



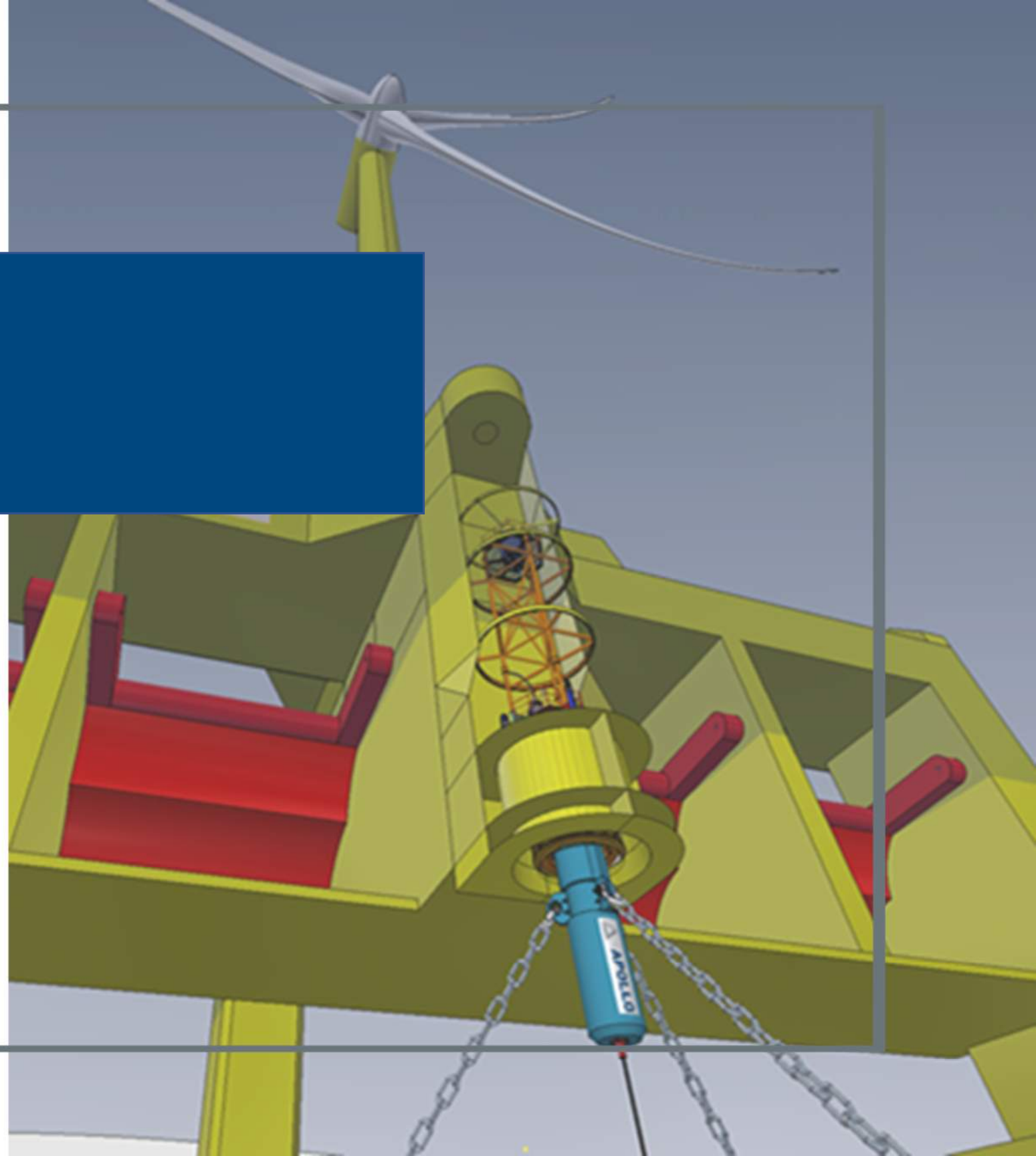
PALM (Pull and Lock Marine) QCS SUT Gadgets and Widgets meeting 2022

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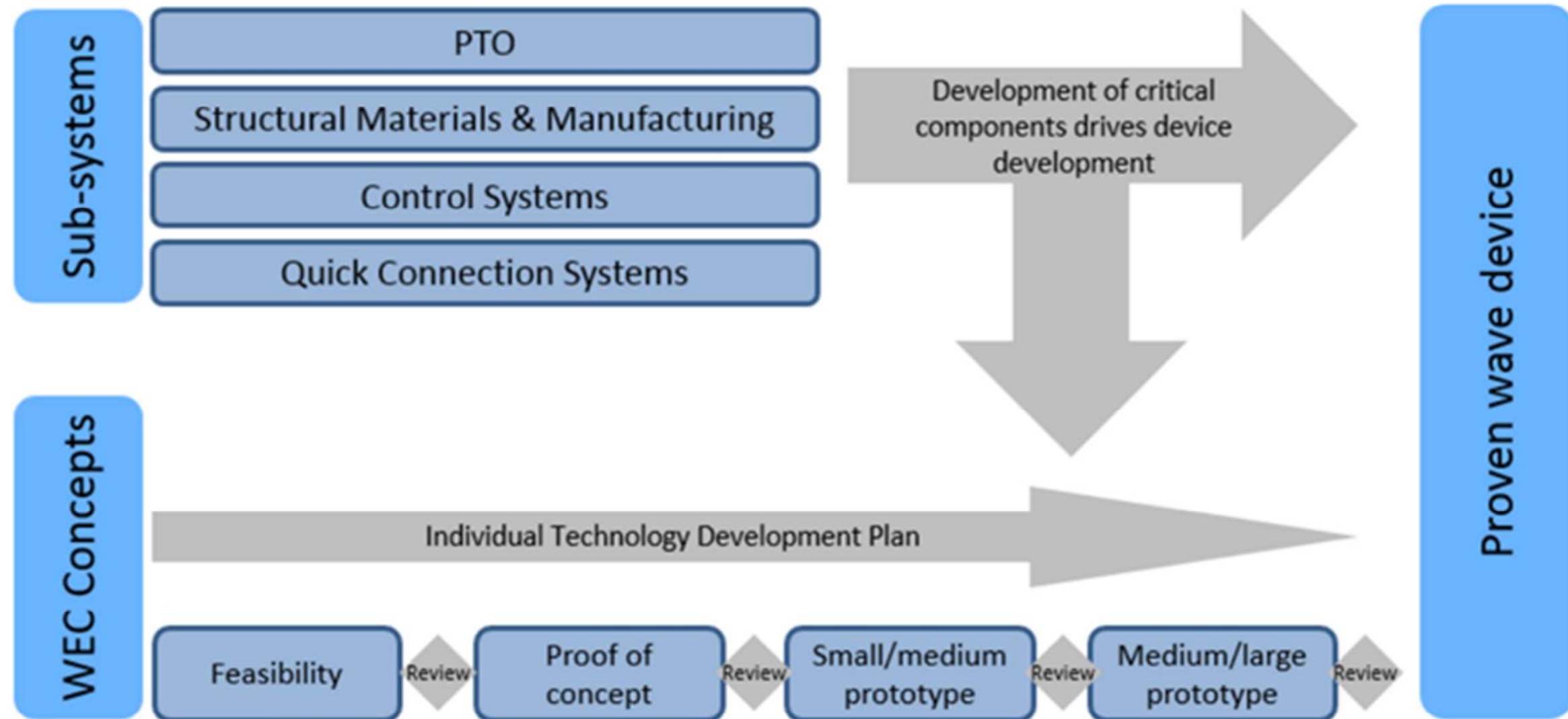


The PALM QCS

- A combined mooring and electrical quick connection system (QCS) for offshore renewables
- Reduces LCOE by expediting marine operations and improving system availability



Wave Energy Scotland QCS programme



Principles (and inspiration)



Izadparast et al., SNAME 2018



Hawse pipe
technology from
floating
production units

Minimized
marine spread
to expedite
operations



Mechanical QCS
approach - proven
in tidal devices



Meygen ARL1500 turbine



Rugged &
marinized for
through-life
integrity

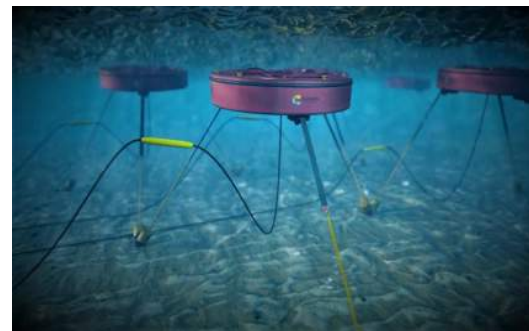
Development to TRL 6

WES STAGE 2
PRIMARY FEED



*3kW, 25 tonne
tension*

WES STAGE 2
ALTERNATE FEED



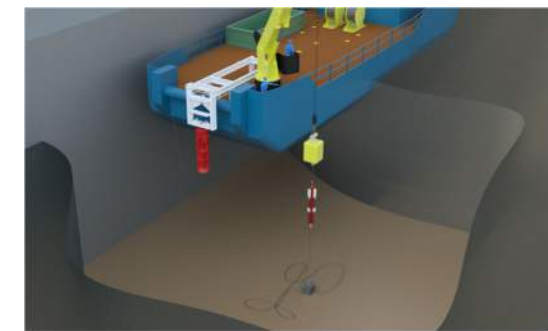
*10MW, 800 tonne
tension*

OWGP HYBRID
SYSTEM FEED

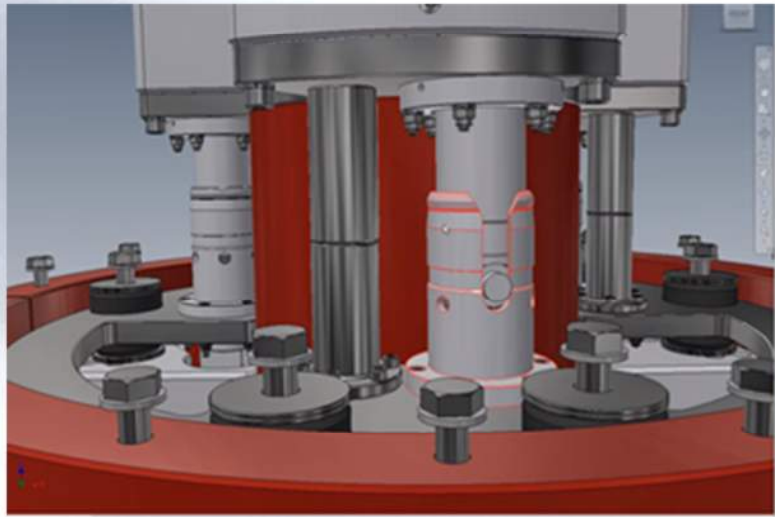


*12MW, 1100 tonne
tension*

Inshore testing
(2Q 2022)



Scaled for WES Stage 2
Primary test case



Cost benefit modelling – full scale, array deployment



CAPEX costs are about the same as for discrete mooring and cable connection systems

But the installation and removal cost savings are substantial at array scale

Item	“conventional”	PALM
Duration/ operation (days)	2	1
AHTS day rate (typ)	£20,000	£15,000
ROV day rate	£2,000	-
Indicative installation/ intervention cost	£44,000	£15,000
No. ops per lifetime	7	7
Life cycle cost/ asset	£308k	£105k
Per 10 assets	£3.1 million	£1.1 m

Estimated through-life saving of ~£200k per hull/turbine



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