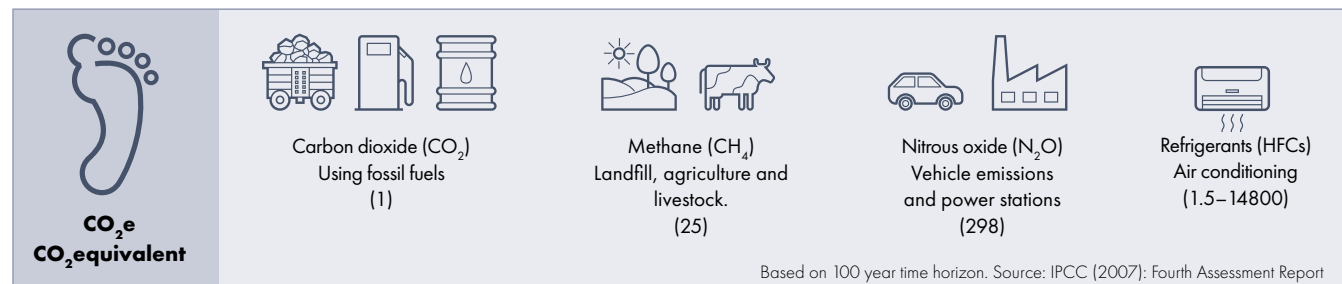


# A look inside a product carbon footprint

The true value of a carbon footprint is to identify which parts of the product's lifecycle contribute most to its overall climate change impact. It helps us focus on where we need to concentrate our efforts in order to reduce the footprint and demonstrate improvements over time.

The Paper Profiles for our papers show that purchased electricity, and the type and amount of fuel combusted at our mills to generate energy, make the largest contribution. This is why we're continually innovating to improve the energy efficiency of our mills and increase our use of non-fossil and renewable energy sources.



## What is a carbon footprint?

A carbon footprint is a measure of how much something contributes to global warming. More precisely, it's a measure of the amount of greenhouse gases (GHG) emitted in order to do something or to produce and use something. The bigger the carbon footprint, the greater the global warming impact.

Most of us associate global warming with carbon dioxide (CO<sub>2</sub>) released when we use fossil fuels such as coal, oil and gas. But this isn't the only gas which makes up a carbon footprint. It also includes emissions of other greenhouse gases, some more powerful than CO<sub>2</sub>. To keep things simple, a carbon footprint is a single figure, in which all GHGs are expressed as an equivalent amount of CO<sub>2</sub> (CO<sub>2</sub>equivalent or CO<sub>2</sub>e).

## How is a product carbon footprint measured?

A carbon footprint can't actually be measured, it's calculated by examining the lifecycle of the product or service and identifying where greenhouse gases would be released.

Calculating the true carbon footprint of a product is a highly complex task really only suited to academic studies. They're based on the main stages of a product's lifecycle, using the best available data, but making some well-intentioned assumptions along the way.

To establish some ground rules, European paper producers have developed a best practice guide. It's called the 'Ten Toes'.

## CEPI Ten Toes

The CEPI Ten Toes ('Ten Toes: Framework for Carbon Footprints for Paper and Board Products') is the methodology used by most European paper makers to communicate the carbon footprint of their products. It breaks down the carbon footprint into 10 elements and defines how greenhouse gases should be communicated for each of these.



## Use with caution

### Carbon footprints are not meant as a comparison tool

It may be tempting to think that you can now simply compare carbon footprints and decide which product performs best based on these. The CEPI Ten Toes methodology, however, states, that product comparisons "must be done with great care". If you intend to use them for comparison, make sure, data quality, allocation methods and cut-off criteria are known.

### Carbon footprints do not demonstrate overall environmental superiority

A decision based purely on a lower carbon footprint cannot guarantee the overall sustainability of a product. The CEPI Ten Toes methodology emphasizes, that "it is important to remember that there are environmental attributes other than greenhouse gas emissions that may be important to a product's overall environmental performance." Other equally important environmental considerations such as sustainable forest use or water use, and management are not part of a carbon footprint. And in this respect a carbon footprint should never be used to claim environmental superiority of a particular product.


Source: CEPI (2017): Framework for Carbon Footprints for Paper and Board Products

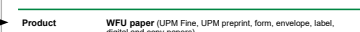
### Carbon footprint calculations are based on assumptions and only reflect the sum of carbon emissions of certain activities at one point in time


Most carbon footprints are a best estimate of their true footprint. They do not reflect all climate impacts. In most footprints several aspects are missing or cannot be calculated due to missing measurement standards or information. A carbon footprint only shows the status quo.

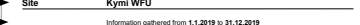
## UPM Paper Profiles

UPM uses the Ten Toes method to communicate the carbon footprint of all products on an annual basis. The calculations are published as a 'Paper Profile' indicating the carbon footprint up to the point a paper product leaves the mill. These profiles provide a full breakdown of the carbon footprint, showing the contribution for each of the ten toes.

3rd Party verified 

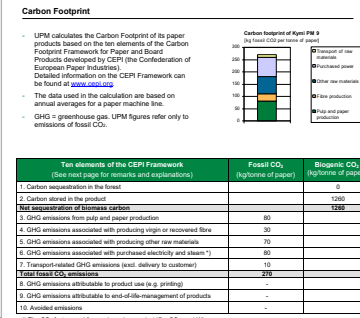
Paper grades covered 

Mill & machine line 

Year to which data applies 

Information gathered from 1.1.2019 to 31.12.2019

Conversion Factor used for power purchased from the grid; we use country specific emission conversion factors which are based on the real power supply to UPM mills in each respective country.













Ten elements of the CEPI Framework (See last page for details and explanations)	Fossil CO <sub>2</sub> (kg/tonne of paper)	Biogenic CO <sub>2</sub> (kg/tonne of paper)
1. Carbon sequestration in the forest	0	1200
2. Carbon stored in the product	0	2000
<b>Net sequestration of biogenic carbon</b>		<b>3200</b>
3. GHG emissions from pulp and paper production	80	
4. GHG emissions associated with producing virgin or recovered fibre	30	
5. GHG emissions associated with producing other raw materials	70	
6. GHG emissions associated with purchased electricity and steam <sup>*)</sup>	80	
7. Transport-related GHG emissions (incl. delivery to customer)	10	
<b>Total fossil CO<sub>2</sub> emissions</b>	<b>270</b>	
8. GHG emissions attributable to product use (e.g. printing)	-	
9. GHG emissions attributable to end-of-life management of products	-	
10. Avoided emissions	-	

\*) The CO<sub>2</sub> factor used for purchased power is 117 g CO<sub>2</sub> per kWh.

The Ten Toes

Product related carbon footprint

1	Carbon sequestration in the forest is the process of capturing and storing atmospheric carbon dioxide (through photosynthesis). Forest certification and traceability of fibre supply ensure stable or increasing carbon stocks in forest. But this effect is difficult to attribute to a specific product, so we do not currently claim a figure.	
2	The biogenic carbon stored in the wood fibre in paper products can be calculated. The longer a product is used, the longer this carbon stays out of the atmosphere. Recycling also delays this CO <sub>2</sub> from returning to the atmosphere by keeping the carbon in the paper cycle.	
3	Combustion of fossil fuels from pulp and paper production, including emissions from production of purchased pulp.	
4	Producing virgin or recovered fibre (CO <sub>2</sub> emissions from forest management, harvesting activities, the collection, sorting and processing of recovered fibre).	
5	Producing non-wood-based raw materials, like chemicals, pigments and fuels.	
6	Purchased electricity, steam and heat including from production of purchased pulp.	
7	Transportation of wood, pulp, recovered paper and pigments to UPM mills. Note: Transport to the customer is not included as this depends on the transportation modes and the distance to an individual customer, but it can be added for a specific case on request.	
8	Product use (e.g. printing) is not in the scope of a paper manufacture.	
9	End-of-life management of products is not in the scope of a paper manufacture.	
10	Avoided emissions (currently not included).	



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