

Inspiration Guide

Ideas for nature-inclusive building



Foreword

All TenneT's activities have a major impact on nature. After all, many of our assets, high voltage transmission lines and high voltage substations are located in natural areas. What we do affects biodiversity, ecosystems and the landscape. Fortunately, our assets can also make a positive contribution to nature. We are not doing this alone.

In 2021, our partners from the Groene Netten (Green Grids) coalition (the Netherlands' major infrastructure operators: Alliander, Enexis, Gasunie, KPN, ProRail, Rijkswaterstaat and Stedin) and TenneT expressed our ambitions to contribute positively to restoring biodiversity in a pledge. Together, the areas of these Groene Netten partners cover 922 square kilometres of land and water - more than the Veluwe and a quarter of the nature in the Netherlands. Our dream is to use three quarters of this area for biodiversity restoration and development by 2030. That is almost 750km², a unique opportunity that we

will seize with both hands! One of TenneT's contributions is the application of meandering mowing at our high voltage substations: 40% of the vegetation always remains intact, which ensures that the insect population at the stations has already increased by about 70%. A result of which we are proud.

In the coming years, TenneT, together with the rest of the Netherlands, will face a huge challenge in managing the energy transition. We are working hard to expand our network while not losing sight of nature, residents and the environment.

This inspiration guide helps us look differently at the construction, adaptation and maintenance of our assets.

As CEO of this wonderful company, I would therefore like to challenge everyone to be inspired by the great examples in this guide and to think along in their daily work about measures that make a positive contribution to our environment and biodiversity in the widest sense.

Manon van Beek
CEO TenneT TSO B.V.



Introduction

Over the next few years, TenneT will work to expand and strengthen our grid to meet the goals of energy transition. This is needed to incorporate electricity from existing and new wind and solar farms. In all these projects, nature-inclusive working is a key principle by respecting, protecting and, where possible, stimulating nature. This means including nature measures in the design and execution.

CSR policy

Our aim is to limit negative impacts of our work and create positive impacts wherever possible. To this end, our investment plans include a 'Commitment to Nature' section. This section contains a description of the expected impact on nature, mitigation measures to minimise the impact and, if possible, measures to create a positive impact on nature.

Local residents

Nature inclusiveness is also increasingly a desire from local residents. People are increasingly aware of TenneT's impact on landscape and wildlife and are increasingly alert to it. We also notice this in our projects where we receive questions from local residents such as 'how can TenneT reduce or prevent damage to nature?' or 'how can nature be included in

projects and business processes as much as possible?'. Finally, we also see (future) legislation such as the Environment and Planning Act pushing for 'nature-inclusive' building. Procedures are becoming increasingly integral, qualities count more than spatially defined destinations and stakeholders become shareholders with shared values.

Inspiration guide

It is an ambition for TenneT to include nature inclusivity in energy transition projects and processes. This inspiration guide serves to give project workers, community engagement managers, competent authorities, interested residents and contractors a toolbox and inspiration to make nature-inclusive building the standard. The inspiration guide serves as motivation and inspiration and supports the realisation of our CSR policy. After all, TenneT wants to create value for stakeholders and society.

An active nature policy is part of this.

The inspiration guide describes ready-made services and products which can be used now to promote biodiversity. However, the preference is to elaborate an integral plan at the front of a project that connects with the surroundings. Measures can then be applied which are useful and which reinforce each other.



The inspiration guide is a follow-up to the Landscape Guide drawn up in 2022, with design principles for a qualitative spatial landscape integration of the high voltage grid. By enabling ecology to run parallel with a landscape plan, we can create opportunities for landscape and nature. This often provides options to reduce costs for the integration itself, but also for cheaper long-term management and maintenance. Moreover, by engaging with the surrounding area on landscape integration and nature-inclusive design, the environment can be involved in the incorporation and decorative elements of the design.



Green map

Our green map shows an overview of small and large-scale initiatives. Would you like to know more about our small and large-scale local and regional initiatives? Have a look at our [green map](#)! Great ideas are born together!

Team Nature, Environment and Landscape – Rights & Environment Management



Further information:
groen@tennet.eu

The right choice in the right place

The design of a station, transmission line, or other element in the electricity grid can contribute to ecology, landscape and the stakeholder process. However, not every measure can simply be applied at every place. Aligning the measures and location results in a good and functional design.

To achieve this, a process to arrive at a landscape plan is desirable. Team Nature, Environment and Landscape can play a guiding role in this. Depending on the complexity of the task, steps can be completed quickly or in depth. In a number of steps of the process, the local residents also have a say and a supported and good design can be created together.

How to create a good design?

A good design is created on a case-by-case basis; however, the process is often similar. To really contribute something to the landscape and ecology, the flowchart is a good guideline. First of all, it is important to get a grip on the project site and its surroundings. These may include previously conducted studies, the nature quick scan, historical maps, soil composition, etc, but also the relevant policies of the municipality or province. Based on

the conclusions of this analysis, an initial design concept can be drawn up using the inspiration guide.

This 'idea of the design' can be discussed with the various stakeholders and directly serves as a good basis for a substantive discussion with the local residents. With the input from these stakeholders and the design concept as the backbone of the design, the design is drawn up, with the various ecological and landscape measures, in a dimensionally consistent manner, drawn in. During this process, this inspiration guide can be used, both to conduct the stakeholder dialogue, but also as a reference book.

Drafting a design ensures that the various ecological and landscape measures are in symbiosis with each other and the surrounding landscape, thus making a real contribution. After preparing the landscape design, it is important not only to outline a final situation, but also to be clear about how this will be constructed and how it will be maintained during the construction period. After construction and design maturity, management is also needed to maintain the desired design. This is also part of good design.

Landscape design

When constructing a new station or its extension, sometimes more space is available than for just one ecological element. At this point, a landscape



design that brings together ecological and landscape elements may be desirable. In some cases, a landscape design is also necessary for the procedure and a landscape design can also give substance to an environmental process, for example in a landscape workshop. The design looks at the landscape and ecological added value, and seeks how different elements come together in a harmonious manner, with the environment and the perception of the location also playing an important role. In addition to describing the future situation, the construction and management of the various landscape elements are also described. A good design allows the various elements specified in this guide to reinforce each other.

Conclusions

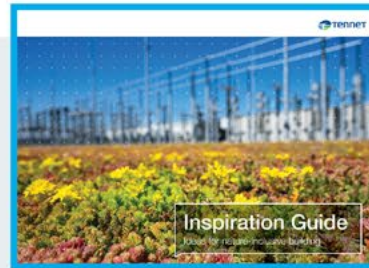
Relevant policy



Inventory and analysis



Conclusions from the analysis and relevant policies (e.g. for nature, environment and landscape) form a basis for the concept design.



Making use of the inspiration guide

Design concept



Check by Team Nature, Environment and Landscape

The design concept shows the main idea of the design without barriers. Broad lines and planes and points represent the main ideas for ecology and landscape.

Design



Check by Team Nature, Environment and Landscape

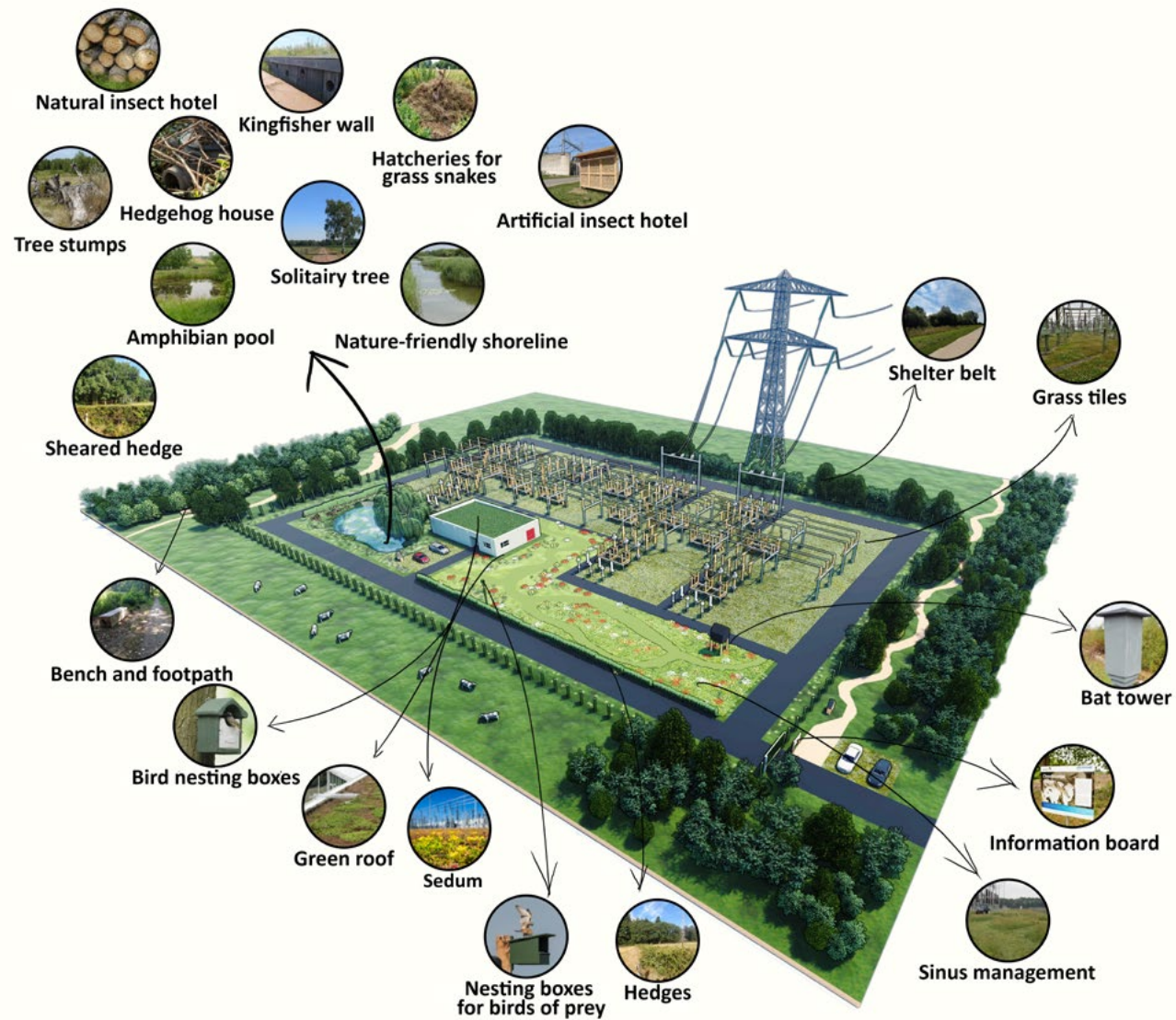
Further elaboration of the concept design so that it 'lands' on the site, dimensionally consistent and with relevant elaborations and images.

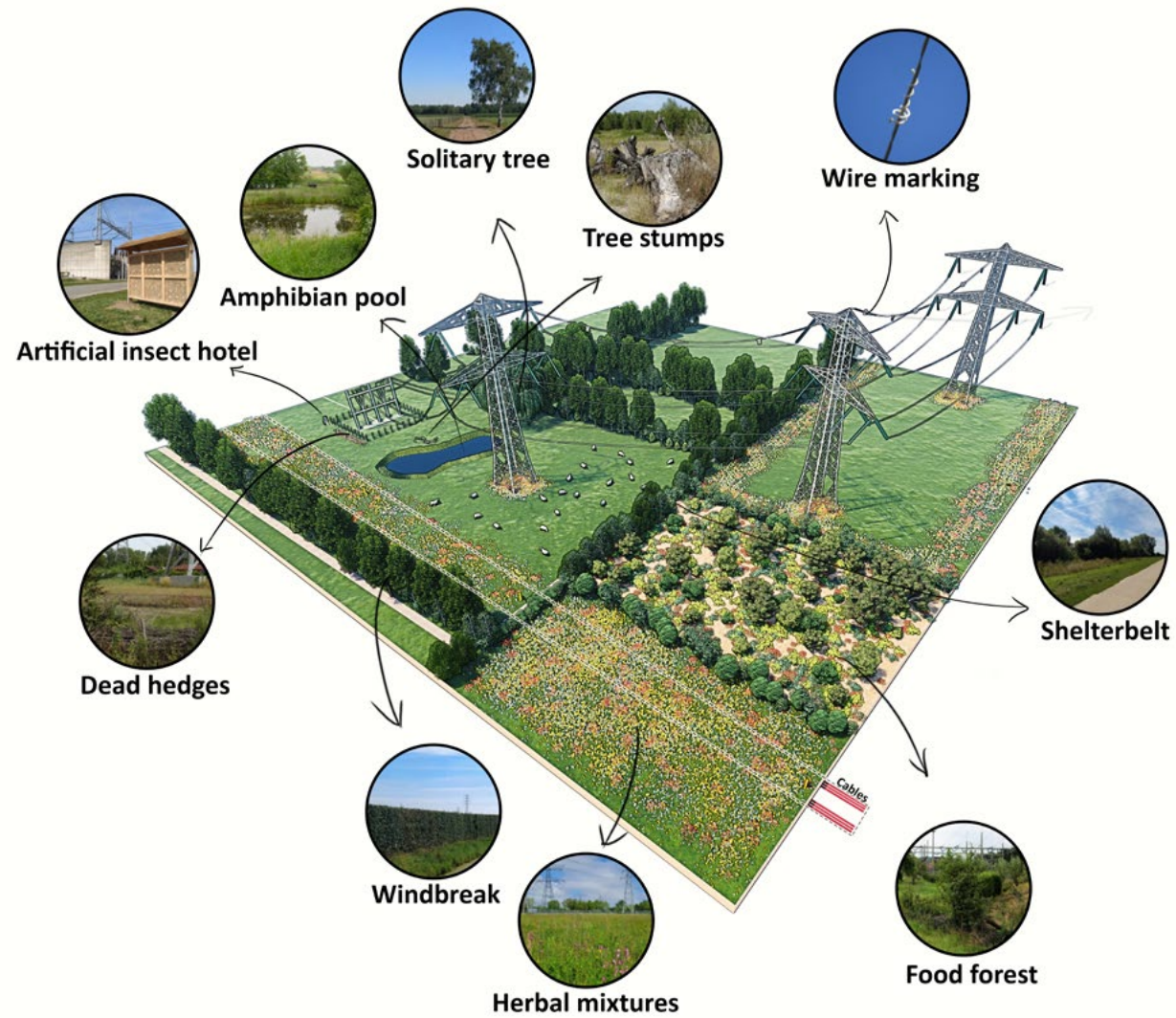
Management and maintenance

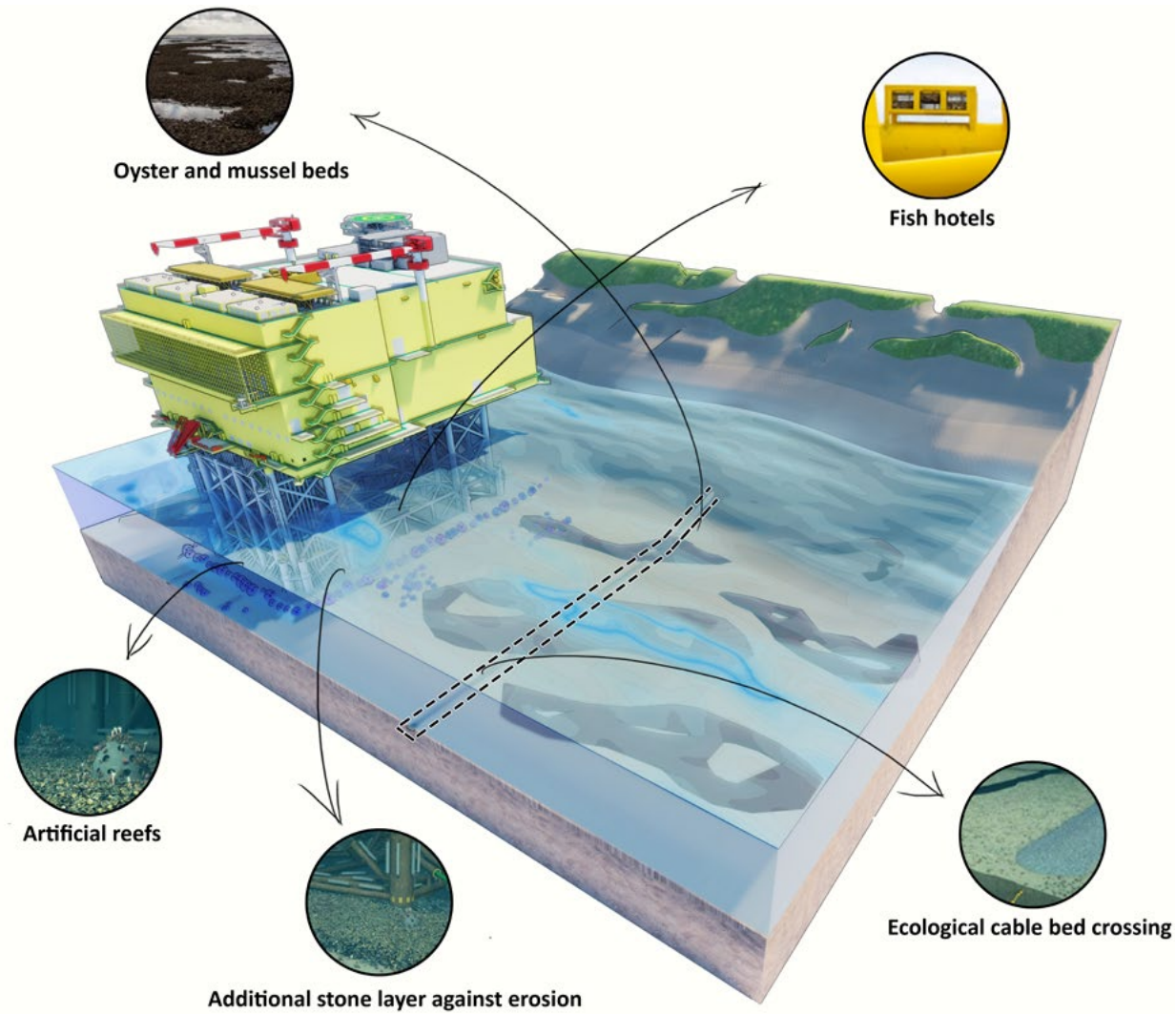


Check by Team Nature, Environment and Landscape

The design should be feasible and manageable with safety and security of supply being paramount. A construction and management section are part of the design.







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Amphibian pool

Ponds are important for amphibians such as frogs, toads and salamanders. Sufficient suitable terrestrial habitat for amphibians is available in most of the Netherlands.

However, suitable breeding waters are often lacking. Creating ponds can make an area suitable for amphibians. Ponds are not only important as breeding waters for amphibians but they also bring variety to a landscape. More variety in a landscape always means more plant and animal species. Ponds can

serve as growing places for aquatic and marsh plants, as habitat for insects and other invertebrates, and as watering places for birds and mammals.

Not only the pond itself but also the slope above the waterline may be ideally suited to certain species groups. These include insects that can make their nests on the sunny north bank.

Several conditions must be taken into account when creating a pond:

- Stagnant or at most weakly flowing water;
- Not too heavily shaded to ensure sufficient sunlight;
- Shallow, so they can be quickly warmed up by the sun;
- Sufficiently deep for the development of larvae in the summer;
- Rich in algae and plankton (food for larvae);
- Provided with sufficient aquatic vegetation, i.e. egg deposition and hiding places;
- Quiet, on the sunny northern shore;
- Provided with gradually sloping banks with a minimum slope of 1:3.

For more information, please visit: www.ravon.nl/Helpdesk/poel-aanleggen.

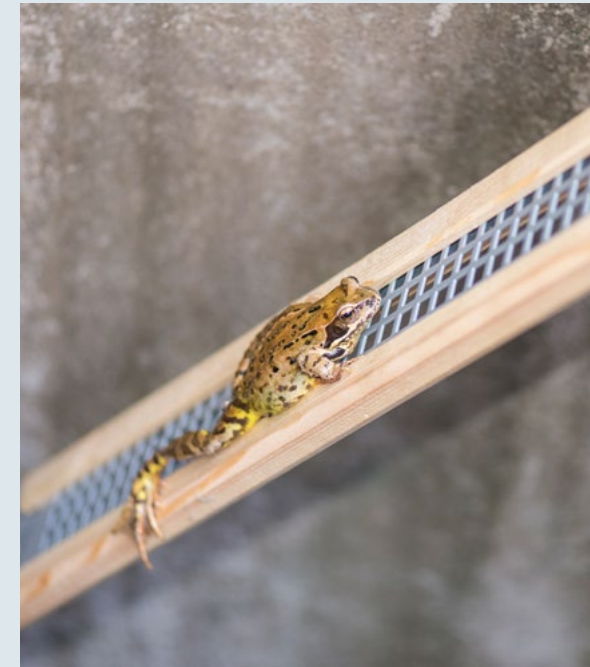




Amphibian ladder

Toad migration is a well-known annual phenomenon where toads (and other amphibians) migrate from their winter quarters to water to reproduce. During this migration, amphibians encounter various obstacles (such as street gullies) from which they are usually unable to escape. National research by RAVON shows that hundreds of thousands to a few million amphibians and other small animals such as mice end up in street gullies, wells, storm drains and cellar

holes in the Netherlands every year. This typically occurs during the migration period. As a lifeline for these animals, it is possible to install an amphibian ladder. This ladder saves not only amphibians, but also hedgehogs and young ducks. The ladder can be placed on all TenneT sites where there are holes, cavities and pits under a transformer (drip trays) that the animals cannot get out of without help.



Points for consideration:

- The ladders should be checked annually to ensure they are still functioning adequately;
- No leaves or other debris may stick to the steps.

Would you like to make your own amphibian ladder? Go to: www.groei.nl

‘Our high voltage grid is a network through the landscape. Using our network as a connection between various natural areas creates a true green network. By stacking various functions such as high voltage (and safety) and biodiversity but also e.g. fire corridors, TenneT is taking climate-adaptive measures to accelerate the energy transition.’

– Erik Salari
Project Manager of Nature, Environment
and Landscape at TenneT





Artificial reefs

Coral reefs are beautiful to see, but above all, they play a central role in the sea. Many marine inhabitants rely on them and the reefs provide numerous goods and services to the ecosystem. Unfortunately, climate change and local human activities such as fishing, shipping and coastal development pose a threat. TenneT's offshore platforms provide opportunities for all species of anemones, poriferans and corals. We reinforce this with the construction of artificial reefs. Artificial reefs come in different forms. Some are specially designed and used to promote marine life. Others, such as shipwrecks and structures in inhabited areas, such as jetties,

sea walls and wave breakers, inadvertently attract marine life. Due to increasing offshore developments, there are more and more of such structures. TenneT can participate in this development by creating artificial reefs at various locations near offshore projects, for the benefit of the marine ecosystem. In doing so, TenneT plays its part in boosting underwater biodiversity.



Point for attention:

- Each location requires a custom solution.

For more information, please visit:

www.reefsystems.org



Bench and Footpath

TenneT's property sometimes extends beyond the terrain inside the fences of a high voltage substation. This land may be reserved for future extensions, but it is also used for proper landscape integration. This can result in beautiful places. By opening up these green spaces with a path or footpath and by adding one or more benches, the local residents can also enjoy the space around the station. If a picking garden is planted, this

picking garden must be accessible. A path and the locations of benches are eminently a design task which allows the perception of the station and the incorporation of its surroundings to be managed.



Points for consideration:

- A path and a bench are only necessary when users are expected;
- The location of the bench and the shape and location of the path are a design challenge;
- Depending on the expected use, a trail (Mowed path, feral) or a path with a semi-paved surface (gravel, shells, etc) can be chosen;
- The path must be situated outside the fences of the station in such a way that it does not disturb plants and animals.



'With its high voltage transmission lines, TenneT is often a guest on other people's land. As a result, we unintentionally leave a footprint. I like the fact that we are eyeing measures to reduce that footprint and reduce the impact of our work on nature and the landscape.'

– Angélique Avink
Head Rights &
Environment Management
at TenneT

Tree stumps

It is common for tree stumps to remain in the forest after pruning and/or felling work is carried out. In the past, these were often cleared because it was seen as negligent or careless forest management.

We now know that these stubs are extremely useful. Insects, fungi and animals love tree stumps. It even makes for a true feast. Apart from cover, digger bees, for example, can nest in the soil material that sticks to the roots. The dead wood itself is broken down by an array of insects, arthropods, molluscs and beetles that can then serve as food again for birds such as the great and lesser spotted

woodpecker or the iconic black woodpecker. Tree stumps can also be placed in places where they contribute to biodiversity and do not hinder future management. They can, for instance, be left at above-ground green space projects or at TenneT substation sites.

Point for attention:

- Leave tree stumps only where they will not interfere with future management and maintenance or where work is being carried out or planned.

For more information, please visit: www.ecopedia.be





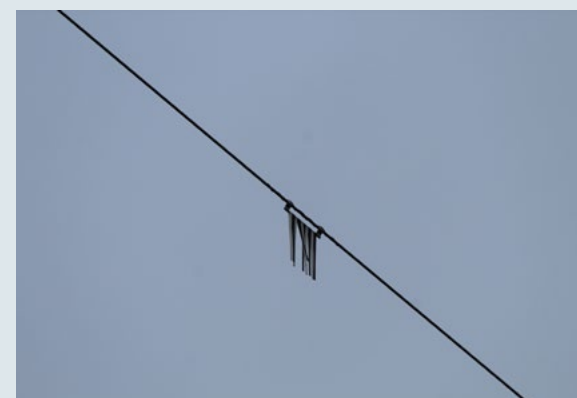
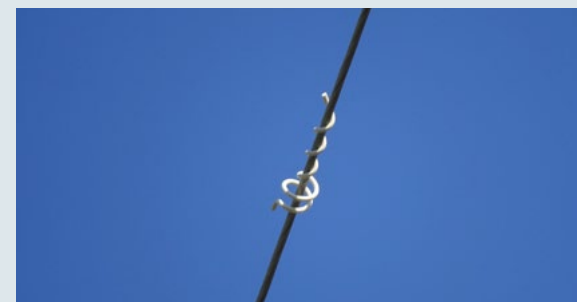
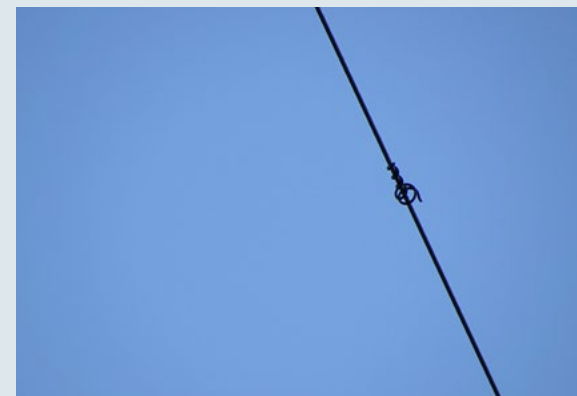
Wire marking

The high voltage grid can pose risks to birds that come into contact with it or that use it to build a nest, or for other purposes. For instance when birds in flight fail to see the earth wire or conductors and fly into them. The eyes of many bird species are not forward-facing, so visibility in the direction of flight is not optimal. If they come into contact with an earth wire or conductor, they can be injured or killed.

To avoid wire casualties to the extent possible, TenneT uses wire markings. We make the transmission lines more visible to birds by hanging plastic or metal spirals ('pigtales') on the earth wire. We also use black and white bird flight diverters in the earth wire. The pigtales and bird flight diverters are proven effective measures that ensure fewer birds fly into the earth wire.

Point for attention:

- New overhead transmission lines and overhead transmission lines that are being upgraded and of which the earth wire is replaced are currently fitted with pigtales by default. We are currently studying which of the measures (pigtales or bird flight diverters) are most effective in which situations.





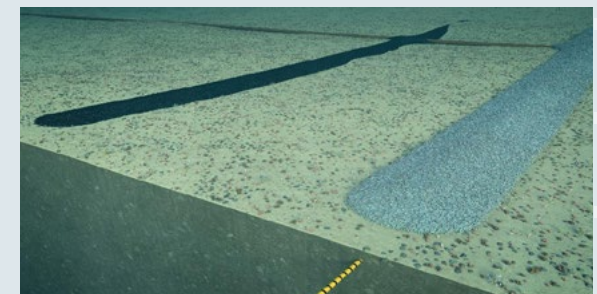
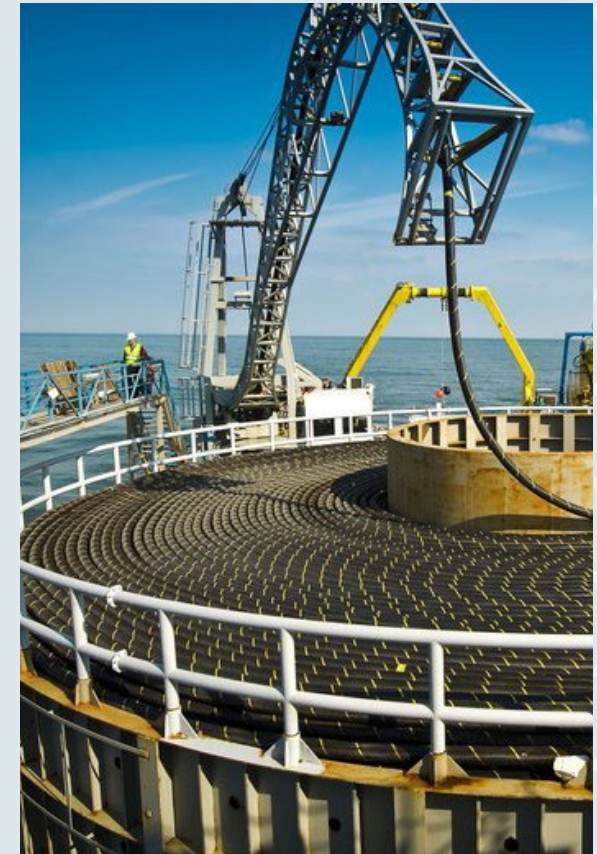
Ecological cable bed crossing

In the North Sea, TenneT is working on the high voltage transmission lines that connect the designated wind areas to the mainland. Where the cables cross an existing oil and gas pipeline, the cables rise above the sea bed. At these sites, a granite top layer is dumped on top of the cable to protect it. Depositing calciferous stones will ensure that

various benthic species will find it easier to nest here and that a different habitat will emerge at these sites. Over the years, 'artificial reefs' can emerge at these sites in the North Sea, where anemones, poriferans and coral can settle.

'TenneT is investing in offshore ecological measures for the grid that are integrated into the design of our offshore structures to the extent possible. One example are fish hotels on the piles of a jacket to provide shelter to juvenile fish. We are also adapting the stone deposits used as erosion protection where possible to both provide a more attractive habitat for fish, crabs and lobsters.'

– Annemiek Hermans
Offshore at TenneT



Ecological lighting

Like all densely populated areas in the world, the Netherlands is increasingly lit up at night with artificial light. This greatly affects nocturnal animals. The reason is that artificial light disrupts the biological clock, orientation and mating of many animal species such as bats, mammals, moths and birds. In addition, the biotopes of the aforementioned species are becoming smaller and smaller as the animals start avoiding highly lit areas. Extensive research has shown that white and green light are found to be most harmful to nocturnal animals. Research shows that red

light is least harmful to animals. Red light can be used, for example, at all substation sites. Furthermore, the lighting at substation sites can be designed in a smart manner. By illuminating the sites only when needed, light pollution is reduced. The light can also be shielded and illuminate only locations that need it. Each substation site will require customisation to reduce light pollution to the extent possible.

oints for consideration:

- All substation sites will require customisation to limit light pollution;
- The use of red light is the least harmful to nocturnal animals.

For more information, please visit: nioo.knaw.nl



Hedgehog house

You find hedgehogs throughout the Netherlands. You can find them in gardens, forest edges, brushwood and in deciduous forests. Hedgehogs are found in all towns and villages in the Netherlands where greenery and shelters are present. Hedgehogs are true nocturnal animals and during the day they often sleep in a nest of leaves, moss or under bushes and dead hedges. They spend much of the year in hibernation. Hedgehogs eat beetles, caterpillars, earthworms and snails. Hedgehogs are wild animals that have

adapted to human habitats. Over a period of 10 years, 50 percent of all hedgehogs disappeared. The main cause is the reduction of greenery in gardens, for instance, which means there is less and less food available and there are fewer shelters. To encourage hedgehogs, hedgehog houses can be installed that function as breeding and/or hiding places. Hedgehog houses can be installed in combination with dead hedges or they can be placed near leaf piles. This means it is also possible at substation sites.



Points for consideration:

- Avoid steep sides;
- Provide sufficient shelter.

For more information, please visit: www.egelbescherming.nl & Mammals | Vivara Pro

‘Manon van Beek has expressed a clear and beautiful ambition to contribute positively to improving and restoring biodiversity. Vivara Pro is pleased and also proud to have been able to provide input for this inspiration guide. To this end, TenneT’s Team Nature, Environment and Landscape made several visits to the “Vivara Pro Nature Experience Centre” and also our own “Vivara Pro Nature Experience Garden” of about 2.5 hectares. At these venues, we were able to enthuse, inspire and motivate each other in a special way. And here is the result: a beautiful and “inspiring toolkit” to make nature-inclusive building a standard. As Vivara Pro, we are happy to be there for all stakeholders to help shape and implement this “full of (TenneT) energy”. Good luck!’

– Eric Michels, Head of Vivara Pro





Additional stone layer against erosion

In the large-scale rollout of offshore wind, the use of large stones or an additional layer of stone can serve as a protective layer to prevent erosion. Protecting against erosion or scouring with an additional layer of stone creates an artificial reef with a positive effect on the marine environment that contributes to achieving national and international

conservation targets. Depending on the shape, it provides many benefits for reef species living on or in the seabed, such as lobster, crab, juvenile cod and other reef-associated species. If the stone layer is studded with flat (European) oyster, it could be the starting point of an oyster reef.



Points for consideration:

- Minimum area to be covered is 20% of the total erosion protection layer;
- An additional layer of rocks with adapted grading of e.g. 40-200 kg placed on top of the standard protection layer as shelter for juvenile cod.



Sheared hedge

The hedge has always had a prominent role in the Dutch landscape as a cattle barrier and to mark boundaries. With the increase in scale and invention of barbed wire, many of the hedgerows disappeared. In the process, not only cultural history has disappeared, but

also the added ecological value that hedges have. Hedges not only provide a clear (visual separation), but also function as a 'highway' in the landscape for many species.

Points for consideration:

- Use native and preferably area-specific plant material;
- A hedge can consist of several species mixed together;
- A hedge can ensure that technical elements blend into the landscape;
- A hedge with thorns can provide a barrier effect with a natural look;
- A hedge should fit into the landscape in which it is placed, with species that suit the soil composition;
- Hedges can be part of a landscape plan in which an integral plan is drawn up for a site from an ecological and landscape point of view.





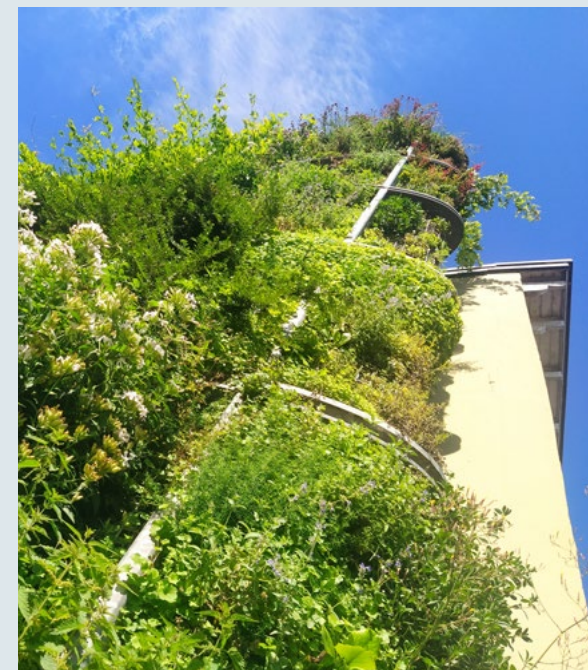
Façade greenery

Besides greenery on roofs, there is another location where more greenery could be applied: façades. Façade vegetation is generally defined as a form of vegetation by climbing plants whose roots are in the soil at the base of a façade. Plants growing in the cracks of old city or quay walls can also be considered a natural form of façade vegetation. Green façades contribute to energy saving, noise reduction, clean air and biodiversity. The most well-known climbing plant is the ivy, but nowadays several types of climbing plants, crops and shrubs can be used on façades. Ivy has plenty of nectar for insects in autumn when most plants stop

flowering and is also the host plant of the Holly Blue. Various methods are available today to green façades, such as applying planters, façade panels, or from the ground up. A vegetated wall provides shelter, nesting and food for birds and insects. Façade greenery, like green roofs, can be applied to buildings on TenneT station sites.

Point for attention:

- It is preferable to use native plants.





Grass tiles

A grass tile is a hollow plastic or concrete tile (usually with a honeycomb structure) that allows you to pave your driveway, for example while retaining a natural look. By filling the hollow spaces with topsoil and grass seed, grass will grow between the tiles. The tiles are usually 40x60 centimetres and form a green verge once the grass is fully grown. Grass tiles are paving material for, among other things, verges, road widening and other areas such as car parks. The benefit of grass tiles over clinkers and asphalt is that it allows much more water to pass through to the ground which is an advantage with the increasing prevalence of extreme

showers. Asphalt and pavements can get very hot in summer, causing cities to heat up more and more in summer. Grass tiles are actually temperature reducing due to the green grass on top of the tiles. Grass tiles also provide a stable surface that will not easily subside. From a sustainability perspective, it is also possible to recycle existing paving as grass concrete tiles. This is easiest done by paving clinkers in a millwork pattern. The space between the clinkers allows herbs to grow and water to infiltrate.

Points for consideration:

- The use of concrete grass tiles is preferred;
- When laying grass tiles next to buildings, a permeable foundation is important.





Grazers

Grazers, such as cattle, sheep, goats and horses, can be used to keep a fenced-in area 'open' (pressure grazing). Grazers can provide a more natural image than using (mowing) machines to keep an area open. There is, however, a significant difference between pressure grazing and extensive grazing. In fact, extensive grazing creates a mosaic of different growth heights, sandy areas where the soil is opened up are created that benefit bees and possibly even some brushwood is created. Manure from grazers can additionally provide a great diversity of insects, provided the grazers are not de-wormed in summer. The disadvantage of

grazers compared to mowing and drainage management is that fewer nutrients leave the area and tall forbs can start to dominate. For grazers to occupy the property right strip, screens may need to be installed. The choice can be made to set up temporary screens during each grazing period. It is also possible to install permanent screens. If pressure grazing is used, temporary screens are a good option. Year-round grazing requires permanent screens.

Points for consideration:

- A sound screen should be installed;
- Grazers like to brush against things, which may result in damage to installations;
- Grazers need care, such as water supply and health checks;
- If unwanted overgrowth or brushwood develop, mowing will still be required.



For more information, please visit:
www.natuurkennis.nl

Gravel or shell roof

A flat (vegetated or not) roof can be made suitable as a nesting site for bird species such as oystercatcher, common tern and various species of plovers. In nature, shorebirds breed on shingle beaches, permanently dry sandbanks, in primary dunes and in salt marshes. At these locations, they are vulnerable to gulls, crows, foxes, rats, stray dogs and cats. On roofs, they are less vulnerable. This is probably one of the reasons why the oystercatcher

increasingly chooses to breed in urban areas, as this is in all likelihood more successful. Solutions like placing shallow trays on rooted canvas with gravel, possibly mixed with shells, makes a roof suitable for the above bird species. It is also possible to cover the entire roof with gravel and shells.

Points for consideration:

- Due to the (exposure to) heat, sufficient shelter should be available in the form of pallets and pipes;
- Open rain pipes are dangerous for young birds; they can be closed with netting.

For more information, please visit:
www.checklistgroenbouwen.nl/maatregelen





Green roofs

Green roofs are roofs that focus on enhancing (local) nature and biodiversity. Green roofs are increasingly common in the Netherlands. Additional advantages of green roofs are that they capture water, for example, have a cooling effect in increasingly hot summers and, conversely, retain heat in winter. Green roofs have a natural (vegetation) covering that matches the immediate environment of the roof. Various types of vegetation can be installed on green roofs. These include lawn, sedum, grasses, herbaceous plants, dwarf shrubs, shrubs, semi-shrubs and trees. Depending on the type of vegetation, green roofs attract insects and other invertebrates. Birds and bats benefit from this. The value of a green roof can be further enhanced by adding additional

objects with an ecological function. Examples include tree trunks/stumps, bee hives, insect hotels, shallow roof ponds or stone piles. Green roofs are suitable for installation on, for instance, roofs of buildings at TenneT substation sites and can be combined with solar panels. Due to the cooler temperatures on a green roof, solar panels will have a higher efficiency than on a standard roof. The use of bifacial solar panels will also allow light to pass through the panels, providing enough light under them to allow plants to grow.



Point for attention:

- It is preferable to use native plants.
- No energy may be supplied back by TenneT: the generation should equal the consumption.
- Solar panels may affect the external appearance of the building, which may need to be coordinated with the municipality; it may also conflict with an image quality plan.

For more information, please visit:
www.greendealgroenedaken.nl

Shelterbelt

Shelterbelts have ecological, landscape and cultural-historical value. In the past, every green element had a utility function, today it is mainly about aesthetics and biodiversity. The location in the country and the landscape determine the desirability, shape and species composition of the shelterbelt. Shelterbelts can be used to blend assets into the landscape. By using native species, the planting can better withstand drought, flooding and pests. In addition, native plants are very valuable for birds and insects; a pedunculate oak, for example, has hundreds of ecological relationships. Some species are

even dependent on a single species. For example, the blackthorn butterfly needs blackthorn, while the lesser kingfisher butterfly needs honeysuckle. In turn, berry-bearing species such as Yellow rose, hawthorn and privet are an important food source for various bird species. Shelterbelt rows provide suitable nesting opportunities for brushwood species such as blackbird and dunnock. A tall pedunculate oak, for instance, is a prime location for a buzzard or great spotted woodpecker.

Points for consideration:

- Shelterbelt and species composition should fit into the landscape;
- Guidelines on planting and high voltage lines;
- Guidelines on planting and cables.

Installation and management of shelterbelt plantation

www.landschapsleutel.wur.nl

www.heggen.nu/plantgoed



Kingfisher wall

Kingfishers are birds of streams and rivers with fresh, flowing water but they also breed near still clear water in lakes, marshes, parks, gardens and fens.

They dig their own nests with a depth of least 50 centimetres in steep sandy banks or in root balls of fallen trees. You can usually see the kingfisher shooting briefly as a blue flash across the water or hear its loud, high-pitched, and shrill call. Kingfishers eat fish and water insects. Despite its name, the kingfisher actually does not benefit from harsh winters

with ice. The kingfisher likes the presence of some trees and bushes near their nesting sites from where they can hunt. Kingfisher walls can be constructed on substation sites near rivers and streams, for example, but always near water. Kingfisher walls can be constructed naturally or artificially by installing a concrete kingfisher wall containing some ready-made artificial nests.

Points for consideration:

- The wall should be vertical and at least 150 centimetres wide and 50 centimetres high;
- There should be a (sitting) branch near the wall;
- There should be sufficient trees and shrubs near the wall;
- Water should be present under the wall.

For more information, please visit: www.vogelbescherming.nl & www.kfnp.nl



Information board

An information board provides brief and concise information to the public in text and images. It is used to explain to the public at a specific location about, for example, our assets or the nature measures we have taken at that location. This could include an explanation of the sheep flock that comes to graze once in a while below the connection. Or about which insects live in an insect hotel. The board also always provides information about TenneT. Who we are and what we do. Information boards are placed such that the public sees the object over or past the board.

This is often on a cycling or walking route. But it could also be at a high voltage substation, for example. We may install an information board together with partners. For instance a municipality. In such a case, we make the board together.

Points for consideration:

- The information board is created in line with the corporate identity, in consultation with the Communications Department. If the board is created together with a partner, at least the correct logos should be used;
- The information board must be sustainable;
- The information board must contain contact information of TenneT.



Herbal mixtures

Sowing herbal mixtures is a good method when you want quick results to increase biodiversity at a site. Unlike regular green grass vegetation, an herbal mixture consists of herbaceous species that all flower and thus attract flower-visiting insects. Herbal mixtures are also important after flowering, flowers turn into seeds which in turn are important food for birds. Insects overwinter in the overhanging stems and the soil life under herb-rich vegetation is much richer than that of a regularly mowed lawn.

An important condition for sowing herb mixtures is that they contain only native and

autochthonous herbs. This is essential to be of value to insects, because apart from the flower, the rest of the plant can also serve as food for caterpillars, for example. In addition, the mixture must be suitable for the subsoil. Is it wet or dry and nutrient-poor or nutrient-rich? Herb mixtures can be combined with insect hotels to provide nesting opportunities in addition to food.

Points for consideration:

- Use only native and autochthonous herb mixtures;
- Apply the right mixture for the right subsoil.

For more information, please visit: www.cruydhoeck.nl



Artificial insect hotel

An insect hotel allows insects to hibernate, lay their eggs and take shelter during cold and rainy weather. Wild bees in particular are stimulated by the installation of an insect hotel.

An insect hotel often consists of a wall of different elements to encourage as many species as possible. Such elements may include wood with drilled-out corridors,

bamboo stems, reed stems and clay blocks. An insect hotel should always be installed in combination with: sowing native flower mixtures and planting native brushwood groups to guarantee food in addition to shelter. To create a working insect hotel, it should be purchased from a reputable party.

Points for consideration:

- Drilled-out corridors should not have burrs so the bees do not damage their wings;
- Hotel should preferably face south;
- Hotel should have a roof with overhang to prevent rain impact;
- Food near the hotel should be guaranteed.

For more information, please visit:

www.landschapsbeheergelderland.nl
Insect wall | Vivara Pro





Hedges

The hedge has always had a prominent role in the Dutch landscape as a cattle barrier and to mark boundaries. With the increase in scale and invention of barbed wire, many of the hedgerows disappeared. In the process, not only cultural history has disappeared, but also the added ecological value that hedges have. Hedges not only provide a clear (visual

separation), but also function as a 'highway' in the landscape for many species. Hedges provide cover and nesting opportunities for field and songbirds and provide food for bees and butterflies with their blooms in spring and food for birds and mammals with their berries in autumn.

Points for consideration:

- Use native and preferably area-specific plant material;
- A hedge can consist of several species mixed together;
- A hedge can ensure that technical elements blend into the landscape;
- A hedge with thorns can provide a barrier effect with a natural look;
- A hedge should fit into the landscape in which it is placed, with species that suit the soil composition;
- Hedges can be part of a landscape plan in which an integral plan is drawn up for a site from an ecological and landscape point of view.





Marten box

Two very similar marten species are present in the Netherlands that use marten boxes. These are the stone marten and the pine marten. The stone marten prefers the urban environment and the pine marten lives mainly in forest areas but nowadays also in green city parks. You won't find these species often because they are mainly nocturnal and live hidden away. There are also other mustelids living in the Netherlands but they hardly use marten boxes. The stone and tree marten are making a significant advance from the eastern

Netherlands across the country. Nowadays, you can even find both species in the heart of Amsterdam. Placing nesting boxes allows animals to take shelter or build a nest. The box can be installed in combination with, for example, a dead hedge in which they can shelter.

Points for consideration:

- Place pine marten boxes at a minimum height of 2.5 metres on a tree or façade;
- Place stone marten boxes in a sheltered location (e.g. under bushes or dead hedges) on the ground.

For more information, please visit:

www.zoogdierenvereniging.nl & [Mammals | Vivara Pro](#)





Gull U

Gulls are found on the coast but some species can also be found inland. They breed together in large colonies. They usually eat crabs and fish. Larger gulls sometimes also prey on other birds, such as pigeons. Gulls seek nesting sites in the dunes but also increasingly in port areas and on flat roofs. On flat roofs of buildings, they are safe and can hatch their eggs without any threat from foxes. Gulls prefer to nest on flat roofs with gravel; substation buildings and substation sites with gravel areas are ideal for this

purpose. Besides gulls, other species may also benefit from gravel roofs such as oystercatcher, common tern and little ringed plover (see gravel nesters). To encourage gulls and gravel nesters, gravel/shell banks with a gull U profile on them can be constructed at substation sites near the coast. Gulls can shelter and nest under the U profile.

Coastal birds breeding area, 10 January 2022.



Natural insect hotel

A natural insect hotel is built using natural materials and elements, in a way as you might encounter them in nature. An insect hotel allows insects to hibernate, lay their eggs and take shelter during cold and rainy weather. Wild bees in particular are stimulated by the installation of an insect hotel, but many other species groups also benefit from this measure. A large insect hotel should be constructed with trunks or stumps of native trees. Filler sand, clay and loam are used as filler material between the trunks. The

wall should always face south. An insect hotel should always be installed in combination with tools/meals: meandering mowing management, sowing native flower mixtures and planting native brushwood groups to guarantee food in addition to shelter.

Points for consideration:

- Use native hardwood tree species such as pedunculate oak or sweet chestnut;
- Use different filler materials such as clay, loam and filler sand.
- Any drill holes should be drilled without splinters or fraying.



Nature-friendly shoreline

A nature-friendly shoreline has a gradual transition from the water to the land. Nature-friendly shorelines are currently widely constructed to improve biodiversity, landscape and water storage. This can be achieved by excavating the bank and creating a gentle slope. Many riparian and underwater plants grow on the marshy bottom and in the shallow water. These attract a huge variety of species, such as different species of fish, insects, amphibians and small mammals. The aforementioned species in turn serve as food for various bird species.

Another positive effect of nature-friendly shorelines is that the water quality improves. Nature-friendly shorelines also provide water storage. There will be less flooding as the banks provide space for water. During dry periods, they can act as water buffers. Constructing nature-friendly shorelines is relatively easy to fit in at substation sites and overhead transmission lines.

Points for consideration:

- The slope is maximum 1:3, but preferably gentler 1:10;
- The gentle slope starts at least 50 cm below the water level, deeper if possible;
- The gentle slope extends to at least 10 cm above the waterline;
- Underwater, the gentle slope has a width of at least 1.50 metres.





Nesting sites for wild bees

Many wild bee species and other insects like sandy soil with little vegetation in which to dig their nests. It is important to preserve such open vegetation where possible. There are possibilities to construct nesting sites for these species. Some examples that can be applied to TenneT substations and transmission lines are shown below.

Sandy soils under a cover

Constructing a sand bed under an overhang of a station building can serve as a nesting site for wild bees. Other insect species, such as the ant lion, also use such facilities.

Nesting mounds

A nesting mound is easy to create by laying down a mound of nutrient-poor soil in a sunlit

spot. It is important that sandy soil is used for this. It is easier for bees to dig their nests in sandy soil than in sand or clay.

Escarpments

Escarpments are easy to create by manually cutting slopes or nesting mounds facing south. This does not necessarily need to be over large areas. For instance, a height of 40 cm and a length of 1 metre can already be a good place for hundreds of bees. If an escarpment is cut on a nesting mound, it is important that the soil has first settled for several months to prevent collapse.



‘Most of the 360 wild bee species in our country dig their nests in the ground. By offering sandy slopes facing south, we can also give these bees a helping hand in their reproduction.’

– Jac Hakkens
Ecologist at TenneT

Points for consideration:

- When creating nesting sites, it is important to have flowery vegetation in the area;
- When the excavated parts regrow after a few years, further excavation is not always an option. However, new soil can then be applied here, so there is once again bare ground.

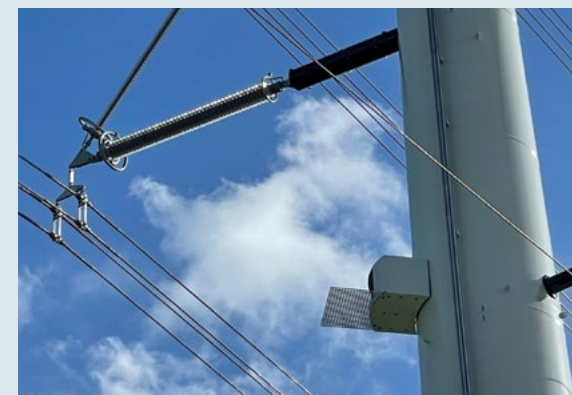
Nesting boxes for birds of prey

In the Netherlands, there are various birds of prey that nest in nest boxes. Examples include the kestrel, peregrine falcon, little owl, tawny owl, eagle owl and barn owl. These boxes can be installed, for example, to increase biodiversity, manage mouse populations, or as a compensatory measure. The above bird species are under threat in the Netherlands. This is partly due to the decline of suitable breeding sites (disappearance of pollard willows, fruit trees, trees with cavities, etc) and changes in the landscape (such as intensification of agriculture and expansion of villages and towns).

At substation sites, these nesting boxes can be installed in the outlying area or near forests. The installation of nesting boxes should be combined with the provision of lookout and resting places (such as posts or trees) and by creating, for example, shrubbery and dead hedges to increase the food supply.

Points for consideration:

- The surroundings should be sufficiently dark;
- There should be sufficient lookouts and hiding places in the area;
- Food supply in the surrounding area should be encouraged if necessary;
- The nesting box should be located away from disturbance and light.



For more information, please visit:

[Vivara kestrel nesting box](#)

[Little owl nesting box](#)

[Peregrine falcon eagle nesting box](#)

Bird nesting boxes

The house sparrow and swift are the two most common bird species living in buildings. House sparrows and swifts are strongly tied to humans and are dependent on what humans offer them as nesting sites, whether intentionally or unintentionally. They often use the same nesting site for years at a time which can usually be found under roof tiles, in cracks and holes in walls but also increasingly in nesting boxes.

Burrowers are bird species that build their nests in burrows and raise their young in them. This includes many bird species that live mainly in forest and (urban) parks. These include woodpeckers (they carve their own burrows) and birds that use existing burrows such as the nuthatch, collared redstart, pied flycatcher, jackdaws, starlings, burrowing pigeons and various species of titmice.

Due to the changing landscape, building-dwelling birds and burrowing birds are declining rapidly as the supply of nesting sites is rapidly disappearing. New buildings often lack suitable nesting sites for these species because building-dwelling birds are not taken into account in the design. Suitable cavities for burrowing birds are also lacking. Providing alternative habitats in the form of built-in and surface-mounted nesting boxes on and in existing buildings and trees may help keep the trend of these species stable. In new buildings, habitats can be created in walls or empty spaces in, for example, an overhang, in consultation with the architect, and nesting boxes can be hung on trees.



Points for consideration:

- Ensure sufficient variation in wind directions on buildings and dwellings;
- Ensure a free flight path.

For more information, please visit:

[Vivara pro hollow bricks for birds](#)
[Why we automatically apply nature-inclusive building](#)
[In my garden/nesting boxes/type of nesting boxes](#)



Oyster and mussel beds

Shellfish beds are natural features in the Delta. They slow down local currents and break waves while protecting mudflats and slabs from wave erosion. In addition, they can sometimes be used as an alternative to breakwaters made of poured stone and concrete blocks. Shellfish filter their food out of the water after which they excrete it. This, in turn, serves as food for all kinds of soil creatures. One way of creating an oyster reef or mussel bed is by depositing dead and live shellfish in baskets. The empty shells act as

attachment sites for new larvae. Oyster and mussel beds increase biodiversity. They form the substrate for other shellfish, algae and many other species. They also serve as foraging areas for lobsters, crabs, fish and starfish, among others, as well as birds such as waders, ducks and gulls. Offshore TenneT sites and projects are ideally suited for oyster and mussel beds.



Point for attention:

- For the attachment of oysters and mussels, a firm substrate is preferred.

For more information, please visit:

www.naturetoday.com

Sand martin wall

Sand martins are characteristic birds of open areas with fresh water such as river areas. To breed, sand martins need a bare sandy or loamy escarpment. They dig nest burrows (up to 120 centimetres deep) in this escarpment where they live in colonies. Most escarpments are man-made at, for example, sand excavations, sand depots and construction sites. Originally, sand martins breed in river and stream banks, riparian banks and dunes. Sand martin walls

can be constructed on substation sites near rivers and streams, for example, but always near water. Sand martin walls can be constructed naturally using sand and loam, but also artificially by installing a wood-cement or concrete sand martin wall containing ready-made artificial nests.

Points for consideration:

- A suitable wall is perpendicular, preferably facing north, northeast or east, and not or only sparsely vegetated;
- The approach route to the wall should be free of vegetation;
- Ensure the site is not publicly accessible to avoid disruption.

For more information, please visit:
[Vivaro pro Sand martin wall](#)



Hatcheries for grass snakes

The grass snake is a harmless and non-toxic snake. It is one of three snake species found in the Netherlands. This snake is found in riparian zones, wet rough areas with vegetation. Grass snakes mainly eat frogs and toads but also mice, worms or snails. Grass snakes use a variety of habitat types, namely wintering sites, foraging sites and reproduction sites. For reproduction, grass snakes need locations where the temperature is 25 to 30 degrees. This can, of course, be at locations where grass and leaves accumulate and where rotten tree trunks are present.

However, these reproduction sites have declined significantly in number over the last few decades. To increase the survival chances of the grass snake in the Netherlands, hatcheries can be created on TenneT sites (e.g. a high voltage substation). Hatcheries can be artificially created using hatching material (leaf litter, horse manure and branches). Materials released during mowing at the high voltage substations can also be used. Hatcheries are created before May because this is when females start looking for suitable breeding sites.



Points for consideration:

- The temperature in the hatchery should be consistently around 25 to 30 degrees Celsius;
- Hatcheries must be created before the month of May;
- Hatcheries should be located near water (2 metres) and brushwood or shrubbery (1 metre);
- A hatchery should be about 2 to 3 metres wide and up to 2 metres high.

View this PDF for more information:
www.ravon.nl



Sedum

Sedum is a plant from the succulent family Crassulaceae. This family has as many as 400 to 500 different species. Succulents are able to absorb and store water in their leaves. Because these plants can store water in their leaves, they are quite resistant to drought. Previously, sedum was known as ground cover. Today, sedum is best known for green roofs, which are becoming increasingly popular. Sedum contributes to biodiversity. The sedum flowers attract insects such as

butterflies, bees and bumblebees. This, in turn, provides food for birds and other animals. In addition, sedum acts as an insulator in summer and winter and can capture particulate matter and absorb CO₂. This improves the air quality. Sedum can be used on roofs of buildings or on the ground at TenneT substation sites.



Point for attention:

- Always check whether it is possible to create native sedum vegetation. This will ultimately increase diversity.

‘To make a real contribution in our role as a “leading green grid operator”, we need to take every opportunity to make full use of our positive impact on nature and create social value.’

– Akshaya Prabakar
Corporate Social Responsibility Program Manager at TenneT



Sinus management

Sinus management refers to a phased mowing method that specifically aims to boost biodiversity. Per mowing cycle, 60% of the vegetation is cut in a meandering pattern. This literally creates space for flowers and insects. A different mowing pattern is used for each mowing cycle, creating a natural image of different growth heights. This ensures different microclimates in a small area by alternating between cut grass and flowering herbs. With this mowing method, shelter for insects, mammals and birds is guaranteed. Nectar plants and places to

deposit eggs are also preserved. It is important to dispose of the grass clippings after each mowing cycle so the soil is atrophied and no shrub vegetation develops. By disposing of grass clippings, fewer nutrients are ultimately available and less frequent mowing will be needed in the future. This tool can be combined well with the Natural Insect Hotel tool.

‘TenneT applies sinus management at a large number of high voltage substations. At these locations, insects increased by 70%, making a nice contribution to biodiversity. The Vlinderstichting (Dutch Butterfly Conservation) advises TenneT on the further optimisation of sine wave management.’

– Albert Vliegenthart



For more information, please visit:
www.vlinderstichting.nl/sinusbeheer



Solitary tree

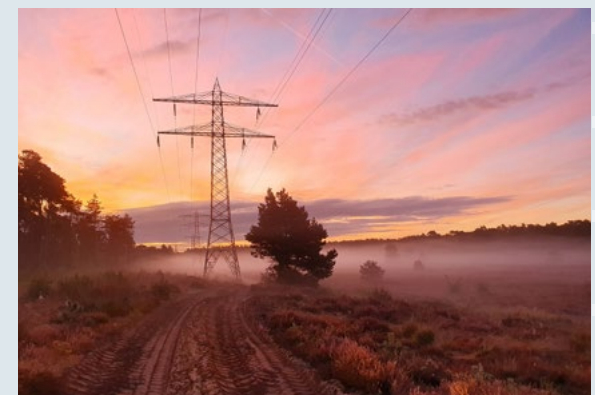
Planting a solitary tree can have a major impact from a landscape and ecological perspective. Landscape-wise, a solitary tree can be planted to 'switch on' a particular spot. A solitary can also be used with certain meaning, such as a memorial tree.

If the species is chosen well, it can also have great value for ecology. For example, there are a variety of flowering trees and many insects depend on trees.

A tree can be selected for flowering, ornamental value of the trunk, autumn colours, ecological added value, fruits, etc. The tree can also be used as a resting place for birds and bats, and a larger tree can also be used to hang bat boxes or bird boxes.

Points for consideration:

- Use native and preferably area-specific planting for landscape trees;
- If it is a memorial tree, or a tree with another significance, an exotic tree can be chosen that possesses certain characteristics appropriate to the significance;
- Take underground cables into account;
- Take high voltage lines into account.



Stepping stones and field edges

Not only rare plants and animals are important, but also common species: basic quality of nature. This could include insects and field birds. These are birds that breed and forage in fields. Insects are the staple food of birds such as field birds partridge, quail and skylark. These species are characteristic of small-scale agricultural landscapes where fields and (rough) verges are present. The birds forage along rough field margins with field weeds, meadows with flowers and, if present, on dykes with brushwood. The main cause of the decline of these species is the increase in scale in agriculture. The use of pesticides and the disappearance of field weeds, overhangs

and rough verges, in addition to the loss of cover and nesting opportunities, means above all a lack of food for the young. TenneT's power pylons can be used as stepping stones. This resulted in the Stepping Stone Pylon project. Below the pylons and areas in the outlying area, field birds can be helped by leaving rough overhangs and keeping plot edges herb-rich. The food situation can be improved by sowing (parts of) plots with herb-rich crop mixtures and leaving the land fallow in winter.

Points for consideration:

- Examine the local soil situation before applying an herb mix;
- Check if a local nature initiative can be joined.

For more information, please visit: www.vogelbescherming.nl





Stone wall for insects

Unlike the honey bee, solitary bees do not live in colonies but in solitary. While a large proportion of solitary bees build their nests in self-dug holes in the ground, other species lay their eggs in hollow stems, in old beetle holes in dead wood, in cavities in stone walls or even in old snail shells. Due to the disappearance of their habitat, solitary bees are under pressure. To give bees a helping hand, bee bricks can be incorporated in the walls of buildings. Bee bricks are special bricks with holes of different diameters in which solitary bees can lay their eggs and

overwinter. They can also be used to make stone walls.

Stone walls serve as shelter, but also as nesting places. Such walls provide habitat for species such as salamanders, frogs, beetles, mosses, ferns and other wall vegetation. Sunny walls are used by insects to warm up. The bee bricks and stone walls can be used at substation sites.

Points for consideration:

- Place insect bricks/stones in sunny and flowery places;
- Stone walls in shady and sunny spots.





Reuse of greenery

Every year, hundreds of hectares of existing plants and shrubs are lost because the greenery has to make way for demolition or renovation of residential areas or for large-scale projects in forest and outdoor areas, for example. Sometimes, entire stretches of forest plots disappear. The reuse of greenery ensures that the existing greenery from, for instance, these forest plots in the area is given a new use. The greenery can also be stored temporarily and replanted after

completion of the project. The reuse of greenery contributes to greening while making the environment climate-proof and encouraging biodiversity. In addition, the reuse of greenery encourages public support and awareness around sustainability, circularity and the energy transition. Greenery reuse can be applied under overhead high voltage transmission lines where conversion projects have been carried out.

Points for consideration:

- Besides the importance of saving greenery for biodiversity and climate adaptation, the social aspect of reusing greenery is at least as important!

For more information, please visit: www.struikroven.nu



Dead hedges

A dead hedge is a narrow pile of branches consisting mainly of tree and hedge cuttings. Dead hedges are made of branches stacked lengthwise (sometimes placed between posts). Creating a dead hedge using prunings is an ecologically sound method of giving existing prunings a second life. Dead hedges attract huge numbers of animals. Birds like the dunnock and wren like to nest in dead hedges. It also attracts numerous other animals such as hedgehogs, small mustelids, insects, amphibians and mice.

The dead hedges serve as breeding grounds but also as protection from predators while providing food. In addition, amphibians and reptiles like to hibernate in a dead hedge. Dead hedges can be created at substation sites, for instance in overhangs, and the branches resulting from pruning under high voltage transmission lines can also be used for the dead hedges.

Points for consideration:

- It is recommended to hold the packed prunings in place with posts;
- The height of the dead hedge should be raised every few years with new prunings;
- Do not position directly under the high voltage transmission lines due to the fire hazard and to maintain access.

For more information, please visit: www.buitenleven.nl





Fish hotels

The correct design of a water body is the basis for healthy fish stocks in the Netherlands. From birth to spawning and from foraging to sheltering and overwintering. Often, there aren't enough safe spawning sites for fish in the water. We all know about bee hotels, but a hotel is no luxury for fish either. Fish hotels can help fish find safe resting and spawning places. In the large-scale rollout of offshore wind farms, concrete structures such as hexagons and culverts can serve as fish hotels. It is very useful

material for adding structure to water. Thanks to their strength and durability, concrete structures lend themselves better to large and deep waters.

The fish hotels can be set up at various locations in the water. The above can be implemented, for example, at offshore projects but also to water near substation sites.

Point for attention:

- Each location requires a custom solution.



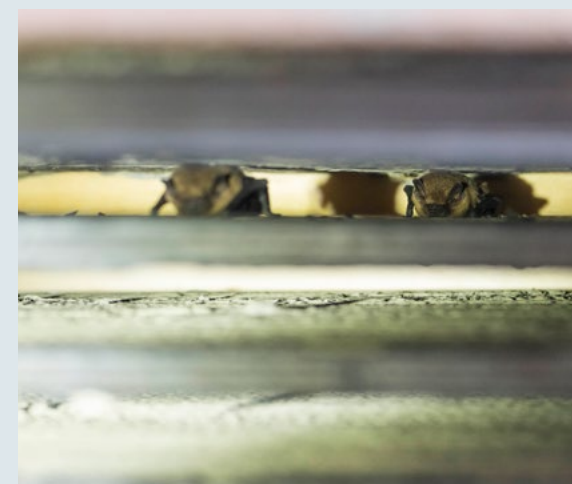
Bat boxes

Bats are the only mammals that can fly. Some bats live in buildings while others live in trees. Bats cannot make their own nests. They depend on cracks and holes, such as an open butt joint that gives access to a cavity wall, a tree cavity or loose bark boards. There are more than 20 bat species in the Netherlands and they all feed on insects. Because of demolition, renovation and insulation of old buildings and neighbourhoods, bat species are in rapid decline as the supply of habitats rapidly

disappears. New buildings often lack suitable habitats for these species because bats are not taken into account in the design, while many older trees are disappearing due to renovation projects. In new buildings, habitats can be created in walls or empty spaces in, for example, an overhang, in consultation with the architect.

Points for consideration:

- Make sure the boxes are unaffected by artificial light;
- Clustering with different wind directions;
- Free flight paths (at least 3 metres);
- Located at a height of at least 4 metres.



For more information, please visit: www.zoogdiervereniging.nl & [Bats | Vivara Pro](#)

Bat cellar and tower

Bats are the only mammals that can fly. Some bats live in buildings while others live in trees. Bats depend on cracks and holes, such as an open butt joint that gives access to a cavity wall, a tree cavity or loose bark boards. Due to the energy transition (post-insulation), bat species are declining rapidly because the supply of habitats is rapidly disappearing. If it is not possible to create habitats in new or old buildings, an alternative may be chosen: bat cellars and towers. These cellars and towers can be placed on a

substation site but also elsewhere, preferably in a semi-open landscape with a lot of greenery or in forests near an overhead or underground connection. The towers can serve as summer, maternity, winter and mating roosts for all bat species. The cellars can serve as summer and winter habitats for all bat species.



Points for consideration with regard to **cellars**:

- High humidity (80-100%);
- Constant temperature (between 1 and 10 degrees);
- Little noise or light radiation inside;
- Free from disruptions;
- Different types of locations.

For more information on cellars, please visit:

[PDF Bat winter roosts](#)

Points for consideration with regard to **towers**:

- Access openings on all wind directions;
- Create different types of habitats in the tower;
- Free flight paths (at least 3 metres).

For more information on towers, please visit:

www.ecopedia.be

Butterfly and insect bushes

Nectar from flowering butterfly and insect bushes is vital for butterflies and many other types of insects. Nectar is the fuel for insects that allows them to fly and reproduce. Sufficient flowering plants during the flying season is essential. Various studies show that many more insects live in, around and on native shrubs than on non-native species. Non-native trees and shrubs do not naturally occur here and there are hardly any insects that can live on those non-native shrubs. In short: to restore biodiversity, one would do well to opt for planting native shrubs such as: common elder, common rose, single-

stemmed hawthorn, spruce birch, wild privet, common bird cherry, willow and wild rowan. Because places with many insects attract many birds, bats and other species. Native butterfly and insect bushes can be planted on TenneT substation sites and can be combined with native flower mixtures to create a beautiful butterfly garden.



Points for consideration:

- Only native butterfly and insect bushes should be planted;
- Area-specific species should be planted.





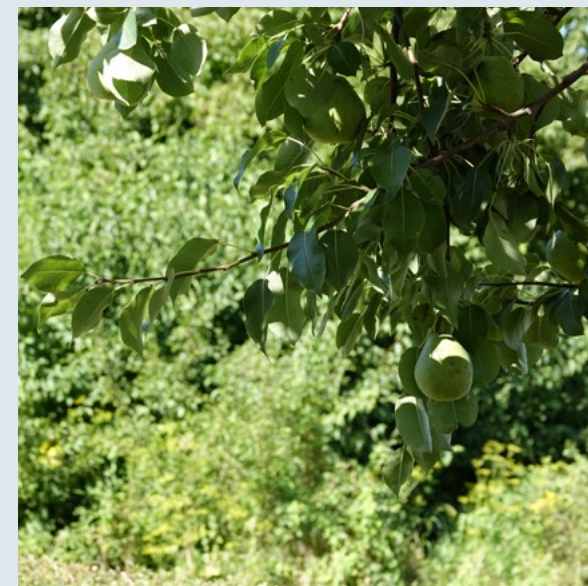
Food forest

A food forest is a highly biodiverse forest for which the species are selected to bear different fruits. These may include species such as apple, cherry, walnut, currant, wineberry, strawberry, purslane, etc. There are many different food forests and they will have to be composed and designed per location.

A food forest should preferably be designed with the local residents, so that those who will use it can also participate in the design process. A food forest can be part of spatial integration, where it not only has a spatial function, but can also be actively used by local residents.

Points for consideration:

- A food forest can only be realised in places where it is actually used;
- Implement only in a landscape where appropriate;
- A food forest can be part of a landscape plan ([link to landscape plan](#));
- Non-native species can also be used for a food forest, but it is important not to use invasive species.





Wadi

A wadi is a green ditch, usually in urban areas. When it rains hard, the soil does not get a chance to absorb all the water. This is mainly due to paving and concreting. Wadis are increasingly common in the Netherlands to store rainwater during extreme showers and to maintain groundwater levels. Water flows from the street surface to a wadi, for example, via gutters and roads. Wadis have different functions in the urban area and they come in different shapes and sizes. Wadis thus contribute to water infiltration,

biodiversity and aesthetics. There is often infrastructure underneath to store the water and drain it elsewhere if the wadi fills up during an extreme shower. Wadis can be constructed on TenneT substation sites and other locations. Water can then flow from roofs and paving (on substation sites) into the constructed wadi during extreme showers, making the substation sites more climate resilient.



‘We sweep the technical people at TenneT along in our enthusiasm for biodiversity and climate adaptation. As Cruijff once said about football: “You won’t see it until you get it.” This also applies to the biodiversity around us. Make successes visible and make TenneT employees proud of their biodiversity hotspots!’

– Rick Karsenbarg
Ecology Consultant at Duvekot



Point for attention:

- Calculate the size of the wadi;
- Determine in advance how to get the water into the wadi.

For more information, please visit:
www.eigenwijsblij.nl

Windbreak

Windbreaks are mainly used in orchards to block the wind. A windbreak often consists of a narrow and high dense green 'wall' composed of native plantings. Windbreaks can consist of various species. Besides having an important function in fruit farming, windbreaks can also be used to incorporate elements of the high voltage grid. Windbreaks (especially if made up of various species) will also have an ecological added value.

A windbreak is at its best if it fits into the landscape, otherwise it is possible to opt for a hedgerow, for example.



Points for consideration:

- Use native and preferably autochthonous plant material;
- A windbreak can consist of several species mixed together;
- A windbreak can ensure that technical elements blend into the landscape. Timely pruning will ensure that the height of the landscape element remains limited;
- Implement windbreaks only in a landscape where appropriate;
- Windbreaks can be part of a landscape plan in which an integral plan is drawn up for a site from an ecological and landscape point of view;
- When windbreaks are planted under overhead transmission lines, consideration should be given to;
- When windbreaks are planted on cables, consideration should be given to.



Colophon

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