

# Benefits of bio-based buildings

Researchers from Stichting Agrodome explain how innovation, collaboration and bio-based buildings are helping the environment

Climate change urges us to look further than energy options alone, and the use of building materials is a long-neglected issue that may prove to be the breaking point in the future. In this article, we – the researchers of the Cycle Assessment Procedure for Eco-Materials (CAPEM) group and Stichting Agrodome – will express our vision and strategy to improve the environmental footprint of the building sector.

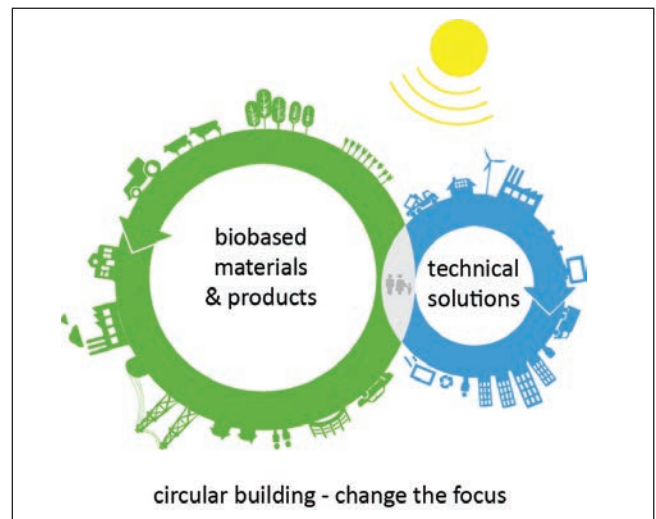
## Circular economy

The effects of climate change and the climate conferences of Paris, France, in 2015 and Marrakech, Morocco, in 2016 showed that there is a great urgency to change the way we do things, and this will have a large impact on society. This awareness is expressed in the signed contract by most of the countries in the world. The economic change will be from linear to circular thinking.

One of the consequences is that the industrial sector should look for better options than fossil fuel-based materials and products. In our opinion, the only way to go forwards is through a strong focus on bio-based solutions because bio-based materials and products can be produced and used in a closed circle, with the Sun as the principal supplier of power.

## The building sector effect

The building sector is responsible for large amounts of waste, resources use and transport. Up to 40% of global waste is traced or related to the building sector, with all subsectors, including mining, land reclamation, and transport and industry emissions, strongly connected to climate change. By changing the existing ways of producing building materials, we can take large steps in improving the environmental impacts of the building sector and lower the impact on the climate.



## Bio-based solutions

To improve the environmental impacts of the building sector we should make more use of what the world can provide in short and sustainable chains. Bio-based materials, which can be produced locally, play an important role in this change. Likewise, they don't need much processing and the same amount of materials can be regrown within a product's lifetime. Bio-based materials can be considered CO<sub>2</sub> neutral, and that is vital to reducing the effects of climate change. So, we change from a linear, exhausting use of resources to a circular system, where CO<sub>2</sub> and other climate-changing effects will become almost neutral. This will change the environmental effect of the building sector dramatically.

Practical solutions are just as important, and thinking about bio-based solutions should be the start. If it is not possible to find a bio-based solution, or if it is not practical, then the solution should at least be circular, avoiding waste and based upon reused, recycled materials.

## A bio-based economy

Agrodome's strategy to transform the building sector into a bio-based one rests on three pillars:

### ■ Transparency regarding environmental aspects

To be more sure that we are not making mistakes in replacing one way of living for another, we have to take the whole lifecycle of products into consideration and be very transparent in the way we produce things. Lifecycle assessment (LCA) methods are developed to calculate the environmental aspects of materials and products in a transparent way;



### ■ Developing testing methods

To convince the building sector that bio-based materials are better to use than fossil-based materials, communication regarding the advantages in a technical sense is paramount. Backed up by LCA studies, the information has to be solid enough to avoid 'greenwashing' in the communication. Currently, only a few bio-based materials and products are tested in a laboratory; most are tested in field situations. This is good but difficult to repeat and communicate on a larger scale. Studies should be made to prove the technical advantages of bio-based materials, which can lead to a change of test methods. The test procedures of today are, of course, based upon current materials. Rethinking the methods that give proof of fire resistance, stability, insulation etc. is therefore necessary; and

### ■ Improving SME collaboration

It is difficult for a single SME to create a level playing field with the bigger companies producing large quantities of materials. SMEs can better join forces to change regulations and create a large market. The start was made with a successful Green Deal bio-based building, where more than 40 companies and ministries worked together to create a level playing field. Agrodome is one of the founders of its successor, EcoBouw Nederland (EcoBuild the Netherlands). This organisation has united companies to create a strong position in the building sector and is able, as a larger group, to invest in changing standards through research and marketing.

### Communication and marketing

As mentioned, transparency is important for good communication and marketing, creating a large support base for the new circular economy using bio-based materials. To be transparent is often a hurdle for companies, especially for innovative SMEs. It is a paradox that should be solved to make the needed transformation from a traditional, linear, fossil-based system to a bio-based circular system. Apart from the companies' knowledge protection, a company should be transparent in the way things are produced and what kinds of materials are used, otherwise society cannot be sure that the solutions, new products etc. are not harming the environment even more than those they are

replacing. This requires a shift in paradigm and mindset, with new solutions in intellectual property protection. Agrodome is working on this aspect in co-operation with stakeholders in the building industry, including the government, to create a transparent and equal playing field.

### Conclusion

Working together with all the stakeholders is the key in each solution. We have to overcome the traditional borders and create a new way of thinking. Co-creating is a good way to cope with the challenges that climate change brings, and Agrodome is working on this with different stakeholders by creating coalitions of companies, institutes and governments that are willing to change. Through communication concerning the added value of bio-based materials, which is based upon solid research, we can convince traditional building actors to make the shift to other materials, supported by the provision of tools such as a better LCA method fitting the demands of this time and of the future, as well as the necessary tools to make it possible to translate thoughts and ideas into practical actions fitting the reality.

### Contact

Readers of this article who feel the same urgency to change the building industry, and who want to work this out in a practical way, are welcome to contact Agrodome. Agrodome likes to be involved in research to improve the environmental impact of building materials, products and building concepts, and in projects that help create a solid, scientific, practical base for the use of bio-based materials.

## Agrodome

Fred van der Burgh  
Sissy Verspeek  
Stichting Agrodome  
Member of the CAPEM Group

+31 317 427570

fred@agrodome.nl  
sissy@agrodome.nl  
www.agrodome.nl