

# Bio-based Construction Materials

A Policy Learning Platform peer review 29-30 May 2024

FINAL REPORT



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Interreg  
Europe



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Provincie  
Zeeland

## Preface

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### ***Creating opportunities for the regional economy in Zeeland***

It has been quite some time we proudly completed the first circular project in Zeeland. During the construction of the youth clinic at Emergis, two booklets were published. Many Zeeland parties have taken the lead in this endeavor. However, we have experienced challenges in building on this initial success. The market is uncertain, regulations are not yet supportive or directive, and often, the pricing just does not add up.

For these reasons, we were pleased to organize the very first Interreg Europe Peer Review on May 29th and 30th, 2024. The central theme was promoting circular biobased construction. This event was an excellent opportunity to strengthen our European collaboration and gain new insights.

Over the course of these two days, specialists from various European regions shared their knowledge and expertise with us. The valuable policy recommendations they provided offer us concrete tools to further scale up circular biobased construction in Zeeland. Attention was given to the entire chain, from farmer to building.

I want to thank all those involved for their dedication and contributions to this successful event. Your presence and input have helped us take a step toward a sustainable and circular future for Zeeland. We will work with these results to continue our exemplary projects, which we are so proud of, with many more new projects to follow.

**Jo-Annes de Bat**

*Provincial Executive Member*

*Middelburg, June 19, 2024*





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Group picture 29 May

## Paragraph 1 Brief presentation of the beneficiary and its motivation to host a peer review

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### Reduction of CO2 emissions

In recent years, the climate crisis has become a hot topic as well as one of the biggest global challenges of our time. This fact is inextricably linked to tackling CO2 emissions. This also applies to the European Union. They have implemented various initiatives and policy measures to reduce greenhouse gas emissions and stimulate sustainable energy. In 2016, the Paris Climate Agreement was signed. The signatories agreed to limit global warming to a maximum increase of 1.5 degrees Celsius<sup>1</sup>. Following this example, the European Union has the ambition to become the first climate-neutral continent by 2050. That is why in 2019, the European Green Deal was presented to tackle climate and environmental challenges<sup>2</sup>. This initiative helps the European Union to use raw materials more efficiently and stop biodiversity loss and pollution<sup>3</sup>. It is about both greenhouse gas reduction and stimulating sustainability and circularity. The aims for the circular use of raw materials, biodiversity, and water and soil quality are laid down in the 'Actieplan Circulaire Economie' (Action Plan Circular Economy). The ultimate aim of the plan is reducing the EU's CO2 footprint and doubling the percentage of circular material use in the EU by 2030<sup>4</sup>.

Under the auspices of the European Green Deal, member states, including the Netherlands, have committed to achieving climate neutrality by 2050. Concurrently, the Netherlands grapples with a housing crisis, marked by a shortage of 390,000 homes<sup>5</sup>. Conflicting objectives impede progress, given that the production of conventional building materials, such as concrete and steel, contributes to 11% of the annual Dutch CO2 emissions<sup>6</sup>. The potential resolution to the housing crisis without exacerbating the climate predicament lies in the adoption of biobased building materials.

### CO2 and the construction industry

The built environment plus the construction industry is responsible for almost [40% of CO2 emissions](#) worldwide. Furthermore, the Dutch construction industry will, at its current growth rate, be responsible for about 40% of our yearly energy use and 30% of our total water use by 2050<sup>7</sup>. The construction industry and built environment use many materials and are responsible for many (heavy) transport movements. Resolving the housing crisis without further aggravating the climate crisis is possible thanks to the use of bio-based building materials. [The European Interreg 2 Seas project CBCI](#) has taken the initiative to call attention to this.

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<sup>1</sup> <https://ecer.minbuza.nl/ecer/dossiers/climate-en-milieu/circular-economy> (in Dutch)

<sup>2</sup> [EUR-Lex - 52019DC0640 - NL - EUR-Lex \(europa.eu\)](#)

<sup>3</sup> [The European Green Deal \(europa.eu\)](#)

<sup>4</sup> [Circular economy | Expertisecentrum Europees Recht \(minbuza.nl\)](#) (in Dutch)

<sup>5</sup> [Woningtekort stijgt fors naar 390.000, pas vanaf 2028 minder krapte \(nos.nl\)](#) (in Dutch)

<sup>6</sup> <https://www.dgbc.nl/upload/files/Publicaties/circulariteit/Position%20Paper%20Whole%20Life%20Carbon%20-%20DGBC.pdf> (in Dutch)

<sup>7</sup> [pdf \(overheid.nl\)](#) (in Dutch)

CO2 reduction, climate resilience, and regional economic development are salient topics and objectives for the Province of Zeeland. Since 2013, the province has been actively involved in circular biobased construction under the aegis of the Interreg 2 Seas program, undertaking research and publishing three whitepapers on the subject. [The CBCI whitepaper on rules and regulations](#) has concluded that Belgium (Flanders), France, England, and the Netherlands encounter analogous challenges regarding biobased construction and its upscaling.

### Main conclusions CBCI whitepaper

- 1) Circular bio-based building is, in fact, possible under the existing laws and regulations. They appear to be less restrictive than is commonly believed.
- 2) The problems with circular bio-based construction are known to and similar for all countries (the Netherlands, Belgium, France and the United Kingdom). The differences in approaches arise from their governance culture, amongst other things.
- 3) The European climate policies must be better aligned with the domestic and regional legislation arising from them.

Nevertheless, biobased construction has yet to gain widespread traction in the Netherlands and Europe due to a deficiency in harmonized laws and regulations from the European Union. The paramount question is: *How can biobased construction be expanded in the Province of Zeeland across the entire production chain, and how can best practices, encompassing policies, from elsewhere in Europe be implemented?*

The Province of Zeeland aspires to glean insights from international experiences, engage in European collaboration, and formulate a Zeeland-centric approach to circular biobased construction. This in line with the Zeeland Environmental Vision<sup>8</sup> and the Regional Energy Strategy. Furthermore, armed with this knowledge, stimulus measures can be judiciously tailored.

With the Peer Review, the Province of Zeeland intends to address the issues and conclusions from the previously mentioned whitepaper. The guiding principle that the problems involved in upscaling bio-based construction 'are the same' in several European countries combined with a similar European guiding principle (the Green Deal applies to all countries) means that differences in regional approaches can prove decisive for a successful scaling-up approach. **The Province of Zeeland wishes to learn as much as possible from these 'European' differences in regional approaches.** What is a provincial authority's sphere of influence? Which buttons can Province of Zeeland push?

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<sup>8</sup> [Zeeuwse Omgevingsvisie](#) (in Dutch)

## Paragraph 2 Specification of the policy challenge encountered

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The Province of Zeeland's circular approach is embedded in its provincial policies. This is laid down in the Zeeland Omgevingsvisie (Environment Vision)<sup>9</sup> and involves the following ambition: *a sustainable and innovative economy and a climate-proof and carbon-neutral Zeeland*. This ambition is worked out in greater detail in the Economisch Uitvoeringsprogramma 2022 – 2027 (Economic Implementation Programme 2022 – 2027)<sup>10</sup>, which involves the following three ambitions:

- The realisation of circular revenue models
- Making the transition towards renewable (bio-based) raw materials
- Improving the reuse of raw materials

Since 2013, Province of Zeeland has been very active in the area of the circular economy. This is part of the Programma Regionale Economie (Regional Economy Programme), which is primarily focused on (Zeeland) businesses. The three basic themes are:

- Ports and industry
- (Circular) purchase and tendering
- Circular construction

Province of Zeeland takes a proactive approach by taking into consideration whatever is going on on a national level, and by using opportunities to collaborate with regional parties. This is a stimulating role. It is the municipalities, after all, who commission construction work. By looking at the expansion of building chains and knowledge clusters ('ecosystems') on a provincial level, Province of Zeeland fosters maximum innovation and added value. This leads us to the key question: ***how can bio-based building in the Province of Zeeland be scaled up throughout the entire production chain?*** In this, we distinguished between supply and demand as two thematic blocks (figure 1):

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<sup>9</sup> [Zeeuwse Omgevingsvisie](#) (in Dutch)

<sup>10</sup> [Transitie naar een duurzame en klimaatneutrale economie - Economisch Uitvoeringsprogramma 2022-2027](#) ([zeeland.nl](#)) (in Dutch)



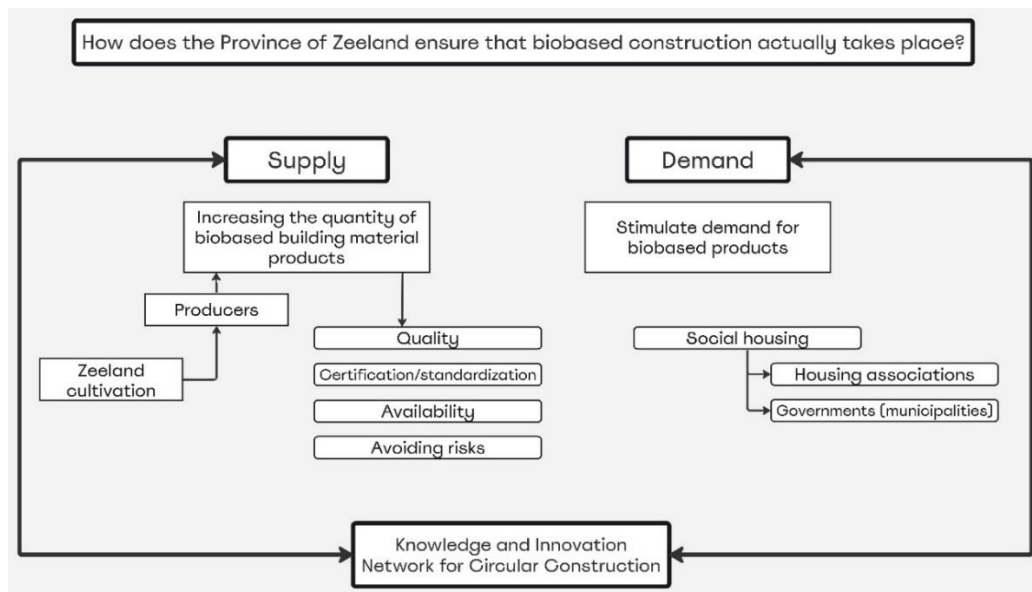


Figure 1: Conceptual model

**1<sup>st</sup> thematic block: What can the Province and Municipalities do to stimulate the demand and supply sides of bio-based construction (and in which order of priority)?**

- Which policy instruments can be deployed to foster construction with bio-based materials? How can results be monitored?
- In what way, with which instruments, can Province of Zeeland and municipalities stimulate the demand for bio-based products, in order to increase sales?
- Provide good and bad practices from their regions
- Which financial incentives can be deployed to stimulate the use of bio-based building materials for construction purposes?

**2<sup>nd</sup> thematic block: How can the Province support the Knowledge and innovation network to upscale / mainstream the knowledge on both demand and supply side?**

- How could stakeholder collaboration with heterogeneous parties be further improved?
- What are the primary challenges identified by housing corporations, contractors, architects, and construction firms that impede the scaling-up process?

From the Province of Zeeland, all participants (peers and stakeholders) were asked two guiding questions:

- What are your 3 most important challenges?
- What are your solutions and suggestions? (reference projects)

## Paragraph 3 Participants

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The selected peer experts by the Interreg Europe Policy Learning Platform have experience with biobased building materials and their implementation in the construction sector:

- **Camilla Hayselden-Ashby** has experience with hemp-based materials, and is especially focusing on the problem of market demand/readiness, farmer supply and processing capacity.
- **Dominique Girolami** brings his experience from work as an architect working with bioecological building materials, as well as from the work of OVAM.
- **Ana Quintas** is very experienced in the topic, working with policymakers and other stakeholders, on environmental and ecological merits, as well as awareness raising and education.
- **Joan Romero Clausell** brings experiences from Valencia and Spain, where many innovative policies in sustainable construction are taking place. He has 10 years of experience working in a construction company that specializes in bio-based materials, including prefabricated straw bale panels and clay plasters. He also works in academia and is involved in policy-making.
- **Mihaela Frincu** has been involved in several pioneering projects in Romania building with different types of biobased building materials.





## Members of the beneficiary organization

J.M.M. (Han) Polman, The King's Commissioner in the Province of Zeeland  
J. (Jo-Annes) de Bat, Provincial Executive Member  
B. N. H. (Burak) Şahin, Trainee Circular Economy  
R. A. M. (Richard) van Bremen, Senior Policy Officer Circular Economy  
W. (Wieteke) Wolterbeek, Senior Policy Officer Europe  
M. (Marnix) Mohrmann, Transition Advisor European and National Programs  
S. (Saïdja) de Deckere, Purchaser

## Stakeholders

F. (Fred) van der Burgh, Director Agrodome Foundation, Wageningen  
N. (Nescio) Midavaine, Programme Manager K&I Network Circular Construction, Middelburg  
D. (Derk) Thijs, Owner Thys + Gutberlet Architecture, Middelburg  
M. (Myron) Koster, Researcher in Biobased construction MNEXT, Breda  
S. (Saitia) Comenencia, Policy Officer Circular Economy, Municipality of Middelburg  
M. (Maximilian) Knauth, Student HZ University of Applied Sciences, Vlissingen

**Agrodome**  
Advies & Ontwikkeling

MNEXT  
MATERIALEN  
& ENERGIE  
X TRANSITIE

**THYS + GUTBERLET**

  
**Circulair bouwen Zeeland**  
Kennis & Innovatienetwerk

**M**  
MIDDEL  
BURG

 **UNIVERSITY**  
OF APPLIED SCIENCES

## Peer experts

Camilla Hayselden-Ashby, Nuffield Scholar, United Kingdom  
Dominique Girolami, Ovam, Belgium  
Ana Quintas, Circular Economy Expert, The Netherlands  
Joan Romero Clausell, Valencia Institute of Building, Spain  
Mihaela Frincu, INCDPC ICECHIM Calarasi Branch, Romania

## Interreg Europe & Policy Learning Platform

Diane Bulon, Policy Officer, Interreg Europe  
Astrid Severin, Thematic Expert on Greener Europe, Interreg Europe PLP  
Magda Michaliková, Thematic Expert on Greener Europe, Interreg Europe PLP  
Thorsten Kohlisch, Project Manager of the Interreg Europe Policy Learning Platform

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## Paragraph 4 Policy Recommendations

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The Interreg Europe Peer Review was hosted by the Province of Zeeland at the historic Abbey of Middelburg, on May 29 and 30, 2024. During the two days of the peer review, all participants (the host, stakeholders and peers) had the opportunity to present the institutions they represent and their interest and involvement with bio-based construction and materials. Given the background, knowledge and expertise of the participants, it can be said that the entire chain was present at the table. To achieve the presented policy targets, the peers recommended the following (first general ideas):

### Communication

- Zeeland already has a lot of great examples to share, speak about them
- Co-create a **vision statement** that outlines your long-term goals and aspirations for the future
- Devise a communication strategy
- Create a **common branding** and narrative
- Work with **ambassadors**, organise media trips, interviews, etc.

### Education

- Focus on **awareness raising** and **education** of the public and the contractors/builders
- Develop a **demonstration site** - education, training
- Show the work that has been done - route around the city

### Policy measures

- Use **public procurement** (% of biobased materials, targets for reducing emissions from construction)
- Use **subsidies** and **tax incentives**
- Work on certification and labelling

### Stimulating supply and demand

- In order to stimulate demand and supply, it is important to **influence the entire construction value chain**
- Develop of a **strong business case** for farmers, manufacturers, processors
- Supply of materials - analyse the seasonality and cost, map / establish regional value chains
- **Use residual streams** (bio-based construction materials from wheat straw, grass)
- **Stimulate demand by** showing long-term benefits (health) and economic benefits (lower energy consumption)
- Explore which materials can be sourced locally

All recommendations came together in a first outline for a 5-year action plan.



The Province of Zeeland wants to translate the results of the peer review into concrete goals. We stimulate and facilitate this *process* on the basis of the following principles:

### 1. Intrinsic motivation

- Work with intrinsically motivated individuals in pairs for 'ultimate reciprocity'.
- Keep relationships alive and working.

### 2. Transparency and trust

- Share results and ideas (open source).
- We work on the basis of trust.

### 3. Unique projects

- Make project unique – possibly in parts – tailored to the person and region.

### 4. Quality

- Strive for maximum quality without any compromise.

### 5. Simple and understandable

- Make results simple and small so they can be understood by everyone.
- Provide handy and understandable summaries for professionals, laymen and administrators.
- Focus on good writing and summarizing, with flexibility and language skills as a requirement.

### 6. Cooperating foreman

- Participate in projects yourself and focus on practice (knowledge)

### 7. Work with young people

- Work in an inspiring way with young people, regardless of their level of education.
- Select based on ambition and commitment.
- Offer training places for younger colleagues (trainees, graduates) to gain new insights.

### 8. Innovation and inspiration

- Integrate new experiences and innovations into the approach, such as biomimicry/design.
- Create space for experimentation through open source, with a focus on imagination and realisation.

## Possible setup of this process

### Multi-stakeholder approach

The essence of the multi-stakeholder approach is to activate others. The more people activated, the more actors activated, the stronger the network, the more connections in the network, and the greater the chance of something beautiful emerging from it.

- Core high-quality policy process: The core of a high-quality policy process is not the content or the process itself but the activation of stakeholders.
- Who are the relevant stakeholders?
  - Are we inviting the *usual suspects* or also the *unusual ones*?
- How does the interaction take shape?
  - Is it a dialogue of the deaf or mutual learning?

This approach aims for high-quality interactions through various rounds of perception-building. An important success criterion is whether there is increasing commitment. Are the parties becoming more enthusiastic about what they are doing as the process progresses? During this process, actors may join or leave over time. When it comes to meetings, this approach has a permeable boundary. The core is, once enthusiasm is built, how do you anchor this later within the organizations?

### Utilization of boundary spanners

- Policy realization occurs within networks.
- Border areas are crucial for the direction and speed of policy development and implementation.
- The greatest opportunities lie in these border areas.

### Strategies of boundary spanners

- They build workable relations across (organizational, project, municipal or national) boundaries and between silo, and between governmental and non-governmental entities.
- They manage these relationships in a non-hierarchical way.
  - While the parties may be diverse, boundary spanners treat them as equals.
- They combine the motives, responsibilities and roles of network parties into a rich agenda and innovative outcomes (framing).



## I Stakeholder collaboration: Zeeland's Hub



### What?

We aim to focus on both content and process.

### How and when?

*Short term (July – September 2024)*

- Conduct one-hour interviews with participants (experts and stakeholders). Goal: review the Peer Review and explore future contributions.
- Make presented examples from peers and stakeholders available to everyone in a structured manner. Ensure all participants have access to freely usable information.

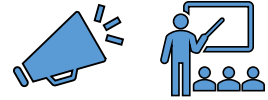
### Result

- Share results with all other Dutch provinces within the Interprovincial Consultation (IPO).
  - Incorporate previous Peer Review results from North Brabant and the interviews.
- Prepare a Provincial Executive memorandum for all provinces (in collaboration with the Province of North Brabant).
- Aim for consensus among other Dutch provinces to collaborate jointly.

*Long term (from January 2025)*

- Establish Zeeland's Hub
  - Build on the Zeeland Knowledge and Innovation Network for Circular Construction.
  - Connect with communication and branding efforts, and address the 'how' question.
  - Build on our strengths → What is Zeeland particularly strong in?
  - Training programs
    - Internal/external internships (in combination with HR department)
    - Traineeships
  - Organize an annual international conference on circular bio-based construction, with the Province of Zeeland serving as the host. The opening will be done by a provincial official or provincial executive member.
  - Explore opportunities for a European project.

## II Communication, branding and education



### What?

We want to work on a mission, vision statement and education that outlines the long-term goals and aspirations for the future. We want to engage partners in formulating a vision statement to foster a sense of ownership.

### How and when?

#### Short term

- Branding
- Professional communication and PR
- Story-telling
  - ‘*Shaping the Future Delta*’
  - Develop a Dutch and an English slogan, to gain international recognition.
  - Approach this theme from an economic point of view.
- Engage local students (Scalda or HZ University of Applied Sciences) to come up with ideas. This can take the form of an additional work project or a research internship. In this way, students can connect theory with practice.
- Involve other departments within the Province of Zeeland to align with their narrative.
- Connecting with scientists from the [DAN-CE network/Het Groene Brein](#) (Dutch Academic Network)

## III Governance and monitoring: Exploring projects for Zeeland and funding



### What?

- Explore collaboration with other stakeholders.
  - Internal: Procurement
  - External: engage with municipalities in the province of Zeeland, housing cooperations and explore program [Biobased Innovation Gardens](#).

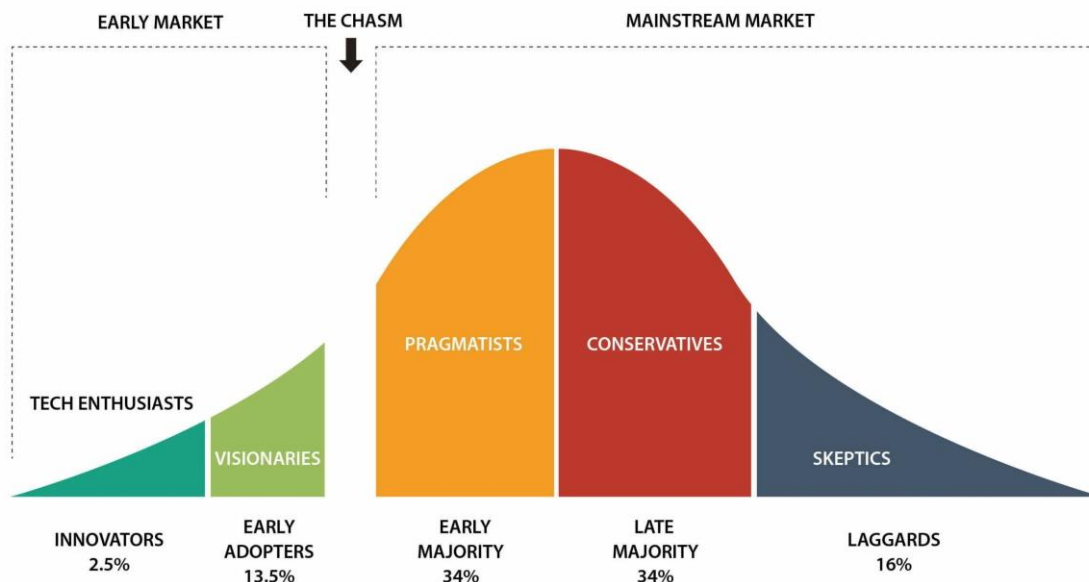
## IV Mapping the starting position, update knowledge



- Evidence-based decision making
  - Factsheets
  - SWOT-analysis
  - Opportunities
  - Study

- Fill the value chain approach with good examples.
  - *What is our starting point?*
  - *What are our strengths?*
  - *How will we develop it through a value chain approach?*
- Landmarks / ambassadors / showcases
- Result: we outline a realistic starting position highlighting the opportunities in Zeeland. This includes connections with communication, branding and potential European projects (see previous points).

**In which phase is the above described approach in relation to transition management?**



This brings us to the following *Plan of Action for 2024 – 2027*. This action plan is an improved version of the previously presented conceptual model:

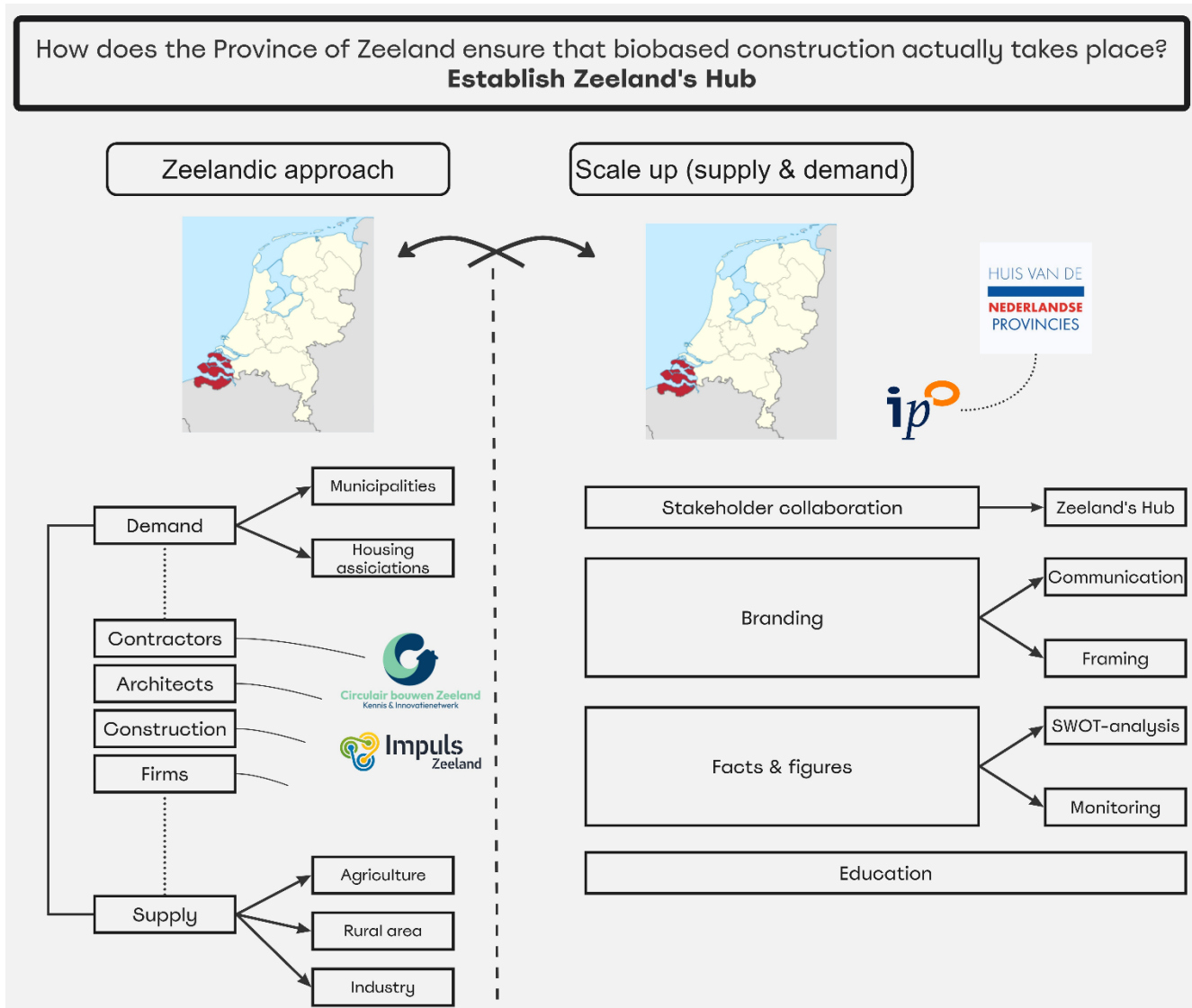


Figure 2: Plan of Action 2024 - 2027







## Paragraph 5 Conclusions and follow-up

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This Peer Review ensured that all relevant stakeholders from the entire value chain were present at the table. The combination of the organizational approach of a peer review and the professional approach taken has made this method highly successful. We now have an overview of all challenges with potential solutions based on a clear value chain approach focused on circular bio-based construction. This provides an opening for regional specification. The revised conceptual model is recognizable and applicable for other participants and regions.

This means we now have a clear roadmap for scaling up circular bio-based construction. Depending on the sub-tasks, we will also engage that network to take further steps.

Surprisingly, Romania and Spain participated. These ‘unusual suspects’ provided significant added value alongside the ‘usual suspects’ like the United Kingdom, Flanders, and the Netherlands. They also made a strong contribution. The overall organization was inspiring, refreshing, and substantively strong. We look forward to a follow-up meeting with the same participants.

Content-wise, it was clear that communication and branding emerged as key elements to address. This also offers opportunities to connect with other societal challenges. In Zeeland, this includes relationships with recreation, tourism, and water management. Given the recognizable nature of the problems and challenges, we see opportunities for collaboration with other provinces, alongside internal collaboration with colleagues focused on construction, rural areas, the agricultural sector, and cultivation. Additionally, we aim to align with European initiatives.



*“These two days have been a turning point. We will implement everything that has been recommended to us. As a next step, we will start sharing responsibilities and see with every department what they are happy and able to take over.”* – **Richard van Bremen**



*“I am very satisfied with the peer review method, which has been orchestrated with high quality, structure, and expertise by the Policy Learning Platform.”* – **Burak Şahin**



*“I am really happy with the structured and very relevant recommendations. In the procurement department, we will in particular consider applying specific targets for biobased materials and looking into monitoring the results very closely.”* – **Saïdja de Deckere**

