

Expertgroup

Product Data for Sustainable Constructions

What sustainability data on products do stakeholders in the construction, real estate and installation sectors need and how is this information ideally available?



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Takeaways

1. As social and legal requirements on sustainability become increasingly urgent and compelling, parties in the construction chain need to be more knowledgeable about the sustainability of products.
2. It is necessary that parties can easily access product data. Being able to link to other product data, such as geometric data, material properties and trade information, is essential for working efficiently.
3. To quickly make construction sustainable, the most important data on many products should be available in the short term. That takes precedence over complete data on a few products. For this, it must be easier, less labour-intensive and cheaper to collect information.

Chairman



No perspective without insight

The world is facing major sustainability challenges. We want to combat global warming as much as possible, restore biodiversity – and thus our food supply – and ensure that the earth remains habitable for people and animals. The construction industry has a major part to play. The built environment's share in global CO₂ emissions is estimated at 38 per cent. Moreover, the construction industry is a major consumer of primary raw materials. Steering to reduce emissions, material use and underlying environmental impact is therefore especially important, especially in view of an increasing construction volume.

The question this expert group considered:

What sustainability data on products do stakeholders in the construction, real estate and installation sectors need and how should this information ideally be available?

1. Societal challenge - Be the change

To limit global warming, on 1 January 2020 we were allowed to emit 400 gigatonnes of CO₂ equivalent¹ worldwide for no more than 1.5 degrees of warming, and 1,150 gigatonnes of CO₂ equivalent for no more than 2 degrees of warming.² And those are not amounts per day, per month or per year. No, that's it, forever! If we emit more, the earth will also warm up more. For the Netherlands, this means that if we want to stay below 1.5 degrees warming, we can still emit a maximum of 730 megatonnes of CO₂ equivalent.

38 per cent CO₂ emissions from built environment

The share of the built environment (which includes all buildings from offices to houses and roads) in global CO₂ emissions is estimated at 38 per cent.³ On the one hand, this concerns CO₂ emissions from the construction process itself: so-called material-related emissions, such as the extraction, production and transport of building materials. On the other hand, it concerns the energy consumed by a building during its lifetime: so-called operational emissions. Think of lighting and heating of buildings.

1 CO₂ EQUIVALENT MEANS THAT IN ADDITION TO CARBON DIOXIDE (CO₂), OTHER GREENHOUSE GASES ARE ALSO COUNTED. THESE ARE NITROUS OXIDE (N₂O), METHANE (CH₄) AND THE FLUORINATED GASES (F-GASES).

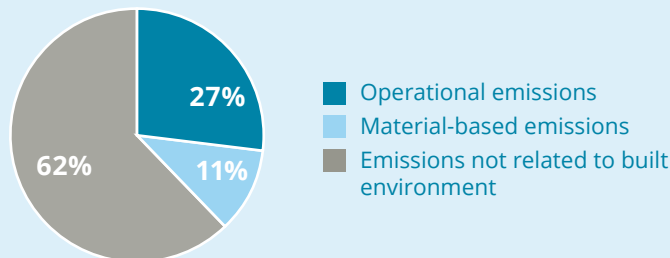
2 IPCC (2020) ASSESSMENT REPORT 6: THE SCIENTIFIC BASIS – SUMMARY FOR POLICYMAKERS. TABLE SPM.2

3 UN ENVIRONMENT PROGRAMME, PRESS RELEASE 16.12.2020

Facts & figures climate impact in the Netherlands

- Over the past 5 years, we have emitted 178 megatonnes of CO₂ (equivalent) per year.
- To stay below 1.5 degrees warming, the remaining CCO₂ budget in the Netherlands is 730 megatonnes of CO₂.
- 11 per cent of the Netherlands' CO₂ emissions come from materials in construction.
- The construction sector uses 50 per cent of all extracted materials in the Netherlands.

PERCENTAGE OF CO₂ EQUIVALENT EMISSIONS BY THE BUILT ENVIRONMENT IN THE NETHERLANDS



Source: KEV, Nibe

Reducing operational emissions has been receiving considerable attention for some time. However, reducing material-related emissions has only received the attention of a wider audience in the past few years. Whereas we can still make a significant impact here, even in the short term. As can be seen in the pie chart, an estimated 11% of the Netherlands' CO₂ emissions come from construction (the material-related emissions) each year.

Making strides quickly

If we build more sustainably, for instance by using materials with a lower CO₂ footprint (such as bio-based materials and locally produced materials), we can make strides quickly. This has a direct effect on reducing CO₂ emissions. Especially when you consider that new housing is hugely in demand, and that this increases the likelihood that more houses will be built.

If we continue as we are doing now, in about four years the CO₂ budget will be consumed (based on a remaining CO₂ budget of 730 megatons and annual CO₂ emissions of 178 megatons). The Dutch targets of 55 per cent CO₂ reduction by 2030 (compared to reference year 1990) are therefore important and good, but they do not stand alone. We also need to meet targets today and tomorrow.

Other ecological limits

This is not just about reducing CO₂ emissions, though. Many materials are finite and the so-called Earth Overshoot Day is around April in the Netherlands. That is the moment in the year when we have already used more materials for that year than the earth can recover. The built environment is a big consumer in this respect, with as much as 50 per cent of all extracted materials going to the built environment.

Besides reducing CO₂ emissions and thus counteracting climate change, there are eight other 'ecological limits' on our earth. There are major challenges there, too. These include reducing biodiversity loss and preventing so-called 'novel entities': toxic substances that nature cannot break down.⁴

2. Available tools

Through all kinds of methods, databases, indicators and tools, a lot of information is already available on the sustainability of products. Too many methods and databases. It is not easy to get a good overview. More than three-quarters of the respondents in this expert group's survey indicated that information is currently available in a very fragmented way.



“That you struggle with data availability is not crazy, experts do too. It is important to understand the challenges and get a handle on solving it together.”
Pascal Sluiter, expert group member

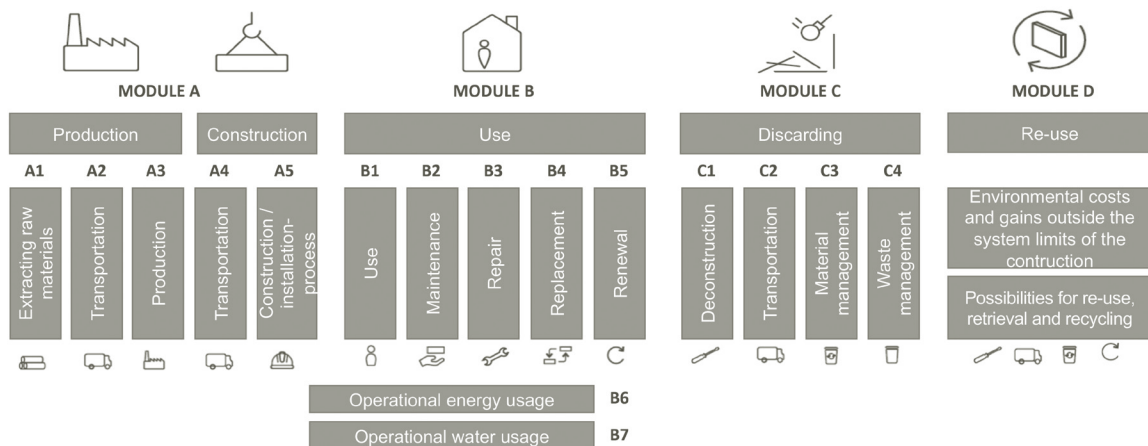
2.1 Measuring material-related environmental impact

In this report, we will focus on the data around material-related environmental impact, because that is where major challenges lie. The environmental impact of products is calculated by means of a life cycle analysis (LCA). The results of these LCA calculations are documented in Environmental Product Declarations (EPD). Manufacturers and industry associations submit Environmental Product Declarations (EPD) to the NMD Foundation for inclusion in the National Environmental Database (NMD). In doing so, there are three categories of data:

- Category 1 data: verified, brand-specific data, owned by the manufacturer.
- Category 2 data: verified, sector-specific data, which are (often) owned by the industry.
- Category 3 data: unverified, generic data, compiled by experts.

Once the data for the various products and product categories are available, parties can enter the project-specific design and the Environmental Performance of Buildings (EPB) is determined. In doing so, there are four stages that provide more detailed information:

1. Module A: Production and construction phase
2. Module B: Use phase
3. Module C: Demolition and treatment phase, including waste treatment
4. Module D: Re-use, recovery and recycling



The various modules from the Environmental Performance Constructions (source: EN15804)

Other methods and indicators

The Environmental Performance of Buildings is about the legal framework. We could fill pages with information on methods, indicators, databases and product registries, tools and labels that say something about the sustainability of organisations, products and buildings. The following figure shows some of these organisations. In practice, there are even more. To provide clarity to the market, having a range of databases is certainly not preferable, especially if they are not connected. The next section of this blueprint will further show that more than three-quarters of the respondents in the survey conducted by the expert group find it takes a lot of time to gather information, and that the information is fragmented.



3. Need for data

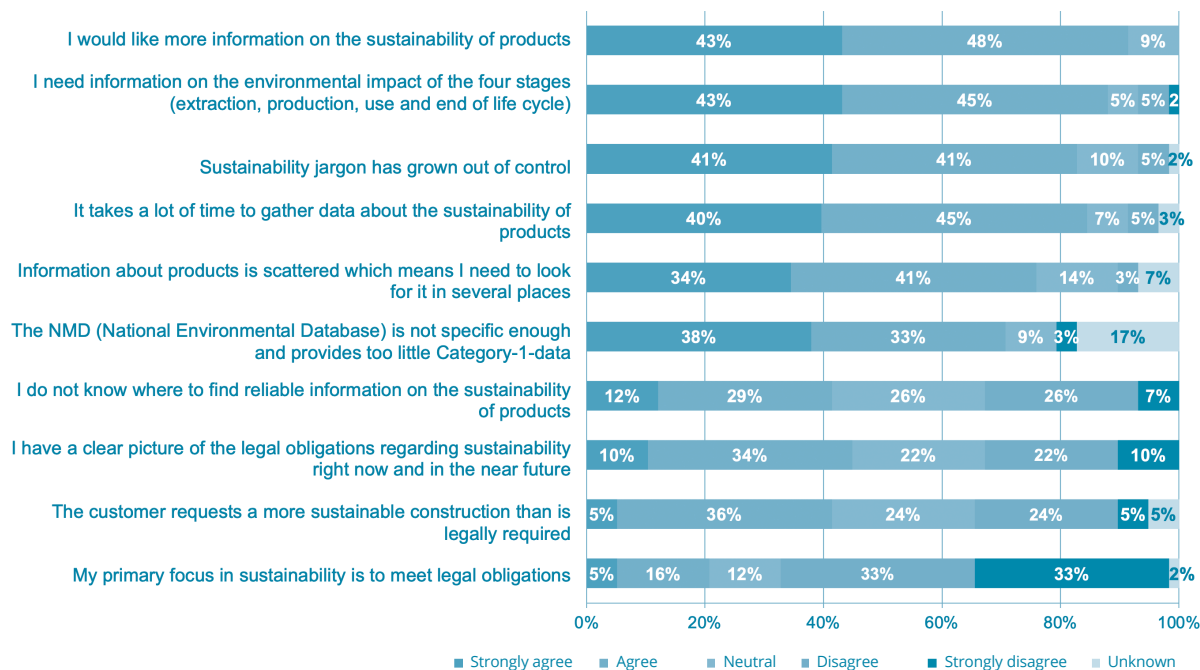
As yet, the answer to the question of whether the information is also available, which is needed to create sustainable buildings and comply with regulations, is no. It is shocking to see how poor the availability and accessibility of information needed by the construction industry is. And this while there is a great need for it, according to our research.

3.1 More information on sustainability needed

As many as 91 per cent of respondents want more information on the sustainability of products. For most people (88 per cent), this involves information on the four phases of extraction, production, use and end-of-life. According to 71 per cent, the National Environmental Database is not specific enough and has too little Category-1-data, i.e. verified, brand-specific data, owned by the producer.

Some 85 per cent believe it takes a lot of time to collect data on the sustainability of products. In addition, 75 per cent of those surveyed indicate that information on products is fragmented, requiring them to search in multiple places. A full 82 per cent feel that there is currently a proliferation of sustainability terms.

To what extent do you agree with these statements? (n=58)



Information is poorly available

There is only one indicator that a majority of respondents think is easily accessible and that is the Energy Label, although only 52 per cent say so. According to 19 per cent, although the information is accessible, it costs money and 9 per cent think it takes time to get the information to the surface. And to think that the Energy Label is still the best performing indicator in terms of availability.

Of all the other indicators we presented, at most 26 per cent said it was easily accessible. It costs a lot of money and even more often: a lot of time. The Material Passport⁵ and Life Cycle Assessment (LCA⁶) stand out in that a large group of respondents indicated that these two cost a lot of money.

Wish: one digital, reliable place

In the survey, respondents were also asked in what way they would like data to be available in order to build as sustainably as possible. Through one digital, reliable place, is the answer. A place that is complete and well-structured, controlled and managed by the government, for example. With information that makes it possible to make comparisons at product level in terms of CO₂, environmental and circularity impact of traditional and circular (new) products for the various life phases, up to and including reuse. Think of a general attestation or otherwise independently verified product sheet.

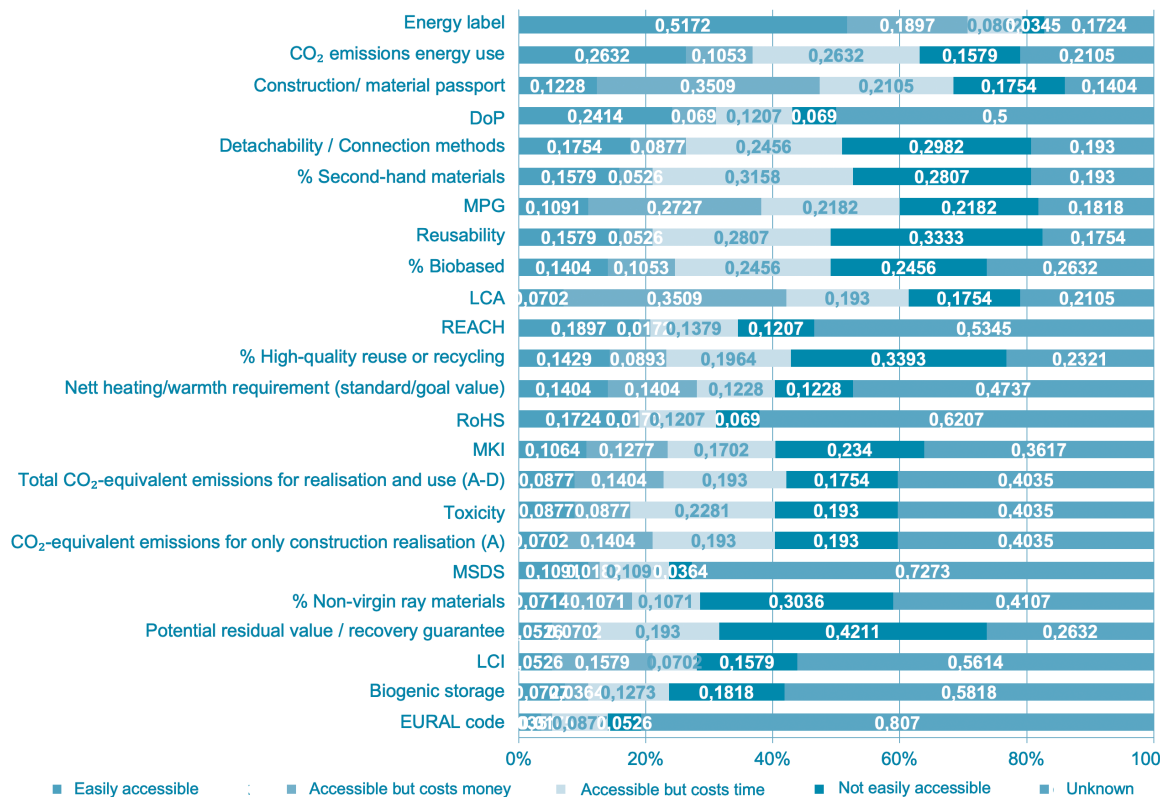
Manufacturers would like this to be done on the basis of an international standard, and that they themselves will have to provide the information in as few places as possible.

Building owners would like to see distinct levels distinguished in the data, such as building-, site-, area-, project- and product-related data. For this study, we limit ourselves to product data.

5 THE MATERIAL PASSPORT REMOVES MATERIALS FROM ANONYMITY. IT RECORDS BUILDING MATERIALS OVER THE LIFE CYCLE OF A BUILDING ACCORDING TO AMONGST OTHER THINGS, FINANCIAL VALUE, LIFESPAN AND QUALITY

6 LIFE CYCLE ANALYSIS A PRODUCT IS ALSO KNOWN AS CRADLE-TO-GRAVE ANALYSIS. IT IS A METHOD TO DETERMINE THE TOTAL ENVIRONMENTAL IMPACT OF A PRODUCT THROUGHOUT ITS LIFE CYCLE. A BETTER LCA MEANS A LOWER MPG SCORE

To what extent do you have the impression that information is freely accessible? (n=58)



Need for unlocking data

The respondents would really like information to be made accessible through a central location or database by linking data sources and/or with linked data.⁷ A number of respondents advocate integrating the data with existing standards. The conditions mentioned for using the database are transparency and low cost.

4. Challenges and solutions

It is extraordinary, to say the least, that in this era of digitisation and sustainability, so much is still unclear. Not to mention that even sustainability specialists are far from always knowing what sources they need for what, and what information they can get from those sources at all. Even the legally required information is hard to come by for anyone. As a result, achieving the most sustainable buildings possible is no mean feat. What then is needed to improve data availability and exchange?

Reliable data on the sustainability of applicable products and materials are currently neither fully available nor easily accessible.

⁷ LINKED DATA ARE STRUCTURED DATA CONNECTED TO OTHER ENTRIES, WHICH CONSEQUENTLY ARE BETTER TO USE FOR SEMANTIC QUERIES

What needs to be done?

From our research and the interviews conducted by the expert team, it follows that it is important to pay attention to:

- A. a good data structure with easy access;
- B. availability of high-quality data;
- C. application of data.

For all three of these points, we briefly outline below the main dilemmas as well as our recommendations for solutions to them. The extensive online report explains this in more detail.

This emerges when the expert group discusses the topic:

- There is huge lack of knowledge within the chain. What should I deliver and who wants what data?
- Uniformity of data is lacking. Terms are not uniformly interpreted.
- The National Environmental Database is not specific enough and there is too little manufacturer-specific Category-1-data.
- The LCA database contains a lot of outdated data. There are product category rules for existing products, but not for new products.
- There are too few LCA experts to carry out analyses. As a result, there is inadequate verified information.
- There are too few incentives to use and thus provide information. Without demand or requirement, it does not happen on a large scale.
- Traceability of data is difficult, making data less reliable.
- Data are partly shielded (not available or only against payment).
- We can build smarter if we use data proactively instead of reactively. In this way, we are able to make more sustainable choices in advance instead of only assessing sustainability when submitting the environmental permit.

4.1 A good data structure with easy access

? Dilemmas

- fragmentation;
- a long chain of involved parties;
- lack of uniformity of data
- project-oriented rather than cross-project working;
- it is difficult to use data. Some information is costly to access.

👍 Recommendations

In the current situation, finding and using information is therefore cumbersome, prone to errors and in some cases (very) cost/labour-intensive – if the information is available at all. All of this complicates circular behaviour.

The availability of an information infrastructure, including clear agreements on standards, ownership, accessibility, storage, exchangeability, rights and use is essential for circular behaviour. Consideration must therefore be given to where, how and by whom detailed product information is stored, maintained and made accessible. In the comprehensive report you can find online, we suggest a data model for the long and for the short term. In the following image, you can see the long-term proposal: the so-called ideal plate.

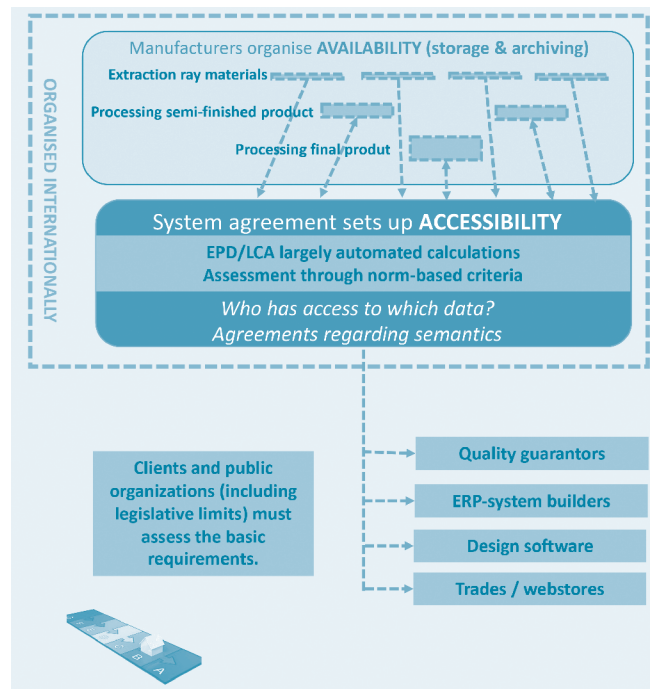


“Sustainability data should be a kind of utility.
It is something of public interest.”

Menno Rubbens, expert group member

Priority actions on accessibility:

	Overheid	digiGO	NED	Anders
Make a plan to implement the semantics frameworks already laid down by Platform CB'23. ⁸	✓			
Make a plan to implement the desired data structure.		✓		
Make budget available to build the desired infrastructure.	✓			



4.2 Availability of high-quality data

? Dilemmas

- it is too expensive for the manufacturer
- there is too little insight into data;
- there is false security;
- a lot of data is outdated;
- there is a shortage of capacity⁹;
- there is too little Category 1 data.

👍 Recommendations


The expert group thinks that the availability of high-quality data can be improved if the following issues are implemented:

- improving timeliness;
- improving the accessibility of the National Environmental Database;
- using foreign SPDs;
- using information other than the National Environmental Database;

⁸ FOR VARIOUS PARTIES, BOTH THOSE WHO HAVE TO CREATE THE LCA AND THOSE WHO HAVE TO CHECK THINGS AND THOSE WHO HAVE TO DEVELOP THEIR SERVICES TO MAKE THE INFORMATION AVAILABLE.

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- verifying LCAs in practice with manufacturers;
- something is better than nothing;
- digitised data generation;
- making more detailed data transparent.

 Priority actions regarding availability of high-quality data:	Government	digiGO	NED	Other
Create a roadmap and include which short-term sustainability goals are priorities.	✓			
Simplify the administrative process for entering and verifying information in the National Environmental Database.			✓	
Develop a model that reduces the cost of recording and managing information in the National Environmental Database.			✓	
Ensure understanding of the aspects that have the greatest environmental impact for key product groups and ensure that those data are reliably in the National Environmental Database.				Chain standard construction with NVTB
Explore the possibility of enforcement and testing for actual performance in practice (factory and buildings) with a focus on end-of-life and maintenance.	✓			
Complete and update information in the National Environmental Database.			With manufacturers	
Develop a model to ensure the topicality and thus usability of information in the National Environmental Database.			✓	
Make more budget available for the National Environmental Database to perform all tasks properly.	✓			
Intensify international contacts to arrive at an international plan for streamlining international databases.			With international colleagues	
Investigate the development path towards European integration of sustainability data and what that means for the future of the National Environmental Database.	With the MRPI, EPD-network and ECO platform			
Investigate the possibilities of using digitisation to reduce the amount of work to collect meaningful reliable data.			✓	
Investigate the possibility of an EPD-light variant for new products, among other things.			✓	

4.3 Application of data

Dilemmas

- the Environmental Performance of Buildings (MPG) is too general;
- we are too reactive;
- a lack of transparency;
- a lack of incentives;
- too much variation.

Recommendations

- making better use of existing MPG calculation software;
- structure, clarity and semantics in the call for tenders;
- setting the bar high;
- more transparency in project performance;
- more incentives for manufacturers to provide sustainability data.

Priority actions on the application of data:

	Government	digiGO	NED	Others
As clients and competent authorities, demand more detailed data than a general MPG figure. Consider a separate Module A statement.	✓			Clients with PIANO en NEVI
Draft an ILS ¹⁰ with sustainability questions.		✓		
Investigate with design software parties how sustainability data can be cleverly integrated into their systems.		✓		
Investigate possibilities for more transparency in information and corresponding adjustments in contracts between manufacturers and National Environmental Database, including under what conditions manufacturers are willing to share more information.	✓			
Explore the possibility of raising the bar and demanding better environmental performance.	With the MRPI, EPD-network and ECO platform			
Investigate the possibility of an Environmental Performance dashboard so that there is more transparency (for better and for worse) about the environmental performance of completed buildings.	✓			

5. What do we need to do now?

This blueprint contains advice to ensure that data on the sustainability of building products become more readily available, more accessible and also more intelligently used. To make real strides, it is important that requirements from clients and governments are raised. Moreover, we need a universal language for standards and agreements. Additional prerequisites for circular behaviour are pricing mechanisms and culture change. Although price mechanism and culture change are beyond the scope of this report, it is good to recognise their importance and pay attention to them.

As an expert team, we want to emphasise that the urgency is high and it is unacceptable in these times that information provision is still so poorly regulated. We hope that the relevant parties will take up this appeal to them, so that we can put our shoulders to the wheel together.

¹⁰ ILS STANDS FOR INFORMATION DELIVERY SPECIFICATION. IT REFERS TO THE RECORDED AGREEMENTS BETWEEN CLIENT AND CONTRACTOR.



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