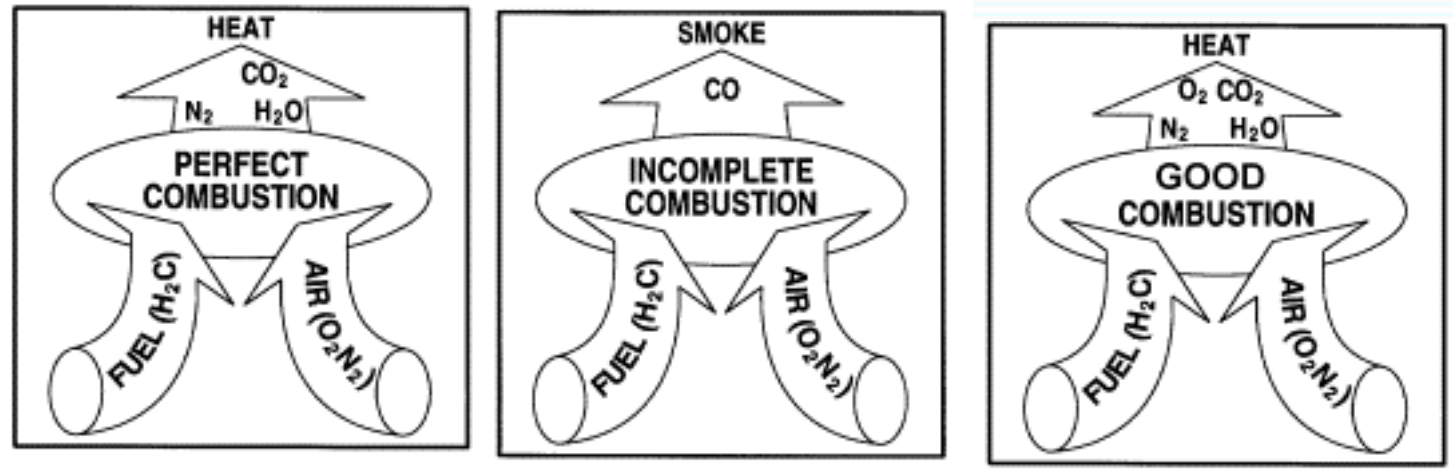
Incomplete Combustion

Commonly used fuels like natural gas and propane generally consist of carbon and hydrogen. When a fuel has a large ratio of hydrogen, more excess air must be provided. Water vapor is a by-product of burning hydrogen. To maintain it's vaporous state, it robs heat from the flue gases, which would otherwise be available for more heat transfer.

Natural gas contains more hydrogen and less carbon per BTU than fuel oils and as such produces more water vapor. Consequently, natural gas is generally slightly less efficient than fuel oil.

Too much, or too little fuel with the available combustion air may potentially result in unburned fuel and carbon monoxide generation. A very specific amount of O2 is needed for perfect combustion and additional (excess) air is required for good combustion. Too much additional air can contribute to CO generation, lower efficiencies and perhaps unsafe conditions with heating equipment not out living its full service life.



Carbon burned to CO2 will produce more heat per pound of fuel than when CO or smoke are produced.

A number of experiments have shown that when one pound of carbon is burned to CO2, 14,000 BTU's are produced. When a pound of carbon is incompletely burned to CO, only 10,200 BTU's are produced, 4,400 less BTU's or heat.

Also, carbon may become deposited on heat exchanger walls or vent systems surfaces – further reducing efficiency and/or increasing safety risks.