

# Supplemental Explanation

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## Heating values (HHV: Higher Heating Value, LHV: Lower Heating Value)

The “heating value” is the amount of heat released when combustion gas, resulting from the adiabatic and complete combustion of a unit quantity of fuel in a certain state, cools to its original temperature. The heating value can be expressed as either the higher heating value (HHV) or the lower heating value (LHV).

During the combustion process, the latent heat of vaporization of hydrogen gas, generated from the reaction between hydrogen and oxygen and also generated from the vaporization of moisture contained in the fuel, and the latent heat of condensation, obtained when the generated water vapor in the combustion gas condenses, are released. The latent heat of vaporization and the latent heat of condensation are included in the quantity known as the “higher heating value (higher heating value or gross heating value)”, but are not included in the quantity known as the “lower heating value (lower heating value or net heating value)”.

The standard heating values used in heating value calculations differ according to the country, type of statistics and equipment, and therefore care must be exer-

cised when using these calculated heating values.

Higher heating values are used mainly in the following items.

- (a) Comprehensive energy statistics and other similar types of statistics
- (b) Power generating efficiency of thermal power plants in Japan
- (c) Heating values used in the “Law Concerning the Rational Use of Energy” (Japanese Energy Act)
- (d) Heating values used for calculating CO<sub>2</sub> emissions in Japan

Lower heating values are used mainly in the following items.

- (a) Thermal efficiency of boilers
- (b) Thermal efficiency of power engines such as diesel engines, gas engines and gas turbines
- (c) Indication of co-generation performance
- (d) Heating values used for calculating CO<sub>2</sub> emissions for IPCC (Intergovernmental Panel on Climate Change)





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