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MARINE CONFERENCE

23 JUNE 2021 ONLINE

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Morag Watson
Director of Policy
Scottish Renewables

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The renewable solution for marine nations: Scotland's leading work in the global climate fight

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Gauri Singh

Deputy Director-General

International Renewable Energy Agency

IRENA
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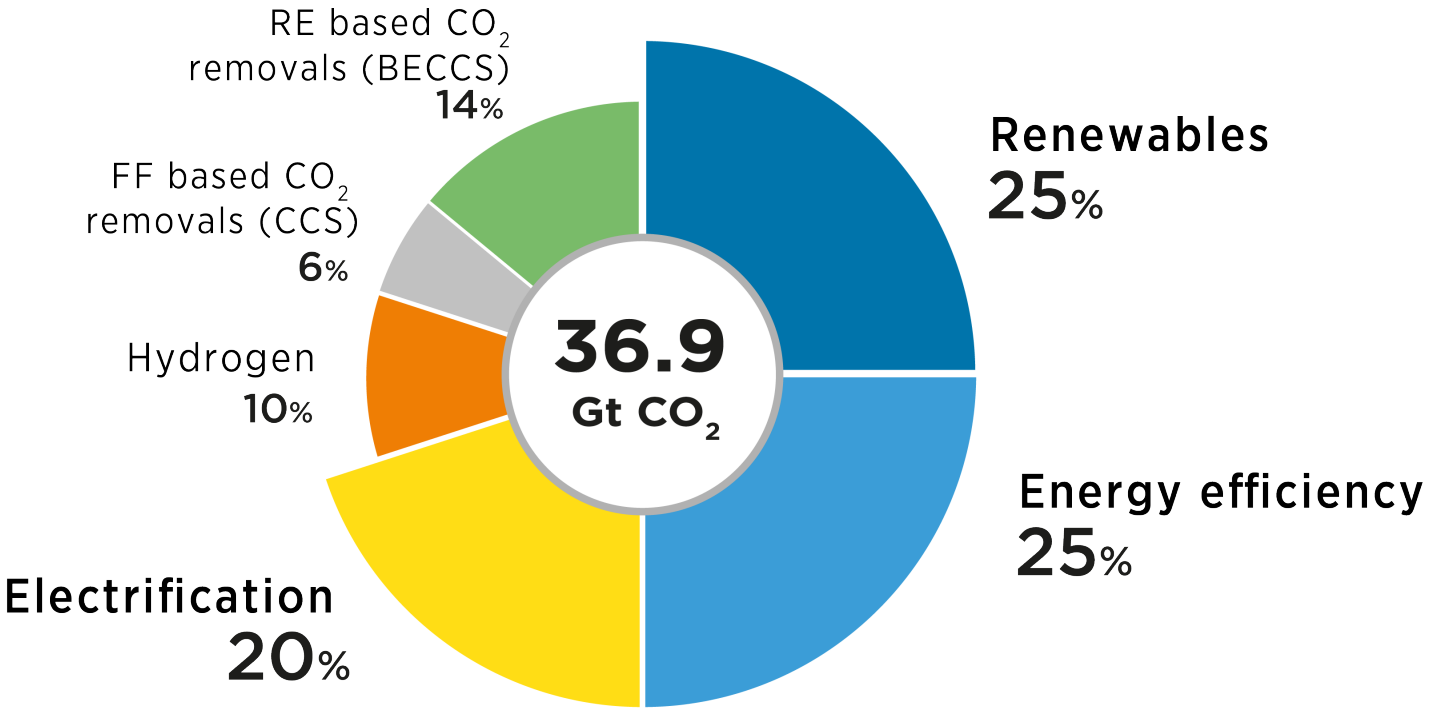
WORLD ENERGY TRANSITIONS OUTLOOK

1.5°C Pathway

Scottish Renewables Marine Conference • 23 June 2021•

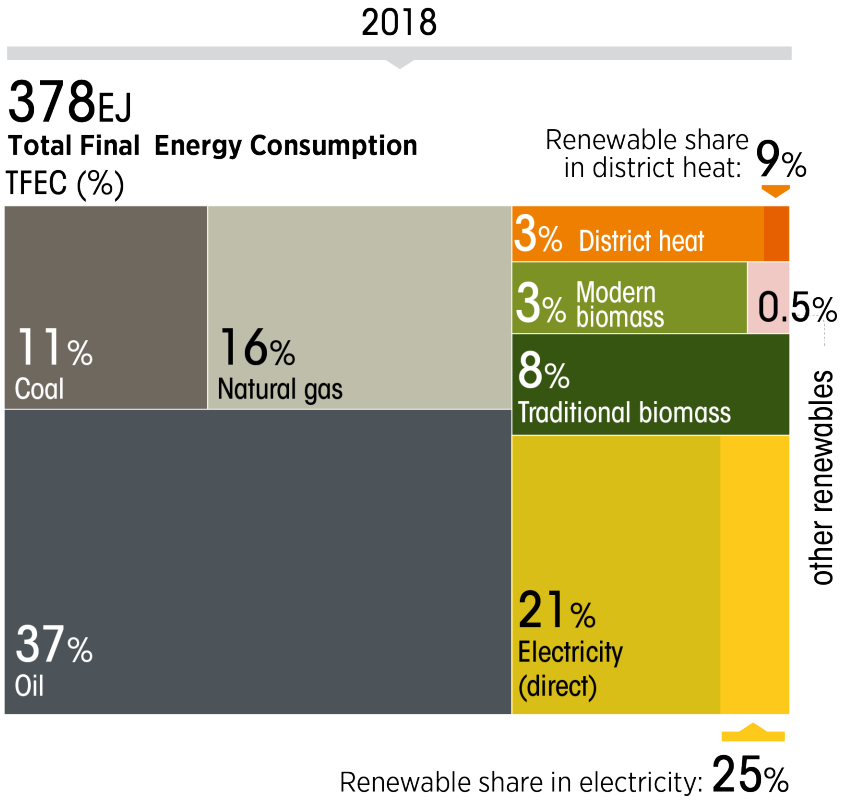
Renewables, efficiency and electrification dominate energy transition

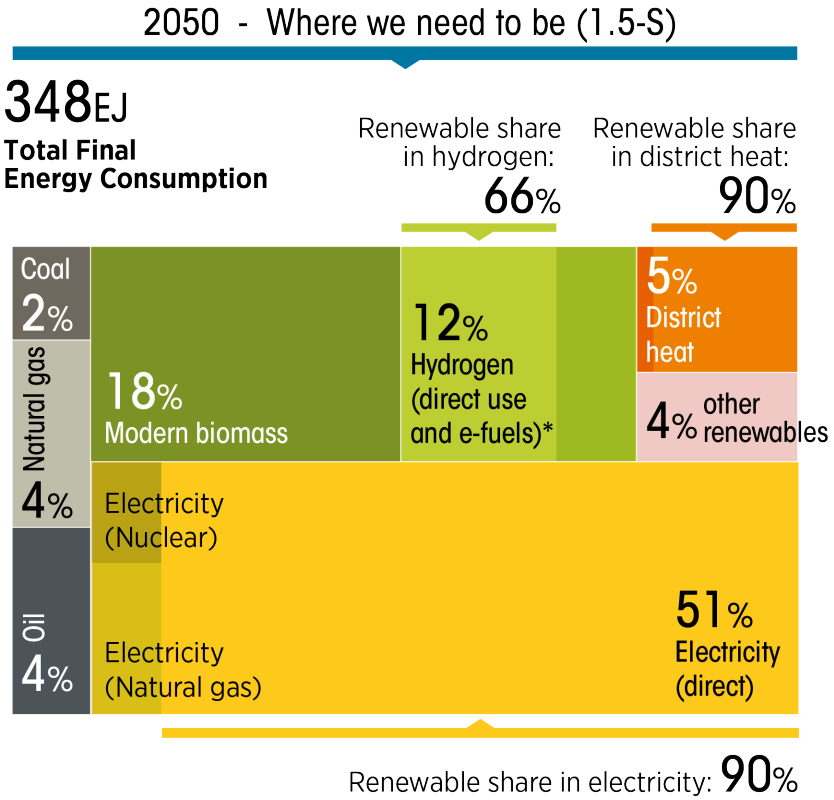
Six components of the energy transition strategy



90% of all decarbonisation in 2050 will involve renewable energy through direct supply of low-cost power, efficiency, electrification, bioenergy with CCS and green hydrogen.

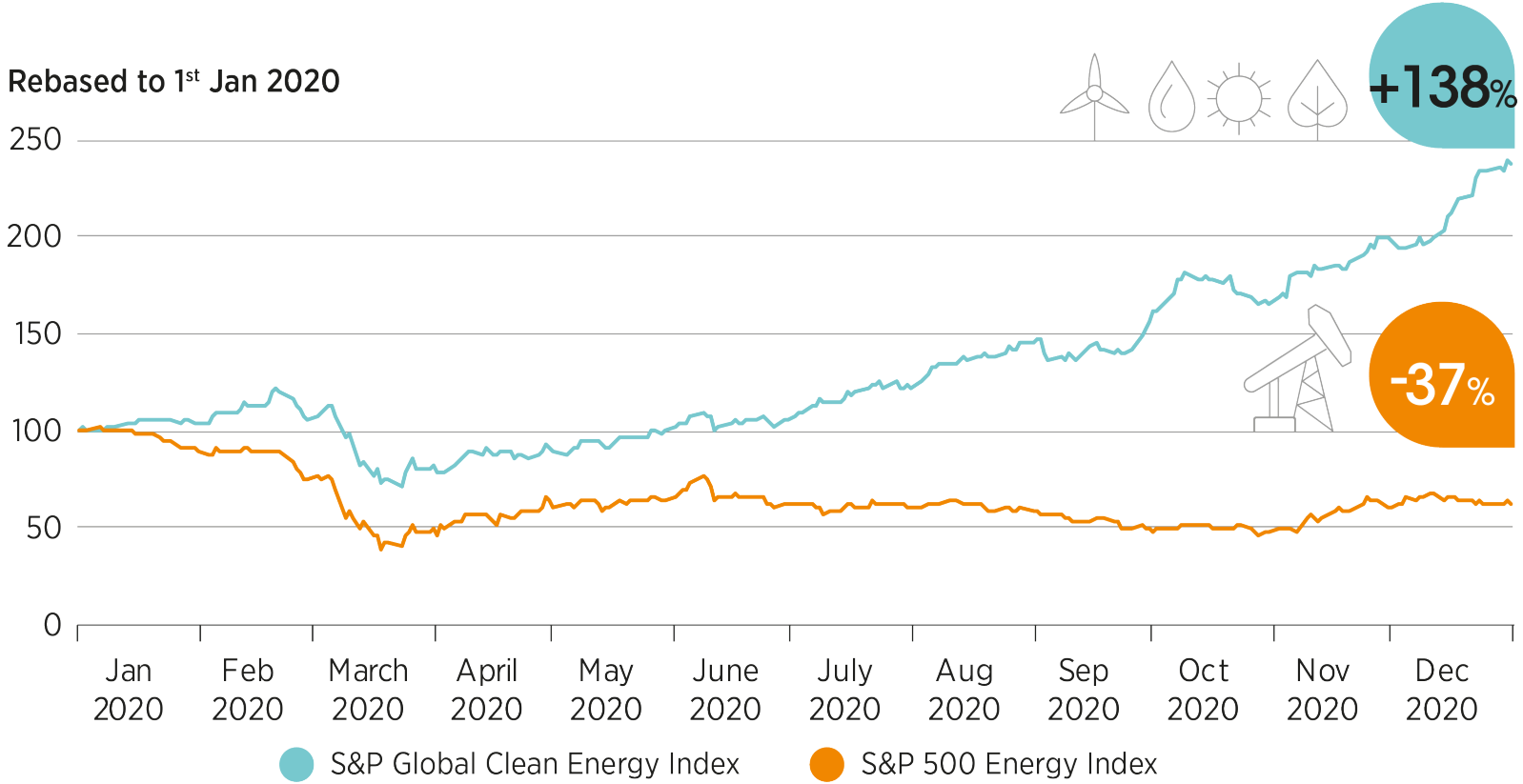
Electricity becomes the main energy carrier in 2050





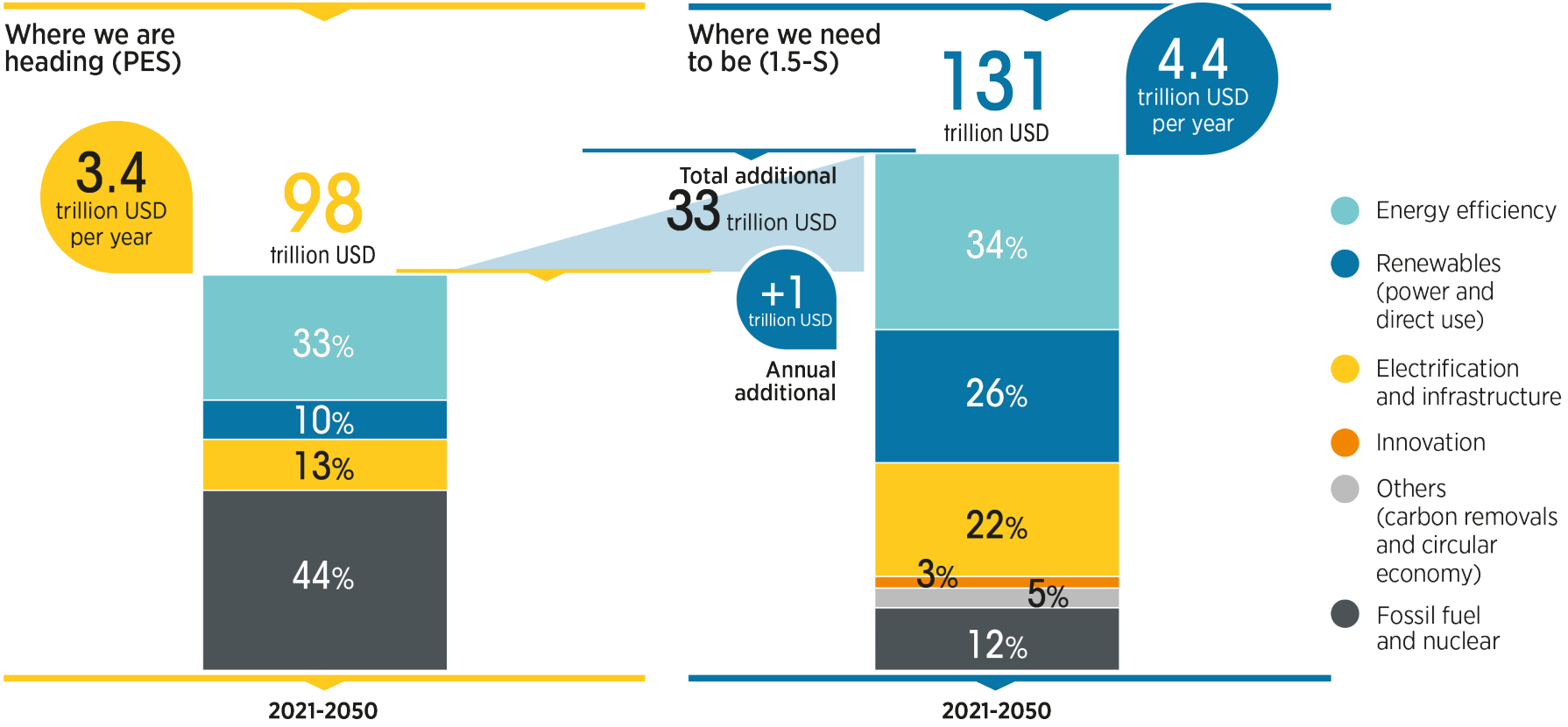
90% of total electricity needs will be supplied by renewables by 2050.

Recent trends in financial markets



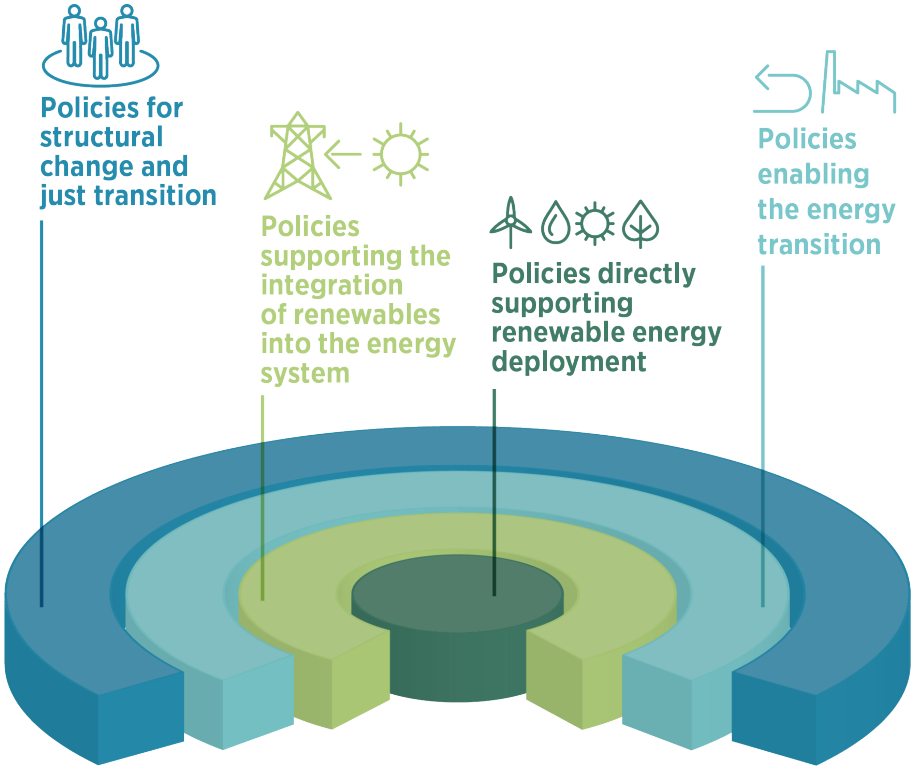
Investors and financial markets are anticipating energy transition and allocating capital away from fossil fuels towards energy transition technologies, such as renewables.

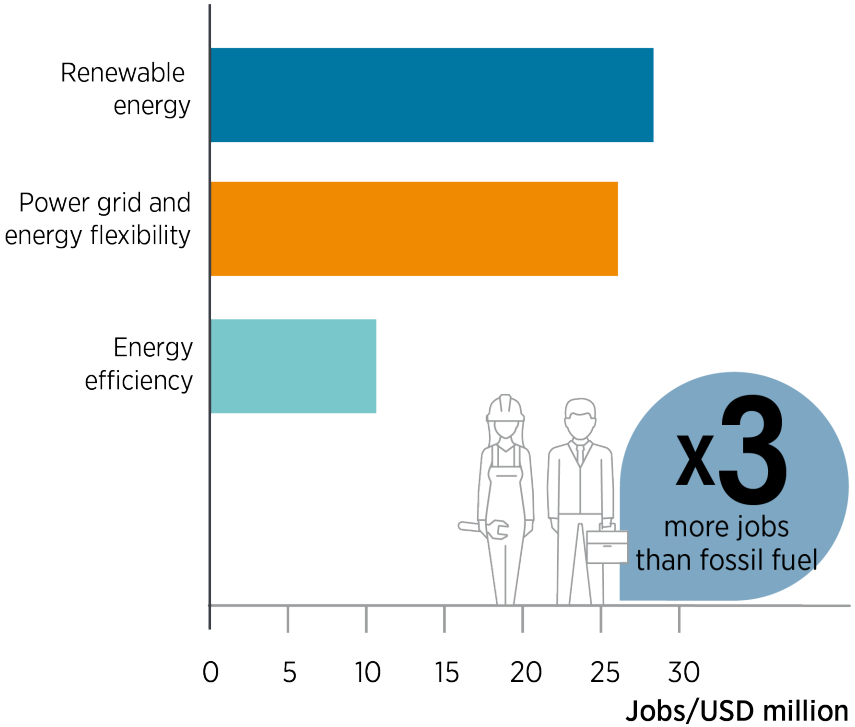
New investment priorities: renewables, efficiency and electrification



A climate-safe future calls for the scale-up and redirection of investments towards energy transition technologies, away from fossil fuels.

Broad set of policies required for a just transition





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Rémi Gruet
CEO
Ocean Energy Europe

Gareth Davies
Managing Director
Aquatera

Learning from experience - market led analysis of marine energy opportunities

Presented by Gareth Davies: MD Aquatera and Chair of Aquatera Group
gareth.davies@aquatera.co.uk

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WHY are we here?

The facts

- The world needs more energy
- The world needs carbon free energy
- The world needs to reduce the use of fossil fuels
- Established carbon free/low carbon energy sources don't/can't provide all the solutions

Key questions

- **CAN MARINE/OCEAN ENERGY HELP?**

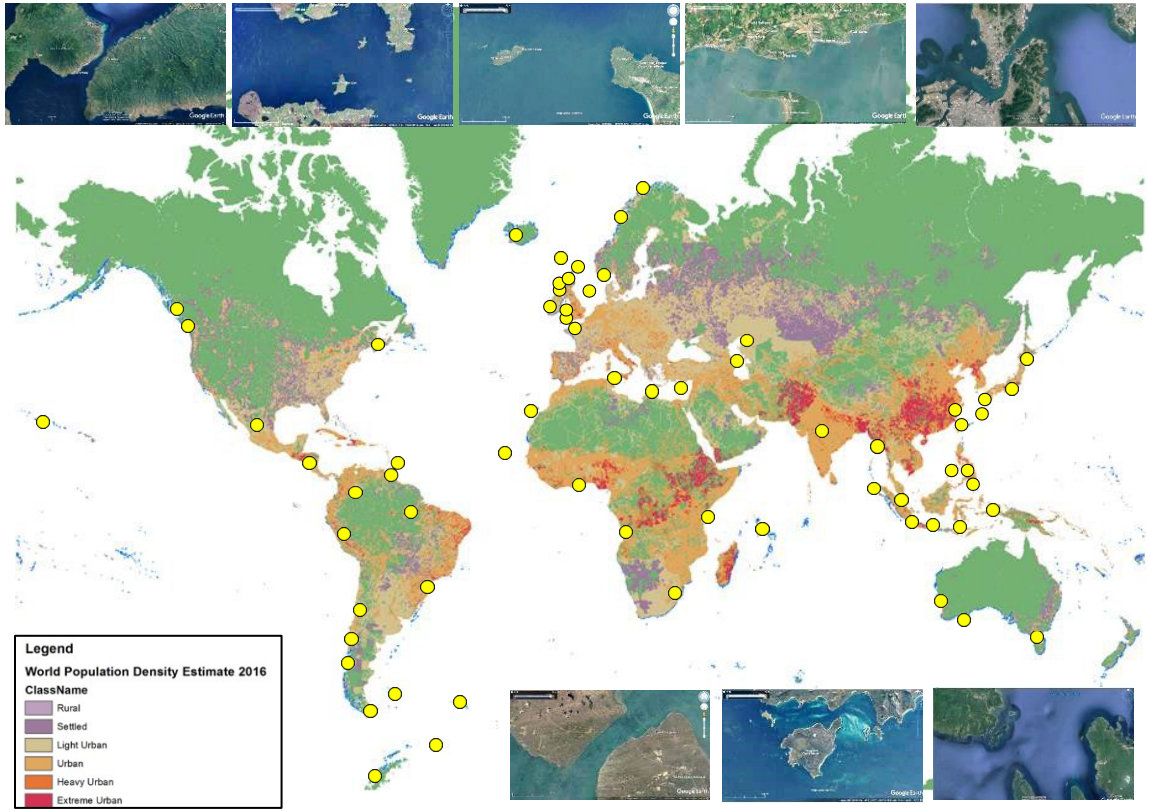
Requirements for success

- There are some universal building blocks that will be needed
- Without any one of these any initiative will fail
- Have previously considered the needs for ‘appropriate technology’
- Now looking for ‘attractive’ markets

500 million 1 km² markets - 1.6 million coastal km

Each square km on earth has its own specific and unique energy fingerprint:

- Resources available
- Level and pattern of supply
- At what proximity
- Infrastructure
- Connectivity
- Balancing mechanisms
- Types of need
- Affordability
- Pattern of demand



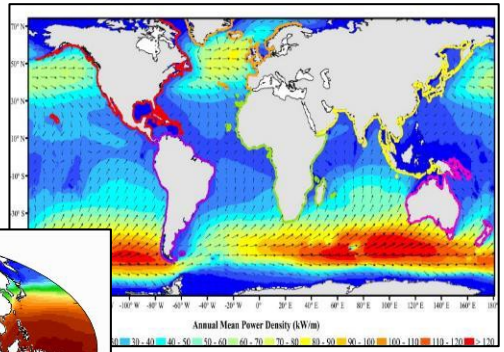
Co-opetition of site resources

- Are tidal or wave competing against or working with wind, thermal and solar?
- They can at times help each other, they may at time also outcompete each other

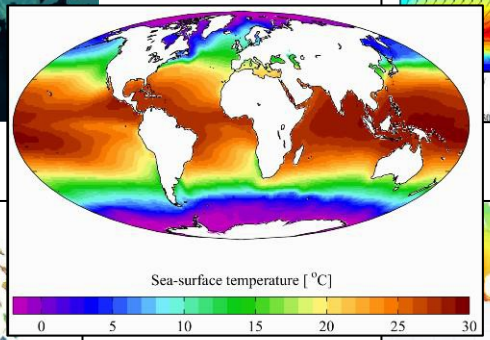
- **Need the right resource for the job in hand**

Tidal resources

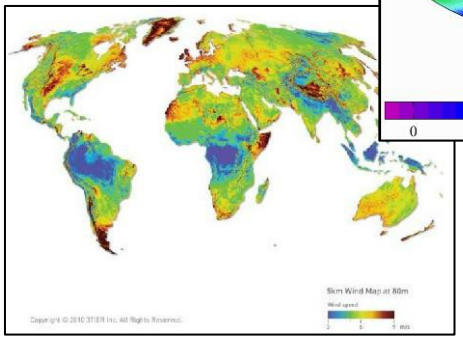
Wave resources



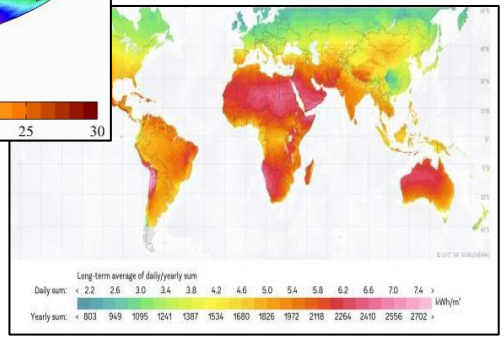
Thermal resources



Wind resources



Solar resources



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Key energy market factors

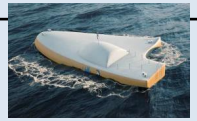
- Energy product or service supplied
- Scale of demand
- Revenue/price available
- Standing market access costs/limits
- Specification of supplied energy service
- Competitiveness of alternatives
- Synergies with alternatives
- Prospects over time

You are not going to sell the same product of service to each of these people!

Technology and market definition scheme

<10M	<2M	>3.5 m/s	40-200 m	>1MW					
<4M	<1M	>3 m/s	20-100 m	250 kW-1MW					
<2M	<500M	>2.5 m/s	10-70 m	50kW-250 kW					
<200k	<100k	>2 m/s	2-30 m	5kW-50kW					
<25k	<$10k	1-2 m/s	0-1000 m	<5kW					
Early stage cost (No 2 to 10)	Later stage cost (After 100)	Typical stream velocity	Typical water depths	Technology Markets	Ultra high value low demand	High value	Added value	Standard value	Low value high demand
				Typical range of products/services provided	Lighting, small battery charging, specialist energy services, instrumentation, oil & gas	Local ice, heat, transport, mining, tourism	Community energy, transport, isolated industry	Weak grid energy, green users	Strong grid energy, all customers
				Actual market value (US$/MWh)	>$500 to 50/ MWh	$500-150/ MWh	$150-70/ MWh	$70-30/ MWh	<$30
				Typical demand package sizes	Watts - kW	kW-MW	MW-10MW	10MW-100MW	>100MW
				Typical no. of people served per site	<10	10-1000	1000-10,000	10000-100,000	>100,000
				Number of sites to develop globally (tide)	10,000	1000	200	100	<50
				Viable distance from	10s m	kms	10s km	100s km	1000 km?

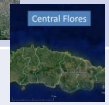
Example technologies at different scales

Technology	Tide	Wave	Offshore wind	Aqua-
Mega >1MW	 	 		
Macro 250 kW- 1MW		 		
Midi 50kW-250 kW	 			 
Mini 5kW-50kW	 	 		
Micro <5kW	 			  
Low energy regimes				

Market mapping technology opportunities

Key	Floating solar	Offshore wind	Tide	Wave	Aqua thermal
Low value	Standard value	Elevated value	High value	Ultra high value	
			N/A	N/A	>10 MW
				N/A	1-10 MW
					100 kW-1 MW
N/A					10 kW -100 kW
N/A					<10kW

Site specific market mapping of place & enterprise opportunities

Low value	Standard value	Elevated value	High value	Ultra high value	
       					>10 MW
		  			1-10 MW
					100 kW-1 MW
				 	10 kW -100 kW
				 	<10kW

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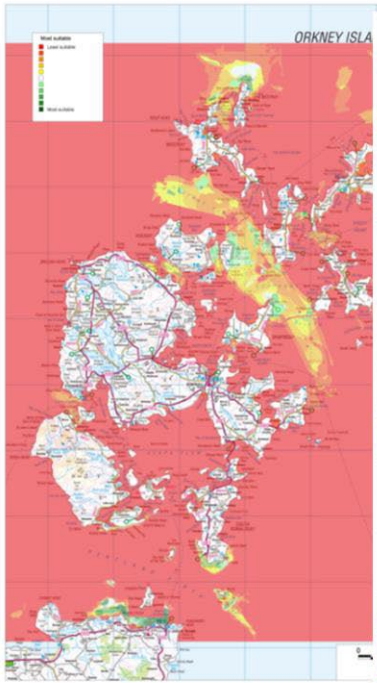
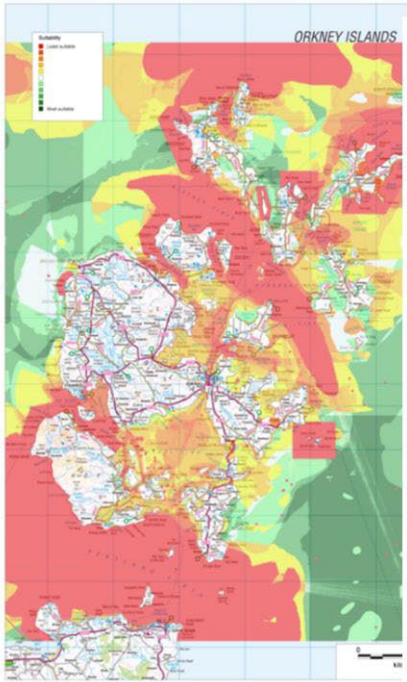
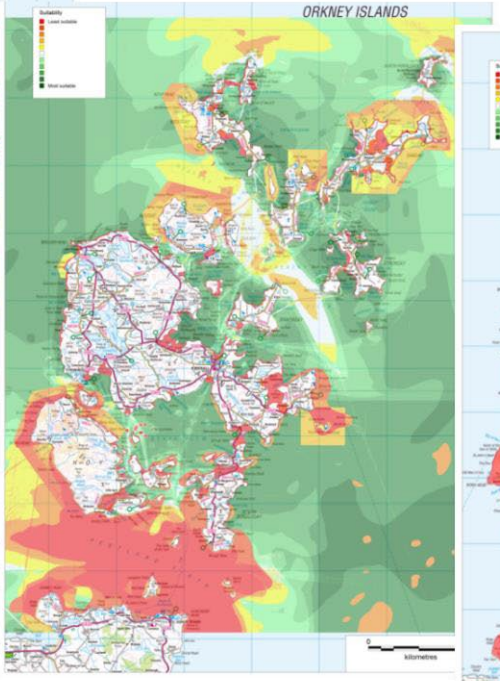
Detailed option evaluation for actual energy systems development



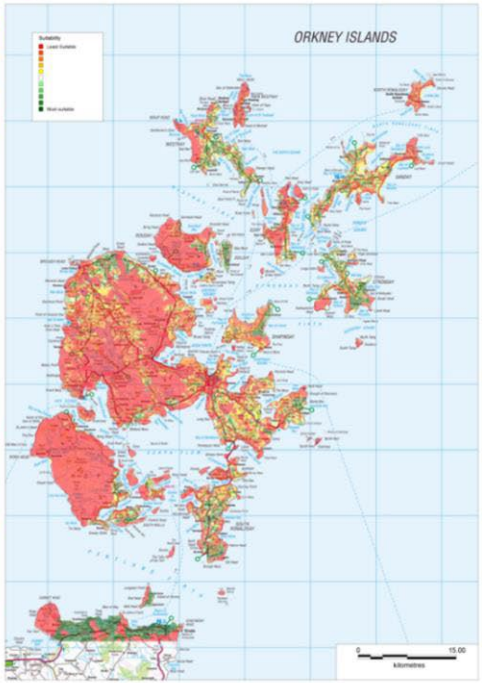
Tide



Wave



Cables

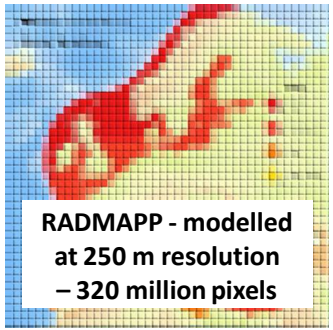


Substations

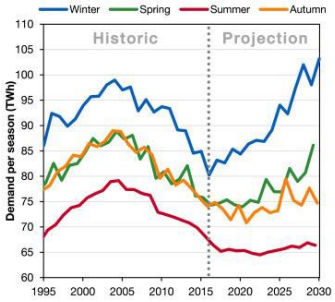
Integrated energy systems modelling - EVOLVE

Key question: Can blue energy make an effective contribution to local, national & European energy systems markets, with particular reference to where, what, when, how and at what price?

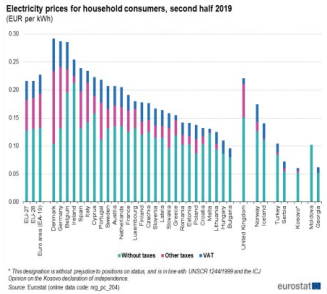
Place



Time



Value



What

How

Targets & policy
Net zero context
Total energy outcomes

INTEGRATED ENERGY SYSTEMS MARKET

Electricity, transport, power

heat, cooling, balancing

ReFLEX ORKNEY

ReFLEX GLOBAL

Investment
Meeting needs
Offsetting risks

Aquatera – Edinburgh University – WAVEC – RISE – Core Power – Orbital Energy

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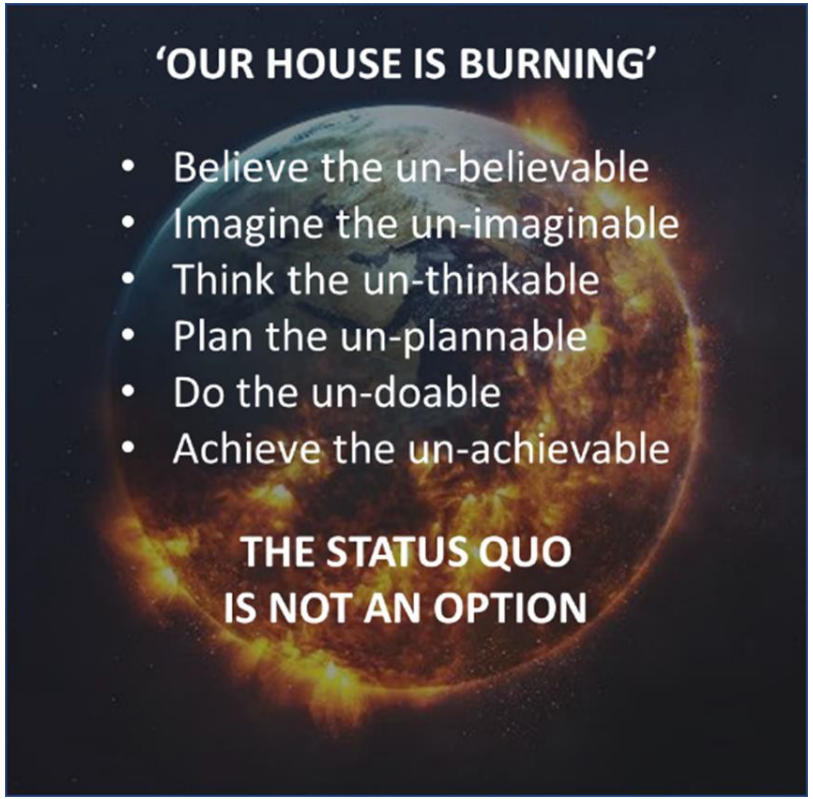
The blue economy offers wide diversity & scale of energy opportunity

Final thought



Eileen Linklater

External Relationship Manager

European Marine Energy Centre

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Vision: A globally successful marine energy industry as part of a clean energy system

Eileen Linklater

SR Marine Conference June 2021

A globally successful marine energy industry…

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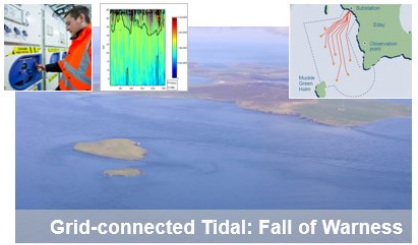
Purpose-built, open-sea performance testing facilities for ORE technologies

First in the world, est. 2003

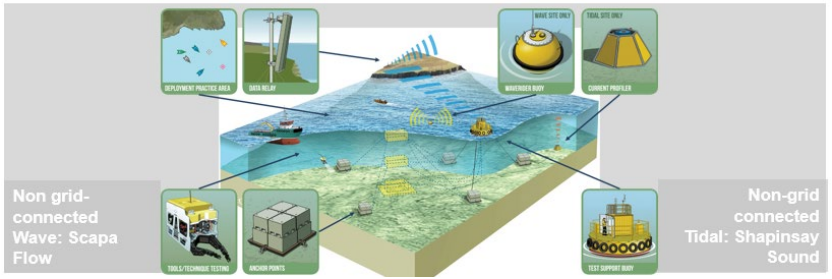
Only IEC designated marine energy test centre in the world

One of the harshest marine environments

Grid-connected Wave: Billia Croo



Grid-connected Tidal: Fall of Warness



Non grid-connected Wave: Scapa Flow

Non-grid connected Tidal: Shapinsay Sound

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32 devices • **20** developers • **11** countries

A globally successful marine energy industry …

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WAVE - on site - TIDAL

ORBITAL
MARINE POWER

Magallanes
Renovables

wave energy
SCOTLAND

mocean
energy

A globally successful marine energy industry …

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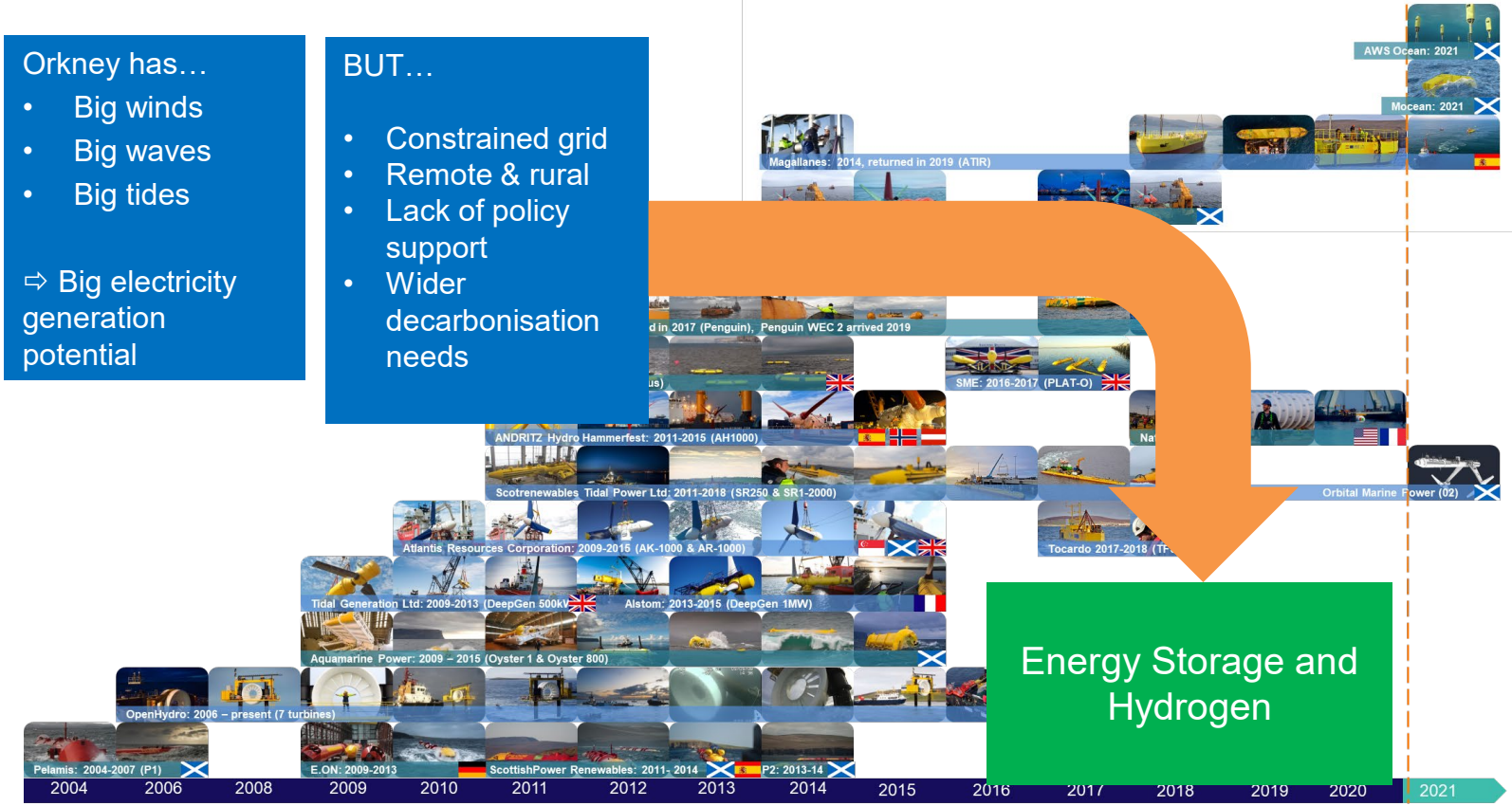
Orkney has…

- Big winds
- Big waves
- Big tides

⇨ Big electricity generation potential

BUT…

- Constrained grid
- Remote & rural
- Lack of policy support
- Wider decarbonisation needs



Energy Storage and Hydrogen

…as part of a clean energy system

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1. Producing hydrogen via electrolysis

We power our electrolysers using **tidal and wind** generation co-located at our test sites

2. Storing and handling hydrogen

We have demonstrated inter-island transport of hydrogen, and developed **state-of-the-art mobile refuelling** equipment

3. Developing hydrogen use cases to support decarbonisation activities

Our projects have tested new ways of using hydrogen, including in **transport**, in **vans, ferries and aeroplanes**, in industrial **heat**, investigating feasibility for use in **distilling**, and in providing auxiliary **power** to **ferries** while quayside

…as part of a clean energy system

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Island and coastal communities:

- Shifting the perspective from vulnerable and fragile to adaptable and strategically located
- New futures/possibilities for communities:
  - decentralisation of energy sources through renewables
  - democratisation of energy access, ownership and resilience
  - energy security and a more ‘just’ energy system
- How?
  1. leading the way to commercialisation: making new wave and tidal technology affordable and accessible
  2. focusing on community benefits, local economic impacts, local content/supply chain
  3. knowledge-sharing and collaboration demonstrating replicability

1. **Commercialisation**: R&D reduces costs & increases understanding

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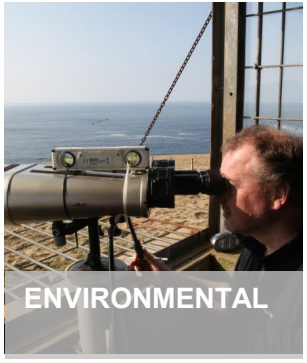
- R&D will drive down the cost of energy and enable developers to progress to achieving economies of scale
- More ‘D’ will help inform future energy systems which need to be more flexible and resilient
- We are learning by doing

Interreg North-West Europe Marine Energy Alliance
Proto Atlantic
BLUEGIFT
Interreg North-West Europe FORESEA
MaRINET2
Interreg North-West Europe Ocean DEMO

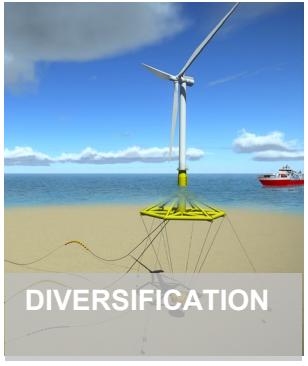
InToTidal
FloTEC
WaveBoost
ocean_2G

Interreg Atlantic Area MONITOR
RiaSoR2 RELIABILITY IN A SEA OF RISK



SEAWave

Interreg 2 Seas Mers Zeeën MET-CERTIFIED
RESOURCECODE MARINE DATA TOOLBOX



Interreg North-West Europe AFLOWT
ReFLEX ORKNEY

2. Marine Energy can create valuable local **economic impacts**

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- **£36m** public investment over 5 phases of construction since 2003
- EMEC has been financially self–sufficient since 2011

Economic Impact

£306,000,000

…is the total GVA contribution of EMEC to the UK economy between 2003 and 2019. (£230,000,000 GVA to Scotland)

Local Support

EMEC supports local companies through its spending. In 2018/19 the share of supplies from the Highlands and Islands was…

52%

Research

£30,500,000

…is the value of Research and Development funding that EMEC has secured since 2016.The vast majority of this is inward investment.

Region	GVA	FTE
Orkney	**£108.4M**	**182**
Highlands & Islands	£127.4M	215
Scotland	£230M	348
UK	£306.3M	452

3. Exporting knowledge to create global markets and empower communities

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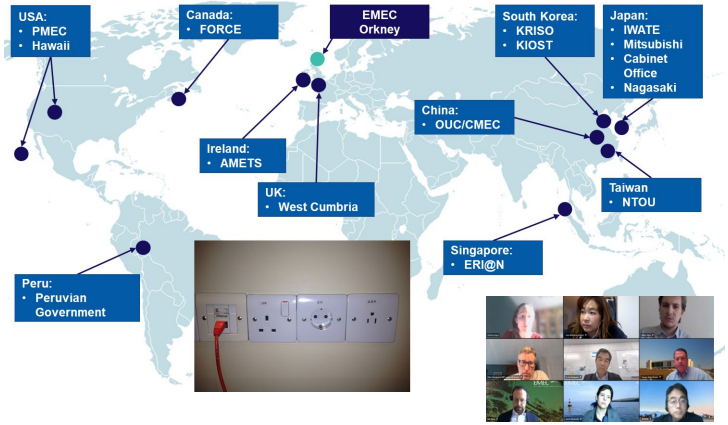
Independent verification of performance data

- Test centre consultancy
- Performance assessment
- Standards development

collaborating on reducing environmental, technical, regulatory and safety obstacles

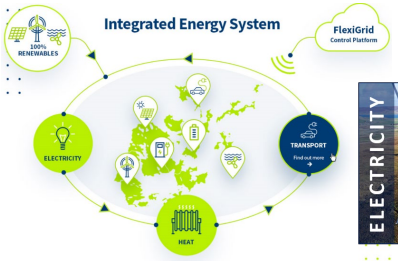
International WaTERS



Project replicability

- ISLANDER
- HEAVEN
- Isle of Wight
- France FOW
- Green Hysland

We are involved in international collaborations seeking to **replicate aspects of the 'Orkney Hydrogen Story' elsewhere**



ReFLEX ORKNEY

Scotland can lead global impacts as a ‘large ocean state’

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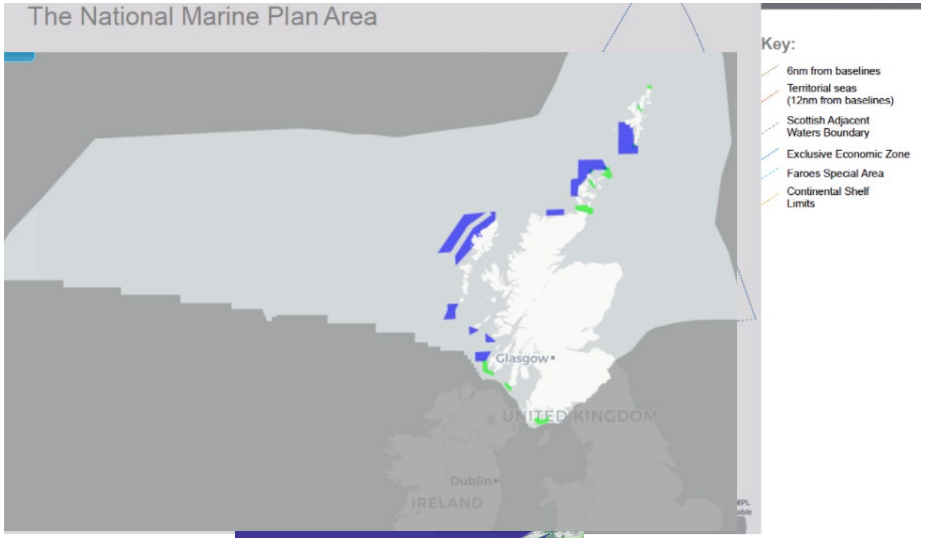
“We are the ocean people…Our islands may be small in land area, but we morph into large ocean states when our exclusive economic zones are factored in.”

Ronny Jumeau, Seychelles Ambassador for Climate Change and SIDS Issues



“the focus placed by the Plan on climate change needs to be raised to a new level … in terms of environmental impact and in terms of major changes in human use of Scotland’s marine zone.”

Scottish Government National Marine Plan Review 2021

Energy security - Export potential - Replicability - Community empowerment

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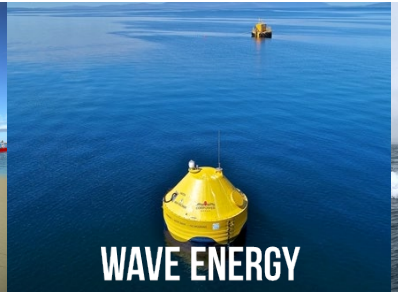

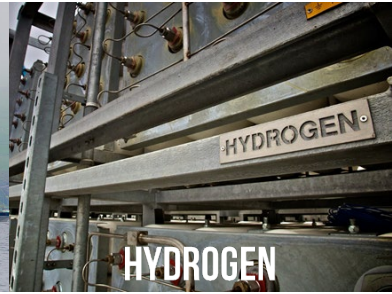

"a just transformation of the socio-energy system is also a decision to live in a different type of society, not simply a low-carbon version of the current one"
(Healy and Barry, 2017)

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Claire Mack

Chief Executive

Scottish Renewables

In conversation with:

Claire Mack
Chief Executive, Scottish Renewables

Wade Islan
Analyst – Public Policy Consulting,
The Economist Intelligence Unit

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Leaders debate: What would success for our sector look like in 2030 and how do we deliver it?

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Tim Hurst
Managing Director, Wave Energy Scotland

Andrew Scott
Chief Executive, Orbital Marine Power

Sean Parsons
Director of External Affairs, SIMEC Atlantis Energy

Gavin McPherson
Head of Policy and Research, Nova Innovation

Sian Wilson
Senior Development Manager, Crown Estate Scotland

Jason Hayman
CEO, Sustainable Marine

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UK Ministerial Address

David Duguid MP

Parliamentary Under Secretary of State

Chair: Morag Watson, Director of Policy, Scottish Renewables

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Shifting gear: Taking marine energy into the mainstream

Chair: Norma Hogan, Senior Development Manager, Highlands and Islands Enterprise

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Craig Frew

Low Carbon Innovation Team Leader

Scottish Government

Scottish Marine Energy Sector

Craig Frew
Head of Low Carbon Innovation
Scottish Government

Gordon Patterson
Marine Energy Sector Lead
Scottish Government

Cabinet Reshuffle

Michael Matheson MSP

Cabinet Secretary for Net Zero, Energy and Transport

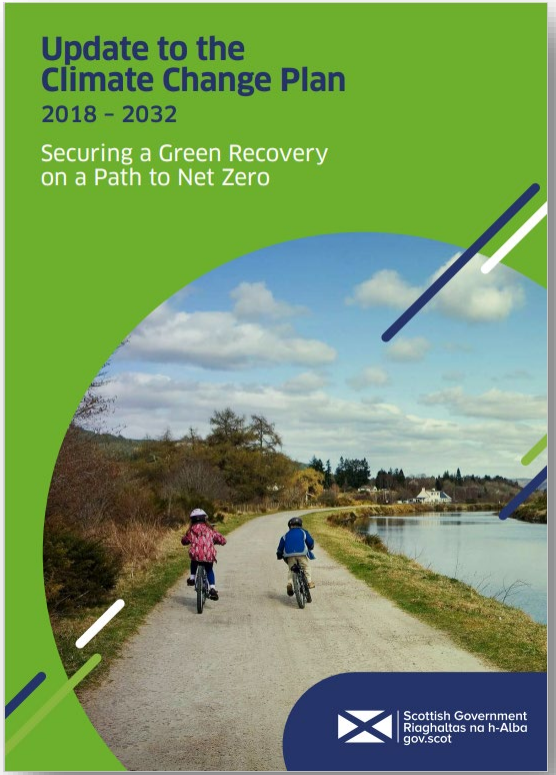
Richard Lochhead MSP

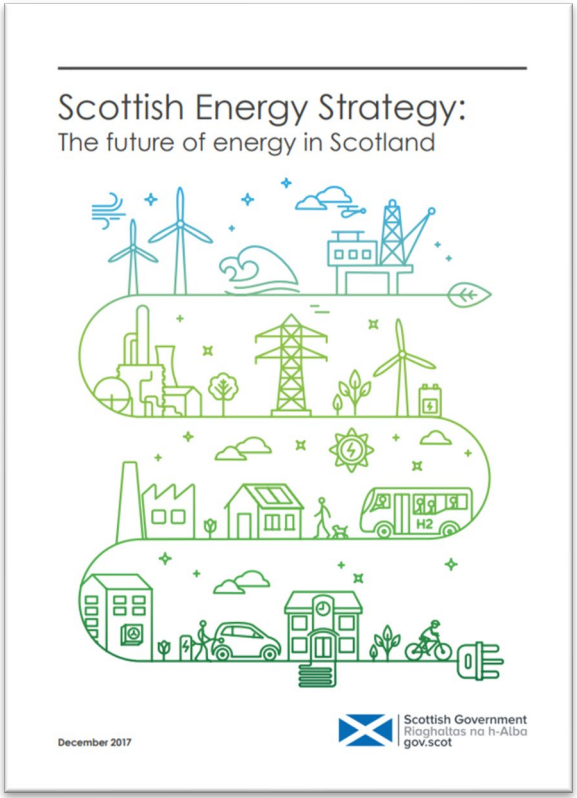
Minister for Just Transition, Employment and Fair Work

Ivan McKee MSP

Minister for Business, Trade, Tourism and Enterprise

Net-Zero


Update to the
Climate Change Plan
2018 – 2032
Securing a Green Recovery
on a Path to Net Zero
Scottish Government
Riaghaltas na h-Alba
gov.scot


Scottish Energy Strategy:
The future of energy in Scotland
H2
December 2017
Scottish Government
Riaghaltas na h-Alba
gov.scot

wave energy SCOTLAND

- Committed £41.6m since 2014 through 95 contracts
- **Mocean** and **AWS** projects now entering real sea trials
- New five-year collaborative programme with Basque Country

Scottish Government
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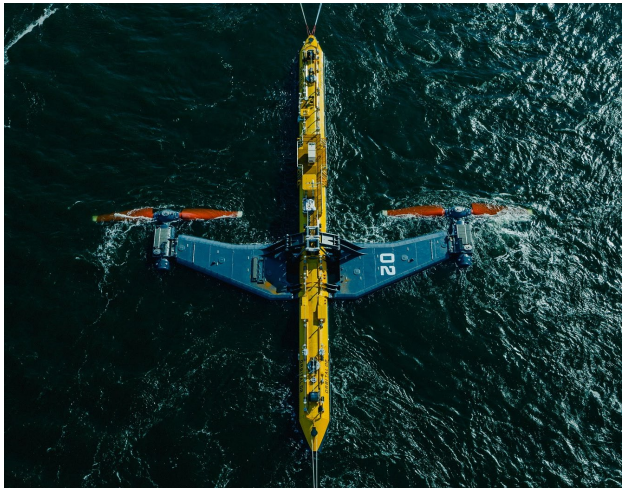
gov.scot

Saltire Tidal Energy Challenge Fund



- 2019 grant funding programme for tidal energy
- Total of nearly £5m awarded under the fund to two projects:
  - Orbital O2 2MW Project
  - MeyGen Subsea connection hub

Hitting the headlines

CNBC

From powerful tidal turbines to huge wave machines, Scotland is becoming a hub for marine energy

The Herald

Edinburgh's Mocean wave machine generates power

Slate

The Scots Are Unlocking the Ocean's Energy Potential

In April, Scottish-based Orbital Marine Power launched the O2, the world's

BBC

Shetland electric cars can now be fuelled purely by the power of the sea

International Water Power & Dam Construction

Royal visit puts spotlight on tidal energy - International Water ...

The Duke and Duchess of Cambridge were in Orkney, Scotland, this ... tour included an excursion to Orbital Marine Power's O2 tidal turbine.

4 weeks ago

Internationalisation

Team Scotland

- **Revenue support and funding streams - Claire Mack**
- **Project Pipeline - Sian Wilson**
- **Grid and Energy System – Henry Jeffrey**

Thank You

Craig.Frew@Gov.Scot

Gordon.Patterson@Gov.Scot

Heather McLarty
Project Manager
ORE Catapult

Sam Porteous
Engineer
ORE Catapult

The Role of Collaborative Projects in Taking Marine Energy to the Mainstream

EnFAIT Project – Overview and Update

Heather McLarty & Sam Porteous

23rd June 2021

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 745862.

Marine Energy Challenges

- Many technical challenges e.g. transmission of power from remote generation areas, convergence of technologies, extreme load cases
- Cost reduction and lowering of LCOE is the key challenge and ultimate goal
- Key to overcoming challenges – continued research, building of deployment and operational experience, continued provision of funding
- Brief overview of EnFAIT project
  - Progress to date and effect on accelerating cost reduction of tidal energy

Project Overview

- Enabling Future Arrays in Tidal (EnFAIT)
- Horizon 2020 flagship €20.2m tidal energy project
- 5 year research project
- Led by Nova Innovation – turbine developer and operator
- World-first grid-connected tidal array
- Efficiency & cost reduction
- Build investor confidence
- Demonstrate commercial operation

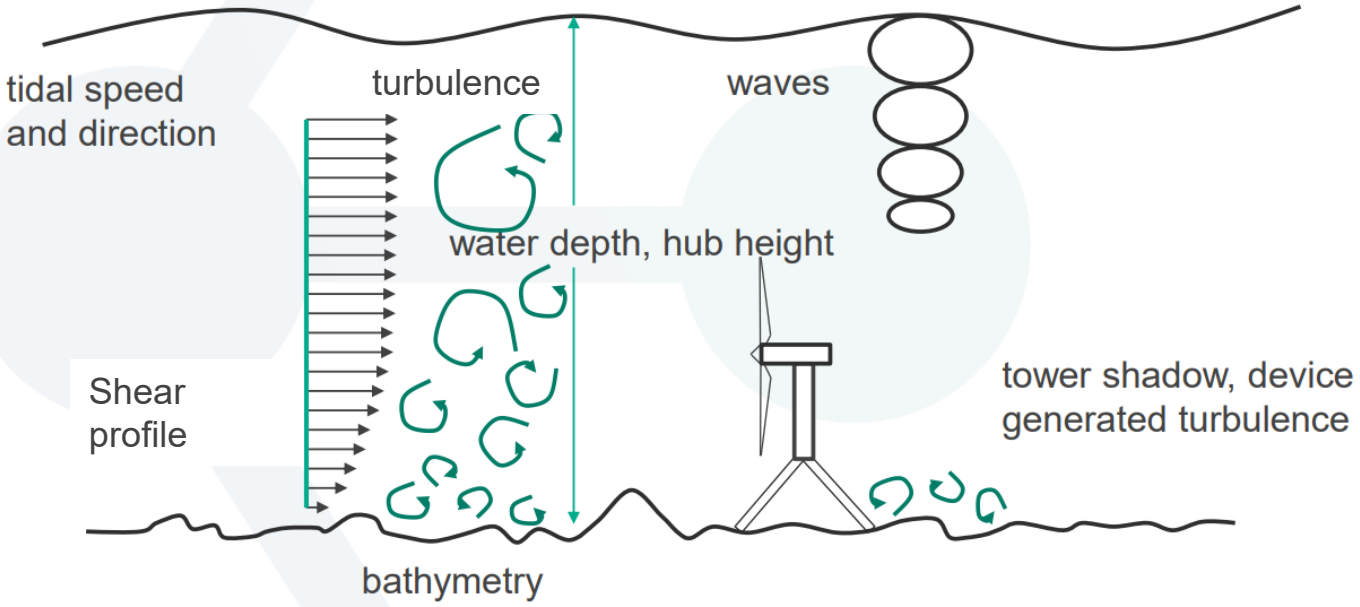
Project Aims and Achievements

- Step change in lifetime cost of energy and learning by doing with more than **40% reduction in operational costs**.
- Exceeded annual service targets, uninterrupted operation for 21 months and consistently with over **85% availability**.
- Condition Monitoring Data Analysis strategy optimising O&M scheduling for **industry leading reliability & availability**.
- Over **14,000 hours** and **469 MWh** between June 2019–2020
- Endorsement from Marine Scotland of no negative impacts on the natural environment.
- Supporting local community and supply chain.

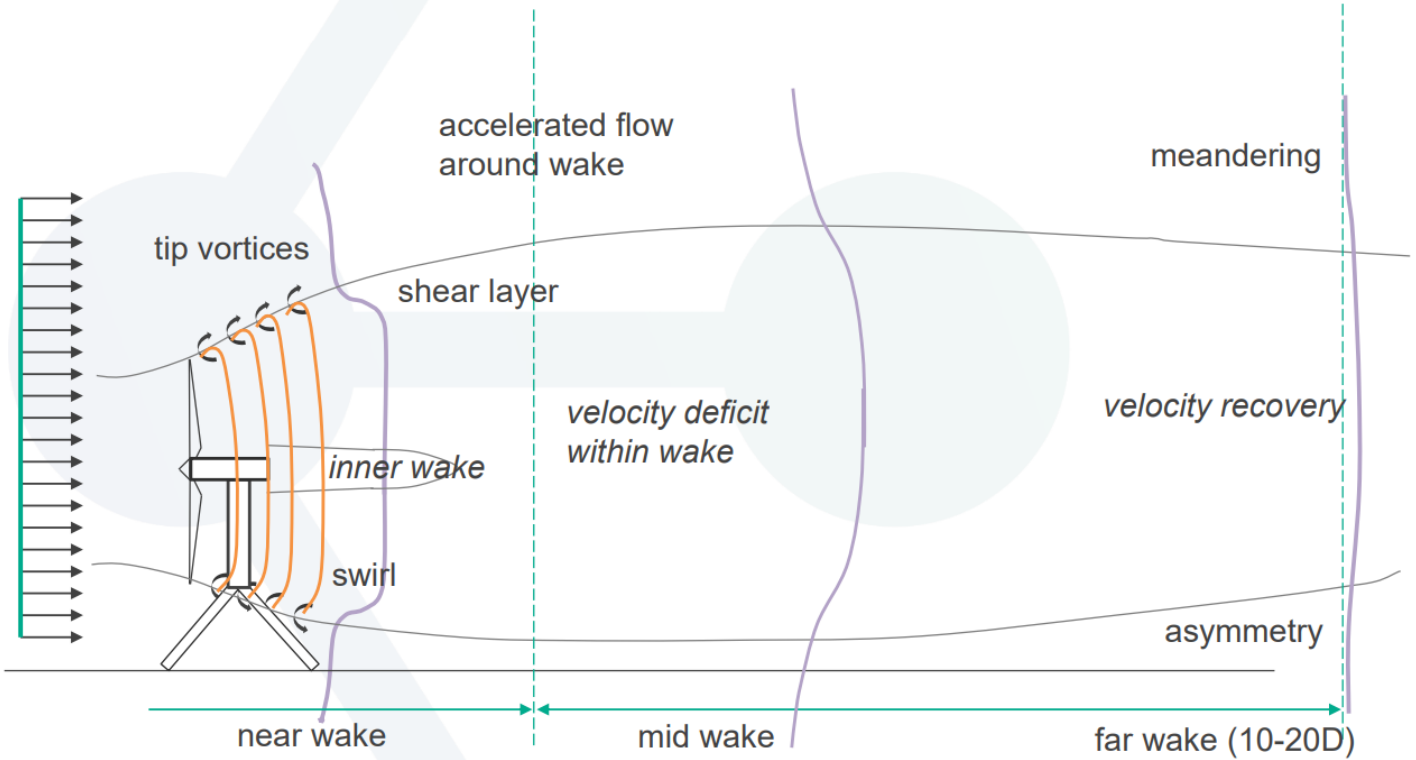
Array Interaction

- EnFAIT investigating effects of interactions between turbines in array on overall array performance
- Flow measurement campaigns
- Turbine instrumentation
- Progress to date:
  - Array Interaction Model developed
  - Site measurements taken
  - Turbines instrumented
  - Enhanced understanding of site flow characteristics & turbine loading

Tidal Flow Characteristics

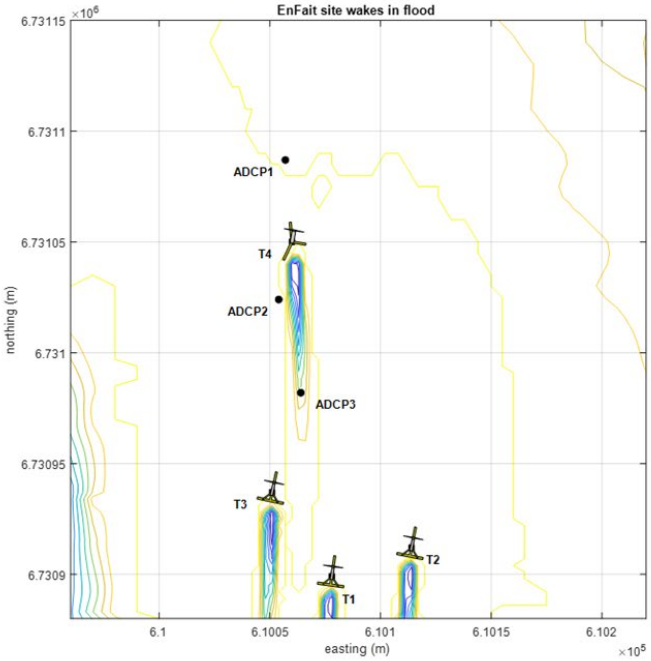


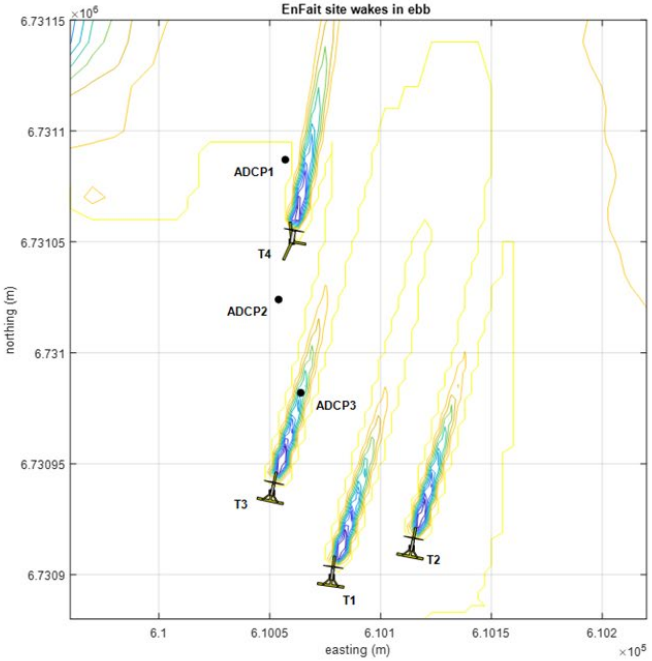
Wake Characteristics



EnFAIT

Modelling and Analysis
Site Flow & Wake Effects





What Next?

- Install 2 more turbines: T5 and T6
- Continue ADCP and ADV deployments
- Analysis of data to further develop wake interaction modelling
- Build and run more models and simulations
- Disseminate array interaction findings to industry

CONTACT US

www.enfait.eu

Email: info@enfait.eu
Tel: +44 (0)131 241 2000

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 745862.

IDETA NOVA INNOVATION CATAPULT Offshore Renewable Energy THE UNIVERSITY OF EDINBURGH

RSK wood. SKF

Henry Jeffrey
Head of Policy and Innovation Group
University of Edinburgh

Potential technological and economic futures for ORE in the UK

Scottish Renewables marine conference 2021

Henry Jeffrey
Charlotte Cochrane and Shona Pennock
University of Edinburgh

Supergen Offshore Renewable Energy

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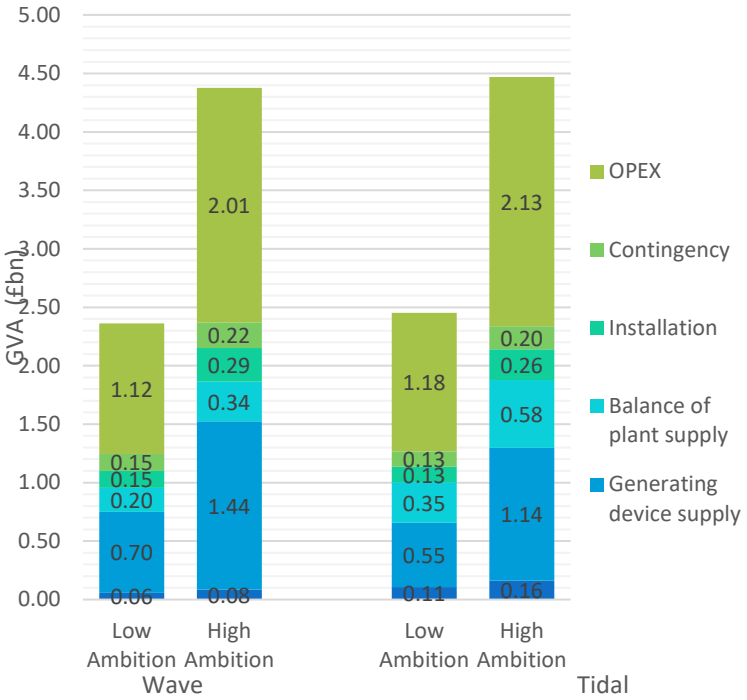
Introduction

- Deployment modelling and scenarios achievable at target costs and with varying competition from other generating technologies
- The economic benefit to the UK economy and supply chain associated with the achievement of each of these scenarios at a UK and global scale
- Supply chain intervention necessary?



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The SET Plan

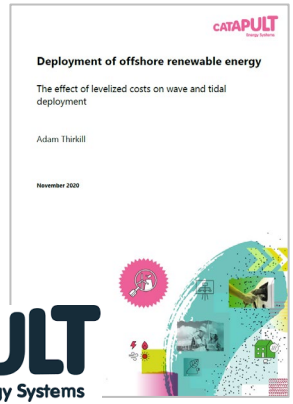
- The Strategic Energy Technology Plan (SET Plan) was laid out in 2015 to lead the clean energy transition in Europe.
- As part of this, the **SET Plan - Ocean Energy** set **quantitative targets** to be achieved (right)

Technology	2030 target LCOE
Tidal stream	€100/MWh
Wave	€150/MWh

Deployment Modelling

UK

- ESME model run by the Energy Systems Catapult (ESC)
- Future Ambition (96%) Scenario
- 96% of Net Zero carbon emissions reductions achieved
- Variation in cost
  - Achievement of SET Plan target
  - Surpassing by 20% and 30%
- Variation in nuclear competition
  - Low (4 GW 2050, Hinkley Point C only) and
  - Mid (10 GW by 2050, Hinkley Point C, Sizewell C and Bradwell C) nuclear competition in energy mix



CATAPULT Energy Systems

Global

- TIMES model run by the IEA Energy Technology Perspectives (ETP) 2020 team
- Sustainable Development Scenario
  - Most ambitious of the ETP's three historical scenarios
  - Paris Agreement met

iea

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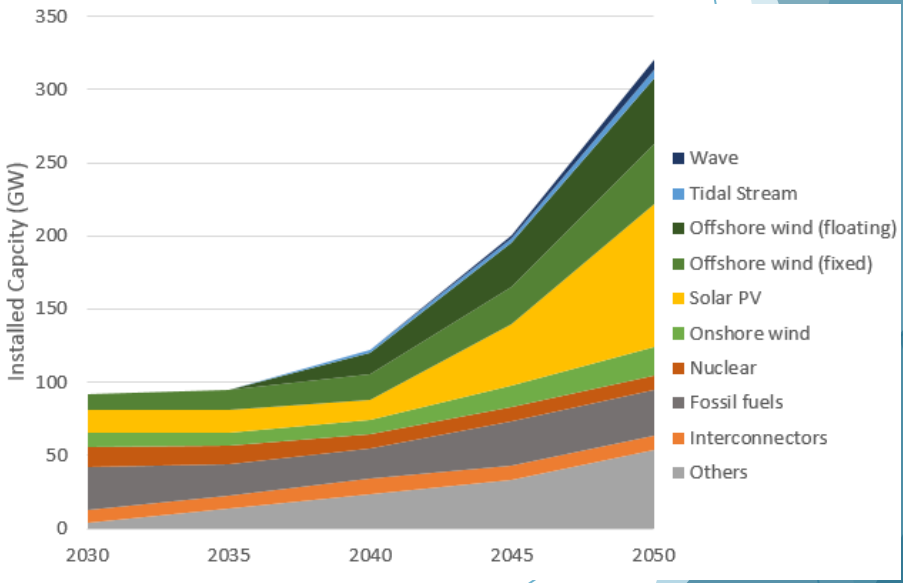
UK electricity mix when SET Plan targets are reached

Over 200GW of renewables by 2050, including:

- 6GW of wave energy
- 6GW of tidal stream



CATAPULT Energy Systems

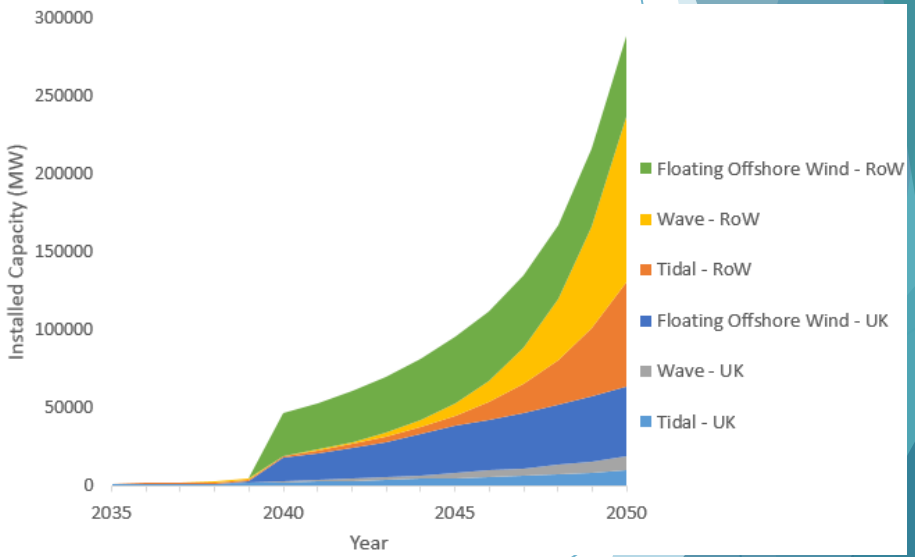
Supergen Offshore Renewable Energy

Energy Systems Catapult, 2020

Global deployments of innovative ORE

288GW of innovative ORE renewables globally by 2050, including:

- 115GW of wave energy
- 77GW of tidal stream



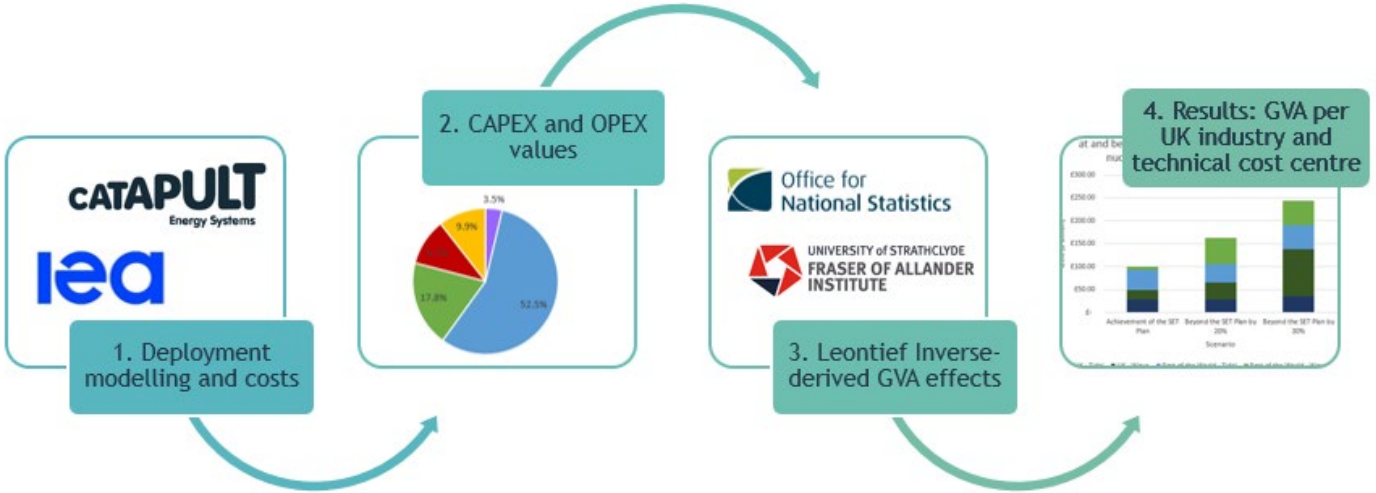
CATAPULT Energy Systems

IEA

Supergen Offshore Renewable Energy

Energy Systems Catapult, 2020

Methodology



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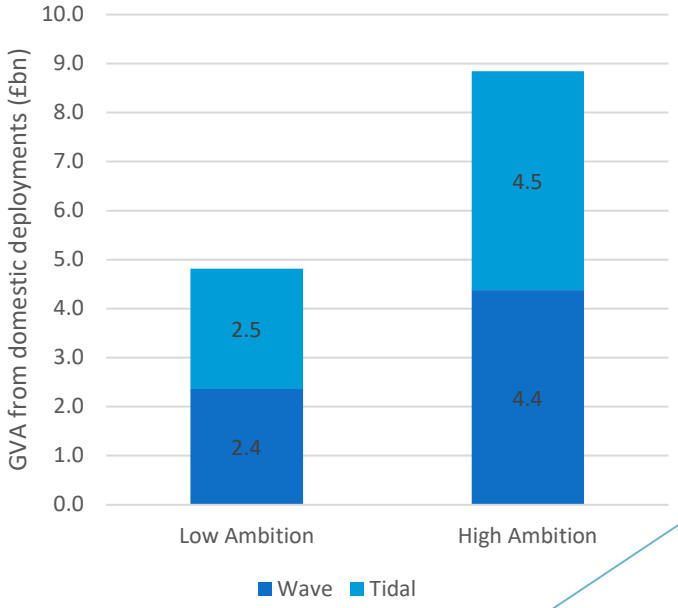
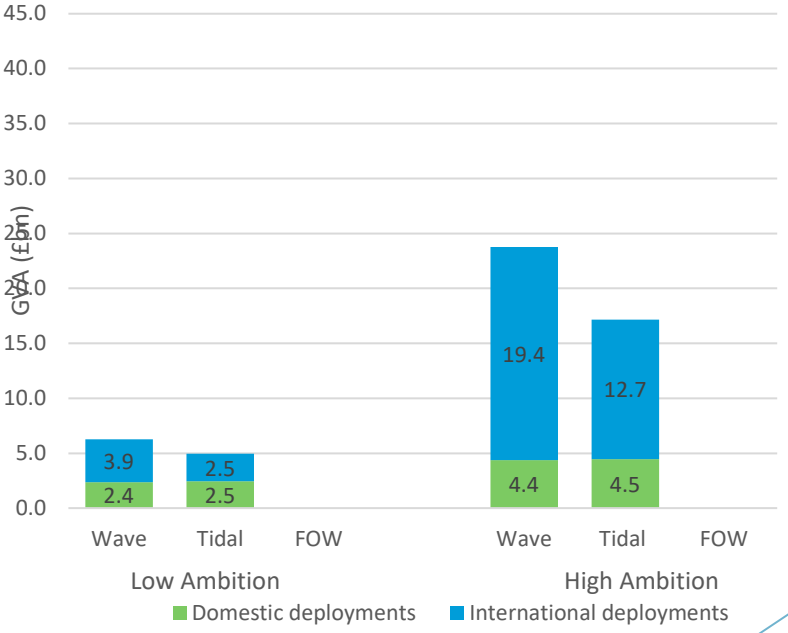
GVA generated for the UK economy for domestic deployments (£ billion)

- The Low Ambition scenario generates nearly **£5 bn in GVA for the UK economy**
- The High Ambition scenario generates nearly **£9 bn in GVA for the UK economy**.



GVA generated for the UK economy for domestic & international deployments (£ billion)

- The Low Ambition scenario generates a over **£11bn in GVA for the UK economy**
- The High Ambition scenario generates a over of **£40 bn in GVA for the UK economy**.



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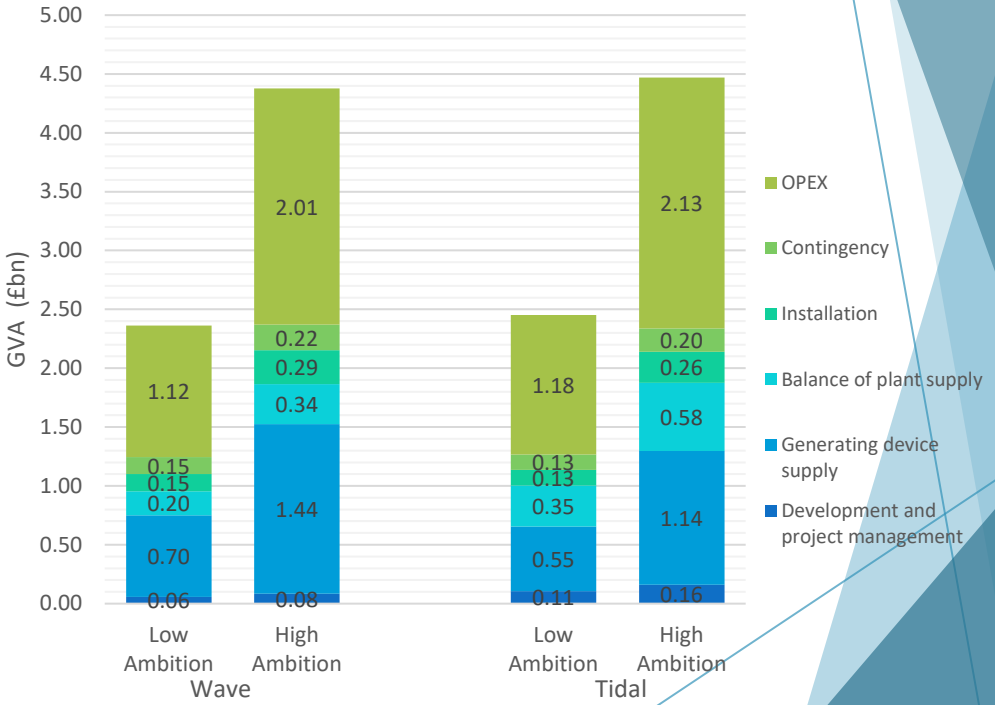
GVA in the supply chain areas – are they equal /where is the value ?

What are the opportunities associated with a stronger UK supply chain?

- The Low Ambition scenario yields an overall economic benefit of over £11bn to the UK economy
- The High Ambition scenario would yield an overall economic benefit of over £40bn to the UK economy
- **All supply chain areas are not equal ! Device / OPEX**



Ongoing work on supply chain and GVA

- Ongoing work: assessing the impact of increasing local content - through the application of targeted investment in specific areas of the supply chain – on GVA results
- Collaboration with HIE and SE
- Results to Scottish Ministers working group Autumn 2021

Scottish Enterprise

HIE
Highlands and Islands Enterprise
Iomairt na Gàidhealtachd 's nan Eilean

Conclusions

- GVA of over £40bn could be generated for the UK economy from the wave and tidal stream elements
- Innovation and development requirements to reach these targets are required for wave, tidal stream
- The supply chain readiness of different offshore renewable components and services result in different GVA benefits
- Present supply chain results to Energy minister autumn 2021

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Thanks for your attention

Henry.Jeffrey@ed.ac.uk

Matthew Finn

Commercial Director

European Marine Energy Centre

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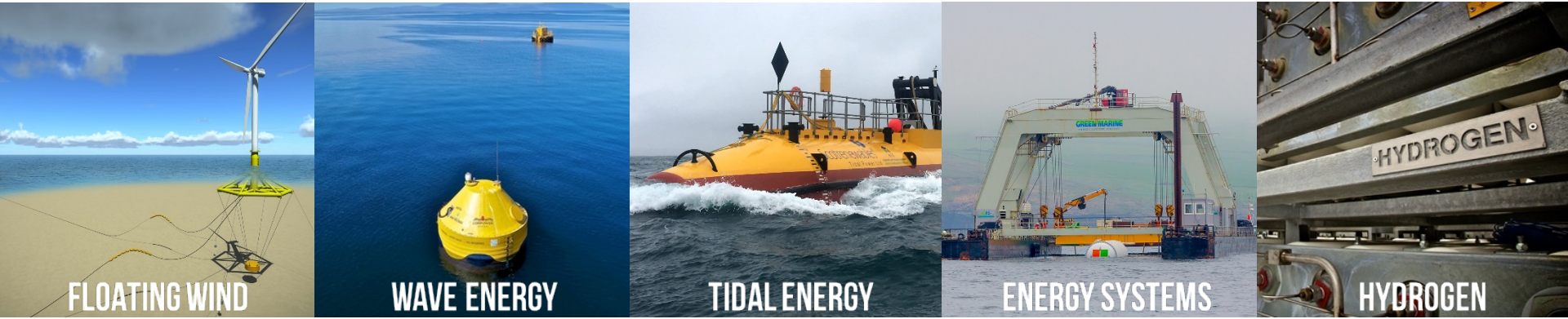


Shifting gear: Taking marine energy into the mainstream

Matthew Finn
Commercial Director

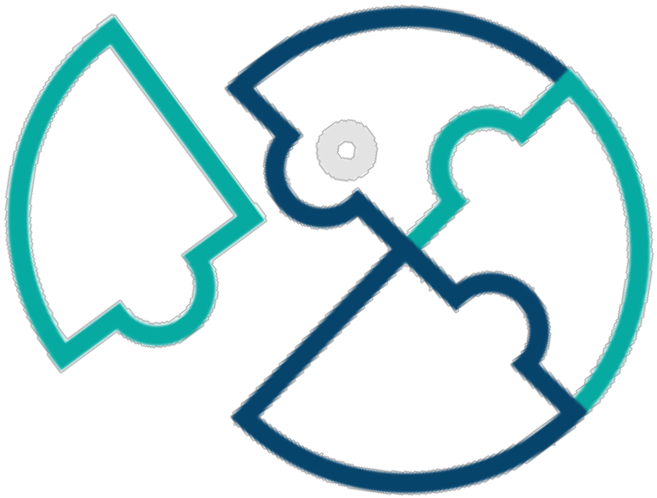
What will it take

1. Natural Resources

2. Infrastructure

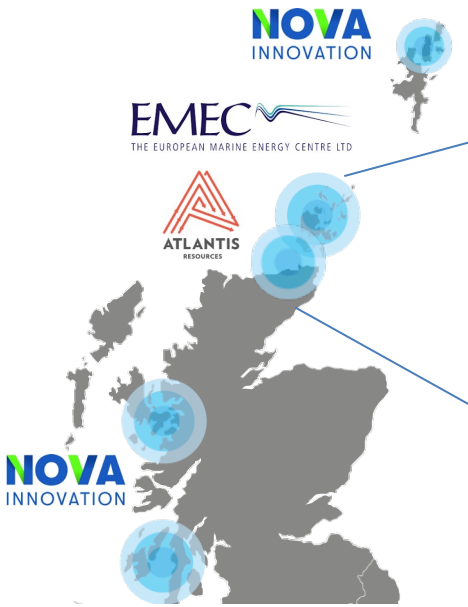
3. Supply Chain

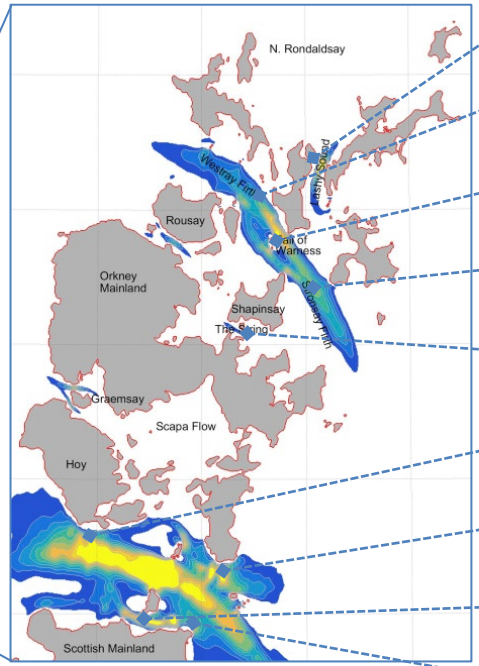
4. Routes to Market



1. Resources - Tidal

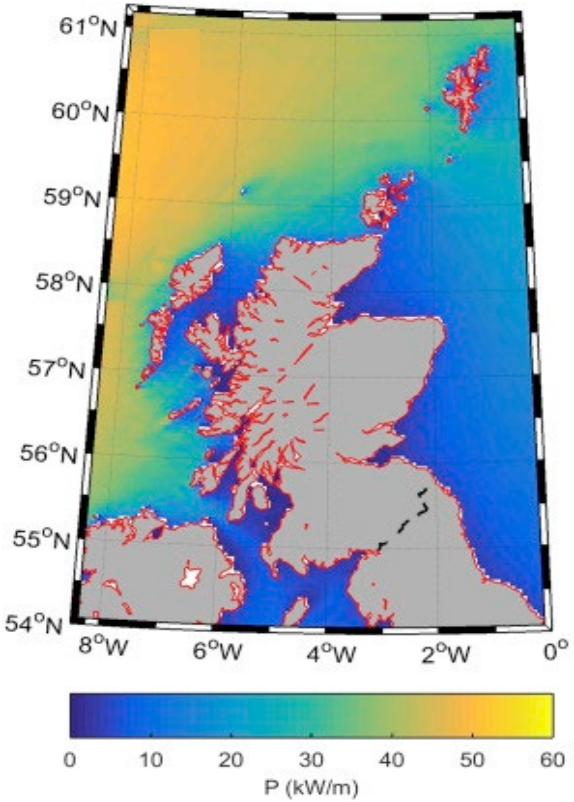
- **7.5 GW of tidal potential**
- **25% of the EU**



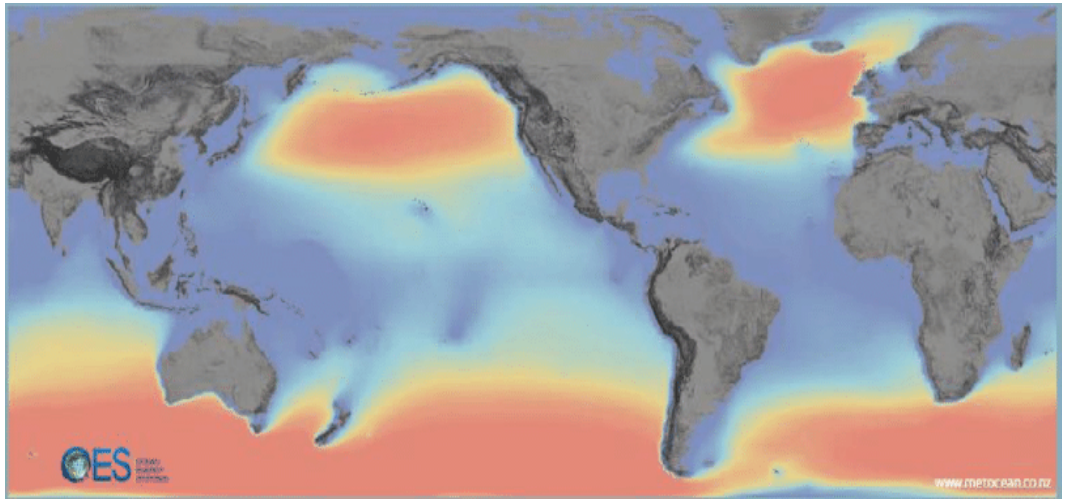


- OMP – Lashy Sound (30MW)
- Westray South (200MW)
- **EMEC – Fall of Warness (4MW+)**
- EMEC - Stronsay Firth (200MW)
- **EMEC – Shapinsay Sound**
- Brims Deep (200MW)
- Brough Ness (100MW)
- **MeyGen - Inner Sound (400MW)**
- Ness of Duncansby (100MW)

1. Resources - Wave



- **15 GW of wave potential in Scotland**
- **10% of the EU resource**
- **Global Wave Resources**



2. Infrastructure

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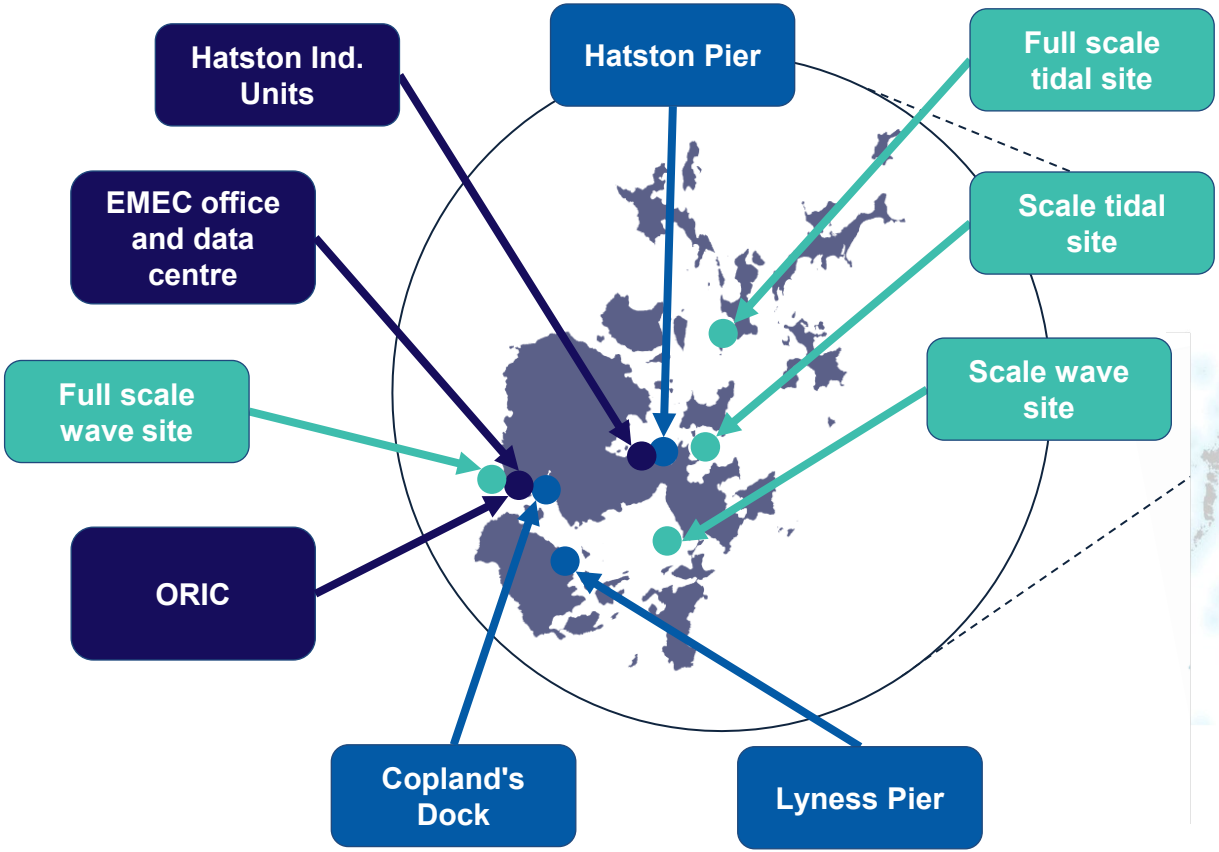

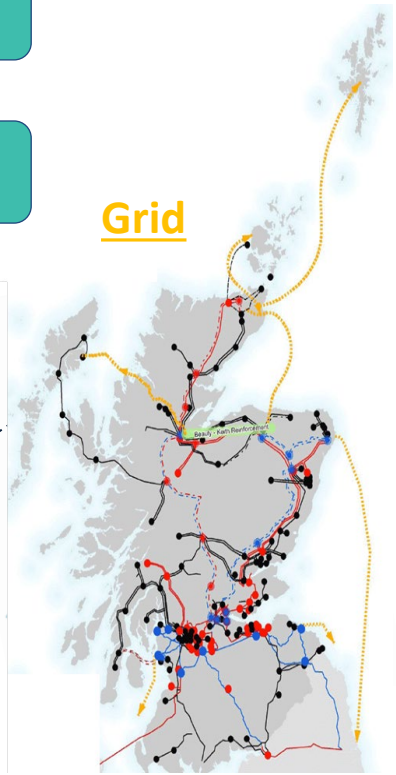

3. Supply chain

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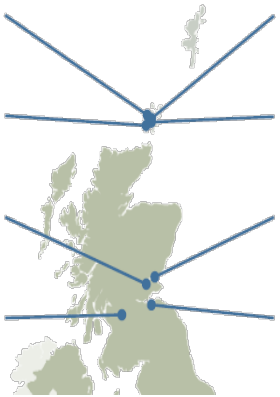
Marine contractors

Manufacturing

Skilled services

Orbital Marine Power Supply Chain:

EMEC	Location: Orkney Islands. Contractor: European Marine Energy Centre. Activity: Operation of installation site.	Location: Island of Eday. Contractor: Orbital Marine Power. Activity: Onshore grid connections.	ORBITAL MARINE POWER
ORBITAL MARINE POWER	Location: Kirkwall, Orkney. Contractor: Orbital Marine Power. Activity: Electrical systems assembly.	Location: Fall of Warness. Contractor: Leask Marine. Activity: Mooring and cable installation.	LEASK MARINE
GRAY FABRICATION	Location: Coupar, Fife. Contractor: Gray Fabrication. Activity: Heavy steel fabrication.	Location: Dundee. Contractor: TEXO Group. Activity: Main turbine manufacture.	TEXO GROUP
LIBERTY	Location: Motherwell. Contractor: Liberty Steel Dalzell. Activity: Main plate steel supplier.	Location: Edinburgh. Contractor: Orbital Marine Power. Activity: Engineering & project management.	ORBITAL MARINE POWER



4. Market Support

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1. Early technology development	2. Devices and early arrays	3. Economies of scale and volume	4. Competitive with other technologies
Capital / R&D grants	*Revenue support* →		
Technology developers	Project developers		
• Scottish Government • Scottish Enterprise • Highlands & Islands Enterprise • WES • Horizon Europe	• ROC's • Ocean DEMO • iPPA (TBC) • ??	• Pot 2 CFD	Open CFD rounds

4. Market Opportunities – Hydrogen

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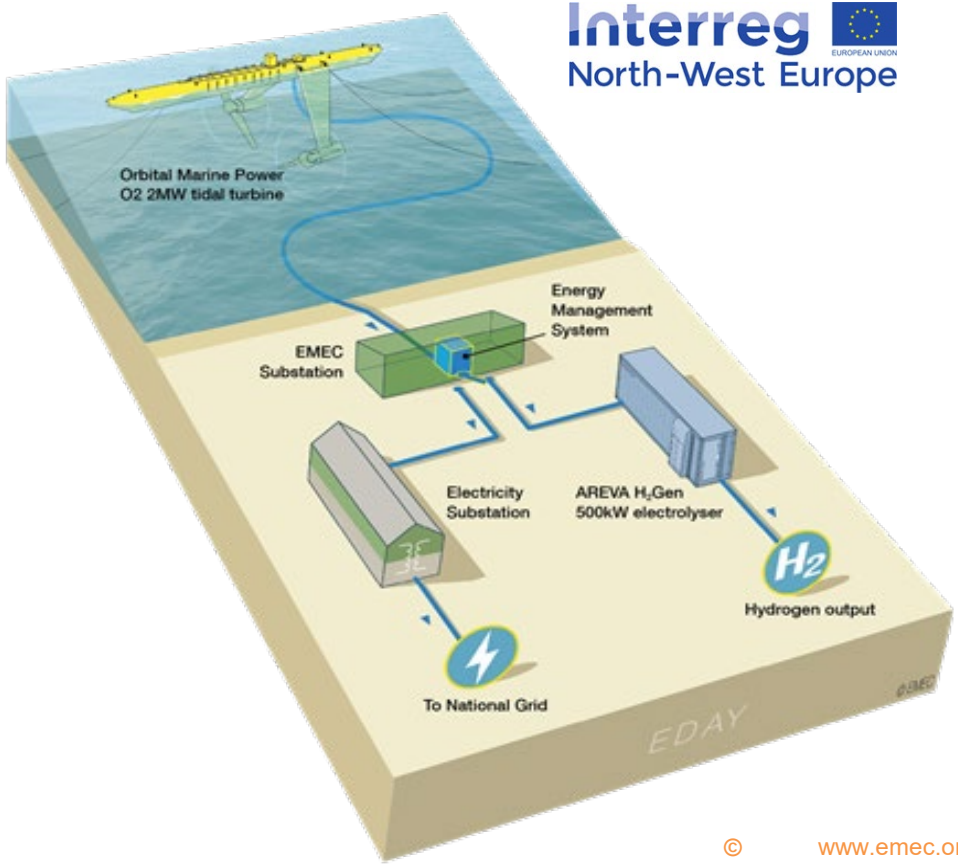
Interreg
North-West Europe



4. Market Opportunities – Data Centres

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4. Market Opportunities – Storage

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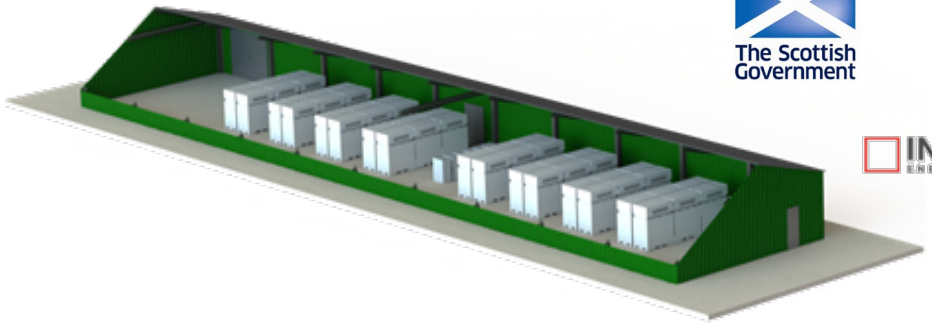
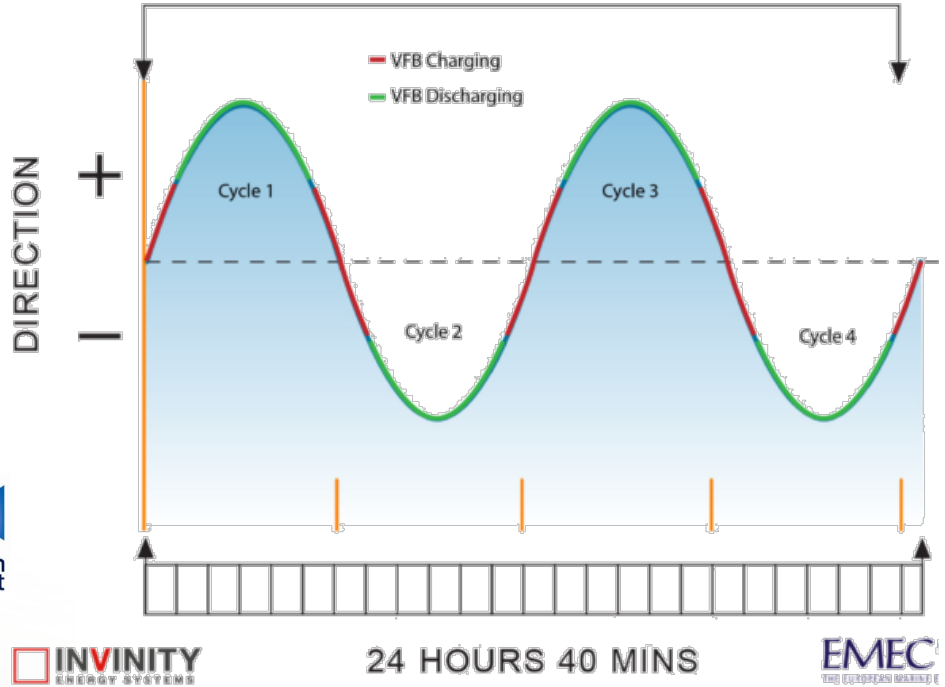


The Scottish Government



Size of the prize

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TIDAL STREAM

2,388 MW installed by 2030

93% of capacity in EUROPE

Cost reduced to circa **€90/MWh**

WHAT THIS LOOKS LIKE

- Tidal farms at utility scale in France, Netherlands, UK and specific sites in Mediterranean
- Exploitation of first lower-flow sites with improved technology and kite technology
- First exports to markets such as Canada, Indonesia, Japan

Ocean Energy Europe

WAVE ENERGY

494 MW installed by 2030

87.5% of capacity in EUROPE

Cost reduced to circa **€110/MWh**

WHAT THIS LOOKS LIKE

- Large wave farms at utility scale along Atlantic coastline
- Smaller farms at utility scale in Mediterranean and North Sea
- Some floating wind co-location
- Exploitation of European and global niche markets - islands and offshore platforms (oil & gas, aquaculture)
- First exports to markets such as United States, Chile, India

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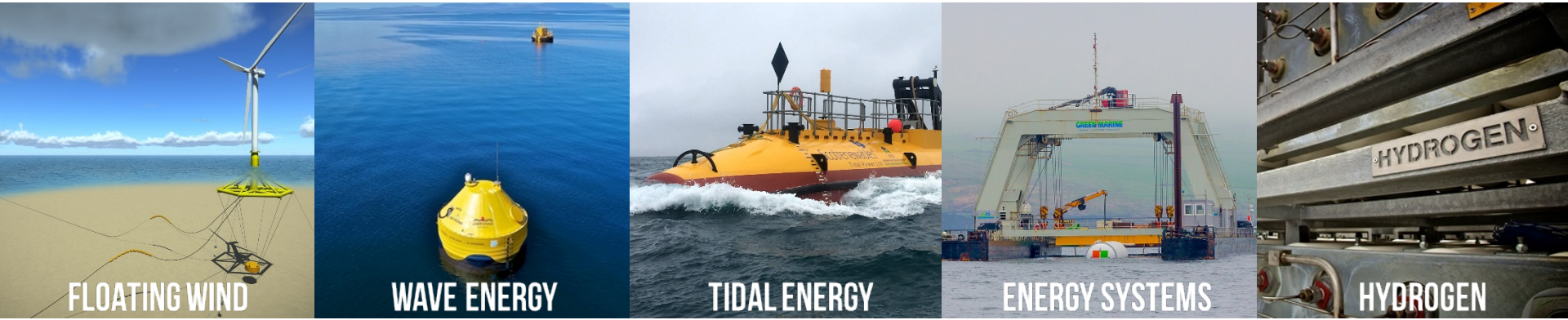

Support services to help develop the ocean energy sector

Matthew.Finn@emec.org.uk

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Submit your questions in the Q & A box

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