

DOC Dublin Offshore

ENGINEERING OFFSHORE SOLUTIONS

Installing Mooring Compliance
to Control FOW System Cost

MIIN in Wexford

23rd November 2022

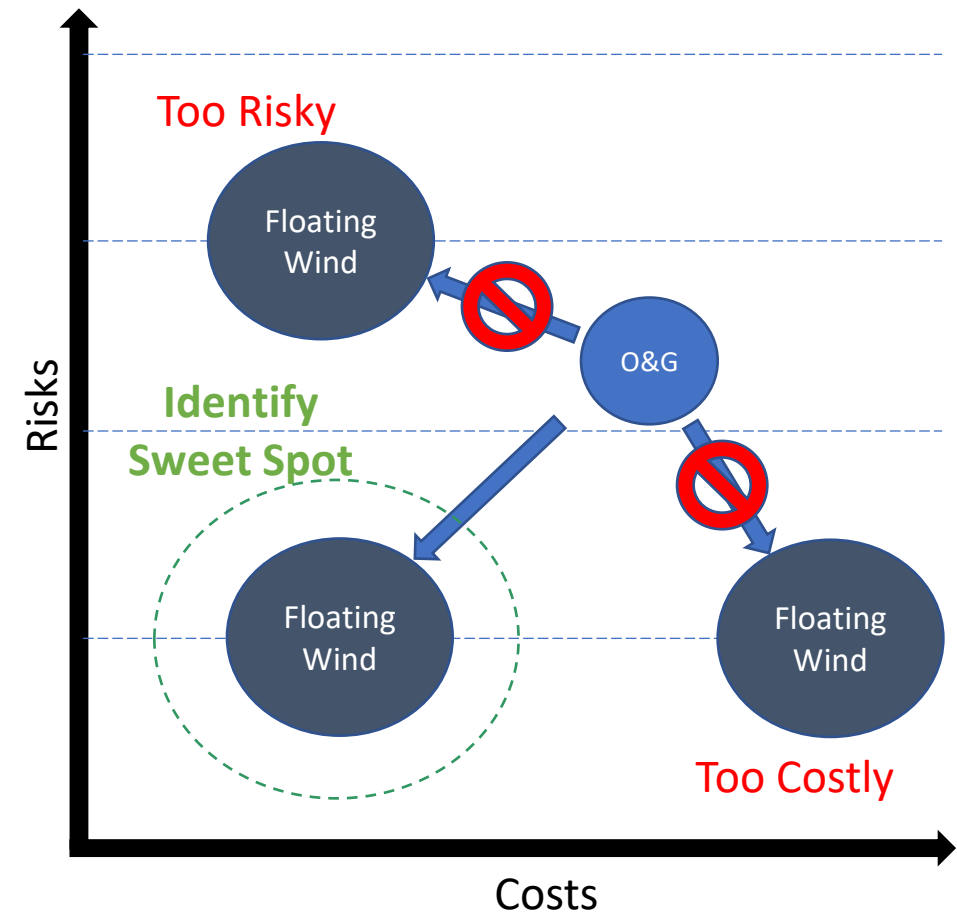
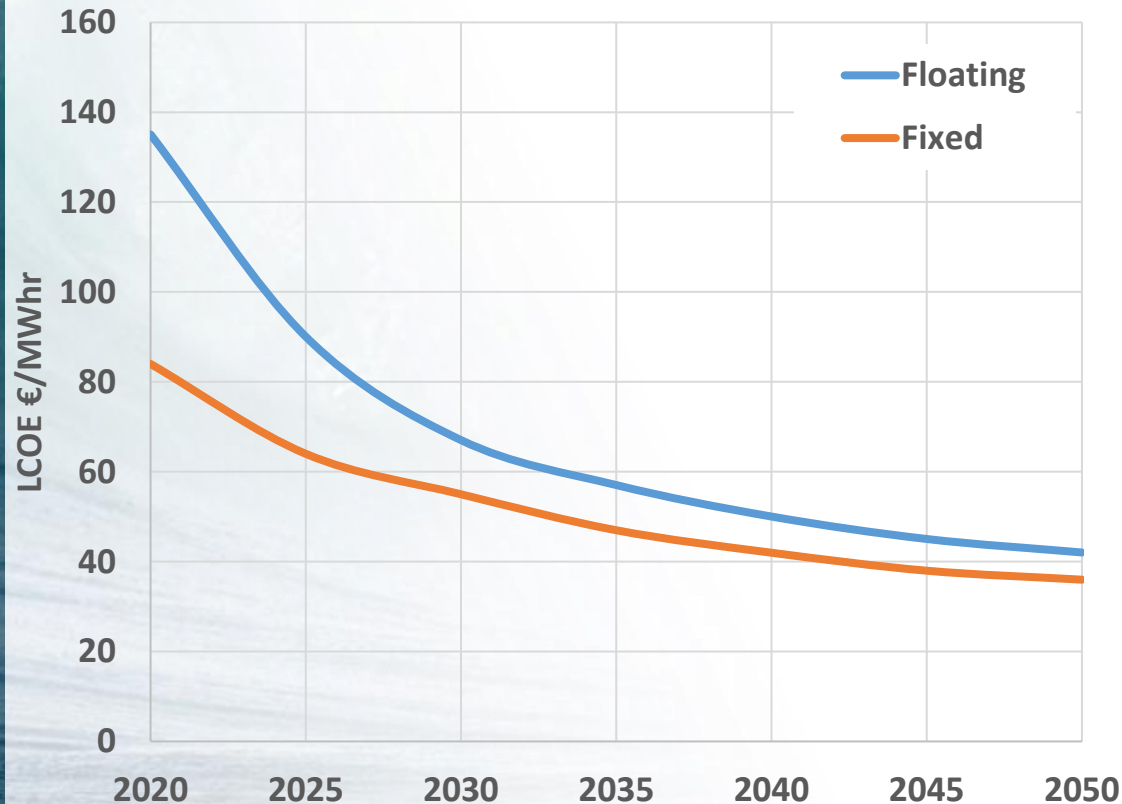


FOW – The need to reduce cost

- Gradual cost reduction predicted for FOW
- FOW costs >> Fixed Wind costs

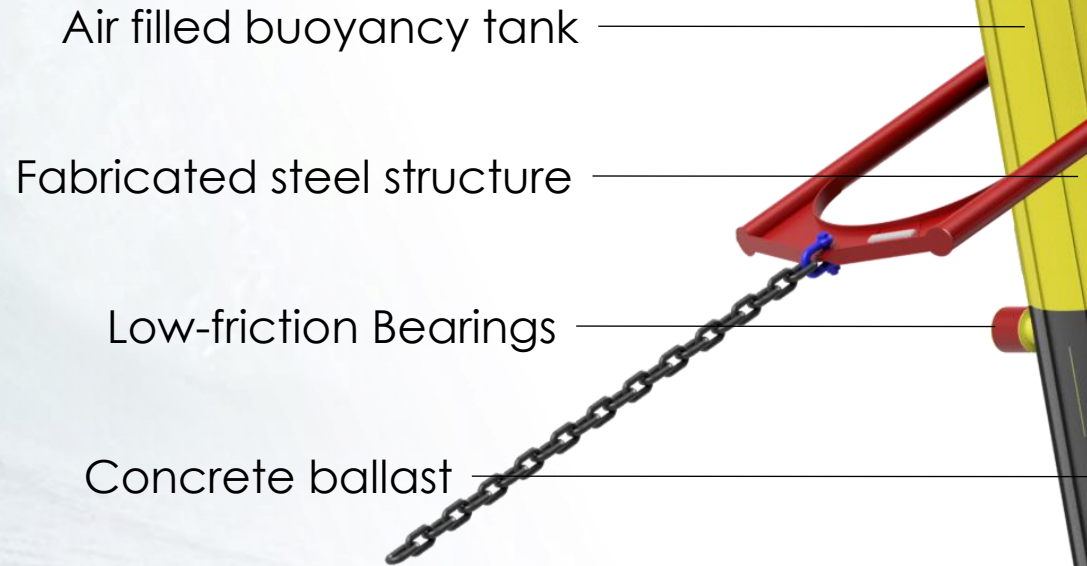
- Cost Reduction required
- Moorings & Install contribute up to 20% CAPEX

Average LCOE of Offshore Wind (Courtesy DNV)

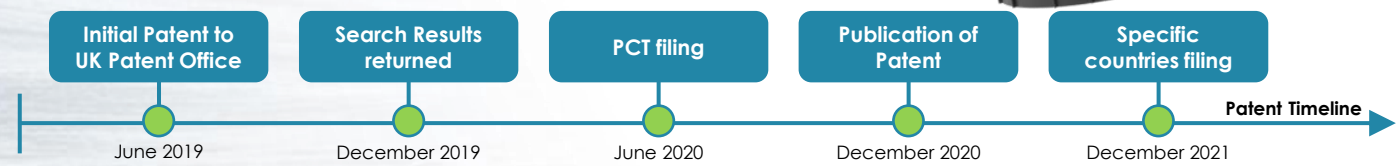


Technology

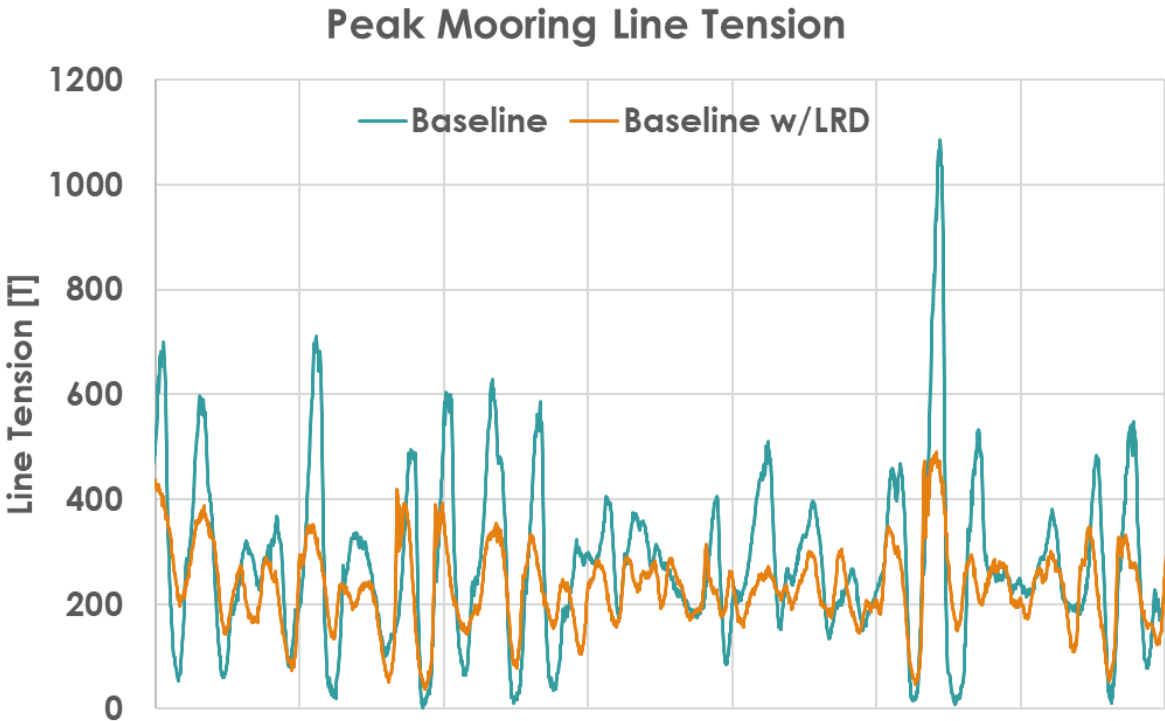
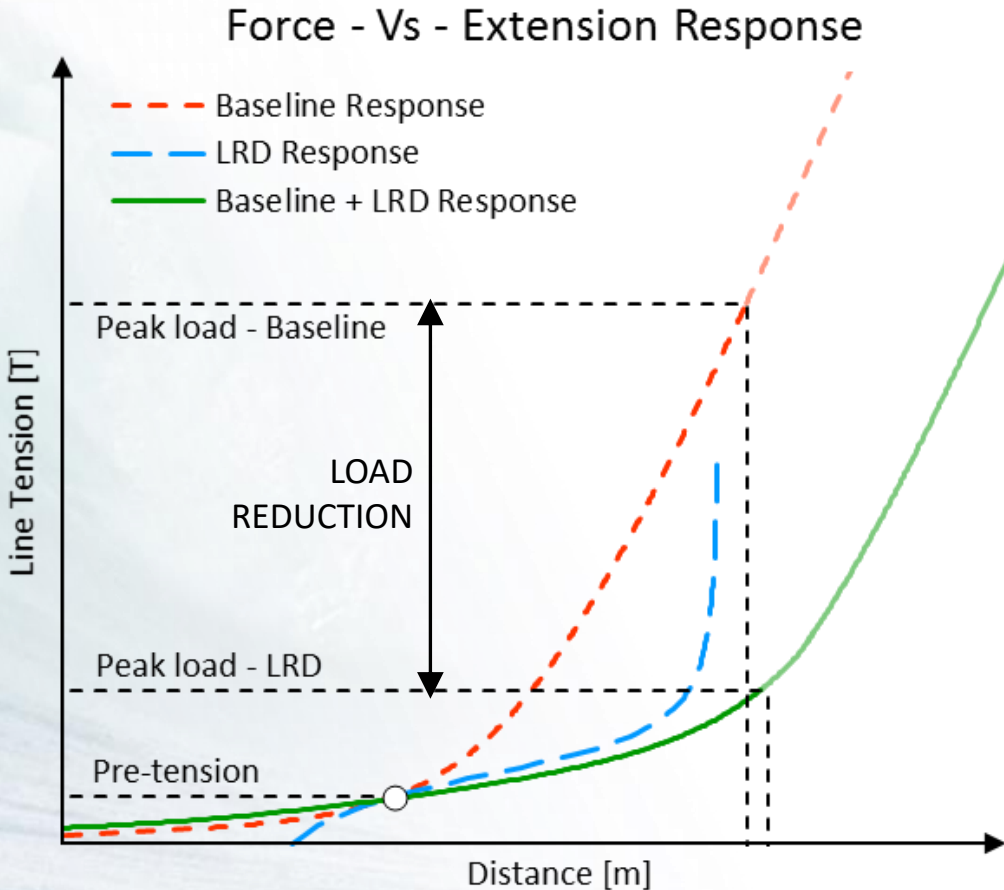
- Connected in-line between anchor and platform
- Rotates with wave-induced platform motion
- Reduces peak and fatigue mooring line loads



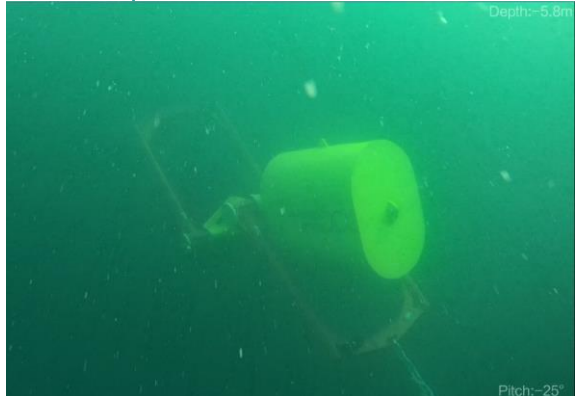
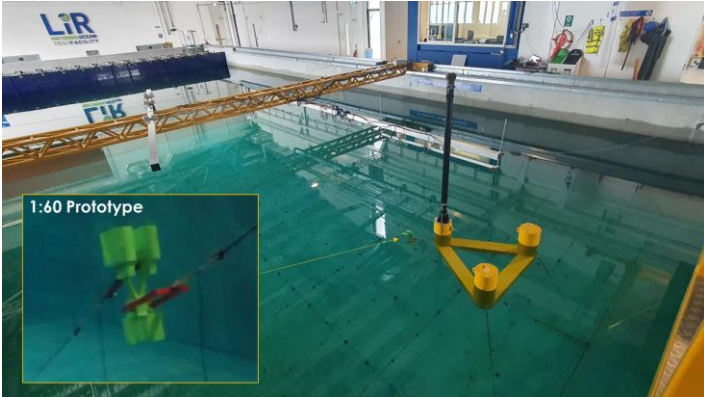
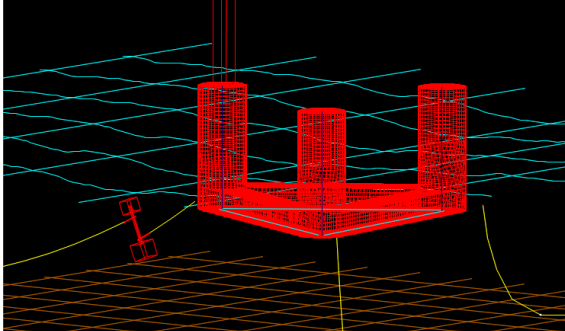
- Reduced Mooring Footprint
- Peak load reduction
- Reduced fatigue
- Storm protection
- Tailored mooring response
- Zero O&M



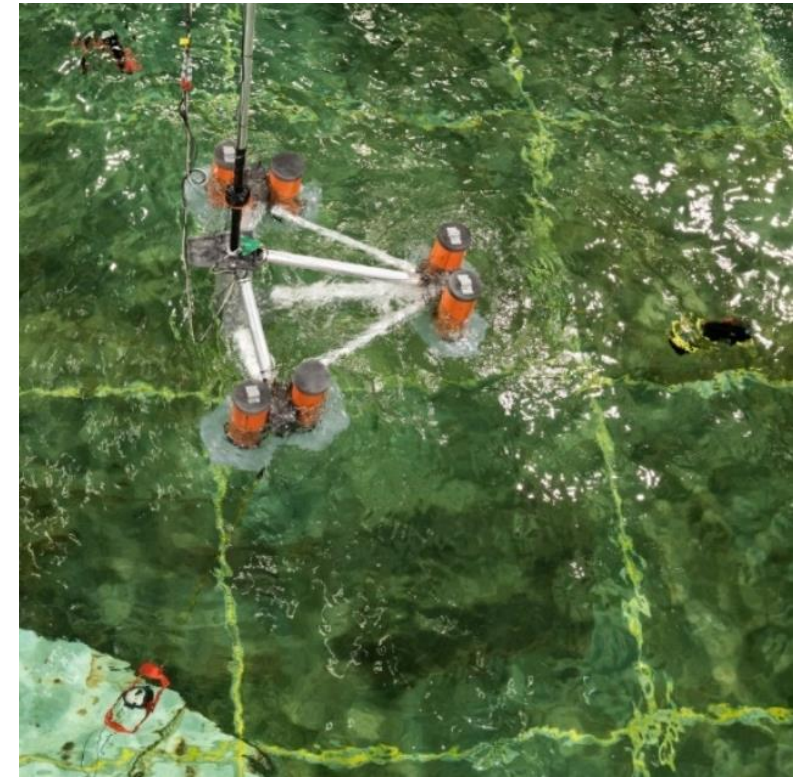
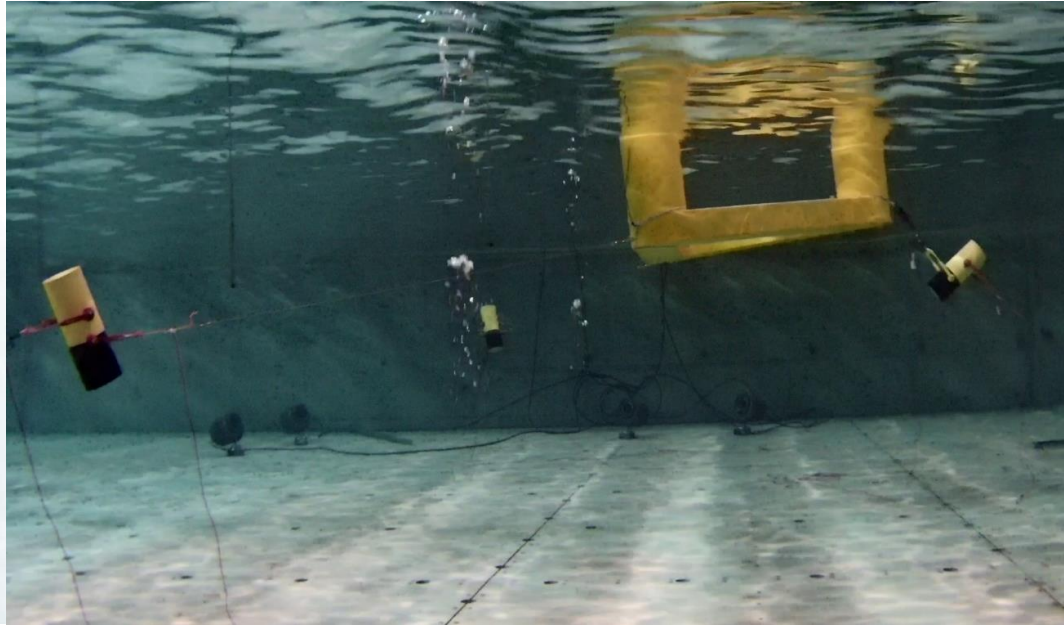
LRD – How it works



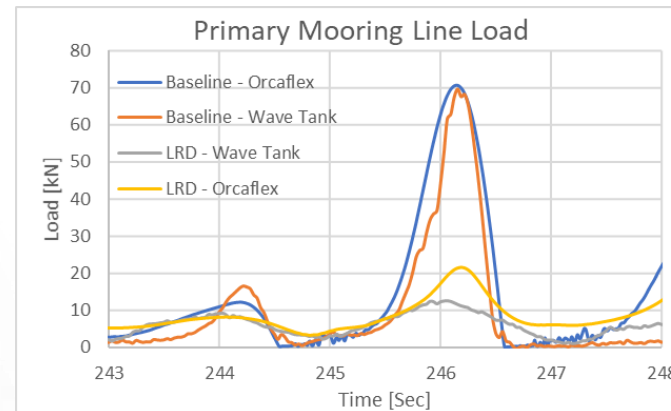
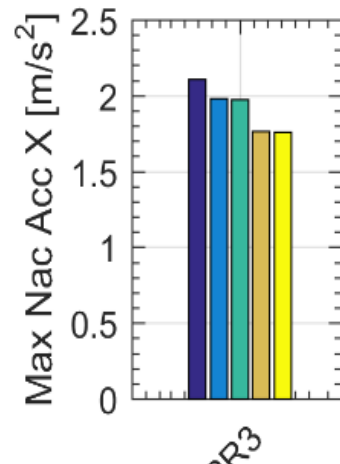
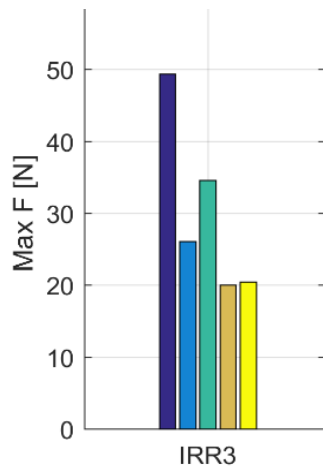
Development Summary



Technology Assessment

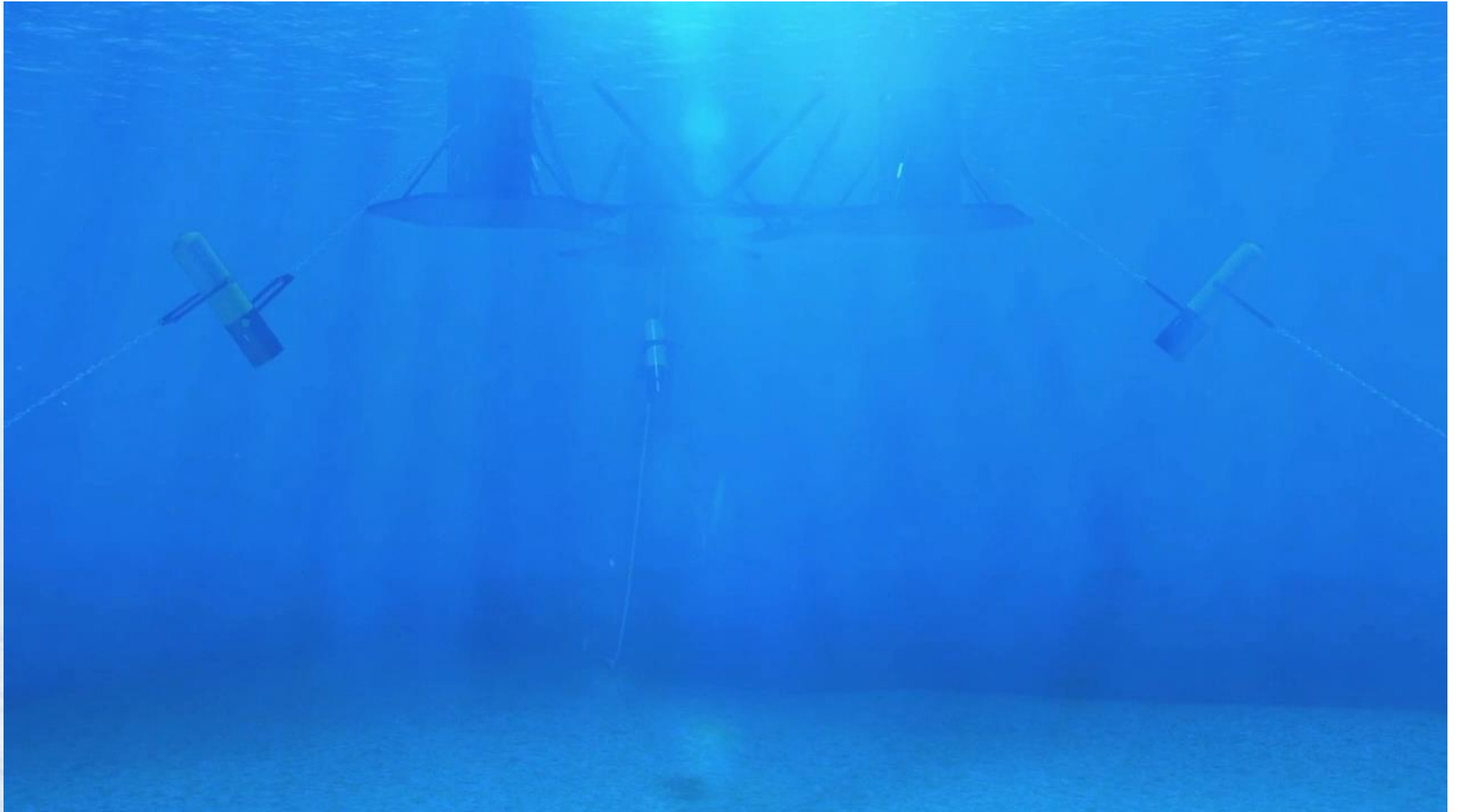


- Conf 1 - Base Line Catenary
- Conf 2 - BLC + LRD
- Conf 3 - Opt Catenary + LRD
- Conf 4 - ITM - Polyester
- Conf 5 - ITM - HMPE

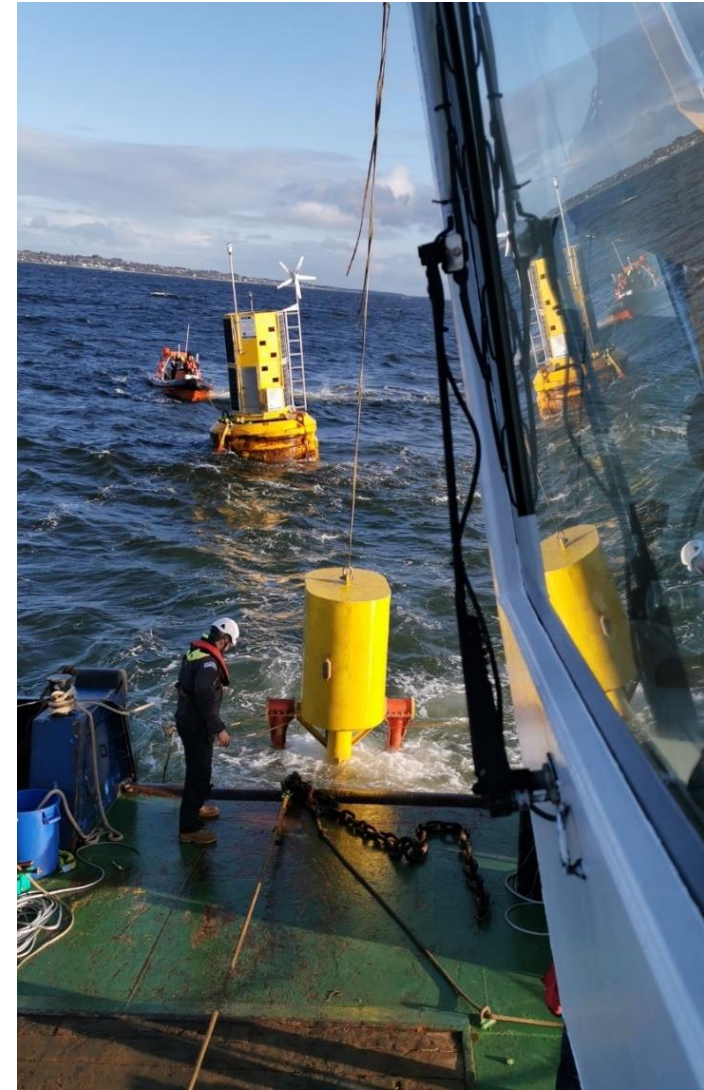
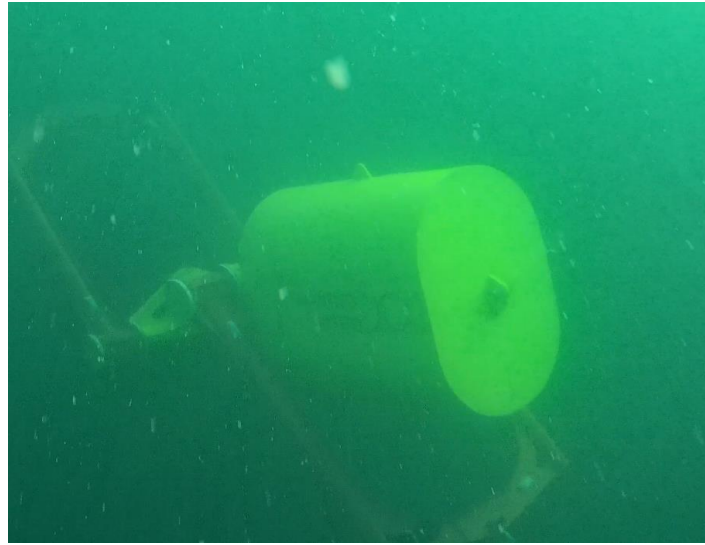


- >70% reduction in footprint
- >50% reduction in mooring load
- Smoothing and reduction in RNA acceleration

LRD – The FOW Solution



Offshore Demonstration



Independent Case Study – FOW Mooring Optimisation

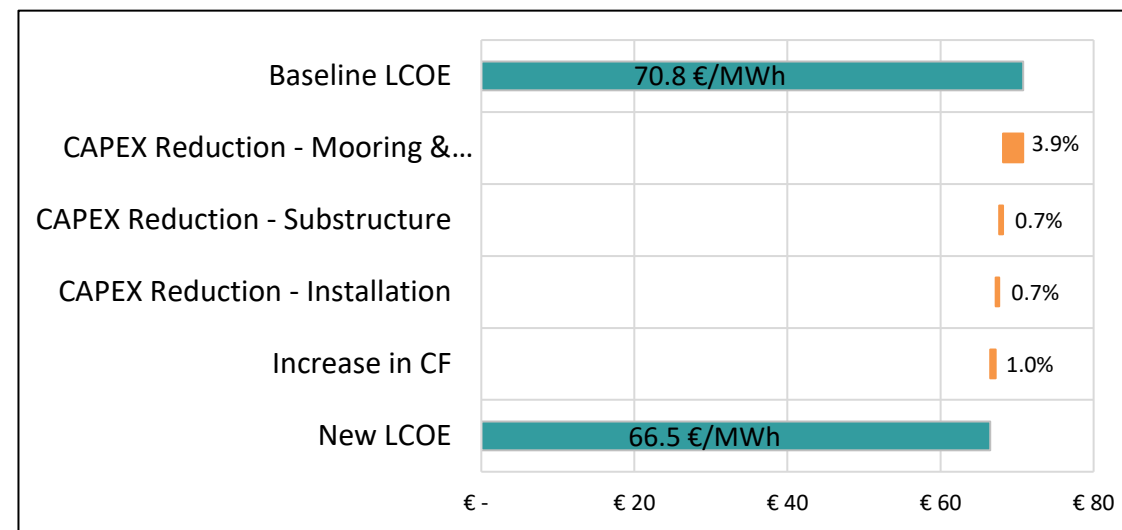
Farm Capacity [MW]	1000
Turbine Size (MW)	10
No. of Turbines	100
Lifetime (yrs)	27
Water depth (m)	100
Metocean conditions	Mediterranean
Project FID	2030
WACC	4.2%
Capacity Factor	52.5%
Platform Type	Steel Semi-Sub



Independent Case Study – FOW Mooring Optimisation

Characteristic	Baseline Mooring	LRD-integrated
Mooring Fairlead	1430T	730T
Peak Load		
Load Reduction	-	50%
Mooring Type	Semi-Taut	Inclined Taut
Mooring Lines	6 No	3 No
Mooring Specification	162mm Studlink Chain x 2230m	Synthetic x 570m
	Synthetic Topline x 300m	
Mooring Footprint Area	0.67km ²	0.2km ² 70% Reduction
LRD Qty	N/A	3 No.
LCOE	€70.8/MW hr	€66.5/MW hr

- 6.1% LCOE reduction
- 50% Mooring CAPEX saving



Temperature: 13.2°C

Depth: -5.3m

Heading: 41°

Pitch: -22°

Thank
You