

Sustainability and climate change in the coating industry

Sustainability is high on the agenda in the world today and is typically defined as a balance between the three areas Environment, Social & Governance (ESG). In the environment area there are several big challenges, one of which is climate change through emissions of green house gases. How will this impact the coating industry?

Global political initiatives

It is international scientific consensus that, in order to prevent the worst climate damages, global net human-caused emissions of carbon dioxide (CO₂) needs to reach [net zero](#) around 2050. The majority of actions set by national governments to cut greenhouse gases and fight climate change, revolve around the 2016 [Paris Agreement](#) – in which 196 countries pledged to reduce greenhouse gas emissions with their own specific goals by the year 2030.

Within the EU, this has been manifested politically by [EU's Green Deal](#) in order to make Europe the first climate neutral region by 2050. There are several actions launched to achieve this and one of the latest is [CSRD](#), which includes a new standard on how to create sustainability reports for investors and other stakeholders. For large companies, this came into effect on January 1, 2024, and in the coming years it will broaden to affect smaller companies as well. Ultimately, around 50,000 companies within the EU will be affected directly ([time table](#)).



820 g
CO₂e/kWh



24 g
CO₂e/kWh

Source: IPCC

Greenhouse gases

Greenhouse gases (GHG) are gas compounds in the earth's atmosphere, that trap heat in what is known as the [greenhouse effect](#). There are six greenhouse gases in the atmosphere, as defined by the [Kyoto protocol](#). They have different greenhouse impacts and in order to make them comparable, a metric measure called CO₂ equivalent is used, which measures each green house gas's global warming potential ([GWP](#)). Methan, which is one of the six green house gases, has for instance a CO₂ equivalent of 28, meaning it has a 28 times stronger green house effect than CO₂.

Life-cycle emissions of electrical sources

To determine and compare the level of emissions and the climate impact of different energy sources, a method called life-cycle assessment can be used. GHG emissions are measured in grams of CO₂ equivalent per kilowatt hour (g CO₂e/kWh).

Approximately how much each type of power emits during its life-cycle (median values IPCC):

- Wind power: 11 g CO₂e/kWh
- Nuclear power: 12 g CO₂e/kWh
- Hydropower: 24 g CO₂e/kWh
- Solar power: 41 g CO₂e/kWh
- Natural gas: 490 g CO₂e/kWh
- Coal: 820 g CO₂e/kWh.

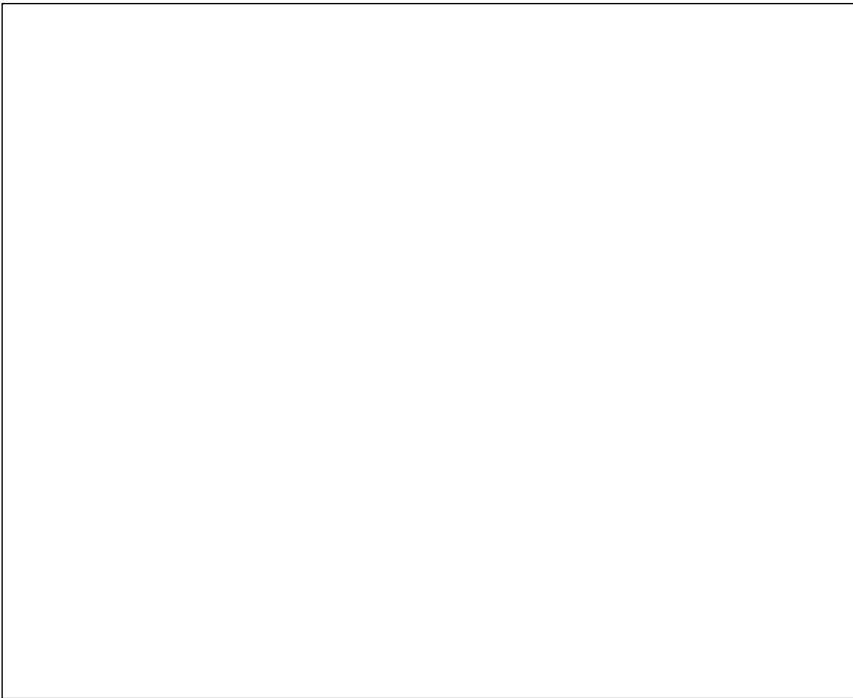
Report standards for GHG emissions

[GHG protocol](#) is a global standard developed by [WRI](#) to help organizations make inventory and calculate their GHG emissions for sustainability reporting. To help the reporting, emissions are divided into 3 scopes, whereof scope 1 & 2 is obligatory according to the GHG Protocol.

CO2 equivalents are also set for materials, transports, energy etc. and used for making calculations of emissions in the 3 scopes.

- Scope 1 Direct emissions from the organization
- Scope 2 Indirect emissions from externally purchased energy
- Scope 3 Indirect emissions except energy both up and down streams for instance purchased material, transport etc.

Within the EU's CSRD directive, is a new reporting standard called [ESRS E1](#), which uses the same principles as the GHG protocol for reporting on climate change and GHG emissions.



Sustainability in the coating industry

Coating is quite an energy intensive industry and considering the energy systems that are standard in today's society, with a large part being fossil-based, it is clear that climate change will be a big challenge for our industry.

In addition to the energy consumption in a coating line, CO2 emissions also arise in scope 3, in the production of for instance powder, chemicals and hanging equipment. Every coating plant will have its own unique mix of

emissions depending on a number of factors, but with the current average CO2 equivalents for energy in the world, HangOn's calculations show that the coating process itself, stands for the highest emissions. However, with a low CO2 energy source, such as hydro power, the statistics changes drastically and powder typically becomes the largest emitter of greenhouse gas.

Efforts needs to be made from all parts of the coating industry to reduce CO2 emissions

and many small streams will make a river. However, one effort worth mentioning with high potential to reduce emissions, is to improve the coating efficiency. [HangOn's studies](#) on a set of standard coating lines, show that the majority of the energy consumption is constant regardless of how many items are being coated. An increased output per hour will therefore give a dramatic reduction in both energy and CO2 emissions per coated item.

Sources & links:

EU green deal: [Delivering the European Green Deal - European Commission \(europa.eu\)](#)

Net Zero: [What is Net Zero? - Net Zero Climate](#)

CSRD: [Corporate sustainability reporting - European Commission \(europa.eu\)](#)

Time line: [Corporate sustainability reporting - European Commission \(europa.eu\)](#)

GWP: [Glossary:Global-warming potential \(GWP\) - Statistics Explained \(europa.eu\)](#)

Kyoto: [Protocol Kyoto Protocol - Targets for the first commitment period | UNFCCC](#)

Green house effect: [What's known as the greenhouse effect](#)

GHG: [Protocol Corporate Standard | GHG Protocol](#)

WRI: [About WRI & WBCSD | GHG Protocol](#)

ESRS: [E1Q&A adoption of European Sustainability Reporting Standards \(europa.eu\)](#)

HangOn's studies: [The HangOn Green Effect – Lower CO2, Lower Energy, Higher Profit](#)