The cost of fuel for a 2 MW boiler:
Type of fuel: wood chips (fuel)
Humidity of fuel: 18-25%

$M = Qx0.86 * 10^3 / qx\eta,$

Q - boiler output, kWt / h
q - calorific value of fuel, (3900 at 20% humidity) kcal / kg
η – efficiency

$M=2000x0.86*10^3/3500x0.84=525$ kg/h

We consider the volume of flue gases formed when burning 525 kg / h of fuel, according to the formula:

$$v_r = B\left[v_{0r} + (\alpha - 1)\, v_0\right]\frac{273 + t_r}{273}.$$

B - fuel costs for providing boiler thermal output **2.0 MWt**, **525 kg / h**
V_{0r} - volume of flue gases formed from 1 kg of fuel, **3.35 nm3 / h**
α - coefficient of excess air, **1,4**
V_0 - theoretical volume of air for combustion of 1 kg of fuel, **2.43 nm3 / h**
t_r - temperature of flue gases, **850 °C**

$V=525(3.35+(1.4-1)2.43)x273+850/273=9326$ m^3/h

According to the attached diagram of the boiler furnaces, the average cross-sectional area of the zones in the furnace of the boiler through which the flue gases pass is **S = 1.4 m^2**.

Flue gas velocity per second:

$S_g=9326/3600=2.59$ m/s

The average time of flue gas movement taking into account the cross-sectional area in the 3 strokes of the furnace, and the length of the gas stroke of **6,5 meters**:

$T_g=6,5x1.4/2,59=3.51$ s