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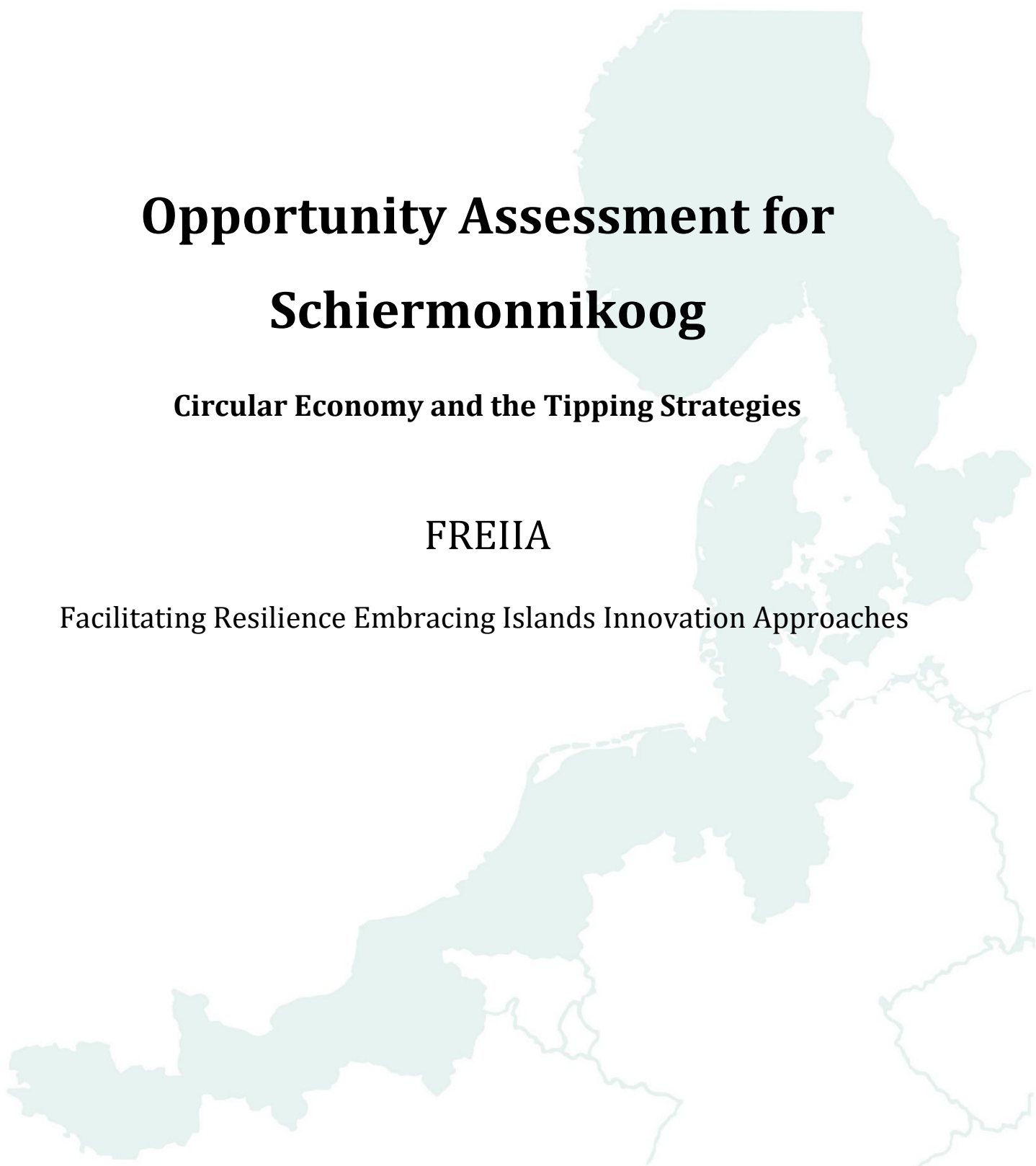
FREIIA

Opportunity Assessment for Schiermonnikoog

Circular Economy and the Tipping Strategies

FREIIA

Facilitating Resilience Embracing Islands Innovation Approaches



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The background of the Opportunity Assessment

The opportunity assessments explore and assess the potential and opportunities for circular innovation on the islands. The reports have been created in an iterative fashion, with AAU and island partners collaborating on creating a report based on the Tipping method for idea generation, inspiration for other islands and as evaluation of each island's current and future status of circular innovation on each island. The island's self-evaluation is conducted through a subjective scoring system, which is argued for by each island and AAU. Besides the intention to generate ideas and provide a preliminary circular innovation evaluation, these reports are also intended to be used by each island's transition teams in the Rudder design-thinking approach. These reports, and these overviews, which the reports may give an initial idea of, can be expanded through continuous work and updates to provide an ever-evolving and adapting map of opportunities for circular innovation.

Innovation is a core theme of the FREIIA project and is the focus of this report, together with the three following subjects: Circular economy, Resilience, and the Sustainable Development Goals. Within these three subjects, circular economy has been chosen to be the main subject of this opportunity assessment. Circular economy is recognised in the FREIIA project as a fundamental way to increase innovation on an island. There are multiple perspectives on circular economy. In this report, it is defined by the 9R Framework. The picture below shows the 9Rs definition of Circular Economy.



The 9Rs describe a hierarchy of circular strategies, with the highest-placed strategies indicating a higher degree of circularity than the lowest. Circularity here is understood as avoiding the extraction

of new resources and instead utilising resources already within the system and using as little energy as possible to create new products or services. This definition does not address issues such as hazardous waste and instead focuses on solid waste in circular economy. The definition does not highlight the variations in technological and biological areas within circular economy either. The following are examples of how an island community can use the 9Rs.

Refuse: The community starts by refusing single-use plastics, such as plastic bags and straws, to reduce the amount of plastic waste generated in the first place.

Rethink: The community has started to rethink how to avoid single-use plastics, e.g. using other materials for single-use plastic products such as paper bags.

Reduce: The community works to reduce their overall waste production by educating residents on responsible consumption practices and encouraging them to buy products with minimal packaging.

Reuse: The community sets up a system for reusing items like hard plastic cups and containers, either through local bottle return programs or by teaching the community how the products can be reused.

Repair: Instead of throwing away broken items, the community encourages residents to repair them whenever possible to extend their lifespan.

Refurbish: The community sets up a workshop where residents can learn how to refurbish and restore items like furniture, preventing them from ending up in landfills.

Remanufacture: Businesses on the island are encouraged to use materials from their discarded products to produce new products with the same function.

Repurpose: Materials from discarded products are used by businesses to create new products with different functions.

Recycle: The community establishes a comprehensive recycling program, collecting and sorting materials like plastics, paper, and glass to be processed and turned into new products.

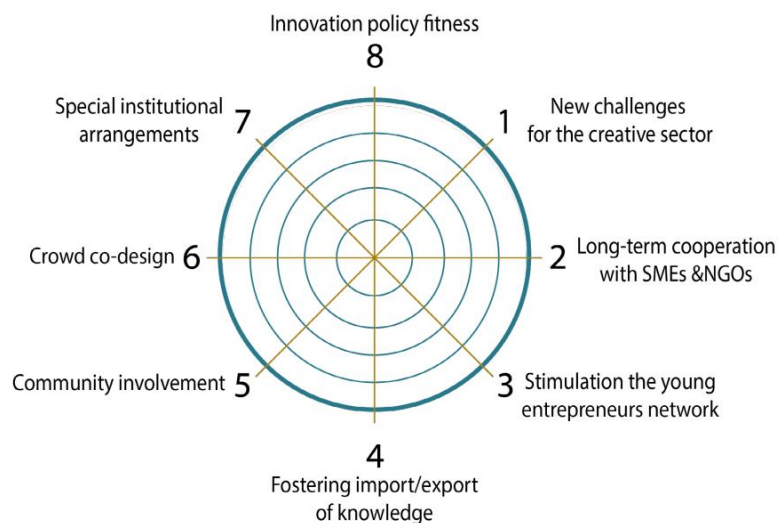
Recover: The community explores options for recovering energy from waste, such as using biomass or waste-to-energy technologies to generate electricity.

By implementing the 9Rs, the island community can significantly reduce its waste output, protect its natural environment, and create a more sustainable future for generations to come. The 9Rs are all

about finding innovative solutions to use fewer materials and processes and thereby keep the materials and products in circulation. As it is a hierarchy, the highest Rs are the most circular way to handle materials and products, yet society can not use only high R strategies. Therefore, the hierarchy functions as a guideline and inspiration to create more circularity, but the actors need to think of how to keep the value of their product or service.

To assess opportunities for circular innovation, multiple other aspects may influence what may locally be a valid opportunity not included in the 9R framework. Economic and social conditions may heavily influence what constitutes a strategy as much as possible. The 9R strategies may involve different actor constellations, which the 9R framework leaves open for interpretation. The strategies and the involved actors influence are not only conditioned by local conditions but also by regional, national and international conditions like legislation. The 9R framework does not address these aspects directly and therefore highlights the need for a governance mechanism which may.

The report is structured through the eight Tipping strategies for improving innovation governance and policy shown in the figure below. Each strategy involves a group of actors mapped for each island. The report explores how these actors enhance circular economy.



A questionnaire made by Aalborg University (AAU) was distributed to the Schiermonnikoog partner (Schiermonnikoog Municipality) and was used by the partner to write a draft of the opportunity assessment report. AAU, with its expertise in circular economy, revised that draft. The questions concerned general characteristics of the island, how the island works with the SDGs and resilience, as well as more comprehensive questions related to the eight strategies. For each of the eight strategies, questions regarding the presence and involvement of relevant actor groups and how these groups work with circular economy were included. The picture below shows a clipping from the questionnaire.

Strategy 2: SMEs & NGOs

Areas of interest	Describe the current practice
Actor present - Which actors within the SMEs and NGOs exist on your island - Which actors on mainland have relevance to SMEs and NGOs for your island? E.g., small companies with new ideas, companies locally producing goods and services, NGOs supporting developing new products and services, companies and NGOs finding solutions for local problems etc.	Working with Circular economy - Does any of the abovementioned actors within the creative sector include any of the circular economy principles? - If any, which and how? - Which principles of circular economy could be relevant to work further on within the creative sector and why? - How does the local government support CE in the creative sector? ● Insert bullets
Involvement of the actor - How are the abovementioned actors involved in the strategy of SMEs and NGOs?	
	Where do you envision you are now with the creative sector and circular economy (score from 1 to 10)? Where do you envision you are in 5 years from now with the creative sector and circular economy (score from 1 to 10)?

At the end of the opportunity assessment report, a figure visualises the scores for how far the partners have estimated Schiermonnikoog to be with each strategy and circular economy.

The scores given by the partners reflect their assessment of how well actors within the strategy are implementing circular economy principles and the potential for further integration of these principles. The scores are based on the 9Rs, with scores indicating the actors' current use of the 9Rs and their ability to advance further up the 9Rs ladder. The scores are, therefore, subjective assessments from the partners. After the conclusion of the report, a list of four projects is shown. These are the projects that have been assessed by the partners to have the most potential to develop further.

This opportunity assessment report shows the level of innovation potential, especially concerning circular economy and evaluates how actor groups associated with the tipping strategies can advance in this area.

Introduction to Schiermonnikoog

To understand the status of Schiermonnikoog's circular initiatives and its future ambitions, a brief description of the island is given in this introduction. Here, aspects of demography, geography, transport, business sector, local government, and waste management are mentioned to illustrate part of the context in which Schiermonnikoog's circular initiatives are situated.

Schiermonnikoog is one of the five inhabited Dutch Wadden islands and is located on the northeastern part of the Dutch coastline. It is the most northern inhabited part of the Netherlands. The island is about 200 km² and is home to about a thousand inhabitants. Schiermonnikoog is the smallest Dutch municipality in terms of citizens, and even though it has its own municipality, there is an additional government structure of the Dutch Wadden-islands collaboration called 'Samenwerkingsverband de Waddeneilanden' (a partnership of the Wadden-islands). In this governance structure, the islands work together on different policy areas such as housing, sustainability, economy, tourism and nature.

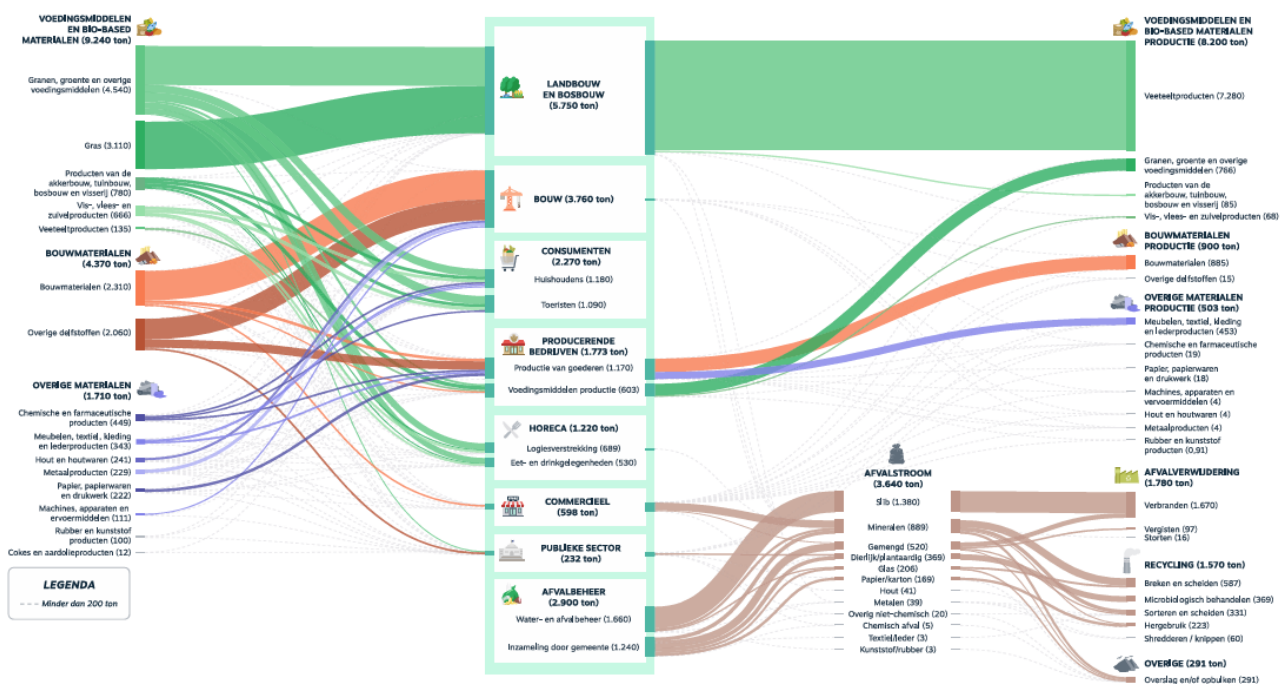
The company Wagenborg Passagiersdiensten provides a ferry from Lauwersoog to Schiermonnikoog multiple times daily. The crossing takes about 45 minutes. Besides that, Wagenborg also provides a smaller, faster ferry that crosses the Waddenzee in about 20 minutes.

Schiermonnikoog is a tourist destination and is visited by 300.000 people every year. The main attraction is the island's rich nature, as a large part of the island is a national park. As part of the Waddeneilanden, the island is also a World Heritage site. The nature on the island is therefore well protected, which makes it a great attraction for people who love to hike, bike, and swim. The beach, dunes, meadows and salt marshes make Schiermonnikoog a diverse island despite its size, attracting a lot of wildlife.

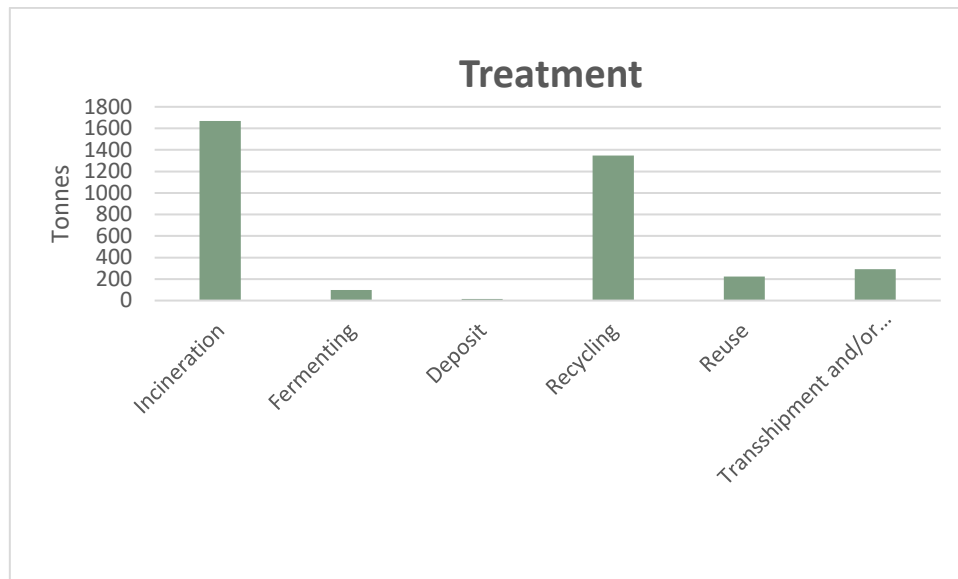
Schiermonnikoog offers educational opportunities, consisting of a primary school and a public high school. In terms of higher education, there is the Schier Academy, an MBO (secondary vocational education) school specialising in gastronomy and cooking. At Schier Academy, students can train to become a host or a chef, professions that align with the island's focus on tourism. These educations are well-suited for the island's vibrant hospitality sector, which includes numerous hotels and restaurants. Additionally, the University of Groningen has a department on the island called 'De Herdershut' (the shepherds' hut) where students in biology and ecology can complete parts of their bachelor's or master's studies. Beyond that, this facility has provided room for long-term research projects that have yielded hundreds of scientific publications and around sixty PhD theses.

The waste on the island is collected in underground bins and at the so called ‘Milieustraat’ (environment-street) to which larger waste items can be brought by consumers and business owners. This waste is handled by Omrin, an organisation owned by Frisian local governments, that sorts the collected waste and recycles it if possible. The waste plant also generates green gas, in which the local governments take part.

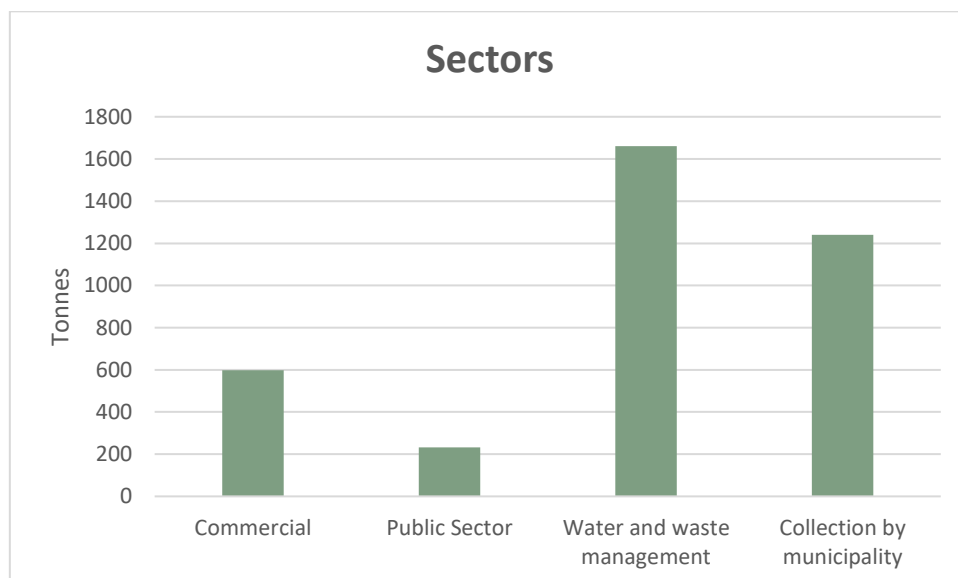
In 2020, the average waste production per capita in the Netherlands was 533 kg. The amount of average waste production in Schiermonnikoog is unknown. However, the municipality has researched the waste streams on Schiermonnikoog. See the figure below for the details.



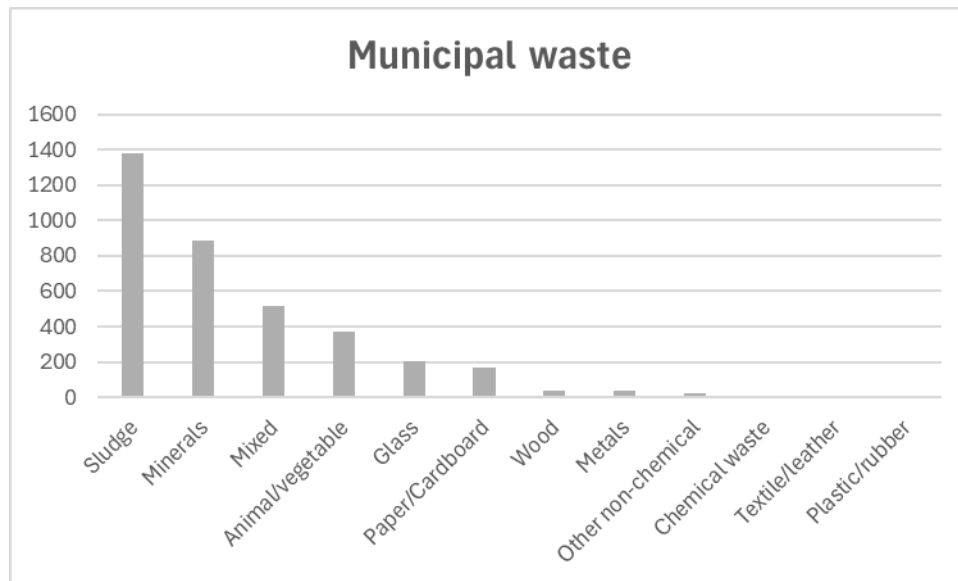
Schiermonnikoog's household waste is mainly incinerated and recycled.



Water and waste management, as well as waste collected by the municipality, account for most of the waste generated.



The waste handled by Omrin is divided into different fractions, as shown in the figure below.



SDGs and Resilience on Schiermonnikoog

On Schiermonnikoog, almost all Sustainable Development Goals (SDGs) are considered relevant, with many integrated into the daily operations of the municipality. For example, the Department of Social focuses on reducing poverty (SDG 1), improving healthcare (SDG 3), supporting primary education (SDG 4) and reducing inequalities on the island (SDG 10). This emphasis is both due to regulatory obligations and the island's ambitions. The island links its budget and policy proposals to the Global Goals. This makes it easier to think about the broader effects of the island community's proposals. The island's primary focus consists of the following:



The island strives to work more integrally with the SDGs, aiming to make them a central element in both policy making and local governance. In accordance with that, Schiermonnikoog organises a yearly event on SDG Action Day. Every organisation and company are invited to participate and consider their contributions to the island's SDGs.

The island expects a rising sea level, more winter rain and less summer water. Reacting to those climate change challenges, numerous research projects have formed that have worked or are actively working on resilience.

1. Water safety with dune- and dike reinforcement will protect the island against a rising sea level. This project also aims to combat salinisation.
2. Water safety strategy, in case of an emergency, how will the people on the island be protected or evacuated? Is there a possibility to reach the island by boat during extreme weather? Where should houses be built on the island?
3. Enough fresh water supply, the consumption of freshwater increases, especially in the summer. Enough water must be ensured, mostly by retaining water in the winter and saving water during the summer.

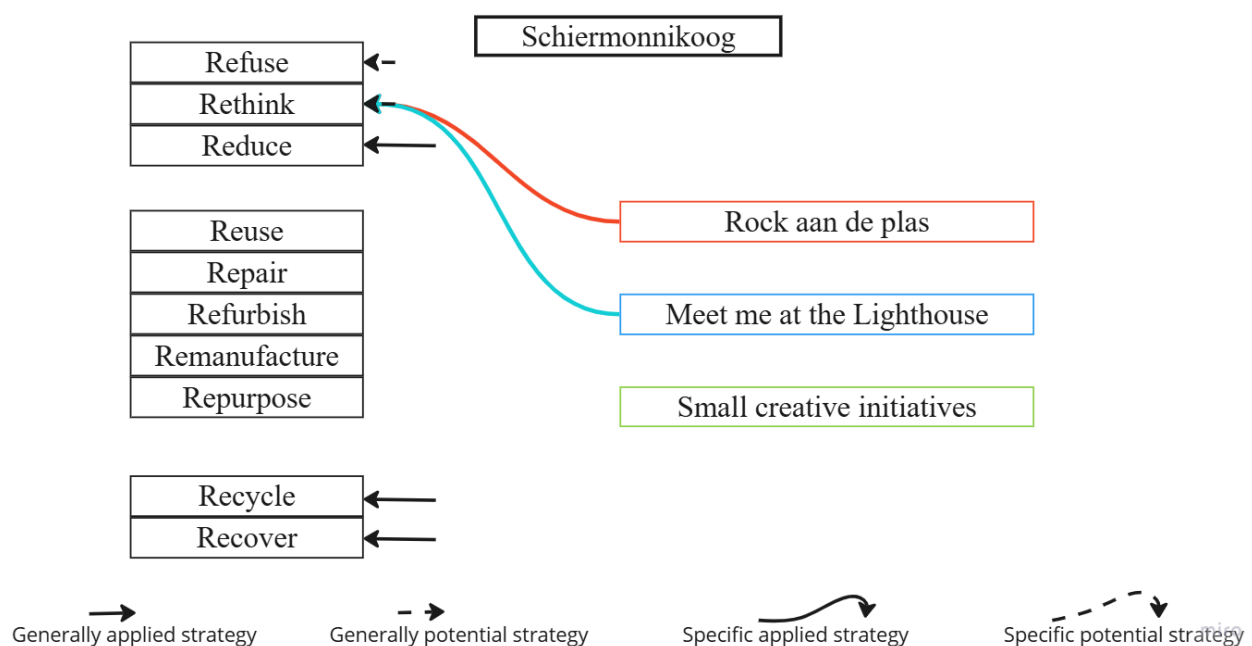
For these projects, the municipality of Schiermonnikoog works on integrated action plans with the local, provincial, and national governments, water authorities, and the local nature manager, so all relevant authorities and governing bodies are involved.

Circular Economy within the Eight Tipping Strategies

The following section presents the different groups of actors and their current work with circular economy in relation to each tipping strategy. The actors included in the report are either working with circular economy or have the potential to work with it. The sections are structured with a visualisation, a description and a summary with the scores of the actors' current work or potential work with circular economy.

Strategy 1: The Creative Sector

In the creative sector, several small initiatives are present on the island. The figure below shows the actors working with circular economy or having the potential to work with it, and which circular strategy they relate to.



The island offers yearly cultural festivals like the International Music Festival and the 'Meet Me at the Lighthouse' literature festival. There are national and international actors involved in these festivals. During the festival Meet Me at the Lighthouse in November, visitors can experience the combination of literature and the beauty of nature across the island. The programme offers multiple hikes accompanied by artists or visits to landmarks on the island where they can listen to a story. In this way, the island has found a creative way to combine its culture with the creativity and talent of artists from across the country.

The festivals Meet Me at the Lighthouse and Rock aan de Plas reduce waste by offering biobased drinking cups, which are recycled after the events. Also, part of the festival's revenue is donated to the National Park to compensate for the space in nature used by the festivities.

The island's graphic designers and communication specialists are closely tied to the local community and the municipality. They often support ongoing campaigns with their expertise to communicate these efforts to both residents and visitors. In this way, they offer their services to complement the initiatives that revolve around innovation on Schiermonnikoog.

A great example of island creativity comes from artists who use items they find on the beach to create jewellery or recycled products. One artist makes jewellery from clamshells, glass and other waste washing on shore, while another uses driftwood to create small icons and boats. Additionally, the island hosts small creative initiatives such as a local pottery shop, a small wool processor, and various studios. The island is also home to a variety of painters, musicians, comedians and other artists. These creative actors on the island vary in size. While the festivals are held annually, other creatives work year-round to show their skill and crafts to the public. Looking at the festivals and artists, the circular strategies rethink and recover are clearly being utilised.

In the future, combining the wide reach of the festivals with the smaller creative initiatives would be an excellent opportunity to introduce these circular ideas to a broader audience. While there are already a few examples of an island-based circular mentality, they are often too small to find a larger audience. By leveraging the popularity of the festivals, the island can promote circular strategies, like rethinking and refusing. With the large number of tourists coming to the island, these initiatives are an excellent entry point for the public to come into contact with this circular approach. Festivals and other creative and cultural initiatives are powerful platforms to educate the public on how they can reduce their footprint.

On Schiermonnikoog, scores for the creative sector and their work with circular economy have been given concerning the abovementioned actors.

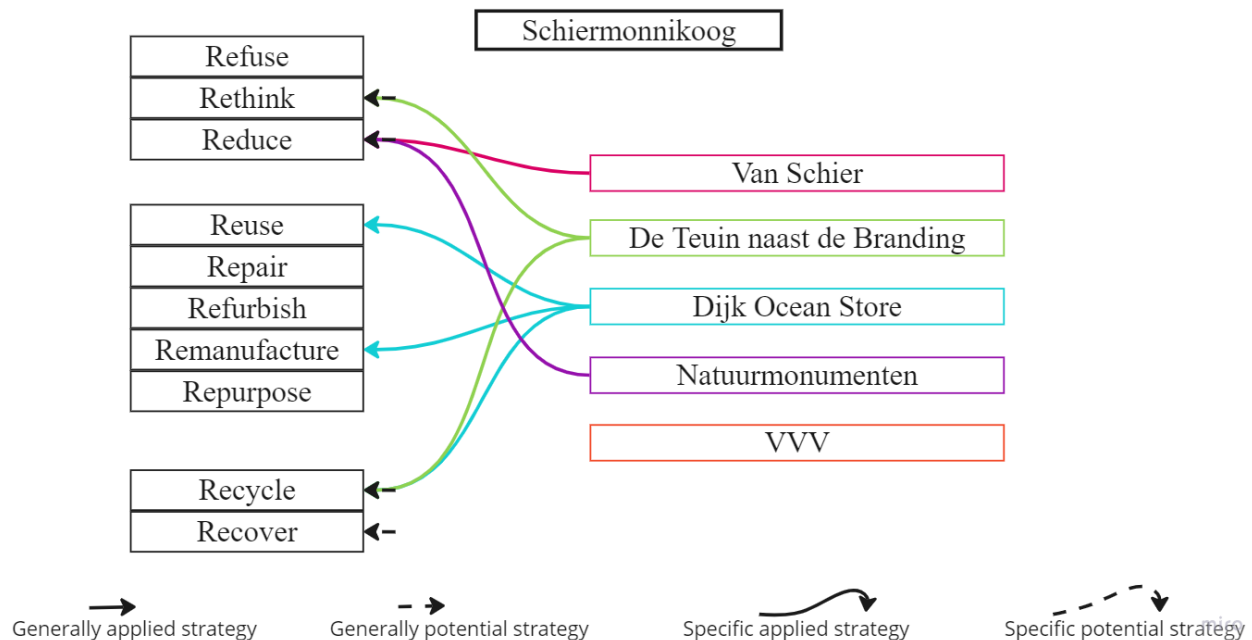
- The envisioned score for the current status is **6 out of 10**
- The envisioned score for the status five years from now is **8 out of 10**

Future opportunities for circular economy integration within the Creative Sector include:

- The Festivals of Meet Me at the Lighthouse and Rock aan de Plas could utilise their popularity to inform their attendees of the circular strategies of **rethink** and **reduce**
- The small “creative” initiatives could also reflect and pursue the strategies of **rethink** and **reduce** in their endeavours

Strategy 2: SMEs and NGOs

Schiermonnikoog hosts multiple small and medium-sized enterprises and non-governmental organisations. The figure below shows the actors working with circular economy or having the potential to work with it, and which circular strategy they relate to.



The island features its own cheese brand, Van Schier, which produces various cheeses from locally sourced dairy. Van Schier has made it possible to reduce the number of cattle on the island by a third. By directly sourcing the dairy on the island from the farmers, the financial possibility for this has been realised and thereby reduces packaging, transport, etc. In this way, the island is able to produce its own cheese and, by lowering the environmental impact of the farming industry, enhancing the position of free nature on the island. Dijk Ocean Store offers a great selection of clothing, accessories and souvenirs and is engaged in making its products as circular as possible by offering brands that make clothing from recycled materials, remanufactured and reused items. This store is situated in the middle of the village on the island and aims to inspire its visitors to think about their purchases' impact, motivating them to choose the most eco-friendly option. The store not only offers items from the island but also aims to offer other brands to reach the visitors of the island.

A great example of the mentality regarding circular economy on Schiermonnikoog is a gardening initiative called De Tuin naast de Branding. In this large flower and vegetable garden & orchard, everybody can pick their own bouquet and harvest fruit or vegetables. It offers the island locally grown produce and visitors a means to connect with nature. Customers can pay as much as they want for the flowers, fruit and vegetables they harvest, with a price suggestion to help. An interesting detail is that

the oyster mushrooms are grown on used coffee grounds from restaurants and cafes on the island. In the wintertime, the garden uses green waste generated by the municipality and the National Park for compost and coverage. Thereby, the garden rethinks the way to do farming and reuses waste as compost, etc.

The first NGO that must be mentioned is Natuurmonumenten. It is a country-wide initiative that strives to protect Dutch nature while offering many ways to enjoy it. Natuurmonumenten is well represented on Schiermonnikoog as the island is home to a large National Park. They provide this park with rangers and offer multiple activities for visitors through their information centre 'Het Baken' in the village. Natuurmonumenten provides a great variety of information and activities to the public while also being present at important government negotiations regarding the future of the islands' natural treasures. Their strategy is to invite people into the natural beauties of the island to get the public to appreciate it and develop a care for it. Regarding circularity, Natuurmonumenten encourage reducing their waste and protecting nature. Another NGO worth mentioning is VVV (Vereniging voor vreemdelingenverkeer), which is, in simple terms, the island's tourism board. Here, visitors can find all kinds of information regarding the island and their visit and book their accommodation. VVV is also housed in 'Het Baken', just like Natuurmonumenten; the two organisations work closely together to make Schiermonnikoog a pleasant place to stay.

In the future, there is significant potential for advancing circular strategies among local actors. For instance, collaboration could be fostered to combine waste streams, turning them into materials for new products through recycling or converting waste into biogas or renewable energy. It is worth noting that biowaste is already being used as compost, and with a shift to biogas production, additional sources of compost would be needed if the supply could not fulfil both needs. Looking at these actors' reach, it is possible to teach the customers and visitors about a more circular approach to their personal consumption habits and thereby rethink and reduce the ways of handling resources.

On Schiermonnikoog, scores for the SMEs and NGOs have been assessed in relation to the roles and actions of the aforementioned actors.

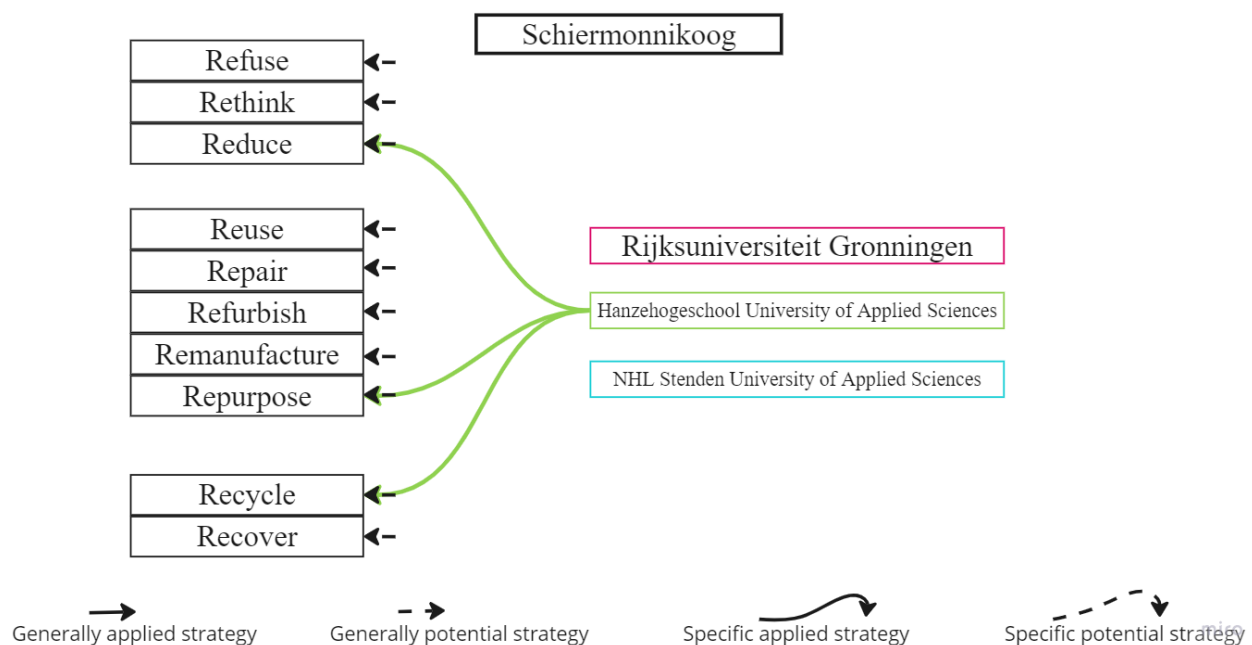
- The envisioned score for the current status is **8 out of 10**
- The envisioned score for the status five years from now is **9 out of 10**

Future opportunities for circular economy integration within SMEs and NGOs include:

- For all the abovementioned actors, **recycling** and **recovery** could be relevant as e.g. to pursue the potential of biogas production.
- **Rethinking** and **reducing** could be promoted by the same actors when engaging with customers and visitors of the island

Strategy 3: Young Entrepreneurs

Different local and mainland actors are related to the strategy of Young Entrepreneurs on Schiermonnikoog. The figure below shows the actors working with circular economy or having the potential to work with it, and which circular strategy they relate to.



With Schiermonnikoog being an island which constantly tries to improve its position on circular economy, many regional universities are getting involved with the island. Rijksuniversiteit Groningen, Hanzehogeschool University of Applied Sciences from Groningen and NHL Stenden University of Applied Sciences from Leeuwarden are all connected to the island. With the Rijksuniversiteit having its own research station for biology and ecology on the island, there is a constant stream of young students visiting and researching the island. Also, the FREIIA project has offered students from the master's degree Design Driven Innovation in Leeuwarden the opportunity to conduct a research project on the island at the beginning of 2024. Yet there is a missing link between the circular strategies and the projects on the island.

Currently, students from the Hanzehogeschool are researching the opportunities for circular production of souvenirs on the island. The EU Interreg North Sea program and Natuurmonumenten have facilitated them in this task. The students have developed different souvenirs that are e.g. made from recycled and biobased materials, which reduces imported plastic souvenirs. One example is a keychain repurposed from residual waste streams such as pruning waste, dredging sludge, jute plastic and worn bicycle tyres from rental stores on the island. This project is ongoing, and the progress will be passed on to a new group of students. This exemplifies how local topics regarding circular economy are often tackled by cooperation with governmental support, local NGOs and regional education to find a solution together. This showcases the strong inter-institutional connections working towards a future-proof Schiermonnikoog.

For the citizens of Schiermonnikoog, it can be hard to find a suitable job on the island after graduating on the mainland. Often, they are faced with the choice of either pursuing a career on the mainland or returning to the island without being able to practise their profession. Most citizens find a job in the large service industry on the island. The municipality is pursuing efforts to offer more jobs on the island that offer higher educated citizens a chance to practise their professions, this is a plan that still needs to be developed. Therefore, the actors from this strategy could include more training in developing their business ideas related to all the 9Rs.

Opportunities for starting an initiative and living on the island are still limited. There is a housing shortage on the island that is very difficult to combat under the current legislation. On top of that, workplaces are scarce. There is a need for the local government to help overcome these challenges, as it is essential for the prospects of young entrepreneurs on the island to have places to live and work. The local government and regional funding should come together to create a better environment for young entrepreneurs to settle themselves and their initiatives on the island. This would make a circular and sustainable housing approach possible.

On Schiermonnikoog, scores for the Young Entrepreneurs have been assessed in relation to the roles and actions of the aforementioned actors.

- The envisioned score for the current status is **5 out of 10**
- The envisioned score for the status five years from now is **7 out of 10**

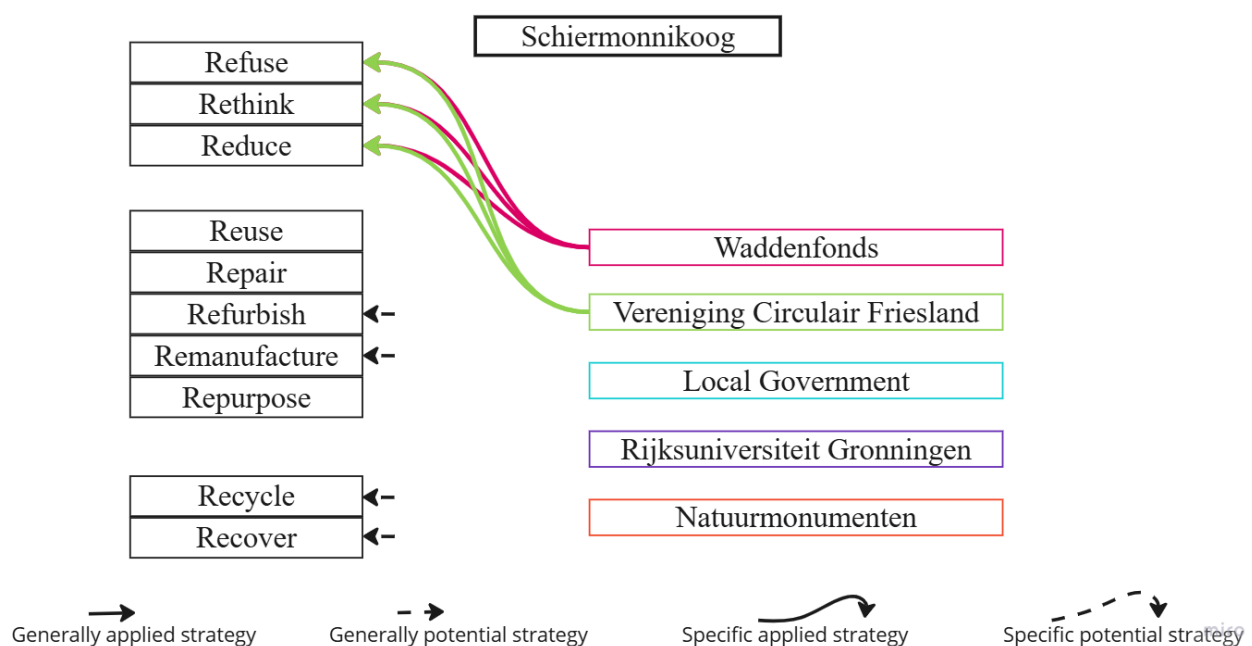
Future opportunities for circular economy integration within Young Entrepreneurs include:

- The local universities could include teaching in all nine circular strategies, as well as include the circular strategies more in the projects on the island

- The local government needs to support the young entrepreneurs and students with housing and resources

Strategy 4: Import and Export of Knowledge

Schiermonnikoog can count on a lot of institutions when it comes to the accessibility of knowledge. Other than the educational institutions mentioned in Strategy 3, the island has access to a lot of governmental institutions, NGOs and local initiatives that strive to make the Dutch Wadden-islands more sustainable and future-proof. These efforts do not only focus on ecology and tourism but certainly also on circular economy. The figure below shows the actors working with circular economy or having the potential to work with it, and which circular strategy they relate to.



The Waddenfonds (Wadden-fund) was founded by the government in 2007 to make innovation on the Dutch islands feasible. Within a changing set of eight topics, the public can apply for subsidies for their company, community or local initiative. Many of these topics revolve around sustainability, enabling various projects on Schiermonnikoog. The Meet Me at the Lighthouse Festival which was mentioned in Strategy 1, is one initiative that has profited from the fund. Besides that, the visitor centre in the village was renovated with the help of the Waddenfonds. This fund is significant for realising the island's circular economy-related projects and initiatives. Not only can the fund assist through funding, but they can also couple knowledge with projects with their extensive network,

Another important example is Vereniging Circulair Friesland (VCF), a regional actor supported by the Province of Friesland and the European Union. VCF aims to make Friesland a potent transition region,

setting an example for other regions and countries and therefore aims to set the standard with an ambitious plan for a 2025 circular transition agenda for the province. Schiermonnikoog is a relevant stakeholder in this project, as many circular projects and important targets for VCF are found in the topics being worked on. VCF works with companies, educational facilities, and government actors to set new standards for circular building, circular businesses, and circular water consumption and management strategies.

As of today, Waddenfonds and Vereniging Circulair Friesland are working on several topics closely connected to the circular strategies. Vereniging Circulair Friesland is working on a regional scale to reduce the usage of non-renewable resources like plastics and is also aiming to create a circular buying scheme for businesses, local governments, and other actors. This can be linked to the circular strategies of refuse, rethink and reduce. Waddenfonds has subsidised the Meet Me at the Lighthouse Festival, in which sustainable consumables have become the new norm, linking it to the strategies of refuse, rethink and reduce.

The municipality is often supported by the Province of Friesland. They assist in the day-to-day tasks but also bring a large network to the island, further helping to explore possibilities for projects on Schiermonnikoog. Beyond that, Natuurmonumenten and the researchers at the Rijksuniversiteit Groningen station import knowledge about nature and ecology to the island. These last two actors also heavily invest in regenerative nature.

Together, the actors mentioned in relation to education, local governments and funds set the stage for many activities on Schiermonnikoog regarding circular economy. With the aim of the municipality having a fully circular-driven philosophy, this creates a promising platform for new initiatives to form on the island, further enhancing its position regarding circular economy and setting an example for other regions. In the future, this added value of external knowledge and capital could be turned into a venture in Schiermonnikoog itself, making the island a breeding ground for circular practices and a place for them to settle. Being a small and tightly connected community with excellent contacts on the mainland, the island community could be a leading example. With the diverse challenges that face the economy, citizens and the nature of an island, this form can be a great example to other actors nationwide and possibly abroad. In the future, this approach could foster multiple circular strategies like remanufacturing, refurbishing, recycling and recovery.

On Schiermonnikoog, scores for Import and Export of Knowledge have been assessed in relation to the roles and actions of the aforementioned actors.

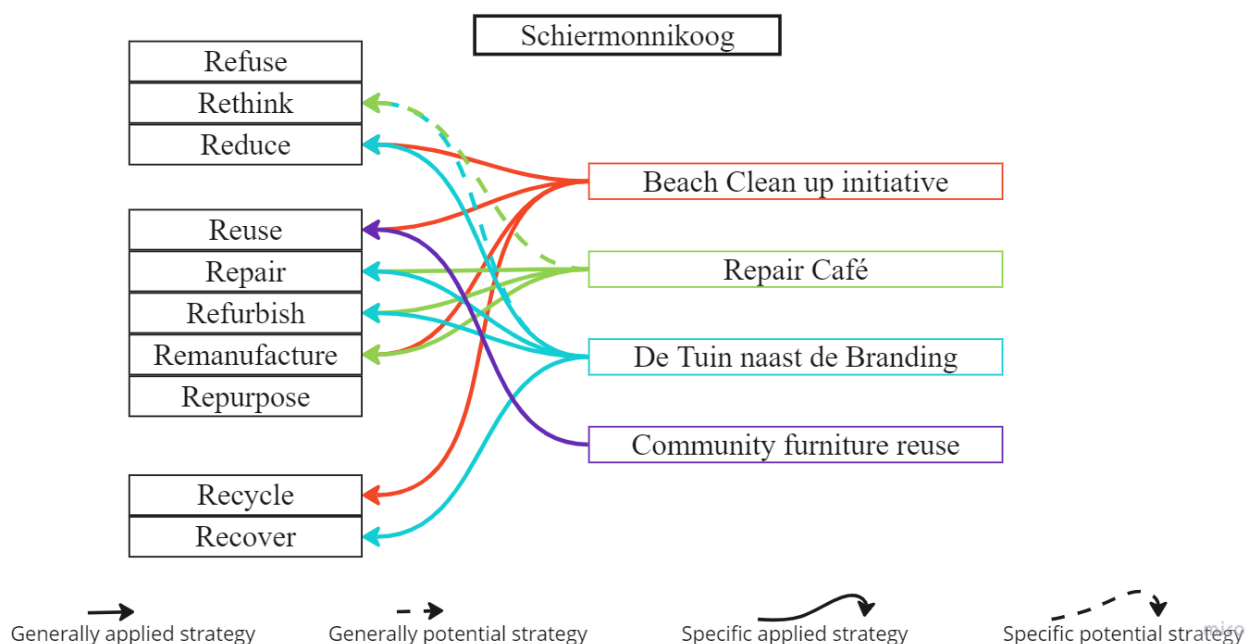
- The envisioned score for the current status is **8 out of 10**
- The envisioned score for the status 5 years from now is **9 out of 10**

Future opportunities for circular economy integration within the Import and Export of Knowledge include:

- For the abovementioned actors, a focus on the creation of a local ambitious circular economy through **remanufacturing, refurbishing, recycling and recovery** may strengthen the island's circular status

Strategy 5: Community Involvement

Schiermonnikoog can count on a very involved community. As mentioned in the other strategies, the island is home to many creative people who try to combine a circular mindset with the projects on the island. The figure below shows the actors working with circular economy or having the potential to work with it, and which circular strategy they relate to.



With many initiatives coming from islanders themselves, the tone is set for others to join them in striving for a more circular approach to living life on the island. A great example of this mindset is the beach cleanups solely organised by the local community. Occasionally, people get together to clean the beaches of trash and debris and thereby reduce the waste in the environment. There have been many occasions

in the past where the community has gone above and beyond to care for the fragile nature on the island, for example, when lost shipping containers in the shipping lane broke open and trash washed ashore. Some of these items and other trash can find a home in circular-minded projects, for example, to create souvenirs like the students of Hanzehogeschool University of Applied Sciences in Groningen. This way, both initiatives can work together to clean up the island and create a new product. A schoolbook example of how a circular mindset can positively affect multiple ends.

Another excellent example of a community-led circular initiative is the Repair Café. This initiative allows people to bring worn-out clothing, broken electronics or furniture to a couple of handy volunteers. Once a month, the café is open and one can learn about how to repair, refurbish and remanufacture broken items. This initiative aims to reduce waste and teach people how to prolong the lifespan of an item. This is a great example of how simple a circular initiative can be.

When looking at the picking garden De Tuin naast de Branding, there is a great deal of community involvement surrounding the core business, besides being a fun place to visit and wander around the crops, flowers and fruits. This initiative supplies local restaurants with many seasonal crops, delivers bouquets to weddings or funerals, and ensures every islander can get fresh and sustainable products from a local source for a fair price. A fun fact is that the equipment used by the picking garden is often repaired at the Repair Café, from wheelbarrows to scissors and ploughs. Everything is kept in order by another community-driven initiative.

Schiermonnikoog is an island that heavily relies on tourism and therefore accommodations to fund its economy. Often, these accommodations renew their furniture before the old one is unusable. The island community has created multiple initiatives to find new homes for these items. On Facebook, multiple groups list them for sale, and a group for free items has been set up. This way, great furniture and other items often get a good home without going into the waste stream.

The residents on the island are very conscious of the impact their everyday living and the tourism sector have on the fragile nature of Schiermonnikoog. Because of this, many volunteers are working for VVV and Natuurmonumenten to help care for nature and educate visitors on its specifics. This is an excellent example of how valuable the island is to many people.

All these community-driven initiatives are promising. With the Picking Garden, aiming to provide locals and restaurants with their crops, they drastically reduce transportation and packaging. With their expansion plans, they aim to use biowaste generated by the National Park and municipality as compost,

rethinking how they help their crops grow. The municipality is actively thinking about a recycling centre in the future. This could also provide the Repair Café with a place to resell refurbished and repaired items to the public, reducing the need to buy new items on the island.

On Schiermonnikoog, scores for Community Involvement have been assessed in relation to the roles and actions of the aforementioned actors.

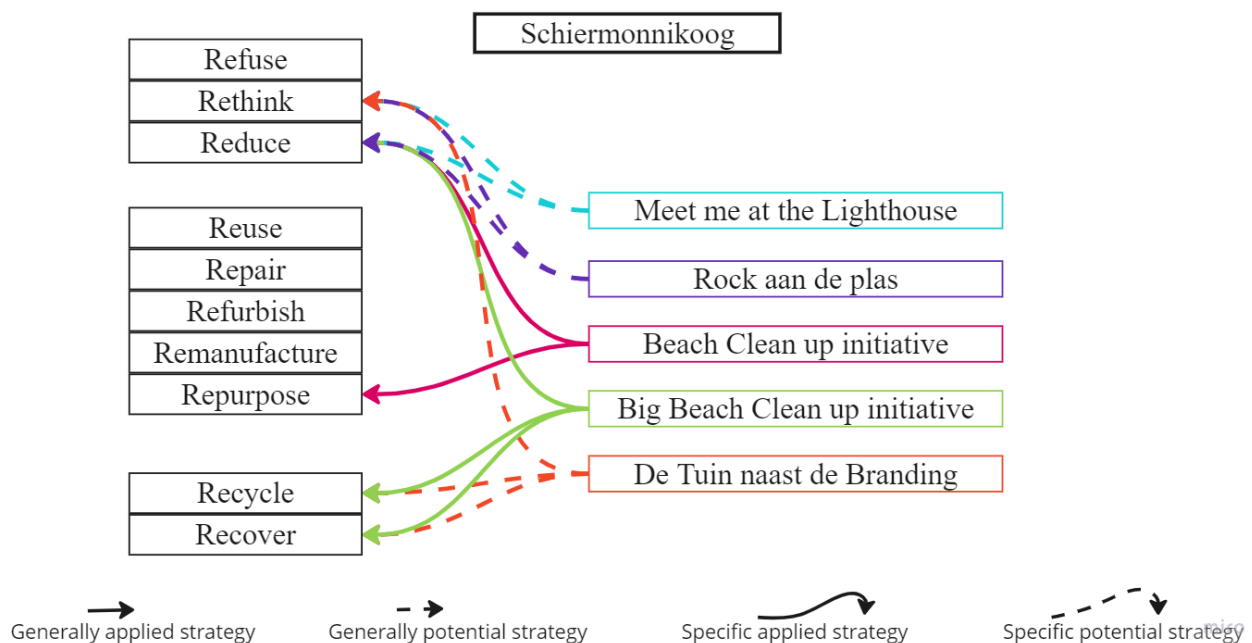
- The envisioned score for the current status is **8 out of 10**
- The envisioned score for the status five years from now is **9 out of 10**

Future opportunities for circular economy integration within Community Involvement include:

- The repair café can **rethink** its circular approach and investigate the possibility of reselling refurbished and repaired items to the public
- De Tuin naast de Branding could **reduce** even more, and **rethink** how they utilise compost for their crops together with the community

Strategy 6: Crowd Co-design

In the Crowd Co-design strategy, several previously mentioned actors and some unique to this strategy are included. The figure below shows the actors working with circular economy or having the potential to work with it, and which circular strategy they relate to.



As mentioned in other strategies, many initiatives and actors aim to combine their efforts to care for the island with interaction with the public. For example, the local Beach Clean-up initiative has a clean beach as its primary objective while also inviting the public to educate themselves on the fragility of nature and how human consumption affects the North Sea. Also, the Repair Café offers a free service to those needing repairs while educating people on how to repair items themselves in the same process. These local initiatives open possibilities for interaction and education, making them a great example of how the island community is very conscious of the message they want to tell regarding circular economy and sustainability.

Often, the different actors on the island come together for an organised event. For example, Natuurmonumenten, the municipality of Schiermonnikoog and De Eilander Balgexpress (a big beach taxi facilitating tours to the island's edge) work together on a big beach cleanup initiative. More than 50 volunteers have signed up to clean up the island's northern coastline. On paper, it is similar to the local beach clean-ups. The waste will thereafter end up as municipal waste and get recycled or recovered, or it will go to other initiatives that reduce the waste in the waste streams, by using it elsewhere.

This time, the different actors co-created an event on a much larger scale, which was made possible by combining the strengths of the different actors into one significant initiative. This shows how well-connected the island community and its actors are.

A great example of how co-design is happening on the island is how the picking garden deals with the seasonal shift in available produce. The demand for certain crops often outgrows the pace at which they can produce them, for example, in winter. To still provide fresh, fair and sustainable produce on the island, the picking garden has some biological farmers on the mainland providing additional stock. Buying this product is completely crowd-driven, as the customer can ask for a particular crop, and the picking garden will source it locally if they cannot produce it themselves. The picking garden has the potential to include the circular strategies in their work related to Crowd Co-design by e.g. getting ideas on how to recover, recycle and rethink at workshops with the public.

The Beach Clean-up initiative shows how involved the community is in keeping the island clean and its nature healthy. Strategies like reuse and recycle quickly come into view as the collected waste is also used for things like jewellery, souvenirs or other items. In the future, events like these could be easily combined with the great number of cultural festivals that are organised on the island year-round. Giving initiatives like these a bigger stage can raise awareness on how to reduce and rethink consumption as a whole and further develop a circular mindset while actively participating in a cultural and fun activity.

On Schiermonnikoog, scores for Crowd Co-design have been assessed in relation to the roles and actions of the aforementioned actors.

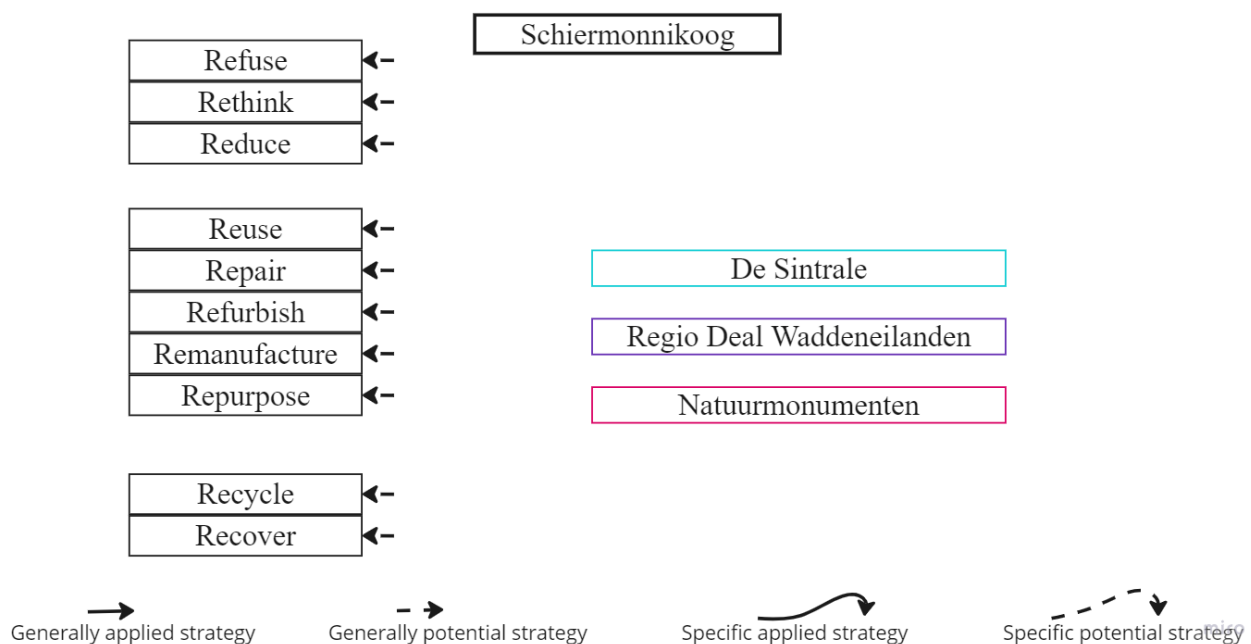
- The envisioned score for the current status is **7 out of 10**
- The envisioned score for the status 5 years from now is **8 out of 10**

Future opportunities for circular economy integration within Crowd Co-design include:

- The interconnectedness of the local community could be promoted and requested to support **reduce** and **rethink** at the island's festivals
- The picking garden could include the crowd in developing new ideas for **rethinking**, **recover** and **recycle**

Strategy 7: Special Institutional Arrangements

On Schiermonnikoog, a few special institutional arrangements can be mentioned and influence the island's circular potential. The figure below shows the actors working with circular economy or having the potential to work with it, and which circular strategy they relate to.



The island has its own energy corporation called 'De Sintrale'. This corporation helps the island become self-sufficient and more sustainable with its energy supply. The corporation is not driven by profit and is solely in the hands of islanders. De Sintrale also puts effort into improving insulation in housing, providing electric transport and developing solar arrays from which the islanders can be supplied with electricity. Every member has a vote in what the corporation invests the profit into, making it a very

democratic and transparent initiative. As of 2024, De Sintrale has developed multiple solar energy parks on suitable roofs on the island, intending to continue to grow soon.

On a larger scale, in 2023, the government announced a 'Regio Deal' (regional investment programme) for the Wadden islands. With the Wadden Islands being a very intensely visited area, this programme aims to tackle the challenges that come with the massive tourism industry and the effects of climate change on the region. The five main topics are living, future-proof entrepreneurship, accessibility, renewable energy and circular economy. This makes the Regio Deal Waddeneilanden a great arrangement in creating feasible projects, especially regarding circular economy. The ongoing projects related to this topic aim to make building, water consumption, agriculture, and water management as circular as possible. With the ambition of the municipality of Schiermonnikoog, this plan makes for a bright future regarding a well-implemented circular strategy.

When looking at Schiermonnikoog, a large part of the island has beautiful nature. To care for nature on the island, a large part has been given the status of a National Park. This ensures that nature on the island is constitutionally protected and that nature's well-being is taken very seriously in policy-making processes. Of course, the island is a great attraction to tourists in every season of the year. The National Park has found the cooperation of Natuurmonumenten to assist in guiding the public into the national park in the friendliest and least destructive way possible. The National Park has the ambition to balance nature, culture and community on the island. This creates opportunities for a circular approach, as this ambition comes with a great responsibility regarding the usage of the island's raw materials.

There is an excellent opportunity to engage the three actors mentioned above with each other to create a circular approach for the island together. Covering energy usage, protecting nature and finding funding and assistance for larger initiatives. Having all these actors already present on the island makes for a great institutional landscape to make Schiermonnikoog an exemplary circular island. The potential is in including the circular strategies in their collaboration and finding solutions together.

In terms of circular strategies, many of the actors mentioned above provide the island with the possibilities which it needs to improve on this topic. De Sintrale reduces fossil fuels used on the island by offering a sustainable energy source for households. In another example, the Regio Deal leads to rethinking policies by investing in a circular buying policy, which has the potential to include reducing single-use plastic, using reusable cutlery, etc. In general, the buying policy could include all nine Rs. The actors could especially rethink solutions related to their problems with waste.

On Schiermonnikoog, scores for the Special Institutional Arrangements have been assessed in relation to the roles and actions of the aforementioned actors.

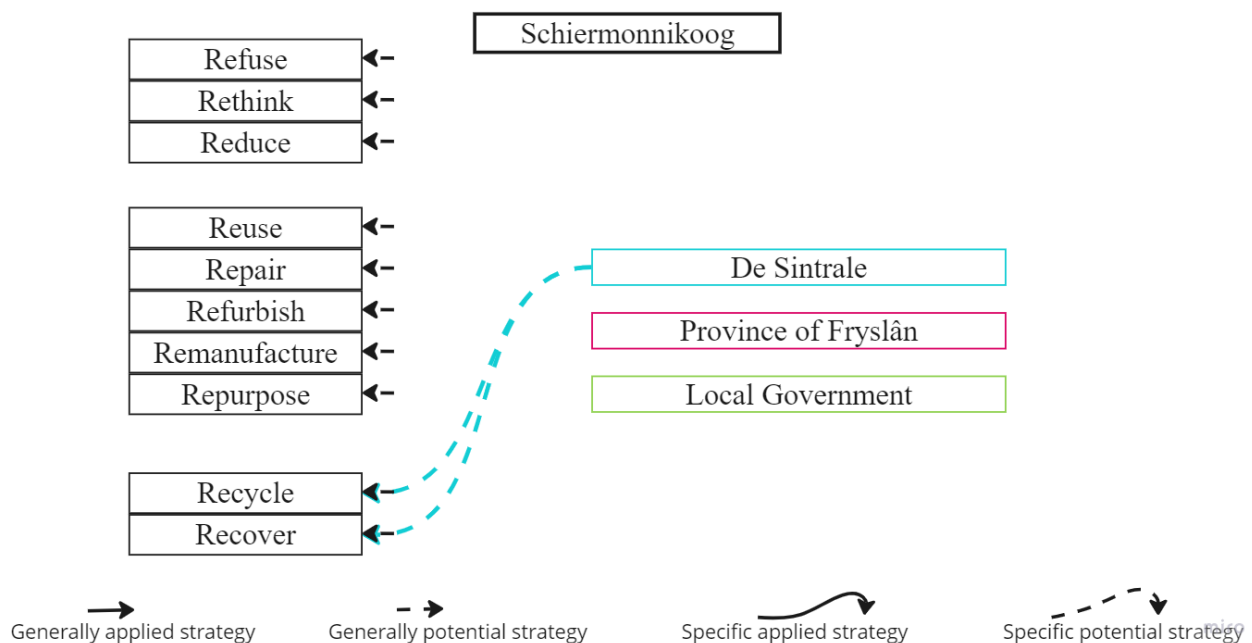
- The envisioned score for the current status is **7 out of 10**
- The envisioned score for the status 5 years from now is **8 out of 10**

Future opportunities for circular economy integration within Special Institutional Arrangements include:

- A collaboration between De Sintrale, Regio Deal Waddeneilanden and the National Park could enhance the utilisation of **all 9Rs**
- The three abovementioned actors could especially look into **rethinking** their work and their way of collaborating now

Strategy 8: Innovation Policy Fitness

On Schiermonnikoog, a few actors in Innovation Policy Fitness can be mentioned. The figure below shows the actors working with circular economy or having the potential to work with it, and which circular strategy they relate to.



The province of Fryslân is actively working on an action plan for transitions that will include more innovation, as so many topics are ever evolving. The chance to include a circular strategy in the

processes of decision-making is one not to pass on. The island of Schiermonnikoog is facing a lot of challenges that are already in the process of being translated into long-term plans or projects. The province can assist in ensuring these processes and projects are as effective as possible. This way, the island can be a testing ground for solutions that can be made feasible elsewhere. With the great connection Schiermonnikoog has with local governing bodies, the island can be a leading example in bringing innovations to life and making sure they are as circular as possible.

In the future, the municipality of Schiermonnikoog envisions their decision-making strategies fully integrated with circularity. This way, all of the abovementioned initiatives and organisations have the task of assisting the island to reach its goals. With the municipality already being supported by, among others, the province, the connections to make this strategy feasible are already in place.

Water management, waste treatment, and tourism projects are subject to large changes in the coming decades. Finding the right solutions means looking at innovative options that have not yet been implemented on the island. Making this decision opens up opportunities for a circular strategy based on the abovementioned examples. The local energy corporation, De Sintrale, can serve as an example in that it can play a more significant role in providing the island with electricity, making the island more self-sufficient. For this to be feasible, the municipality and the province need to support local efforts like this to grow their corporation into a larger and more diverse actor, potentially using waste on the island to create electricity or biogas, just like Omrin is already doing on a larger regional scale. Moreover, there lies big potential in the ambitions of collaboration between local, regional and national actors. Finding enough human capital to accomplish these ambitions is often the limiting factor. If the island is to be a breeding ground for circular approaches, this human capital has to be one of the aspects that needs investment.

In the future, the cooperation between local and regional actors can strengthen all circular strategies. Examples include, that reducing will be achieved by relying less on fossil fuels and using more locally produced renewable energy. When expanding in the form mentioned above, producing biogas or electricity from waste streams on the island can promote the strategy of recovery.

On Schiermonnikoog, scores for the Innovation Policy Fitness have been assessed in relation to the roles and actions of the aforementioned actors.

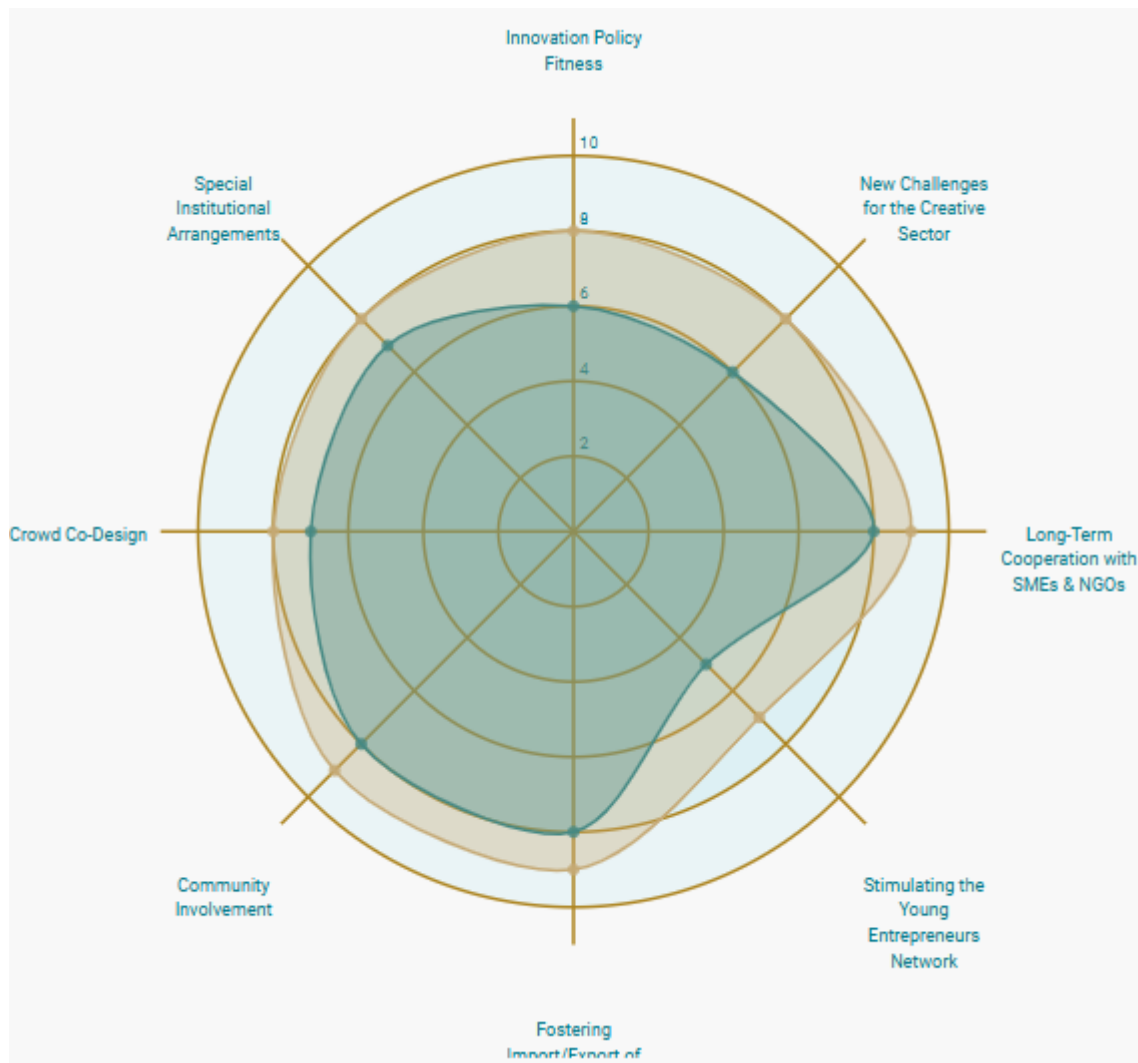
- The envisioned score for the current status is **6 out of 10**
- The envisioned score for the status five years from now is **8 out of 10**

Future opportunities for circular economy integration within Innovation Policy Fitness include:

- The Province of Fryslân, the municipality and the local actors should all collaborate on implementing circular economy through all **9Rs**
- De Sintrale has the potential to **recover** and **recycle** by creating biogas

Conclusion

The strategies' scores are presented in the tipping wheel with additional reflections on the opportunities for further developing the eight tipping strategies and circular economy on Schiermonnikoog.



Schiermonnikoog has several circular initiatives on the island, and they use the 9R strategies in various ways. Both citizens and visitors are open towards a circular economy, which becomes apparent through several community-driven circular initiatives. Governmental and NGO support is available on the island, in mainland funding from Regio Deal Waddeneilanden or the local municipalities' support of different circular initiatives. A core barrier to developing a more extensive use of circular strategies is the lack of housing and workplaces, as the island's economy heavily relies on tourism. This results in there being a limited variation of jobs and fields of work besides those within the tourism sector. However, Schiermonnikoog acknowledges that the tourists are a valuable opportunity for co-creation with the locals to explore how the community can evolve. From the tipping strategies, especially the actors from

Community Involvement with their diverse initiatives such as De Tuin naast de Branding, the Beach Clean-up initiatives, the Repair Cafe etc., as well as the collaboration with mainland universities to research innovative circular products, and De Sintrale's efforts to deliver clean energy to the island, all show an extensive effort focusing on circular innovation. Basing future co-creation on the success of already established networks of circularity may help create an exemplary circular island.

Future project ideas

In this section, four possible project ideas will be presented. These ideas have come to light through the research on the above-mentioned strategies regarding circular economy on Schiermonnikoog. The ideas will be presented in no specific order.

Circular Crafts Centre

A place on the island where artisans, artists and other people can start up their initiatives surrounding circular economy. This will also be a place where people can unite and share their thoughts and expertise, becoming a hub of knowledge, craftsmanship and sustainable working. This could also be a place for people to visit and buy souvenirs or other products, learning about circular economy in the process. The location could be near the waste sorting area, close to the ferry terminal. Also, funds from Regio Deal Waddeneilanden could be used to facilitate this project.

Young Entrepreneurs Association

Schiermonnikoog must become a place for young entrepreneurs to start their businesses, especially surrounding the circular economy. By creating a young entrepreneurs association, these initiatives can come together and learn from each other. This could possibly be led by a small committee from the municipality or the already established entrepreneurs' association.

“Thrift store” in the village

All these initiatives need a place to sell and promote their products and services. Combined with the large amount of furniture that gets reused in the holiday accommodations, this “thrift store” can be a great place to find good deals and contact circular initiatives.

Human Capital Centre

The high ambitions of the island's community are not in line with the number of hands and the expertise on the island. The Human Capital Centre can be a place where initiatives can find the people they need to realise their ambitions. People who want to help the island with their expertise can also come here to find work, which will help diversify the island's economy, which is currently heavily reliant on tourism.

Reference list

Core literature

Tipping Manual:

https://vbn.aau.dk/ws/portalfiles/portal/320650657/HanTIPPING_Large_Print_Version.pdf

The 9Rs: https://www.researchgate.net/figure/The-9R-Framework-Source-Adapted-from-Potting-et-al-2017-p5_fig1_320074659

Research center, De Herdershut: <https://www.rug.nl/research/gelifes/organisation/herdershut>

Waste

Metabolic(2023). *Schiermonnikoog Circulair*.

Waste produced per capita for the Netherlands: https://www.eea.europa.eu/themes/waste/waste-prevention/countries/2023-waste-prevention-country-fact-sheets/netherlands_waste_prevention_2023

Actors and projects

De Sintrale (island's energy corporation): <https://www.desintrale.frl/>

De Tuin naast de Branding (picking garden): <https://detuinnaastdebranding.nl/>

Dijk Ocean Store (clothing and accessory shop): <https://dijkoceanstore.nl/>

Field station "De Herdershut". (2023, 5 september). University Of Groningen: <https://www.rug.nl/research/gelifes/organisation/herdershut>

Hanzehogeschool Groningen student project:

<https://www.interregnorthsea.eu/freija/news/students-of-hanze-hogeschool-do-assignment-on-schiermonnikoog>

Meet Me at the Lighthouse (literature festival): <https://mmatl.nl/>

Municipality of Schiermonnikoog <https://www.schiermonnikoog.nl/>

Nationaal Park Schiermonnikoog: <https://www.np-schiermonnikoog.nl/>

Natuurmonumenten (Nature care NGO):

<https://www.natuurmonumenten.nl/natuurgebieden/nationaal-park-schiermonnikoog>

NHLStenden University of Applied Sciences, Master Design Driven Innovation:

<https://www.nhlstenden.com/hbo-opleidingen/master-design-driven-innovation-master-voltijd>

Omrin (waste manager): <https://www.omrin.nl/ons-verhaal>

Province of Fryslân <https://www.fryslan.frl>

Regio Deel Waddeneilanden: <https://www.dewaddeneilanden.nl/regiodeal>

Repair Café Schiermonnikoog: <https://www.vvvschiermonnikoog.nl/agenda/lytje-pole-agenda-schier/activiteitenagenda/repair-cafe>

Rock aan de plas (music festival): <https://www.rockaandeplas.nl/>

Samenwerkingsverband De Waddeneilanden (cooperation of Dutch Wadden-islands)

<https://www.dewaddeneilanden.nl/>

Schier Academy (education): <https://www.waddenacademy.com/schier-academy>

Van Schier (cheese manufacturer): <https://vanschier.nl/>

VVV Schiermonnikoog (tourism board): <https://www.vvvschiermonnikoog.nl/>

Vereniging Circulair Friesland: <https://circulairfriesland.frl/>

Waddenfonds: <https://waddenfonds.nl/>

Wagenborg Passagiersdiensten (Ferry operator): <https://www.wpd.nl/>