



Offshore Wind Energy Deployment in the European Union

Concerted Action for Offshore Wind Energy Deployment (COD)

Environmental Issues

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Introduction

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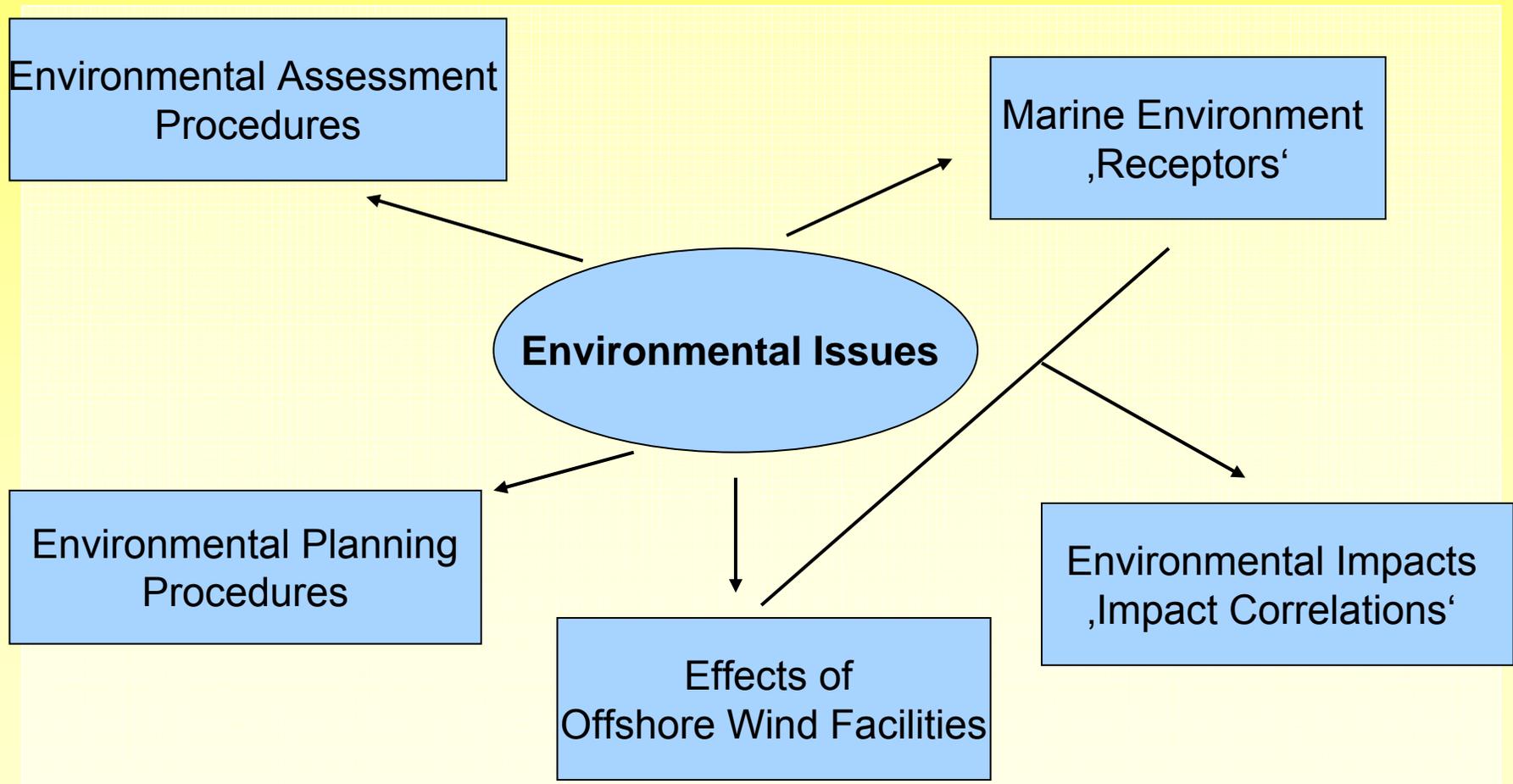
Berlin University of Technology

Dept. Environmental Planning and
Environmental Impact Assessment

→ representing Germany in the COD project



Scope of Environmental Issues





Results of COD Workpackage “Environmental Issues”

Details see COD website:

- report on environmental issues
(Elke Bruns, Ines Steinhauer)
- COD - database
(NEW, TU Berlin)

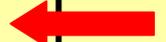
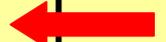
Thanks to all supporting members of COD group !



Database: contents

- **COD database**
- number/ distribution of entries
 - ◆ dependent on research activities
 - ◆ dependent on number of applications
- Denmark, the United Kingdom and Germany provide highest numbers of publications

Country	Data records
BE (Belgium)	9
D (Germany)	56
DK (Denmark)	119
IRL (Ireland)	5
NL (Netherlands)	19
PL (Poland)	1
SE (Sweden)	6
UK (United Kingdom)	69
Σ	284





Database: details

- database is not exhaustive
 - comment on the database contains information on
 - ◆ types of publications
 - ◆ kind of accessible information
 - ◆ context
- ➔ actualization desirable in view of expected final reports, among others from the Danish demonstration programme in 2006/07



Assessment procedures on project level

Environmental Impact Assessment (EIA)

Observations

- EIA procedures are no major constraint
- EIA = *risk* assessment - still widely based on assumptions
- precautionary principle requires comprehensive investigations
- investigation efforts for EIA are widely accepted

Recommendations

- research on causal interconnections by effect and monitoring studies, supported by baseline research
- standardising investigation methods on the basis of emerging best practise experiences



Assessment procedures on superior level

Strategic Environmental Assessment (SEA) Spatial planning (delineation of suitable areas)

Observations

- applying strategic assessment procedures and schemes for spatial planning still at the beginning

Recommendations:

- superior level approaches needed to cope with large-scale cumulative or transboundary effects in view of high background stress level
- transnationally agreed schemes desirable
 - detailing information needs, assessment procedures and criteria for SEA
 - detailing participation procedures



Components of the marine ecosystem

(potential receptors)

- birds (sea birds, resting birds, migrating birds)
- marine mammals
- fish
- benthos
- soil/seabed
- hydrology

- visual landscape
- men

Observations:

- similar interpretation of national EIA-regulations on the marine environment

- different levels of investigation needs

- harmonisation of investigation methods desirable



Potential effects

- barrier and scaring effects
- collision risks (birds / bats)
- noise
- disturbing effects
- electromagnetic fields (cables)
- introduction of artificial substrates
- sedimentation / turbidity
- changes in hydrography
- visual intrusion,
- ship collision

Observations:

- ➔ scope of potential impacts is generally approved
- ➔ increase of knowledge by results from Danish monitoring and effect studies

But:

- ➔ prediction of effects (intensity, reach) is still difficult
- ➔ evaluation of significance is controversial



Impacts on marine mammals

Main potential impacts (e.g.)

- loss of habitats due to disturbance effects / avoidance
- physical damage due to noise (ramming)

Results from effect/monitoring studies:

- no direct impacts (physical damage) stated
- avoidance of habitats was not observed

Recommendation:

- ➔ monitoring of cumulative effects and impacts on population stability (e.g. by noise, disturbance)



Impacts on birds

Main potential impacts (differentiation between migrating birds, seabirds and resting birds is essential (e.g.):

- loss of habitats due to disturbance
- bird collision

Observations:

- avoidance of wind farm areas is observed
- habituation / avoidance behavior is species-specific
- higher collision risks for migrating birds
- collision rates: no reliable numbers

Recommendations:

- ➔ high priority: monitoring of wind farm related cumulative effects
- ➔ monitoring of collision risks (quantifying methods)
- ➔ models to support predictions of habitat loss



Impacts on benthos

Main potential impacts:

- habitat loss due to foundation / scour protection
- change of species composition due to artificial substrate

Observations:

- change of species abundance and composition is evaluated differently
 - ◆ increase of biodiversity
 - ◆ alienation
- exclusion of fisheries in wind farm areas lead to positive effects

Recommendations:

- ➔ monitoring of cumulative effects
- ➔ adjustment of evaluation standards (depending on local protection aims)



Impacts on fish

Main potential impacts:

- disturbance effects during construction phase
- turbidity
- electromagnetism (follow-up effect)

Observations:

- consideration of isolated effects on fish stocks is difficult
- improvement of nutrients (biomass) due to artificial reef-effect
- wind farm areas may serve as refuge for fish (exclusion of fishery)

Recommendations:

→ *not available*



Conclusions

Up to now: single case results only – generalisation is limited!

- effects on project level seem less invasive than expected,

But:

- cumulative impacts on the background of a high stress level are dominant !
- strategies on superior level (SEA, spatial planning) are required
- proper site selection seems most important for mitigation and social acceptance
- pilot wind farms should be built, accompanied by a compulsory monitoring scheme to proceed in gaining knowledge



COD



Thank you very much
for your attention