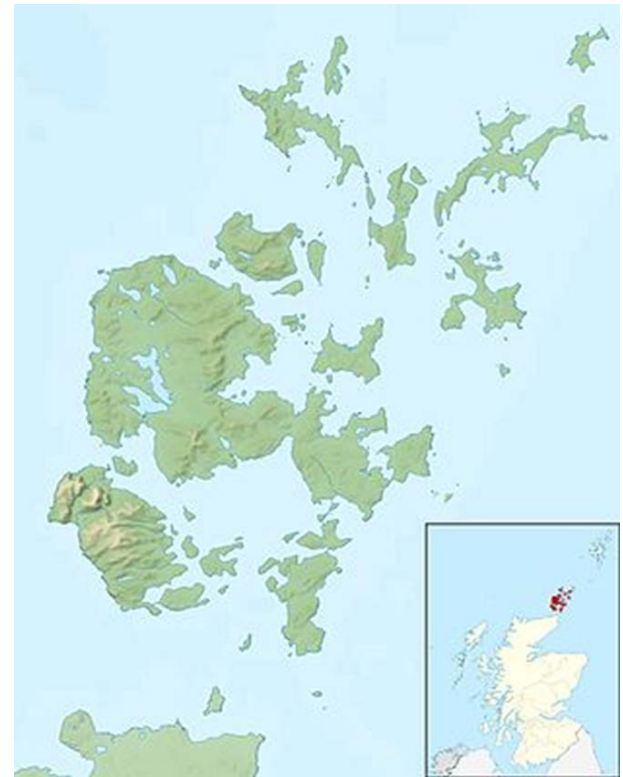




Synergies between ocean energy sectors

Gareth Davies
MD Aquatera,
Gareth.Davies@aquatera.co.uk



Areas of possible synergy – WHAT?

- Planning
 - Energy markets
 - Incentives (if any)
 - Spatial planning
- Permitting
 - Offshore development areas
 - Nearshore development areas
- Finance
- Surveying
- New offshore energy demand
- **Cables/pipelines/transport of product**
- **Installation, maintenance & decommissioning vessels**
- **Service bases**
- **Vessel berths**
- **Support supply chain**
- Design standards
- Components (moorings, materials, instruments, safety systems, PTO's etc)
- People (skills, expertise etc)
- Service and inspection teams
- Inspection technology (AUVs)
- Landfall
- Onshore power management/conversion
- Monitoring and surveillance
- Emergency response
- Conditions forecasting
- Political lobbying



Aims of synergies – WHY?

- To save money?
- To increase the chances of success
- To provide essential energy – to match demand
- To balance power outputs
- To accelerate progress
- To avoid pitfalls
- To reduce wasted effort and resources
- To reduce conflict with other sea users and wildlife – reduced footprint
- To attract investment and political support

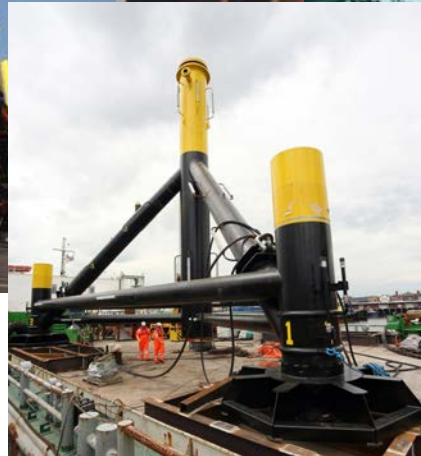


Ports - Wind, wave and/or tide?



How close to site does a port have to be?

Foundations, wind, wave and/or tide?



Anchors – wind, wave and/or tide?



Seabed type, ease of installation and loading are critical

Heavy lift – wind, wave and/or tide?



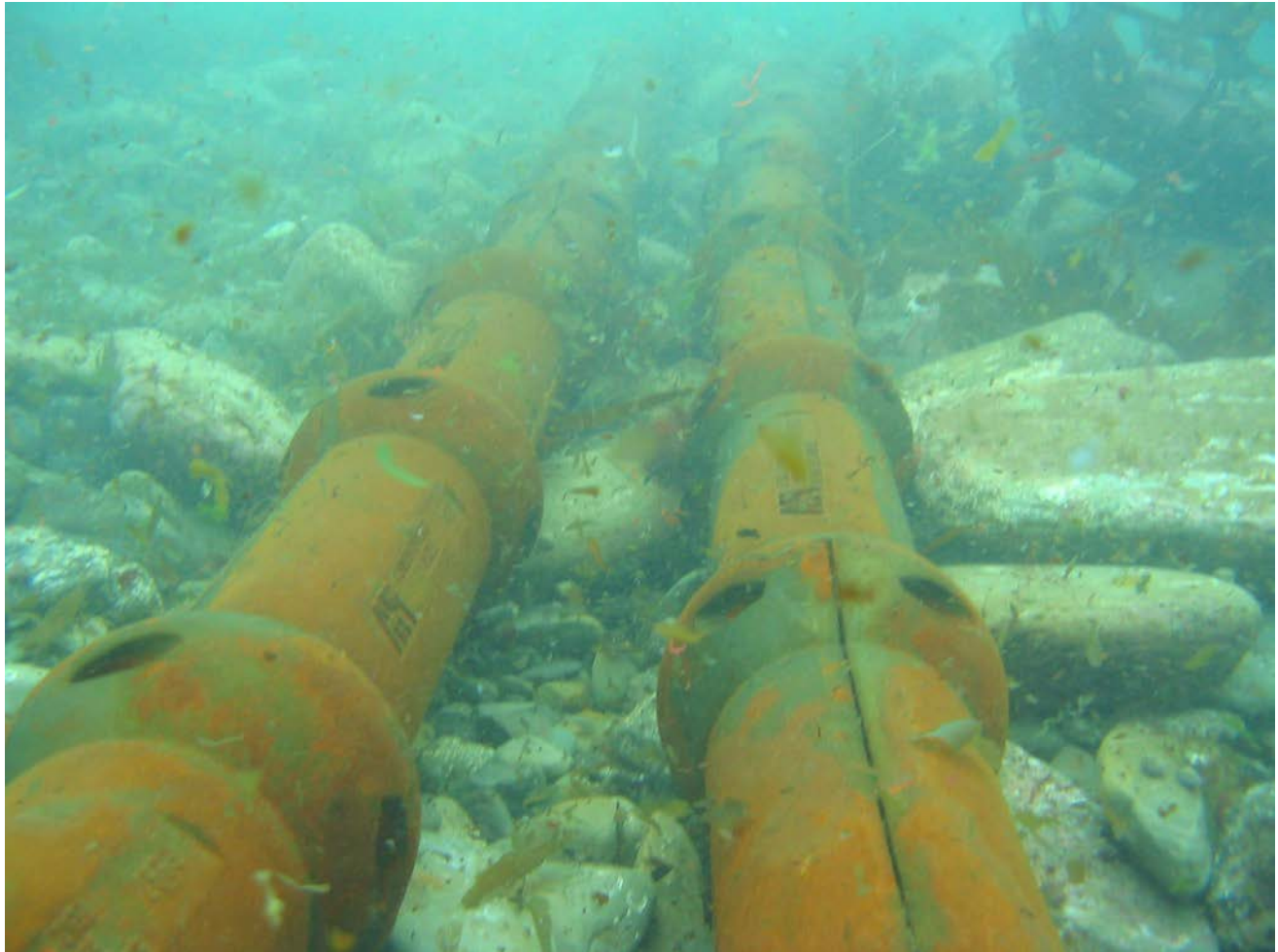
Workboats – wind, wave and/or tide?



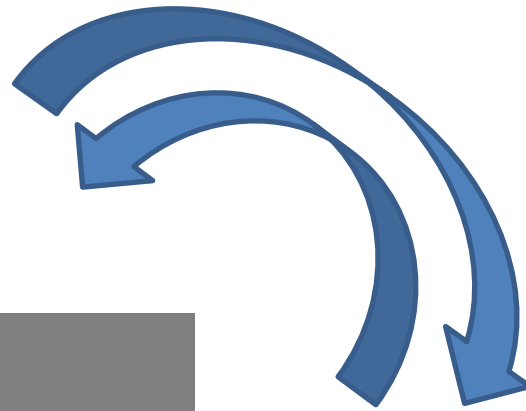
Cable laying – wind, wave and/or tide?



Cables – wind, wave and/or tide



How is the land to sea transition achieved?



Key factors

- Size,
- Weight,
- Shape,
- Accuracy required,
- Transition approach (one piece, large pieces, piece meal?)

Options

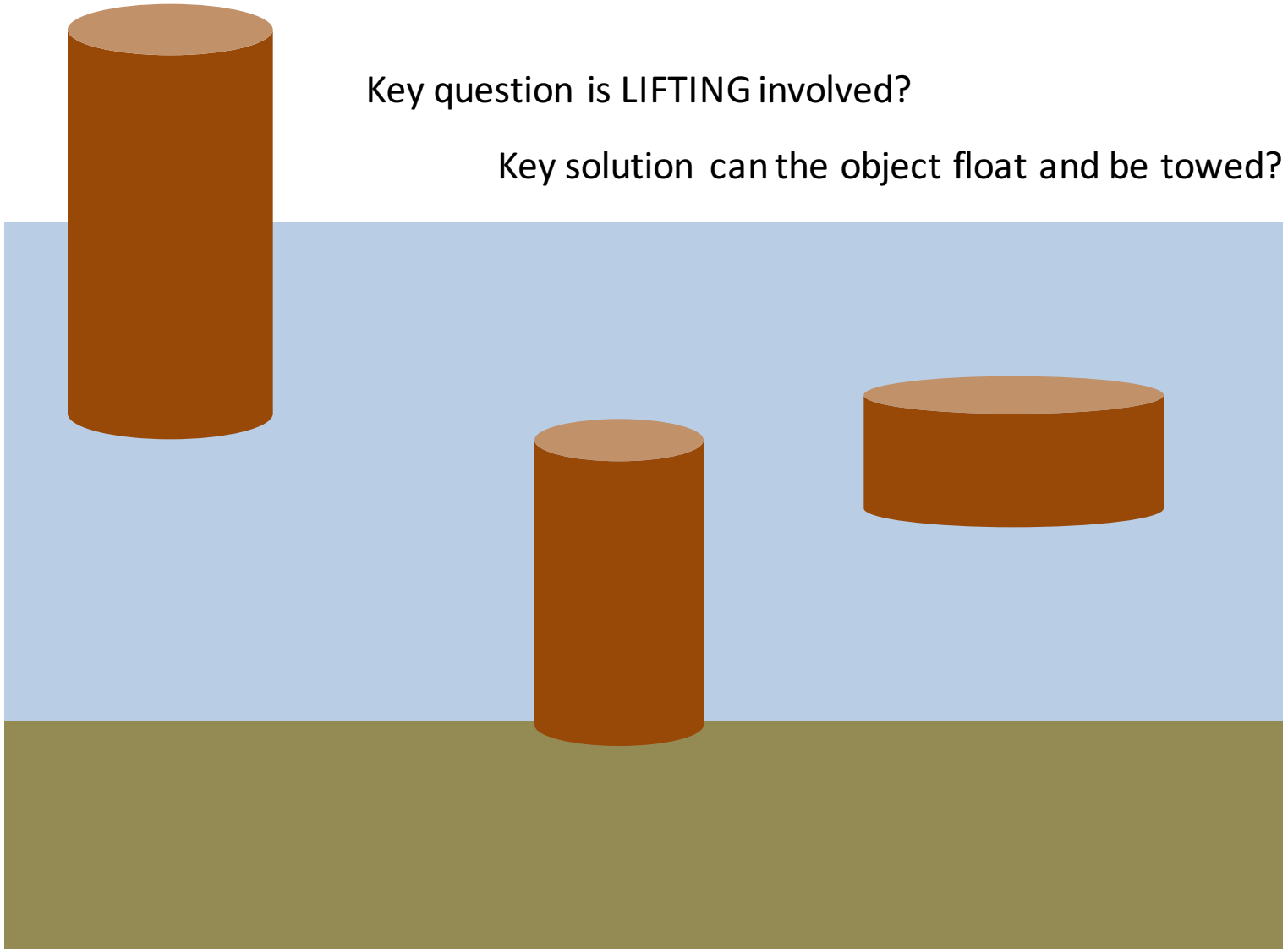
- Cranes
- Lifts
- Slips
- Dry docks
- Quaysides



How significant is size, shape and position for marine operations?

Key question is LIFTING involved?

Key solution can the object float and be towed?



Key infrastructure building blocks

- Land/sea transition point
 - Lifting capacity
 - Laydown space and weight bearing
 - Wet storage areas
- Support vessels/vehicles
 - Lifting vessels
 - Towing vessels
 - Cable lay platforms
 - Mooring handling platforms
 - Foundation setting platforms
- Components
- Offshore infrastructure
 - Substations
 - Storage
 - Energy transformation
 - Offshore markets
 - Links to shore
- Onshore infrastructure
 - Storage
 - Onward distribution links
 - Onshore markets

aquaterra



Small scale wave
and tide may be
different

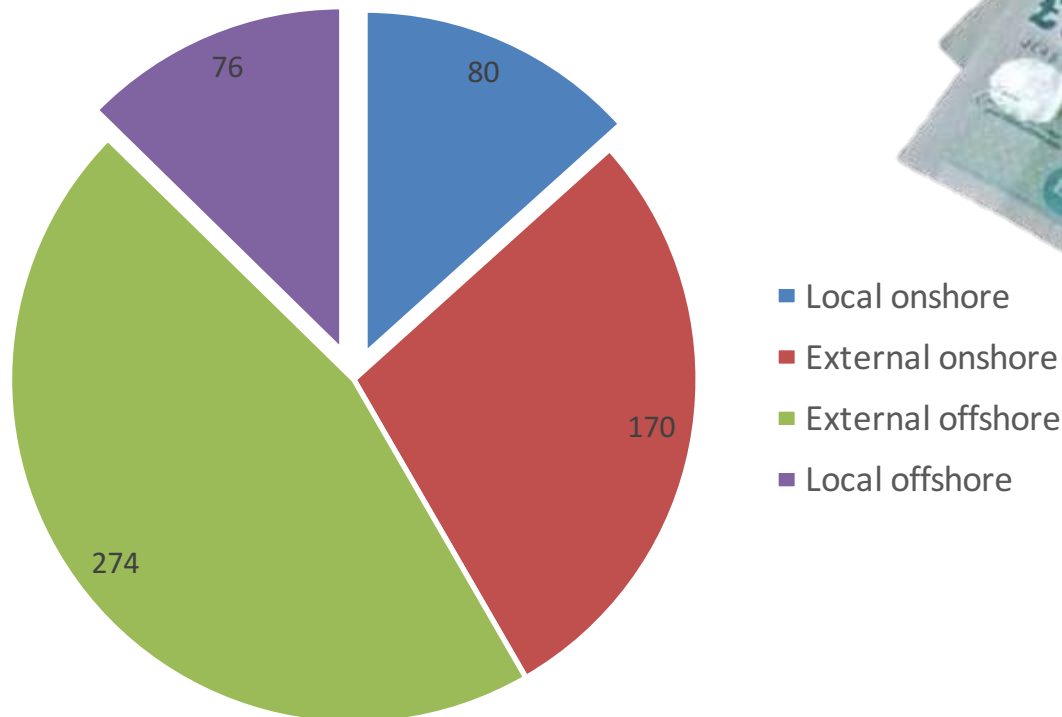
Creating infrastructure capacity underpins progress



People, vessels, ports

How much has been spent achieving what we have achieved?

£M spent in/on Orkney



We have ~25% stake in this

Spreading this kind of investment across all sectors may be desirable or indeed essential



Energy systems - Priority themes

