Nationale Milieu DATABASE

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Guide to environmental performance calculations

‘Practical aid to calculating the environmental performance of construction works’

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1. Introduction

This guide is a practical aid to a number of interpretations and design questions that may occur when calculating the environmental performance of construction works[1]. The environmental performance of construction works is an important indicator of the sustainability of construction works. The more sustainable the material use, the lower the environmental performance of the works, the better it is for the environment.

The environmental performance calculation is a tool in the design process and can be used in e.g. the clients brief or procurement requirements in order to lay down the result of a design process. The guide contains a brief description of the Dutch Determination Method Environmental Performance of Construction Works[2] (buildings and infrastructure projects). The guide does not include an explanation of Dutch construction legislation. For further information in this regard, please visit the websites of the national government and the National Environmental Database Foundation (NMD). Furthermore, the guide is not a set of calculation and schematization rules for 'abstracting' buildings to calculate quantities; this is a responsibility within the various calculation instruments for calculating the environmental performance.

n conjunction with the energy performance of a building or nearly-Zero Energy Buildings (in Dutch: BENG), the environmental performance is an increasingly important factor in the overall environmental impact of a building. In the Netherlands, a limit value for environmental performance has been introduced in the national Buildings Decree that entered into effect on 1 January 2018. This guide relates to this regulation. The environmental performance is determined using the Determination Method Buildings and Construction Works of July 2020 pursuant to the current version of the National Environmental Database (NMD).

Section 2 provides a broad outline of the environmental performance calculation, partly in light of the Dutch construction legislation. Within this context, section 3 outlines which building sections and building installations should be taken into account. Section 4 briefly looks at the key influences of building sections and building installations on the environmental performance. The service life is an important aspect in the environmental performance of a building and is discussed in section 5. Finally, section 6 looks at the impact of key design parameters on environmental performance.

[1] *'Construction works' refers to both buildings and infrastructure projects, including railway construction and energy infrastructure.*

[2] *Determination Method Environmental Performance Construction Works/version 1.0 (July 2020)*

2. The environmental performance calculation in brief

2.1 Determination Method Environmental Performance Construction works

The environmental performance calculation is performed in accordance with the Determination Method Environmental Performance Construction works. The Determination Method is based on an environmental lifecycle analysis, or LCA. An LCA looks at all stages in the lifecycle of a product, with particular emphasis on the function that a product needs to fulfil, in this case in construction works. An LCA evaluates the lifecycle stages of a product, such as production, construction, use and processing at the end of its life. The transport that takes place between and within stages, –such as to the construction site, is also taken into account.

The Determination Method does not focus on the environmental performance of individual products, but the environmental performance of an entire building or infrastructure work. The building or construction work is the unit to which the performance relates (the functional equivalent) and in which the product is used to enable the building to fulfil its function. The design and the intended service life define the building products and installations used and the number of replacements thereof during the service life of the building.

The environmental performance of construction works can be determined with calculation instruments that have been pre-validated by the National Environmental Database Foundation. *www.milieudatabase.nl/milieuprestatie/rekeninstrumenten/* (only available in Dutch).

The basis for the Determination Method is European standard EN 15804, which has been developed for Environmental Product Declarations (EPD) at product level. In the Determination Method, EN 15804 for determining the environmental performance of buildings and infrastructure works is transposed and supplemented by scenarios that apply to the Netherlands.

The Determination Method contains two sections:

1) Methodological requirements with product category rules for the LCA for all building products and installations.
2) Calculation of the environmental performance of a building and/or infrastructure works. The LCA environmental information for products and building installations generated in accordance with section 1 acts here as input.

The result of the environmental performance calculation is an environmental profile which, until recently, comprised eleven environmental impact categories in accordance with EN 15804, including depletion of raw materials, the greenhouse effect, and depletion of the ozone layer. The environmental performance, a single-score indicator expressed per m2 peryr of a building, is calculated by multiplying the results of the LCA (the environmental impacts per category) with weighting factors, and dividing the aggregated result by the Gross Floor Area and the lifespan of the building. The weighting factors are determined on a member state level and indicate the (relative) severity of the environmental effects. Using a single-score indicator to express the environmental performance makes it easier to compare performances of different buildings with each other, and to communicate it.

EN 15804 was amended in 2019 and, in terms of its methodology, harmonized with the LCA methodology of the PEF (Product Environmental Footprint) methodology of the European Commission[3]. The amended EN15804 prescribes an environmental profile with nineteen environmental impact categories. The Determination Method is amended according to the EN15804+A2 as from 1 July 2020, which is effective from 1 January 2021.

ENVIRONMENTAL IMPACT CATEGORY UNIT	EQUIVALENT		single- score indicator
Depletion of abiotic raw materials (excluding fossil energy carriers) – ADP	Sb eq	Raw materials	
Depletion of fossil energy carriers – ADP	Sb eq		
Climate change – GWP100 j.	CO2 eq	Emissions	
Ozone layer depletion – ODP	CFK-11 eq		
Photochemical oxidant formation – POCP	C2H4 eq		
Acidification – AP	SO2 eq		
Eutrophication – EP	PO4 eq		
Human toxicity – HTP	1,4-DCB eq		
Ecotoxicological effects, aquatic (freshwater) – FAETP	1,4-DCB eq		
Ecotoxicological effects, aquatic (marine) - MAETP	1,4-DCB eq		
Ecotoxicological effects, terrestrial – TETP	1,4-DCB eq		

Environmental impact categories in accordance with the Determination Method valid until 1 January 2021.

[3] *"NEN-EN 15804:2012+A2:2019"*

Impact category	Indicator	Unit
Climate change – total	GWP-total	kg CO2-eq.
Climate change – fossil	GWP-fossil	kg CO2-eq.
Climate change – biogenic	GWP biogenic	kg CO2-eq.
Climate change – land use and change to land use	GWP-luluc	kg CO2-eq.
Ozone layer depletion	ODP	kg CFC11-eq.
Acidification	AP	mol H+-eq.
Freshwater eutrophication	EP freshwater	kg PO4-eq.
Seawater eutrophication	EP-seawater	kg N-eq.
Land eutrophication	EP-land	mol N-eq.
Photochemical ozone formation	POCP	kg NMVOC-eq.
Depletion of abiotic raw materials, minerals, and metals	ADP-minerals&metals	kg Sb-eq.
Depletion of abiotic raw materials Fossil fuels	ADP-fossil	MJ, net cal. val.
Water use	WDP	m3 world eq. deprived
Fine particulate emissions	Illness due to PM	Illness incidence
Ionizing radiation	Human exposure	kBq U235-eq.
Ecotoxicity (freshwater)	CTU ecosystem	CTUe
Human toxicity, carcinogenic	CTU human	CTUh
Human toxicity, non-carcinogenic	CTU human	CTUh
Land-use related impact/soil quality	Soil quality index	Dimensionless

Environmental impact categories in accordance with the Determination Method valid after 1 January 2021.

The Determination Method is performance-oriented, not solution-oriented. The construction's final environmental performance is assessed. This leaves freedom of design and room for innovative solutions. The method itself does not prescribe any product or design solution nor requirements to a construction method and/or technique.

2.2 National Environmental Database (NMD)

To ensure the comparability of an environmental performance, it is important that the environmental data of the materials and products used in the construction works are laid down in a similar way. Section 1 of the Dutch Determination Method Environmental Performance Construction works imposes methodical requirements in this regard. These requirements are consistent with the European standard EN 15804+A2, which has been developed for Environmental Product Declarations (EPD) at product level. Where EN 15804+A2 still contains a number of optional aspects that can be voluntarily applied, they have been made compulsory in the Dutch Determination Method Environmental Performance Construction works, with scenarios applicable to the Netherlands. If producers have an EPD based on EN 15804+A2, they do not need to carry out the entire LCA again for use in the Netherlands, but only the additional work in order to incorporate data on those scenarios into the existing environmental data. For further information, see clause 2.6 'Product category rules for the LCA' in the Determination Method Environmental Performance Construction Works.

The National Environmental Database (NMD) was established to ensure the verifiability of the environmental data submitted by producers and to ensure a uniform use of the data when calculating the environmental performance. The environmental data that a producer declares and provides for inclusion in the NMD is verified in accordance with the procedures and requirements of the NMD verification protocol. Consequently, the NMD and the Determination Method are linked. The information stored in the NMD is used in calculation instruments for both buildings and infrastructure works.

The NMD is a database consisting of product files including data on environmental profiles and quantities that are used in the construction design. The NMD primarily contains product files that specify the environmental effects of production of a material, processing at the end of life of the material, transport to the construction site, etc.. General process information about background processes, such as basic materials, processing at the end of life of the material, and transport is stored in the NMD in separate files called 'basic profiles'[4]. The NMD Foundation is responsible for managing and maintaining the database, including quality assurance of the environmental data supplied. The industry is responsible for providing relevant and sufficient verified environmental data.

[4] *https://milieudatabase.nl/milieudata/basisprofielendatabase-en-database-met-afdankscenarios/*

The environmental profile in a product file is derived from the Environmental Performance Declaration (EPD) from the producer. This EPD, based on EN 15804+A2, is in line with the system proposed by the Construction Products Regulation[5], particularly the sustainable use of natural resources (basic requirement no. 7). Since no compulsory harmonized methods for Member States have yet been drawn up, the Dutch Building Decree applies the Dutch Determination Method which is in accordance with EN 15804+A2, as drawn up within the CEN TC 350 committee of the European Standardization Institute and which the industry may apply on a voluntary basis. This provides a retroactive interpretation of consideration 55 of the Construction Products Regulation: The basic requirement for construction works in respect of the sustainable use of natural resources must, in particular, take into account the recyclability of construction works and of the materials and parts thereof after demolition, the sustainability of construction works, and the use of environmentally-friendly raw materials and secondary materials in the works.

Appendix 1 to the Regulations, 'Basic requirements for construction works', states that construction works as a whole, as well as the individual parts thereof, must be suitable for the intended use, taking into account, in particular, the health and safety of the persons involved throughout the lifecycle of the works. With normal maintenance, construction works must be capable of satisfying these basic requirements over an economically reasonable service life.

Furthermore, basic requirement no. 7 states that the construction works must be designed, built and demolished in such a way that the use of natural resources is sustainably and in particular ensure the following:
a) The reuse or recyclability of the construction works, their materials and parts after demolition;
b) The durability of the construction works;
c) The use of environmentally compatible raw and secondary materials in the construction works.

The system of the Determination Method and NMD intends that building installations are inextricably linked with the intended use of construction works. As such, the industry supplies environmental data for both construction products and building installations for inclusion in the NMD.

The Dutch EPD program operator MRPI (Environmentally Relevant Product Information Foundation (MRPI)) offers domestic and foreign manufacturers the opportunity to publish an MRPI-EPD certificate on the basis of the Determination Method (here, EN 15804+A2), which can then be included in the National Environmental Database one on one.

In addition to data on environmental impactcategories the NMD also includes environmental data relating to the reuse and recyclability of the materials, as well as the use of primary and secondary raw materials in products placed on the market. This information is retrieved from LCA reports.

The Determination Method with the NMD verification protocol is also the Dutch Product Category Rule (PCR) for an EPD of entire buildings (prefabricated or building kit) that are put on the market as a single product.

[5] *REGULATION (EU) NO 305/2011 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 9 March 2011 laying down the harmonized conditions for the marketing of construction products and repealing Council Directive 89/106/EEC with EEA relevance.*

2.3 Implementation of the Determination Method in regulations

The Determination Method, which relates to the Dutch Buildings Decree, is applied in a similar way in various other Dutch sustainable building schemes, such as certification in accordance with BREEAM-NL and GPRGebouw. For the infrastructure sector, the method is incorporated into the calculation instrument DuboCalc.

In both the Buildings Decree and in the event of certification in accordance with BREEAM-NL and GPR-Gebouw, the requirements and quality levels are imposed on the user function (functional unit) and not on the physical object to which the Determination Method relates. An appendix to the Determination Method indicates how the environmental performance of a building can be translated to the user function of a building. To this end, structures and building installations are taken into account in order to be able to determine the environmental performance of a user function.

The environmental performance of a building function is then determined by dividing the environmental impact of the materials allocated to that user function by the gross floor area (GFO in m^2, determined in accordance with NEN 2580) allocated to residential and office function and expressing it as a single-score indicator per m^2 per yr.

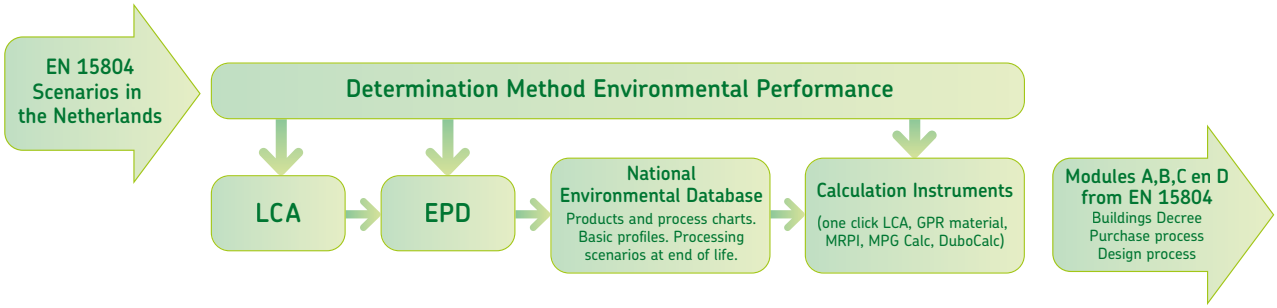


Diagram of the components on which the Determination Method imposes requirements.

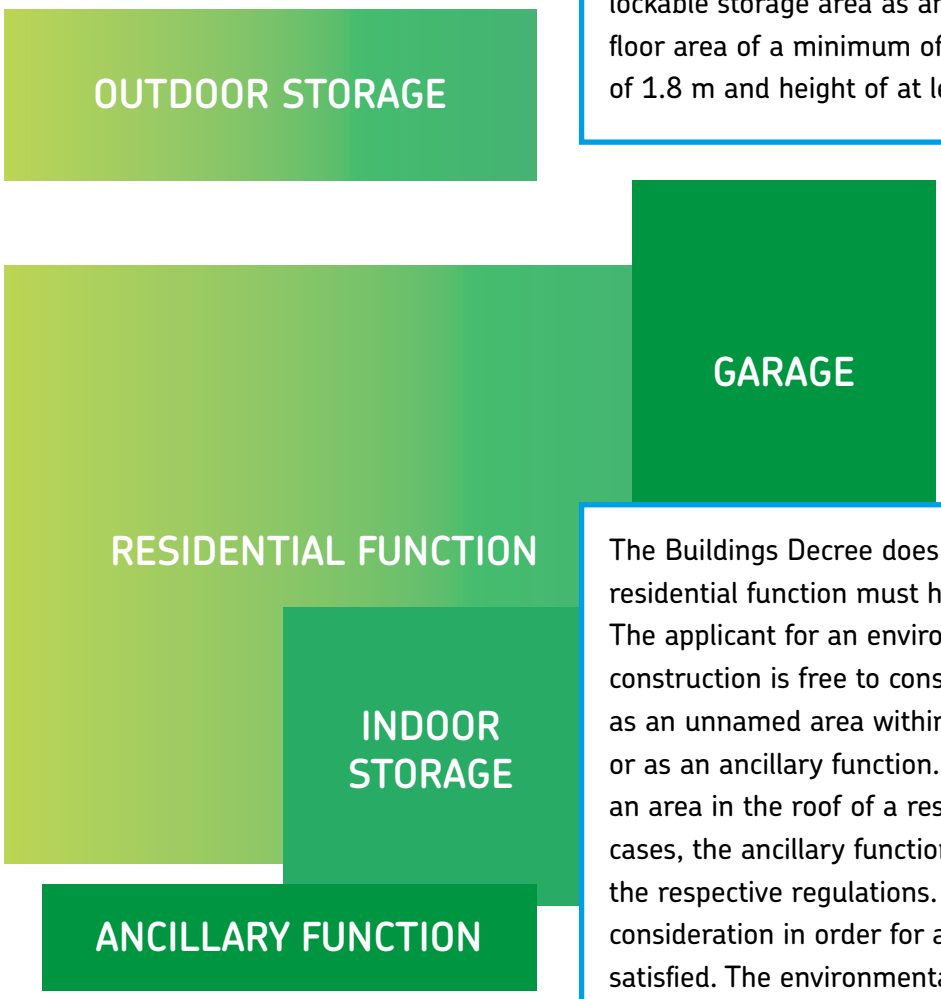
2.4 Regulations in the Buildings Decree

Since 1 January 2013, the Dutch Buildings Decree has imposed the calculation of the environmental performance on a residential function and office function to be constructed. It does not impose environmental performance requirements on renovation. Furthermore, no environmental performance requirements are imposed on temporary construction works – works with a preservation period not exceeding fifteen years at the same location. The regulation is imposed on a building with a residential function. This means that the environmental impact of ancillary building functions[6] does not need to be taken into account in order to satisfy the regulation. However, the environmental impact of ancillary functions must be taken into account for office buildings. After all, an office building is a building or part of a building with only one or multiple office functions and ancillary functions.

The Buildings Decree stipulates that the environmental performance calculation does not need to be performed for an office building that forms part of a building with user functions other than an office function or ancillary function.

[6] *Ancillary function: a user function that serves another user function.*

Sec. 4.5 Buildings Decree
Article 4.31
A residential function has a non-communal, lockable storage area as an ancillary function with a floor area of a minimum of 5 m^2 with a width of 1.8 m and height of at least 2.3 m above that.



The Buildings Decree does not stipulate that a residential function must have indoor storage. The applicant for an environmental permit for construction is free to consider the indoor storage as an unnamed area within the residential function or as an ancillary function. This applies equally to an area in the roof of a residential function. In both cases, the ancillary function must continue to satisfy the respective regulations. This requires a complex consideration in order for all regulations to be satisfied. The environmental performance calculation is no exception.

Schematic representation of the different functions in a single-family home.
The regulation in the Buildings Decree relates solely to the environmental performance of the residential function.

The limit value for the single-score indicator is imposed on the structure and building installations for which an environmental permit for construction has been applied for. The building regulations also stipulate that all permit-free construction activities that are included in the new construction must satisfy the new-build requirements that apply to the respective works. The end result must satisfy the new-build requirements at the time of delivery. As an example, this means that if a permit-free dormer window is installed on a residence under construction, it must be included in the environmental performance calculation.

In some cases, existing structures, products, and building installations are reused in their entirety. In that case, the LCA environmental data for those structures, products, and building installations are free of environmental burden in accordance with Appendix III to the Determination Method Environmental Performance Construction Works.

Next to the fact that the environmental impact of structures , products or building installations released from an existing building is difficult to determine, the reuse of these products has a 'pull effect' for circular construction and must therefore be rewarded. Reused structures, products and building installations must of course satisfy the other regulations of the Buildings Decree.

The environmental impact of recycling into a raw material or construction material is reflected in the environmental performance, as this is an aspect that is included in the EPD of a construction product. This product declaration is in turn input for the environmental performance calculation.

For the moment, this view is consistent with the interpretation of the European Construction Products Regulation, which implicitly states that manufacturers are responsible for compiling EPDs. The remarketing of a construction products goes beyond the responsibility of the manufacturer. It must be noted that there is growing discussion within Europe as to whether the responsibility should rest with the initial producer or with the person who places the product to be reused back on the market.

3. The building sections and installations that must be taken into account

3.1 System approach for application in the Buildings Decree

In the case of buildings with multiple user functions, a calculation of the environmental performance of the entire building is performed, whereupon the environmental impact or performance is divided proportionally by the percentage gross floor area of a user function and the total of the user and ancillary functions that are present.

Regulations, certification programmes, and other rules specify which building sections and installations must be taken into account in order to satisfy the quality requirements specified in the respective regulation. For example, the Dutch Buildings Decree states that the calculation relating to the regulation in the Buildings Decree only needs to take into account the environmental impact of the structure and building installations with which other regulations in the Buildings Decree are associated, such as regulations relating to structural and fire safety, health, and energy performance. Although the presence of a central-heating boiler, radiator, or lighting is not required under the Buildings Decree, but may form part of an installation that is intended to satisfy the regulation on energy performance, the environmental impact thereof must be taken into account. This also applies to tiling that may have been used in order to satisfy the regulation on waterproofing. Structural requirements are associated with many structures and form part of the environmental performance in the Buildings Decree. For example, structural and/or fire safety requirements are often imposed on (permit-free) internal walls and must be taken into account in the environmental performance calculation. The appendix to the Determination Method includes a checklist that stipulates which structures and building installations must usually be taken into account when calculating the environmental performance of construction works.

Of the energy-supply facilities that must be taken into account when calculating the environmental performance in accordance with the Buildings Decree, only the percentage of the environmental impact intended for the building-related energy use of the user functions needs to be taken into account. In other words, the part that was specified in the permit application for the energy performance (EPC) or nearly-Zero Energy Buildings (in Dutch: BENG). As such, a distinction can be made for energy supply by solar panels, for example, between a percentage that is used for household use and a percentage for applications required to satisfy the other regulations under the Buildings Decree 2012. In that case, the environmental impact for use of appliances that are not building-related does not need to be taken into account for application of the Buildings Decree.

A specific element within this is the use of services from outside the building in order to satisfy the energy performance. This could include wind turbines, standard electricity connections, heat connections, and thermal energy storage systems. To allocate this external energy supply in the environmental performance calculation, default values[7] have been included in the NMD. Furthermore, for these energy sources as well as photovoltaic panels, only that percentage of the default value that was used to satisfy the energy performance specified in the permit application needs to be taken into account.

This reasoning also means that site facilities such as road paving and boundary fencing do not need to be taken into account in the environmental performance under the Buildings Decree. This is without prejudice to the fact that other regulations, certification programmes, and rules may require site facilities to be taken into account in order for the respective quality levels to be satisfied.

3.2 How to deal with missing information from the NMD when performing an environmental performance calculation?

The NMD is a dynamic database that was launched with the most common materials and supplemented by the industry with more specific product data. Responsibility for supplying LCA data for inclusion in the NMD rests with producers. The database contains largely confidential data that are not available to the public, unless the producer makes this information available in a performance declaration for a product.

In case of a product for which LCA data have not been supplied for inclusion in the NMD, the product can be broken down into its constituing products or materials for which data are available. If this proves unsuccessful, a comparable product may be chosen instead.

[7] *Default: a preset value that is given to a variable if the user of the software does not enter a value himself.*

4. The influence of building sections and installations on environmental performance

When optimizing a design based on the environmental performance score, building installations, facades, floors, and roofs turn out, on average, to be the most contributing elements. The foundation and supporting structure typically have a lower contribution.

	REGULAR RESIDENTIAL FUNCTION	NOM-RESIDENTIAL (ENERGY NEUTRAL)
Foundation	approx. 07 %	approx. 05 %
Floors	approx. 16 %	approx. 16 %
Supporting structure	approx. 07 %	approx. 11 %
Facades	approx. 18 %	approx. 13 %
Roofs	approx. 06 %	approx. 04 %
Building installations	approx. 33 %	approx. 45 %
Installation	approx. 13 %	approx. 09 %

Percentage contribution of structures and building-related installations to the environmental performance score of a building with a residential function.

The following design choices often have a positive impact on the environmental performance score:

- Avoiding material use, e.g. by opting for slimline and/or non-solid structures (e.g. hollow-core slabs instead of solid floors);
- A balanced installation for ventilationHVAC-system [SA(45][pvl46]can lead to a considerable improvement in the environmental performance;
- Using products with a considerable [JS47](high-quality) recycled content;
- Using bio-based materials.

Sources:

Research: 'The principles and parameters of the environmental performance of buildings (MPG)' based on experiences in 2012 - 2016 [W/E 24 February 2017]

Research: 'The MPG of NOM, BENG, and ZEN homes' [DGMR 1 November 2017]

5. The influence of the service life

5.1. Environmental effects considered over the entire service life

The Determination Method offers practical guidance for analysing environmental performance based on international standards. The Determination Method is based on the environment-related lifecycle analysis, or LCA. A LCA looks at all stages in the lifecycle of a product, with particular emphasis on the function that a product needs to fulfil in construction works. A LCA evaluates the lifecycle stages of a product, such as production, construction, and disposal. The transport that takes place between and within stages – such as to the construction site – is also taken into account.

5.2 The service life of buildings in the Determination Method

The Determination Method Environmental Performance Construction does not specify a fixed value for the service life of a building and it can be determined as you see fit. A typical default value[8] for homes and residential buildings in the Netherlands is 75 years. For office buildings, the typical default value is 50 years. It is allowed to use an alternative value, if substantiated and justified. In case of a deviating service life, the 'Specific Building Service Life Guideline; addition to the Determination Method Environmental Performance Construction Works' may be used. This publication was compiled at the request of the Ministry of the Interior and Kingdom Relations and can be found at *www.milieudatabase.nl*. In addition, ISO 15686-8 provides further academic guidelines for calculating the estimated service life using the factor method.

The building service life is, therefore, a relevant factor:

- ***Shorter building service life***
  With a building service life of less than the default value of 75 years, the environmental performance per year increases significantly when the materialization remains unchanged. If a relatively short service life is to be expected, it is additionally important to pay attention to products with low environmental impact, short-cycle products, and circular principles such as reuse, recyclability, and degradability.
- ***Longer building service life:***
  With a building service life of more than the default value of 75 years, the environmental performance per year decreases in relative terms but by no means in proportion to the longer service life than 75 years. This is because the longer service life is only relevant to long-cycle elements whose service life is the same as that of the building.

The short-cycle elements will be replaced once or several times during those 75 years, which will increase the overall environmental impact almost proportionally. Long-cycle elements typically include the shell and partly the outer shell (closed facade parts), both parts that have a relatively limited contribution to the overall environmental performance.

[8] *Default: a preset value that is given to a variable if the user of the software does not enter a value himself.*

6. The influence of key design parameters

6.1 Gross floor area (GFO)

The influence of the gross floor area on the environmental performance score (which is expressed per m^2 per year) is relatively high in small homes or residential/office units. This is due to the relatively large amount of material per gross floor area (unfavourable ratio between floor and surrounding area) combined with the regular building installations and facilities that are required, which are independent of the size of the home. Compared to a standard single-family home with an average environmental performance of 0.50, the environmental performance can quickly increase in very small homes. On the other hand, the environmental performance scope will decrease as the gross floor area increases.

6.2 Number of floors

In residential buildings with only one floor, the environmental performance score is relatively high. This is due to the fact that communal facilities such as the foundation, entrance, and access can be distributed over a limited number of homes. As the number of floors increases, the environmental performance score per home decreases. The reduction speed is increasingly lower as with an increase in the number of floors, the need for a heavier structure increases.

6.3 Floor height

The environmental performance score increases by 2 to 3% for each 10% increase in the floor height. This is due to the fact that the facade area increases even though the gross floor area remains the same. Even with a floor height of more than three metres, the increase in the environmental performance score will be limited.

6.4 Facade area

If the facade area increases but the number of m^2 of gross floor area (facade/GFO ratio) remains the same, the environmental performance score will increase. An increase of 10% to the facade/GFO ratio will lead to a several percentage point increase in the environmental performance score. A square building without indentations or steps in the facade is material-efficient and will score highly as a result. A patio apartment or home with bay windows, extensions, and ornamental facades has more material per m^2 of gross floor area, relatively, and will score lower than average as a result.

6.5 The proportion of open sections in the facade

The open sections in the facade have a higher environmental impact than the closed sections. This is caused, in part, as the environmental impact per m^2 of glass is high, especially in the case of triple glazing. A 25% increase in the proportion of open facade sections will lead to a several percentage point increase in the environmental performance score. Combined with an unfavourable facade/GFO ratio, this can lead to a relevant increase in environmental performance.

Addendum to the Guide to Environmental Performance Calculations and NMD in the European playing field

As described in previous chapters, the Determination Method and National Environmental Database (NMD) are embedded in the Dutch policy of performance requirements for a civil engineering works. For example, the Determination Method has been designated to calculate the required performance following a notification procedure in the Decree (Bouwbesluit). The performance requirement is set in a single-score indicator per m^2/yr.

The core of the performance-based approach is that there is no obligation to apply a particular building material, construction product, design factor, or construction method. This provides scope for constructing parties to meet a desired or required performance. In the building code for private construction guidelines, 'deemed-to-satisfy' solutions have been provided for this purpose in order to ensure that the required performance can generally be met.

On this basis, and given that the Determination Method is based on EN 15804, the system is in harmony with free trade. The system also ensures that the products and building installations installed in that civil engineering works have such properties that the essential/functional environmental performance requirements of the civil engineering works can be met.

Having the modular structure of EN 15804, the Determination Method and the NMD offer the possibility to draw up LCA reports in order to include, in a uniform manner, the high quality of reuse and recycling in input streams and of reuse in input streams in performance declarations for construction products and installations. This aims to provide a market-driven incentive for the recovery of construction and demolition waste and its material-specific fractions. From a European perspective, the Determination Method can thus be positioned as a life cycle assessment as referred to in 'A new Circular Economy - Action Plan for a Cleaner and More Competitive Europe' and then in the level 2.4 'Life Cycle Assessment' (impact/m^2/yr) of the European project LEVEL(s)).

The increasing number of Nearly Zero Energy Buildings with a high energy performance means that more and more building installations must also have properties that allow the essential/functional requirements to be met. Using the essential/functional environmental performance requirement as a starting point, stakeholders in the Netherlands have opted for a horizontal application of EN 15804 in order to determine the environmental performance of both a construction product, building installation, or other energy-related product. In more general terms, this could be a model to harmonize the Construction Products Regulation and the Ecodesign Directive [1] in terms of assessment methods. For example, industry products for thermal insulation (CPR area code 4), flat glass (CPR area code 30), and other energy-related products, including construction products, only need to use one determination method, which considerably reduces the administrative burden.

[1] *In full 'Directive establishing a framework for the setting of ecodesign requirements for energy-related products'*

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