

**GPP**  
**2020**

procurement  
for a low-carbon  
economy



## CO<sub>2</sub> impact calculators for procurement

GPP 2020 Factsheet  
June 2016

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## Introduction

If we buy a low fuel consumption vehicle, install an energy efficient computer, or renovate social housing to the passive house standard we know we are saving energy, and likely reducing CO<sub>2</sub> emissions - *but by how much?*

For public authorities looking to measure their progress towards meeting CO<sub>2</sub> reduction targets, and to work out which actions to prioritise, it is important that we can answer this question. CO<sub>2</sub> emissions can be caused at every stage of a product's lifecycle – from the extraction and processing of the raw materials used, the manufacture and transportation of the product, through to the use of the product, and finally its disposal (or reuse).

It is highly complicated (and not practical for public procurers) to make a precise comparison between the lifecycle CO<sub>2</sub> emissions of alternative products/services. However, it is possible to calculate a good approximation of this comparison by using existing life cycle assessment (LCA) studies and default values. This enables us to provide figures on the direct environmental impact of our sustainable procurement actions – so valuable in communicating benefits to decision makers and the wider public.

The GPP 2020 calculators focus on high energy-using products, are primarily based on a comparison of emissions from this consumption of energy. They allow an authority to enter the characteristics of the innovative, sustainable solution they have bought (or are considering buying), and then compare this to a baseline – this may either be the previous solution used/bought, or the average solution (in terms of environmental performance) currently available on the market.



## The GPP 2020 CO<sub>2</sub> impact calculators

The GPP 2020 project has developed CO<sub>2</sub> impact Excel calculators for procurement for four separate product/service categories:

- Office ICT equipment
- Vehicles
- Street lighting
- Energy performance contracting

The tools all allow you to calculate the CO<sub>2</sub>-eq.<sup>1</sup> and energy savings to be obtained by purchasing an energy efficient product/service over a standard product/service. In most cases the user will need to define their own benchmark for the standard product/service.

The tools are designed to be usable by anyone with basic knowledge of Excel. Each tool contains an instructions sheet with information on how to use the calculator.

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<sup>1</sup> The tools consider all greenhouse gases

## Office ICT calculator

Link: [www.gpp2020.eu/fileadmin/files/Calculators/Office-ICT-Calculator\\_revised\\_2015-02-09.xls](http://www.gpp2020.eu/fileadmin/files/Calculators/Office-ICT-Calculator_revised_2015-02-09.xls)

<b>Scope</b> <ul style="list-style-type: none"> <li>• Copiers (monochrome and colour)</li> <li>• Fax machines (inkjet and laser)</li> <li>• Multifunction Devices (MFD – inkjet, laser, monochrome and colour)</li> <li>• Printers (inkjet, laser, monochrome and colour)</li> </ul>		
<b>System boundaries</b> <ul style="list-style-type: none"> <li>• Only the CO<sub>2</sub> emissions from the generation of electricity necessary to run the ICT-equipment<sup>2</sup></li> </ul>		
<b>Minimum data input requirements</b> <ul style="list-style-type: none"> <li>• Your country</li> <li>• The number of each product type to be purchased</li> </ul>	<b>Alterable variables</b> <i>Default figures for these are included in the tool, but can be changed by the user if required<sup>3</sup>:</i> <ul style="list-style-type: none"> <li>• The <i>idle, sleep</i> and <i>off</i> energy consumption of both the efficient product and a standard benchmark for comparison.</li> <li>• The average annual number of hours spent in different modes</li> <li>• The average lifetime of the product</li> <li>• Electricity costs (€/kWh) and CO<sub>2</sub> emissions per kWh (kg/kWh) – national default values are provided for both</li> <li>• The proportion of units which are switched off at night, and the proportion of units with sleep settings / low power mode enabled</li> </ul>	<b>Outputs</b> <ul style="list-style-type: none"> <li>• Electricity savings (kWh/year)</li> <li>• Electricity savings (toe/year)</li> <li>• Reduction of CO<sub>2</sub>-Emissions (t CO<sub>2</sub>/ year)</li> <li>• Electricity costs savings (€/year)</li> </ul>



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<sup>2</sup> It must be noted that, as energy efficiency improves the importance of emissions from the production stage in particular are becoming an increasingly important proportion of overall product CO<sub>2</sub> footprints – especially for laptops. It remains highly complex, however, to accurately calculate these emissions.

<sup>3</sup> The default values for the benchmark standard product and the efficient model come from a tool developed by the US Environmental Protection Agency. These values can be changed by the user – for example, using the figures for your current equipment. However, given the rapid progress in device energy efficiency a more realistic benchmark is to compare against an average product on the market - [www.topten.eu](http://www.topten.eu) is a useful resource for assessing this.

## Vehicles calculator

Link: [www.gpp2020.eu/fileadmin/files/Calculators/Vehicles\\_Calculator\\_revised\\_2015-02-09.xls](http://www.gpp2020.eu/fileadmin/files/Calculators/Vehicles_Calculator_revised_2015-02-09.xls)

<p><b>Scope</b></p> <ul style="list-style-type: none"> <li>Road vehicles with: <ul style="list-style-type: none"> <li>Standard combustion engines (either running fossil fuels or biofuels)</li> <li>Hybrid engines</li> <li>Fully electric motors</li> </ul> </li> </ul>		
<p><b>System boundaries</b></p> <ul style="list-style-type: none"> <li>Calculates the direct and indirect CO<sub>2</sub> emissions of the fuel used (direct emissions = emissions from driving; indirect emissions = emissions from the production of the fuel).</li> </ul>		
<p><b>Minimum data input requirements</b></p> <ul style="list-style-type: none"> <li>Your country</li> <li>Number of vehicles to be purchased</li> <li>Distance travelled annually</li> <li>Type of fuel used</li> <li>Fuel consumption per 100km</li> </ul>	<p><b>Alterable variables</b></p> <p><i>Default figures for these are included in the tool, but can be changed by the user if required:</i></p> <ul style="list-style-type: none"> <li>Direct and indirect CO<sub>2</sub> emissions of different fuel types – default figures taken from the EU Renewables Directive</li> <li>National values for CO<sub>2</sub> emissions of electricity consumed (CO<sub>2</sub>-eq/kWh)</li> </ul>	<p><b>Outputs</b></p> <ul style="list-style-type: none"> <li>Energy savings in toe/ year and percentage terms</li> <li>Reduction of CO<sub>2</sub>-Emissions in t CO<sub>2</sub>/ year and percentage terms</li> </ul>



# Street lighting calculator

Link: [www.gpp2020.eu/fileadmin/files/Calculators/Street\\_Lighting\\_Calculator\\_revised\\_2015-02-09.xls](http://www.gpp2020.eu/fileadmin/files/Calculators/Street_Lighting_Calculator_revised_2015-02-09.xls)

<p><b>Scope</b></p> <ul style="list-style-type: none"> <li>Street lighting fixtures/luminaries</li> </ul>		
<p><b>System boundaries</b></p> <ul style="list-style-type: none"> <li>Only the CO<sub>2</sub> emissions from the generation of electricity necessary to run the lights</li> </ul>		
<p><b>Minimum data input requirements</b></p> <ul style="list-style-type: none"> <li>Your country</li> <li>The number of light fixtures/luminaries</li> <li>The number of lamps per fixture</li> <li>The power per lamp in Watts (including low power mode, if relevant)</li> </ul>	<p><b>Alterable variables</b></p> <p><i>Default figures for these are included in the tool, but can be changed by the user if required:</i></p> <ul style="list-style-type: none"> <li>Electricity CO<sub>2</sub> emissions per kWh (kgCO<sub>2</sub>/kWh) – national default values are provided</li> <li>Operating time per year – default values provided are from a GPP 2020 example (street lighting in Croatia)</li> </ul>	<p><b>Outputs</b></p> <ul style="list-style-type: none"> <li>Reduction of CO<sub>2</sub>-Emissions in (t CO<sub>2</sub>/ year and percentage terms)</li> </ul>



## Energy performance contracting calculator

Link:

[www.gpp2020.eu/fileadmin/files/Calculators/Energy\\_Contracting\\_Calculator\\_revised\\_2015-02-09.xlsx](http://www.gpp2020.eu/fileadmin/files/Calculators/Energy_Contracting_Calculator_revised_2015-02-09.xlsx)

<p><b>Scope</b></p> <ul style="list-style-type: none"> <li>Any renovation work which leads to reductions in energy consumption, for example through energy performance contracting</li> </ul>		
<p><b>System boundaries</b></p> <ul style="list-style-type: none"> <li>Calculates the CO<sub>2</sub>-emissions generated during the production of heat or electricity.</li> </ul>		
<p><b>Minimum data input requirements</b></p> <ul style="list-style-type: none"> <li>Your country</li> <li>Current consumption of different forms of energy and fuel by the building</li> <li>Projected consumption of different forms of energy and fuel by the building following the renovation work</li> </ul>	<p><b>Alterable variables</b></p> <p><i>Default figures for these are included in the tool, but can be changed by the user if required:</i></p> <ul style="list-style-type: none"> <li>Direct and indirect CO<sub>2</sub>-eq emissions of different types of energy and fuel – default values are taken from a CO<sub>2</sub> calculator developed by the Austrian Environmental Agency</li> <li>Planning horizon/lifetime of the measures being implemented</li> </ul>	<p><b>Outputs</b></p> <ul style="list-style-type: none"> <li>Energy savings in toe/year and percentage terms</li> <li>Reduction of CO<sub>2</sub>-Emissions in tCO<sub>2</sub>/year and percentage terms</li> <li>Total energy and CO<sub>2</sub> savings over the selected planning horizon</li> </ul>





## About GPP 2020

GPP 2020 aims to mainstream low-carbon procurement across Europe in support of the EU's goals to achieve a 20% reduction in greenhouse gas emissions, a 20% increase in the share of renewable energy and a 20% increase in energy efficiency by 2020.

To this end, GPP 2020 will implement more than 100 low-carbon tenders, which will directly result in substantial CO<sub>2</sub> savings. Moreover, GPP 2020 is running a capacity building programme that includes trainings and exchange. – [www.gpp2020.eu](http://www.gpp2020.eu)



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