

## CO<sub>2</sub> emission factor

The CO<sub>2</sub> emission factor for natural gas is a value representing the amount of CO<sub>2</sub> formed through combustion of the gas. The most commonly used unit is kg CO<sub>2</sub>/GJ<sub>lower</sub>. The CO<sub>2</sub> emission factor is calculated from the lower calorific value and under the assumption of 100% combustion. Natural gas has an emission factor of around 55 kg CO<sub>2</sub>/GJ<sub>lower</sub> and is calculated based on the specific gas composition.

The CO<sub>2</sub> emission factor for natural gas in the Danish gas system is calculated by Energinet according to the agreement with the Danish Energy Agency who is the responsible authority. It is determined from the yearly average gas composition measured by a gas chromatograph in the transmission grid at the Egtved gas crossing. The gas composition used is for the gas going towards the east as this is deemed to be the most representative stream for the gas consumed by the Danish gas users. The CO<sub>2</sub> emission factor is published yearly by the Danish Energy Agency and can be found here:

[The Danish Energy Agency's yearly CO<sub>2</sub> statement](#)

### **Certificate of origin system for biomethane:**

Biomethane (upgraded biogas) has, by definition, an emission factor of 0 kg CO<sub>2</sub>/GJ<sub>lower</sub> according to the Energy Agency's yearly CO<sub>2</sub> statement. This is due to the fact that unlike natural gas, which is extracted from the underground and through combustion emits new amounts of CO<sub>2</sub> to the atmosphere, biomethane only emits carbon from organic material which has undergone gasification and is already included in the atmospheric circuit.

Biomethane makes up for more than 25% of the yearly Danish gas consumption. Because of this there are occurrences where the biomethane physically takes up all the capacity in the distribution network that it must be flowed to the transmission system oppositely of traditional natural gas. To promote the biomethane in Denmark Energinet enable through certificates of origin that biomethane can be sold directly and traceable from producer to consumer. As previously mentioned biomethane has an emission factor of 0 kg CO<sub>2</sub>/GJ<sub>lower</sub> which create incentives for certain gas consumer to use the certification system to convert to biomethane consumption. Consumers who draw advantage of the CO<sub>2</sub> quota can use certificates of origin to deduct their emission in their CO<sub>2</sub> report.

[Read more about biomethane and certificates of origin here](#)