

Hedwige-Prosper Project:

better flood safety,
more tidal nature



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Groot Saeftinghe Border Park



Welcome to Hedwige-Prosper

This unique borderland has seen two pieces of reclaimed land depoldered to become one with the Scheldt again: the Hedwige Polder on the Dutch side and Prosper Polder on the Belgian side. This has given the river more room to flow again and allows valuable tidal nature to recover. This is great news on so many levels.

This large-scale Sigma Plan project makes a significant contribution to the European conservation objectives and reinstates the natural defences against the force of the tides, especially in extreme weather conditions. Besides creating a safer, more natural environment, it offers many recreational opportunities for the area's cyclists, hikers and nature lovers. Together, the Hedwige-Prosper area and the existing Drowned Land of Saeftinghe form a single nature reserve of no less than 4,500 hectares: the largest tidal area in Western Europe and the green heart of Groot Saeftinghe Border Park. The construction of an observation tower on the panorama hill will soon give visitors an iconic place to explore the area's distinctive landscape and nature.

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Better flood protection and a more natural environment

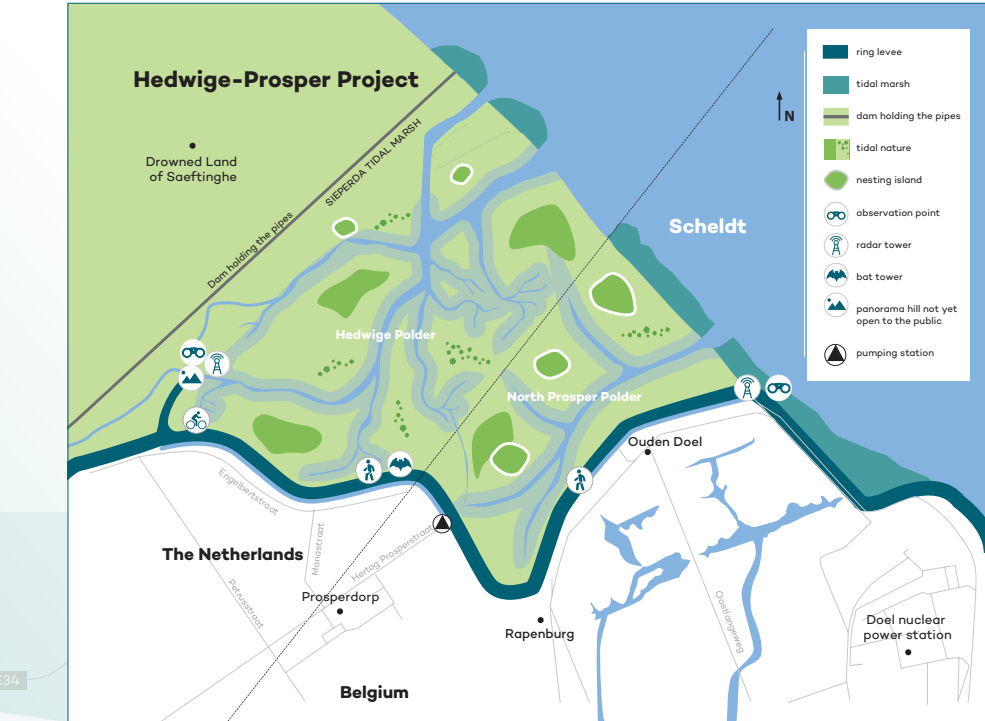
The Sigma Plan protects Flanders from floods. In extreme weather conditions, the Scheldt and its tributaries can reach dangerously high water levels and may even flood. That is why the Sigma Plan is investing in stronger and higher levees and a chain of natural floodplains in the river valleys. This gives rivers more room to flow and overflow.

The Sigma Plan was a direct result of the floods after the Gale of January 1976. To stop similar disasters from happening again, the government launched an ambitious plan. Its name, the Sigma Plan, was inspired by the Dutch Delta Plan and the first letter of the Scheldt. In 2005, the Sigma Plan got an update based on new scientific insights. Since then, the plan has focused on both flood safety and the development of the area's natural river environment, recreational activities and local economy. The Sigma Plan is implemented by De Vlaamse Waterweg nv and the Agency for Nature and Forests.

The Hedwige-Prosper Project, a milestone

The flooding of the Hedwige Polder and Prosper Polder on the border between Belgium and the Netherlands was a milestone in the Sigma Plan's history. This area was reconnected to the Scheldt in October 2022. This gives the entire region better protection from flooding at high tides and allows valuable tidal nature to develop. The project covers a whopping 300 of the total 600 hectares of natural environment to be restored on the Western Scheldt, one of the goals of the Western Scheldt Nature Package implemented by the Province of Zeeland on behalf of the Dutch state.





Project
Project status
Surface area

Hedwige Polder and Prosper Polder
 Completed
 465 hectares
 (Prosper Polder 170 hectares,
 Hedwige Polder 295 hectares)

Municipality
Duration
River
Intervention

Beveren (BE) – Hulst (NL)
 2008-2023
 Scheldt
 Depoldering



Hedwige-Prosper area in 2023

The new Hedwige-Prosper area

Why depolder?

The Hedwige Polder and Prosper Polder are land that was reclaimed for agriculture in the past. The Prosper Polder on the Belgian side (Beveren) was drained in 1847 and the Hedwige Polder on the Dutch side (Hulst) was drained in 1907.



The reconnection of the borderland to the river Scheldt will give the river more room to flow. This will in turn avoid upstream flooding. Levees and a fish-friendly pumping station will protect the local residents. The return of ebb and flow will gradually create tidal mudflats and marshes again. The restoration of the river Scheldt's natural environment protects the habitat of many rare plants, birds and other animals. The new tidal nature also provides additional filtration of the river Scheldt's water, restoring the natural balance. This helps us to meet the EU Birds and Habitats Directives.

The depoldering is also part of the river Scheldt treaties between the Belgian region of Flanders and the Netherlands. Together, they work towards a safer, more accessible and more natural river Scheldt. This unique collaboration has also allowed Flanders to work on Dutch territory.

A long history

Despite the undisputed benefits of depoldering – better flood safety and better development of the natural environment – the flooding of the polder landscape has not been without controversy. There was opposition from various parties, legal wrangling and so on, so the depoldering was repeatedly postponed. Here are some dates and key moments in 15 years of history.



→ 2005

A cross-border vision of the future

The Belgian region of Flanders and the Netherlands jointly develop a vision for the future of the Scheldt estuary: the 2010 Development Outline. Waterway accessibility should go hand in hand with better flood safety and biodiversity in and around the Scheldt. This is only feasible if the river is given more space.

● **The Hedwige Polder and Prosper Polder become part of tidal nature**

The Belgian region of Flanders and the Netherlands sign a treaty that states how they want to put that vision of the future into practice. The Netherlands commits to 600 hectares of natural environment restoration along the Western Scheldt. It is a continuation of two cross-border projects: the Hedwige-Prosper Polder Project and the expansion of the Zwin nature reserve. The Hedwige-Prosper Polder Project is part of the “Natura 2000” network to protect European biodiversity.

● **Sigma Plan update**

The original 1977 Sigma Plan is updated based on new scientific insights. The Flemish regional government makes the environmental component of the 2010 Development Outline an integral part of the updated Sigma Plan. This ensures the safety and environmental aspects are integrated as much as possible. From then on, the Sigma Plan also makes an important contribution to the EU environmental goals for Flanders with specific conservation objectives for each area (habitat and species).





→ 2008

● Reaffirmation of the treaty

In Zeeland, there is growing opposition to the restoration of the natural environment, including the depoldering of the Hedwige Polder, as required by the state. That is why the minister sets up a committee. The committee finds that flooding the Hedwige Polder is the best way to make the Western Scheldt healthy again.

● Prosper Polder works start

The work to restore the natural environment starts in the Belgian region of Flanders. The construction of a flood defence levee that is 4.8 km long and 9 m high (12.5 m above sea level) has to protect the hinterland from the water from the river Scheldt.

→ 2009

● Cabinet examines alternatives beyond the levees

In the Netherlands, resistance continues to grow. The government therefore decides to explore alternative plans, such as the artificial creation of tidal mudflats and marshes in the stream bed of the Western Scheldt. However, after a negative study, that plan falls through.

→ 2012



● Flanders launches dispute proceedings against the Netherlands

Work on the Flemish side is now almost complete. The new flood defence levee around Prosper Polder is approaching the Dutch border. Flanders wants the Netherlands to honour the agreement and launches dispute proceedings. A solution is to be reached after six months of negotiations. If that fails, an independent committee should settle the matter.

● European Commission starts infringement proceedings against the Netherlands

The European Commission finds that the Netherlands is not taking enough steps to address the urgent restoration of the natural environment of the Western Scheldt. Again and again, the Dutch government looks for alternatives, but the proposed measures beyond the levees do not deliver the desired results for the restoration of the natural environment and do not meet the required 600-hectares surface area. The European Commission starts a procedure.

● Enough research: the natural environment still needs to be restored

The coalition agreement of the Dutch Prime Minister Mark Rutte's second cabinet states that steps to restore the natural environment of the Hedwige Polder should be taken as soon as possible to make the Western Scheldt healthy again.





©Jusbox

→ 2016

● Interreg project in Groot Saeftinghe Border Park

Eight regional partners really get the ball rolling. An area-based approach with local residents has to mend the disturbed relationships between agriculture, the port and the natural environment in the borderland. This sparks several projects about liveability, climate adaptation, sustainable agriculture, mobility, recreation and biodiversity.

→ 2019

● Work starts in the Hedwige Polder

The excavation work in the Hedwige Polder starts. Roads, trees and houses had already been removed. Ditches are dug, a new ring levee is constructed and, finally, the Scheldt Levee and Sieperda Levee are excavated in various phases.



©DEME

● Groot Saeftinghe Border Park Partnership

Eleven Flemish and Dutch partners sign a partnership agreement to push forward the border park's positive development. They talk and collaborate with the residents and provide impetus to the region.



→ 2021

● Panorama hill planning permission

The plans for the future are approved: the soil resulting from the excavation of the levees is used to build a panorama hill. This will house an observation tower and radar tower with an exhibition area, a restaurant, accommodation and a panoramic terrace for experiencing tidal nature.





→ 2022

● First ditch connection

On 25 October, water from the river Scheldt flows into a ditch in Prosper Polder and onto the Hedwige-Prosper area. Tidal nature contributes significantly to the European conservation objectives and reinstates natural defences against the force of the tides, especially in extreme weather conditions.





→ 2023

● Hedwige-Prosper Project completion

The work of the Hedwige-Prosper Project has been completed. From now on, people can enjoy a unique cross-border nature reserve characterised by tidal mudflats and marshes.





The advantages of tidal nature

Tidal nature consists of low-lying tidal mudflats and higher-lying tidal marshes that flood partially or completely at high tide. In recent decades, large areas of tidal nature have disappeared from the Western Scheldt. We have to stop that decline. Wetlands are an ally in the fight against the effects of climate change. And tidal nature is very valuable to humans, plants and animals. We list some of the advantages here:

Natural buffer against flooding



A resilient river that has enough room to flow and overflow can protect an entire region from extreme weather events. All the embankments restricted the river Scheldt into an ever-tighter trajectory, pushing the water up at storm tides or during heavy rainfall and leading to more floods. New tidal areas give the Scheldt the space it needs. Tidal mudflats and marshes absorb the wave action, thereby reducing the pressure on levees. Wetlands also act like a sponge: they absorb water at high tide and gradually release it to the environment at times of drought. This is crucial during prolonged dry periods.

A bird habitat and fish nursery

Both water birds and migratory birds shelter in the reed beds on the tidal marshes and find food on the tidal mudflats. It is also a peaceful place where fish can reproduce and their offspring can grow up sheltered from danger.



Ouden Doel tidal marsh

©Yves Adams

Tidal mudflats and marshes purify the river water

The Sigma Plan greatly encourages the development of tidal mudflats and marshes in the Hedwige-Prosper area. The mixing of fresh river water with salt seawater will eventually form rare brackish tidal marshes here.



Eurasian teal

©Hugo Willock

Tidal mudflats and marshes purify the river water: they filter any excess nitrogen and phosphorus from the water and they enrich it with silicon. This helps to restore the food chain. Tidal mudflats and marshes also store carbon from the air and increase oxygen levels in the water.

The Hedwige-Prosper Project



Hedwige-Prosper Polder in 2023

How do you turn two polders into a brackish and salt tidal nature with mudflats and marshes? Step by step: a lot of infrastructure work was needed before a single drop from the river Scheldt reached the depoldered area. The key phases of the Hedwige-Prosper Project are listed here:

Ring levee to prevent flooding

To depolder the area, we first built a ring levee to protect the surrounding area from incoming water from the Scheldt. The ring levee is 4.8 km long: 3 km is situated in Flanders and 1.8 km in the Netherlands.

Pumping station drains rainwater

A wide ring ditch is dug along the ring levee to capture inflowing rainwater from the surrounding polder ditches. The pumping station pumps excess water to the Scheldt via the depoldered area. The pumping station is fish-friendly and does not affect any fish in the polder ditches.





Digging inlets and ditches

An extensive inlet and ditches system provides good drainage and encourages the development of tidal mudflats and marshes.

Lowering of the Scheldt Tidal marsh

On the Dutch side, the Scheldt Marsh is excavated and lowered by about 1.5 metres. This intervention allows water to flow smoothly in and out of the area. It provides the additional dynamics needed to create sustainable tidal nature.

Soft shoulder to protect pipes and cables

A clay shoulder runs along the dam that holds the pipes. It is there to absorb the force of the waves now that the Scheldt has been given free rein again.

Building radar towers

Three new radar towers direct the shipping traffic on the North Sea and Western Scheldt. One radar tower is situated in Ouden Doel (left bank), a second is on the Belgian-Dutch border in Reimerswaal (right bank) and a third is near the Zandvliet lock in the Antwerp port area (right bank). The radar tower currently located in the Drowned Land of Saeftinghe is in need of replacement and is to be replaced by a new radar tower on the panorama hill.



©Yves Adams

Radar tower

Excavation of levees

In autumn 2022, the time was right to let water flow into the area. After a phased excavation in a natural process, a gully connecting the Sea Scheldt part of the river and the hinterland emerged on 25 October 2022. The Sieperda Levee between the Drowned Land of Saeftinghe and the Hedwige Polder disappeared, as did the levee along the river Scheldt.



©Sven Dullaert



©Yves Adams

The old creeks are still visible in the landscape

Sustainable work

Did you know that

... we reused soil as much as possible? The construction of the ring levee required a lot of soil. We used the soil resulting from digging the inlets and ditches in the area. We also used as much soil as possible to create the panorama hill.

... the new inlet system was dug in the old inlets that were still there? They had always been there until about 100 years ago when the land was reclaimed. The inlet system directs the water in the right direction.

... archaeologists conducted excavations in the Hedwige Polder before water was allowed in?

This area has a rich history of drowned villages. Archaeological remains from the Middle Ages were found in the peatland! Traces of peat cutting in the soil, animal skeletons (of a cow and several sheep) and pieces of pottery and utensils going back as far as the 14th or 15th century.

Experiments in the field

Hedwige-Prosper Polder also served as a ... testing site to assess the strength of the levees in high water situations. The tests were carried out as part of Polder2C's, a European Interreg project that ran from 2019 to 2022. Polder2C's aimed to improve our knowledge of levees' flood resilience to be even better prepared for the consequences of climate change, such as rising sea levels and flooding.

Until recently, all scenarios and decision-making processes were based on theoretical models. However, the replacement of the Scheldt Levee temporarily left a unique levee of several kilometres long in the Hedwige-Prosper area. It was the perfect place for testing flood defences and disaster plans under realistic conditions. This resulted in a living lab in which 13 partners from the Netherlands, Belgium, France and the UK worked together. It was a great success that allowed us to gain a great deal of knowledge in the field for future generations.

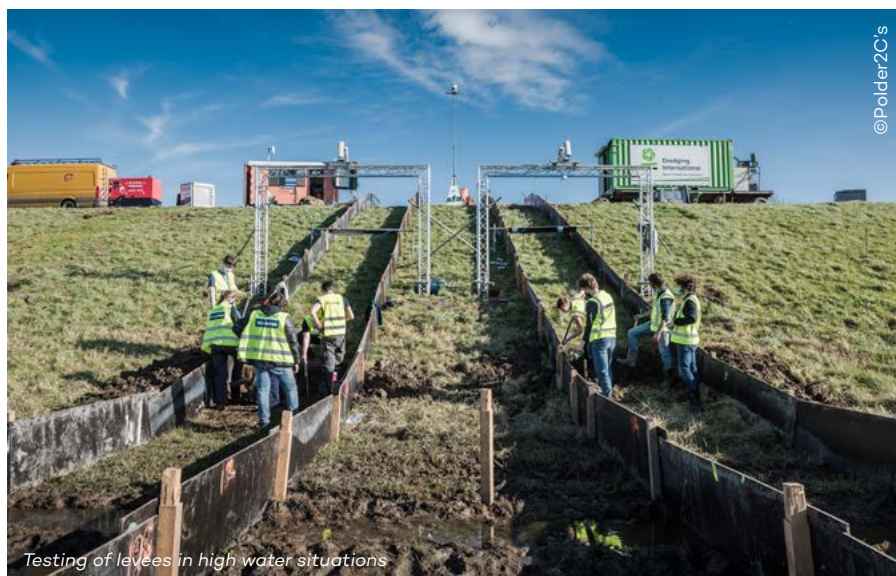



 2 Seas Mers Zeeën
 

 Polder2C's

Interreg Nederland België

www.polder2cs.eu



Testing of levees in high water situations

Home to many animals

From sea aster mining bee to seal

The restoration of the river Scheldt's natural environment protects the habitat of many plants and animals. This tidal nature is the place to be for water birds and migratory birds. Fish also use the new nature reserve to rest and spawn. The Hedwige-Prosper area is still in full development, but many gullies have already formed after just one year. As a result, various fish species have swum into the area from the river Scheldt: perch, bream, zander, flounder, sprat, eel... The creation of this large tidal area has not only created a vast nature reserve; it is also one big fish buffet for common and grey seals. These curious swimmers sunbathe on the higher banks. The quietest spots serve as nurseries for pregnant seal mothers. This new base for seals has definitely increased your chances of being able to admire these cute marine mammals in the wild.

Another typical tidal marsh dweller is the sea aster mining bee, which is slightly greener and more velvety than the average honey bee. It gets its name from its food the sea aster, a flowering plant only found on tidal marshes. It is called a mining bee due to its ground-nesting lifestyle.



Support for vulnerable species

The Hedwige-Prosper area is part of Natura 2000, a European network of nature reserves that protects European endangered animals and habitats. During the preparatory work, ecologists made sure that vulnerable species were not put at risk. The landscaping works were carried out step by step to allow the animals there to leave their habitat and find a place elsewhere.

Several protected bat species have their habitat on the polder. The common pipistrelle, brown long-eared bat and Nathusius's pipistrelle are just a few examples. To help them find a new habitat, we hung bat boxes nearby and built a bat tower just outside the polder. We also helped little owls, barn owls and natterjack toads move house.



Common shelduck

©Marc Sloopmakers



Sea bass

©Hugo Willox



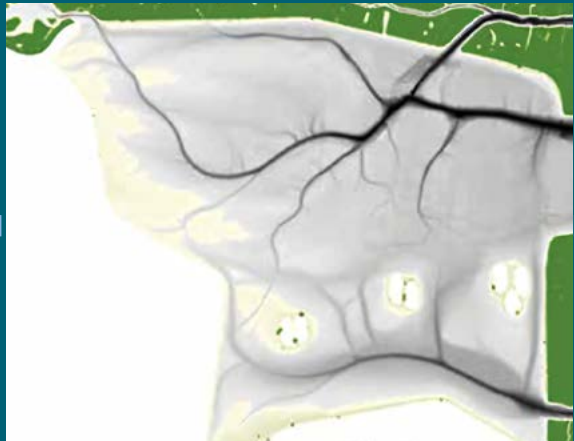
European spoonbill

©Hugo Willox

Nesting islands for birds

The timing of the connection to the Sea Scheldt part of the river was carefully chosen after the nesting season, allowing any nesting birds still in the area to flee. Meanwhile, we also created many nesting islands for birds that want to rest or nest. The breeding sites are large and high enough not to flood at high tide. More and more birds are using them today. The Hedwige-Prosper area, for example, has attracted very high numbers of shelducks, spoonbills and avocets. A promising start for a nature reserve that is still in the early stages of its development.

The future of the Hedwige-Prosper area



Tidal mudflats and gullies in the early years

1



Vegetation development after 6 years.

Everything starts with tidal mudflats and gullies

For the first 10 years, this area will have little vegetation due to its low-lying position. It will consist mainly of tidal mudflats and gullies. The mud in the tidal mudflats is teeming with invertebrates. An optimal interaction between plant growth, water flow, soil uplift and gully formation helps to create a robust tidal landscape.

Now that the brackish water from the Scheldt flows through the Hedwige-Prosper area again, tidal nature with mudflats and marshes can develop. This is a dynamic process that is typical of tidal nature. In about 50 years, this area will look like the Drowned Land of Saeftinghe. Researchers in Flanders and the Netherlands have developed a computer model to predict how the area affected by the low and high tides is going to evolve.



First tidal marsh
formation after 10 years

2

After 10 years: the first plants and bird species

After a few years, the first vegetation will develop on the boundaries of the area, as small overgrown islands on the silt. Slowly, this will spread to the centre of the area, towards the Western Scheldt. On these elevations, first sea asters and sea lavender will germinate, followed by alkali bulrush. The small islands of vegetation gradually attract

more bird species. The areas of vegetation on the edges of the area are the perfect habitat for songbirds. White-tailed eagles will also feel more and more at home here – a high pole topped with an artificial nest is already in place on one of the nesting islands.



Vegetation development after 18 years.



Varied landscape
after 30 years

3



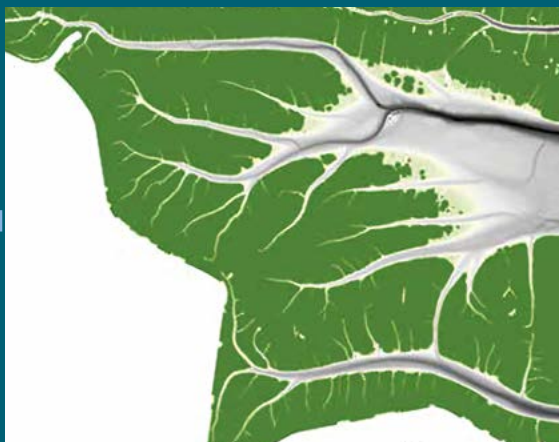
Vegetation development
after 30 years.

After 30 years: varied landscape with tidal marshes

The area slowly elevates and more and more
vegetation appears with flowering sea asters in
yellow and white-pink hues.



Vegetation development after 50 years.



High tidal marshes
after 50 years

4

After 50 years: high tidal marshes

Eventually, a vast tidal marsh area forms with typical large and small gullies and inlets that allow excellent drainage. The highest parts of the tidal marshes are overgrown with plant species such as reed and sea couch. They are a perfect home for numerous birds, including the western marsh harrier.

Source: NIOZ & UA: Wetenschap en productie

3D Visualisations: Robert Rooseboom, Expivi (www.expivi.com)

Together, the Hedwige-Prosper area and the adjacent Drowned Land of Saeftinghe form a single nature reserve of no less than 4,500 hectares: the largest brackish tidal area in Western Europe and the natural heart of Groot Saeftinghe Border Park. The surrounding polders, agricultural activities and transition into the port area complete the border park and are a rough indication of the boundaries of Groot Saeftinghe Border Park.

www.grensparkgrootsaeftinghe.eu



GRENSPARK GROOT
SAEFTINGHE

GROOT SAEFTINGHE BORDER PARK





Panorama hill

The rough character of the Drowned Land of Saeftinghe and the Hedwige-Prosper area offer a unique natural environment experience. The panorama hill in the Hedwige-Prosper area is the perfect place to experience tidal nature. A radar tower and surrounding panorama tower will be built on the hill to welcome visitors. The tower will have room for a visitor centre, food and drink facilities, an exhibition space and accommodation. At the highest level, a panoramic terrace offers unique views of the gullies, tidal mudflats and marshes, the vast polder and the hustle and bustle of the port of Antwerp. A hidden treasure for those not put off by an often brisk wind.





Amongst the natural environment, agriculture and the port

The landscape of Groot Saeftinghe Border Park has many surprises to offer: you can take lovely strolls along the vast fields, watch the ships slide by on the Western Scheldt or enjoy the vast inlets and endless levees. Nature, agriculture and port are leaving their mark on the border region, creating opportunities and challenges. Groot Saeftinghe Border Park is a collaboration between 11 Flemish and Dutch partners with the combined development of agriculture, nature, recreation and port as the common thread. Involvement, dialogue and cooperation with residents are key in this respect. This is how partners and residents organise a vital environment together.



www.sigmaplan.be



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