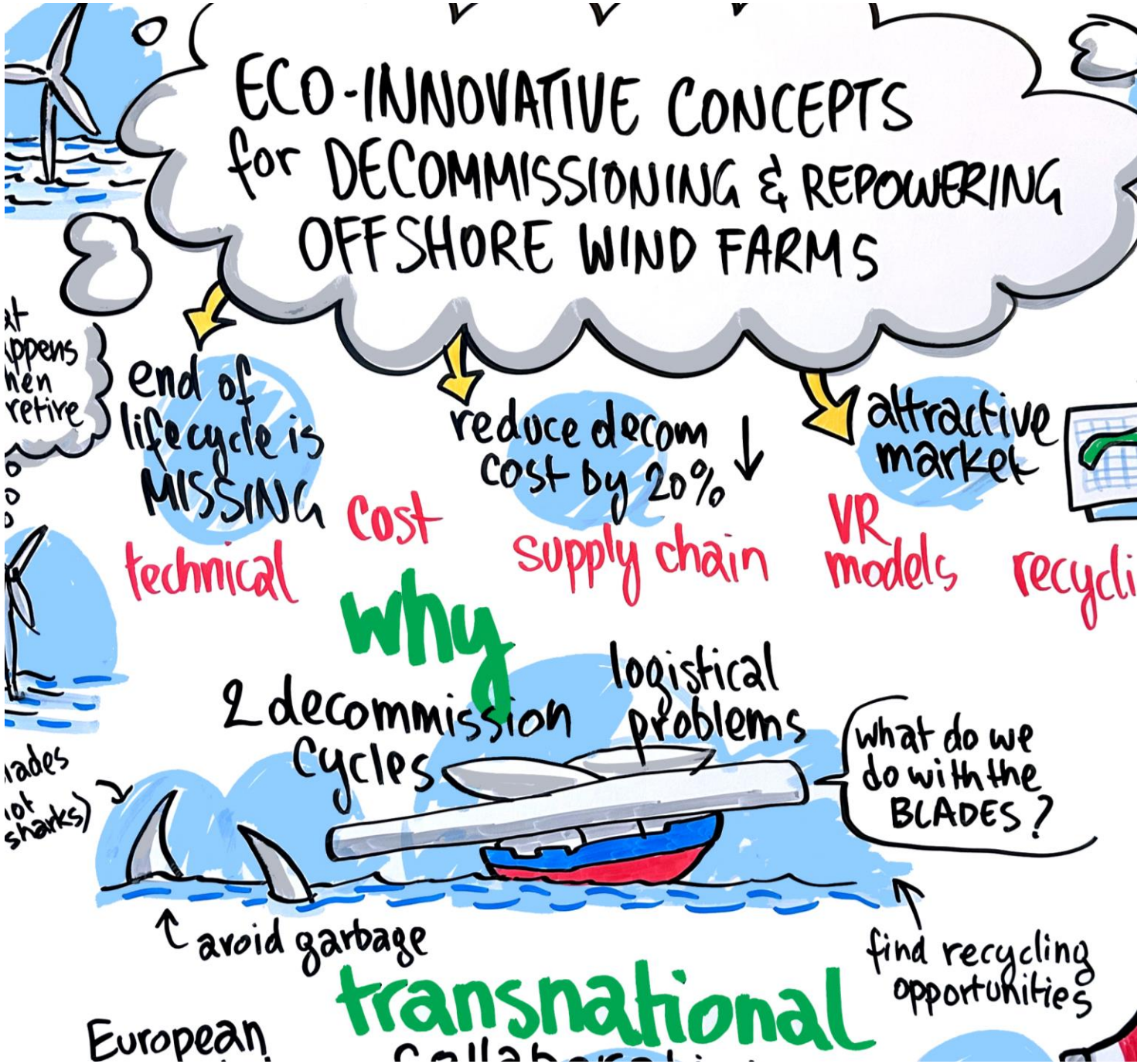
Visual Summary
JIXSO
Decomtools
Final Conference

Ostend
19 January 2023



Ostend

19 January

decomtools

final conference

WELCOME!

ECO-INNOVATIVE CONCEPTS for DECOMMISSIONING & REPOWERING OFFSHORE WIND FARMS

what happens when I retire

end of lifecycle is MISSING

technical cost

reduce decom cost by 20%

supply chain

attractive market

VR models recycling

why

2 decommission cycles

logistical problems

what do we do with the BLADES?

blades (not sharks)

avoid garbage

find recycling opportunities

transnational collaboration

European scope but worldwide perspective

Cultural diversity

communication

administration

Kristof Braekeleire

jixso.com

the wind is free but wind power is business

european perspective

on decommissioning & off shore wind

more and more capacity reaching end of life

reality

why don't we decommission more?

options

repowering?

political pressure

still in good shape

regulation

LAW of the SEA

the case

300 by 2030

full? refurbish? partial?

does it make sense?

future

environment perspective

environmental impact

during operation

during decommissioning

redesign

do we build new?

do we keep some?

impact

what's the impact?

plan

business perspective

DO IT TOGETHER

REPOWERING

collaborate

the North Sea is small but making us money

it moved from experiment to business

make it better

the wind is always there

revenue

staff

subsidies

business need financial incentive

it's a GIGANTIC INDUSTRY

BUILD NEW PARKS or REPOWER ???

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end of lease

value supply chain

value for money

end of life

offshore LCOE

PANEL 1

preparing for offshore wind turbine end of life market

we have the North Sea let's use the WIND!

challenges & opportunities

can we scale up solutions?

scale

recycling

legal frameworks

European

facilitate

knowledge sharing

best practices

together

need to collaborate across countries

shape

WIND is CLEAN!

floating

make it attractive

it's not waste

it's an ASSET !!

extend the leases

find alternatives

how do we accelerate ?

it's an opportunity

BIGGER mills means LESS mills !!

interconnect

ambitions

GREEN DEAL

projects

design auctions that drive sector forward

no NEGATIVE BIDDING !!

planning & spacing

share the sea space

add NON-PRICE CRITERIA

- environment
- sustainability
- added value
- ...

align

one vision for Europe

tech evolves fast

communicate results → successes

create POSITIVE IMAGE !!

hydrogen factories

↳ connect mills to hydrogen production

the grid

↳ don't forget !!

skills → find people locally

↳ reskill where needed

Kristal Braekeleire

Advantis

flexible blade cutting system

for end of life blades

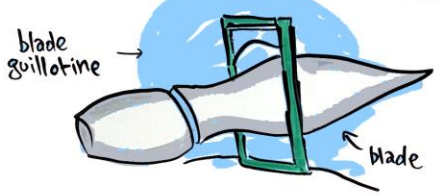
new regulation

↓

banning landfill

need scalable Solution

need volumes (off shore)



need funding

questions

European competition among "decommissioners"

there's enough volume

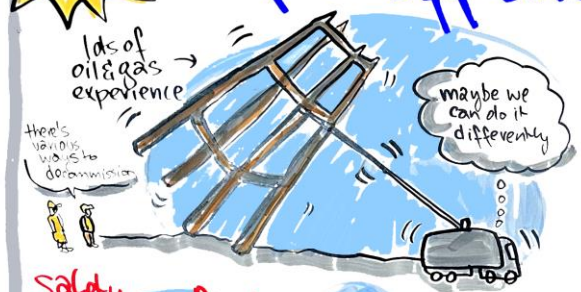
be creative in re-use

what about SAFETY ??

Western Norway University

challenges ahead for offshore windfarms

off shore decom.



Need experience

- plan
- remove
- dispose

Safety

UXO
squid
Projectile
W.W.II

Poor datasets

Surprises
subsea structures

VERY COSTLY BUT NORWEGIAN COMPANIES know how to HANDLE this BUT they need large VOLUMES

University of Aberdeen

decision support system

for decommissioning of offshore

FUNCTIONS

- define offshore wind farm
- define available resources
- define removal scenarios
- evaluate removal cost & emission

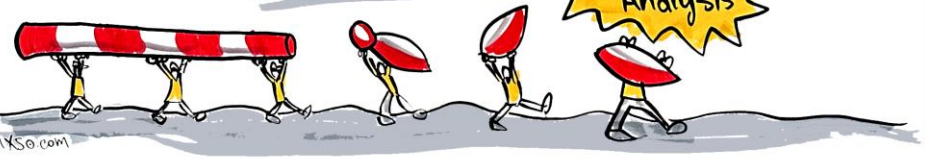
data platform → models

Deterministic Analysis

TOTAL REMOVAL (days)
TIME
N° of TB/BY TRIPS
COST (m€)
EMISSION (ton CO_2)

combine blade 3,2 & 1|2 → gives input on scenarios

Stochastic Analysis

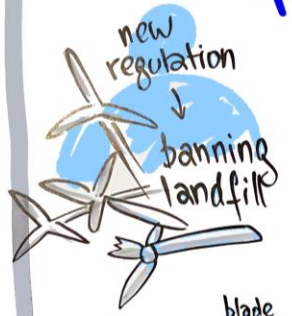


Kristal Bradelaire
JIXS.com

Advantis

flexible blade cutting system

for end of life blades



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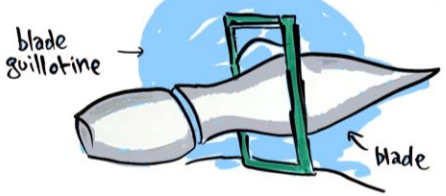

need funding

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there's enough volume

What about SAFETY ??

University of Emden/Leer

end of life planning of owts

from a logistical perspective

planning → decom → logistics → waste → post-decom

UNCERTAINTIES across the supply chain

regulators · processes · economics · tech · environment

location · seastate · wind speed

CO_2 ↓ reduction by changing method → simulation give good overview of supply chain strategy → basedata is crucial

don't RUSH · validate data

Port of Grenaa

port logistics

the gate to Kattegat

be flexible

WIND is extremely IMPORTANT to US

but also RECYCLING & WASTE MANAGEMENT

SHIP recycling

EURO WIND

keep it all close to the port

STEENA RECYCLING

new WIND industry is a challenge it's massive

HIGH FOCUS

use infrastructure of the port

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Kristof Brackeleire

Port of Oostende

belgian volumes & market off shore wind

also a lot onshore

2,2 GW installed since 2020 → off shore → 3,6 GW by 2030

bigger turbines · bigger blades

concession for maintenance 15-20 years → lifetime extension

20 years

steel ← mostly → concrete

+ a bit of: aluminium, copper → well established recycling market

polymere → hard to recycle

Rhenus Logistics

logistical challenges & concept for decom

OFFSHORE WIND PARKS

all covered by one service partner

high expected volumes OWT decom

lack of experience in large decoms

decom becoming complex & diverse

tech variety 3 MW → 15 MW

remove EVERYTHING except scour protection

need to be efficient

Similar vessels ↳ jack up

cost !! will be a driving factor

need industrial level of recycling

Consider capacity in the port

port access critical

Knowledge from installations

it's feasable vessels could be bottleneck

as little storage as possible

quick cargo turnover

free up storage

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why is recycling problematic?

ECHT regie in transitie

need to change the narrative

Circular strategies

very difficult to meet EU waste directive

conflict

RECYCLING = recovering & reprocessing waste materials

ECHT?

material impact of recycling

holistic approach is needed

PLAN

CHANGE the plan

steer TENDER CRITERIA

SUBSTITUTE VIRGIN FOSSIL OILS

PYROLYSIS OIL → market exists

↳ no oxygen = no burning

PYROLYSIS of FIBRES

share data among academics

Complete material & energy recovery

Joulmine GMBH & CoKG

transform wind turbines blades into fibres, hydrogen & Methanol

regenerative

everyone focusing on fibres

solutions need to be scalable

time to market is of the essence

let's gasify this

need to save carbonates → 15 million metric tons needed for chemical industry

CARBONATE CIRCULARITY

55 tons per facility CFRP capacity

22,000 tons of CO_2 regenerated

jlxso.com Kristof Braekeleire

blade-made scalable repurposing

BLADE-MADE

We love Blades

Sound barrier

AVOID Blades becoming WASTE

promise is in the scale

need paradigm shift in industry

want more impact

need circular value chains

assist wind industry in their EOL

recycling opportunities for blades

UPP!

recycling the unrecyclable

UPPAC

polymers

The Un-Waster

various waste types

maritime festival hospital

climate tree

makes recyclable robust & high quality construction materials

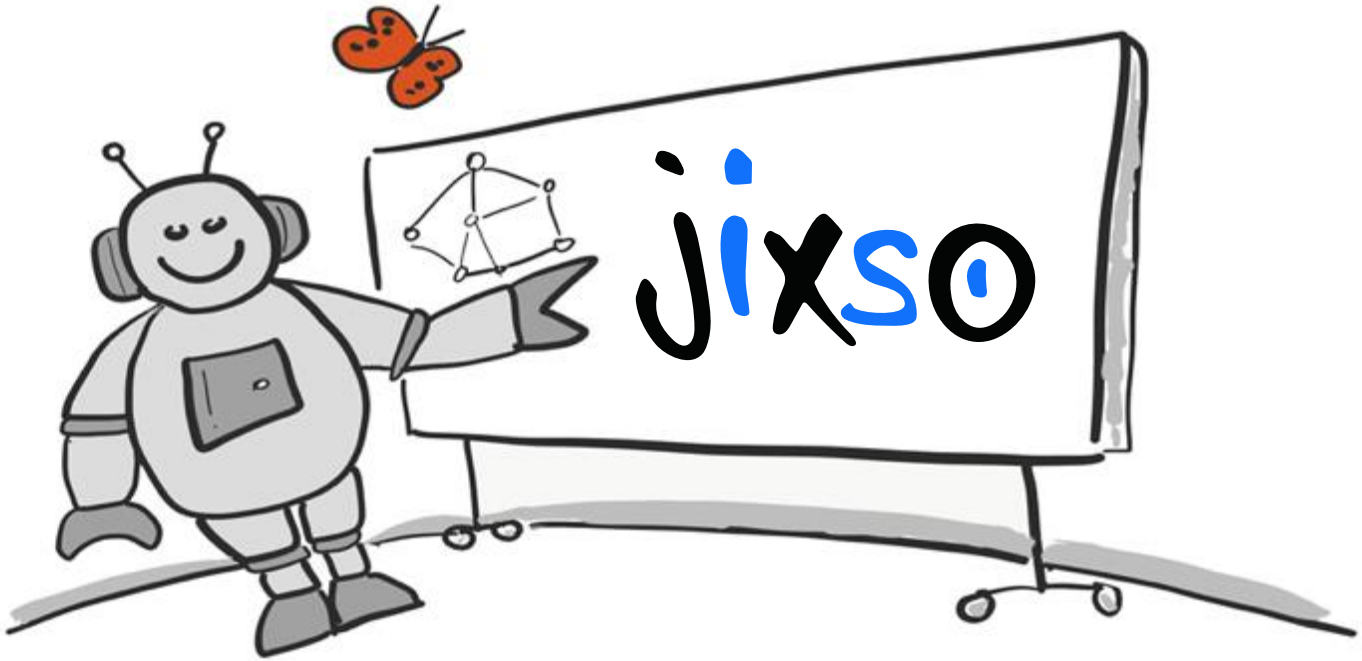
planks

poles

beams

materials for construction

LET'S UNWASTE!!



"We draw your strategies."

All visuals created by Kristof Braekeleire

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