



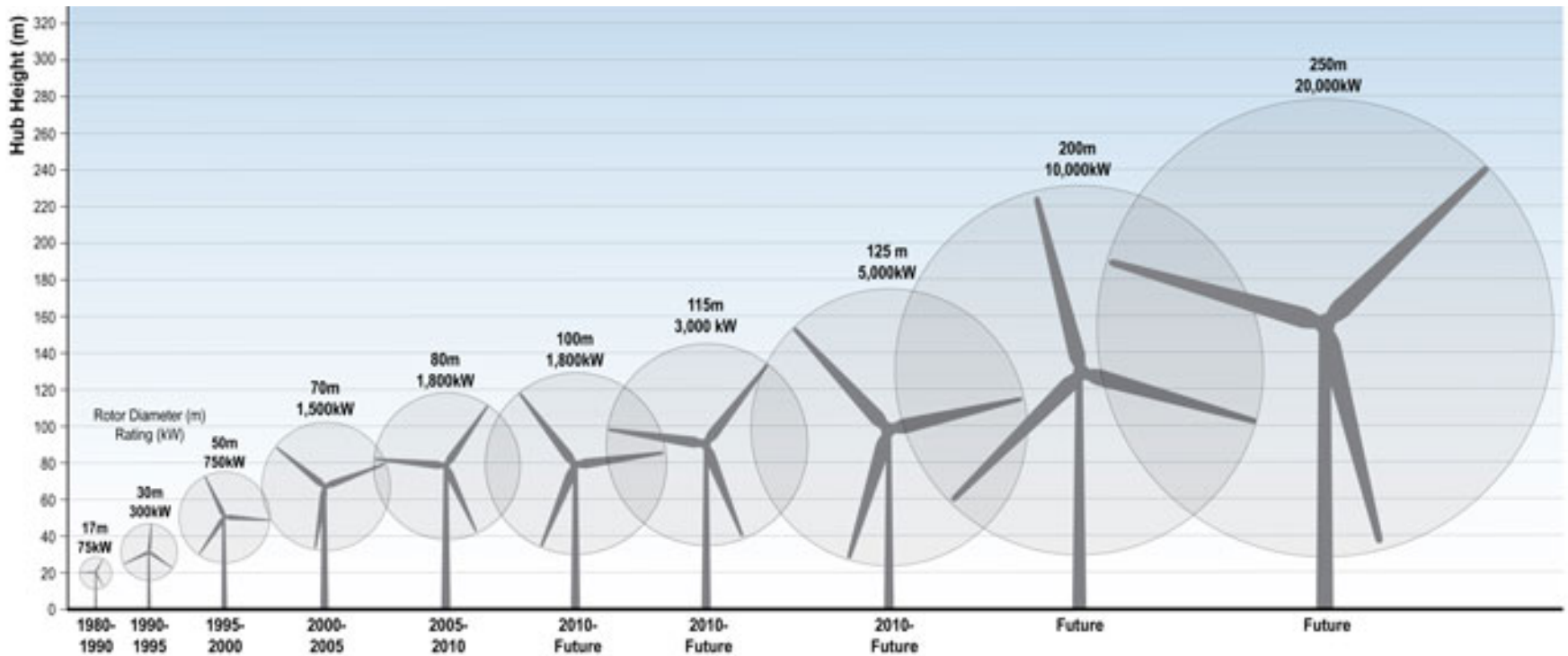
# Wind Shipping and Logistics

## Risk and Insurance

# Agenda

- Wind turbine development
- Increasing risks
- Insurance
  - Early phase features
  - Detailed risk analysis
  - Marine Warranty Surveyor
  - Owner controlled insurance
  - Package for offshore wind risks
- Claims experience
  - Offshore wind construction
  - Cable losses
- Issues...

# Wind turbine development



## ■ Weights

- Nacelles (mt)
- Blades (mt)



75  
12

175  
30

250?  
60?

350?  
100?

# Increasing risks

- New and unproven technology
- Complexity of lifting operations
  - Component weight doubled or tripled
  - Installation heights increased up to 50%
  - Twin lifting (two cranes)
  - Weather windows shorter
- Transport and installation equipment stretched to the limits – or already past critical loads at installation?
- Infrastructure inadequate
- Increased value of WTG components
- Loss of revenue due to lack of suitable equipment
- Many parties involved
  - Health and safety
  - Communication structure
  - Decision making
  - Documentation



# Insurance

## - Early phase features

- The following early phase features impact insurance cost and cover
  - Risk analysis and loss scenarios – including technology and natural perils
  - Design features (load-outs / lifts / system redundancies / foundation and turbine technologies)
  - Legal framework for grid connection and transmission
  - Contractual obligations
  - Financing arrangements
  - Ownership structures
  - Ability to leverage existing corporate insurance relationships
  - Availability and cost of insurance capacity
  - Risk appetite
  - Project organisation
  
- Tailor insurance programme to the specific risk features of project

# Insurance

## - Detailed risk analysis



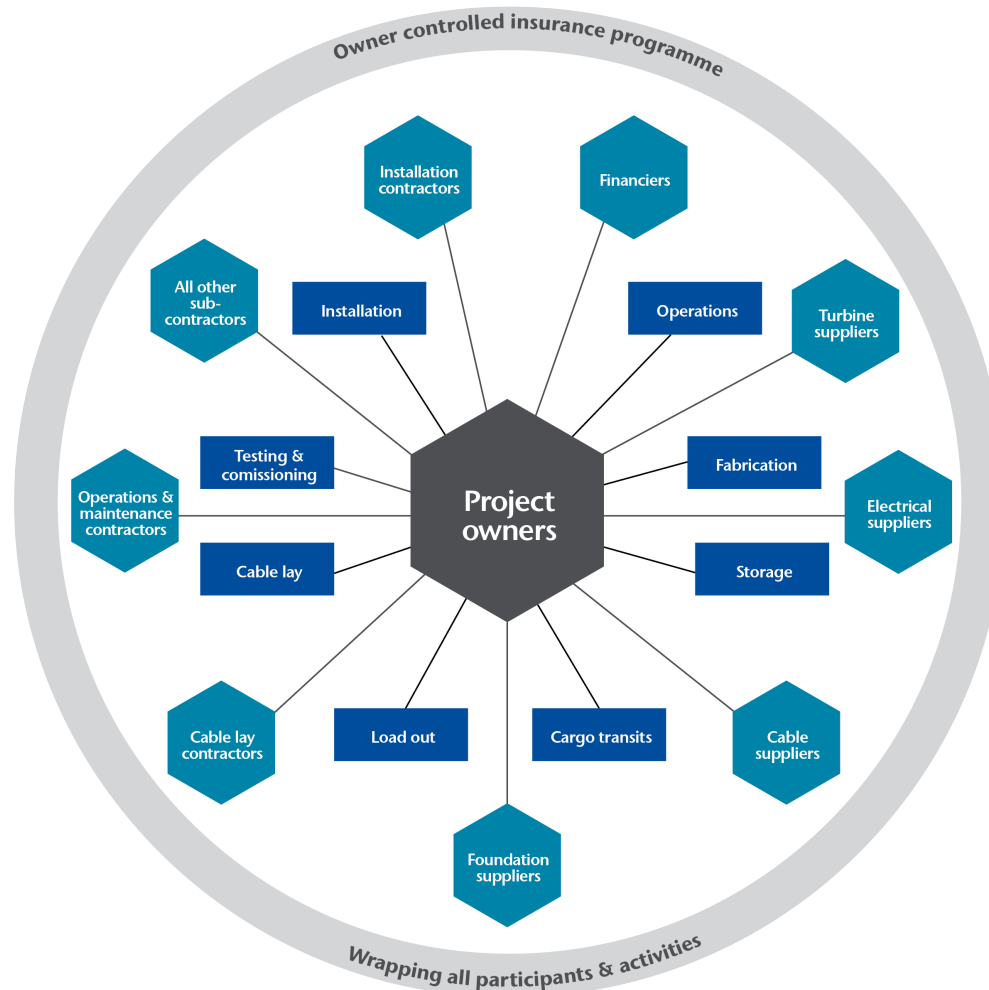
- Identify major loss scenarios from construction and operational activities relating to
  - Cost to repair or replace worse case damage events
  - Costs and timeline of mitigation strategies that could be employed
  - Additional costs which would be incurred in order to maintain and resume operations
  - Length of time which would be required for full reinstatement of damaged property
  - Calculation of estimated loss of revenue following delay or interruption
  
- Impact model generated and figures calculated for EML
  
- EML Report used for underwriting

# Insurance

## - Marine Warranty Surveyor

- Essential for accessing international (re-)insurers
- Ensures best risk management practice during construction
- Activities to be approved by MWS
  - Transport and installation of Turbines / Foundations / Cables / Substations
  - Approval of project execution plan
  - Condition surveys of vessels and equipment
  - On site surveillance and approval of marine operations and installation activity
  - Approval and attendance at a number of repetitive installation operations

# Insurance - Owner controlled programme





# Insurance

## - Package for offshore wind risks

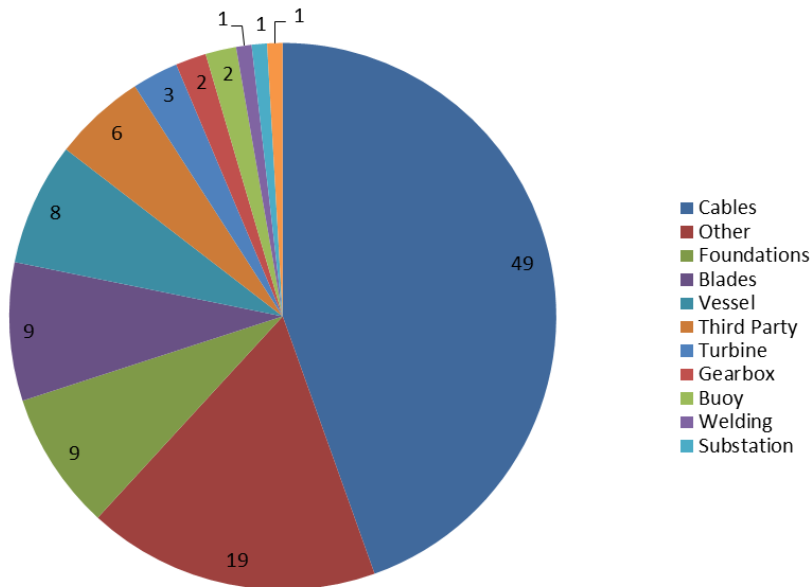


Phase	Cover	Responsibility	Parties covered
Construction	Construction All Risks (CAR) including Marine Transit and Terrorism	Principal	Principal, all contractors, technical advisors, any lenders
	Third Party Liability (including marine liability)	Principal / Contractors	Principal, all contractors, technical advisors, any lenders
	Delay in Start-Up (DSU) including Marine DSU and Terrorism	Principal	Principal and any lenders
Operating	Operating All Risks including Machinery Breakdown	Principal	Principal, Maintenance contractor, any lenders
	Business Interruption (BI)	Principal	Principal and any lenders
	Third Party Liabilities	Principal	Principal, Maintenance contractor, any lenders
General	Employer's liability / Workers Compensation	Each party	For their own interests only
	Motor liability	Each party	For their own interests only
	Contractor's plant and equipment	Contractor	For their own interests only
	Professional indemnity	Designers	For their own interests only
	Charterer's liability	Chartering party	Liabilities related to the chartering party
	Hull & Machinery	Vessel owner	Vessel owners' property
	Protection & Indemnity	Vessel owner	Vessel owners' liabilities
	Vessel construction	Yard or owner	Construction of hulls
Plant & Equipment	Contractor	For their own interests only	

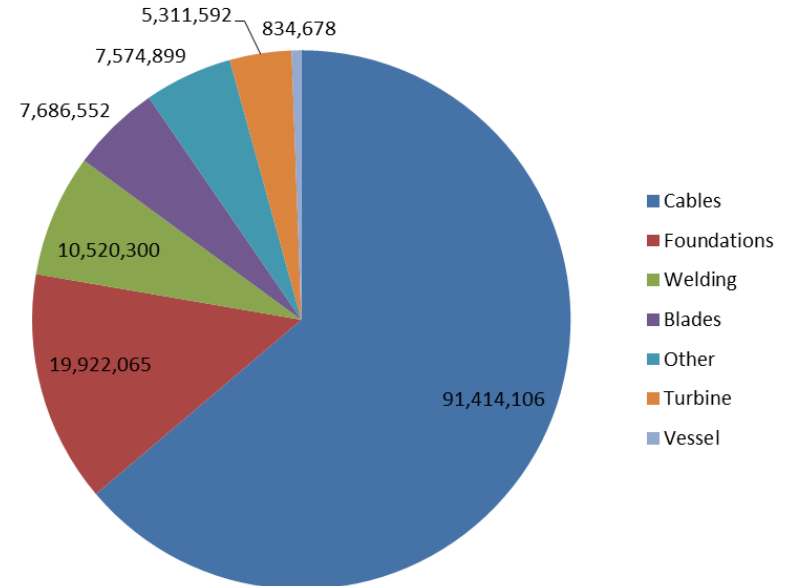
# Claims experience - Offshore wind construction



**Construction Offshore Wind Losses by Number of Claims**



**Construction Offshore Wind Losses by Value**



# Claims experience

## - Cable losses

- 45 cable claims between 2010 and 2014 during construction
- 17 export cables and 28 inter-array cable claims
- Approximately EUR 75m in claim value
- 6 loss categories
  - damage resulting from contact with the plough
  - loops introduced into the cable during installation exceeding the minimum bend radius
  - damage discovered post lay to the cable
  - faulty workmanship resulting in damage
  - damage caused during pull-in operations
  - “other” causes which are more unique



Dette billede kan ikke vises i øjeblikket.



# Issues...



- Will the shipping and logistics industry...
  - be able to develop equipment and solutions in time?
  - be able to fund the necessary investments in equipment in such a relatively long perspective?
  - need cooperation and information from WTG manufacturers to be able to “meet the needs”?
  
- Should the WTG manufacturers...
  - standardize logistic equipment for WTGS?
  - facilitate logistic contractors investments?
  - provide an “early warning”?
  
- Can and will authorities...
  - develop infrastructure in time?
  
- Will...
  - transport and installation cost increase and erode the expected decrease in price per MW by the up-scaling of WTGs?
  - O&M costs increase?

## What is the most cost effective size of WTGs?

# Contact Details



**Anders Bek | Risk Executive, Special Risks | Chartered Insurance Broker**

Aon Risk Solutions | Broking Excellence | Special Risks

Strandgade 4C | 1401 | Copenhagen K

t 32697000 | d 32697185 | m 20951418 | f 32697001

[anders.bek@aon.dk](mailto:anders.bek@aon.dk) | [LinkedIn](#) | [www.aon.dk](http://www.aon.dk) | [Facebook](#)

