# THE CIRCULARITY GAP REPORT

## Friesland

Closing the Circularity Gap
in Friesland

CIRCLE ECONOMY

Circulair Friesland

**This document has been reformatted as a PDF of the Circularity Gap Report Friesland, which is a digital-first report. For the best experience and to ensure content accuracy, please consult the digital report.**

# FOREWORD

Imagine if regions across the world joined forces to transition to a circular economy—sharing strategies, successes, and solutions. The pace of change could increase dramatically.

Why regions? Because they are close to the people, businesses, and systems where real change happens. We believe up to 70–80% of the circular transition can be organized regionally.

Over the past decade, the Frisian region has become a European frontrunner. Through the Circular Friesland Association, our public and private partners have worked together to build a future-proof regional economy.

Now, in collaboration with Circle Economy, we present the **first Dutch regional Circularity Gap Report**—a data-driven strategy to measure our progress and close the gap by 2035. This report is more than a tool for Friesland. It's a blueprint for other regions ready to take action.

We believe the biggest opportunities lie in working together. By exchanging insights, scaling what works, and aligning efforts, we can move faster and further.

So here's our call to action: analyse your own regional circularity gap. Join us in creating a global network of ambitious, impact-driven regions.

The circular transition is urgent. Together, we can accelerate it.

**EVERT JAN VAN NIJEN**
Managing Director Circulair Friesland

This year marks the 10-year anniversary of Circular Friesland—an impressive milestone that reflects the region's ongoing commitment to advancing the circular economy. We're proud to be working alongside them on this important project: Circularity Gap Report (CGR) Friesland.

The CGR Friesland builds on the work we've done over the past years in the Netherlands and internationally. It offers valuable insights into how Friesland is progressing toward circularity and helps identify the opportunities and challenges ahead. We're especially excited to be launching this CGR on a digital platform for the first time, making it more accessible and engaging for a wider audience.

This collaboration represents more than just a report—it's the beginning of deeper cooperation between regions, with Friesland setting an inspiring example for others to follow. We are grateful to be part of this journey and look forward to continuing to work together toward a more circular and resilient future.

**IVONNE BOJOH**
CEO, Circle Economy

# SUMMARY

Friesland is pioneering a path toward a circular economy through an integrated, locally driven approach that harnesses the power of regional collaboration. At the heart of this transformation is the belief that circularity is not only about closing material loops, but about creating a future-proof economy that together addresses social, environmental, and economic challenges.

Through a powerful coalition of businesses, governments, and knowledge institutions — known as the "Frisian Model" — Friesland has built a strong foundation for circular innovation rooted in local strengths. As the region looks ahead to 2035, it aims to enhance its impact by strengthening data systems, driving innovation through targeted support, and fostering deeper collaboration at regional, national and international levels. Continued investment in policy, education, and innovation will be essential to scaling its circular economy.

Friesland's cooperative, data-driven, and action-oriented approach demonstrates how regional ecosystems can lead the way in circular economy transitions — offering a scalable model for others around the world.

**An integrated regional approach: the Frisian Model**

Friesland's circular transition is driven by an integrated and collaborative framework known as the Frisian Model. This model is powered by a Triple Helix of engaged leaders from business, government, and academia—an ambitious alliance. The Circular Friesland association acts as an independent and connecting force, ensuring that regional efforts are guided by a shared ambition for circularity. With 80% of circular economy activity happening at the regional level, Friesland shows how place-based leadership can accelerate systemic change.

**Circular economy as a means to tackle broader challenges**

Friesland approaches the circular economy as a tool for creating a better world — not just through environmental gains, but by addressing wider societal and economic challenges. The region's broad vision is anchored in seven pillars and driven by companies committed to building a resilient, inclusive, and sustainable future. Circularity here is a catalyst for positive change, grounded in local values and future-proof thinking.

**A transformed economy through key regional clusters**

Friesland's new economy is taking shape through dynamic regional clusters focused on water technology, materials, and soil — areas where the region holds deep expertise. These clusters are driving innovation, creating new business models, and offering practical solutions to global challenges. With the motto "global challenges, local solutions" Friesland is showing how regions can act as engines of global transformation.

**Taking local action and monitoring progress**

The region backs its ambition with monitoring and accountability. CGR Friesland tracks progress using key environmental, economic, and social indicators, helping stakeholders identify what's working and where gaps remain. Real-world case studies show circularity in action across sectors, highlighting tangible impact

## ENDORSEMENTS

"The Circularity Gap Report Friesland marks a significant milestone—not just for the region, but for circular economy governance at large. Over the past decade many key players in the Friesland region have translated ambition into tangible progress. This report offers a robust, evidence-based benchmark and shares rich, transferable insights from the Frisian model. It's a testament to the power of regional leadership, long-term commitment and collaboration. The Frisian model shows that a robust circular economy starts on a regional level. Friesland sets a new standard for how regions can measure, monitor, and accelerate circular transitions worldwide."

**MARIEKE SPIJKERBOER**
Director Circular Economy at Ministry of Infrastructure and Water Management

"As a board member of Van Hall Larenstein University of Applied Sciences, a board member of Circulair Friesland, involved in the Frysian educational cooperation and an active participant in Spark the Movement, I am deeply committed to advancing the circular transition in Friesland. Monitoring and continuous development are vital to this process, providing the insights needed to measure progress and refine our strategies. Through collaboration and knowledge sharing, we are crafting effective approaches that contribute to a sustainable future for Friesland and beyond. I take pride in the dedication of Frisian organisations and the robust network fostered by Circulair Friesland, and I fully support the goal of embracing circularity as a fundamental principle."

**ANNEKE LUIJTEN**
Chair of the Executive Board, Van Hall Larenstein University of Applied Sciences & Circular Friesland

“Rabobank Friesland is a proud partner of Circulair Friesland. As a cooperative bank, we believe in collaboration and innovation for sustainable solutions. Circulair Friesland promotes the circular economy in our region, and we enjoy being part of this movement. The efforts to connect and inspire companies, governments and citizens are in line with our mission to make social impact. The projects contribute to a more sustainable future through reuse, waste reduction and circular business models. We appreciate the dedication and leadership in creating a circular economy.”

**CARLO EZINGA**
Director of Rabobank Friesland

“The work of Circular Friesland has been at the forefront of the need to adopt a more circular economic model which is good for business, people and the planet. As pioneers they have inspired through action and now with their new monitoring framework, they are now able to demonstrate the impact bringing credence and confidence that circularity is not just a ‘nice to have’ but the driver for real sustainable economic prosperity particularly at a local and regional level.”

**IAIN GULLAND**
Chief Executive of Zero Waste Scotland & President of ACR+

“Ten years ago, I set up the material flow analysis for Friesland, which led to the start of Circulair Friesland. But change is complicated: people quickly fall back into old patterns. Because the association continued to drive and connect people and organizations, the circular transition in Friesland got underway. To achieve a circular economy, entire chains must support the transition. In Friesland, this is possible because companies, government organizations and educational institutions have organized themselves in a unique strong network. This report will consolidate Friesland’s leading position and should promote this role even more.”

**MARJAN MINNESMA**
Director Urgenda

“As the province of Friesland, we work on the circular economy every day. And with results: The Netherlands is a leader in Europe and Friesland is a leader in The Netherlands. We have been working towards 2025 for 10 years. It is good to mark that moment. To look back at what we have achieved, where we stand and where we want to go. The regional scale is very suitable for this. The CGR Friesland helps us enormously with this. And it is a wonderful means to seek cooperation with other regions beyond Friesland. We will fully commit ourselves to this in the coming years, including the European Circular Summit that Friesland will host in June 2025.”

**FRISO DOUWSTRA**
Regional Minister of the Province of Friesland

# 1. INTRODUCTION

The world population is growing at an unprecedented rate and it does not look like this growth will slow down in the coming years. As a result, the demand for raw materials continues to rise, while the supply (the stock of raw materials) decreases. There is also more and more waste due to the large amount of products that roll off the assembly line every day.

### From a linear economy...

The economy as we know it today can be seen as a linear economy or an economy with recycling. In the linear economy, products are produced, consumed and then thrown away, without a new destination. The economy with recycling adds an intermediate step to this, in which residual flows are partly recycled.

Both economies are characterized by (mainly) one-way traffic from raw material to waste. This does not make them particularly sustainable or environmentally friendly.

### Towards a circular economy

A sustainable and durable alternative to the linear economy is the circular economy. In the circular economy, existing raw materials are reused again and again, in the way that they are most valuable to the economy.

In an ideal circular economy, waste does not exist. For example, producers take back used (and demountable) products and use the residual flows to make new products. In this way, raw materials are used again and again. As a result, far fewer raw materials are needed in a circular economy than in a linear economy. In other words: the economic cycle is closed instead of open.

But a circular economy goes beyond raw materials and recycling. Issues such as sustainable energy, attention to the environment and biodiversity, health and culture also play an important role.

## 1.1 About CGR Friesland

Circularity Gap Report (CGR) Friesland is a joint initiative led by Circulair Friesland and Circle Economy to track the region's progress toward a more circular economy while also serving as a replicable model for other areas. While most CGRs to date have focused on national or global levels, this report highlights the growing importance of regional action.

It also marks a milestone as the first CGR delivered in a fully digital format, making circularity insights more accessible, interactive, and adaptable to local needs. The monitor combines structured indicators—such as resource efficiency, waste reduction, and circular jobs—with on-the-ground case studies showcasing innovative local initiatives. These tools help policymakers, businesses, and communities assess progress, identify opportunities, and accelerate Friesland's transition to circularity.

By aligning with the national goal of halving primary resource use by 2030 and achieving full circularity by 2050, Friesland positions itself as a frontrunner in regional implementation. The digital nature of the tool also enables comparison and collaboration across regions worldwide—sharing lessons, scaling solutions, and advancing the circular economy globally.

## 1.2 How to use CGR Friesland

*CGR Friesland* serves as a practical, evidence-based framework for tracking circular progress. Developed in Friesland but designed for broader application, it allows regions to benchmark their performance, develop their own monitoring systems, and compare results through structured indicators and real-world case studies. While the framework is intended to be replicable, it is grounded in the context of an industrialised, high-income region. As such, some assumptions—regarding infrastructure, governance, and resource availability—may not directly apply to all global contexts, and should be adapted accordingly. By demonstrating Friesland's approach and sharing best practices, we aim to inspire and support other regions in building their own circular economy strategies.

By leveraging these insights, regions can identify synergies and opportunities to collaborate with Frisian businesses, creating mutual benefits and accelerating their own transitions to a circular economy. Additionally, the monitor encourages the exchange of best practices, fostering a global network of innovation and collaboration for a more circular world.

## 1.3 Partners

The success of the *CGR Friesland* is driven by collaboration among local governments, businesses, and knowledge institutions. These partners contribute valuable data, insights, and success stories, strengthening Friesland's transition.

A key factor in Friesland's circular economy leadership is the commitment of local businesses, which invest in circular strategies not only for economic gain but also for long-term environmental and social well-being. Their engagement fosters innovation and cross-sector collaboration, creating a model for other regions. By showcasing this approach, the monitor aims to inspire similar partnerships and ambitious circular transitions elsewhere.

Further important partners include local governments, businesses, and knowledge institutions, which provide valuable data and circular success stories. What makes Friesland's circular transition unique is the strong sense of responsibility felt by many local businesses for the future of the region. These businesses actively invest in circular strategies, not only for economic gain but also to ensure the region's long-term environmental and social well-being. This commitment creates a foundation for innovation and collaboration across sectors, with all stakeholders—governments, businesses, and institutions—working together as motivated changemakers. By showcasing this collaborative approach, we aim to inspire other regions to develop similar monitoring systems and, more importantly, to take ambitious steps towards their own circular transitions.

# 2. THE FRISIAN MODEL

## 2.1 The region of Fryslân (Friesland)

Friesland occupies a distinct position within the Netherlands. With its own language, deep-rooted traditions, and strong sense of community, the province has a well-defined regional identity that influences both its culture (the Frisian down-to-earth DNA) and economy. Frisian is more than just a language—it reflects a mindset of resilience, self-sufficiency, and collective responsibility ('Mienskip'). While Friesland values its heritage, it is equally committed to innovation and progress on its own terms.

Collaboration is central to Friesland's approach to progress. The province has a strong tradition of bottom-up initiatives (supported top-down), where trust and shared responsibility create the conditions for ideas to emerge and evolve. Rather than relying on rigid structures or prolonged planning processes, Friesland fosters a pragmatic, action-oriented approach. The Frisian principle of 'Bêst Genôch' encapsulates this mindset, that makes Friesland an ideal environment for advancing circular economy solutions:

- Focus on learning by doing (good enough to get started)
- Cooperation based on trust, not on transactions
- Acting within the planetary boundaries

With its strong local networks, deep connection to land and water, and a culture of cooperation, Friesland provides fertile ground for circular principles to take hold. Here, circularity is not merely an aspiration but a transition already in motion. Receiving the title of European Capital of Culture in 2018 has strengthened this shared commitment and belief.


## 2.2 The Frisian economy

The Frisian economy is characterized by a unique blend of broad societal well-being and targeted economic strengths. The region's approach to economic development is guided by the concept of "brede welvaart" (broad prosperity), which emphasizes not only economic growth but also a clean, healthy, and happy Friesland. This holistic perspective ensures that economic decisions contribute to well-being without passing on negative impacts to future generations or other regions.

## Economic performance and paradox

Friesland presents an intriguing paradox: while income levels and regional GDP growth are consistently lower than the national average, Frisians report higher levels of happiness and life satisfaction. Residents are more content with their environment, volunteer more frequently, and display a strong sense of community ('Mienskip'). However, this social cohesion is not without challenges, such as demographic shifts, housing pressures, and a tightening labor market could impact the region's resilience.

## Strategic sectors: the six economic spearheads

The Frisian Economic Agenda (Blue Delta Approach) focuses on six key sectors. These sectors underline the region's competitive advantages and foster innovation and investments. The companies in these sectors form regional clusters together with governments, educational institutions and finance. Moreover, these sectors are being used as regional living labs, through which the companies in these sectors make worldwide impact, such as for water (Water Technology).[1]

**1. Agrifood**: A cornerstone of the regional economy, contributing nearly 10% to Friesland's added value and providing significant employment opportunities. The sector focuses on dairy production, local value chains and soil expertise.

**2. Water Technology**: A standout sector, with two-thirds of the North Netherlands' water technology employment based in Friesland, focusing on cleaning water, retrieving nutrients and driving water-saving innovations. The sector is known for its high added value per employee and strong innovation capacity, driven by internationally renowned institutions like Wetsus.

**3. High Tech Systems & Materials (HTSM)**: A sector that not only supports other key industries but also drives innovation through digitalization and advanced technologies. In Friesland, the epicenter of the sector is in Innovation Cluster Drachten.

**4. Circular Materials**: Representing both economic and environmental opportunities, this sector aligns well with Friesland's circular ambitions. The ecosystem focuses on circular plastics, biobased value chains and EU frontrunner in recycling.

**5. Maritime Technology**: Friesland is internationally known for its shipbuilding industry, specifically yachts. This sector offers high added value, a living lab for innovative products and materials and a strong patent position, contributing to the region's distinct economic profile.

**6. Tourism & Hospitality**: This sector plays a critical role in supporting local services and enhancing broad prosperity through tourism revenues and jobs. An excellent sector to promote the strong circular character of the region.

[1] Provincie Fryslân, Innovatiepact Fryslân & Planbureau Fryslân. (n.d.). Blue Delta Monitor. Retrieved from: Blue Delta Monitor website

### Economic challenges and opportunities

Friesland's economy is largely driven by small and medium-sized enterprises (SMEs) and self-employed individuals, with fewer large corporations compared to the national average. While this structure fosters a close-knit business community with long-term vision and commitment, it also presents challenges in scaling innovation. Additionally, the region's relatively low added value per job highlights the need for continued focus on high-value sectors and new business models, particularly in the context of the circular economy transition. The transition to a circular economy is recognized as a key driver of economic renewal in Friesland, with the number of circular businesses having increased by nearly 24% since 2013. The urgency to work towards a circular economy is known, but the ecosystem focuses on creating positive change and capitalizes on opportunities. Circular economy is not so much a goal as it is a means, with which the region promotes a healthy, clean and happy region.

A large share of SMEs—estimated at 60–70%—are willing to take steps toward circularity, but many face barriers such as limited knowledge and a lack of access to relevant networks. This highlights both the strong potential for circular growth and the importance of deeper collaboration and scaling within circular value chains.[2]

### Looking ahead

Friesland's economic strategy is increasingly focused on aligning regional strengths with broader sustainability goals. The region's ability to combine economic development with high levels of social well-being creates a strong foundation for further growth, particularly through circular economy initiatives that leverage its existing economic and social assets.

## 2.3 The Frisian approach to circularity

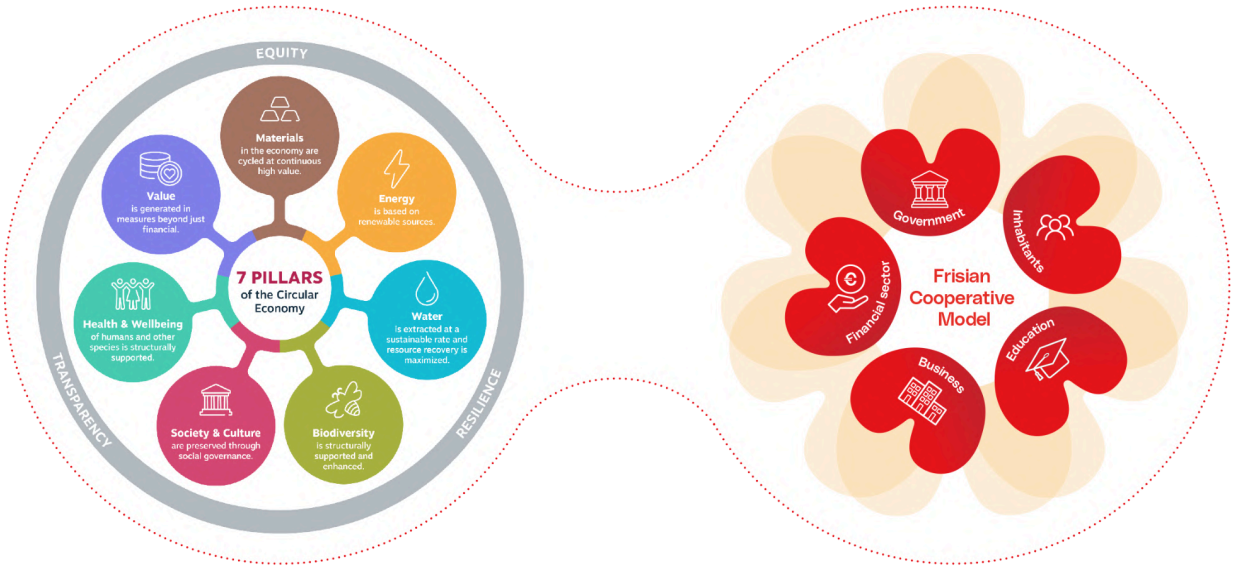
**An integrated Triple Helix Approach: stronger together**

With 180 members from businesses, government bodies, and knowledge institutions, the Circular Friesland association plays a central role in the regional transition toward a circular economy. In 2015, seven Frisian companies laid the foundation for the circular economy in the region. In collaboration with the province of Friesland and the municipality of Leeuwarden, they commissioned a material flow analysis of Friesland. In line with the Frisian values of collaboration and shared responsibility, 25 companies formed the Circular Friesland association just a year later, with a clear ambition: by 2025, Friesland aims to be one of the circular frontrunners in Europe.

[2] Sijtsma, F., Kamminga, O., Langley, D., Broekhuizen, T., Faber, N., Nonhebel, S., Koch, J., van Klinken, R., & van der Werff, E. (2023). *Sneller circulair: Luisteren naar ervaringen van bedrijven om barrières te verminderen*. Rijksuniversiteit Groningen.

This transition has not been a top-down directive but rather an organically developed model. Circular Friesland serves as both a central connecting point and a facilitator of the circular transition. Its bottom-up structure, created by regional companies with a shared belief in the necessity of a circular transition, ensures that the association acts not on its own interests but based on the ambitions and needs of its members.

The strength of Circular Friesland lies in its representation of the so-called 'Triple Helix,' bringing together regional governments, businesses (mainly SMEs), and knowledge institutions to strongly cooperate as equals. This model fosters a collaborative environment where cross-sectoral initiatives can thrive, offering a solid foundation to organize regional activities effectively and maintain close connections among stakeholders. The Circulair Friesland association promotes a collective process of learning by doing and being able to effectively share these best practices and learnings.




To further illustrate the Frisian approach, the following case studies showcase how different initiatives within Friesland are putting this model into practice, demonstrating the real-world impact of the region's circular economy efforts.

## Friesland Builds Circular: Showcasing the Frisian approach to circularity

Friesland Builds Circular (FBC) drives Friesland's circular transition through a bottom-up, trust-based approach, embodying the Frisian approach to the circular economy. By fostering collaboration across the construction sector, from architects to municipalities, FBC turns competitors into partners. Its 'learning by doing' model embeds circularity into real projects like the Frisian Design Approach and Sloten Betonketen, making circular construction the regional standard.

**Check out this full case study on the Knowledge Hub**


## OPNIEUW!: Building a Circular Future Through People, Purpose, and Reuse

Friesland Builds Circular (FBC) drives Friesland's circular transition through a bottom-up, trust-based approach, embodying the Frisian approach to the circular economy. By fostering collaboration across the construction sector, from architects to municipalities, FBC turns competitors into partners. Its 'learning by doing' model embeds circularity into real projects like the Frisian Design Approach and Sloten Betonketen, making circular construction the regional standard.

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## Circular Leadership in Friesland: Gemeente Leeuwarden's Approach

Gemeente Leeuwarden is leading the way in the circular economy transition, driven by a unique bottom-up approach that brings together businesses, government, and knowledge institutions. As part of the Circular Friesland network, the municipality fosters innovation, prioritizes circular procurement, and supports regional projects that contribute to a zero-waste future. From circular construction and placemaking to waste reduction initiatives, Leeuwarden's model demonstrates how collaboration and shared ambition can create lasting economic and environmental impact.

**Check out this full case study on the Knowledge Hub**

## Regional focus

Pursuing this transition at a regional scale is a deliberate choice. The regional scale is ideally suited to accelerating the circular economy— the local level is too small, and the national level is too distant. That is why over 80% of the circular transition is happening within the region. The Frisian model has been copied in the last 5 years by other provinces in The Netherlands, such as Groningen, Drenthe, and Circulair West in North Holland and South Holland. The Northern regions of The Netherlands share a similar view and have the capacity to initiate and develop major international innovations and advancements, while remaining small enough for stakeholders to know one another and collaborate easily, fostering the necessary innovation. In addition to contributing to national goals from the National Program Circular Economy, such as reducing the use of raw materials by 50% by 2030, Circular Friesland and its members also focus on regional issues that are of particular importance.

While the Circulair Friesland Association has been working to promote circularity across the entire economy for over 10 years, it has deliberately focused on specific sectors with unique regional strengths, including:

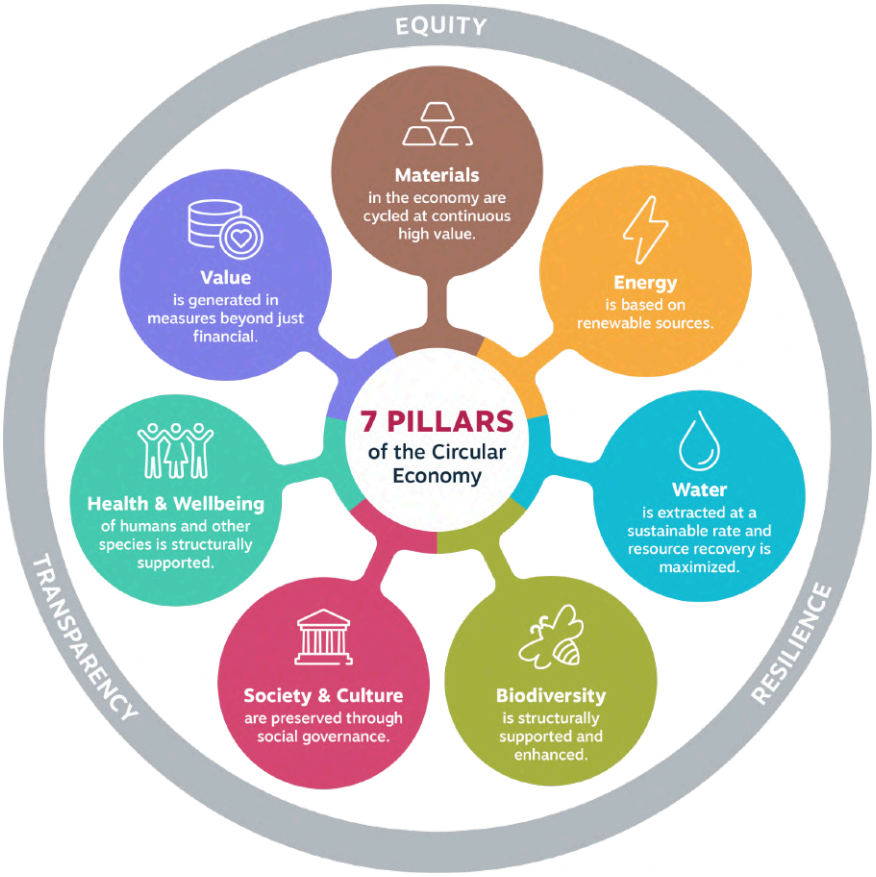
- Circular Construction (Biobased, Industrial (prefab) and Water)
- Circular Materials (Plastics, Biobased and Recycling)
- Water Technology (Retrieving Nutrients from Wastewater)

## The 7 pillars of the circular economy

Many regions and organizations define the circular economy in various ways, with over 200 definitions emphasizing aspects such as closed-loop systems, renewable energy, and systems thinking. While these elements are crucial, the circular economy extends beyond just closing loops—it is fundamentally about fostering a resilient, inclusive, and livable society.

Recognizing the complexity and interconnected nature of circularity, the Circular Friesland association chose not to rely on a single, rigid definition, but instead built its foundation on adaptable design principles. Together with its strategic partner Metabolic, it developed the Seven Pillars of the Circular Economy[3]—not as a fixed framework, but as dynamic and flexible guiding principles. This broad and integrated perspective on circular economy design provides both structure and adaptability, offering a practical way to guide decision-making, inspire action, and measure progress.

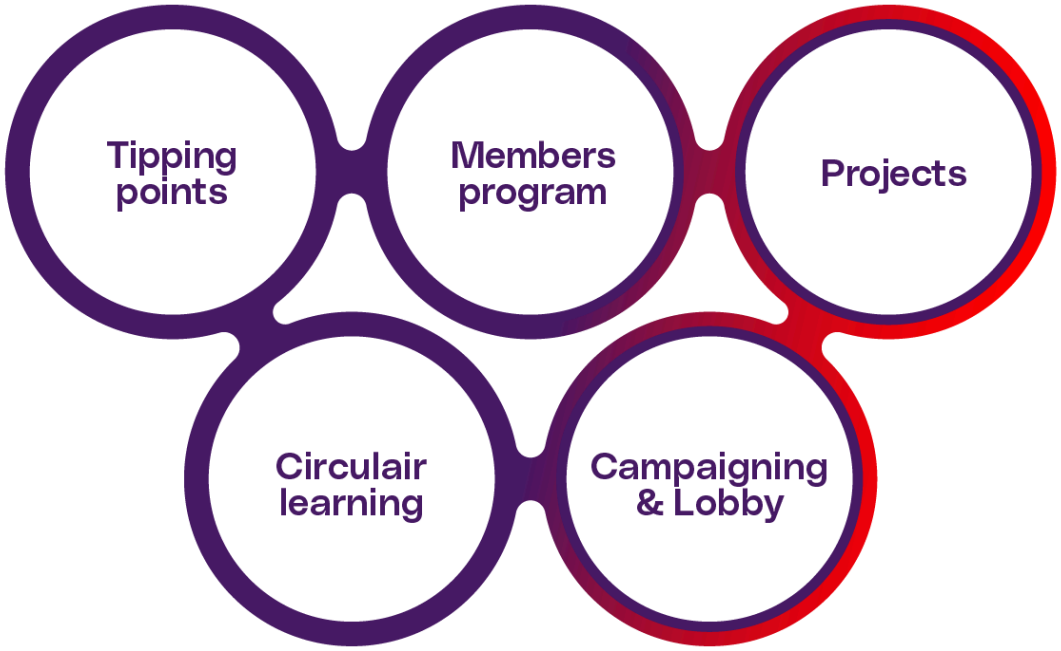
The strength of this model lies in its flexibility. It allows for consideration of regional characteristics while maintaining alignment with broader circular economy goals. The Seven Pillars serve as both a guiding compass and a practical tool for businesses, policymakers, and communities. They help translate the often abstract concept of circularity into concrete actions that can be applied across different sectors and regional contexts.




[3] Metabolic. (2019). The Seven Pillars of the Circular Economy. Retrieved from: Metabolic website

## Strategy

Circular Friesland operates through five common grounds for its members: Association Program, Tipping Points, Circular Learning, Projects, and Campaigning & Lobbying. These elements collectively support the organization's mission to drive the circular transition in Friesland. A more elaborate explanation of the regional transition program can be found in chapter 4.




**1. Association program**

The members of Circular Friesland form the beating heart of the association. A core principle among members is: "When members get to know each other, they begin to trust each other, and when that happens, collaboration follows naturally." An important guiding principle is active participation, where members are encouraged to both contribute and benefit. This dynamic fosters a sense of ownership and energy within the association.

**2. Tipping points**

Circular Friesland focuses on key tipping points that can accelerate the circular transition. These include promoting circular procurement by Frisian governmental bodies, adapting circular principles in education and advocating for legislative changes that facilitate a circular economy at regional, national, and European levels. These actions aim to make businesses flourish, innovate and invest and by doing that, drive the circular economy within the right preconditions. The goal for Circulair Friesland is that within the triple helix, every 'group' can play its part in the best way possible. Through the CGR, the region wants to understand and follow these tipping points even better.

**3. Projects**

The organization is deeply committed to implementing the circular transition through value chain projects. Members are encouraged to test new circular solutions in practice and then scale them up to achieve tangible impact. Additionally, Circular Friesland supports its members in adapting to evolving market conditions. More and more clients incorporate circular requirements into their tenders, and Circular Friesland ensures its members are well-prepared to meet these demands.  Because Circulair Friesland works in the center of the regional ecosystem, the association knows on which topics to focus, where the ambitions of its members and how to scale initiatives from ideas to new standards.

**4. Circular learning**

Circular Friesland believes that the regional circular transition can only succeed  if the region keeps continuously learning. The educational sector is essential for this. The knowledge institutions are responsible for educating students as future key players in the circular economy, training the current labor force based on circular innovations, as well as co-create those innovations with partners from the field. Circular Friesland empowers students and professionals to generate new insights and energy during their studies, amplifying the impact of their education to meet the needs of the association's members.

**5. Campaigning & lobbying**

While promoting Friesland as a circular frontrunner, Circular Friesland adheres to the principle of "be good and tell it." The association works with enthusiasm to showcase the circular achievements of its members and programs to other regions in the Netherlands, the EU and globally. By sharing concrete examples of the circular economy from companies, governments and educational institutions, Circular Friesland aims to connect to other regions and contribute to building a sustainable and resilient circular economy outside of its own region. Moreover, the Frisian 'Ambition Table on Laws and Regulations' uses best practices and perceived thresholds to change policies nationally and European.

**Integrated regional programs: sectors, value chains and tipping points**

The Friesland region has learned that a circular economy can only be achieved by:

- Making (regional) SMEs and other companies take the initiative
- Setting a certain sector or societal challenge central
- Connect the societal challenges with positive change
- Focus on creating new value chains (circular and biobased)
- Promoting and connecting Supply and Demand simultaneously
- Creating ownership at the relevant stakeholders
- Building the right capacity at and/or for the relevant stakeholders

- Changing the framework, by setting new preconditions (crucial for upscaling and creating the essential Level Playing Field)
- Connecting the region with national and international (EU) policies and funds

This is why the region works with integrated regional programs that combine all these success factors. These regional programs form essential 'umbrellas' for all kinds of regional initiatives that can be connected, supported and scaled up. Examples of these programs are:

- SPARK the Movement (regional educational institutions)
- Closing the Nutrient Cycle (SNuK)
- Circulair Commissioning and Procurement (regional governments)Wad Gaat Om (Wadden-region is Turning, hospitality/tourism)
- Friesland Builds Circular

The outline of these programs can be found in the CGR Friesland case study collection on the Knowledge Hub.

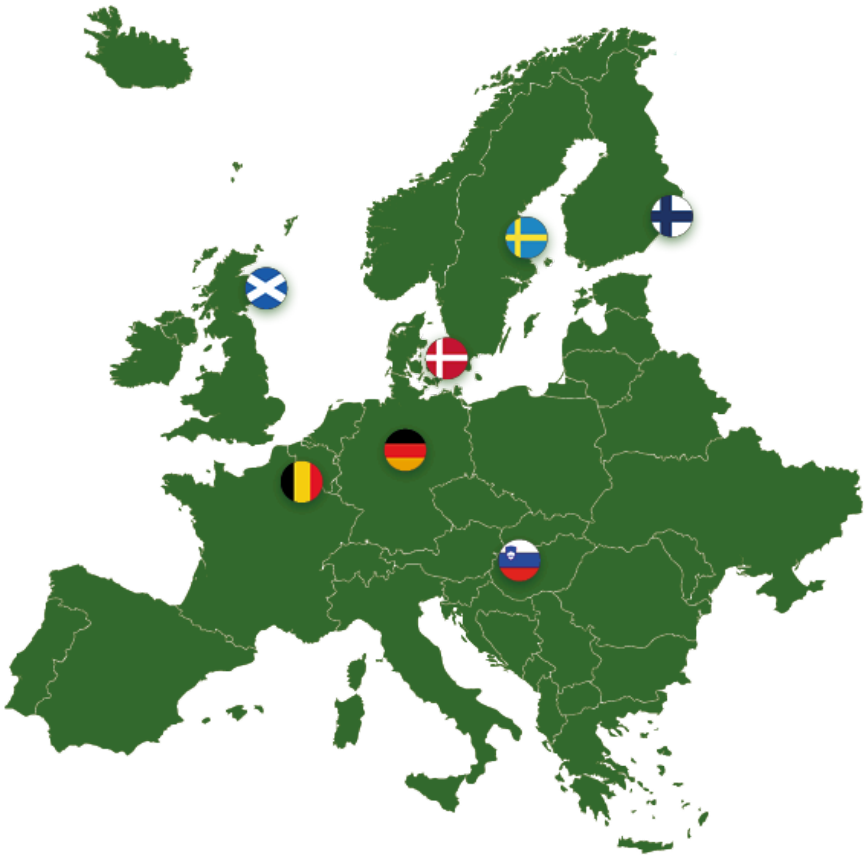
One of the largest and most developed of these programs is Friesland Builds Circular. The program focuses on making circular and biobased construction the new normal in the Frisian region. Therefore, it focuses on different pillars: Demand (Client Support Approach), Supply (Value Chains & Innovation), The New Normal (Circular Criteria), Building the Future (Education) and Laws and Regulation (Policy Influencing). Friesland Builds Circular connects the societal challenge of the housing crisis with creating positive change: new innovations (watertech, biobased and prefab), new business models for farmers (biobased crops), cheaper and faster housing (prefab and biobased) and a healthier and more biodiverse living environment. All relevant stakeholders take part in this program, across the whole value chain. The program is closely linked to European and Dutch policy stakeholders, through which we can influence policies and align the necessary funds towards promoting positive, circular impact.

**Connection to National and EU Policies and collaboration with European regions**

Friesland embraces the vision of the region as a key player in the circular transition: in Europe over 80% of the transition takes place in a region. For this important reason, Friesland aims as a frontrunner to connect regions across The Netherlands, Europe and globally to exchange learnings and best practices, connect companies, change laws and regulations for the better and organize and streamline the required funding for the transition in regions and foster innovation at companies.

Already, Friesland is cooperating with other European regions in EU innovation programs (e.g. HORIZON, Interreg) and through the ACR+ network with other similar regional public-private partnerships in Europe, such as Vlaanderen Circulair (Belgium), Kirkular Pirkanmaa (Finland) and Zero Waste Scotland (UK). Together with these regions, Friesland aims to expand this network towards other frontrunners in Europe and beyond. The focus is on developing further the different circular regional approaches and monitoring the transition and movement. The

cooperation in and between regions in the circular transition is a hopeful movement in the face of global turbulence. It is where the circular economy becomes tangible, inspiring and ready for scaling up.



# 3. MONITORING PERFORMANCE

To effectively track Friesland's transition toward a circular economy, CGR Friesland contains a refined set of indicators categorised into three key themes: **environmental**, **economic**, and **social**. These themes were selected for their accessibility and strong alignment with established frameworks, such as the *United Nations Sustainable Development Goals (SDGs)* and the *7 Pillars of the Circular Economy*.

While sustainability and circularity are closely related, this monitor specifically focuses on circular economy principles—minimising resource extraction, extending product lifecycles, and designing out waste—while also fostering social and economic value by retaining resources within the system. Importantly, the circular economy is not solely about materials; it embodies an integrated approach that rethinks entire systems—connecting design, production, consumption, and reuse in ways that also promote equity, resilience, and well-being.

The selected indicators reflect this holistic perspective by measuring key aspects such as resource efficiency, material flows, circular business activity, and social impact. By structuring the monitor around these circularity-focused indicators, we ensure that Friesland's progress is assessed in a way that directly supports its transition toward a fully circular economy.

## 3.1 Environmental

Environmental indicators are fundamental to measuring the transition towards a circular economy, as its core aim is to minimize material and water consumption, waste, and emissions while regenerating natural systems.

This section examines material extraction—both domestic and international—for use in Friesland, through **Material Flow Analysis** and **footprinting**. It also includes the **waste treatment breakdown**, detailing how waste is processed, reused, or diverted from landfills. The **Circularity Metric** tracks the extent to which materials are recycled as compared to the total material consumption. Additionally, the **share of renewable energy consumption** is included, alongside a dedicated section on **water**, emphasizing its critical role in the circular economy. Sustainable management and technological innovation in water use can significantly minimise environmental impact and enhance resource efficiency. These indicators collectively ensure that circular economy efforts yield tangible environmental benefits, complementing the economic and social dimensions.

### 3.1.1 Material flows and footprints

Using socioeconomic metabolism, we track material and energy flows within Friesland's economy, which operates like a living system. The Sankey diagram illustrates how virgin and secondary materials are extracted, imported, processed, and consumed across 'sectors of final demand.' It highlights the distribution of raw material consumption across seven sectors, each representing a societal need: Housing and Infrastructure, Services, Mobility, Nutrition,

Manufactured Goods, Healthcare and Education, and Communication. This breakdown offers a clear view of how resources flow to meet societal demands.

A previous material flow analysis was conducted by Metabolic and Urgenda in 2015. However, the analysis had a different scope, focusing primarily on agriculture, energy, and water. Due to differing sector aggregation and methodological choices—such as the inclusion of water—direct comparison is not possible. Our approach covers the entire economy across seven societal needs and represents all flows in weight terms, explicitly excluding water to avoid distortion.[4]

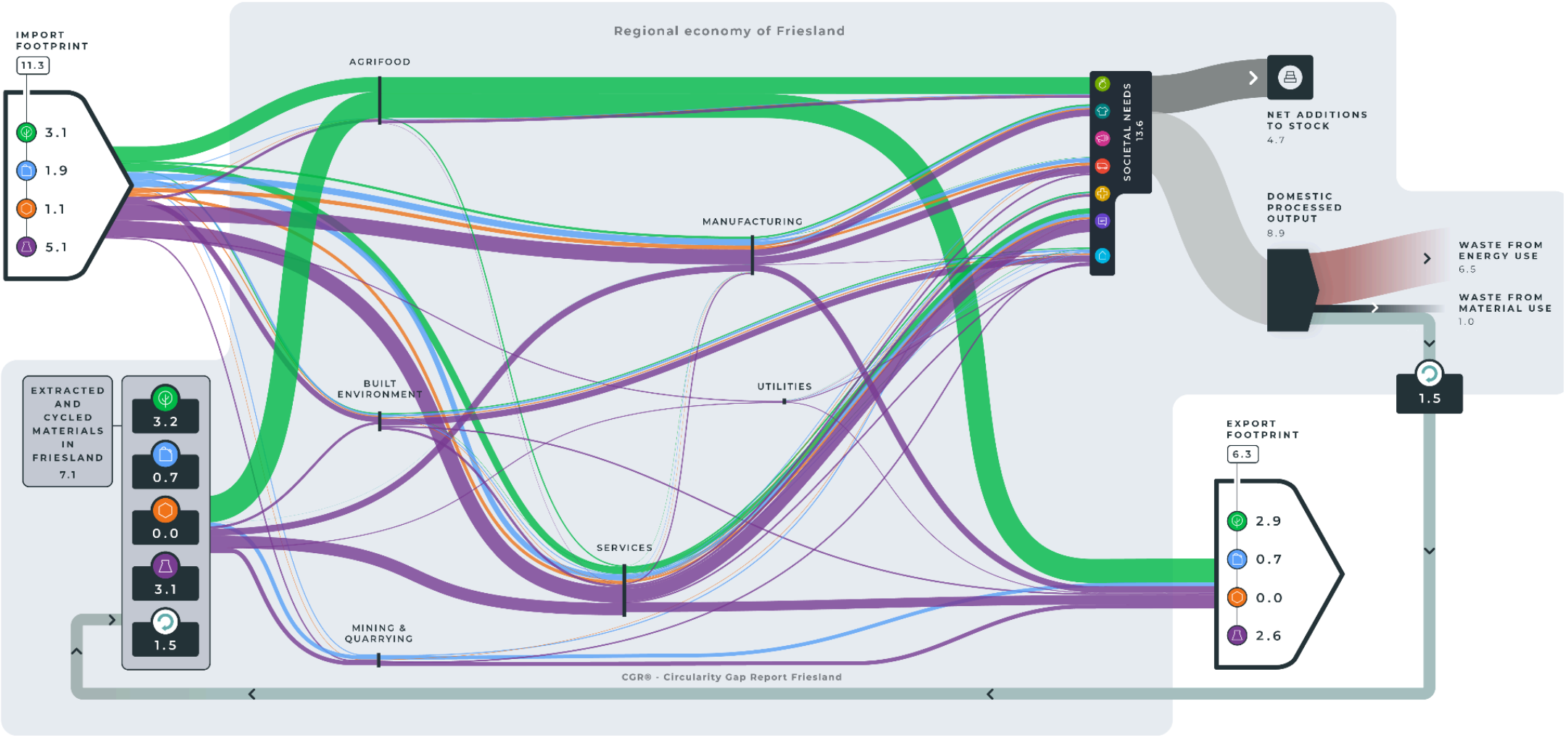
Friesland, as a relatively small but economically active region, relies heavily on trade, making its economy both import-dependent and resource-intensive. While Friesland engages in domestic resource extraction, particularly in the agrifood sector, much of this output is ultimately exported, contributing to other region's footprint.

The Sankey diagram tracks all materials—both virgin and secondary—as they move through the economy, showing extraction, imports, processing, and final consumption. In contrast, the **material footprint**, also known as **Raw Material Consumption (RMC)**, focuses only on virgin materials extracted to support Friesland's societal needs. It measures the total amount of raw materials required worldwide to produce the goods and services consumed in the region.

- **Biomass** – natural materials like crops, wood, and animal products.
- **Fossil fuels** – resources such as oil, coal, and natural gas used for energy and manufacturing.
- **Metal ores** – raw materials like iron, copper, and aluminum used in construction, electronics, and transportation.
- **Non-metallic minerals** – materials like sand, gravel, and limestone, essential for buildings and infrastructure.

[4] Metabolic & Urgenda. (2015). Circulair Fryslân: de economie van de toekomst. Retrieved from: Urgenda website

## FRIESLAND'S SOCIOECONOMIC METABOLISM This figure depicts Friesland's material flows




MATERIAL GROUPS

| BIOMASS | FOSSIL FUELS | METAL ORES | NON-METALLIC MINERALS | CYCLED MATERIALS |
|---|---|---|---|---|
| 3.4 | 2.0 | 1.1 | 5.6 | 1.5 |

SOCIETAL NEEDS

| NUTRITION | MANUFACTURED GOODS | COMMUNICATION | MOBILITY | HEALTHCARE AND EDUCATION | SERVICES | HOUSING AND INFRASTRUCTURE |
|---|---|---|---|---|---|---|
| 2.8 | 1.7 | 0.1 | 2.5 | 0.8 | 3.1 | 2.6 |

All units are in **million tonnes**

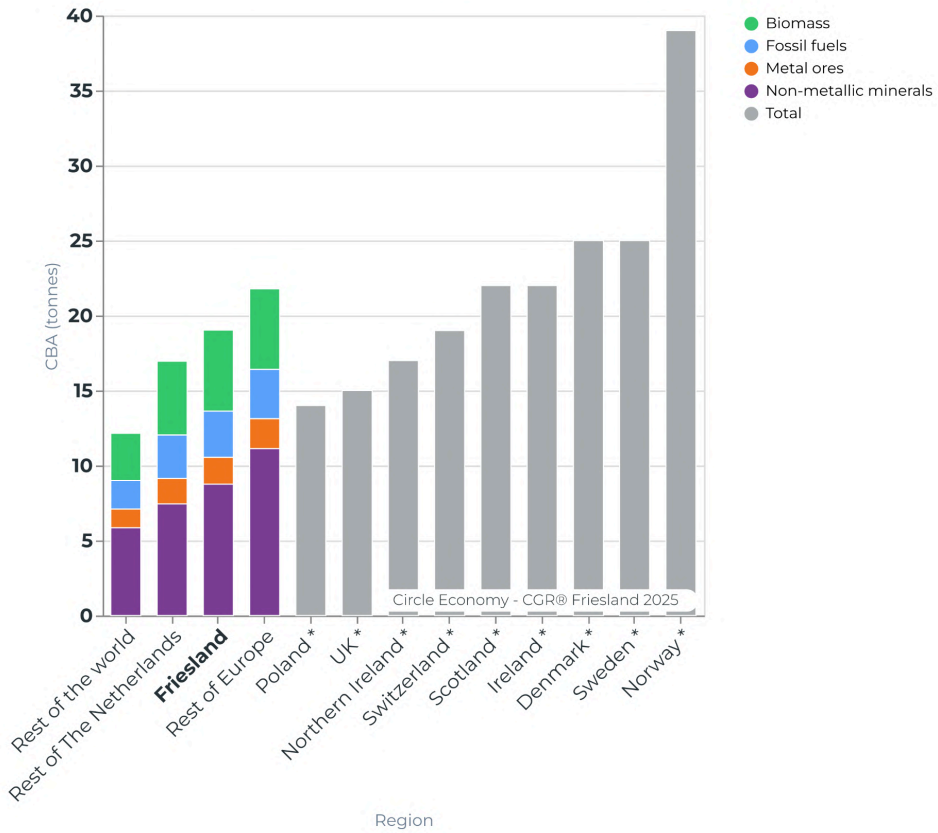
Version 2.0, 2025

**Friesland's material footprint per capita is lower than the European average, but higher than the Dutch average.**

This suggests that while the region performs relatively well at the European level, it is lagging behind nationally and globally. Given the Netherlands' goal to halve primary raw material use by 2030, this underscores the need for Friesland to intensify its efforts if it wants to stay on track and contribute meaningfully to national circularity targets.

Friesland's material footprint totals 12 million tonnes annually, or 19 tonnes per capita. This is slightly higher than the national average for the Netherlands, which stands at 17 tonnes per capita. In comparison to Europe, Friesland's material footprint is below the regional average of 22 tonnes per capita. On a global scale, Friesland's footprint is higher than the world average of 12 tonnes per capita.

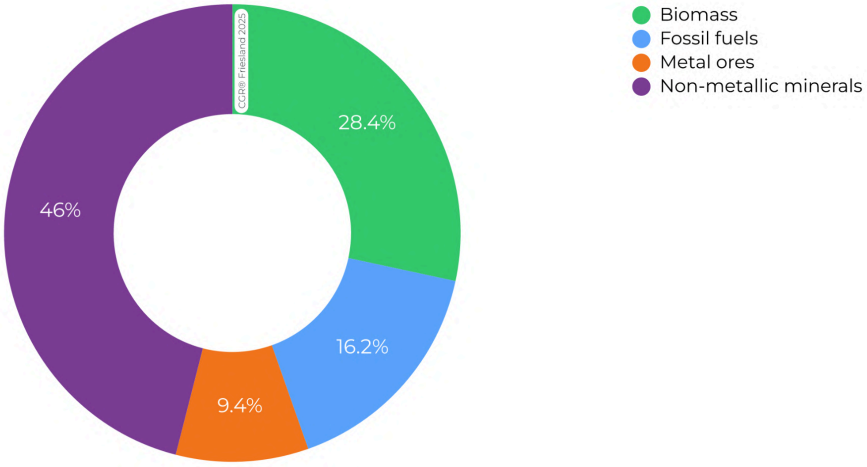
**Per capita material footprint per region**



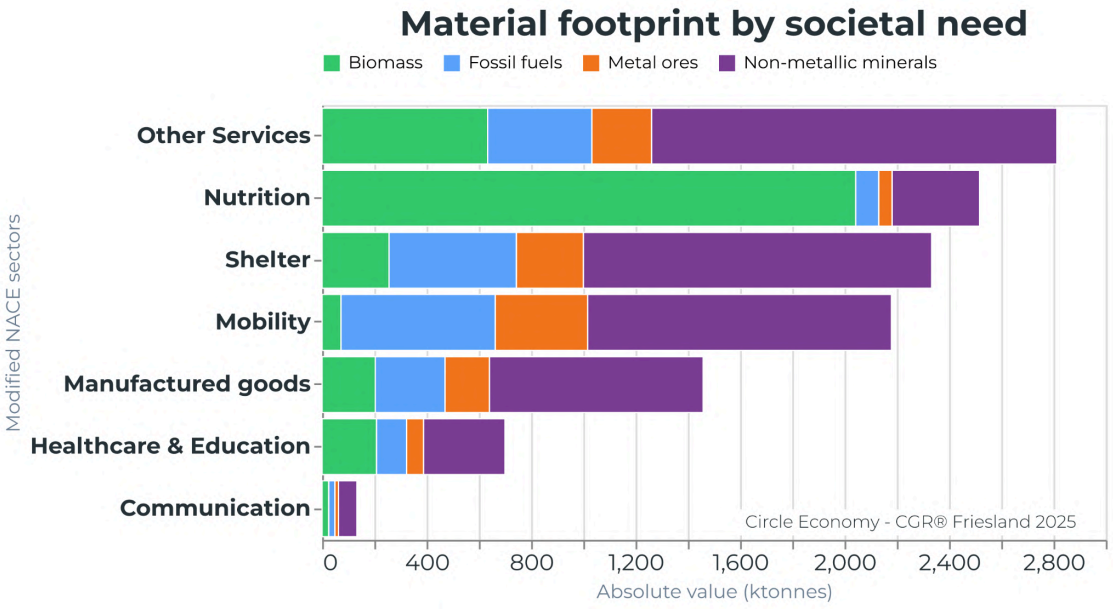

* Note that these figures have been rounded off and drawn from different data sources and years and are, therefore, not directly comparable. The figures are intended to broadly illustrate the position of this analysis in a wider context.

Friesland's material footprint is broken down into four key material groups. The largest share, 46% of the total footprint, comes from non-metallic minerals (5.6 Mt), with sand and gravel making up the majority of this category. Biomass follows at 28% (3.4 Mt), with the largest share of this coming from grazing, straw, and feed. Fossil fuels account for 16% (2.0 Mt), while metal ores make up the smallest share at 9% (1.1 Mt). The significant contributions from non-metallic minerals and biomass reflect Friesland's strong agricultural sector and highlight the extensive use of materials in infrastructure and construction.

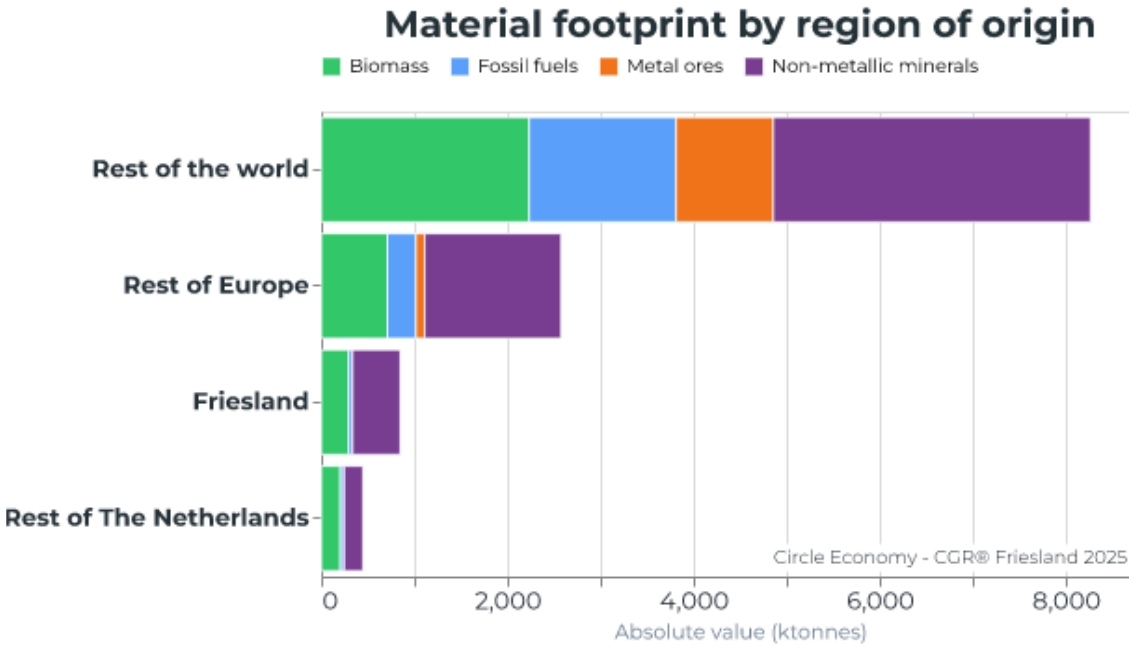
## Material footprint by material group



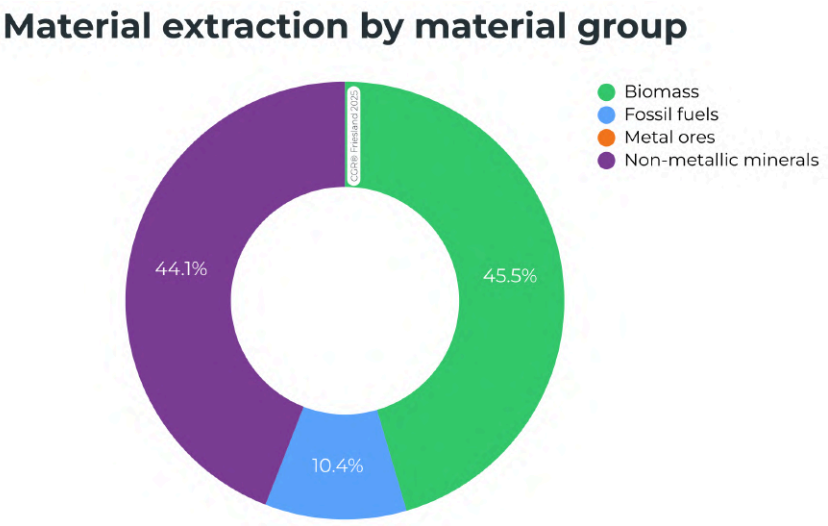

The most material-intensive sector in Friesland is 'Other Services' (including public administration and defence, business services, computer programming, and wholesale trade as the most materially intensive sectors), with the largest material group being non-metallic minerals. This sector's material footprint totals around 2.8 Mt. It is followed by Nutrition with 2.5 Mt, Shelter with 2.3 Mt, Mobility with 2.2 Mt, and Manufactured Goods with 1.5 Mt. Healthcare and Education follow with a footprint of 0.7 Mt, with Communication contributing the least to Friesland's overall material footprint at 0.1 Mt.



The material footprint by country of origin highlights the spatial distribution of environmental impacts, showing where resource extraction, production, and emissions occur. In Friesland's case, the largest share of its material footprint—8.3 Mt—originates outside Europe. The second-largest portion, 2.6 Mt, comes from the rest of Europe beyond the Netherlands. Meanwhile, Friesland itself accounts for 0.8 Mt, and the rest of the Netherlands contributes 0.4 Mt. This demonstrates that Friesland's virgin material consumption is largely reliant on international supply chains, with the majority of resource extraction and production occurring beyond its borders.




Total material extraction in Friesland reaches 7.1 Mt, with the majority consisting of biomass (46%), non-metallic minerals (44%), and fossil fuels (10%). Of the materials extracted, the largest share—3 Mt—is exported to other European countries, while 1.9 Mt are sent beyond Europe. An additional 1.3 Mt is directed to the rest of the Netherlands, and 0.8 Mt remain within Friesland. This distribution shows that while over 60% of Friesland's extracted materials are used regionally or nationally, a significant portion is also exported globally.



While Friesland's material footprint is largely shaped by international resource extraction, its extraction profile is more regionally focused, highlighting a structural imbalance between imported and exported materials.

## Improving material flows and footprints

Friesland is home to many initiatives that already contribute to reducing its material footprint—a key pillar of the circular economy and essential for meeting national goals.

- The first circular concrete chain in Heechterp, Leeuwarden
- It Swettehûs: Circular Innovation in Infrastructure
- Friesland Builds Biobased: The Fibre Hemp Deal
- On the way to green asphalt in the Northern Netherlands

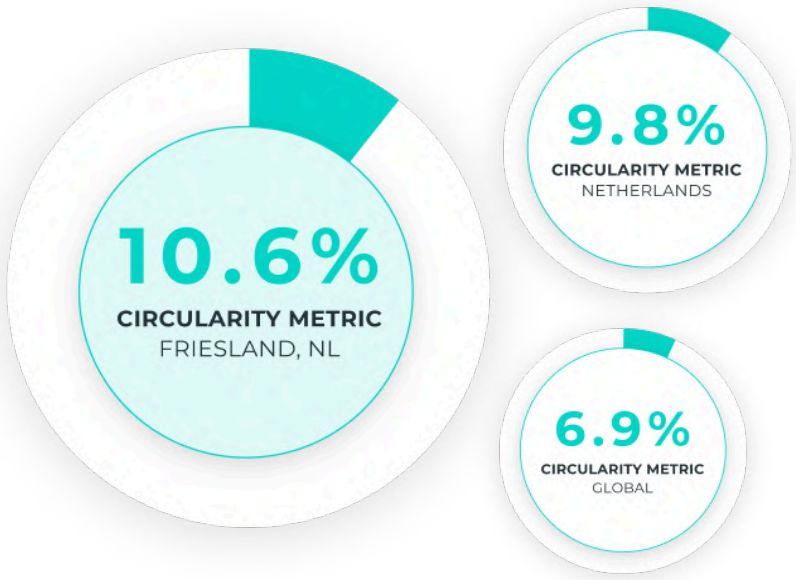
**To strengthen this impact, the region can focus on measures, such as:**

- Shortening supply chains wherever possible, increasing control over material flows and reducing dependence on external inputs.
- Prioritising higher R-ladder strategies such as reuse, repair, and refurbishment can make a significant difference—many of these actions can be carried out locally, using resources already within the province.
- Scaling up the initiatives already underway will be crucial to accelerating progress.
- Encouraging initiatives to measure their material footprint impact

### 3.1.2 Circularity Metric

Friesland's Circularity Metric stands at 10.6%—notably higher than both the Dutch national average of 9.8% and the global average of 6.9%.

This indicates that the region is performing well in reintegrating secondary materials into its economy and is already ahead of broader national and global trends.



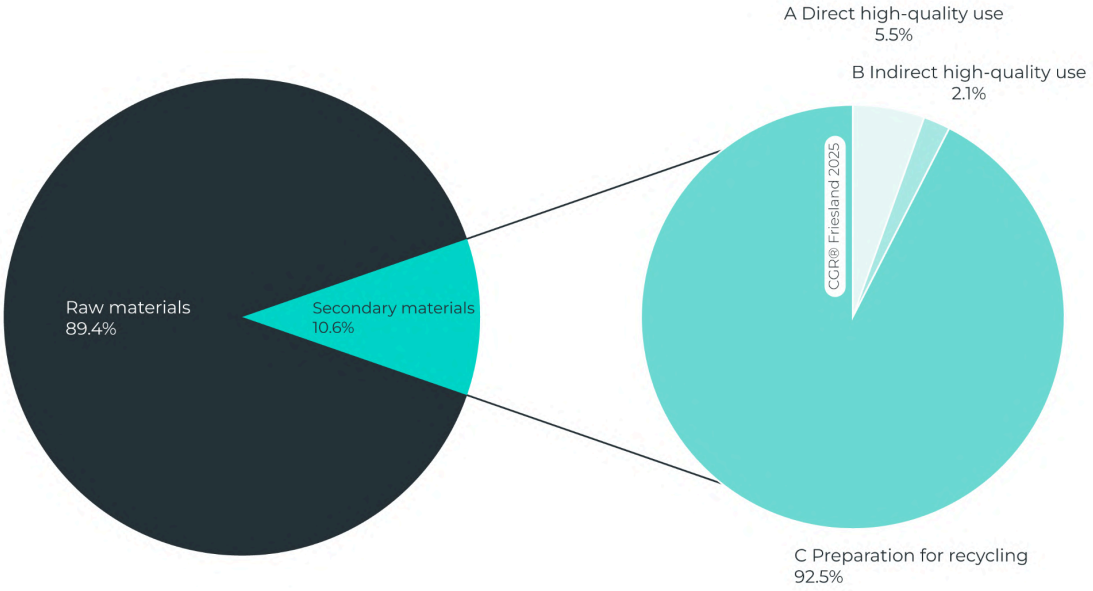

The Circularity Metric represents the share of secondary materials consumed in the region, relative to the total consumption of materials (virgin & secondary). Friesland's Circularity Metric is 10.6%, meaning that 10.6% of the region's material consumption comes from secondary materials that have been recovered and reintegrated into the Frisian economy. This is higher than the Dutch national Circularity Metric for the same year, which stands at 9.8%.[5]

[5] Circle Economy continuously improves the methodologies, data sources, and quality assurances of our CGRs, and as such results may vary. The methodology used to calculate the technical cycling of the economy differs between the old approach outlined in the CGR Netherlands 2019 report and the methods applied in this analysis. While both approaches share a similar foundation, certain methodological choices have a significant impact on the results.

One key difference is the selection of the Multi-Regional Input-Output (MRIO) database, which can substantially affect the calculation of Raw Material Consumption (RMC). In the previous analysis, Exiobase was used, whereas this study relies on the FIGARO MRIO database. Because this study is subnational, we used a NUTS2 MRIO based on FIGARO to downscale the latest economic data. Additionally, the year of analysis of the previous Dutch assessment was based on 2016 data, while the current analysis is based on 2023 data. Additionally, all material extraction figures have been updated in the environmental extension to use a more globally aligned data source.

## Secondary material consumption breakdown in Friesland

This chart shows a breakdown of all secondary material use (circularity) in Friesland. The left pie shows the total number of materials used, of which 10.6% were sourced from recycled materials. The close-up pie shows the waste treatment breakdown of these recycled materials.




Among Friesland's secondary material inputs, the largest share— 93% (1.3 Mt)—comes from recycled waste, primarily processed through breaking, a method primarily used to prepare construction and demolition waste for reuse as aggregates in circular construction. Additionally, 6% (79 kt) of secondary materials are directly repurposed in construction without extensive processing, preserving their original form and function. Finally, 2% (30 kt) come from indirect high-quality reuse (where some form of treatment is required before reuse).

<ASIDE> You can view other national and regional circularity metrics here.

Beyond database selection, the inclusion of certain recycled and recovered waste streams as secondary materials also plays a crucial role. In the previous methodology, the reported waste included soils and dredging spoils. However, in this analysis, these materials are excluded, as they are considered waste from unused extraction and therefore not part of RMC calculations. Additionally, other biological waste flows—such as agricultural waste, food waste, and common sludges—are also excluded from the recycled content. These materials are included in the ecological cycling potential instead, and are as such not included in the technical cycling rate.

### Improving the circularity metric

Friesland is home to a wide range of initiatives that are already helping to improve its Circularity Metric—by both reducing overall material consumption and increasing the share of secondary materials in use.

- NTCP: Pioneering Circular Plastics in Friesland
- Grondbank Leeuwarden: A Circular Approach to Soil Reuse
- Circular Renovation of Carré 1: Leading by Example
- Urban Mining: Refurbished sanitary facilities

**To strengthen this impact, the region can focus on measures, such as:**

- Measures that reduce the material footprint, as mentioned in this section.
- Stimulating the demand for secondary materials through public procurement initiatives.
- Managing waste locally and through impacts to ensure sufficient availability of secondary materials.
- Prioritising high-value reuse over downcycling.

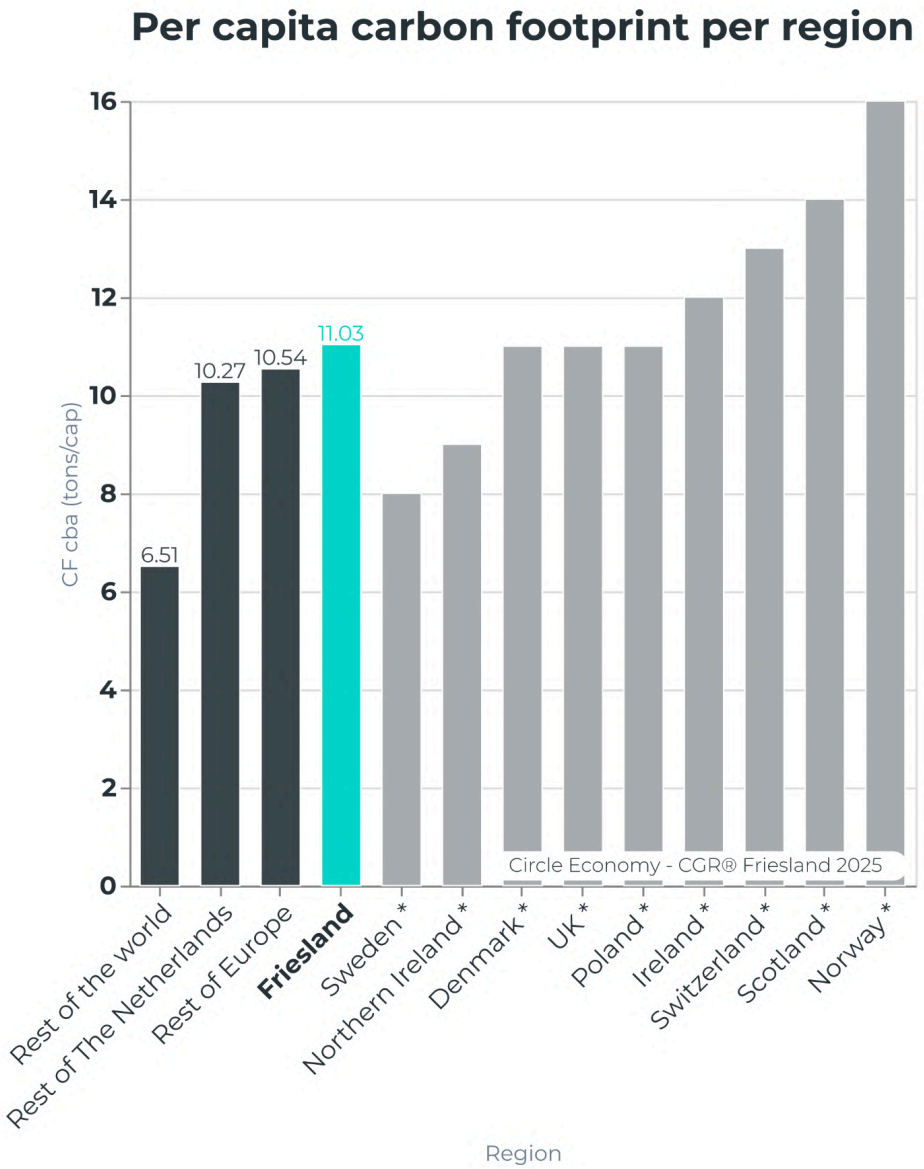
## 3.1.3 Carbon footprint

**Friesland's carbon footprint per capita is higher than the global, European, and Dutch averages.**

This indicates that while the region's carbon emissions are comparatively high, it has significant room for improvement. This underscores the need for Friesland to intensify its efforts to reduce emissions, especially given the Netherlands' ambitious climate targets. By accelerating its transition to a low-carbon economy, Friesland can contribute more effectively to both national goals and global climate mitigation efforts.

The carbon footprint, from a consumption-based perspective, tracks the total emissions linked to a region's final demand. It uses input-output modeling to account for not only the region's direct emissions but also those that occur along the supply chain, including the embodied carbon in imported products. This approach differs from a production-based carbon footprint, which only

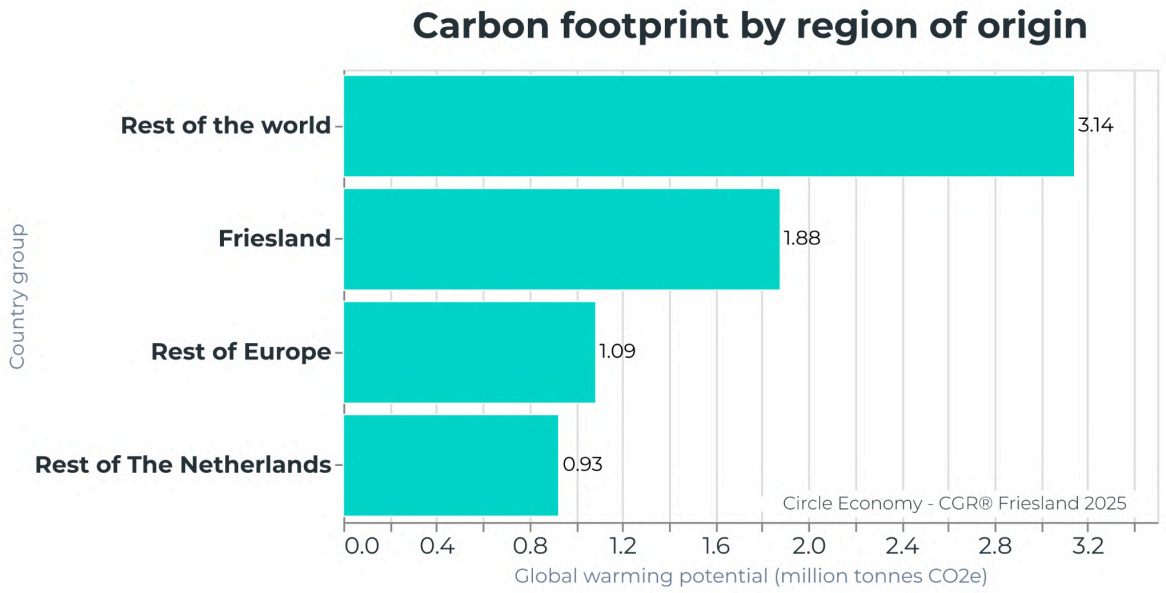
considers emissions produced within the region's borders, regardless of where the products are consumed. The consumption-based carbon footprint provides a more complete view of the region's impact on global emissions.



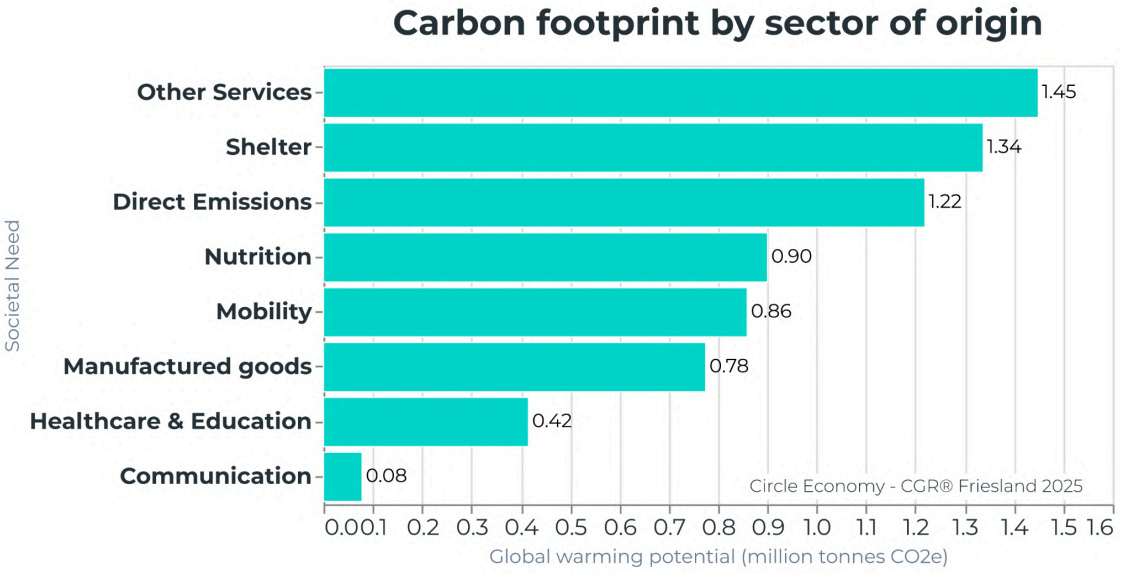

* Note that these figures have been rounded off and drawn from different data sources and years and are, therefore, not directly comparable. The figures are intended to broadly illustrate the position of this analysis in a wider context.

Friesland's carbon footprint totals approximately 7 Mt of CO2 equivalent (CO2e), or about 11 tonnes per capita. In comparison, Friesland's carbon footprint per capita is slightly above the Netherlands and European average of 10.2 and 10.5 tCO2e, respectively. It is also notably higher than the global average, which is 6.5 tCO2e. per capita. This trend somewhat follows Friesland's material footprint, which is slightly below the European average but slightly above the Dutch average. The connection between material use and carbon emissions highlights that Friesland's material consumption—particularly from emissions-intensive production abroad—contributes

significantly to its carbon footprint. As a result, Friesland's carbon and material footprints display similar patterns of higher-than-average impact, underscoring the need for more sustainable consumption and production practices.




Of Friesland's total carbon footprint of 7 MtCO2e, 2 Mt (27%) originate within the region, while 1 Mt (13%) come from the rest of the Netherlands. The remaining 60%—or 4 Mt—is sourced from outside the Netherlands, with 3 Mt coming from beyond Europe. This highlights Friesland's significant reliance on emissions-intensive production in regions outside Europe, emphasising that its carbon emissions are intricately linked to global production and consumption patterns. This global dependence suggests that addressing Friesland's carbon footprint requires a broader focus on changing international supply chains and more sustainable production practices.



Several sectors play a significant role in Friesland's overall carbon emissions. The 'Other services' sector leads, contributing 20% of the region's total carbon footprint. Shelter, primarily associated with the built environment and construction activities, follows closely at 19%. Direct emissions, including those from personal transport and household heating, account for 17%, while nutrition, linked to food systems and agriculture, represents 12%. Interestingly, while nutrition scores high in Friesland's material footprint, it has a relatively low impact on the carbon footprint. This discrepancy may be due to the high volume of materials used in food production and consumption (e.g., packaging, agriculture) without a corresponding high level of carbon emissions, possibly because the food system relies less on carbon-intensive energy or production methods compared to other sectors.

## Improving carbon footprint

Friesland is home to many initiatives that already contribute to reducing its carbon footprint.

- Fijn Wonen's Circular Construction Powered by Robotics
- Leva: Circular Modular Housing for Sustainable Living
- Friesland returns to its roots with the flax value chain
- Cup Concept: Re-usable hard cups for zero waste events

To strengthen this impact, the region can focus on measures, such as:

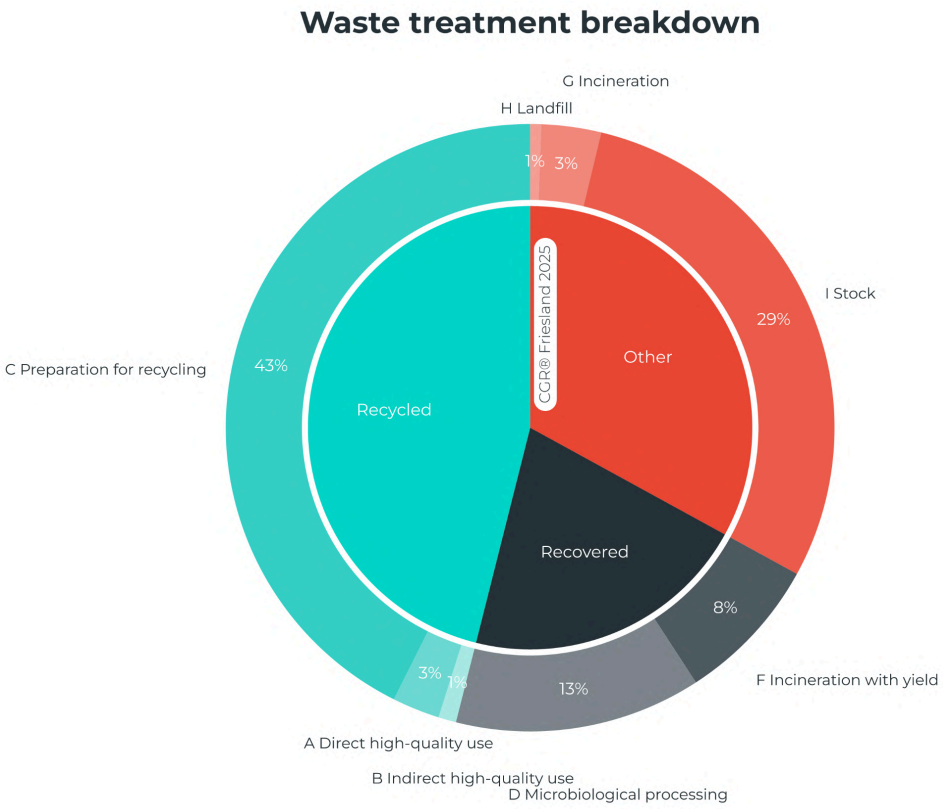
- Increase share of renewable energy consumed, especially in difficult-to-decarbonise sectors such as transport and manufacturing.
- Shorten supply chains by sourcing materials locally where possible, and choosing low-carbon options even when importing.
- Scale up circular practices like reuse, repair, and refurbishment to reduce demand for carbon-intensive production.

### 3.1.4 Waste treatment breakdown

> **Friesland performs well in waste treatment, with high recycling rates.**
>
> This demonstrates a solid foundation for managing waste within the province. However, a large share of this recycling comes from aggregates, and per capita municipal waste generation remains high[1].

The waste treatment breakdown illustrates how waste in the region is processed, encompassing methods such as recycling, landfilling, and incineration. It also accounts for imported waste, providing a comprehensive view of how waste is handled within the region. This breakdown highlights the percentage of waste processed through each method, offering valuable insights into the region's waste management practices and their environmental impact.

This analysis identifies three primary categories of waste treatment: recycling, recovery, and other. Each of these categories can be further subdivided into more specific processes to give a detailed understanding of waste management practices. Recycling includes preparation for recycling, direct high-quality reuse (where no processing is necessary), and indirect high-quality reuse (where some form of treatment is required before reuse). Recovered waste encompasses microbiological processing, including biological treatments such as composting, anaerobic digestion, and fermentation, as well as incineration with energy recovery. The "other" category refers to landfilling, incineration, and temporary storage before treatment or final disposal.



The total waste treatment in Friesland amounts to **3.1 Mt**. The largest waste treatment category in Friesland is recycling, with a recycling rate of 46%, amounting to 1.4 **Mt**. Of this total, the majority—1.3 **Mt**—is prepared for further recycling. Only 4% of the total waste 0.1 **Mt**) consists of high-quality materials that are either directly reused or treated and then reused. This breakdown shows that recycling is the dominant waste treatment method in Friesland, accounting for nearly half of the total waste. However, the fact that only 4% of the total waste is reused as high-quality materials highlights a discrepancy between materials prepared for recycling and those directly reintegrated into the economy.

The next largest waste stream is categorized as 'other waste flows,' with the majority (29%) temporarily stored or set aside for later treatment. Of the total waste, only 1% is sent to landfill, and 3% (0.1 **Mt**) is incinerated. This demonstrates that minimal amounts of waste are sent to landfill and incineration, with Friesland's rates being far lower than the EU average of 30% for landfilling and 7% for incineration.[6]

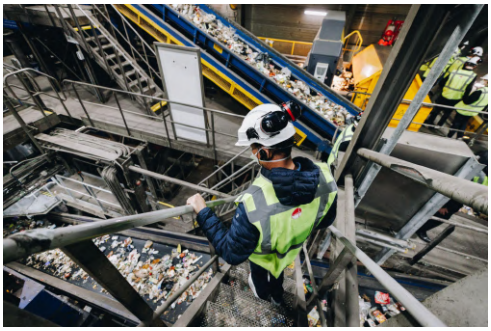
Recovered waste accounts for 13% (0.4 **Mt**), with the majority processed through microbiological treatments such as composting and anaerobic digestion. Another 8% (0.2 **Gt**) is recovered through waste-to-energy processes. Omrin's waste separation rate stands at an impressive 78%, placing it among Europe's top performers. A key factor behind this success is the separation and digestion of organic waste fractions (OWF), which distinguishes Omrin from other waste management systems.[7]

[6] Eurostat. (2024). Waste statistics. Retrieved from: Eurostat website

[7] Data is sourced from an unpublished study by the National Monitor Programme of the Cooperative Provinces (IPO)

## Improving waste treatment

Friesland is home to many initiatives that already contribute to improving its waste management system.



### Omrin: Showcasing the Frisian approach to Circular Economy

Omrin champions Friesland's circular economy through a collaborative, trust-based approach. Starting as a regional waste management company, it has grown into a key player by connecting municipalities, businesses, and knowledge institutions. Circularity is woven into every aspect of Omrin's operations, from waste recovery to creating local value. With a governance model that prioritizes shared responsibility and continuous learning, Omrin exemplifies Friesland's bottom-up, partnership-driven transition to a sustainable future.

**Check out this full case study on the Knowledge Hub**

- Advancing Circular Waste Management: Omrin's Innovative Recycling Technologies
- SNUK: Closing Nutrient Loops in Friesland
- Cycle Up Hub: Circular service hub for

**To strengthen this impact, the region can focus on measures, such as:**

- Reducing overall waste generation through smarter design, local reuse centres, and awareness campaigns that encourage responsible consumption.
- Importing and designing products that allow for easier reuse and recycling, by favouring materials and formats that support disassembly, durability, and end-of-life processing.
- Prioritising businesses and initiatives that support higher R-strategies like reuse, repair, and refurbishment—before recycling.

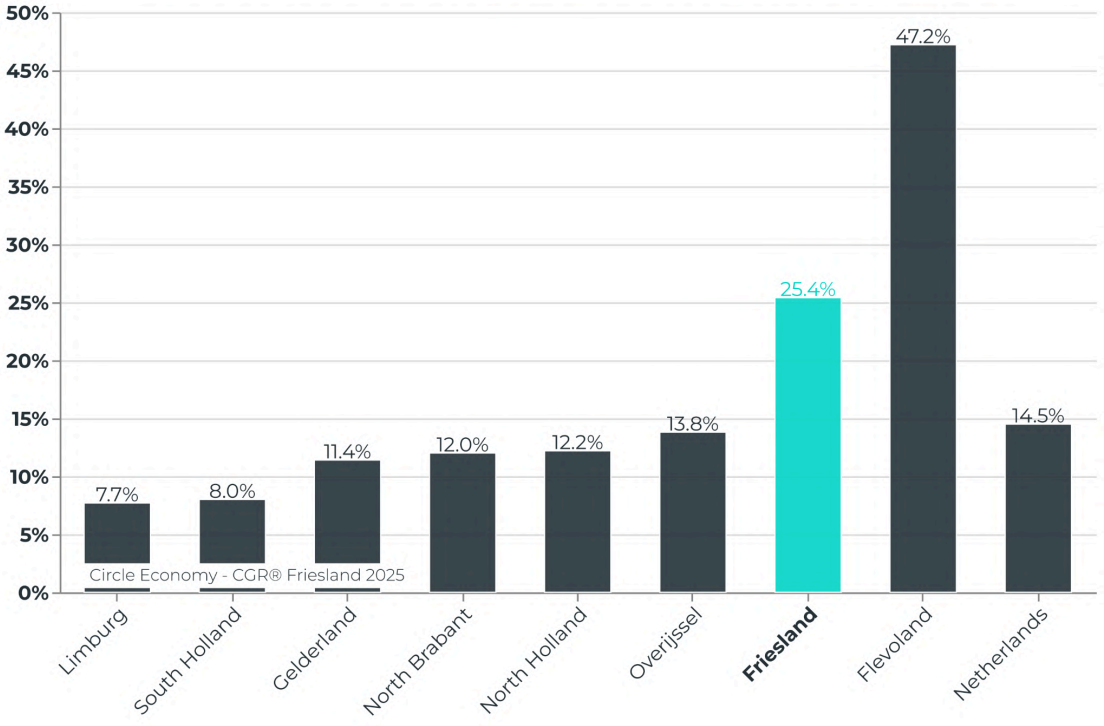
### 3.1.5 Renewable energy

> **Friesland is one of the leading provinces in the Netherlands when it comes to renewable energy consumption, second only to Flevoland.**
>
> Its share of renewable energy is well above the national average, and just above the European average.

Renewable energy consumption is a key indicator of a region's commitment to sustainability. This section tracks the share of energy derived from renewable sources, such as wind, solar, and biomass, reflecting progress toward reducing reliance on fossil fuels. Higher renewable energy consumption contributes to a cleaner, more sustainable energy system, supporting both environmental and economic goals in the circular economy.

Friesland has the second-highest rate of renewable energy consumption in the Netherlands, with 25% of the region's energy consumption coming from clean energy.[8] The only Dutch province with a higher rate is Flevoland, which has a renewable energy share exceeding 45%. Friesland's renewable energy consumption also surpasses the national average, with the Netherlands as a whole at 15%. In a broader context, Friesland's renewable energy share is slightly above the European average of 24.5% in 2023,[9] placing the region in a favorable position relative to many other European countries in terms of renewable energy usage.

**Share of renewable energy in gross final consumption (2022)**




[8] Regionale Klimaatmonitor. (2022). Energieneutraal Dashboard. Retrieved from: Rijksoverheid Website
[9] EEA. (2025). Share of energy consumption from renewable sources in Europe. Retrieved from: EEA Website

### Improving renewable energy

Friesland is home to many initiatives that already contribute to transitioning to a renewable energy system.

- Omrin's Renewable Energy Initiatives
- Shared mobility for every village: Buurtbestuurders
- Full electric transport for students and social support in Leeuwarden
- Energy innovation in practice at Energiecampus Leeuwarden
- Us Kooperaasje: Support for all local energy cooperations

**To strengthen this impact, the region can focus on measures, such as:**

- Scaling up solar energy on buildings, home, and public infrastructure, with support from local cooperatives and regional incentives.
- Accelerating community-owned wind energy projects, particularly in areas with high wind potential, ensuring local involvement and benefits for residents.
- Electrifying Friesland's regional bus fleet and installing solar-powered charging stations.

## 3.1.6 Water

**Friesland is a frontrunner in addressing water scarcity and promoting water reuse.**

While some indicators—such as water purification performance—show strong results, assessing the overall circularity of water use in Friesland remains challenging due to a lack of comprehensive regional data. In particular, there is insufficient information to fully evaluate water use, reuse, and cycling across the entire province.

Water plays a crucial role in Friesland's circular economy, which focuses on minimising waste, reusing resources, and reducing environmental impact. The demand for clean drinking water is rising, while water scarcity is also intensifying—driven in part by climate change. At the same

time, the growing scarcity of raw materials, combined with geopolitical tensions and increasing demand in emerging economies, makes reducing our dependence on these resources more important than ever. Embracing a circular economy helps address these challenges by limiting waste production and minimising environmental harm.

A key element of this approach is effective urban water cycle management, which involves several stakeholders. Vitens is responsible for supplying clean drinking water. Municipalities collect communal wastewater through sewer systems, and Wetterskip Fryslân (the regional water authority) purifies this wastewater before returning it to the environment. This collaborative structure supports sustainable water use and reuse.

The problem of water scarcity leads to a demand for solutions that contribute to efficient water use and reuse. Circular solutions regarding water play an increasingly important role across all industries and especially in sectors where water is an essential part of the production processes. Examples are energy (hydrogen transition), sustainable agriculture and sustainable food production.

Friesland as a region of water technology is on the forefront of (inter)national innovative developments in circular water use. Leeuwarden is the European city of water technology. In Friesland the water sector plays an important economic role, showing relatively more businesses and employment than the Dutch average. Within the WaterCampus trendsetting research is done (Wetsus, CEW) and market intelligence and business support are organised (Water Alliance). Next to companies and the WaterCampus the Frisian water board (Wetterskip) plays a prominent role in the circular water transition with its policy aimed at sustainable and circular water.

In the context of water, a circular economy involves three key pillars:

1. **Water reuse & resource efficiency**: Maximising water recycling and reducing consumption in industries and households.
2. **Nutrient, raw material & energy recovery**: Extracting valuable materials (e.g., phosphorus, nitrogen, bioplastics) from wastewater, and water as energy source.
3. **Sustainable and low-impact water infrastructure**: Applying circular design principles to purification plants, pipelines, and water systems helps extend their lifespan, reduce material waste, and lower environmental impact.

**1. Water reuse & resource efficiency**

Friesland is becoming increasingly vulnerable to water scarcity, driven by climate change and rising demand. In 2018, the province came close to triggering the *verdringingsreeks*, the national water allocation hierarchy—a situation that could recur without effective mitigation measures. To address this, national policy aims to reduce drinking water consumption from 128 to 100 litres per person per day by 2035. As of 2024, Friesland's total drinking water use is 51 million cubic meters. Nationally, freshwater management is guided by the Zoetwater strategy under the Deltaprogramma, while at the provincial level, Friesland follows the Klimaatbestendig 2050+ agenda. In line with this, Wetterskip Fryslân has committed €30 million to support climate adaptation initiatives.

The province promotes sustainable water use through the R-ladder approach (Refuse, Rethink, Reduce, Reuse) and is investing in both urban and rural water storage, as well as expanding water reuse technologies—particularly those sourced from wastewater treatment plants. A key example is a sludge dewatering unit in Heerenveen where Wetterskip Fryslân purified approximately 80 million liters (80,000 $m^3$) of treated wastewater as process water was achieved in its first year of operation in 2025. While this currently represents a small share of total industrial water use—equivalent to the annual water consumption of about 800 households—it signals a shift toward more circular practices and aligns with Friesland's ambitions.[10]

Key indicators for monitoring progress include IJsselmeer inlet rates, which serve as a critical stress signal, and baseline assessments of sectoral water usage and resilience potential. However, there is currently a lack of reliable data on provincial-level water consumption and reuse. Forecasting tools such as the Klimaatbeleid Dashboard (assessing policy impact by 2030) and Circular Transition Indicators (CTI) are used to track progress toward circularity and adaptive capacity.

Wetterskip Fryslân plays a pivotal role in this context through its high-performing water purification efforts, achieving an efficiency rate of 88.7%, notably above the national average of 87.2%. Beyond nutrient removal—such as phosphorus, and nitrogen—this purification capacity enhances opportunities for water reuse, supporting more efficient and circular water

[10] Wetterskip Fryslân. (2024). We gebruiken gezuiverd rioolwater voor ontwateren slib. Retrieved from: Wetterskip Fryslân website

management. The extraction of usable materials during purification further strengthens the link between water quality and resource recovery in practice.[11]

**2. Nutrient, raw material & energy recovery**

Wastewater is increasingly recognized as a valuable resource, containing recoverable energy, nutrients, and materials that can help address growing resource scarcity. In Friesland, the water sector is actively innovating to transform waste streams into sources of value, aligning with broader circular economy goals.

There are no overall figures on recovery from wastewater. However, Friesland is an international front-runner with multiple innovative projects, demo sites, and businesses, like the Waterschoon building project, Hydraloop, and PHA2USE.[12] Recovery potential is estimated to be high, with goals to recover 600 tonnes/year for phosphorus (with up to 90% recoverable) and 6,000 tonnes/year of cellulose—though the commercial viability remains uncertain. Bioplastics also represent a promising area of growth, but consistent and reliable data on production volumes is still lacking. Wetterskip Fryslân is also working on extracting valuable materials from sewage sludge, and research by Wetsus is exploring innovative approaches to reuse blackwater sludge, highlighting emerging opportunities for circular resource use.

Wetterskip Fryslân also produces 2 million $m^3$ of biogas per year from sewage sludge digestion. Although lower in the R-ladder (energy recovery rather than recovery and reuse), this biogas production supports renewable energy goals.

**3. Sustainable and low-impact water infrastructure**

Circularity is a key principle in managing water infrastructure, including dikes, treatment plants, and pumping stations—core assets within the construction and engineering (GWW) sectors. These systems carry a high material and environmental footprint, making them critical to achieving long-term sustainability goals.

The WAVES dashboard currently omits data in this category. However, we can view the infrastructure in the context of the larger picture, where a Circularity Metric of 10.6% was calculated, including water infrastructure. Due to its distinct governance and procurement structures, it is recommended that this sector be tracked separately within broader circularity monitoring efforts. While specific data on the quality of Friesland's water infrastructure is not available, the Dutch tap water system as a whole is known for its high efficiency, with leakage rates below 10%—significantly lower than in many other comparable countries, where losses can

[11] Unie van Waterschappen. (n.d.). Dashboard - gezuiverd water. Retrieved from: Unie van Waterschappen website
[12] Unie van Waterschappen. (n.d.). Dashboard - gezuiverd water. Retrieved from: Unie van Waterschappen website

exceed 30%. This long standing efficiency positions the Netherlands as a leader in water infrastructure performance.[13]

## Improving the water system

Friesland is home to many initiatives that already contribute to improving its water system.

### Wetterskip Fryslân: Circular Water Management

Wetterskip Fryslân pioneers circular water management by embedding sustainability into every aspect of its operations. As Friesland's regional water authority, it safeguards dikes, regulates water levels, and treats wastewater—while steering a bold transition toward climate neutrality by 2030 and full circularity by 2050. From rethinking dike construction to recovering raw materials from wastewater, WF turns essential water infrastructure into engines of resource regeneration, supporting Friesland's ambition to become a leading circular region in Europe.

**Check out this full case study on the Knowledge Hub**

- The New Normal in construction - prescribing water savings
- Waterschoon: Leading the Way in Urban Circular Water
- From wastewater to worth: The PHA2USE Project

**To transition to a more circular water system in Friesland, actions such as the following will be key:**

- To advance water sustainability, increased investment and innovation in reuse technologies is essential—particularly alongside the integration of decentralized systems in new developments, such as rainwater harvesting and greywater

[13] Beuken, R., Lavooij, C., Bosch, A., & Schaap, P. (2008). *Low leakage in the Netherlands confirmed*. In Proceedings of the 10th Annual Water Distribution Systems Analysis Conference. p. 1–8. doi.org/10.1061/40941(247)174

recycling.

- Establishing a clear strategy to reduce tap water consumption across Friesland can play a pivotal role in achieving regional circular water goals.
- There is significant potential in scaling up pilot projects and businesses focused on nutrient recovery, especially for agricultural and industrial reuse.
- Circular design principles and sustainable materials should be embedded in water infrastructure projects, complemented by the deployment of innovative sensors and digital technologies for smarter asset management.
- Strengthening data collection across the province is key to monitoring water usage, improving efficiency, and tracking the reuse of materials and energy.

## 3.2 Economic

Economic indicators are essential for evaluating the success of a circular economy, focusing on how efficiently resources are used, how innovation drives new circular business models, and how economic activity can align with circular practices rather than traditional growth. In addition to these indicators, this section also considers the role of **circular procurement** as a key mechanism for driving demand for sustainable products and services, influencing both public and private sector practices. While green growth is often proposed as a pathway to achieving a circular economy, it faces significant challenges, including the rebound effect and the difficulty in fully decoupling economic growth from environmental degradation. These limitations highlight the need for a deeper focus on circular strategies that reduce overall material consumption and prioritise regenerative systems.

This section explores the role of **innovation** and **competitiveness** in driving the transition to a circular economy. By examining factors such as a region’s ability to foster innovative solutions, support sustainable business practices, and create employment opportunities in circular economy-related fields, we gain a clearer understanding of how these elements contribute to economic resilience and the success of circular businesses. The focus on innovation reflects the importance of new ideas and technologies, while competitiveness highlights the region's capacity to lead in this transformation. Additionally, **Circular Jobs** tracks employment that directly supports this transition across all sectors of the economy.

### 3.2.1 Competitiveness index

**Friesland scores 117 on the EU Regional Competitiveness Index (RCI), well above the EU average of 100.**

This indicates a strong competitive environment for businesses, including those in the circular economy. This positions Friesland as an attractive region for sustainable, innovative business growth.

The EU Regional Competitiveness Index (RCI) assesses a region's ability to support businesses, including those focused on the circular economy, by evaluating factors like innovation, infrastructure, education, labor market efficiency, and macroeconomic stability. A high RCI indicates a competitive ecosystem with the right conditions—such as a skilled workforce, supportive infrastructure, and innovation-driven initiatives—that help businesses grow sustainably and contribute to regional development.

**Competitiveness index**

Friesland scores 117 on the RCI, well above the EU average of 100, and ranks 40th out of 234 EU regions.[14] While Friesland's economy used to be more traditional and regionally focused within the Netherlands, it now stands out for its strong competitiveness, which is essential for supporting businesses in the transition to a circular economy. This strong performance reflects the region's competitive advantages, particularly in key areas like institutions, macroeconomic stability, and technological readiness, which are crucial for fostering circular businesses. Friesland's position in the upper middle of EU regions demonstrates its capacity to offer the necessary conditions for circular economy initiatives, making it an attractive location for businesses seeking to thrive in a sustainable and innovative environment.

For more detailed insights into Friesland's competitiveness and its potential as a thriving hub for circular businesses, please refer to the interactive dashboard, which provides comprehensive data and further positions Friesland within the broader EU context.

## Improving the competitiveness index

Friesland is home to a wide range of initiatives that are already helping to improve its competitiveness index.

- WaterAlliance: uniting water technology companies
- Innovatiepact Fryslân: Cooperating for Broad Prosperity in Friesland
- Where hightech innovation connects: Drachten

**To further leverage this competitive edge, Friesland can focus on:**

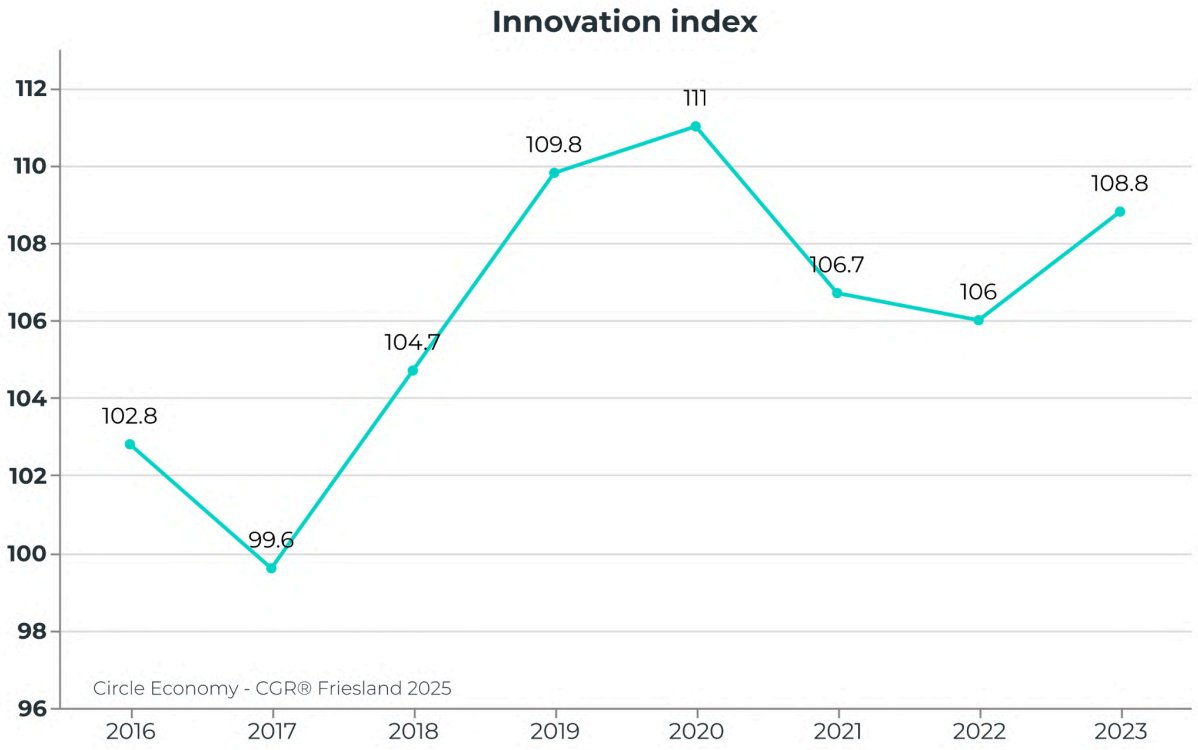
- Strengthening infrastructure for circular economy businesses, ensuring access to sustainable resources and efficient logistics.
- Enhancing labor market efficiency by offering specialised training programs in circular economy practices to ensure a skilled workforce.
- Fostering strong institutional support, including policies and incentives that encourage businesses to adopt circular models and invest in sustainable practices.

[14] European Commission. (2022). EU Regional Competitiveness. Retrieved from: European Commission Website

### 3.2.2 Innovation

> **Friesland scores 108.8 on the European Innovation Scoreboard, just slightly above the EU average of 108.5.**
>
> This indicates a relatively strong performance in research, innovation, and collaboration between businesses and research institutions. While its score is above the EU average, it remains on par with many other regions, highlighting potential for further innovation across various sectors.

The **European Innovation Scoreboard** provides a comparative assessment of the research and innovation performance of regions in EU Member States, as well as other European and selected third countries. By evaluating factors such as research intensity, innovation outputs, and collaboration between businesses and research institutions, the Innovation Index offers valuable insights into a region's capacity to foster innovation. For circular businesses, this index is crucial in determining the region's ability to support the development and implementation of innovative solutions that drive the transition to a circular economy. It highlights the strengths and challenges of a region's innovation system, helping to identify areas where targeted actions can enhance support for circular business models.



Friesland scores **108.8** on the European Innovation Scoreboard, slightly above the EU average of 108.5.[15] This positive result indicates that Friesland performs well in research and innovation, with strong research intensity, innovation outputs, and collaboration between businesses and research institutions. The innovative power within Friesland has increased in recent years, positioning the region as a "strong innovator" based on the European Innovation Index (Regional Innovation Scoreboard). Compared to the rest of Europe, Friesland performs above average, but when compared to the rest of the Netherlands, it ranks at the bottom of the national innovation rankings. Despite this, Friesland's above-average performance within the EU reflects a competitive innovation environment that supports the growth of circular businesses, showcasing its potential to foster innovation and develop circular economy solutions.[16]

In addition, Friesland has seen notable growth in the number of **highly skilled tech employees**, with growth in recent years matching the national average over the past 10 years. This is a relatively strong performance for a region that is economically more traditional and somewhat peripheral. This development is crucial for driving the transition to a circular economy, as a highly skilled workforce is essential for the development and implementation of innovative circular solutions.[17]

In 2023, Friesland contributed 3.1% of the applications awarded under the **Dutch RVO innovation programs**, which aligns with the region's share of the total Dutch business population. Over the years, the number of applications from Frisian entrepreneurs has risen, consistently exceeding the national average, especially prior to the pandemic. However, there has been a decline in the share of Frisian applications in 2022 and 2023, possibly due to a lack of complete data. The MIT scheme, a funding program supporting small and medium-sized enterprises (SMEs) in innovation, is widely used in Friesland, with a higher-than-expected number of applications and approvals given the region's business size. This high level of involvement in innovation is a strong indicator of Friesland's active role in fostering sustainable business practices, reinforcing its capacity to support the growth of circular economy (CE) initiatives.

[15] European Commission. (2023). Regional Innovation Scoreboard: Country regional profile Netherlands. Retrieved from: European Commission Website
[16] European Commission. (2023). Regional Innovation Scoreboard: Country regional profile Netherlands. Retrieved from: European Commission Website
[17] Platform Talent voor Technologie. (2024). Kenmerken van de arbeidsmarkt technologie. Retrieved from: PTvT Website

## Improving innovation

Friesland is already home to a wide range of innovative initiatives.

### WaterCampus: A Global Hub for Circular Water Technology

WaterCampus drives Friesland's circular water innovation through trust-based collaboration. Rooted in the region's deep water heritage, it connects businesses, universities, and governments to turn research into real-world solutions. From nutrient recovery at Spoordok to Hydraloop's decentralized reuse, WaterCampus makes Friesland a global leader in sustainable water technology.

**Check out this full case study on the Knowledge Hub**

- Circular Plastics innovation in the Northern Netherlands
- Promoting, supporting and connecting startups and scale-ups from the Northern Netherlands

**To further enhance this innovation potential, Friesland can focus on:**

- Leveraging existing business-research-government collaborations to scale successful circular technologies.
- Expanding funding and support for SMEs, through programs like MIT, by actively promoting the availability of funding, creating targeted opportunities for circular innovations, fostering partnerships with financial institutions, and supporting local incubators and accelerators.
- Encouraging innovation-driven growth, which will naturally create more job opportunities and a vibrant ecosystem, making Friesland an attractive place for young professionals and helping to retain talent in the region.

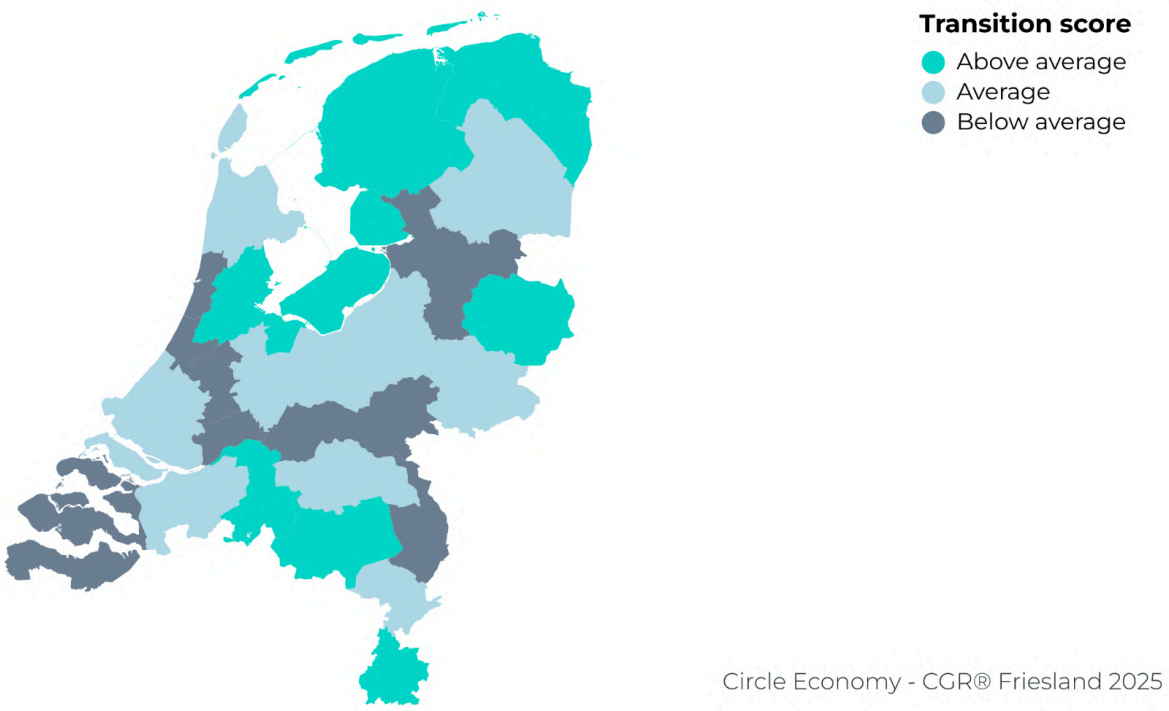
### 3.2.3 Sustainable businesses

**Friesland performs above the national average in the NEx-T Index.**

This indicates that businesses in the region are making solid progress in integrating sustainable practices across key areas like circular entrepreneurship, green energy use, and transparent supply chains.

The NEx-T Index is a measurement tool that tracks the progress of Dutch businesses in transitioning to a sustainable and inclusive economy. It assesses companies across seven key dimensions, including circular entrepreneurship, green energy use, biodiversity impact, transparent supply chains, and inclusive business practices. By evaluating company intentions, business integration, and actual results, the index provides a comprehensive picture of how businesses are embedding sustainability into their operations.

Friesland performs above the national average in the NEx-T Index, highlighting that businesses in the region are making notable progress in integrating sustainable practices.[18]




[18] Rabobank. (2023). Koplopers verduurzaming trekken transitie naar nieuwe economie nog niet vlot. Retrieved from: Rabobank website

### Improving sustainable businesses

Friesland is home to many initiatives that already show how businesses are leading the way in terms of sustainability, including circularity.

- Fostering the green business leaders of tomorrow
- CIRCO hub Fryslan: Developing circular business and products together
- BOXO: Re-use packaging scale-up for B2B
- Hydraloop: Revolutionising Greywater Recycling in Friesland
- Advancing Frisian Regenerative Agriculture: A Business-Led Transition

**To accelerate the transition to more sustainable businesses, Friesland can focus more on actions such as:**

- Encouraging circular entrepreneurship by offering more support for businesses that adopt circular models, such as providing incentives, funding, and resources to help them scale their sustainable practices.
- Improving supply chain transparency by promoting the use of traceability technologies, sustainability reporting standards, and third-party audits to ensure businesses can track and communicate the environmental and social impacts of their supply chains.

## 3.2.4 Circular jobs

**Friesland's workforce, with approximately 8% of total jobs classified as directly circular, provides an indication of how circular the entire Frisian economy is.**

This suggests that a significant portion of the region's economy is already engaged in circular activities such as repair, recycling, and resource recovery, yet highlights the potential for further growth as the circular economy continues to expand.

The shift to a circular economy will reshape labour markets worldwide. Some jobs will evolve or disappear, while new 'circular jobs' will emerge. As businesses move away from the traditional take-make-waste model, workers will need new skills, and businesses must adapt to changing demands. But what exactly are circular jobs, and how can we ensure this transition benefits workers?

The circular economy is built on reusing materials and closing resource loops—processes that are often more labour-intensive than linear production. Activities like repairing, remanufacturing, and resource recovery require both manual and technical skills, from logistics and sorting to engineering and design. If managed well, the transition can create opportunities for workers across all skill levels.

This shift presents a chance to rethink not just material use but also labour markets. By focusing on quality jobs, inclusive workplaces, and continuous learning, we can ensure that workers thrive in a circular economy.

**What is a circular job?**

A circular job encompasses any occupation within circular economy sectors. These jobs either contribute directly to producing environmental outputs (such as conservation activities) or to establishing environmental processes, like waste minimisation and resource efficiency within organisations.

Circular jobs are typically classified as direct or indirect. **Direct circular jobs** support core circular economy strategies, including repair, refurbishment, recycling, and waste management. **Indirect circular jobs** facilitate the circular economy through services such as logistics, information-sharing, and public sector initiatives that enable or regulate core circular activities.

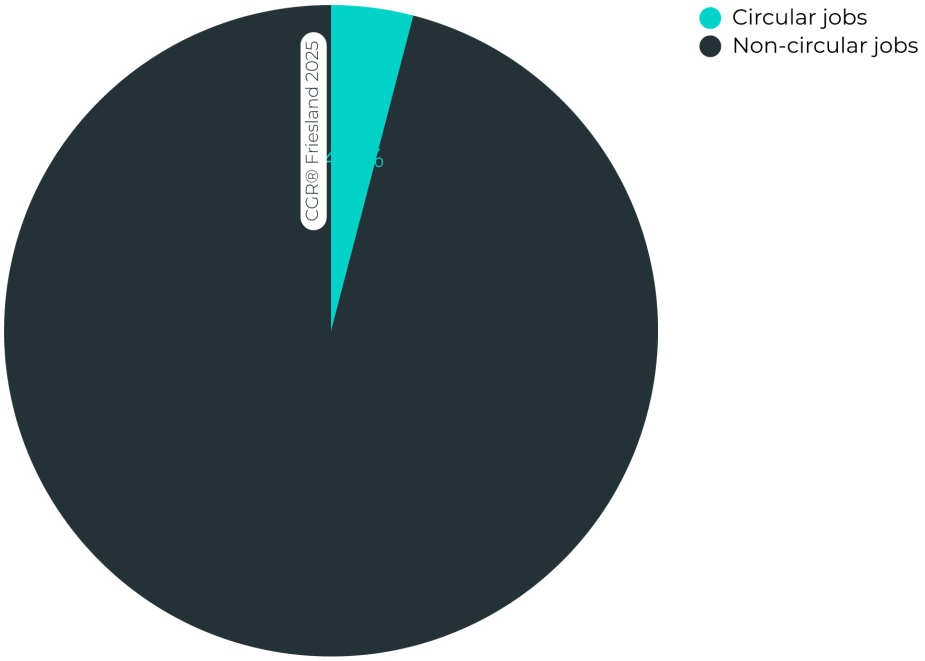
In Friesland around 4% (13,280) of total jobs can be classified as directly circular.[19] In this analysis no further refining to include indirect jobs or sector level classification is possible.[20]

Other studies examining circular jobs in the Netherlands have classified 8.1% of jobs nationally as circular, therefore Friesland is at the national average.[21] This prior study identified the majority of circular jobs in the Netherlands as preserving and extending lifetimes of things in existence, and incorporating digital technologies. While this is not an accurate representation of the circular sectors in Friesland it gives an indicator of the type of sectors typically involved in direct circular activities.[22]

Explore the Blue Delta Monitor to view broad economic dimensions of the Frisian Economy.

[19] Data sourced from PWR Fryslân from the year 2023
[20] Data available outlined only direct jobs which cannot be split into NACE sector categories usually used in the circular jobs calculation.
[21] This study is from 2019, the current figure may be different.
[22] Circle Economy. (2020). Circular Jobs, Understanding Employment in the Circular Economy in the Netherlands. Retrieved from: Circle Economy Website

## Circular vs Non-Circular Jobs




### Improving circular jobs

Friesland is already home to many circular jobs.


#### OPNIEUW!: Building a Circular Future Through People, Purpose, and Reuse

OPNIEUW! is redefining circular entrepreneurship in Friesland through hands-on collaboration and social impact. Founded on the belief that business should serve both people and the planet, it transforms discarded materials into high-quality furniture while providing meaningful work opportunities. Rooted in trust and community, OPNIEUW! has grown from a bold idea into a market leader, proving that circularity is not just about reuse—it's about creating value through inclusion, innovation, and long-term vision.

**Check out this full case study on the Knowledge Hub**

- Ekwadraat: Delivering services for the energy transition

**Shifting the economy further towards more jobs directly contributing to a circular economy requires further actions such as:**

- Investing in skills development and training for both existing workers and new job seekers, with a focus on skills needed in circular activities like repair, remanufacturing, and resource recovery. This will ensure that the workforce is prepared for the increasing demand for these roles.
- Promoting circular job creation in key sectors, such as recycling, waste management, and product refurbishment, by incentivising businesses to adopt circular economy practices and create sustainable job opportunities within these areas.
- Fostering innovation in digital technologies to support circular practices like resource tracking and product lifecycle management, helping to integrate technology into the circular economy and creating new, tech-based job opportunities for the future workforce.

### 3.2.5 Circular procurement

**Due to limited data and fragmented efforts, it is difficult to assess the region's overall progress on circular procurement.**

While it is being measured in some contexts, such as within businesses and some municipalities, a comprehensive picture of Friesland's performance in this area remains unclear.

Governments and businesses play a critical role in this transition through circular procurement, using their purchasing power to drive demand for sustainable products and services. By prioritizing resource-efficient, reusable, and recycled materials in both public and private procurement, they can foster innovation and create market incentives that accelerate the shift toward a circular economy.

In Friesland, the public sector is actively working to speed up the transition to a circular economy through circular purchasing and tendering. With annual public procurement exceeding €1 billion, these resources are strategically directed to foster circular solutions, with the region aiming for maximal circular purchasing by 2025. This ambitious goal ensures that public sector purchases drive sustainable innovation and stimulate the local circular economy.[23]

## Improving circular procurement

See below for different examples of circular procurement in action.

- Circulaire Afschrijven: Unlocking Value in Circular Investments
- Friesland's Leadership in Circular Procurement: The Circ-NSR Project
- Circular Procurement program for all Frisian governments

**While the region is making strides, there are still opportunities to accelerate progress. Friesland can focus further on actions such as the following:**

- Strengthening circular procurement frameworks by expanding the adoption of circular purchasing criteria across all municipalities and government agencies, ensuring that public procurement consistently prioritises products and services that are sustainable, reusable, and made from recycled materials.
- Building capacity and knowledge in the public and private sectors by offering training and resources on circular procurement, enabling procurement professionals to make informed decisions and support local businesses adopting circular practices.

[23] Circ-NSR. (n.d.) Province of Friesland. Retrieved from: Circ-NSR Website

## 3.3 Social

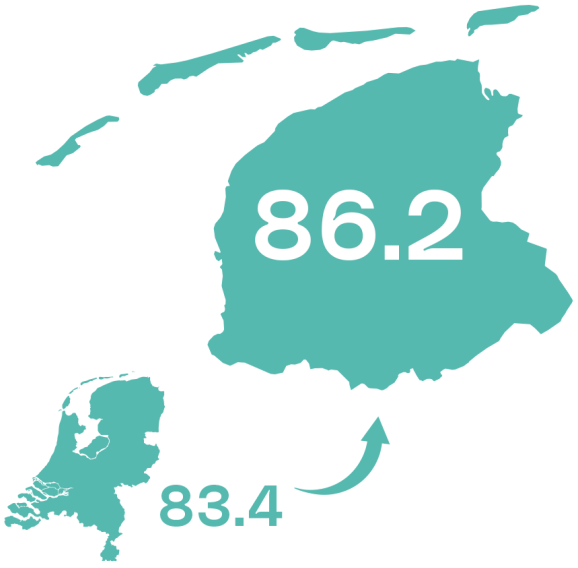
Social indicators are crucial for assessing the human impact of a circular economy, ensuring that the transition not only benefits the environment and economy but also enhances overall well-being, health, and social cohesion.

This section includes an index of **life satisfaction** in the region; two indicators related to **community**—trust in local institutions and extent of volunteering work; and **inclusivity in the workplace**. **Education** and **health** are included as themes to show how they are both drivers and impacts of a circular economy transition. Together, these indicators highlight how circular strategies can contribute to a more equitable, resilient, and thriving society.

### 3.3.1 Life satisfaction

> **Friesland's life satisfaction is higher than both the national and EU averages.**
>
> This highlights the region's strong foundation for a holistic circular economy transition.

Life satisfaction is closely linked to the circular economy, which, in a broad welfare sense, promotes not only environmental sustainability but also improved social and economic well-being, fostering healthier communities and more resilient livelihoods.



Friesland scores 86.2, outperforming the rest of the Netherlands, which scores 83.4, according to Planbureau Fryslân.[24] The Netherlands, in turn, scores 7.6, placing it at the top of the EU, ahead of the EU average of 6.6, according to Eurostat.[25] These scores indicate that Friesland is well-positioned to leverage circular initiatives that drive both environmental improvements and broader social and economic benefits. By surpassing national and EU averages, Friesland shows its capacity to effectively integrate circular economy principles, contributing to healthier communities, resilient livelihoods, and overall life satisfaction.

### Improving life satisfaction

**To ensure that this transition continues to support, rather than hinder, happiness and well-being, Friesland can focus on the following actions:**

- Maintaining and expanding community-centered circular initiatives that contribute to healthier, more resilient communities, such as local food systems, green spaces, and sustainable urban planning, all of which enhance social well-being and life satisfaction.
- Ensuring circular economy policies integrate well-being outcomes, measuring and prioritizing how circular initiatives positively impact quality of life, such as through reduced pollution, more green spaces, and fostering sustainable lifestyles that boost overall happiness.

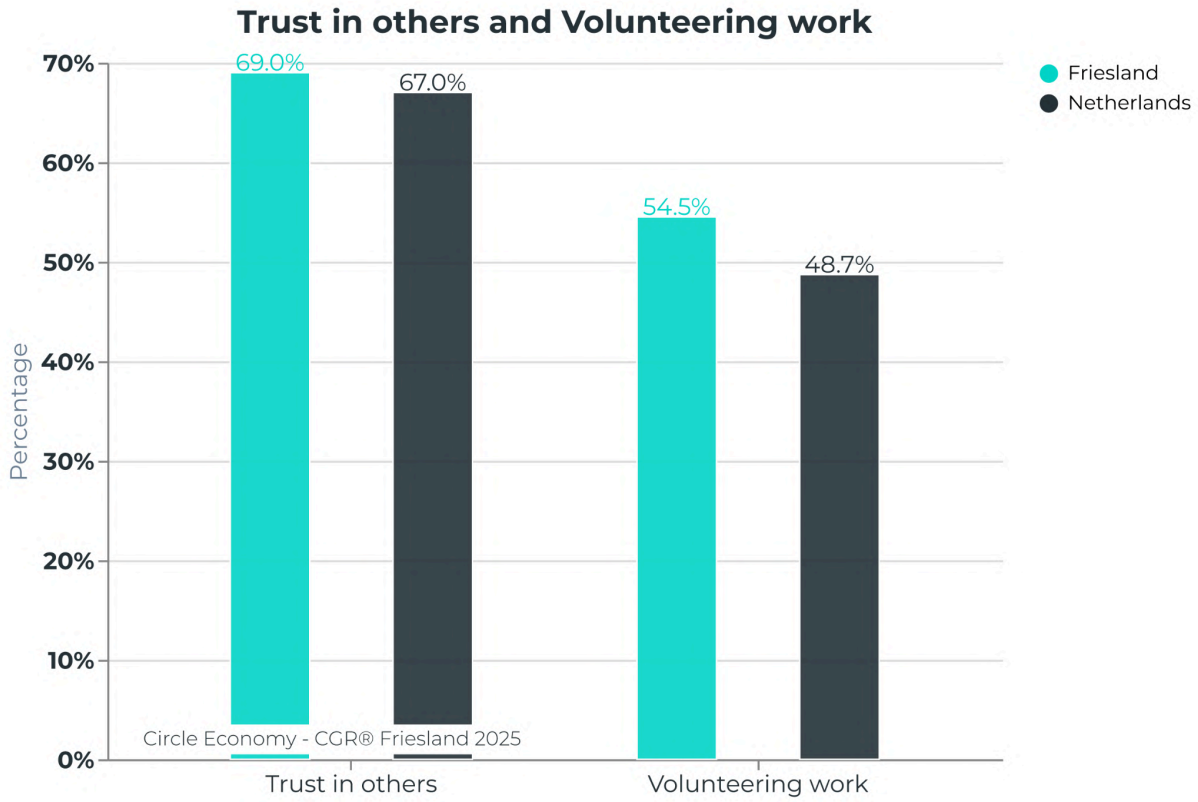
## 3.3.2 Community

**Friesland's community engagement is notably strong, with high levels of trust and volunteering, surpassing the national average.**

This demonstrates that Friesland is well-positioned to leverage its social cohesion and sense of mienskip to drive effective collaboration and inclusivity in the transition to a circular economy.

[24] Blue Delta Monitor. (2024). Gelukkige mens. Retrieved from: Blue Delta Monitor Website
[25] Eurostat. (2024). Life satisfaction by sex, ages, educational attainment and domain. Retrieved from: Eurostat Website

Strong social ties and a sense of belonging are essential for the success of a circular economy. In Friesland, the concept of *mienskip*—a deep-rooted sense of community, mutual support, and collective responsibility—plays a central role in fostering collaboration, shared resources, and local initiatives. This strong community spirit empowers individuals and organizations to work together towards common goals, driving innovative, community-led solutions that align with circular practices. By strengthening these social bonds, *mienskip* not only encourages the adoption of sustainable practices but also promotes inclusivity, ensuring that the transition to a circular economy is both regenerative and equitable for all members of society.




In Friesland, both trust in others and the percentage of people involved in volunteer work are above the Dutch national average.[26] The high rate of volunteering underscores the above concept of *mienskip,* showcasing high levels of community engagement and a collective mindset which are essential for collaboration.  Similarly, high levels of trust reinforce social cohesion, providing a strong foundation for effective cooperation and collective action.

[26] Plan Bureau Fryslân. (2025). Meedoen en vertrouwen van inwoners van Fryslân, Retrieved from: Plan Bureau Fryslân Website

## Improving the community

The following examples showcase initiatives already ongoing in Friesland that harness a strong sense of community.

- Project Nieuw Oud Oost: A Circular Approach to Urban Development
- Kening fan 'e Greide: Community for Biodiversity
- Sociale Voedseltuinen: Circular Communities in Friesland
- Culture for Circularity: Arcadia in Friesland

**To build on the existing strength, the following actions are key:**

- Increase support for community-driven circular initiatives, ensuring more funding, resources, and policy backing for projects like community gardens and resource-sharing hubs.
- Raise awareness of the benefits of circular activities by promoting the positive impact of initiatives like repair cafes and sustainability workshops, encouraging more participation from the wider community.
- Link circular economy initiatives to schools by integrating sustainability and circular practices into the curriculum, encouraging younger generations to get involved in hands-on projects and creating long-term engagement.

### 3.3.3 Inclusive labour market

> **With low income inequality and high levels of community engagement..**
>
> .. Friesland can create diverse employment opportunities and support skills development for those facing barriers to traditional work.

An inclusive labour market is essential for ensuring that the benefits of economic activity are accessible to all, and a circular economy can provide opportunities for an inclusive labour market. By prioritising skills development, local job creation, and diverse employment pathways, circular initiatives can support people who face barriers to traditional employment. By embedding inclusivity within the transition to a circular economy, Friesland can create a labour market that is both resilient and accessible, ensuring that economic and environmental benefits extend to all members of society.


Beyond direct circular jobs, broader labour market indicators highlight Friesland's strong foundation for inclusivity. The region already demonstrates lower income inequality than the Dutch average, with a Gini-coefficient of 0.24 in Friesland, compared to the Dutch Gini-coefficient of 0.28.[27] Additionally, Friesland's high levels of volunteering (as shown in the community

[27] Plan Bureau Fryslân. (2025). De samenstelling en verdeling van inkomens in Fryslân. Retrieved from: Plan Bureau Fryslân Website

indicators above) reflect a deep sense of community and social care which are essential elements for fostering an equitable workforce. In combination this lays the groundwork for an inclusive and equal workforce.and positions Friesland as a region ready to embrace the growing opportunities of a circular economy while ensuring that no one is left behind.

## Improving the inclusive labour market

Below is an example that showcases Friesland's inclusive labour market.

- Circular business requires an inclusive labour market

**To improve inclusivity in Friesland's labour market, the following actions are examples of measures to be taken:**

- Expand targeted skills training across various sectors, ensuring opportunities in high-demand areas like digital technology and green energy, for those facing employment barriers.
- Promote local job creation by offering incentives for businesses to hire from disadvantaged communities.
- Increase access to diverse employment pathways by providing flexible work options, including part-time, remote, and apprenticeships, ensuring opportunities for youth, seniors, and other underrepresented groups.

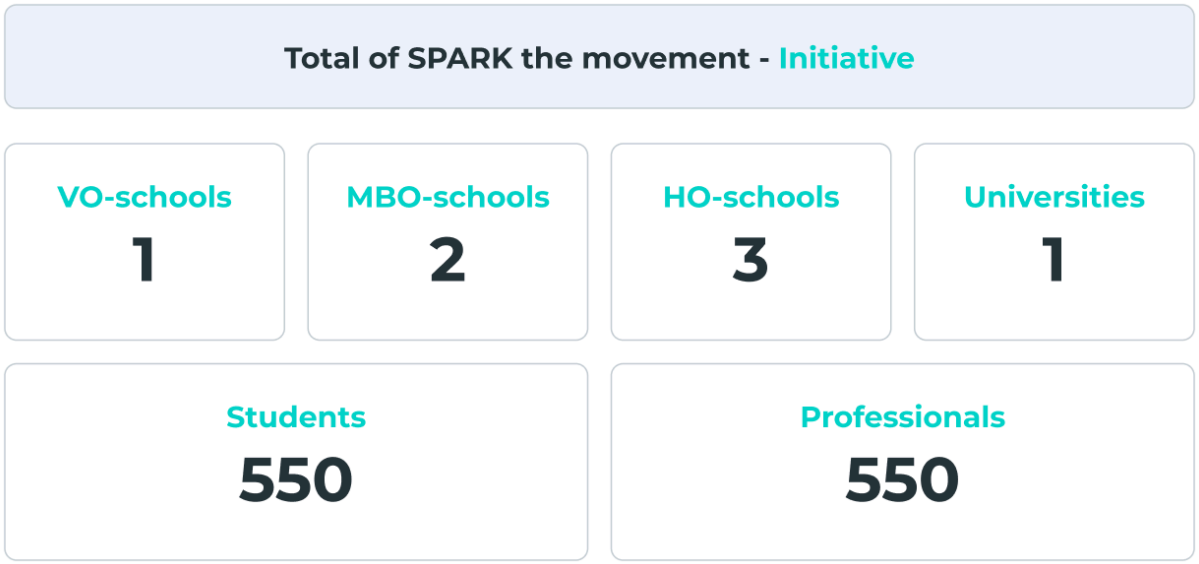
### 3.3.4 Education

> **Friesland has shown a strong commitment to integrating circular economy principles into education through initiatives like SPARK the Movement, which connects schools, businesses, and policymakers.**
>
> However, despite these ongoing efforts, there is a lack of comprehensive data to fully assess the region's progress in this area.

Education is crucial to the success of a circular economy, providing individuals with the knowledge, skills, and awareness needed to promote resource efficiency, waste reduction, and sustainable consumption. By fostering a culture of circularity, education helps embed these principles across communities. Additionally, vocational training and reskilling programs are essential for preparing the workforce for circular professions, such as repair, remanufacturing, and sustainable design, and bridging gaps created by inevitable shifts in employment.


In Friesland, education and learning are deeply integrated into the region's broader circular economy approach. By investing in education that aligns with circular economy goals, Friesland not only serves to strengthen its labour market but also ensures that future generations are equipped with the knowledge to create a more equitable and sustainable society. Moreover, Friesland emphasises collaboration through hands-on learning, reinforcing circular principles in practice.

A prime example of this is '*Education Accord Friesland*' which is an educational agreement between five educational institutions and the province of Friesland and the Municipality of Leeuwarden that works towards structurally integrating circularity, inclusiveness into education, particularly at a community level.[28] As part of this effort, the agreement is developing '*werkprogramma*' lifelong learning plans designed to embed circular economy education into the region's broader curriculum, ensuring a lasting impact.




Although there are limited indicators to measure circular education in Friesland[29] , the region's commitment is evident through the involvement of education institutions in initiatives like SPARK the Movement. This program connects schools, businesses, and policymakers to embed sustainability across all education levels. All MBO, HBO, and WO institutions[30] in Friesland actively participate in SPARK alongside a range of companies, primary education institutions, and other stakeholders. Their collective involvement underscores the region's dedication to promoting circular principles through education.

SPARK embodies a holistic approach to sustainability education, integrating environmental and circular economy principles while also emphasizing social sustainability aspects such as equity and inclusion.

Friesland's leadership in circular economy education is further demonstrated through various initiatives, including SPARK the Movement's 'Los met Lisdodde'[31] , CIRCO Hub Fryslân's efforts to train businesses in circular design and entrepreneurship, and VCF's Circular Business Management Program. These efforts showcase the region's commitment to equipping individuals and businesses with the skills needed for a circular future.

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[28] InnovatiePact Fryslân. (n.d). Onderwijs Akkord Fryslân. Retrieved from: InnovatiePact Website
[29] This is a clear gap that has been identified and something that future initiatives will aim to tackle.
[30] Leer voor Morgen. (n.d.). SPARK the movement. Retrieved from: Spark the Movement Website
[31] Leer voor Morgen. (n.d.) Los met Lisdodde. Retrieved from: Leeren vor Morgen Website

## Improving education

The following examples showcase initiatives already ongoing in Friesland that integrate circular economy principles into education.

- Turn your ideals into action with the best BSc of The Netherlands
- Learning to manage socio-technical change processes in Friesland (MSc)
- Education cooperates for Broad Prosperity and a circular economy
- SPARK the Movement: Educating for a Circular Friesland

**To build on the existing strength, the following actions are key:**

- Expand circular economy education across all school levels, ensuring sustainability and circular principles are embedded in primary, secondary, and higher education curricula, fostering a deeper understanding from an early age.
- Strengthen vocational and reskilling programs tailored to the circular economy by focusing on practical skills in areas like repair, remanufacturing, and sustainable design, preparing the workforce for the growing circular economy sectors.
- Enhance collaboration between schools, businesses, and policymakers by linking education initiatives like SPARK the Movement to local industries, ensuring that students gain real-world insights and skills that align with market needs, while also encouraging more involvement from local businesses.

### 3.3.5 Health

> **Friesland's circular economy initiatives can have a clear positive impact on public health, especially through practices like circular agriculture and water management, which contribute to cleaner environments and healthier food systems.**
>
> However, there is a lack of comprehensive data to fully measure the overall health outcomes directly linked to these initiatives.

The circular economy has a significant positive impact on health in Friesland by addressing environmental factors that directly influence public well-being. For example, circular agriculture plays a key role by reducing the use of harmful chemicals and fertilisers, which in turn improves soil health and water quality. This results in healthier food production, leading to better-quality local food and healthier diets for the population. Furthermore, circular agriculture practices enhance biodiversity, which supports stronger ecosystems that can mitigate the spread of diseases and improve overall public health. In the realm of water management, circular strategies focus on reducing industrial runoff and improving wastewater treatment, which helps maintain high-quality drinking water. By fostering these practices, Friesland's circular economy not only contributes to a cleaner environment but also plays a pivotal role in improving the health and well-being of its communities.

## Improving health

While Friesland has made strides in incorporating circular economy practices, there is limited data to directly measure health outcomes. However, the potential for circular economy practices to enhance public health remains clear. The examples below show how Friesland is working towards this link:

- Caring for Soil is Caring for Life
- The 'walking' forest of Leeuwarden: BOSK 2022
- Cooperating for perspective in Leeuwarden's most colourful district

**To further integrate circular economy principles and improve health, the following actions are good starting points:**

- Promote circular agriculture that reduces the use of harmful chemicals and fertilizers, focusing on regenerative practices to improve soil and water quality. This would lead to healthier, more sustainable food systems, directly benefiting public health by providing cleaner, more nutritious food.
- Enhance circular water management practices, such as improving wastewater treatment and reducing industrial runoff, ensuring high-quality drinking water and promoting healthier ecosystems that contribute to overall well-being.
- Raise awareness about the link between the environment and health, connecting the positive health impacts of circular practices, such as cleaner food systems and water quality, to public health initiatives. Education campaigns could help people understand the health benefits of living in a cleaner, more sustainable environment.

# 4. FRIESLAND IN ACTION – THE REGIONAL TRANSITION PROGRAM

To accelerate the circular transition, Friesland has developed a regional transition program and is focusing on reaching certain circular tipping points and key sectors known as circular clusters— areas that are of significant economic importance and can drive the most substantial impact on the region's transition to a circular economy. These sectors, such as construction, agriculture, water(technology) and tourism, present unique opportunities for reducing resource consumption, minimizing waste, and fostering innovation.

Circular Friesland and its members are leading several programs and projects aimed at these tipping points and clusters. By bringing together businesses, governments, and knowledge institutions, Circular Friesland is driving collaboration and developing circular solutions in these critical areas. This chapter will explore how Friesland is leveraging these opportunities to make the most significant impact on its circular transition.

## 4.1. Tipping points

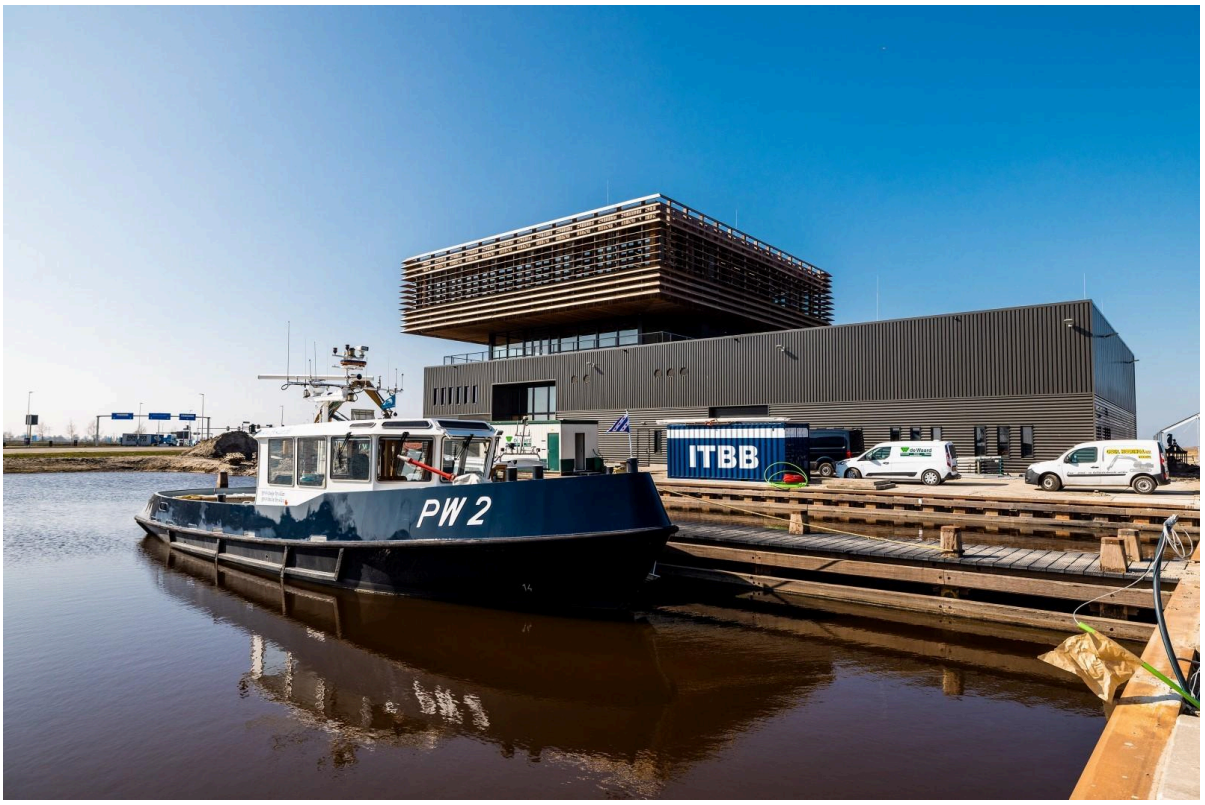
As mentioned in Chapter 2, Friesland has determined certain 'tipping points' for the circular transition—crucial and decisive areas that largely determine the success of the region's circular transition. These tipping points are linked to numerous programs and projects driven by Circulair Friesland and its members. The Frisian tipping points include:

### Circular Procurement

Circular procurement enables the purchasing party to ensure that, at the end of their service life or useful life, products or materials will be re-used effectively in a new cycle. It is crucial that products and materials retain their value. It is important to avoid value destruction due to "downcycling" (e.g. processing A4 paper into toilet paper) wherever possible. As a procurer, you can have immense impact on the transition by using circular criteria for the required solution.

Frisian governments spend approximately €1.5 billion annually on physical goods, making them a key driver in generating demand for circular products. Through circular procurement, they help create future-proof business models and employment opportunities, contributing to a more circular and sustainable Friesland. Recognizing this potential, Frisian governments have set clear ambitions: 25% in 2025, 75% in 2030 and aiming for 100% circular procurement by 2035.

To achieve these goals, Frisian governments have developed an intensive collaboration. Circular Friesland supports them in advancing this transition through initiatives such as the regional programme Circular Commissioning & Procurement by Frisian Governments and the learning community Circular Business Operations. These combined efforts have led, among other outcomes, to the construction of the provincial bridge control centre Swettehûs, which was built using approximately 50% reused materials.




A concrete example of how circular demand is being stimulated is the ‘Stimulating Demand Approach’ within the Friesland Builds Circular programme. This approach aligns with the national goals of the National Approach Biobased Building (NABB), which aims to stimulate the use—and procurement—of biobased building materials. By 2030, at least 30% of all new housing projects in the Netherlands will include a minimum of 30% biobased materials by mass.

**Explore: Circular Procurement program for all Frisian governments**

## Circular Entrepreneurship

The Circular Friesland Association is committed to developing and scaling up circular entrepreneurship across the region. There are approximately 20.000 SME's situated in Friesland. Every organisation in Friesland has the potential to operate circularly—but businesses require help in translating circular economy to what it means for their company, how to take the first steps and scale up. That’s why Circular Friesland, together with partners from across the Northern Netherlands, develops practical knowledge, tools, and networks to help organisations get started and make real progress. SME's are supported through activities such as CIRCO tracks, which help identify circular opportunities in existing processes, or through collaborative initiatives like the ‘Ambition Table for Innovation and Financing’.

Circular Friesland sees circular entrepreneurship as essential for building a resilient and future-proof regional economy. It involves designing business models that close resource loops, reduce waste, and retain value—through strategies like reuse, repair, sharing, product-as-a-service, and reverse logistics. By embracing circular practices, companies not only contribute to solving major global challenges such as resource scarcity and waste, but also benefit from lower costs, new revenue streams, regulatory preparedness, and stronger customer relationships.

**Explore: CIRCO hub Fryslan: Developing circular business and products together**

## Circular education

Education plays a vital role in Friesland's circular transition—by preparing students as future changemakers, retraining today's workforce, and co-developing innovations. To support this, SPARK the Movement was initiated by local entrepreneurs and the Province of Fryslân. It has since evolved into the shared program for sustainability and circularity in Frisian education, spanning all levels from primary school to university.

SPARK strengthens the region's transition by organising multi-level, multi-disciplinary, and multi-stakeholder learning processes, developing transformative learning environments, and stimulating the knowledge, skills, and expertise of educators for the circular transition. By valuing existing initiatives, facilitating collaboration with regional businesses and governments, and embedding sustainable practices within schools, SPARK ensures that education remains a driving force in building a circular future. This unique, region-wide approach has earned international recognition from the United Nations University.

**Explore: SPARK the Movement: Educating for a Circular Friesland**

### Legislation and regulation

Laws and regulations often still favour the linear economy and its business models, hindering the circular transition in many areas. At the same time, the Netherlands has set the ambition to be 50% circular by 2030 and 100% circular by 2050. To ensure that legislation supports rather than obstructs circular progress, Circular Friesland—together with the Province of Fryslân and the Northern Netherlands collaboration network—initiated the Ambition Table on Laws and Regulations.

This initiative operates in two key ways: by providing organisations with insights into existing and emerging circular policies, and by leveraging its network and position to present concrete proposals and recommendations to national and European policymakers.

Thanks to the practical experiences of its members, Circular Friesland holds a unique knowledge position—enabling the association to offer constructive, practice-based input into both Dutch and European policy development.

**Explore: Lobbying for a circular economy: connecting practice and regulations**

## 4.2. Circular clusters

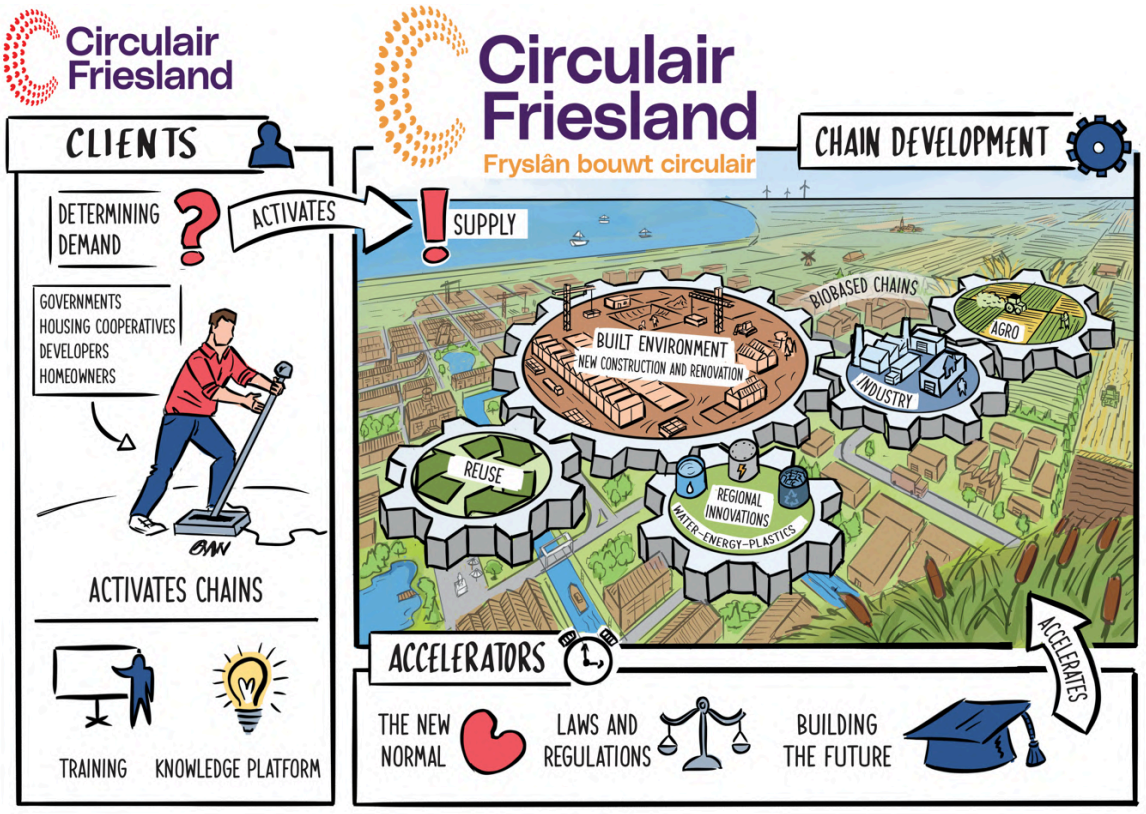
Friesland focuses on these economic sectors because of the regional (economic) importance, the potential circular impact for these sectors and the solutions they offer (inter)nationally. Friesland aims to form clusters of these specific sectors, by adapting the triple-helix approach and building integrated regional programs on these sectors. This provides the sector with clear ambitions, goals and actions. Moreover, such a profile helps in communication, fostering cooperation, and attracting financial options to scale up. These sectors include:

## Construction

Conventional building materials such as cement, steel, and bricks are associated with significant carbon emissions during extraction, production, and transportation—and are rarely reused. In contrast, natural building materials such as wood, hemp, miscanthus, and straw offer the potential to construct homes that store carbon instead of emitting it, while also providing benefits such as high insulation values and a healthy indoor climate.

The Dutch government has recognized the potential of biobased building materials—not only as sustainable and healthy options for construction but also as a new revenue stream for local farmers transitioning away from livestock farming. This recognition led six Dutch ministries to launch the NABB in 2023.

With its building program Friesland Builds Circular, Circular Friesland and its members contribute to the national goals of the NABB by promoting circular construction in the region—stimulating demand through the introduction of circular criteria and developing regional supply chains for biobased building materials. Circular Friesland also acts as the regional chain manager for the NABB and manages a €5 million budget as part of the Future-Proof Living Environment program, funded by the Dutch National Growth Fund.



## Water

Water is central to Friesland's identity and economy. Shaped by lakes, rivers and coastlines, the region has become a frontrunner in water innovation, earning the title of European Capital of Water Technology. At the heart of this leadership is the ecosystem Watercampus. Consisting of several water technology related organisations, with Wetsus, the leading European research centre of expertise for sustainable water technology, based in Leeuwarden.

Friesland's innovation ecosystem includes forward-thinking companies such as Hydraloop, which develop smart water reuse systems to reduce household consumption. These solutions are particularly vital as the Netherlands strives to cut daily drinking water use to 100 litres per person by 2035. Moreover, the urban development area Spoordok will be an iconic construction project with 2.000 houses for which the ambition 'no drop of water will leave the area' is set.

Friesland actively supports this national goal through initiatives like the Ambition Table for Drinkwater-Saving, a regional collaboration that brings together government, knowledge institutions, and businesses.

### WaterCampus: A Global Hub for Circular Water Technology

WaterCampus drives Friesland's circular water innovation through trust-based collaboration. Rooted in the region's deep water heritage, it connects businesses, universities, and governments to turn research into real-world solutions. From nutrient recovery at Spoordok to Hydraloop's decentralized reuse, WaterCampus makes Friesland a global leader in sustainable water technology.

**Check out this full case study on the Knowledge Hub**

**Also explore: Hydraloop: Revolutionising Greywater Recycling in Friesland**

## Plastics

Friesland tackles the plastic waste challenge by promoting circular solutions in close collaboration with the other northern provinces of Groningen and Drenthe. Through initiatives like Greenwise Circular Plastics, the north aims to become a leading hub for circular plastics. These efforts bring together the entire plastics value chain—from production to recycling—while

driving innovation in design for circularity. Friesland is also home to the National Test Centre for Circular Plastics, further strengthening its role in research and development.

Friesland is also home to the Wadden Sea—the largest tidal system in the world and a dynamic wilderness landscape with high ecological and environmental value. To reduce plastic pollution in this unique area, the extensive cooperation program Wad Gaat Om applies a circular approach focused on reuse, natural materials, and systemic change. Together with entrepreneurs, governments, and educational institutions, efforts are being made to establish a new standard for plastic use and prevention.

In European projects like FrontSH1P and X-Lives, Circulair Friesland collaborates with national and international partners to advance sustainable plastic solutions and build a resilient, resource-efficient economy.

**Explore: Systemic change for a plastic-free Wadden area**

## Infrastructure

The infrastructure sector has a major material footprint and plays a key role in the transition to a circular economy. Roads, bridges, and other public works require large quantities of raw materials and have long lifespans, making design and procurement decisions particularly impactful. Circular Friesland and its members try to stimulate the use of circular materials in the infrastructure sector through initiatives such as the 2024 asphalt agreement, a collaborative approach of the three northern provinces of Friesland, Groningen and Drenthe to stimulate the production and usage of more sustainable asphalt variants.

Another notable example of how circular infrastructure can contribute to both ecological and societal goals is the iconic Fish Migration River at the Afsluitdijk. This innovative project reconnects the Wadden Sea and the IJsselmeer, enabling migratory fish to move freely between salt and freshwater—a vital condition for their reproduction and survival. By integrating ecological restoration into large-scale infrastructure, the project demonstrates how circular principles can support biodiversity, strengthen water systems, and create added social and recreational value.

**Explore: Restoring Ecological Balance: The Fish Migration River in Friesland**

## Hospitality and tourism

The tourism and hospitality sector in Friesland is experiencing rapid growth, contributing significantly to the region's economy. However, this growth also brings with it a considerable environmental impact. Despite this, the sector holds a unique position—both as a major consumer of circular products and as a potential source of inspiration for visitors. Given its visibility, the sector plays a crucial role in shaping the region's image and identity.

In response to these challenges, Circular Friesland and its members and regional partners are actively engaged in initiatives designed to promote circularity within the tourism and hospitality sector. Notable projects include "Sleeping in the Future," participation in the European Interreg project 3ST, and the facilitation of CIRCO courses for key regional stakeholders.

Through collaboration with businesses, government bodies, and educational institutions, Friesland is exploring ways to help the sector transition towards circular practices. This includes identifying and addressing barriers such as conflicting interests, regulatory challenges, and financial constraints, while working together to transform these obstacles into opportunities for a more sustainable and future-oriented tourism industry.

**Explore: Systemic change for a plastic-free Wadden area**

### Agrifood

Agrifood has long played a central role in Friesland, shaping both the economy and the relationship between city and countryside. As one of the region's circular clusters, agrifood is part of the broader transition towards a circular economy—focused on closing nutrient loops, improving soil health, and supporting sustainable food systems.

Friesland aims to reduce nutrient leakage in its agri-food system by 2035, in line with the national goal of full circularity by 2050. This transition depends on collaboration between farmers, governments, knowledge institutions, and businesses.

An example of this approach is SNuK (Closing Nutrient Cycles), where partners work together on concrete projects that contribute to a fairer, more resilient agricultural system with a future-proof earning model for farmers. Friesland also contributes toward more futureproof agricultural systems by fostering the cultivation of crops for biobased building materials (in line with the NABB) and through engaging with the national program on regenerative agriculture (ReGeNL).

**Explore: SNUK: Closing Nutrient Loops in Friesland**

## 4.3 Case studies

The region of Friesland has many initiatives that showcase its dedication to a continued transition to a circular economy. They serve as practical examples of the circular economy, led by governments, businesses, knowledge institutes, NGOs, or collaborations between them. These case studies demonstrate successful strategies, innovative approaches, and impactful collaborations that contribute to a more circular and sustainable economy.

A selection of featured cases have already been showcased in this report, providing a glimpse into initiatives and their outcomes.

**To see the full spectrum of circular economy case studies for the region of Friesland, visit the CGR Friesland case study collection on the Knowledge Hub.**

# 5. ACCELERATING THE TRANSITION

To achieve a truly circular economy, Friesland must address the existing circularity gap by focusing on both successes and areas requiring more attention. Key indicators reveal where progress is being made and where challenges remain. At the same time, the region must stay attuned to the impact of ongoing initiatives, understanding the short, medium, and long-term effects these tipping points will have. Finally, it's essential to define the roles of all stakeholders in closing the gap—ensuring that collective efforts drive tangible and lasting change toward a more sustainable future.

## 5.1 The gap today

The Netherlands has set two landmark targets for the circular economy: a 50% reduction in primary raw material use by 2030 and a fully circular economy by 2050. Reaching these goals will depend not just on European and national policy, but on the active leadership of regions—where implementation, innovation, and collaboration truly take shape. Friesland is committed to being a frontrunner in this transition. But the scale of ambition means that many shifts must happen simultaneously—across sectors, systems, and actors. It's not about isolated fixes, but about coordinated, parallel efforts that together drive system-wide change.

Key indicators already highlight the urgency. Reducing Friesland's material footprint is a priority for aligning with long-term circular targets, but carbon emissions, especially scope 3 emissions primarily linked to production and supply chains abroad, are falling behind. Tackling these emissions is essential from a climate perspective. Meanwhile, waste generation remains high (as in many western regions), underscoring the need to keep products in use longer and rethink linear consumption patterns.

Yet several important aspects of the circular economy remain poorly measured or monitored—from freshwater use to circular procurement, the integration of circular economy principles into education and training, and the public health impacts of circular practices. These data gaps are vital for achieving a holistic transition to a circular economy, ensuring that all dimensions are properly addressed. The good news is that identifying these blind spots is a critical step forward. With a clearer understanding of the gaps, Friesland is now in a stronger position to tackle them through better monitoring, focused action, and shared learning.

## 5.2 What lies ahead

Friesland's circular transition is not only defined by long-term ambition but by a clear roadmap of tangible efforts already underway. To close the circularity gap, the region is leveraging high-impact tipping points and sector-specific clusters where change is most feasible and impactful—and most needed. These strategic areas, supported by practical programs and cross-sector collaboration, are expected to drive systemic transformation in the years ahead.

Four key focus areas are already expected to shape Friesland's trajectory toward a more circular and resilient regional economy:

### 1. Circular procurement as a market driver

Friesland's public sector holds unique influence: its annual €1.5 billion in procurement spending represents a major lever for creating circular demand. Through programs like *Circular Commissioning & Procurement by Frisian Governments* and *Circular Business Operations*, public entities are embedding circular criteria into purchasing policies—generating demand for sustainable goods and services and catalyzing market transformation.

By 2035, all public procurement in Friesland is intended to be 100% circular. This will not only accelerate innovation among suppliers but also establish long-term employment opportunities and ensure that circularity becomes a core principle of public value creation.

**Projected impact**:

- Shift from pilot projects to system-wide adoption of circular procurement standards
- Stronger circular supply chains across the region

## 2. Scaling circular entrepreneurship

Circular entrepreneurship is central to building a future-proof economy in Friesland. Through support structures like *CIRCO tracks* and the *Ambition Table for Innovation and Financing*, the region is helping businesses identify circular opportunities, develop regenerative business models, and access relevant financial and knowledge networks.

From product-as-a-service models to reverse logistics, local companies are increasingly finding new ways to reduce waste, close resource loops, and retain value. As these approaches scale, Friesland aims to become a hotspot for circular innovation in Northern Europe.

**Projected impact**:

- Widespread SME adoption of circular business models
- Growth in green jobs
- New circular value chains emerging regionally

photo: Menno de Boer

### 3. Embedding circularity into education

SPARK the Movement has become the backbone of circular education in the region. Spanning all educational levels and involving schools, governments, and businesses, SPARK embeds sustainability into curricula while fostering regional collaboration.

By training today's workforce and preparing future changemakers, the program ensures that circular thinking becomes second nature in Friesland's next generation of professionals.

**Projected impact**:

- Circular principles mainstreamed in education
- Stronger talent pipelines for circular sectors
- Increased innovation through student–business collaboration

## 4. Sectoral focus: circular and biobased construction (value chains)

Friesland is applying a cluster-based approach to accelerate change in sectors where circularity can have outsized impact. One major example is construction, where conventional materials contribute significantly to carbon emissions. Through initiatives like *Friesland Builds Circular*, the region promotes biobased construction, supports local value chains, and manages regional participation in national programs such as the *National Biobased Building Programme (NABB)*.


Other clusters—such as water use, plastics, agriculture, and tourism—are also evolving through focused programs and partnerships. For example, the *National Test Centre for Circular Plastics* and European collaborations like *FrontSH1P* are positioning Friesland as a leader in plastic circularity.

**Projected impact**:

- Biobased materials becoming standard in construction
- Decreased carbon intensity
- Development and adoption of circularity standards across key sectors such as agriculture, water, plastics, and tourism—ensuring consistent practices and measurable progress

Together, these focus areas represent more than isolated projects—they are interconnected strategies forming the foundation of Friesland's circular transition. By acting on these high-leverage points, the region is not only addressing immediate challenges but shaping a long-term vision of economic and environmental resilience.

## 5.3 Closing the gap

While the circularity gap remains substantial, Friesland has laid a strong organisational foundation to close it—yet this foundation is not a finished structure, but rather a solid starting point that must be further developed and expanded. Built on collaborative partnerships, deep local engagement, and a clear regional vision, this structure provides the scaffolding needed to accelerate aligned action and foster innovation.

Crucially, Friesland is not starting from scratch. The region can build upon a growing body of successful circular initiatives and pilot projects that have already proven their value in practice. These examples offer concrete models that can be scaled up or adapted to new sectors and regions. The conditions for doing so are promising: trust, experience, and cooperation are already in place, creating fertile ground for growth.

### Further innovation & development

Friesland aims to continue investing in the research, development, and scaling of high-value circular materials and processes. While general barriers to innovation—such as high upfront costs, limited funding, and slow adoption of new technologies—remain relevant across many regions, Friesland has shown an ability to partly overcome these through its distinctive regional approach. Strong public-private cooperation, a culture of practical experimentation, and targeted educational initiatives have created fertile ground for innovation. This context not only helps to mitigate typical obstacles but also provides a high potential for accelerating future circular development. Building on this momentum, targeted financial incentives, regulatory support, and shared innovation hubs can further unlock and scale up successful solutions.

One key area where there is high potential for change is the significant share of Friesland's material footprint that comes from imported goods and resources. Reducing this dependency offers both environmental and economic opportunities. By focusing on local innovation, businesses in the region can identify where resource efficiency gains can be made through near-shoring—collaborating with neighbouring provinces—or onshoring, by strengthening local industrial capacity. These strategies not only reduce emissions from transport and logistics but also unlock added value by making smarter use of local skills, materials, and by-products. Examples include scaling up biobased material production for construction, as well as expanding nutrient recovery from wastewater to offset reliance on imported fertilisers. Supporting these types of initiatives can help build more self-sufficient value chains, foster circular innovation, and stimulate local economic development.

Additionally, education plays a key role in ensuring that the next generation of professionals is equipped with circular economy skills. However, simply integrating circularity into curricula is not enough. Training programs should aim to be practical, industry-driven, and aligned with real-world challenges, ensuring that graduates can apply circular principles directly in their careers.

## Maintain strong government collaboration

Collaboration with national and European governments is crucial to creating a level playing field—for instance, by enabling true pricing mechanisms. Equally important are clear incentives, accountability, and effective enforcement to drive meaningful progress. Additionally, strengthening networks of frontrunner regions is essential to demonstrate the tangible impact regions can have in the circular transition, while facilitating the exchange of best practices, knowledge, and innovative solutions.

Local governments are encouraged to lead by example through stronger circular procurement, ensuring that public spending supports circular materials and services—particularly those that promote higher R-strategies. To create a more robust circular economy, minimum standards should be set for circular procurement, particularly in key sectors or materials where Friesland's businesses have leverage, such as biobased materials, locally sourced food, and feed.

## Attract investment & internationalisation

Attracting private investment is crucial to scaling Friesland's circular economy. This requires targeted incentives, risk-sharing mechanisms, and clear regulatory support to make circular business models financially viable. While these barriers to innovation are common in many regions, Friesland's particular challenge lies in the small scale of its businesses. With a large proportion of SMEs—many of which are relatively small in size—Friesland faces a lack of large companies that typically serve as pull factors for innovation.

Scaling circular value chains across Friesland's more than 20,000 SMEs[32] requires fostering collaboration and building stronger networks within the region. By encouraging partnerships among SMEs, larger firms (where possible), and research institutions, Friesland can overcome these challenges and drive widespread adoption of circular practices. Supporting these businesses with dedicated resources and tailored solutions will be essential to achieving significant growth and impact in the circular economy.

[32] Eikelenboom, M. (2022). *Achieving sustainability together: Stakeholder collaboration for corporate sustainability and the circular economy*. University of Groningen. doi.org/10.33612/diss.196174869

## Strengthen circular monitoring

Friesland is dedicated to going beyond simply monitoring circular economy indicators—it aims to actively bridge data gaps, improve measurement methods, and translate insights into action. Without accurate and comprehensive data, policies and investments risk being misaligned with real needs. The set of indicators presented in this report—covering material use, environmental impact, economic performance, and wellbeing—provides a strong foundation for monitoring progress in the coming decades.

However, important data gaps remain, particularly in the areas of **circular procurement, education and health impacts** as well as overarching indicators reflecting the progress of the transition in the **water** sector. Closing these gaps is critical to ensure that indicators reflect real-world dynamics and support more effective decision-making. This integrated approach makes it possible to assess trade-offs over time; for example, increases in material consumption may not necessarily lead to gains in wellbeing or economic performance.

To make monitoring truly effective, it must be more than a top-down reporting exercise. Indicators need to be actively owned across different levels of decision-making and embedded into real-world processes—from regional strategies to project design and procurement. This requires translating high-level indicators into specific, actionable goals that guide daily choices in both the public and private sectors.

Looking ahead, it is essential to define new, clear goals for 2030 and beyond. These forward-looking targets will provide direction and ambition, while ensuring that monitoring systems remain relevant and aligned with long-term transitions. Importantly, circularity goals—such as doubling the circularity rate—should be seen as outcomes of more fundamental targets: increasing the use of secondary materials and reducing overall material consumption. Setting clear priorities in this way strengthens accountability, sharpens focus, and empowers stakeholders to align efforts over time.

**Other regions are invited to collaborate with Friesland to accelerate circular economy efforts through data-driven strategies, innovative partnerships, robust policy frameworks, and international investment opportunities—let's build a sustainable future together.**

# ACKNOWLEDGEMENTS

Circle Economy would like to thank the funders, authors and contributors for their contribution to the preparation of this edition of this report. Authors and contributors have contributed to the report in their individual capacities. Their affiliations are only mentioned for identification purposes.

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Nations and regions are leading change agents for the circular transition. As hotspots of consumption and innovation, they ar ekey creators of sustainable solutions. With the power to create an enabling environment and incentives, countries are critical in closing local and global Circularity Gaps.

The Circularity Gap Report provides nations with a benchmark from which to track progress, and highlights impactful avenues for change.

**Get in touch to develop a tailored scan for your country or region.**

Year of publication: 2025
Version 1.1 (May 2025)

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