Impacts of power lines on bird populations in Europe

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NABU – BirdLife Germany

RGI Environment Workshop, Glasgow
June 16, 2011

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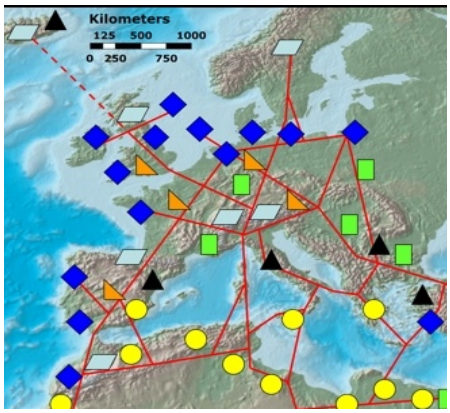
Grid development for expanding the renewables

Large scale ...



Sketch of European Super Grid (TEN-E)

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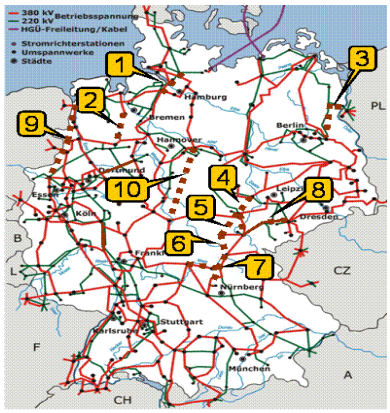
... and small scale



Priority new/amplified (extra-) high voltage lines in Germany

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Renewables Grid Initiative

The challenge

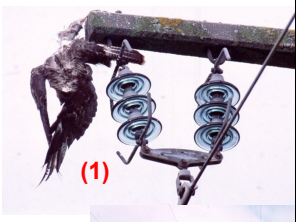
- To ensure energy grid development for the renewables ***and*** to preserve biological diversity
- Problem for **bird populations** in Europe:

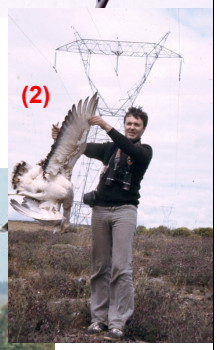
  High and large-scale bird mortality from above-ground power lines due to

  (1) Risk of electrocution

  (2) Risk of collision

  (3) Negative impacts on habitats





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(1) Risk of Electrocution

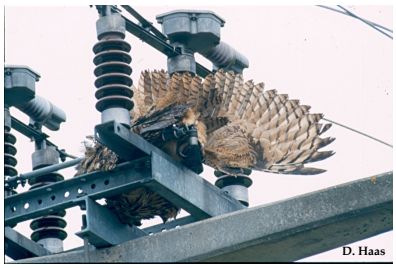
Dangerous types of power poles in the middle voltage range (distribution lines)

due to bad design:

- short and upright insulators ('pin type')
- single-level arrangements
- small distances between the lines

Birds perch, roost or nest on such poles

⇨ Causing short-circuits between energised wires, or ground-faults



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(2) Risk of Collision

- In flight, birds can collide into aerial wires or cables of power lines, because cables are often difficult to see, particularly the neutral cable.
- Migrating birds flying at heights between 20 m and 50 m are at considerable risk of collision.
- High losses reported where power lines cut across flyways and migration corridors, such as river valleys and valleys between mountains.
- Multi-level arrangements lead to highest risks.

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Documentation of affected bird species

D Haas, M Nipkow, G Fiedler, R Schneider, W Haas, B Schürenberg (2003):

A report on the severity of impacts on bird population mortality due to electrocution and collision

- For numerous medium-sized and large birds, such as Storks, Eagles, Vultures, other Raptors, Owls, Ravens, Bustards, Rails and Waders, electrocution and collision are one of the main mortality factors.

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Extent of risk to birds – general problems of quantifying losses

- Total number of birds lost by electrocution and/or collision is difficult to assess, and there are only little systematic accounts.
- A high proportion of victims is not found, but disappears within some hours/days due to predators (up to 71 % within 24 hours, NL).
- Injured birds drag themselves up to 2000 m from the place of accident.

⇩

What we generally find is the 'tip of an iceberg'

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(3) Negative impacts on staging / wintering areas and protected areas e.g. in the NATURA 2000 network

- When above-ground powerlines cut across open landscape, staging and wintering habitats may be reduced in availability and quality for birds.
- The amount of casualties is the highest on important bird areas, e.g. the NATURA 2000 network.

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Current Situation

1. There is a high demand to **integrate biodiversity aspects** into both the existing grid of power lines **and the grid expansion planning**.
2. Implementing detailed **criteria for bird protection** will be essential and allows the renewables to develop in a sustainable way.

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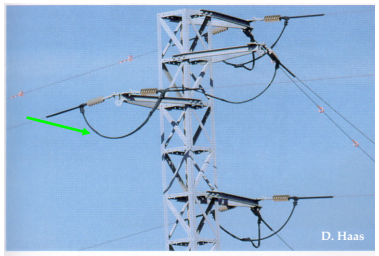
(1) Standards to protect birds from Electrocution

Bird-friendly types of power poles in the middle voltage range (distribution lines)

- Suspended insulators
- Insulated wires
- Insulated cross-arms

⇨ **Pose no (or little) risk to birds**



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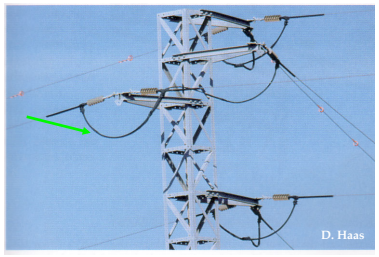
(1) Standards to protect birds from Electrocution



Bird protection clauses in technical standards reflecting the state-of-the-art, discussed and committed between

- energy utility companies,
- nature conservation authorities,
- nature conservation organisations:

GERMANY

August 2011: VDE-AR-N 4210-11

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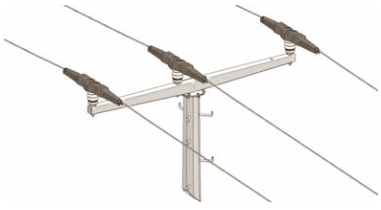
VDE-AR-N 4210-11 (Germany)

Examples: Insulating hoods



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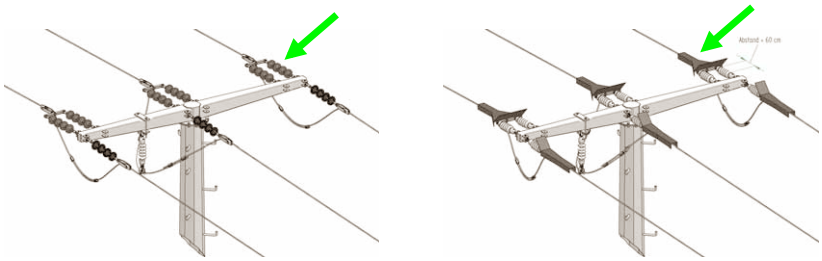
VDE-AR-N 4210-11 (Germany)

Examples: Strain pole configurations



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(2) Standards to protect birds from collision

Single-level arrangement of the high-voltage conductor cables, *Former East Germany* (left), combined with painted coulor for air safety in day light, and without a dangerous neutral cable, *France* (right).

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(2) Standards to protect birds from collision

- Clearly visible hanging vertical structures (figures)
- Landscape planning, SEA and EIA: Examination of different strategic and routing alternatives, in order to avoid fragmentation of landscape and/or negative impacts e.g. on the NATURA 2000 network
- Underground cables

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Advantages of underground cables

- ✓ Lower disturbance of natural scenery
- ✓ Lower electromagnetic radiation
- ✓ Higher public acceptance → quicker authorisation
- ✓ Fewer transmission losses
- ✓ Avoidance of woodfires
- ✓ Higher weather tolerance
- ✓ Cheaper on long-term(!)
- ✓ **Full bird protection**

Germany, Dec 2005

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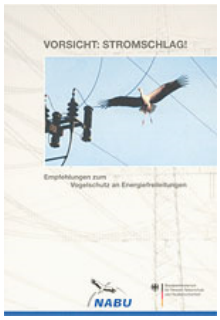
Legal background

A) International Conventions:

1.) Convention on the Conservation of Migratory Species of Wild Animals (CMS),

‚Bonn Convention' ⇨ Resolution 7.4 (2002)

Guide[illegible] bird-friendly pole configurations and effe[illegible]itigation techniques against bird ele[illegible]on



CMS

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Legal background

A) International Conventions:

2.) Convention on the Conservation of European Wildlife and Natural Habitats,

‚Bern Convention'

⇨ Recommendation No. 110 (2004)

- Ban of the most dangerous pole types
- Technical standards for bird safety against bird electrocution and collision
- Priorities for research and monitoring

25 Anniversary / Anniversaire
BERN CONVENTION
1979 - 2004

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Legal background

A) International Conventions (Bonn 2002, Bern 2004)

B) Binding legislation – international and national

❖ **European Union, 1979**

Birds Directive (79/409/EEC, today: 2009/147/EC)

Article 5 sets out the protection of all bird species referred to Article 1 and prohibits (…) *deliberate killing or capture by any method.*

⇨ Member States are urged to undertake effective measures against (otherwise ongoing) casualties of bird electrocution.

⇨ We need guidelines to ensure harmonised application of the EU Birds and Habitats Directives within all planning procedures for new grids.

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Legal background

A) International Conventions (Bonn 2002, Bern 2004)

B) Binding legislation – international and national

❖ **GERMANY, 2002:**

Federal Nature Conservation Law in Germany (§ 53, today: § 41)

„Newly erected power poles and technical hardware have to be constructed to exclude the possibility of bird electrocution.

Mitigating measures are to be undertaken on existing power poles and technical hardware in the medium voltage range within the next ten years. (...)“

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Legal background

A) International Conventions (Bonn 2002, Bern 2004)

B) Binding legislation – international and national

❖ **SLOVAKIA, 2002:**

Act on the Protection of Nature and Landscape (543/2002)

(5) "If bird casualties on electric power lines or telecommunication hardware can be proven, the nature conservation authority can call on the operator of the power line or the telecommunication hardware to take measures against bird mortality."

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BirdLife International

➢ **Position Statement on Birds and Power Lines**

On the risks to birds from electricity transmission facilities and how to minimise any such effects.

(adopted by the BirdLife Birds and Habitats Directive Task Force on 10 May 2007)

➢ **Budapest Declaration on Bird Protection and Power Lines**

(adopted by the *Conference "Power lines and bird mortality in Europe" on 13 April 2011)*
⇨ demands that bird losses on new power lines are to be eliminated from 2016 onward

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Demands from nature conservation

1. All plans and projects regarding the construction of power lines should comply with the Directives of Strategic Environmental Assessment (SEA) and Environmental Impact Assessment (EIA).
2. We need a sensitive mapping of new power lines: Exclusion of important bird areas and protected areas.
3. New middle and high voltage power lines (up to 110 kV) should generally be constructed as underground cables.

4. If above-ground power lines:

✓ no neutral cable or a marked cable for better visibility

✓ single-level arrangements where ever possible

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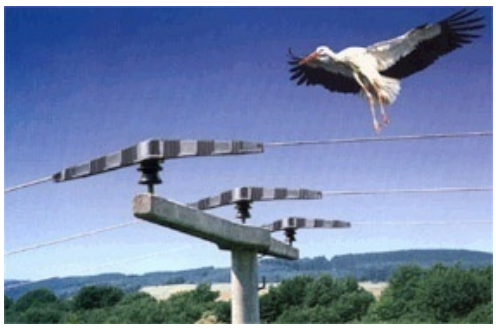
Thank you for your attention !



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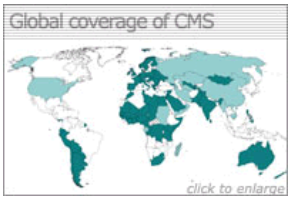
„Bonn Convention“

Resolution 7.4

CMS



- Calls on all Parties to curb the increasing electrocution risk from medium-voltage transmission lines and to minimise this risk in the long term.
- Calls on all Parties to include appropriate measures in **legislation** (...) to secure safe constructions and thus minimise electrocution impacts on birds.
- Calls on all Parties to appropriately neutralise existing towers (...) of dangerous construction types.
- Encourages constructors and operators of new medium-voltage transmission lines to provide for bird-friendly constructed power poles.
- Invites all concerned to apply as far as possible to the catalogue of measures contained in document UNEP/CMS/Inf.7.21 (NABU-brochure).

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Electricity Grid expansion

- Growing share of renewable energy sources
  - EU Renewables Directive: Binding national targets for use of renewables
    → EU from 7% of energy mix in 2007 to 20% by 2020
- Limited availability and predictability of renewable energy sources
  - “Smart grid” to balance supply and demand
- Different locations of energy sources and demand
  - Huge renewable energy potential esp. in Scandinavia (hydro power), North-Sea (offshore wind power) and Southern Europe (solar power)
  - Cross-national cooperation to reach national targets of EU Renewables Directive possible

Birds and Electrical Wires
March 5, 2009

NABU

Grid expansion policies in Germany

- Federal Powerline Expansion Law (draft Dec 2008):
  - Accelerate legal authorisation procedures
  - Identify priority projects
  - Promotion of innovative technologies (i.e. underground cables)
- Under-ground Cable Law, Lower Saxony:
  - The regulation is the use of underground cables in the vicinity of residential buildings and in protected areas
- Regional Planning for offshore windparks and cables:
  - Assigns designated areas for cables and pipelines

Birds and Electrical Wires
March 5, 2009