

BIRD FLIGHT DIVERTERS IN THE GERMAN TRANSMISSION GRID

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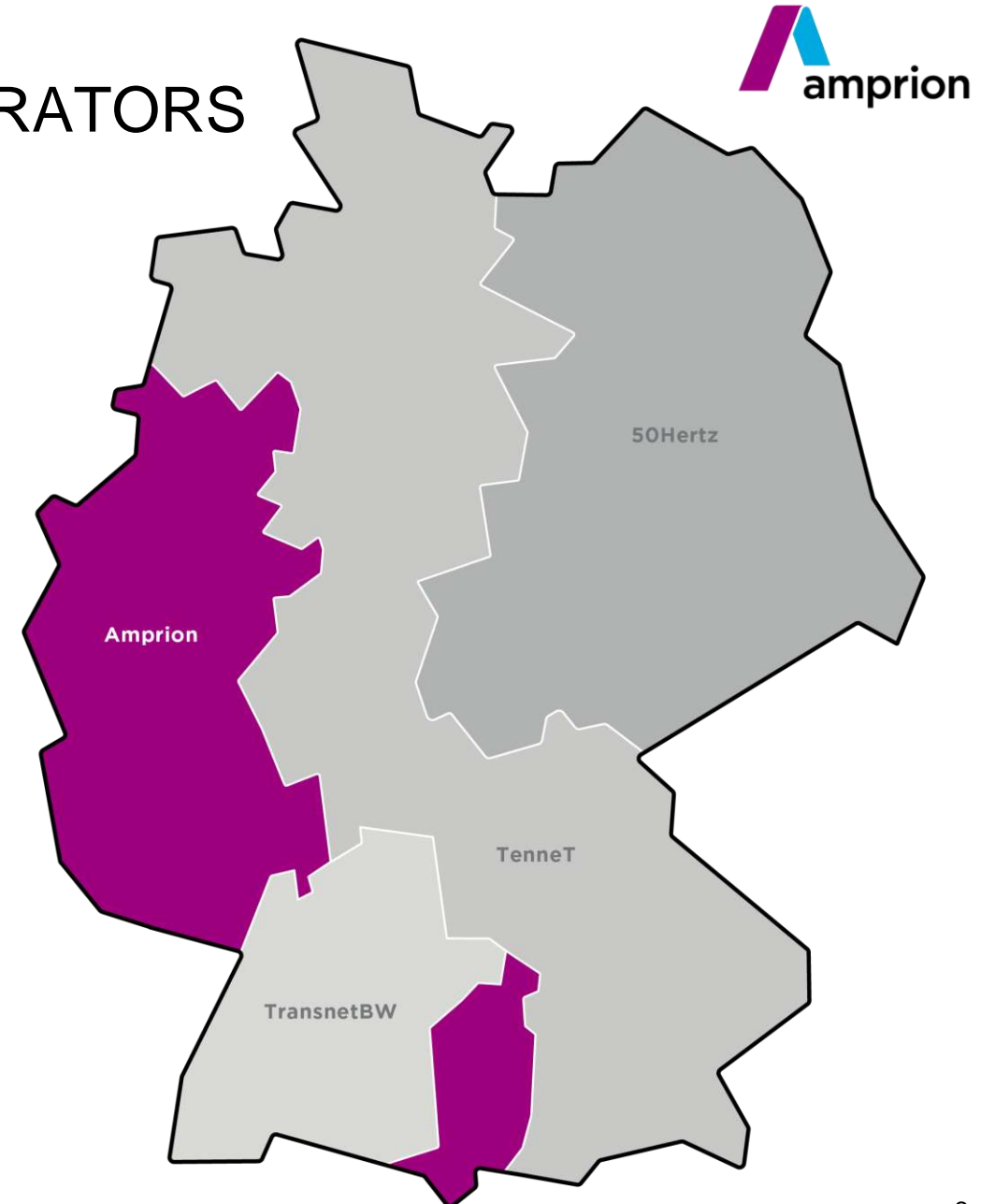
*RGI ENERGY & NATURE WEBINAR:
BIRD'S-EYE VIEW - ORNITHOLOGY FOR A
NATURE-FRIENDLY ENERGY TRANSITION*

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ABOUT AMPRION

THE FOUR TRANSMISSION SYSTEM OPERATORS

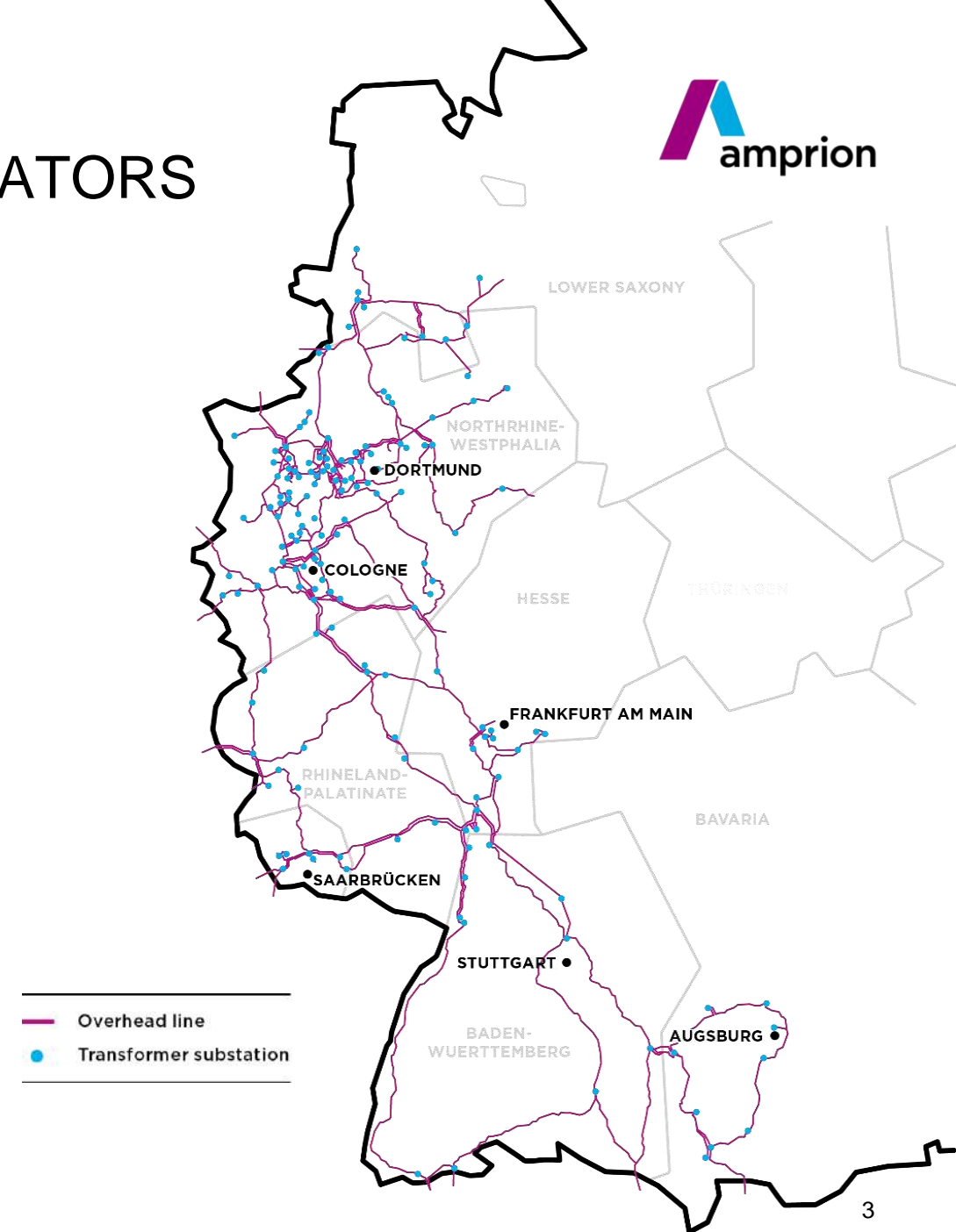
- Germany's four transmission system operators (TSOs) 50Hertz, Amprion, TenneT and TransnetBW
- The four transmission system operators are responsible for the long-distance routes of Germany's power grid
- Their responsibilities and grid areas ("control areas") are defined by law: they plan and maintain the extra-high voltage (EHV) grid, control grid operation and ensure the safety and stability of the entire power system



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- 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
- Our extra-high voltage grid (220-380 kV) transports electricity across an area that stretches from the North Sea to the Alps



BIRD FLIGHT DIVERTERS

DIVERTERS IN THE TRANSMISSION GRID



Bird flight diverters in the German transmission grid

- Protection markers are a commonly used measure to reduce the collision risk for birds on power lines
- Mainly **two types of diverters for ground wires** are used in the transmission grid in Germany (220 and 380 kV)

BIRD FLIGHT DIVERTERS

DIVERTERS IN THE TRANSMISSION GRID

Bird flight diverters in the German transmission grid

- Protection markers are a commonly used measure to reduce the collision risk for birds on power lines
- Mainly **two types of diverters 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
- For new power line projects the mounting of BFD can be a permit condition



Fotos: Daniel Schumann

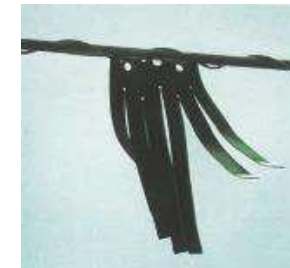
DEVELOPMENT OF BLACK AND WHITE FLAGS

A QUICK OVERVIEW



Different marker designs were mounted and tested

Project lead by Group of the State Bird Protection Authorities on collision and development of new markers started



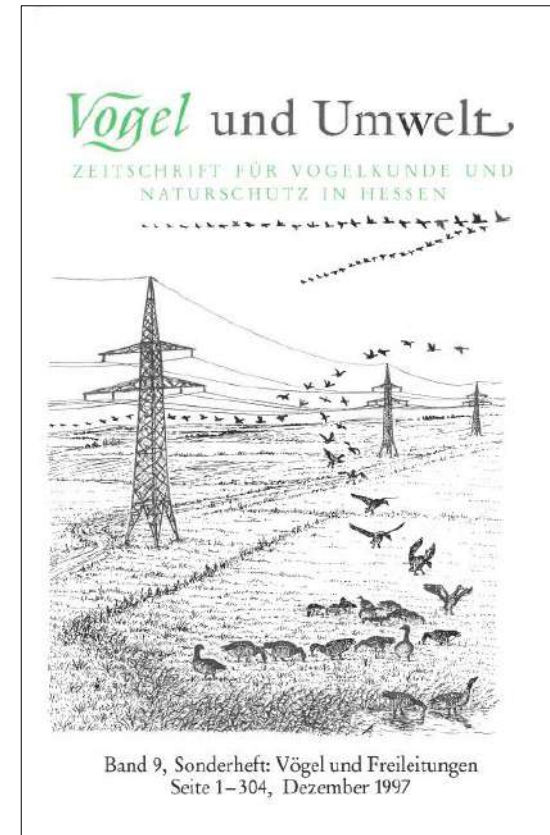
Fotos: Baumgärtel et al. (1997): Vogelschutzmaßnahmen an Hochspannungsfreileitungen – Markierungstechnik. In: Richarz, K. & M. Hormann (Hrsg.) Vögel und Freileitungen. – Vogel u. Umwelt 9, Sonderheft

DEVELOPMENT OF BLACK AND WHITE FLAGS

A QUICK OVERVIEW



Results of the project were published and mounting of black and white markers was recommended



DEVELOPMENT OF BLACK AND WHITE FLAGS

A QUICK OVERVIEW



New black and white diverter flags are mounted for the first time



DEVELOPMENT OF BLACK AND WHITE FLAGS

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First scientific publications on the new diverter

**Hochspannungsfreileitungen und Vogelschutz:
Minimierung des Kollisionsrisikos**
Bewertung und Maßnahmen zur Markierung kollisionsgefährlicher Leitungsbereiche
Von Frank Bernshausen, Josef Kreuziger, Dirk Uther und Michael Wahl

FRANK BERNSHAUSEN et al., Wirksamkeit von Vogelabweisern an Hochspannungsfreileitungen, NUL 46 (4), 2014, 107-115

Wirksamkeit von Vogelabweisern an Hochspannungsfreileitungen
Fallstudien und Implikationen zur Minimierung des Anflugrisikos
Von FRANK BERNSHAUSEN, JOSEF KREUZIGER, KLAUS RICHARZ und STEFAN R. SUDMANN

DEVELOPMENT OF BLACK AND WHITE FLAGS

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Group of the State Bird Protection Authorities (LAG VSW) recommends black and white devices

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A QUICK OVERVIEW



NABU
recommends
black and white
diverter flags

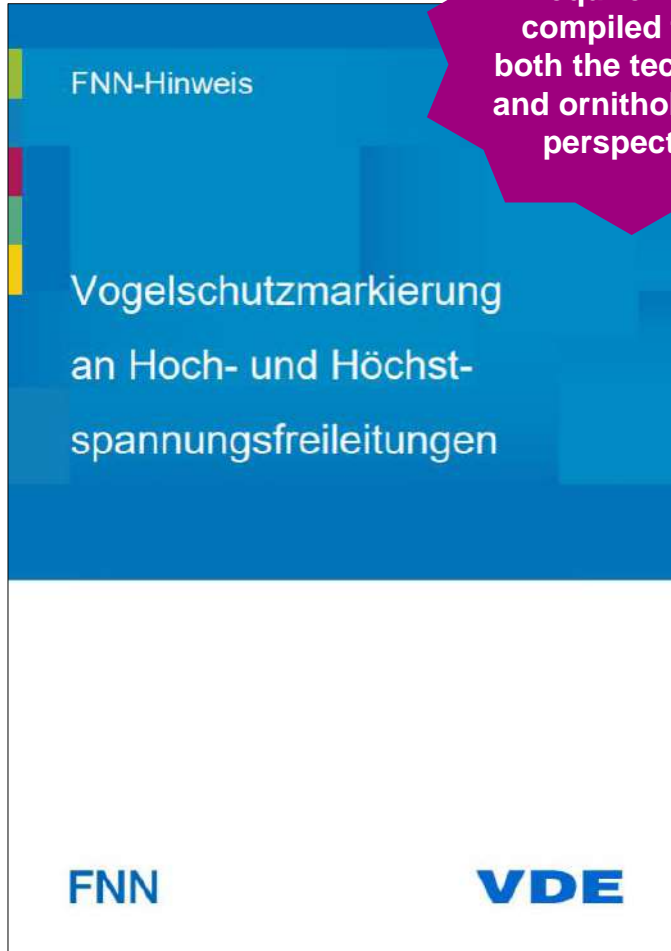
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DEVELOPMENT OF BLACK AND WHITE FLAGS

THE „FNN-HINWEIS“



Requirements compiled from both the technical and ornithological perspective

Who are the VDE and FNN?

- a German technical-scientific association
- creating and maintaining standards in the field of electric safety
- FNN is a committee inside the association

What does the “FNN-Hinweis” include?

- Project group made up of representatives from grid operators, nature conservation organizations, ministries, planning offices (ecologists) and manufacturers
- Legal as well as ecological background of wire marking
- Technical requirements of diverters (construction, material, mechanical requirements, examinations needed,...)
- Includes advice on marker mounting for grid operators
- Advice on how to determine relevant power line sections that need to be marked

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KLAUS JÖDICKE et al., Wirksamkeit von Vogelschutzmarkierungen an Erdseilen von Höchstspannungsfreileitungen

Wirksamkeit von Vogelschutzmarkierungen an Erdseilen von Höchstspannungsfreileitungen

Ermittlung von artspezifischen Kollisionsraten und Reduktionswerten in Schleswig-Holstein

Von KLAUS JÖDICKE, HILGER LEMKE und MORITZ MERCKER

BEATE KALZ et al., Wirksamkeit von Vogelschutzmarkierungen an einer 380-kV-Freileitung, NuL 47 (4), 2015, 109-116

Wirksamkeit von Vogelschutzmarkierungen an einer 380-kV-Freileitung im Nationalpark Unteres Odertal

Minimierung des Anflugrisikos durch Montage von Vogelschutzmarkern

Von BEATE KALZ, RALF KNERR, ELKE BRENNENSTUHL, ULF KRAATZ, TOBIAS DÜRR und ANDREAS STEIN

Further confirmation of diverter effectiveness through scientific studies

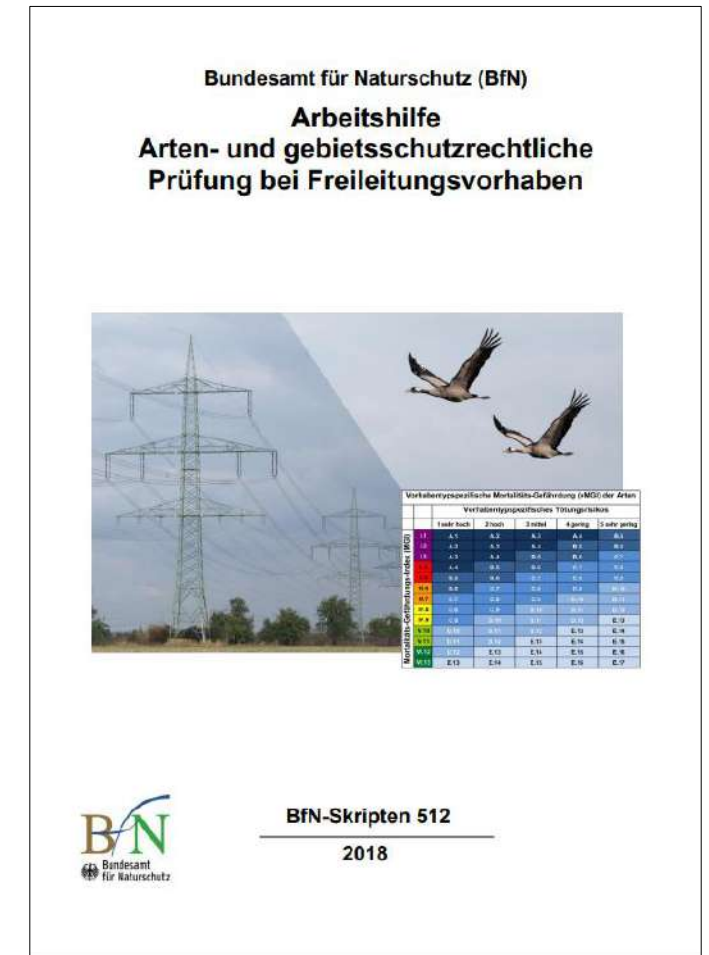
In 2018 studies by the German federal agency for nature conservation published studies on bird flight diverters

DEVELOPMENT OF BLACK AND WHITE FLAGS

PUBLICATIONS BY THE FEDERAL AGENCY FOR NATURE CONSERVATION

The „BfN-Skript 512“

- Usually for new power line projects an assessment by external experts is performed (environmental studies)
- The aim of the methodology is to develop a standardised assessment and evaluation framework, with which the planning projects can be assessed and evaluated according to uniform standards regardless of the federal state and project sponsor

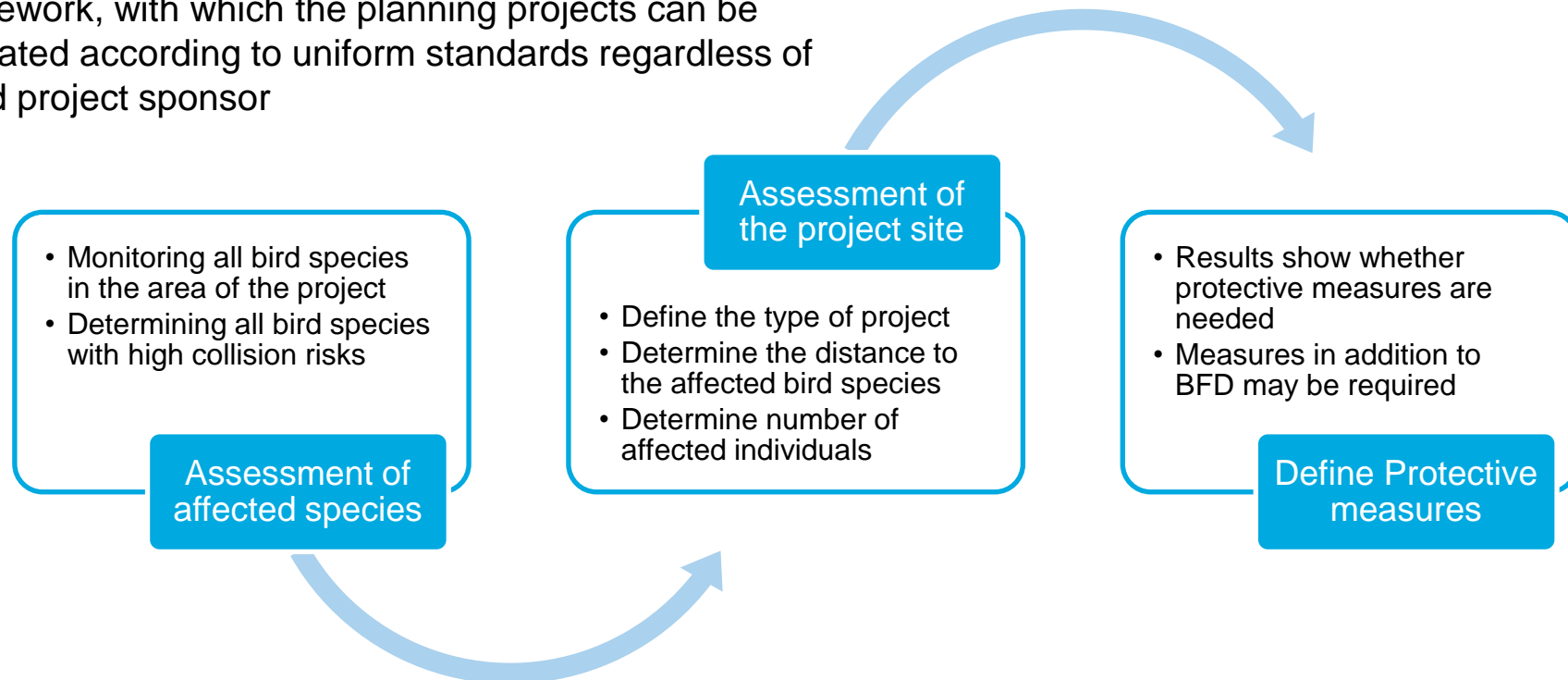


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2024



Bird flight diverters 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 (diverters are mounted for several years)
- Replacement in case of damage is necessary
- Installation can still be very complex
 - 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
- Improvement of markers based on scientific studies both regarding technical issues as well as efficiency is still wanted



QUESTIONS?

