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REVIEWING AND MITIGATING THE IMPACTS OF RENEWABLE ENERGY DEVELOPMENTS ON SPECIES AND HABITATS PROTECTED UNDER THE BIRDS AND HABITATS DIRECTIVES

June 2020

BirdLife International Europe and Central Asia | Partnership for nature and people

STELLA Consulting

ECOSYSTEMS LTD

NIRAS

Institute for European Environmental Policy

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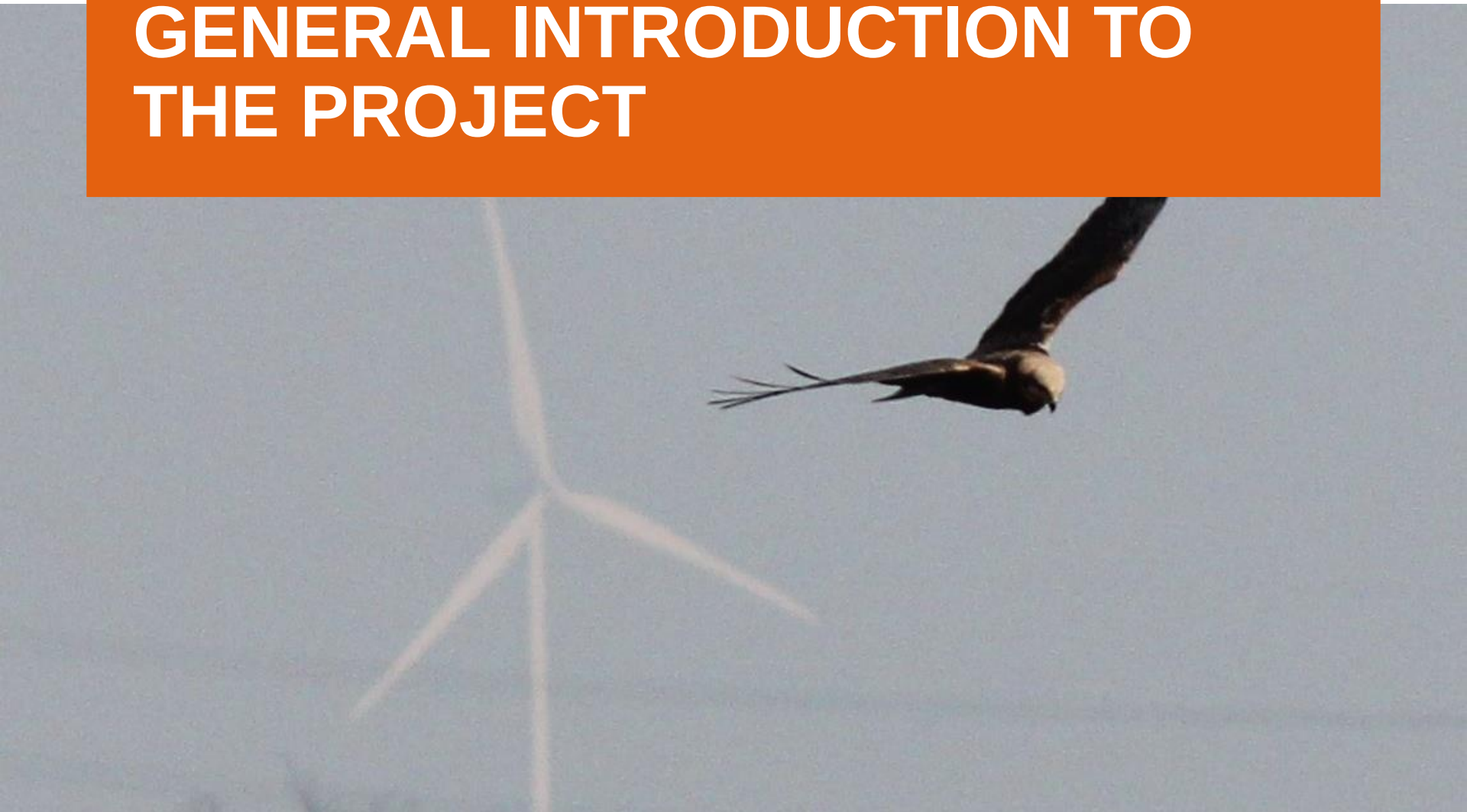
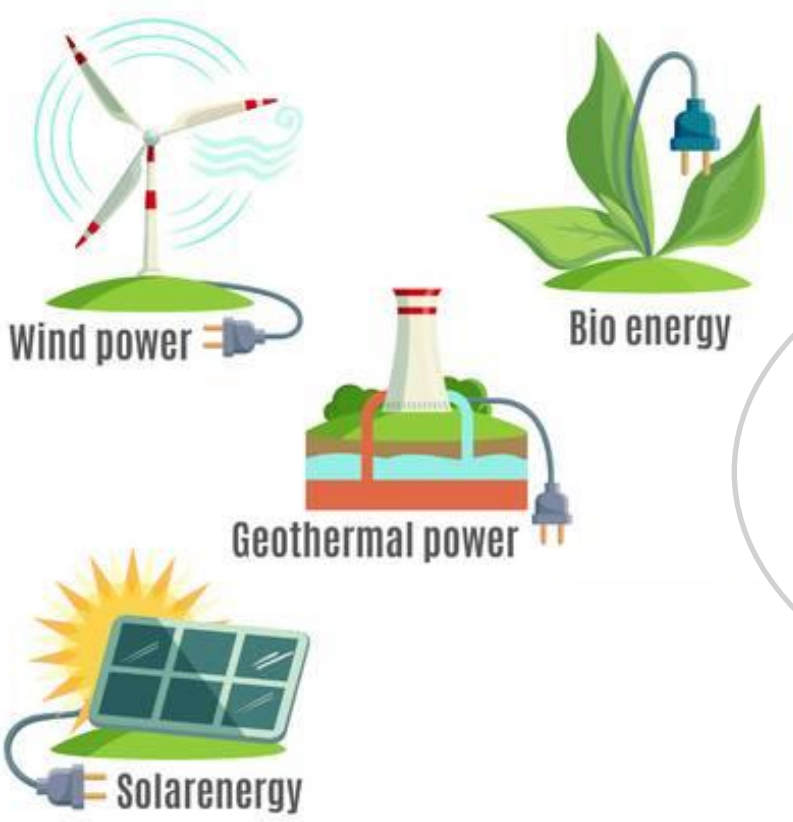
GENERAL INTRODUCTION TO THE PROJECT



Objectives



IMPACTS

NATURA 2000

HOW TO MITIGATE?

Scope of study

1. Renewable energy developments
    - **wind, solar, ocean, geothermal and bioenergy** (hydropower and transport infrastructure are excluded)
    - whole life cycle: construction, operation and decommissioning
2. Habitats and species protected under the EU legislation
    - Main focus on birds, bats and marine mammals
    - Also coastal and marine habitats, terrestrial habitats, and other species groups if relevant
    - Not only focused on Natura 2000 sites but also on Annex IV species
3. Planning and Permitting procedure

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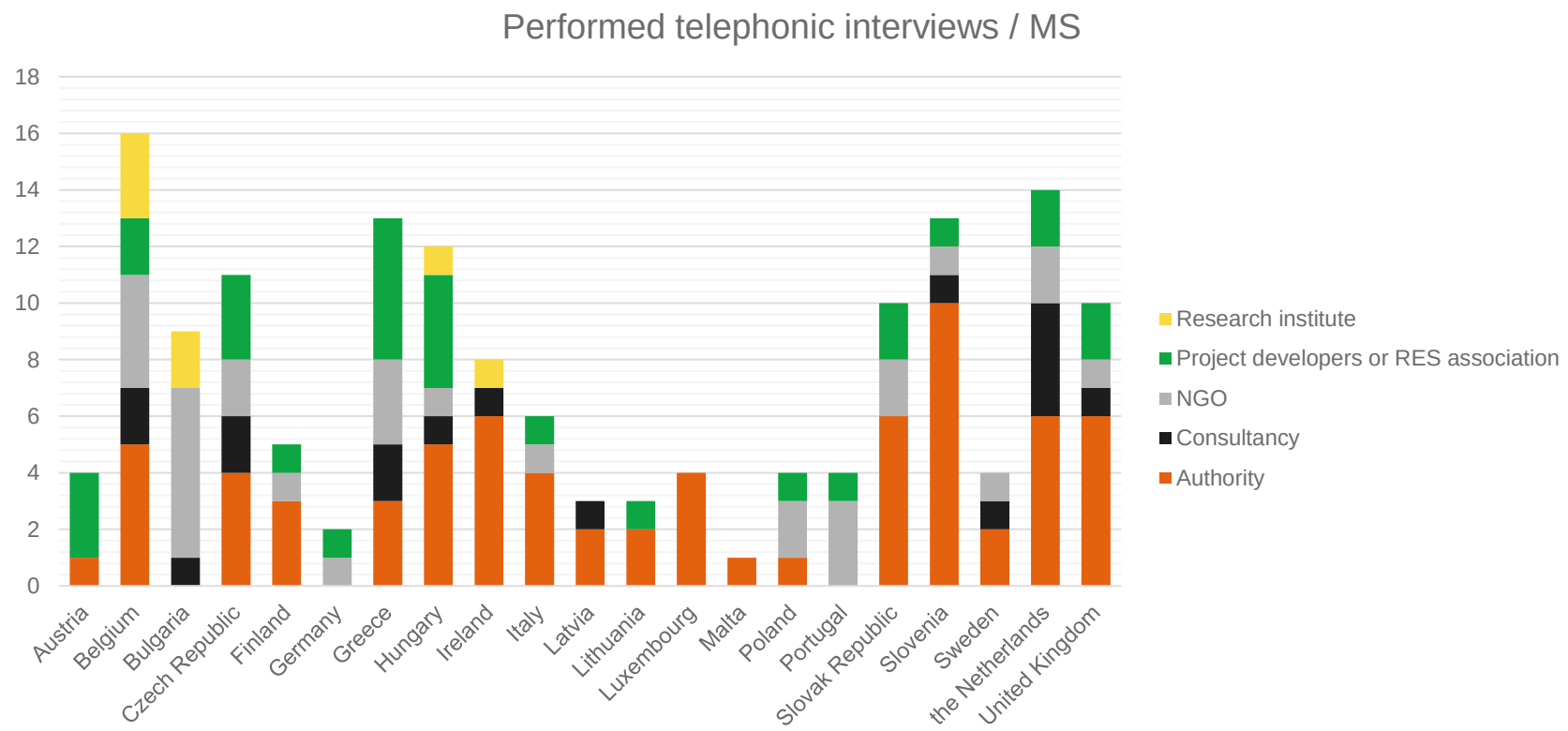
MAIN FINDINGS OF STAKEHOLDER CONSULTATION

Stakeholder consultation: facts and figures



Total = 156 stakeholders telephonically interviewed

Main findings of stakeholder consultation

Significance: what is ‘significant’? How to measure mortality? Precautionary principle and worst-case assumption. Adaptive management and post-monitoring

Cumulative impacts: lack of methodologies, accumulation of effects, scope (planned or approved), geographical scope and lack of data

Data: Lack of good quality data → time required for baseline surveys, post monitoring, but post monitoring data is rarely interpreted, lack of resources from authorities to interpret data, confidentiality etc.

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EC GUIDANCE ON WIND ENERGY AND N2000

Structure EC Guidance

1. Wind energy in Europe
2. The EU's policy framework and legislation for nature and biodiversity
3. General approach and principles
4. Strategic planning
5. Onshore: Potential effects
6. Offshore: Potential effects
7. Monitoring and adaptive management

Structure EC Guidance

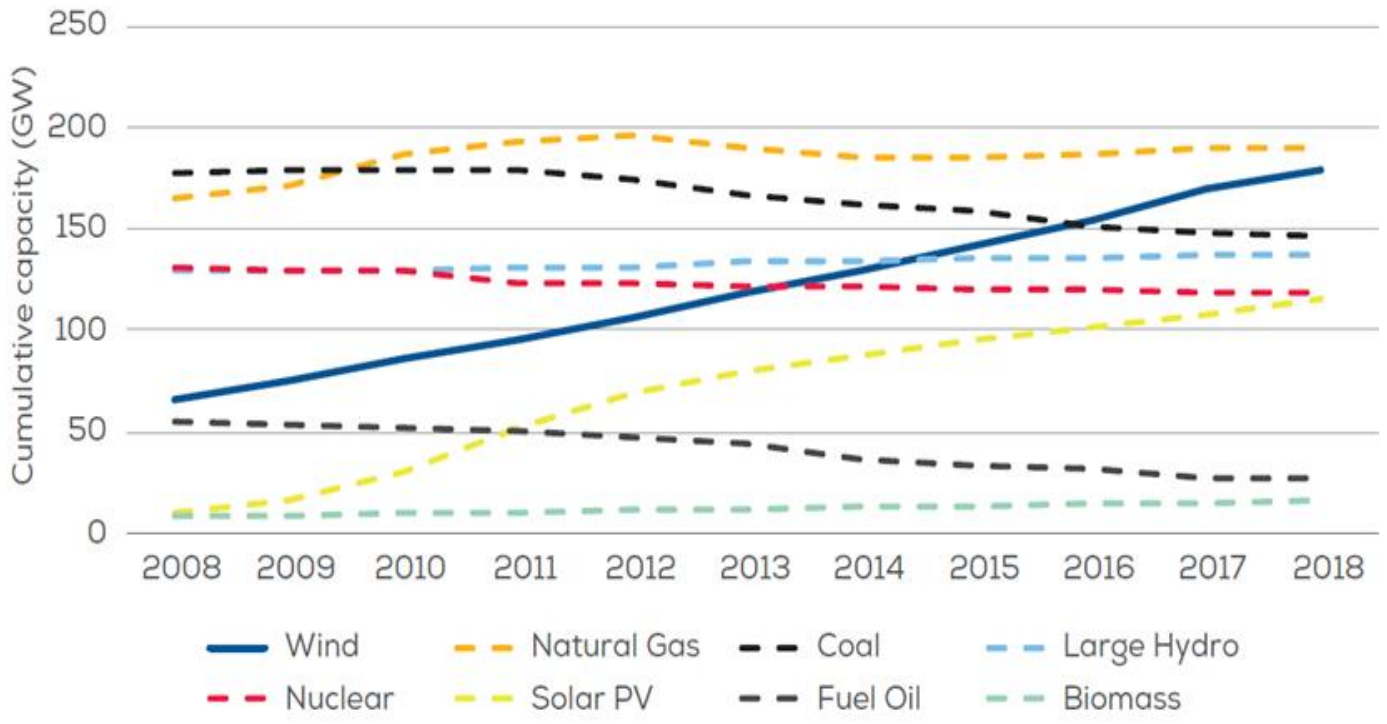
Chapter 1: Wind energy in Europe

- Ambitious targets to decarbonize the economies set by the EU:
  - 20% of energy production from RES by 2020
  - A renewable share of at least 32% of gross EU energy consumption by 2030
- On track for 2020, however:
  - > 30% RES consumption in FI/SE/LV ⇔ < 5% in MT/LU/NL

Structure EC Guidance

Chapter 1: Wind energy in Europe

Total power generation capacity in the European Union 2008-2018



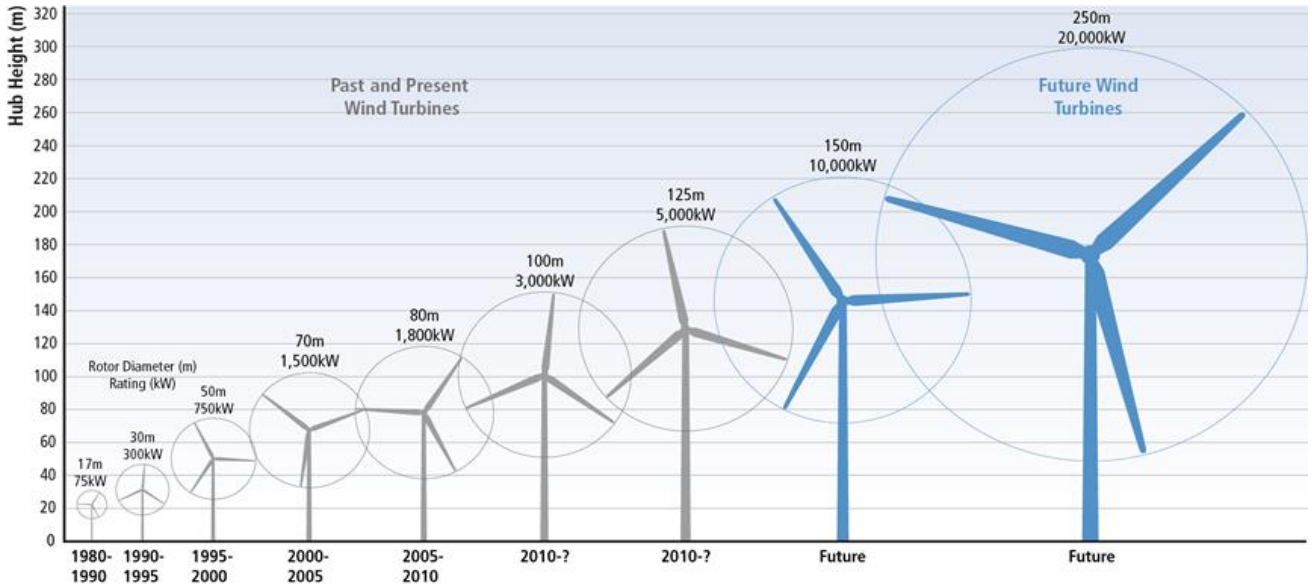
14%

Source: WindEurope, 2019

Structure EC Guidance

Chapter 1: Wind energy in Europe

- The EU policy framework for promoting renewable energy sources
  - Climate neutral energy sector in 2050 → doubling of wind capacity is needed
- Trends in wind energy developments

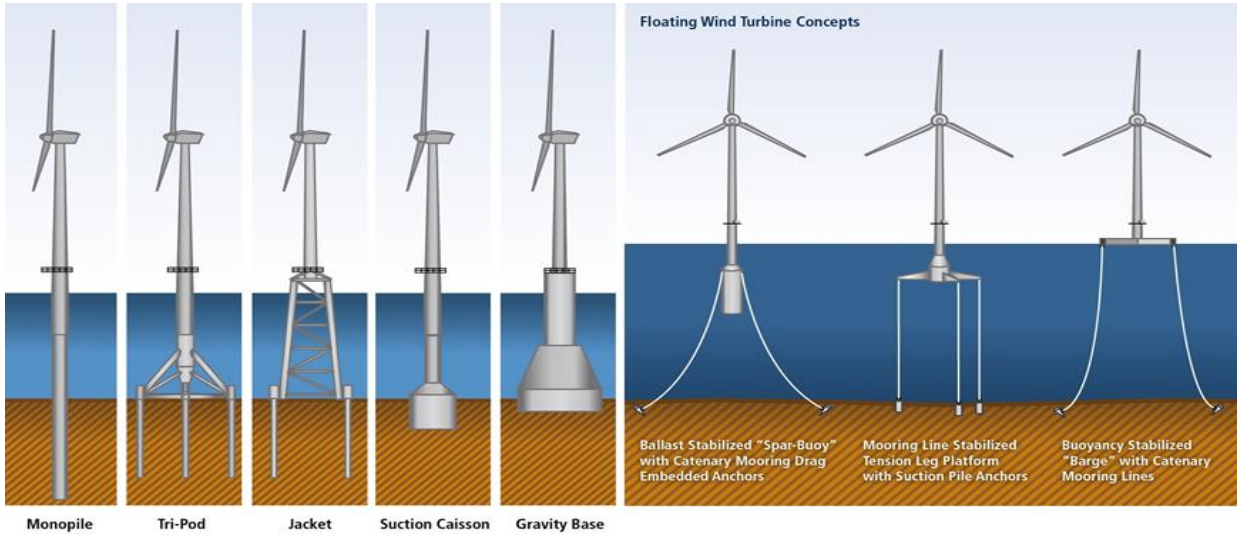


Source: Edenhofer *et al.*, 2011.

Structure EC Guidance

Chapter 1: Wind energy in Europe

- Trends in wind energy developments
  - Foundation design



Source: Edenhofer *et al*., 2011.

  - Multiple-use developments

Structure EC Guidance

Chapter 2: The EU's policy framework and legislation for nature and biodiversity

- EU biodiversity policy framework
- Step-by-step approach for wind farm developments potentially affecting Natura 2000 sites
  - Stage 1: screening
  - Stage 2: appropriate assessment
  - Stage 3: derogation
- Based on:
  - EC Guidance 'Managing Natura 2000 sites. The provisions of Article 6 of the Habitats Directive 92/43/EEC (updated June 2019) (EC, 2019a)
  - EC Guidance 'Assessment of plans and projects in relation with Natura 2000 sites. Methodological guidance on the provisions of article 6(3) and (4) of the Habitats Directive 92/43/EEC (updated XXX) (EC, 2019b)

→ Both to consult for a correct interpretation and application of the legislation.

Structure EC Guidance

Chapter 2: The EU's policy framework and legislation for nature and biodiversity

- Species protection provisions
  - Mainly Art 12 and Art 16 of Habitats Directive

- Based on:
  - EC Guidance document on the strict protection of animal species of Community interest under the Habitats Directive 92/43/EEC (updated XXX) (EC, 2019c)

→ Recommended to consult for a correct interpretation and application of the legislation.

Structure EC Guidance

Chapter 3: General approach and principles

- Strategic planning (incl. wildlife sensitivity mapping)
- What is a significant effect?
- Establishing the content and the spatial and temporal extent of the assessment (scoping)
- Establishing a baseline
- Assessing cumulative effects + recommendations
- Stakeholder participation

Structure EC Guidance

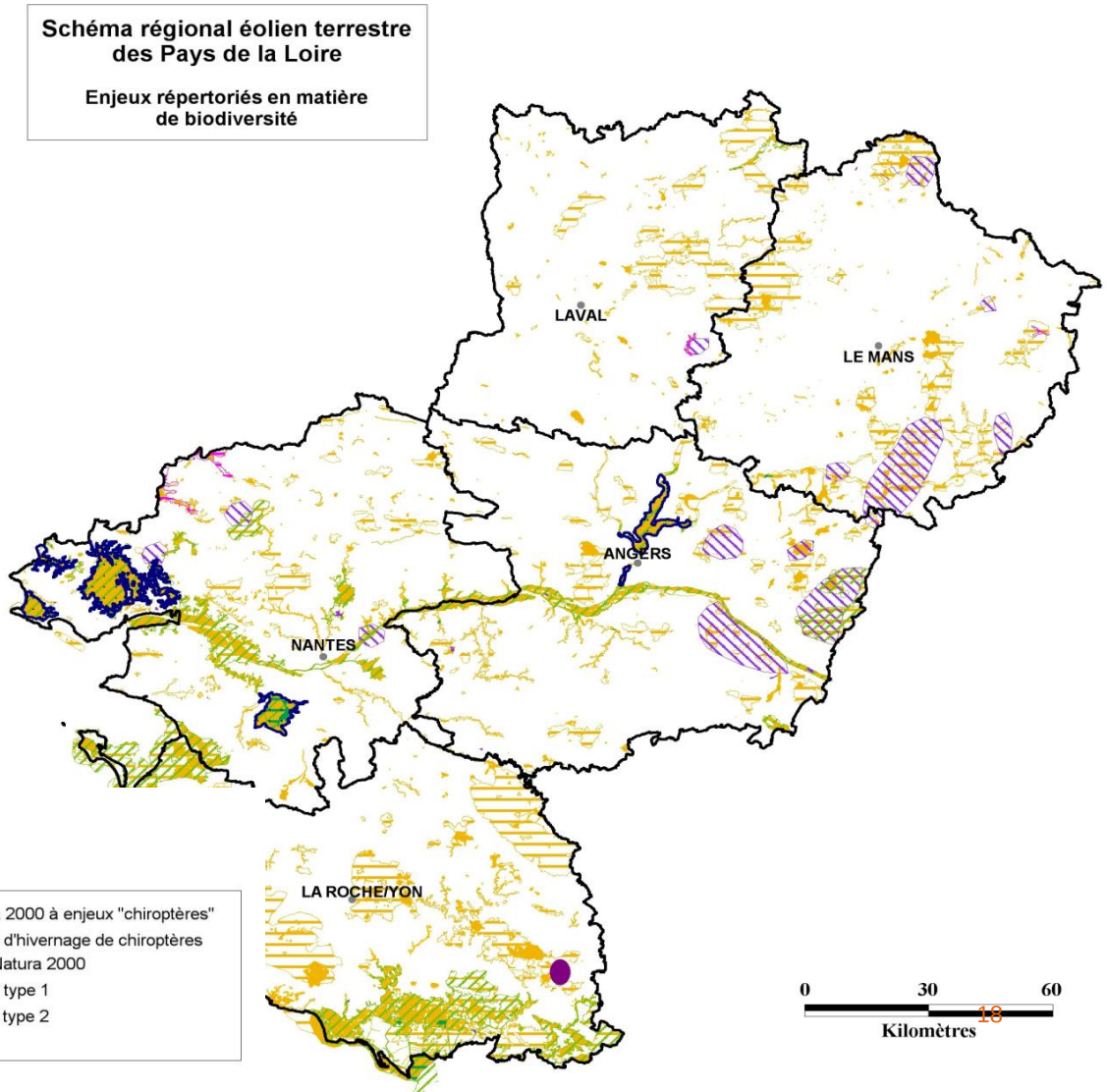
Chapter 4: Strategic planning

- The importance and advantages of strategic planning:
  - For offshore, also in the context of EU marine spatial planning legislation
- Examples given of strategic approaches to avoid significant effects (including wildlife sensitivity mapping)

Good practices

Pays de la Loire, France

Strategic planning onshore – ‘Schéma Régional Eolien’



Source DREAL Pays de la Loire, fond cartographique BDCarthage® ©Ign
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Good practices

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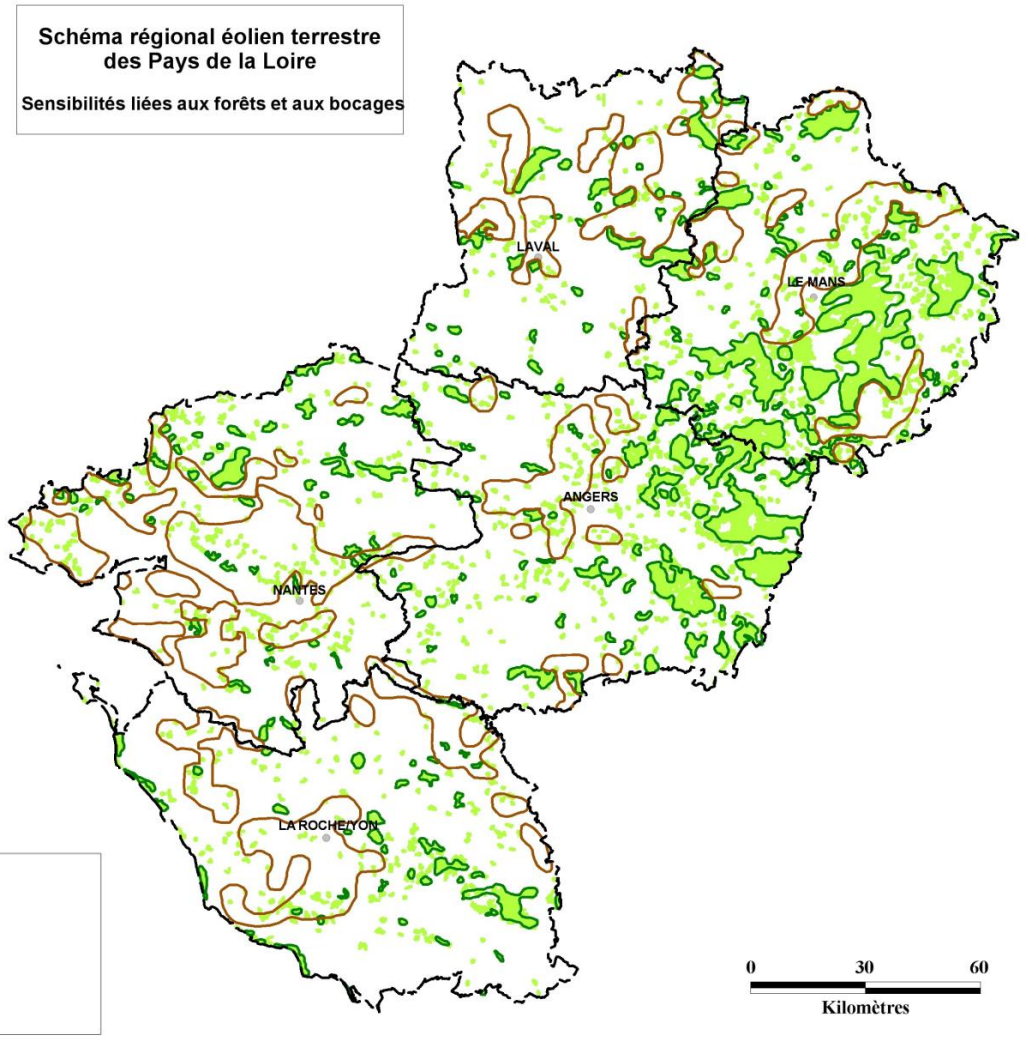

Source DREAL Pays de la Loire, fond cartographique BDCarthage® ©Ign
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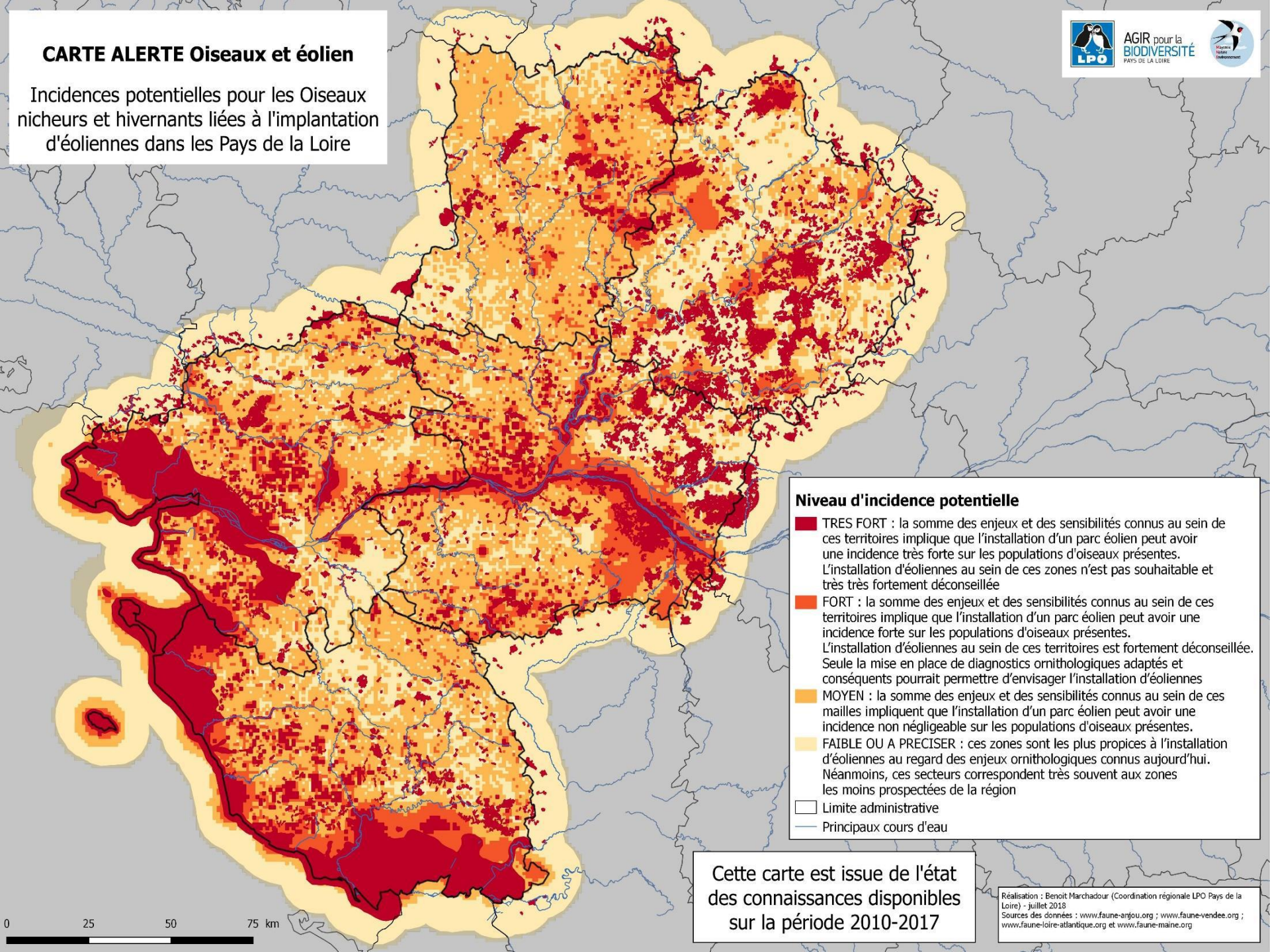
- Massifs forestiers de plus de 25 ha
- Massifs forestiers de plus de 25 ha (identifiés dans l'étude LPO 2010) représentant un enjeu pour les chauve-souris et l'avifaune
- Bocages représentant un enjeu pour les chauve-souris

CARTE ALERTE Oiseaux et éolien

Incidences potentielles pour les Oiseaux nicheurs et hivernants liées à l'implantation d'éoliennes dans les Pays de la Loire

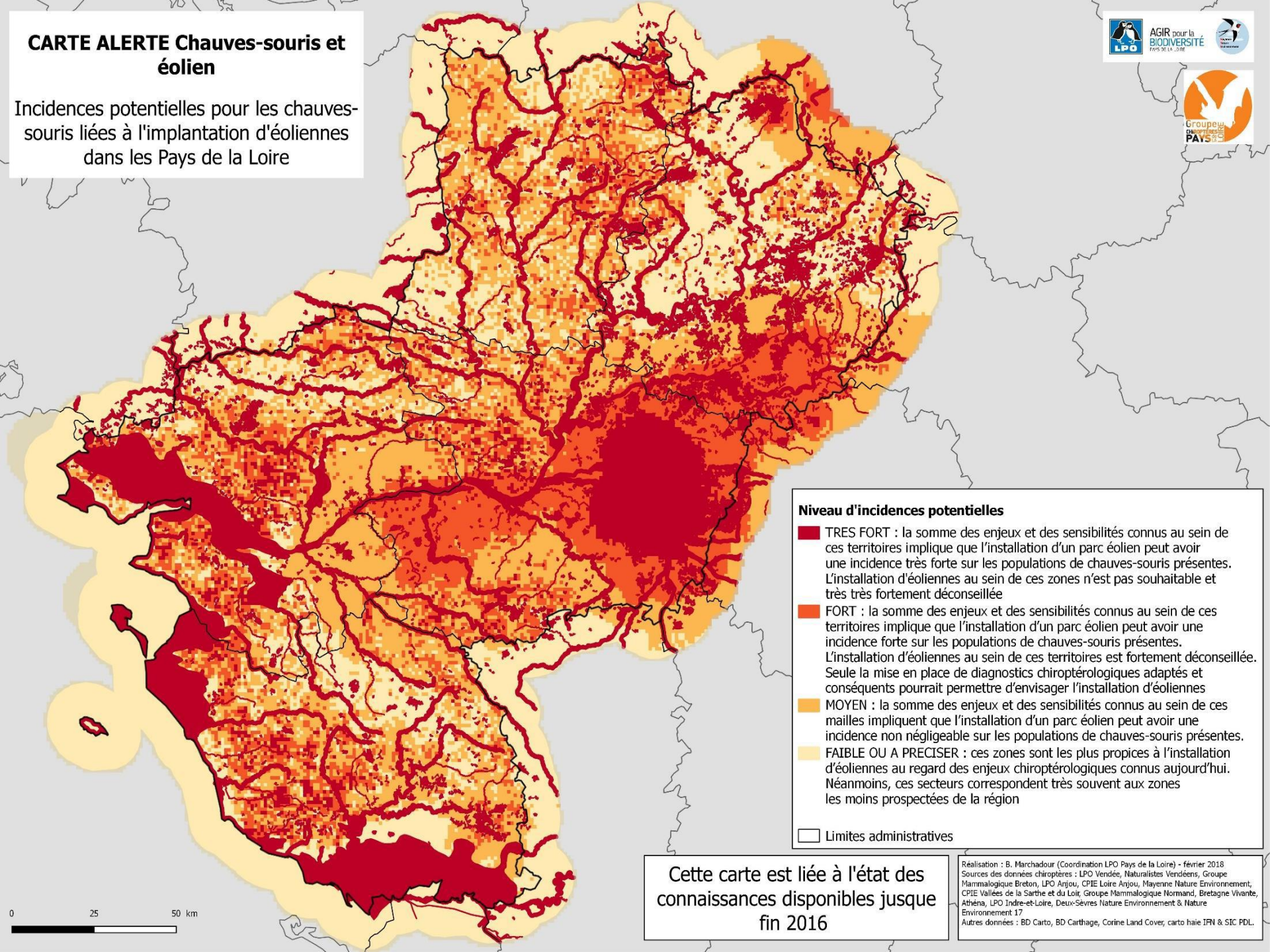


Cette carte est issue de l'état des connaissances disponibles sur la période 2010-2017

Réalisation : Benoit Marchadour (Coordination régionale LPO Pays de la Loire) - juillet 2018
Sources des données : www.faune-anjou.org ; www.faune-vendee.org ; www.faune-loire-atlantique.org et www.faune-maine.org

CARTE ALERTE Chauves-souris et éolien

Incidences potentielles pour les chauves-souris liées à l'implantation d'éoliennes dans les Pays de la Loire



Cette carte est liée à l'état des connaissances disponibles jusque fin 2016

Réalisation : B. Marchadour (Coordination LPO Pays de la Loire) - février 2018
Sources des données chiroptères : LPO Vendée, Naturalistes Vendéens, Groupe Mammalogique Breton, LPO Anjou, CPIE Loire Anjou, Mayenne Nature Environnement, CPIE Vallées de la Sarthe et du Loir, Groupe Mammalogique Normand, Bretagne Vivante, Athéna, LPO Indre-et-Loire, Deux-Sèvres Nature Environnement & Nature Environnement 17
Autres données : BD Carto, BD Carthage, Corine Land Cover, carto haie IFN & SIC PDL.

Structure EC Guidance

Chapter 5 (onshore) and Chapter 6 (offshore): Potential effects

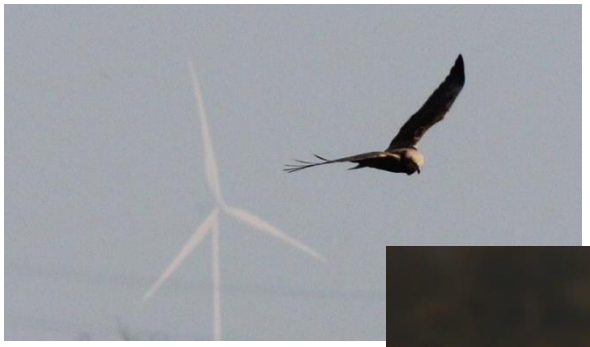
For each receptor group:

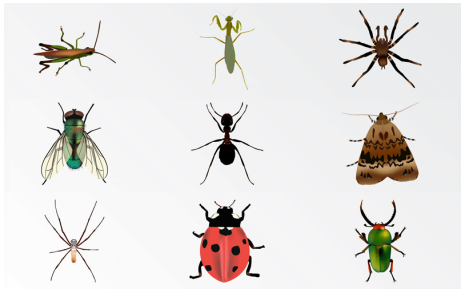
- Identification of the key effect groups, related to life cycle phase of the wind energy development
- Guidance on required baseline data and survey approaches
- Overview of how significance is assessed
  - Key uncertainties in determining significance
- Effectiveness of mitigation measures

Structure EC Guidance

Chapter 5 (onshore) and Chapter 6 (offshore): Potential effects

The **potentially affected receptor groups** are divided in the following categories:





Structure EC Guidance

Chapter 5 (onshore) and Chapter 6 (offshore): Potential effects

Main potential impact groups:

- Habitat loss and degradation
- Habitat fragmentation
- Habitat disturbance
- Collision
- Barrier effect
- Barotrauma (for bats)
- Loss of flight corridors and roost sites
- Acoustic impairment (injuries from underwater noise)
- Habitat creation

…

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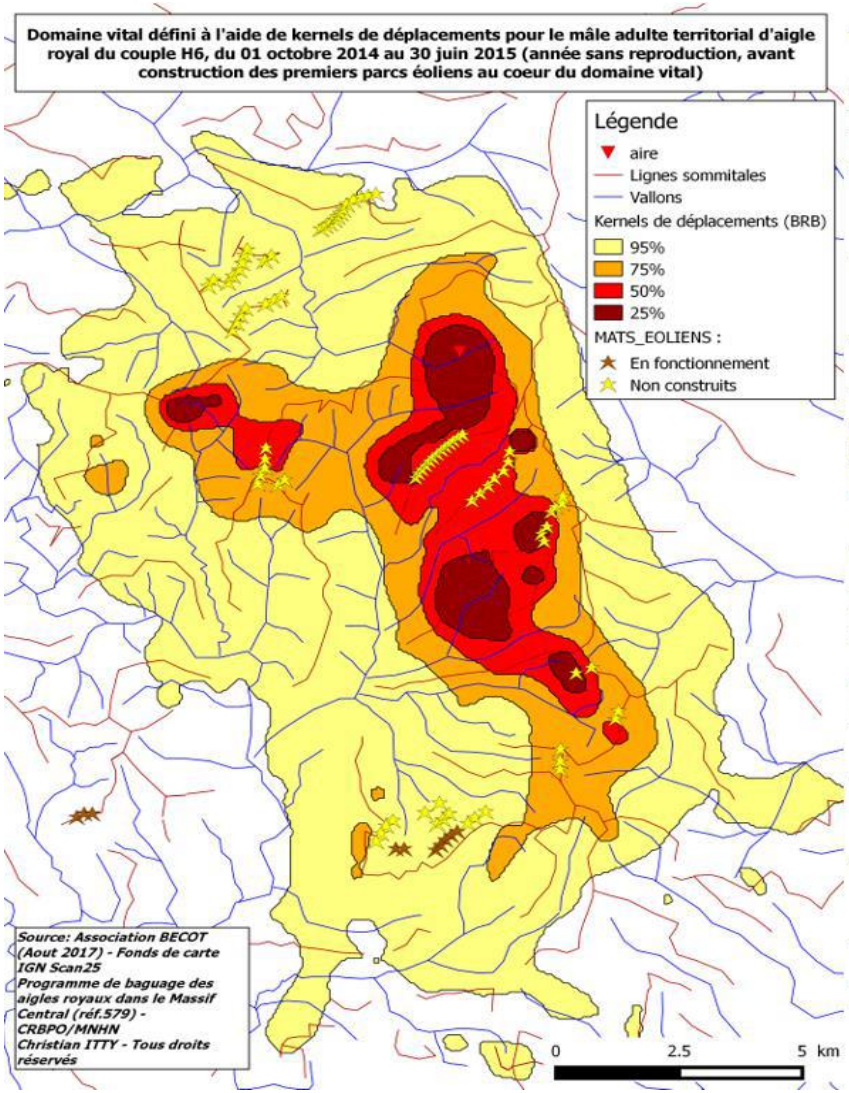
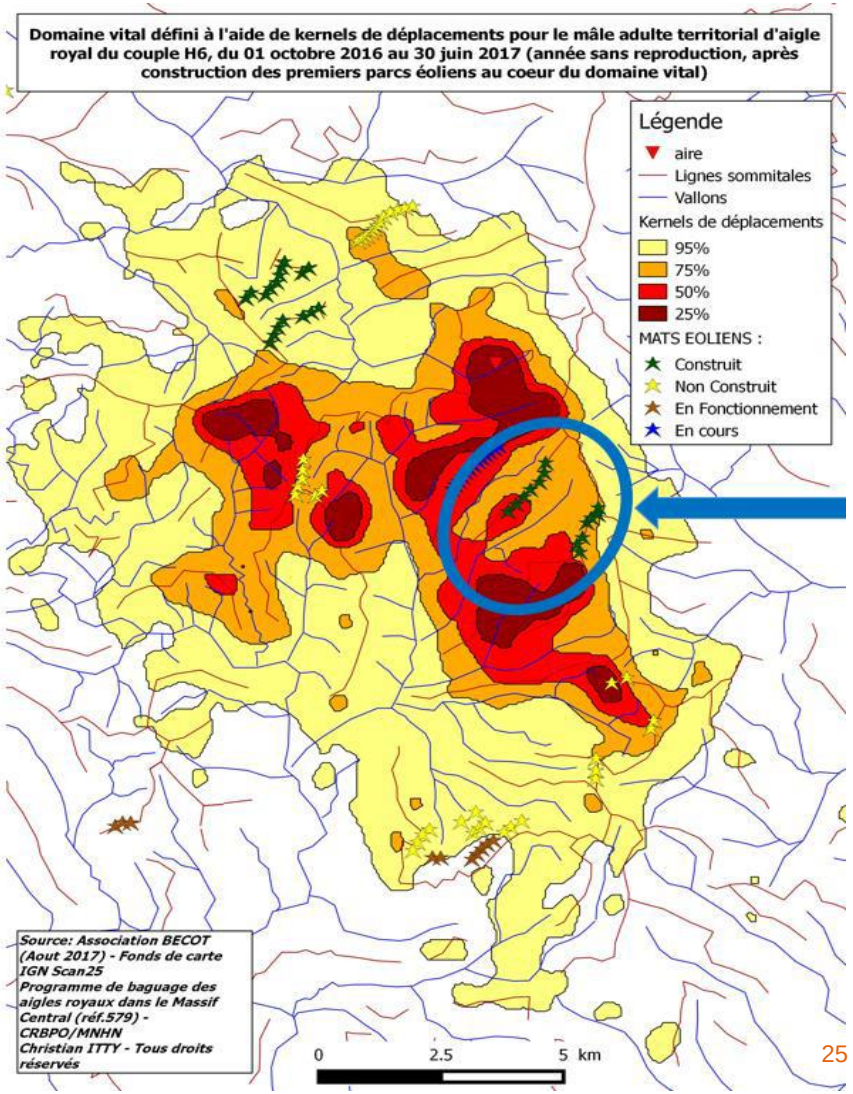
Illustration of displacement effect





Structure EC Guidance

Chapter 5 (onshore) and Chapter 6 (offshore): Potential effects

Main types of measures:

- Macro-siting: avoiding ecologically sensitive areas
- Micro-siting: turbine arrangement and location
- Infrastructure design: turbine number and physical specifications (incl. turbine height, lighting, foundation design…)
- Scheduling and turbine operational timing: avoiding, reducing or phasing activities at ecologically sensitive times (e.g. increasing cut-in speeds)
- Deterrents: acoustic and visual methods
- Habitat management to dissuade and lure species away from turbines

Structure EC Guidance

Mitigation of noise of pile driving on marine mammals, Germany

Standard procedure: noise mitigation techniques:

- Deterrence of porpoises before piling starts
- Check if porpoises are within 750 m with a C-POD
- Gradual increase of noise intensity of piling
- Threshold of 160 dB SEL and 190 dB Lpeak within 750 m
- Max. 180 min
- Use of bubble curtain

Source: Hero Lang (Trianel) www.bfn.de

Structure EC Guidance

Chapter 7: Monitoring and adaptive management

- Examples of good practice on monitoring (e.g. bird/bat carcass searching);
- Principles of adaptive management, not as an alternative to the precautionary principle, but as a safeguarding tool to complement it

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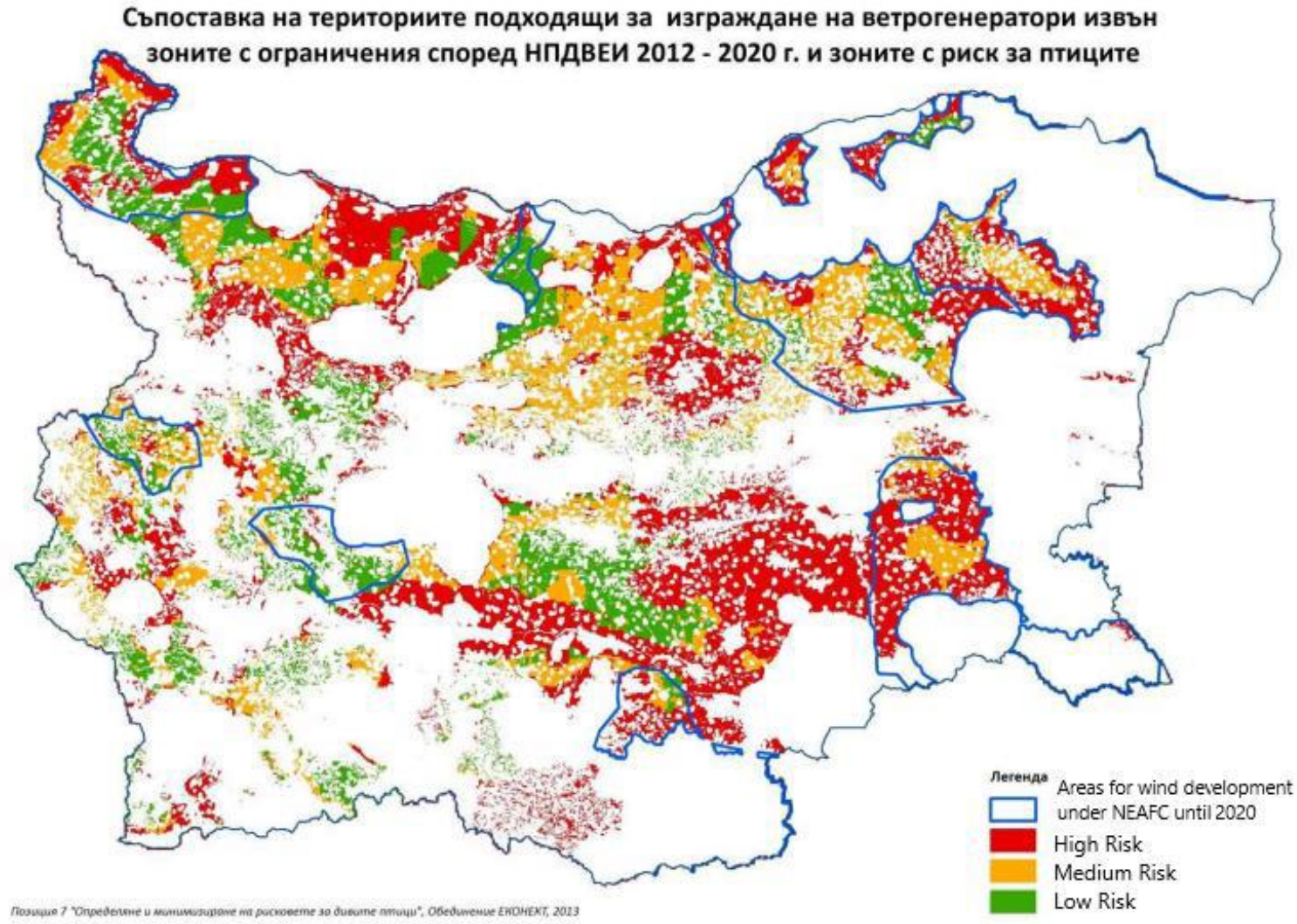
MANUAL ON WILDLIFE SENSITIVITY MAPPING

The Manual on WSM

- Comprehensive summation of the datasets, methodologies and GIS applications
- Interactive tool → as a website
- Links to external websites and documents

- Aim:
  - Equip governments and other relevant parties to develop WSM for RES
  - Support effective adherence to EU nature legislation

Existing examples



Example of a wind farm sensitivity map from Bulgaria

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IMPACTS OF OTHER RENEWABLE ENERGY SOURCES

Solar energy findings

Current deployment

- 2,63% of EU gross renewable energy inland consumption (2015)
- Increasing market for floating PV panels (e.g. pilot projects on marine solar farms)

Technical features

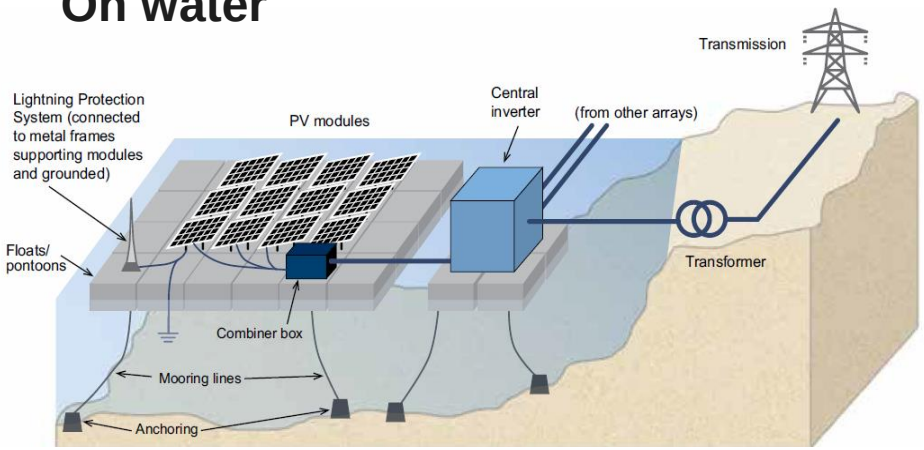
- Photovoltaic cells (PV): sunlight converted to electric current (mostly used)
- Concentrating solar power (CSP): sunlight heats a fluid, and indirectly generates electricity through powering a turbine or engine through steam
  - Different technologies: parabolic trough (most mature), heliostat power tower, parabolic dish, etc.
  - Requires high intensity sunlight & low annual cloud cover, so limited potential in EU (deployed in e.g. Spain)

PV structures

On land

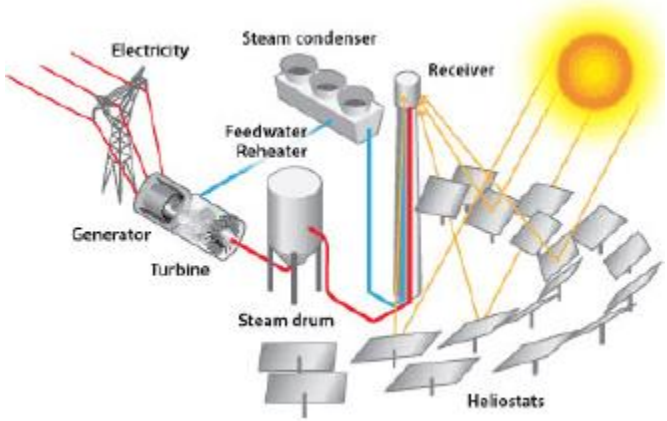
Solar park, UK

On water



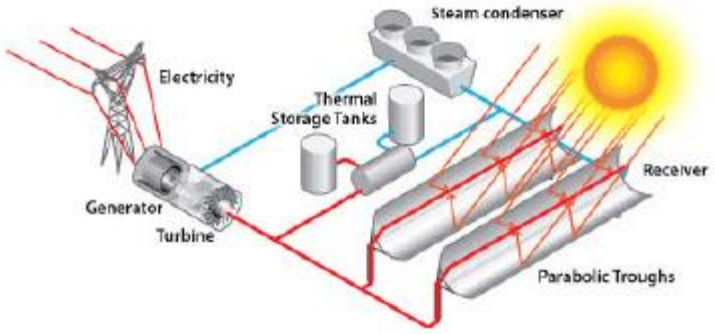
Floating PV, India

Concentrated Solar Power examples



Solar power tower, Sevilla, Spain

Parabolic trough, Egypt



Solar energy impacts

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Ground-mounted solar parcs (PV, CSP)

Impact groups (C: construction / O: operation / D: decommissioning)	Affected species and habitats
Habitat loss and degradation (C), including soil compaction, surface etc.	Dependent on location: birds, bats, mammals, reptiles, amphibians, fish (inland lakes)
Fragmentation (e.g. fencing) (C, O)	Mammals, reptiles, amphibians
Disturbance and displacement (C, O, D), e.g. by light (during the night), human presence	Birds, bats, mammals
Collision (O)	Birds, bats
Singeing (O)	Birds
Altered microclimate (O)	Vegetation
Increased use of herbicides (O)	Vegetation, invertebrates, ground-nesting bird species
Attraction of invertebrates (O) (e.g. insects like water beetles that confuse panels with water)	Birds, bats (increase availability of prey)
Habitat creation e.g. by increasing groundwater level, by extensive management of flower strips, etc. (O)	Potential positive impacts on several fauna groups and habitat types, depending on location and type of measures

Ground-mounted solar parcs (PV, CSP)

Mitigation measures

- Avoid locations important for EU protected species and habitats, incl. forage area and other functionally linked land
- Preferably sited on brownfields / degraded land with low biodiversity value
- Measures to improve biodiversity:
  - Reducing / avoiding biocides and fertilisers
  - Sheep grazing or mowing
  - Permeable fencing (but site-specific approach: large mammal access might not be appropriate when ground-nesting birds are present)
  - Including hedgerows, stone walls, hedgebanks, field margins, scrub, etc. functioning as corridor, providing shelter, nesting and foraging area

Floating solar panels

Literature is scarce

Expected impact:

- Reduced light availability
- Impact on water temperature and heat distribution
- Impact on oxygen availability
- Impact on algae, aquatic plants, plankton and benthos
- Fish: reef effect, protection from fishing, loss of feeding grounds
- Birds: no impact as long as ecological quality of the water is maintained
- Marine mammals: barriers, entrapment and entanglement risk
- Cumulative impact when combined with wind power parks or hydropower plants – no research available yet

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IMPACTS OF BIO ENERGY

Study Focus and Methods

- Potential impacts associated with the cultivation, production and extraction of feedstocks for all bioenergy end uses on habitats and species protected under the EU's Birds and Habitats Directives
- Gaps in the coverage of policies designed to mitigate such impacts.
- Protection of species and habitats applies whether they sit inside or outside a protected site.
- 'Bioenergy's interactions with protected species differs from other RES:
  - Raw material feedstock
  - Biomass can be regrown, but this requires the use of land, water and nutrients for ongoing production. Associated environmental impacts are sensitive to the level of supply, meaning a change in biomass use for energy influences land use or land management.
  - Increased demand for bioenergy will drive demand for bioenergy feedstocks, which are generated primarily from agricultural and forest commodities. This in turn can have impacts on EU protected habitats and species.

Analytical Approach

- 3 main types of land use and land management consequences

Biomass feedstock	Focus of the study	Potential interaction with habitats or species protection
Conventional crops (i.e. food and feed crops) and residues from agriculture	• Crop species: primarily oilseed rape, maize, wheat and other cereals, sugar-beet and grass • Residues from crops and from the management of semi-natural habitats	Changes in the intensity of agricultural land management and land use
Purpose grown energy crops cultivated on agricultural land	Miscanthus, reed canary grass, short rotation coppice, afforestation and small-scale tree planting	Changes in the intensity of agricultural land management and land use
Forest biomass from existing forest land including the use of roundwood and primary forest residues	The extraction of material from existing forests including residues such as stumps, thinning, tops and branches, deadwood plus rejected sawlogs and other low value trees	Changes in the forest management regime

Analytical Approach

Review of future EU use of biomass for energy and its consequences up to 2030;

Identifying potential risk factors

Assessment of species and habitat vulnerability, based on nowadays biomass use, projected for 2030;

Identifying the sensitivity and vulnerability of different habitats and species to the anticipated risks

Analysis of the coverage of current policy in the EU (based on six national case examples) +

Identification of policy gaps

Gap Analysis – comparing coverage of existing policies to identified risks

Conclusions - future policy needs

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