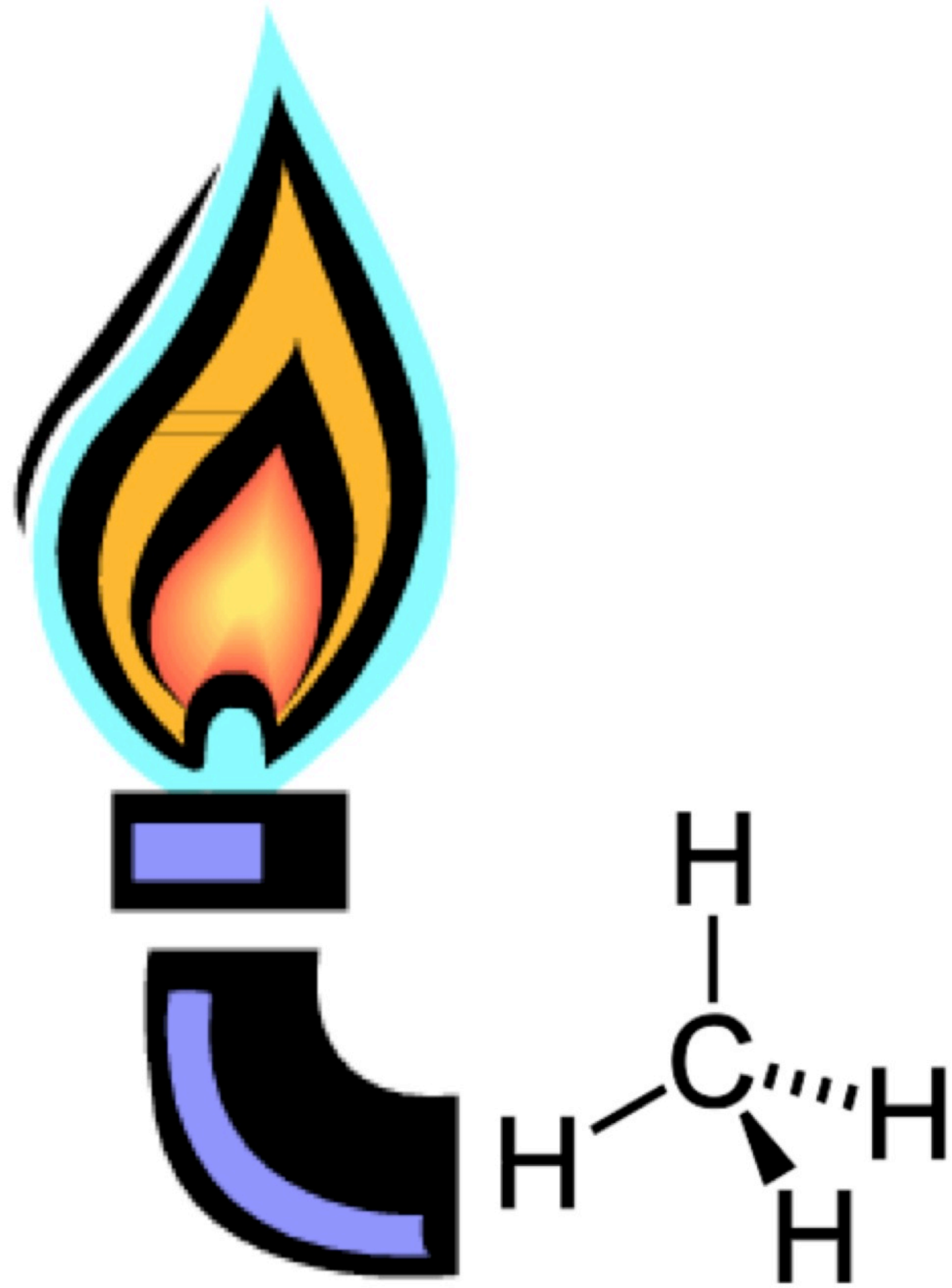
ethanol



water



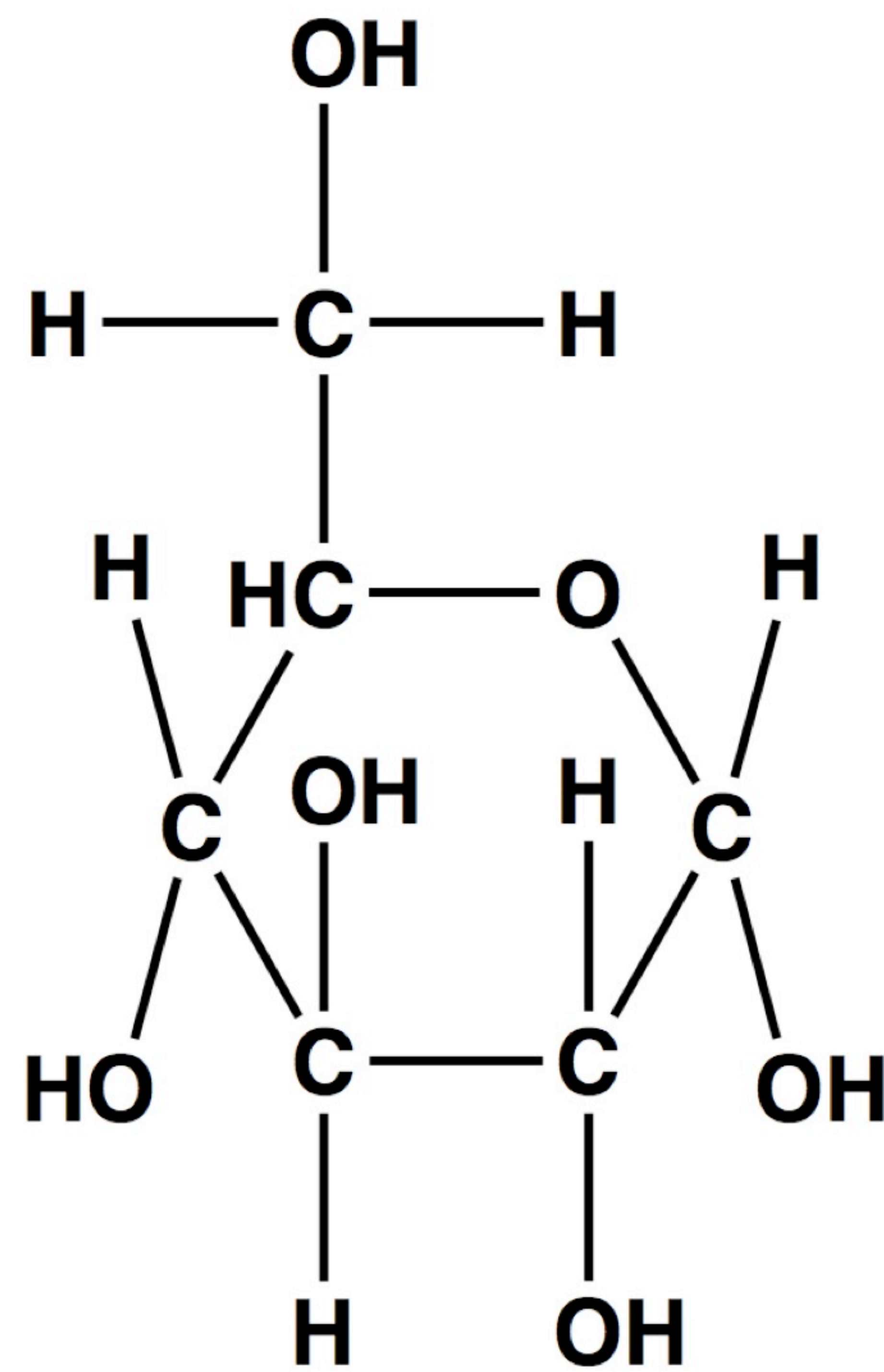
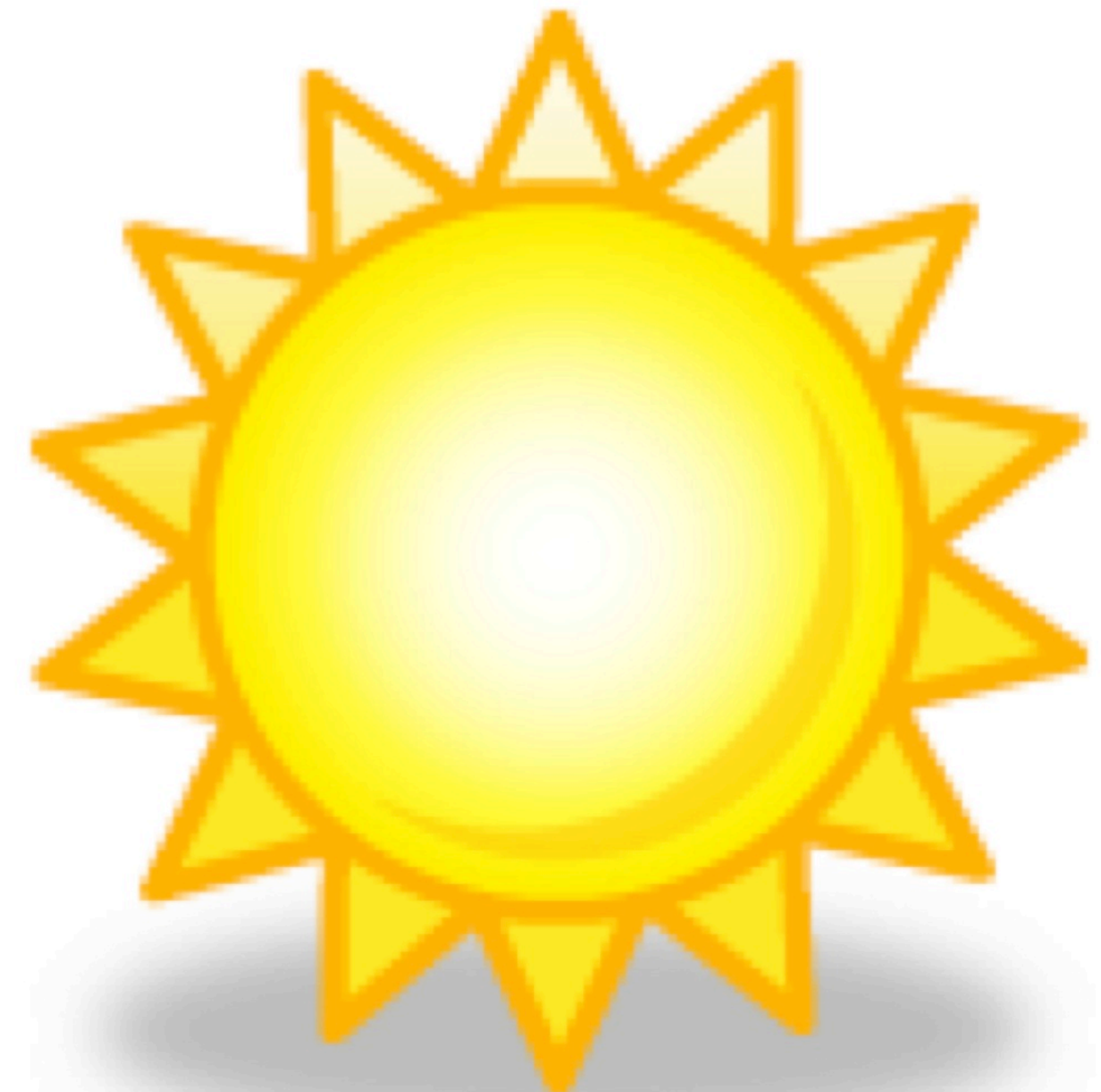
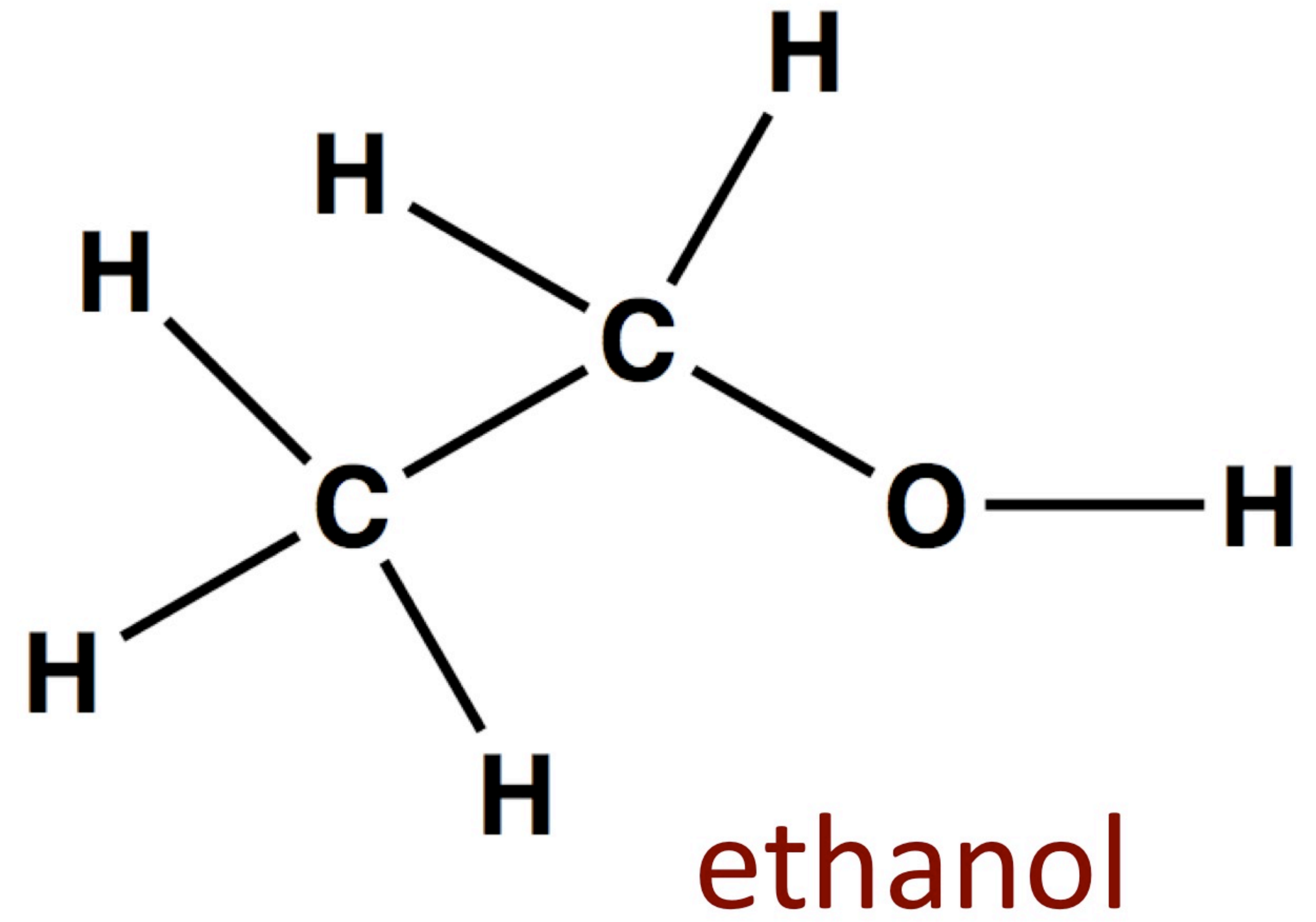
oxygen



Natural Gas



Electricity

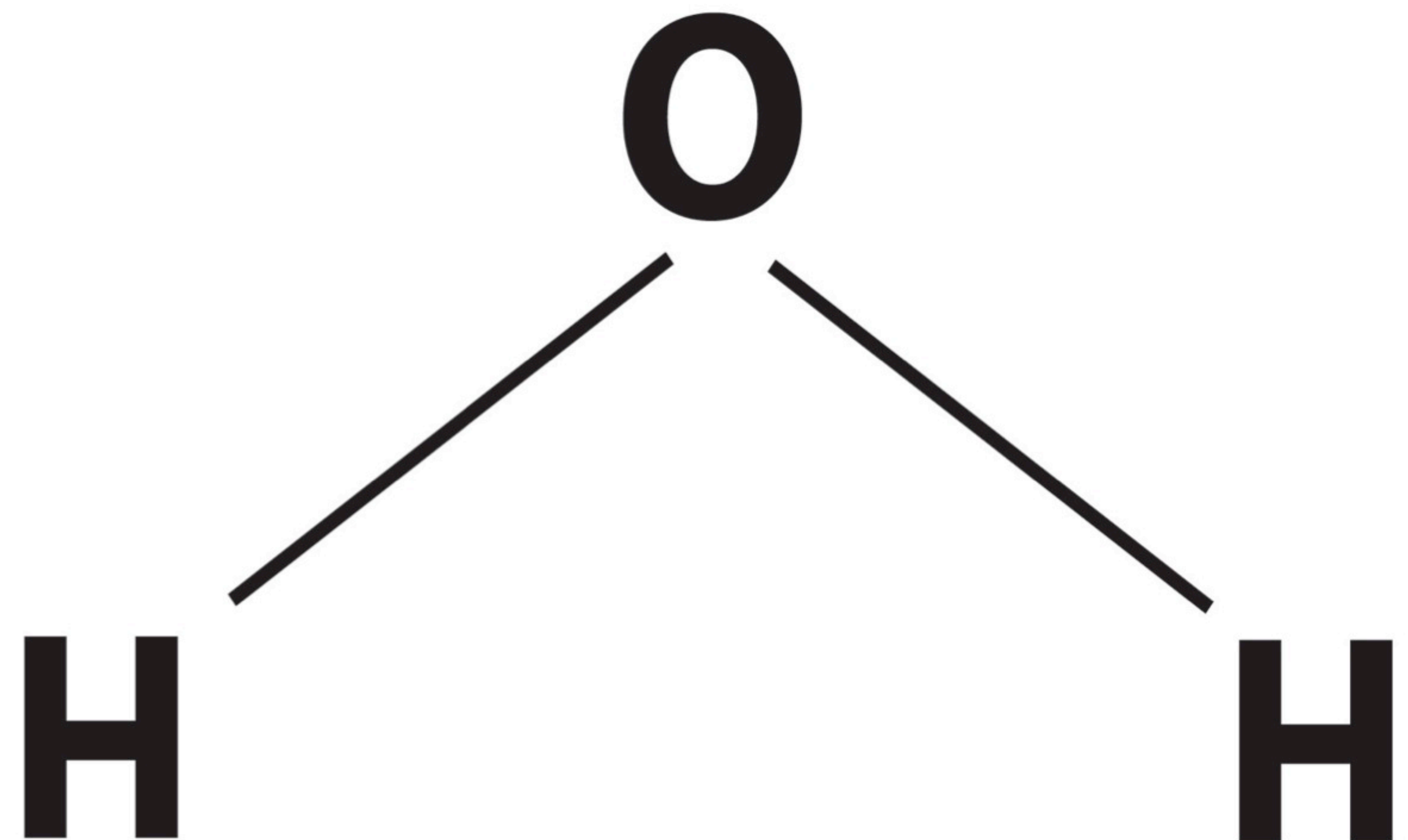


glucose



HEAT

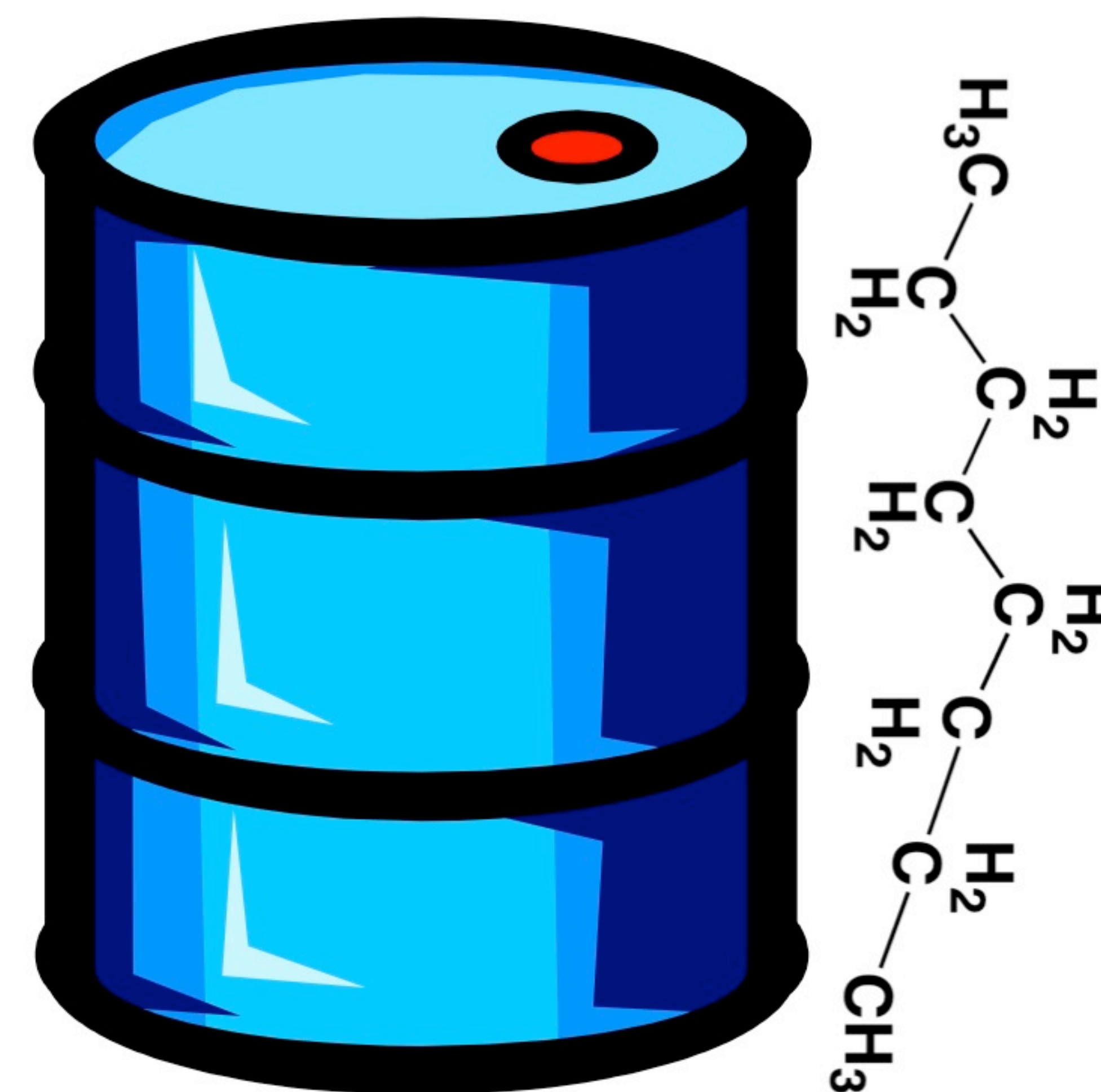
**Chemical
Energy**



water



carbon dioxide



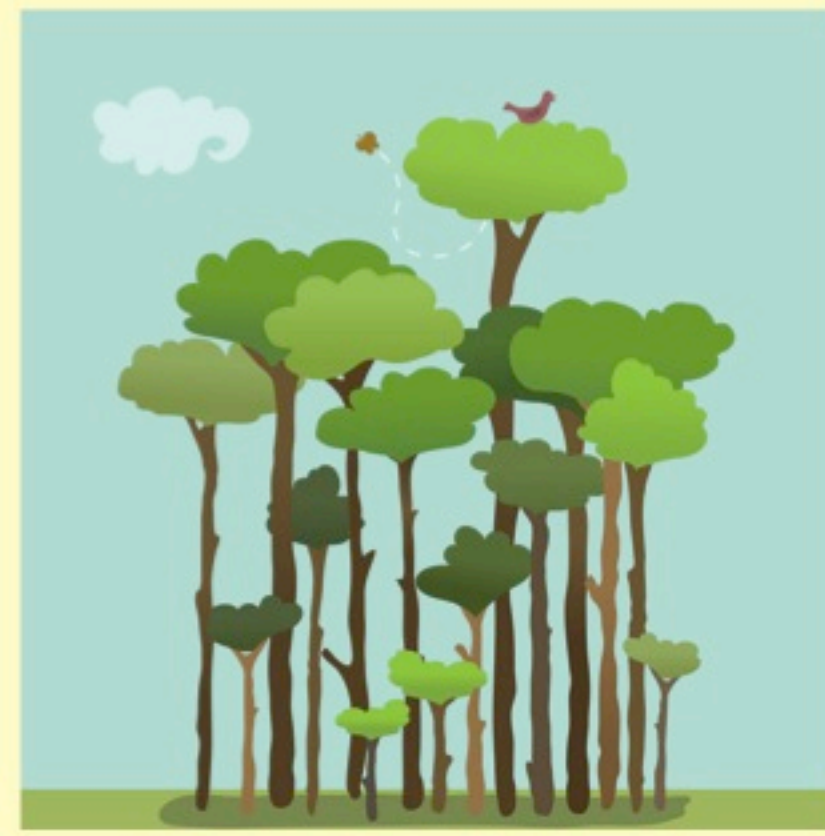
petroleum



oxygen

**Kinetic
Energy
(motion)**

Plants



Farming practices



Feedstock Transport



Biofuels Life Cycle

Car



Refining



Product Transport



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July 2010



U.S. DEPARTMENT OF
ENERGY