



Cost Reductions Through Collaboration and Shared Learning

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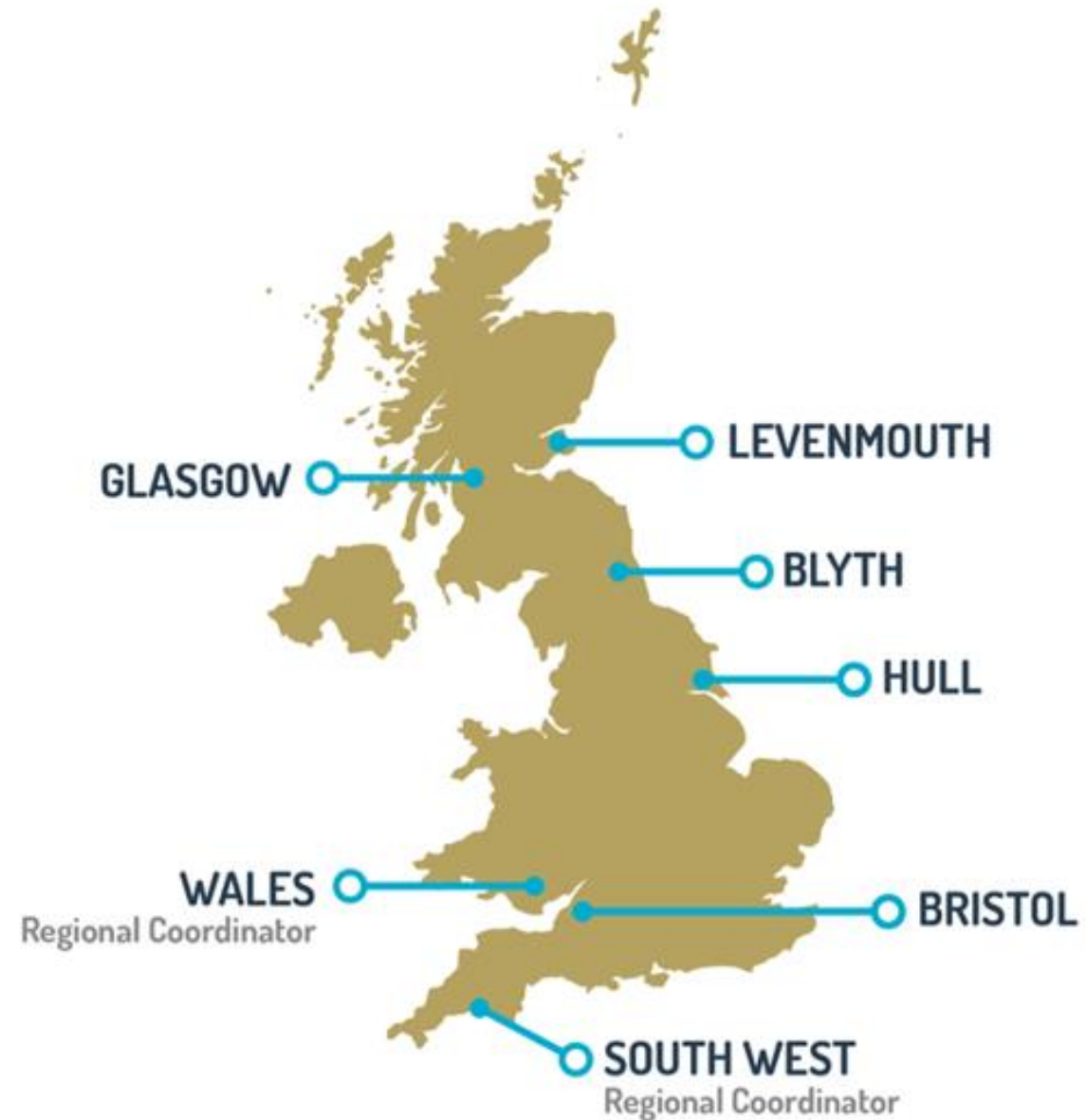
Our mission

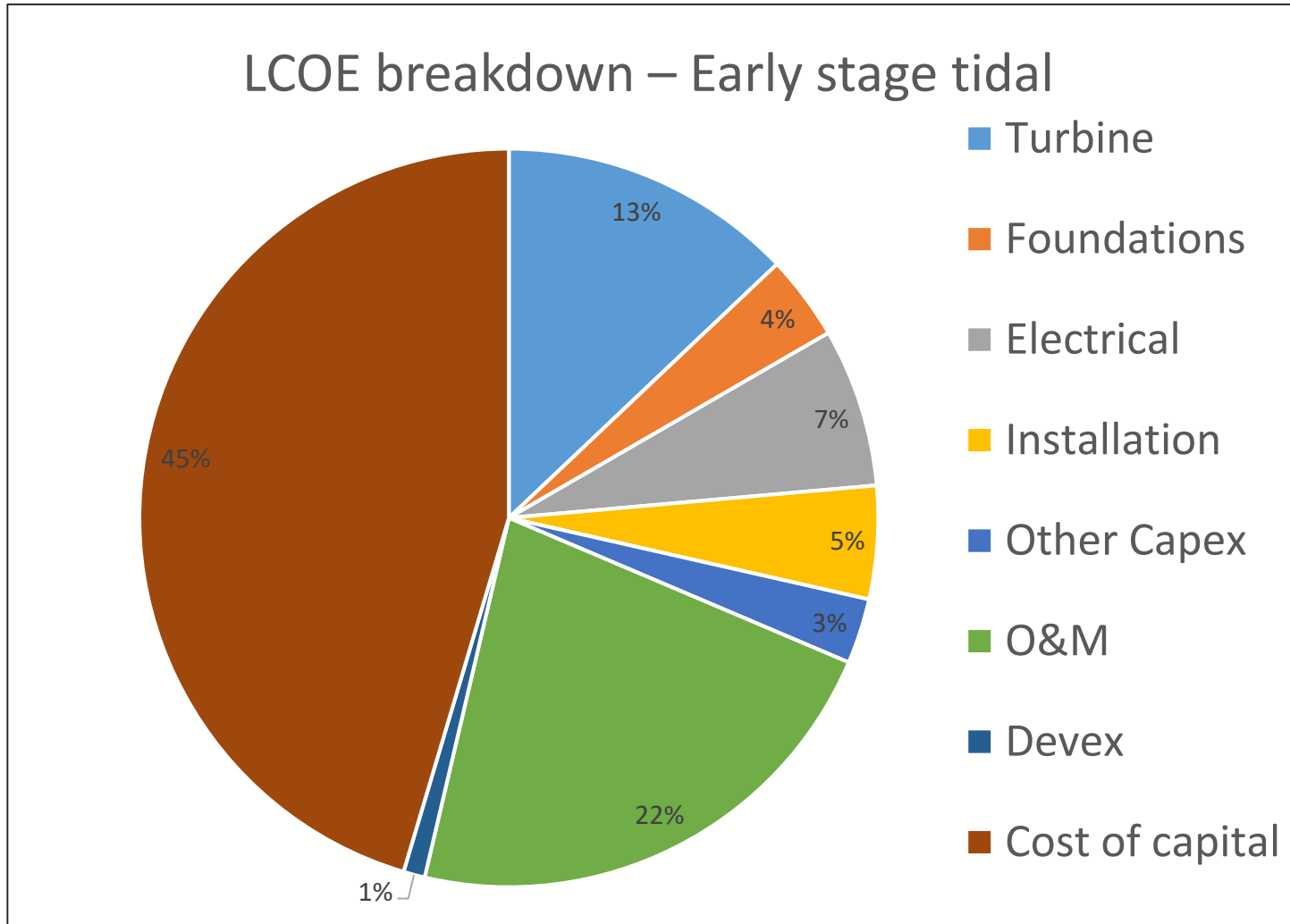
To accelerate the creation and growth of UK companies in the ORE sector

Our vision

ORE Catapult will be the world's leading offshore renewable energy technology centre

- **Centres of Excellence**
 - **Academic Research Hubs**
in partnership with leading universities
- **Open-access Testing Assets and Facilities**
Blyth and Levenmouth



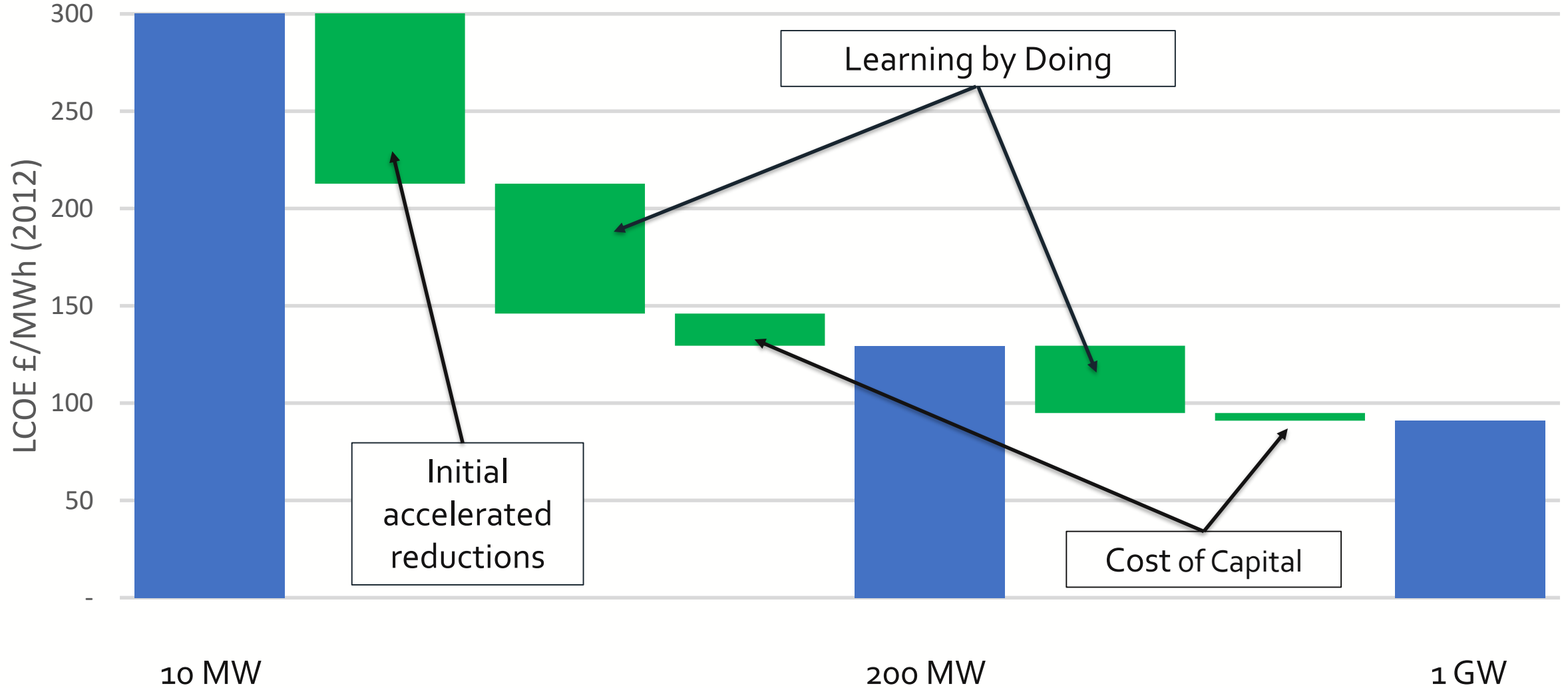


Priorities based on share of LCOE:

1. Cost of capital
2. O&M
3. Turbine
4. Electrical
5. Installation
6. Foundations/Moorings
7. Devex and Other capex

Based on ORE Catapult analysis:
Marine Energy Cost Reduction & Industrial Benefit, March 2018

Tidal Stream LCOE reduction



Initial Accelerated Reductions

- Economies of Volume
- Economies of Scale
- Accelerated Learning

Learning by Doing & Innovation

- Optimised processes & manufacturing
- Real life operational & weather data
- Collaborative shared learning

Cost of Capital

- Increase project debt
- Reduce equity risk
- Insurance & Warranties

We have had pushback from Government:

- Can we believe these projections?
- Can 'Learning by Doing' really deliver when it's spread across so many different device concepts?

- **New report commissioned by Scottish Government**

- What areas can Device and Project Developers collaborate on without risking loss of proprietary information?
- Where and how can technologies be improved independent of new device installations
- Prioritise those areas with biggest impact on LCoE
- Intended to be published soon.

- **Six areas identified**

- Blades
- Pitch Control
- Subsea Hubs
- Wetmate connectors
- Nacelle Installation & Retrieval
- Foundations

Blades



- Instrument blades to understand environment
- Fatigue life testing – avoid over-designing
- Identify manufacturing facilities that can expand with industry

Pitch Control



- Record and share data on failures
- Work with key suppliers to share learnings and secure continuous improvement
- Standardise – make the market bigger?

Subsea Hubs



- Subsea cabling is expensive to lay and prone to damage
- Hubs are being planned by major developers.
- Combine learnings to accelerate development

Wetmate Connectors



- New designs for voltage required and harsh environment
- Collaborate with oil and gas (and other?) industries
- Standardise – voltages, frequencies, data

Nacelle Deployment & Recovery



- Limited operating windows
- Assess requirements against capabilities of vessels
- Explore opportunities to develop port & harbour infrastructure

Foundations



- Move away from gravity-based
- Instrument to understand fatigue loads
- Avoid over-engineering
- Design codes & standards

Innovations need Demonstration:

- Get it wet or put it in a relevant environment – META, Flumes & Tanks; Accelerated Life Testing
- Validation: Does it do what it says on the tin?
- Verification: Does it do what the customer needs?
- Independent and public: Sharing outcomes leads to investor confidence and cheaper cost of capital

Need to take risks on Balance of Plant

- Cannot let these costs stand still
- Need to find ways to mitigate risks for device developers

Need to innovate in parallel with project developments:

- Project deployments are expensive and lumpy, we need continuous improvement
- Need to evidence and report improvements – MEC, Tidal CRMF.

Contact us

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