

CHALLENGES AND OPPORTUNITIES OF IMPLEMENTING SOLUTIONS

CONNECTING BIODIVERSITY
RECONCILING NATURE AND THE ELECTRICITY GRID
08. NOV 2023, BERLIN

CHRISTIN OSADNIK

WHO WE ARE

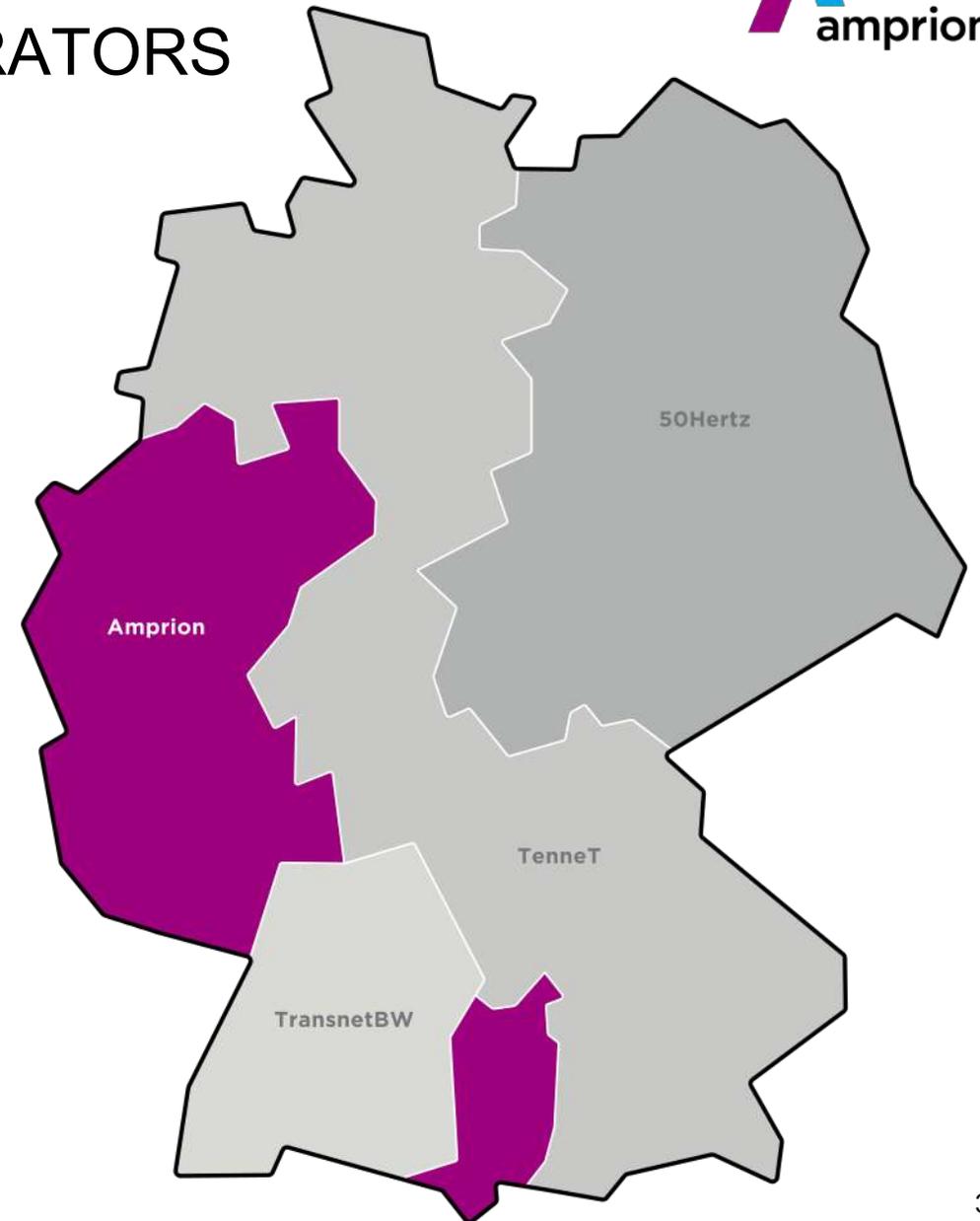


STRONG SHOULDERS

THE FOUR TRANSMISSION SYSTEM OPERATORS



Germany's four transmission system operators (TSOs), 50Hertz, Amprion, TenneT and TransnetBW, are responsible for "long-distance transport" in the country's power grid: that is, the supra-regional transport of electricity at extra-high voltage level. Their responsibilities and grid areas ("control areas") are defined by law: they plan and maintain the extra-high voltage (EHV) grid, control grid operation and ensure the safety and stability of the entire power system.



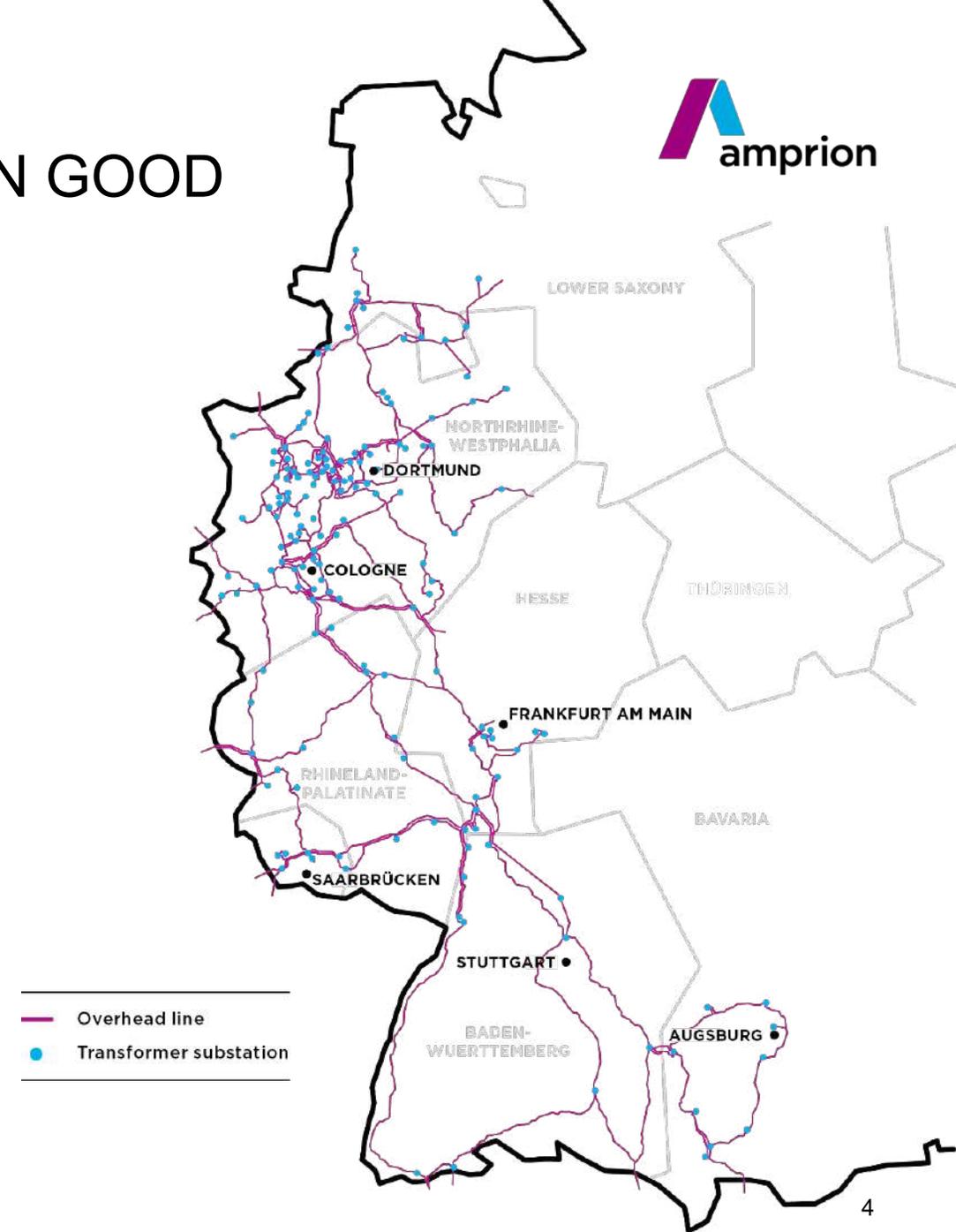
SO THE LIGHTS NEVER GO OUT

HOW AMPRION WORKS FOR THE COMMON GOOD

The power network is similar to the road network. Amprion and three other transmission system operators are responsible for the long-distance routes of Germany's power grid.

Our EHV grid transports electricity across an area that stretches from the North Sea to the Alps. Around a third of Germany's economic output is generated in this area. Our power lines are lifelines of society: they secure the quality of life and jobs for 29 million people.

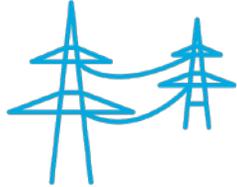
Amprion is paving the way for a climate-friendly energy system. To this end, we are expanding the grid and helping industry with its efforts to decarbonise. So that the lights never go out. Amprion connects.



OUR RESPONSIBILITIES

SECURE POWER SUPPLY FOR MILLIONS OF PEOPLE

OUR RESPONSIBILITIES



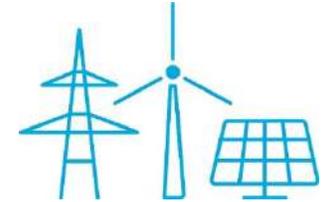
GRID OPERATIONS

We operate an 11,000-kilometer EHV grid in an area that stretches from the North Sea to the Alps.



GRID STABILITY

We keep the grid stable and safe so that electricity can flow for some 29 million people.



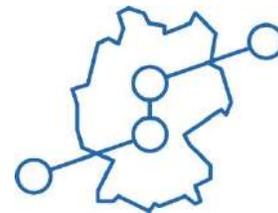
GRID EXPANSION

We are expanding and upgrading our grid in order to pave the way for a climate-friendly energy system. And our infrastructure planning activities cut across the sectors.



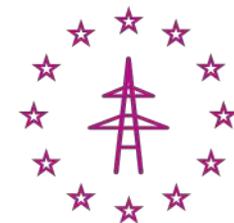
DECARBONISATION

We support industry in its efforts to switch to a climate-friendly economy.



COORDINATION OF POWER FLOWS

We monitor and coordinate electricity flows in Germany and Northern Europe.



POWER TRADING

We handle the “physical” side to power trading in Germany and Europe by transmitting the power traded over our grid.

A SPECIAL RESPONSIBILITY

OUR LEGAL MANDATE



As a transmission system operator, Amprion has a special responsibility for the power supply. Germany's legislators have laid out this responsibility in the Energy Industry Act:

“Operators of energy supply systems are obligated to operate and maintain, as well as optimise, strengthen and develop as needed, a safe, reliable, and efficient energy supply system in a non-discriminatory manner to the extent that this is economically feasible.”

Section 11 Energy Industry Act (EnWG)

WHERE SUSTAINABILITY SPRINGS INTO ACTION

OUR FIELDS OF ACTION



CORPORATE MANAGEMENT

- We stand for law-abiding, ethical behaviour. We respect human rights in our own operations as well as in the supply chain. To ensure compliance with environmental and social standards, we will work towards greater transparency. Our focus is therefore on:
 - Procurement
 - Compliance



SECURE POWER SYSTEM

- We are acting in the interest of the European energy transition and working to ensure system security while integrating renewable energy sources. To this end, we are driving innovation and actively participating in industry collaborations. We are working to promote:
- European framework requirements
 - Collaborations
 - Grid expansion and upgrade
 - Grid and systems development
 - System security



EMPLOYEES

- We look out for the health of our employees and their safety at work. Our corporate culture is characterised by mutual respect and appreciation. As such, we live for diversity and equal opportunity. To achieve this, we invest in:
- Active personal development
 - Occupational health and safety
 - Corporate culture



ENVIRONMENT

- We are striving for climate neutrality for our own operations, making wise use of resources and actively conserving nature and protecting species by making them integral parts of our projects. We are working to promote:
- Species protection
 - Nature conservation
 - Resource conservation and climate protection



SOCIETY AND CUSTOMERS

- We stand for a broad dialogue and create value added in the region through our activities and commitment. For our customers we are a dependable and equal partner. We trust in:
- Social benefits
 - Customer focus
 - Regional commitment

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POWER LINE = LIFELINE

HOW AMPRION IS PROTECTING NATURE

Power line = lifeline – by this we mean our power lines, which pass through long stretches of landscape, forests and meadows. They form the backbone of the power supply system and are also a habitat for many species of animal and plant. For more than 20 years, we have been retaining and conserving these habitats as part of ecological power line management.

1 Forest border management:

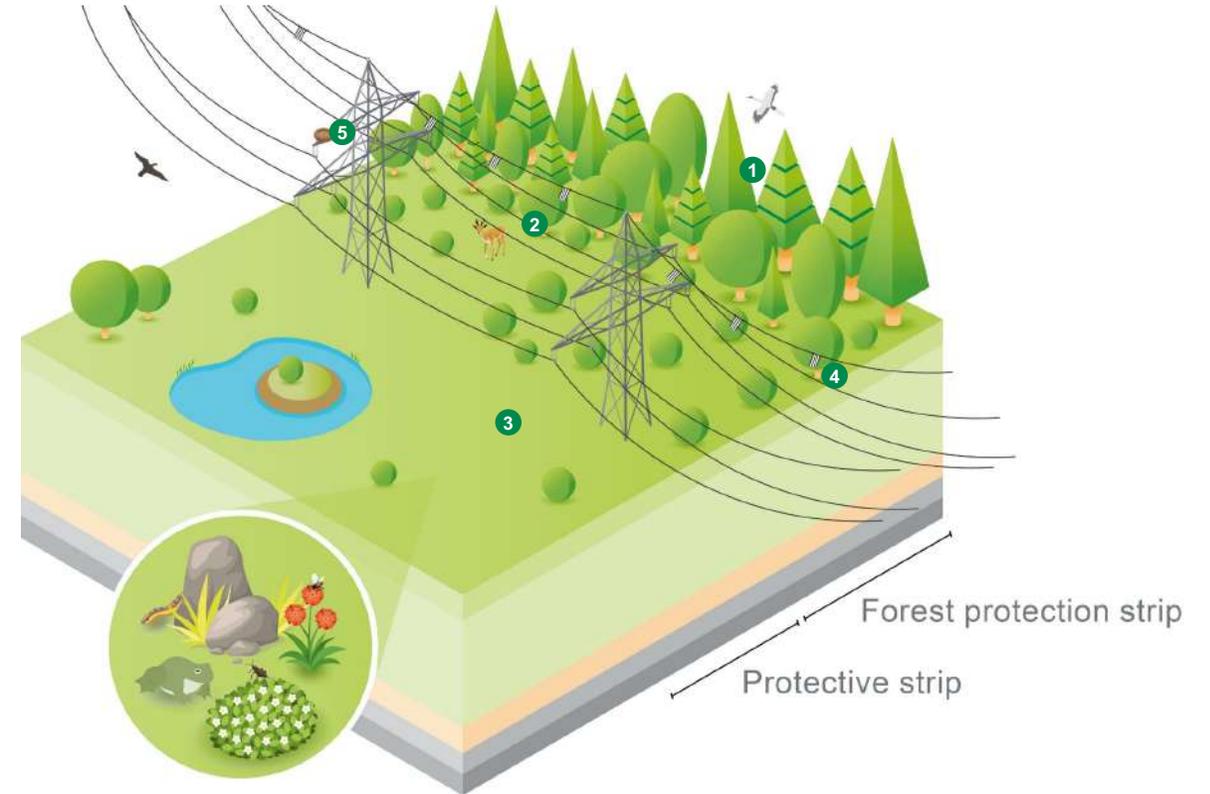
Promotion of stable and highly structured forest borders with shrubs and low-growing tree species.

2 Biotope network structures:

Overhead power lines can interconnect the differing habitats of various animal and plant species.

3 Open landscapes:

Maintenance of valuable habitats in open landscapes, such as rough pastures, hedgerows or heathland.



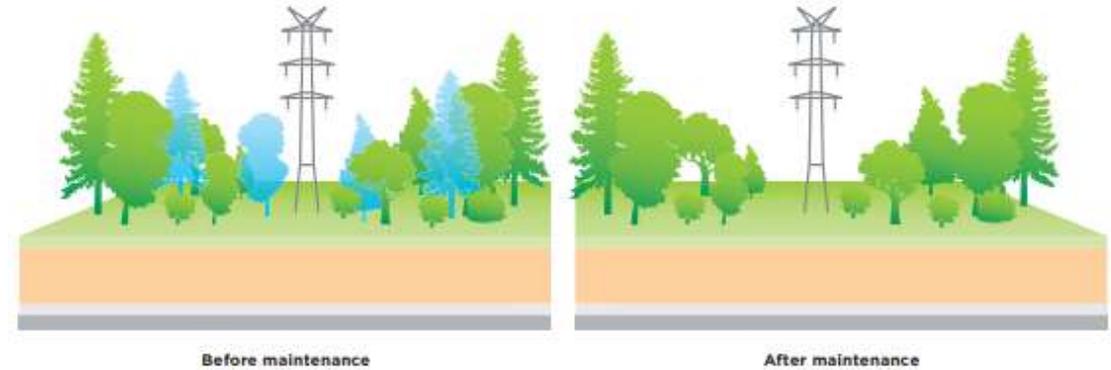
POWER LINE = LIFELINE

INTEGRATED VEGETATION MANAGEMENT AT AMPRION

- Our key guiding principle is to maintain more frequently, over smaller areas and more carefully instead of rarely, over large areas and intensively
- **The IVM plans form the basis for line maintenance:** They map the routes of the power lines and show the various types of biotope as well as maintenance targets

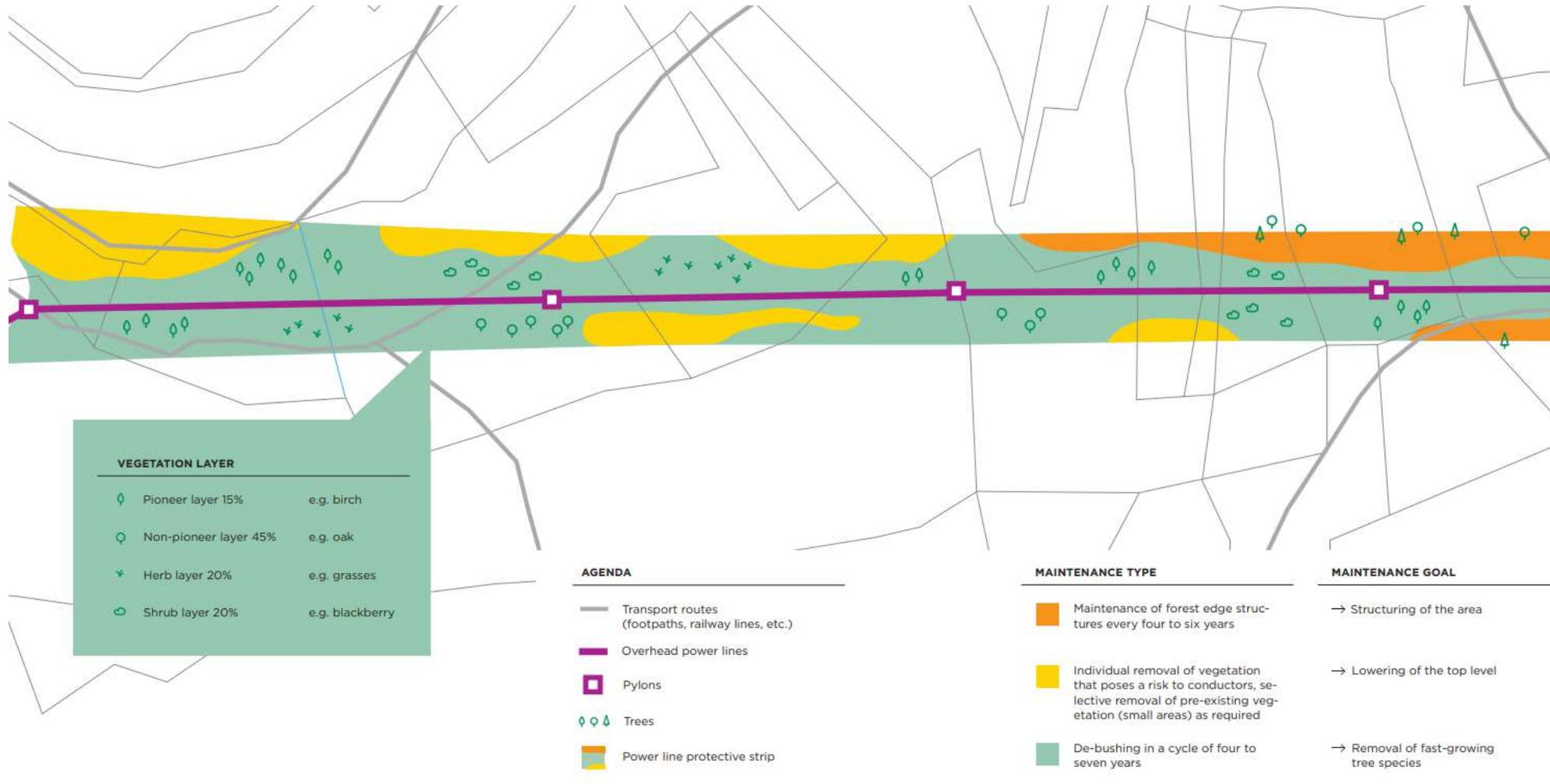
TODAY'S MAINTENANCE PRINCIPLE: MORE FREQUENT AND EXTENSIVE INTERVENTION

To create sufficient distance between the conductors and the vegetation, we intervene more frequently today by gently and proactively cutting back trees and shrubs.



POWER LINE = LIFELINE

THE IVM-PLAN



Schematic representation of an IVM plan with maintenance units as examples

POWER LINE = LIFELINE

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- **The IVM plans form the basis for line maintenance:** They map the routes of the power lines and show the various types of biotope as well as maintenance targets
- IVM plans are based on on-site vegetation mapping
- We coordinate the measures that are appropriate for the respective on-site situation with all relevant stakeholders such as landowners
- IVM plans are checked at regular intervals and update the maintenance measures shown

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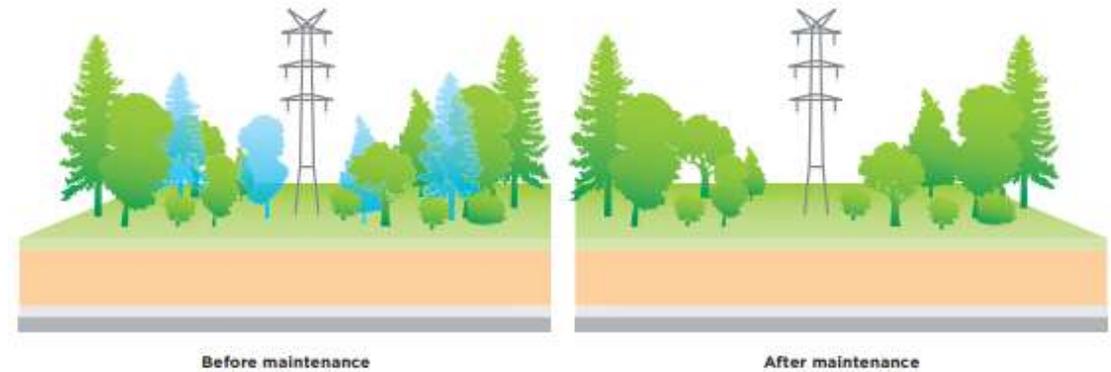


Foto: Johannes Döppler

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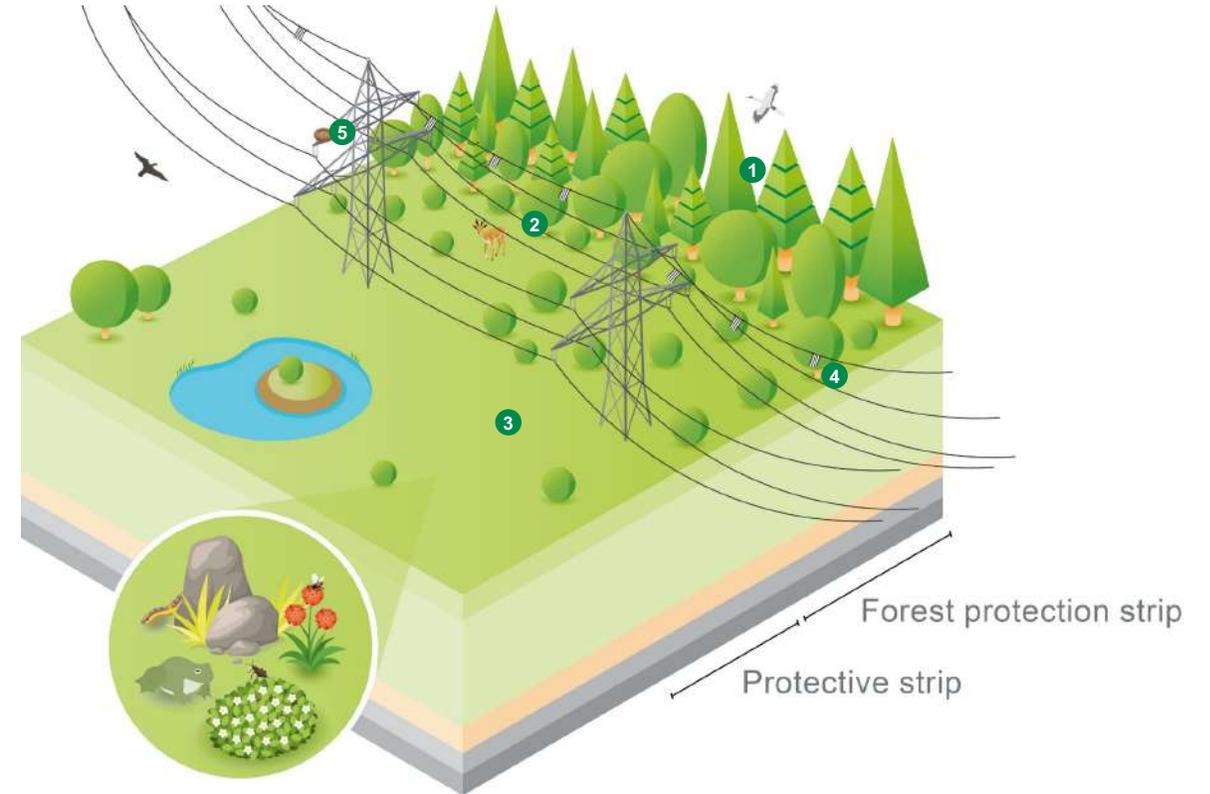
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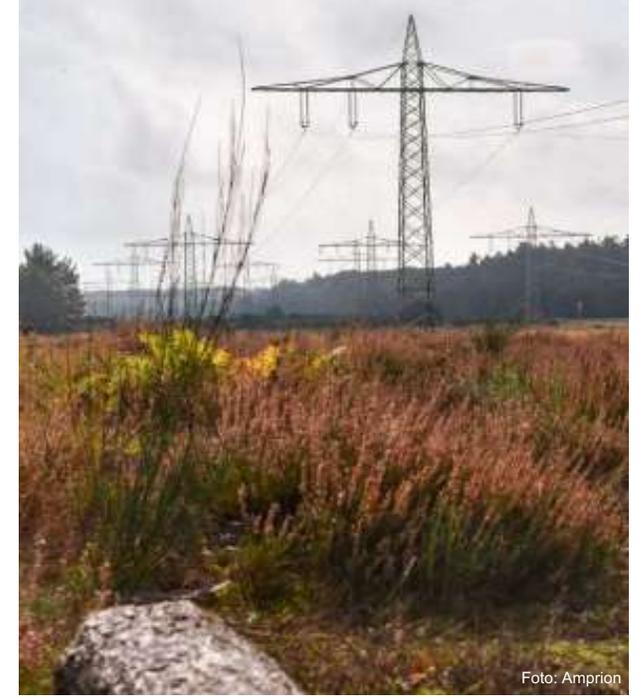
Maintenance of valuable habitats in open landscapes, such as rough pastures, hedgerows or heathland.

4 **Bird protection:** Reducing the collision risk to birds by installing bird protection markers on the earth wires.

5 **Pylons as breeding sites for birds:** If necessary, securing nests or installing species-specific nesting aids.



IMPRESSIONS



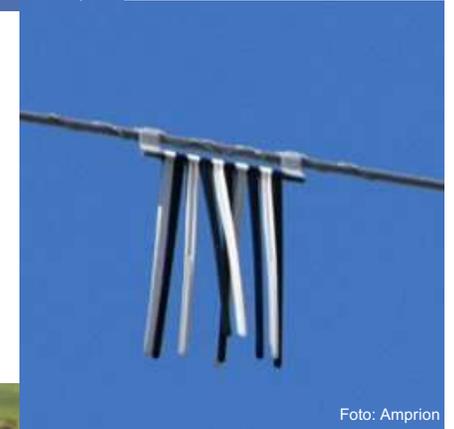
CHALLENGES AND OPPORTUNITIES OF IMPLEMENTING SOLUTIONS

BIRD PROTECTION MARKERS

SOLUTIONS FOR BIRD PROTECTION

Bird protection devices in the German grid

- Mainly two types of marking devices for ground wires are used in the transmission grid in Germany (220 and 380 kV)
- In the distribution grid sometimes other marker types are used and conductors are marked in some rare cases
- Protection markers are a commonly used measure to reduce the collision risk for birds on power lines
- For new power line projects the mounting of BPM can be a permit condition
- The Federal Agency for Nature Conservation developed a scientific method that can be used to determine collision risk and necessity of ground wire marking



BIRD PROTECTION MARKERS

SOLUTIONS FOR BIRD PROTECTION



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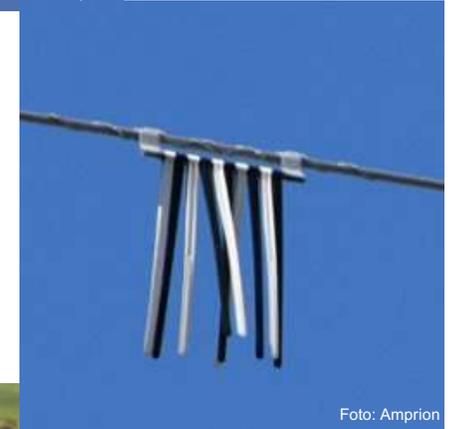
Bird protection markers in Germany

- Effective and approved measure to significantly reduce bird collisions
- Effectiveness and technical feasibility of specific markers is approved by the Federal Agency for Nature Conservation, ornithologists and German grid operators

BUT...

- Regular inspection is necessary
- Replacement in case of damage is necessary
- Installation can be very complex and can sometimes take several months
 - different mounting methods different advantages and disadvantages (assembly duration, costs, necessary permissions,...)
 - power lines must be switched off
 - only technically tested components can be mounted

Mounting of markers should only take place in areas, where the risk of bird collisions is high and can have a significant impact on the occurring species



ELECTROCUTION-SAFE PYLONS

SOLUTIONS FOR BIRD PROTECTION

- The law specifies a retrofit of electricity pylons in the distribution network

Nature Conservation and Landscape Management Act

Federal Nature Conservation Act – BNatSchG

§ Article 41 Protection of birds on overhead power lines

To protect bird species, new pylons and technical components of medium-voltage power lines shall be designed in such a way that birds are protected against electrocution. On existing masts and technical components of medium-voltage power lines with a high risk to birds, the necessary measures to protect against electrocution shall be implemented by 31 December 2012. Sentence 2 shall not apply to the overhead contact line systems of railways.

MOUNTING OF NESTING AIDS SOLUTIONS FOR BIRD PROTECTION

Mounting of nesting aids can be useful for various reasons

- The installation of nesting aids can prevent nests from being built in unfavourable places
 - nests can block important areas on the electricity pylon
 - Branches hanging out can cause flashovers
- > Positive for both the birds and the grid operator

Why a custom made nesting box?

- Especially constructed for mounting on pylons
- Very durable material
- Developed with experts, effectiveness is proven



NATURE PROTECTION PROJECTS WORK WITH NGOS

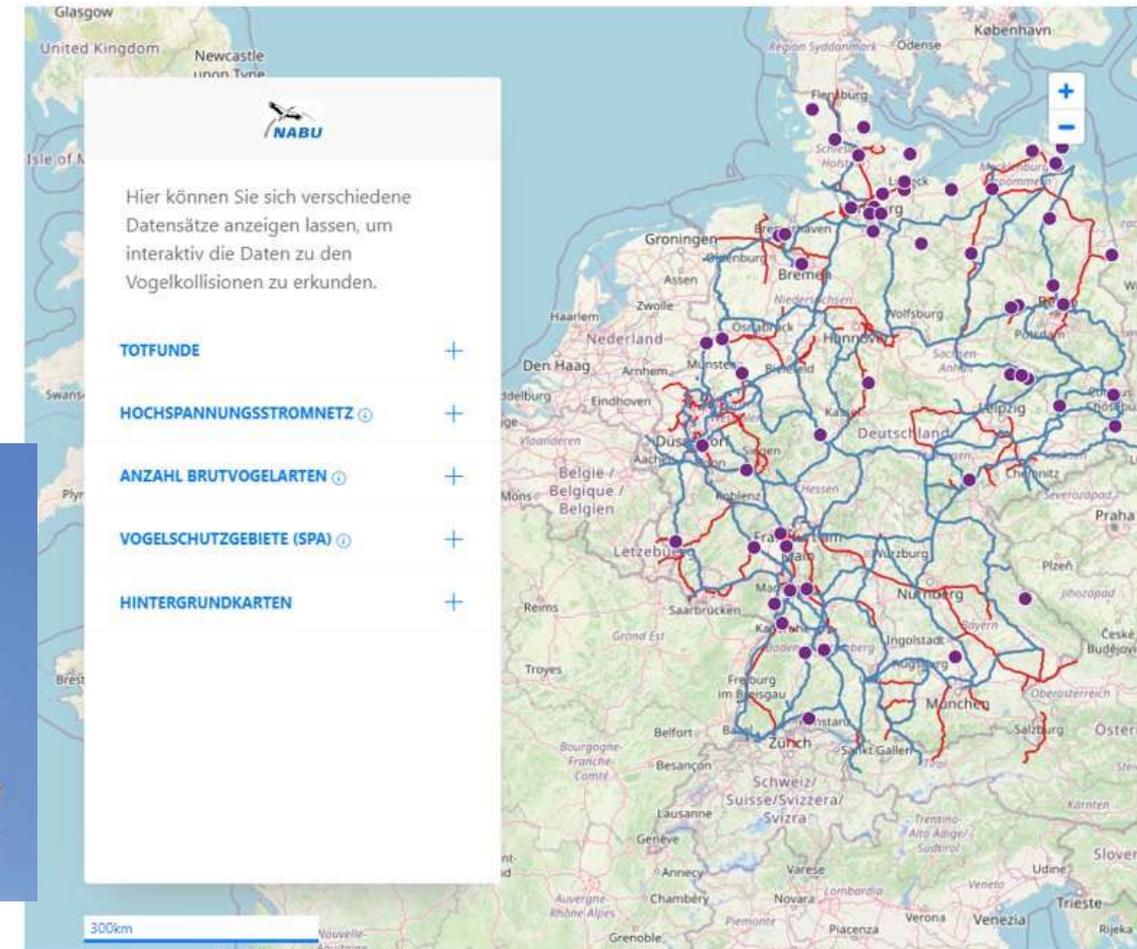
Bird Portal

- NABU and RGI together with german grid operators
- Citizens can report bird carcasses found near oder underneath power lines
- Aim: the gathered data will help to better understand the risks to the lives of different bird species, to improve existing protection measures
- Exchange between NABU and grid operators
- In 2022 RGI organized a conference on the topic
- In 2023 a working group on bird-risk mitigation measures was formed



Ergebniskarte zur Meldeaktion

Mehr Daten für mehr Transparenz



NATURE PROTECTION PROJECTS

WORK WITH NGOS



EUROKITE

- EU LIFE Project, launched 2019
- Europewide conservation project for birds of prey
- Aim: Gathering telemetry data to determine the habitat use of target species and quantify the main causes of mortality of raptor species (special focus on red kites) in the EU
- Part of the project are different working groups, one is dedicated to the topic of power lines
 - experts want to identify problematic power lines throughout Europe, make them safer and thus further reduce the risks for the birds



CONCLUSION

Installation of protection device
to be technically safe and
tested

Effectiveness of measures
must be proven

Discussions with experts are
crucial in order to develop
effective measures

Exchange of knowledge,
experiences and new ideas is
key

THANK YOU FOR YOUR LISTENING!

ARE THERE ANY QUESTIONS?