

Final Symposium of the research project

## SeeOff – Strategieentwicklung zum effizienten Rückbau von Offshore-Windparks

Development of efficient strategies for offshore wind farm decommissioning

March 30<sup>th</sup> 2022



SeeOff

Strategieentwicklung zum effizienten  
Rückbau von Offshore-Windparks

# SeeOff - Strategieentwicklung zum effizienten Rückbau von Offshore Windparks

(Development of strategies for sustainable offshore wind farm decommissioning)

## Project duration:

November 2018 – April 2022

## Projekt coordination:

City University of Applied Sciences Bremen  
Prof. Dr.-Ing. Silke Eckardt

## Website:

[www.seeoff.de](http://www.seeoff.de)

Supported by:



Federal Ministry  
for Economic Affairs  
and Climate Action

on the basis of a decision  
by the German Bundestag



- 09.00** **Welcome and introduction**  
(Prof. Dr.-Ing. Silke Eckardt, City University of Applied Sciences Bremen)
- 09.20** **Dismantling of offshore wind farms at sea**  
(Bernd Köhler, Deutsche Windtechnik)
- 09.40** **Comminution of offshore wind farm components and recovery of materials at land**  
(Dr. Sven Rausch, Nehlsen AG)
- 10.00** **Q & A Session**
- 10.20** ***Coffee Break and Networking in Lounge-Area***
- 10.35** **Economic efficiency of offshore wind farm decommissioning**  
(Janina Bösche, City University of Applied Sciences Bremen)
- 10.50** **Environmental impacts of offshore wind farm decommissioning**  
(Vanessa Spielmann, City University of Applied Sciences Bremen)
- 11.10** **Occupational safety of offshore wind farm decommissioning**  
(Mandy Ebojie, City University of Applied Sciences Bremen)
- 11.25** **Q & A Session**
- 11.45** ***Lunch Break and Networking in virtual Lounge-Area***
- 12.15** **Bringing economic efficiency, environmental impacts and occupational safety together: Multi criteria decision making for offshore wind farm decommissioning**  
(Vanessa Spielmann, City University of Applied Sciences Bremen)
- 12.30** **Public acceptance of offshore wind farm decommissioning**  
(Philipp Tremer, German Offshore Wind Energy Foundation)
- 12.45** **Q & A Session**
- 13.05** ***Goodbye and subsequent Networking in Lounge-Area***
- 13.45** **Closing of conference platform**

# Objectives for sustainable offshore wind farm decommissioning

Sustainable decommissioning of offshore wind farms					
Category	Economy	Environment			Health and safety
Aspect	Economic efficiency	GHG-Emission	Biodiversity	Resource efficiency	Safety at work
Objective	Economic efficient	Low GHG-Emission	Minor local impact	High resource efficiency	Few hazards
Attribute	(Present) value of costs/ decommissioned MW	CO <sub>2</sub> -Equivalent	Fraction of species richness maintained	Recovery rate	Hazard measure

30.03.2022

# Economic efficiency of offshore wind farm decommissioning

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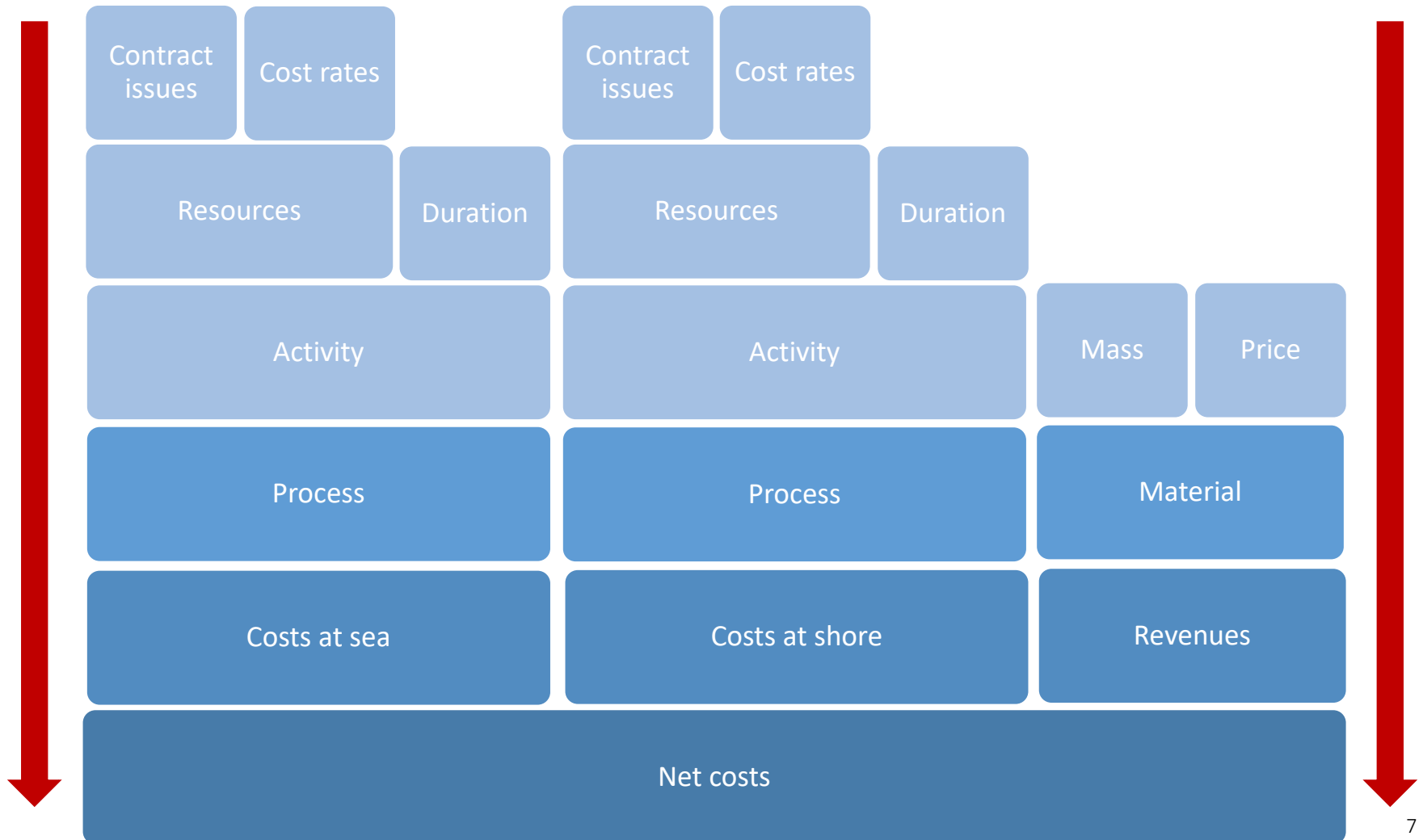
**SeeGff**

*Strategieentwicklung zum effizienten  
Rückbau von Offshore-Windparks*

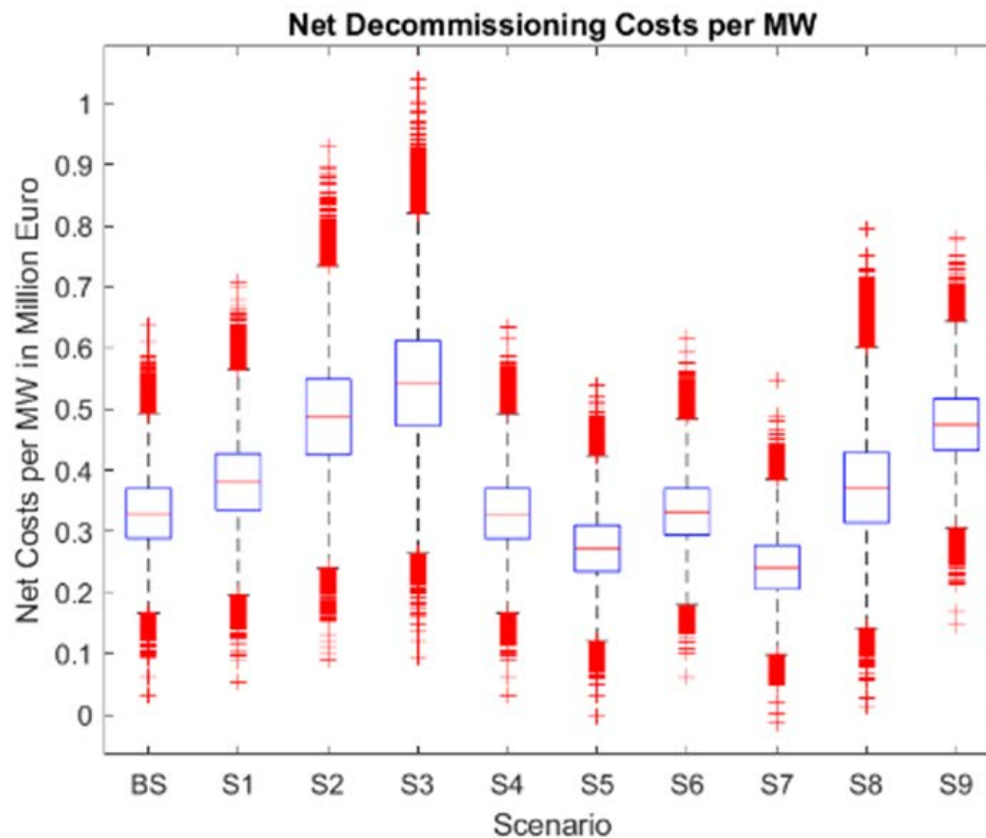
## Economic Goal

- Economic efficiency in the sense of cost minimization
- Contribution to UN sustainability goals
  - Affordable and clean energy
  - Decent work and economic growth
- Risk analyses based on Monte Carlo simulation
  - Availability of vessels
  - Bad-weather conditions
  - Accidents

# Method



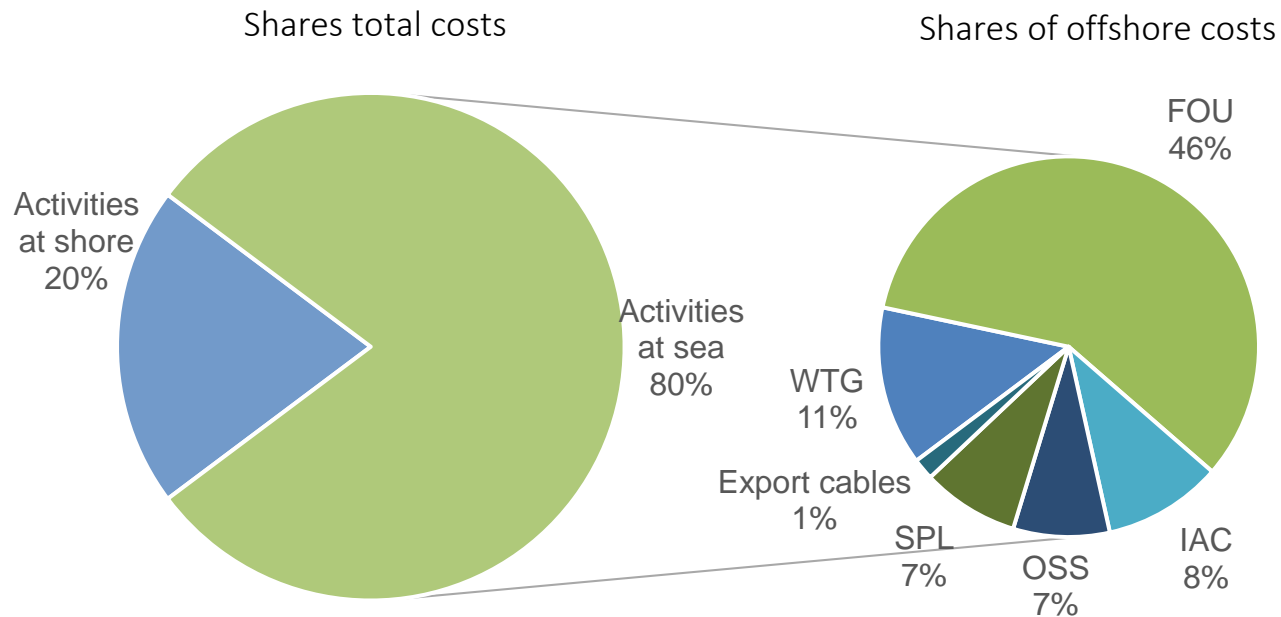
# Net Costs per MW



- BS: baseline scenario
- S1: feeder concept: WTG
- S2: feeder concept: WTG-FOU
- S3: feeder concept WTG and WTG-FOU
- S4: load-off OSS with SPM
- S5: SPL left in situ
- S6: sea cables left in situ
- S7: WTG-FOU: cut above seabed
- S8: WTG-FOU: complete removal
- S9: FOU: cut with DWCM



# Expected Cost Shares (Baseline scenario)



## Impact of different techniques

	BS	S7	S8	S9
Costs [k€]				
Mean	760	640	1,006	1,242
Standard deviation	133	124	229	134
Minimum	220	116	269	578
Maximum	1,432	1,364	2,104	1,891
Durations [d]				
Minimum	2.9	3.1	2.3	4.1
Median	4.1	4.3	4.0	4.7
Maximum	5.3	5.6	5.7	5.3

BS: baseline scenario; S7: WTG-FOU: cut above seabed; S8: WTG-FOU: complete removal;  
S9: FOU: cut with DWCM

## Implication of modified scenarios

	S5	S6	S7
Saved costs, mean [k€]	244	78	367
Lost revenues, mean [k€]	-37	-87	-50
Savings after revenues [k€]	207	-9	318

S5: SPL left in situ; S6: sea cables left in situ; S7: WTG-FOU: cut above seabed

# Thank you for your attention!

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