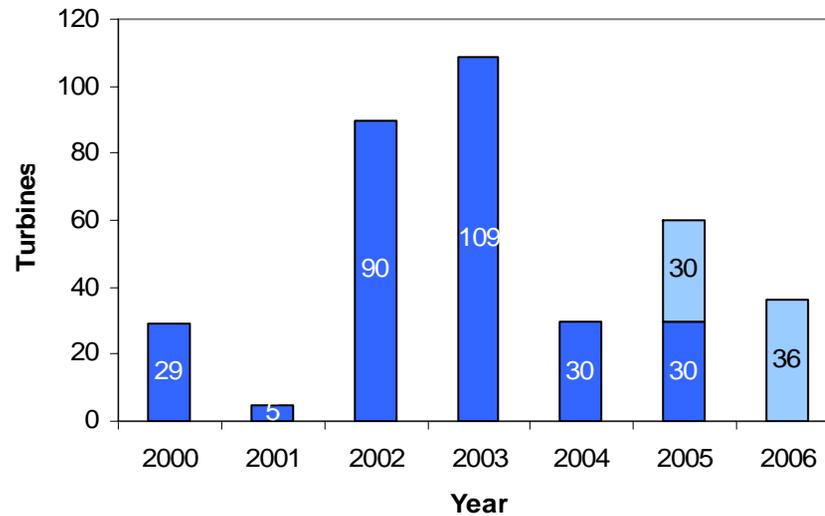


# Future Challenges for a Marine Installation Company



TO STAY ALIVE....

# Number of Turbines Installed per Year



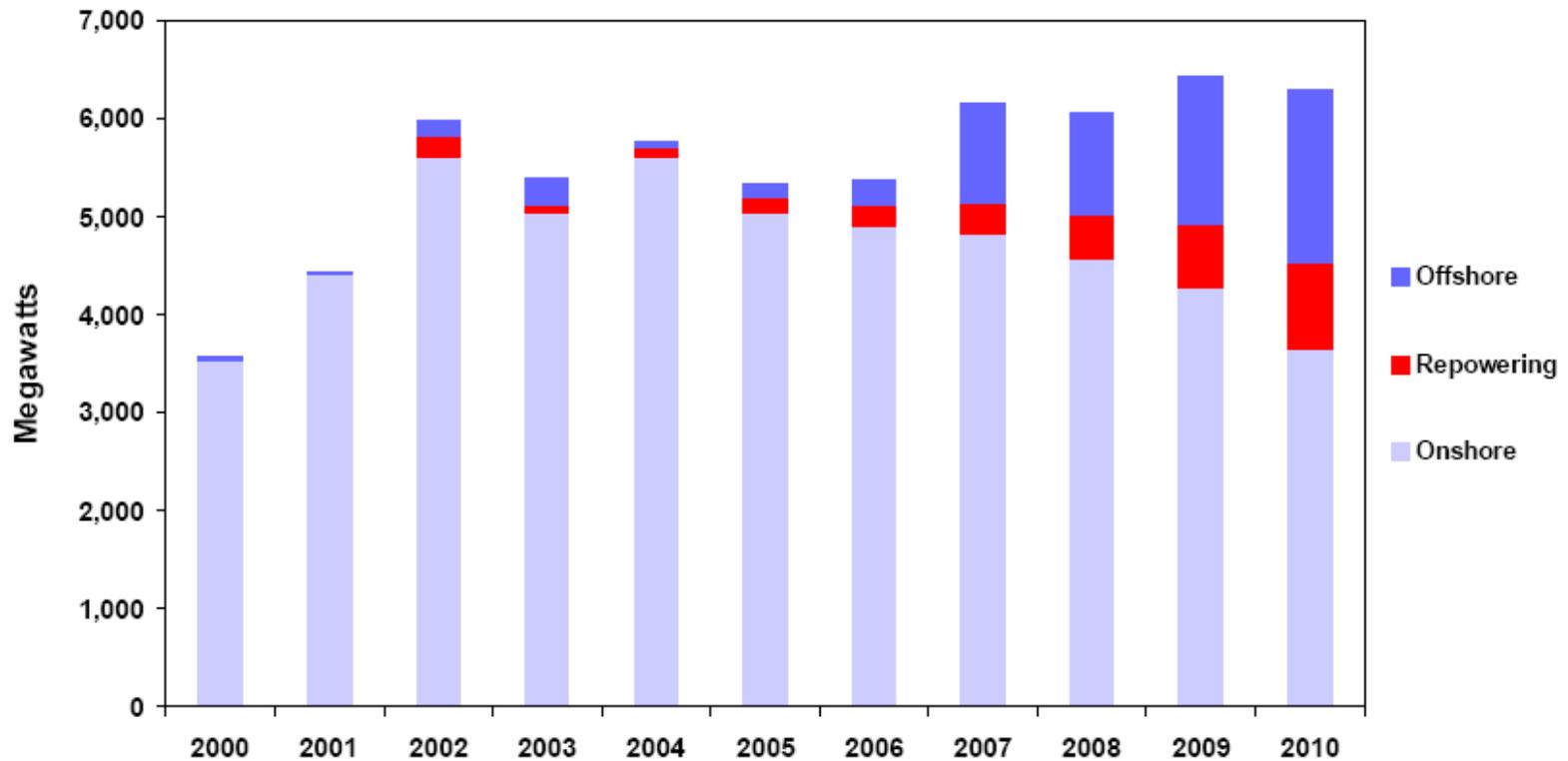
- No trend
- Expected market growth from 2002 and forward  
..... is now.....
- Expected market growth from 2007 and forward

# Why do we then 5 years later still believe in an offshore wind market?

- More wind to be built due to security of supply
- Future owners of offshore wind parks are financially strong
  - 80% utilities
  - 15% energy companies
  - 5% large conglomerates
- High oil prices
- Political will in some countries
- Renewables and green energy is a politically good signal
- Larger projects with larger turbines reduce installation cost per kw

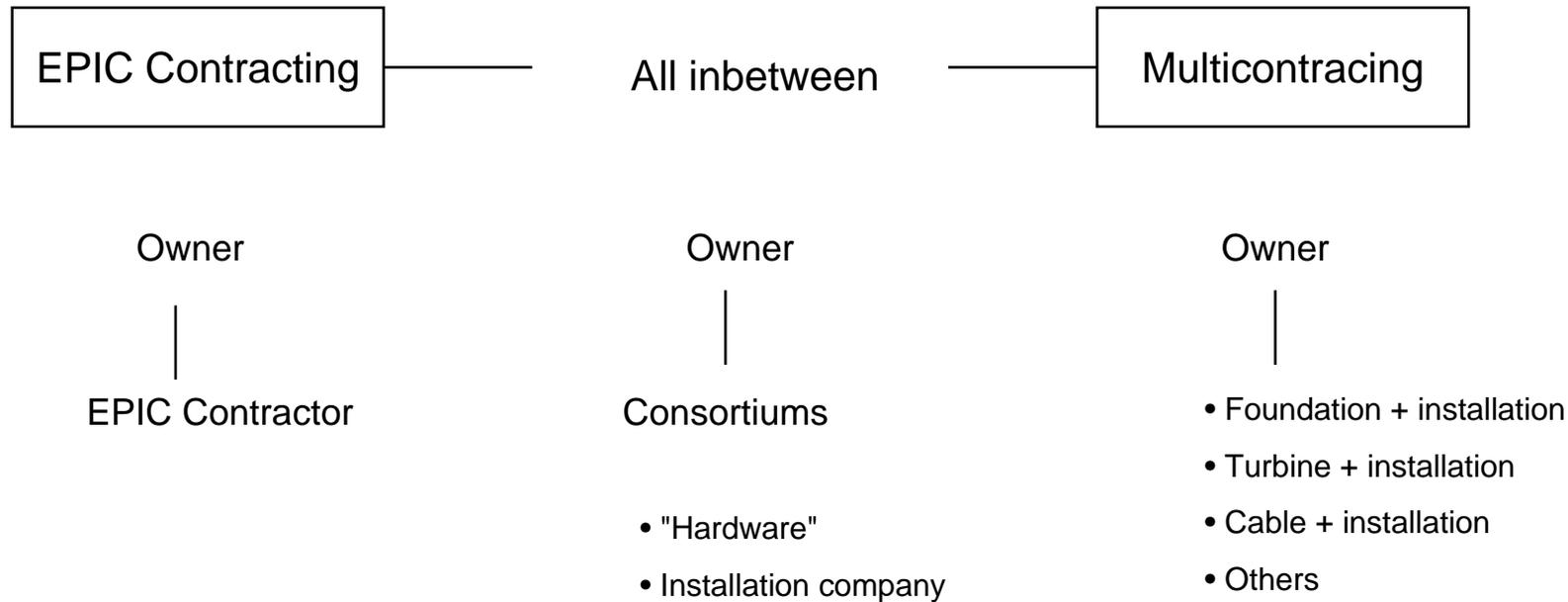
# Shipments

**Total Wind Power Shipments, 2000-2010 (MW)**



Source: Emerging Energy Research

# Contracting Environment for a Marine Installation Company

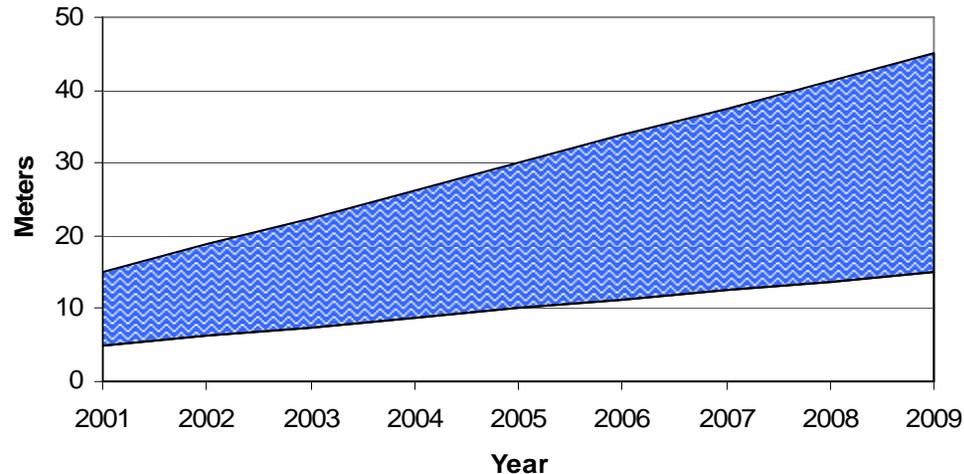


## CHALLENGES

- Installation companies forced to take
- Bigger part of project
  - More responsibility
  - Higher risk

- Installation specialists
- Direct responsibility
  - Lower risk

# Offshore Turbines to be Installed on Deeper Water



## Installation Company Challenges

### Larger Installation Vessels

Longer/stronger support/jack-up legs

- Water depths
  - Tidal
  - Penetration
  - Current
  - Waves
  - Wind (wind resistance)
- + because of:**
- Heavier components
  - Heavier lifts
  - Increased installation heights

# Sea Transport



## Challenges:

- Dimensions
- Weight
- Distance
- Logistics

# Foundations

Gravity



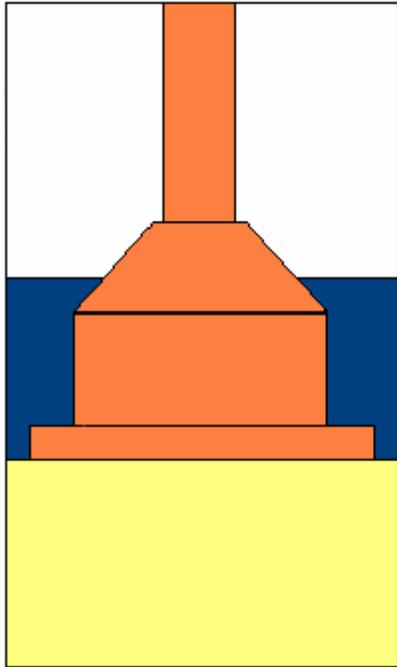
Bucket



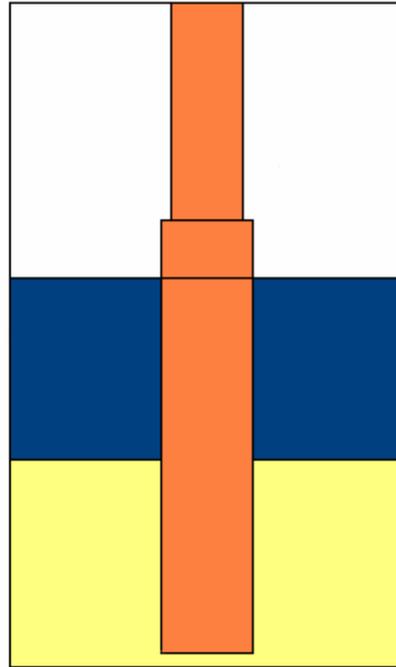
Monopiles



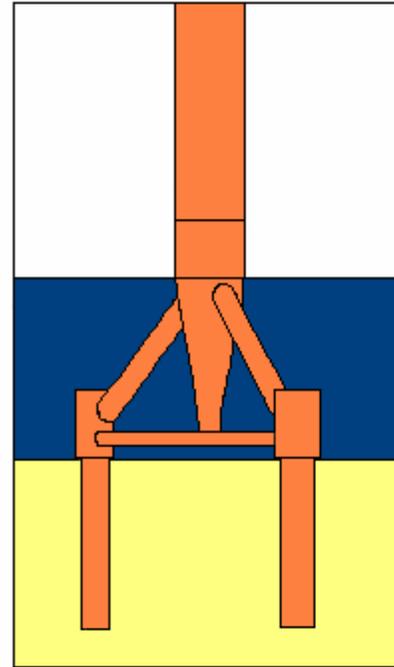
# Offshore Foundations



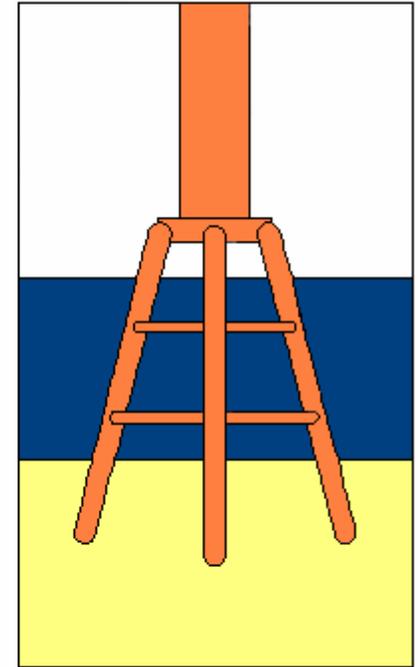
Gravity



Monopile



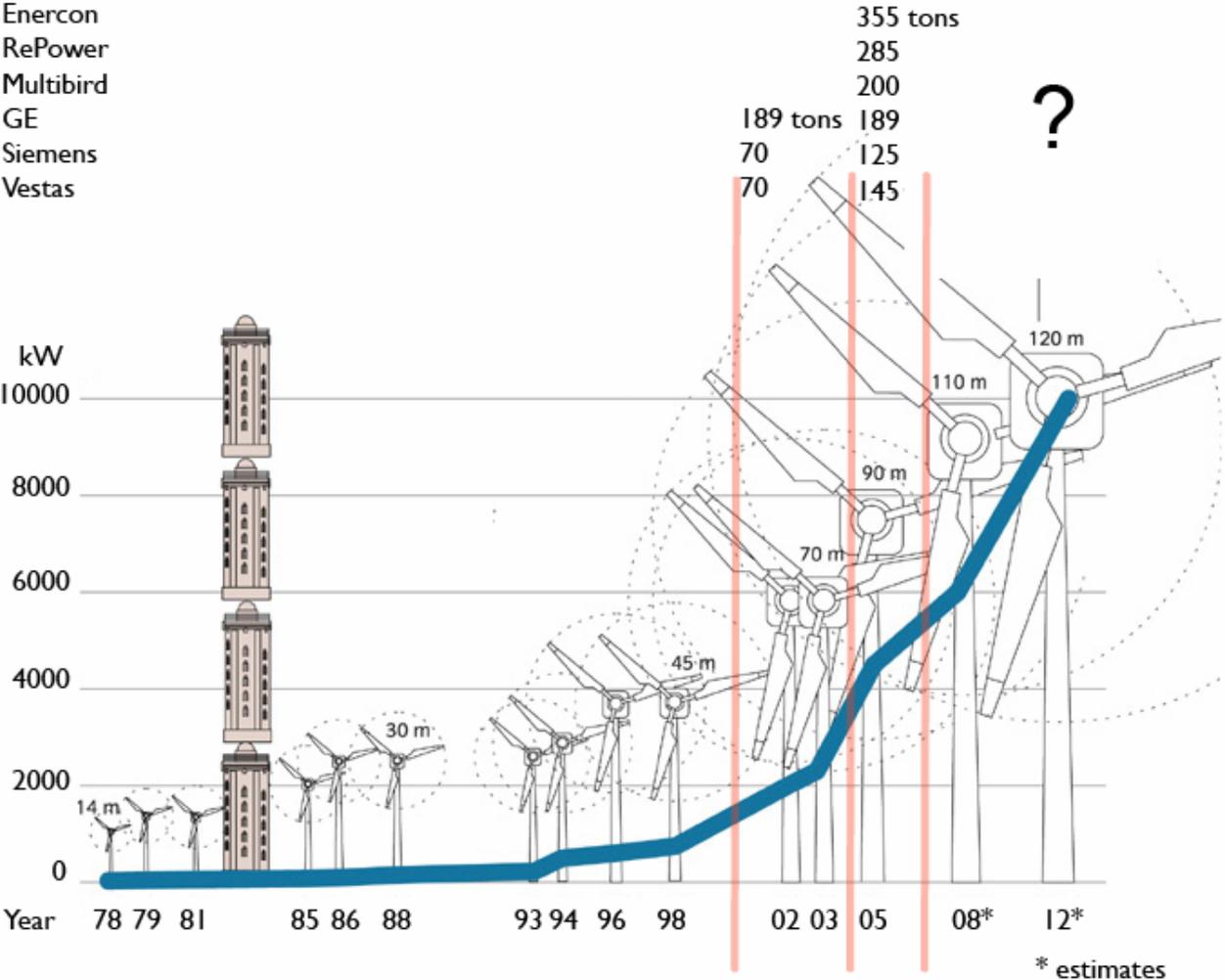
Tripod



Jacket

# Nacelle Weight

- Enercon
- RePower
- Multibird
- GE
- Siemens
- Vestas



# Service



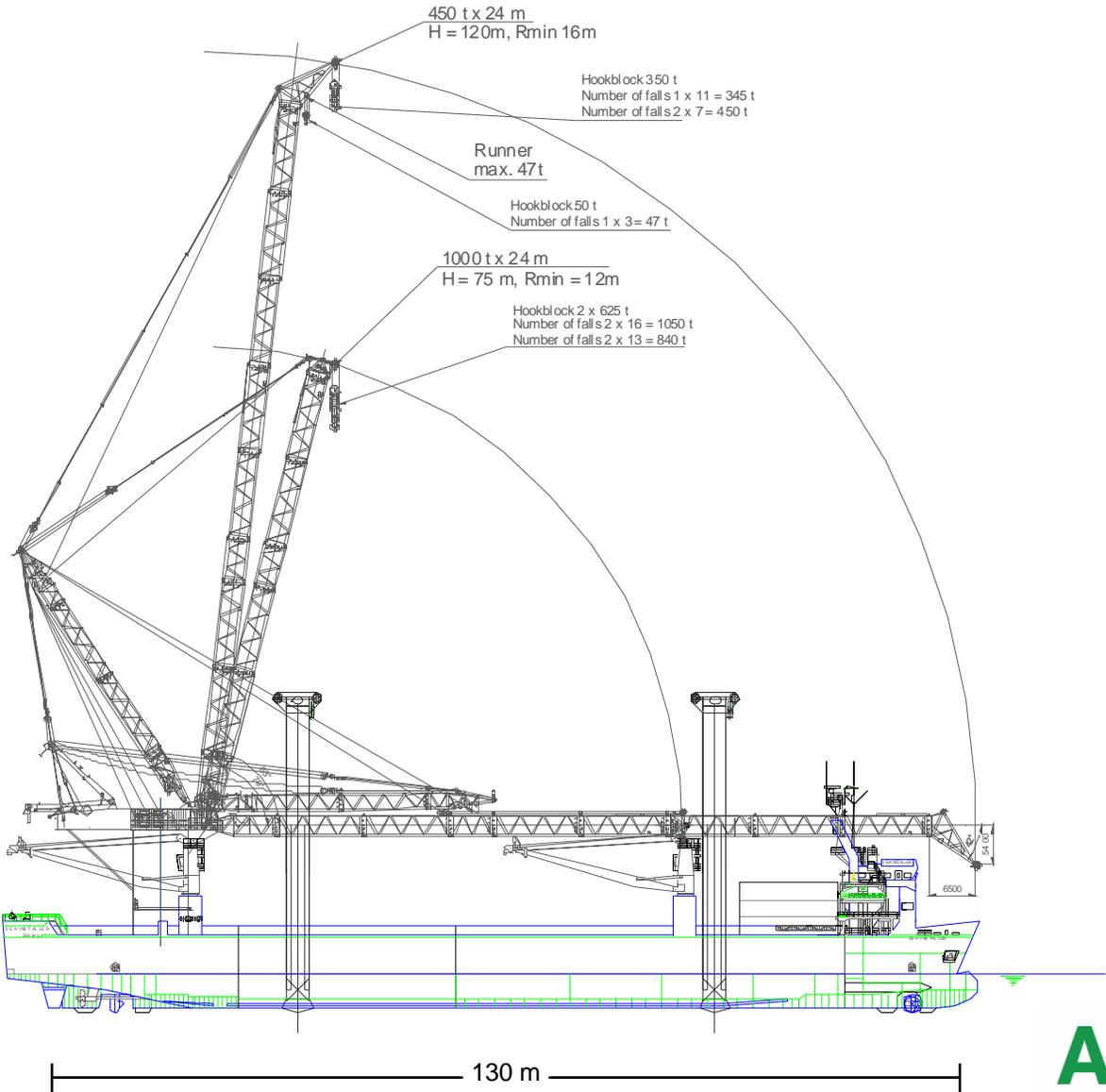
## Challenges:

- Speed
- Access
- Accomodation
- Crane capacity
- Steady operation

# Challenges for a Marine Installation Company

- Market development
- Contracting environment
- Deeper water
- Distance from shore
- Heavier foundations
- Larger/heavier turbine components

# Third Vessel



**A2SEA**

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**Taking Windpower Offshore**

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# Competences

Competences	International Marine Installation Contractor Business							
	Installation Business				Support Business			
	Foundations	Transition pieces	Turbines	Cables	Logistics	Assembly	Transport	Service
<b>General</b>								
Marketing	•	•	•	•	•	•	•	•
Sales	•	•	•	•	•	•	•	•
Contracting	•	•	•	•	•	•	•	•
Finance control	•	•	•	•	•	•	•	•
<b>Specific</b>								
Engineering	•	•	•	•	•	•	•	•
Project	•	•	•	•	•	•	•	•
Marine operation	•	•	•	•	•	•	•	•
Maintenance	•	•	•	•	•	•	•	•
Procurement	•	•	•	•	•	•	•	•
Manpower	•	•	•	•	•	•	•	•

# The Installation Companies

will deliver

but

- We need a constant developing and expanding market to bring the best suitable installation vessels
- Near to full year installations
- Acceptance to
  - Price versus risk
  - Installation conditions
  - Contractual obligations
  - HSEQ priorities

# Installation Vessels

A2SEA



Mammoet



Seacore



MPI



Thank you for your attention