WES Annual Conference 2018

WES Programme Updates and other funding opportunities

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WAVE ENERGY SCOTLAND ANNUAL CONFERENCE 6TH DECEMBER 2018

TINTO AND MOORFOOT SUITES, EDINBURGH INTERNATIONAL CONFERENCE CENTRE, THE EXCHANGE, 150 MORRISON ST, EDINBURGH, EH3 8EE

Agenda

9:00	**Coffee and Registration**
9.30	**Keynote Address – Paul Wheelhouse, Minister for Energy, Connectivity and the Islands**
9.45	**Panel Session –** **Minister, Tim Hurst, WES, Elaine Hanton, Highlands and Islands Enterprise**
10.00	**WES' Programme News and Future Plans – Peter Dennis & Jonathan Hodges, WES** Update on WES' programme and DTOceanPlus
10.35	**HiDrive PTO – Lessons Learned – Patrik Möller, CorPower Ocean**
11.00	**The Economic Value of Wave Energy –** **Tim Hurst, WES & Henry Jeffrey, University of Edinburgh**
11.15	**Coffee & Networking** Posters
11:45	**Structural Materials and Manufacturing Processes and Control Systems** **Project Elevator Pitches** 5 min short, sharp presentation from all programme participants (CorPower Ocean, MaxSim, Ove Arup, Queen Mary University, Tension Technology International)
12:30	**Lunch & Networking**
13:30	**WES' Landscaping Projects – Elva Bannon,WES**
13.45	**Power Take-Off and Novel Wave Energy Converter** **Project Elevator Pitches** 5 min short, sharp presentation from all programme participants (4C Engineering, Artemis Intelligent Power, AWS Ocean Energy, Checkmate Seaenergy, Mocean, Oceaneering, Umbra Cuscinetti, University of Edinburgh)
14.30	**Upcoming Funding Opportunities** **OceanEraNet Cofund – Karen Fraser** **Marine Energy Alliance – Jamie Grimwade, FloWave** **ETP – Norman Morrison**
14:50	**A Global Perspective – Henry Jeffrey, University of Edinburgh**
15:15	**Coffee & Networking**
15:45	**Financing Wave Technology Projects – Louise Wilson, Director, Abundance Investment**
16:15	**Concluding Remarks – Tim Hurst, WES**
16.30	**Networking**

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Speakers' Biographies

Paul Wheelhouse
Minister for Energy, Connectivity and the Islands

Paul is a professional economist and, since 1992, had specialised in higher and further education markets, policy evaluation and economic appraisal and impact assessment of capital projects.

Between May 2011 and September 2012 Paul served on the Scottish Parliament's Finance Committee, and the Standards, Procedures and Public Appointments Committee. And was the Parliamentary Liaison Officer to the Cabinet Secretary for Parliamentary Business and Government Strategy of the Scottish Government. Previously, between May 2011 and Feb 2012, Paul served as Parliamentary Liaison Officer for the Cabinet Secretary for Rural Affairs and Environment and the Minister for Climate Change.

Prior to taking his Ministerial position Paul was a member of cross-party groups on Epilepsy, Rural Policy, Armed forces Veterans, Funerals and Bereavement, Boating and Marine Tourism and deputy convener of Sport. Paul Wheelhouse was appointed Minister for Business, Innovation and Energy in May 2016. He was appointed Minister for Energy, Connectivity and the Islands in June 2018.

Tim Hurst
Managing Director, Wave Energy Scotland

Wave Energy Scotland's Managing Director Tim Hurst has worked in marine energy for some time: first as a consultant for the construction of EMEC and now with Scotland's leading wave technology development programme.

The skills and experience acquired from an early career in the RAF running aircraft operations and maintenance, and later developing new technology for military aircraft are essential qualities for leading this new industry model. After just 3 years in the driving seat, his team of 12 now manages some 84 different projects and works with 177 separate engineering and academic institutions.

He says, "Scotland is an incredible hub for wave energy development and WES has arrived at just the right time. The technology, expertise and supply chain needed to make wave energy commercially viable already exist in Scotland. We have to make sure they stay here."

Elaine Hanton
Head of Energy Technologies and Regulation, Business and Sector Development, Highlands and Islands Enterprise

Elaine has worked in the renewable energy sector for 20 years with much of her career spent at Highlands and Islands Enterprise where she has been responsible for a wide range of renewable energy development activities, with a specific focus on marine energy.

Notably, she led the public sector consortium which established the European Marine Energy Centre on Orkney, and more recently was responsible for setting up Wave Energy Scotland as a subsidiary of Highlands and Islands Enterprise.

She continues to work closely with both organisations. In her current role she is also responsible for supporting the development of emerging technologies and regulatory matters affecting the development of grid infrastructure, including to the islands.

 **Peter Dennis** Project Manager, Wave Energy Scotland	Peter joined Wave Energy Scotland as a project manager in December 2015. He has an education in Civil Engineering and has gained extensive project management experience through a variety of roles in both the private and public sectors. Within WES, Peter has been responsible for WES's oversight of projects in the PTO, Materials and NWEC calls. He has also been involved in the stage gate assessment process on a number of occasions.
 **Jonathan Hodges** Senior Innovation Engineer, Wave Energy Scotland	Jonathan's engineering career began in the aerospace industry with Rolls-Royce and the development and testing of aircraft turbofan engines. Following a Masters' degree in Marine Renewable Energy he moved to the offshore renewables industry, gathering innovation, resource assessment and tecno-economic analysis experience in the wave and tidal sectors. In his role as Senior Innovation Engineer at Wave Energy Scotland (WES) he aims to identify opportunities for innovation and then develop appropriate WES funding calls to support the sector towards achievement of cost competitive wave energy technologies. Jonathan is involved in collaboration activities across Europe and the US to develop tools, common metrics for technology assessment and to seek technology transfer opportunities to advance the sector and support the WES programme.
 **Patrik Möller** CEO, CorPower Ocean	Patrik is the CEO of CorPower Ocean, a leading wave energy developer bringing a step-change improvement on the efficiency of harvesting wave energy. He is a passionate entrepreneur with experience of building technology start-ups from first idea to multi-national operations. Patrik is a board member of Ocean Energy Europe and ETIP Ocean steering committee. He has a MSc in chemical engineering from Lund Institute of Technology and UC Berkeley, California.
 **Henry Jeffrey** Head of Strategy and Internationalisation, University of Edinburgh	Henry is a specialist in marine energy roadmaps, action plans and strategies. He is responsible for dissemination and internationalisation within the UK Supergen Marine programme. He holds the position of "Strategy and internationalisation officer" for "Wave Energy Scotland" and chairs the European Energy Research Alliance (EERA) and the IEA OES group for Ocean Energy. His international collaboration on the production of marine roadmaps and research strategies, includes Canada, the US, Chile and Mexico. Henry has also coordinated several European marine energy projects including DTOcean which developed design tools for arrays of wave and tidal devices.

 **Elva Bannon** Senior Research Engineer, Wave Energy Scotland	With a background in Mechatronic Engineering (BEng) and Advanced Engineering (MEng), Elva has worked in wave energy technology development since 2007, working on several different technology concepts in Scotland and Ireland. Here she honed her skills in tank testing, data analysis and numerical model validation for scale model tests. One of her key responsibilities in WES is academic, professional and international engagement to ensure the WES technology programme is targeting the right topic areas and meeting the needs of the sector. She represents WES on the BSI PEL/114 Committee providing UK input to IEC/TC114 standards development.
 **Karen Fraser** OceanEraNet Coordinator, Scottish Enterprise	Karen graduated University of Glasgow with Honours in Geography and Economics and a Masters in Town and Regional Planning. Worked in local government planning and economic development, with Scotland Europa, providing EU policy and funding services to Scottish stakeholders and, while on secondment to the Scottish Government, established the Scottish European Green Energy Centre. Currently in the Energy and Low Carbon Technologies team at Scottish Enterprise and coordinator of the OCEANERA-NET FUND project.
 **Jamie Grimwade** Technical Sales and Business Development Executive, FloWave Ocean Energy Research Facility	Jamie is Business Development Executive (Energy) for the School of Engineering at the University of Edinburgh. A qualified Naval Architect, Jamie has 15 years experience of working within the wave and tidal energy sector. Jamie is leading the University's involvement the mobilisation phase of the Marine Energy Alliance project, a €3.6m INTEREGG NWE project that will support 40 low TRL wave and tidal technology development companies.
 **Norman Morrison** Marine Energy Research and Business Development Manager, University of Edinburgh	Norman is ETP's Business Development Manager for Marine Energy. Norman has a number of years' experience as an offshore renewable energy consultant. Much of this work involved helping companies of different sizes to diversify from parallel sectors into the offshore wind, wave and tidal sectors. Norman also works for Wave Energy Scotland helping identify research and partnership opportunities. He has worked closely with enablers, developers and throughout the supply chain on a wide range of topics including funding, market analysis and technology evaluation.

Louise Wilson
Director, Abundance Investment

Louise Wilson is a co-founder and joint MD of Abundance which provides debt capital to infrastructure projects for different stages of their development, and regular capital and income to investors. With a strong focus on both the financial and societal contribution of the investments on its platform, Abundance lets individuals, both local and national, invest directly in specific projects of their choice from as little as £5. Abundance has launched fund-raisings for over 35 projects for a total of £80m and was the first crowdfunding platform to offer both an ISA and a pension (SIPP) product. Abundance has raised £10m for SIMEC Atlantis and is currently raising up to £7m of investment for Orbital Marine.

Before Abundance, Louise was Head of Equity Capital Markets at UBS Investment Bank. Louise is on the Advisory Board of Imperial College's Centre for Climate Finance & Investment.

WES Programme

Peter Dennis
WES Project Manager

6 December 2018

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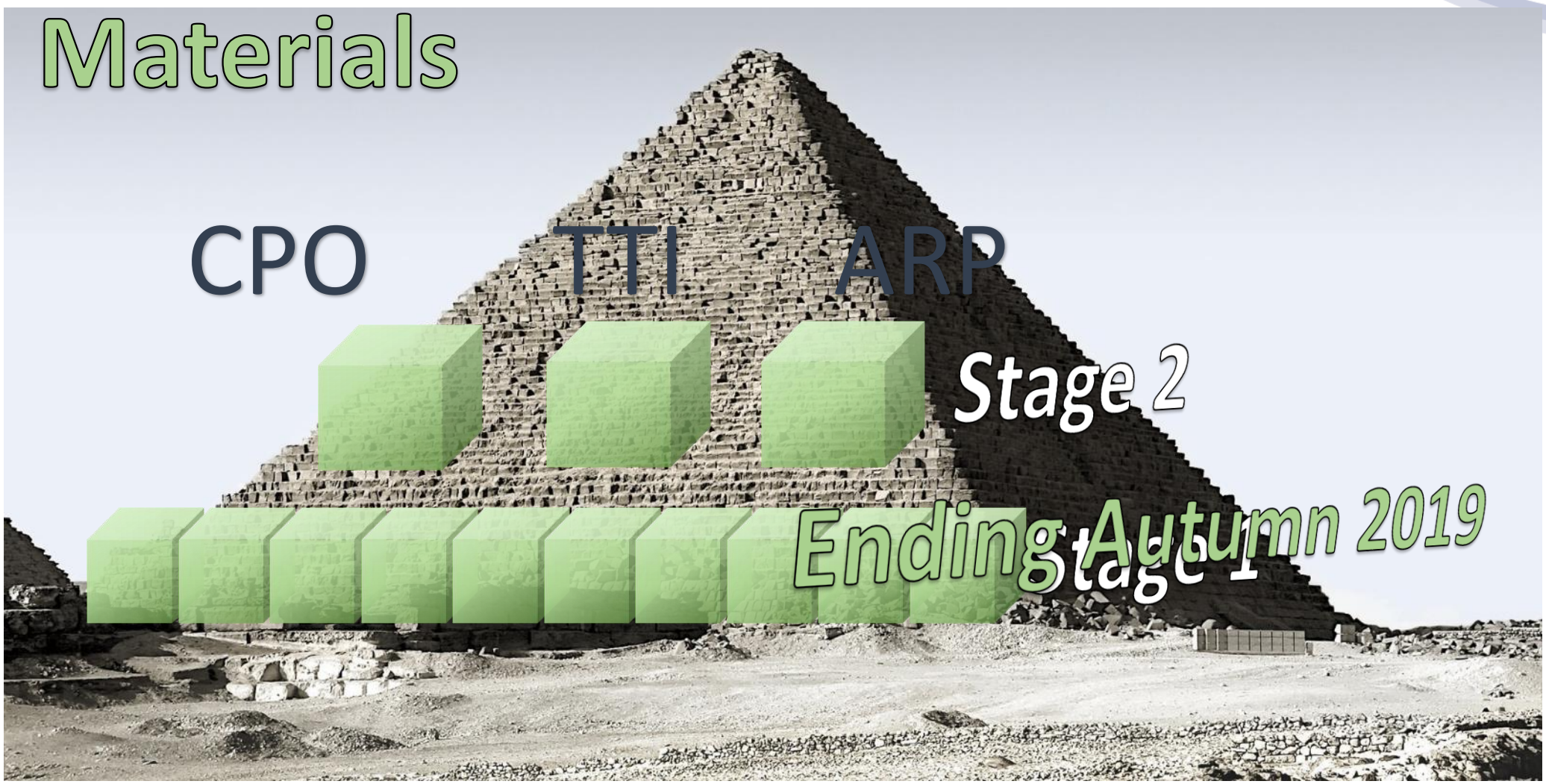
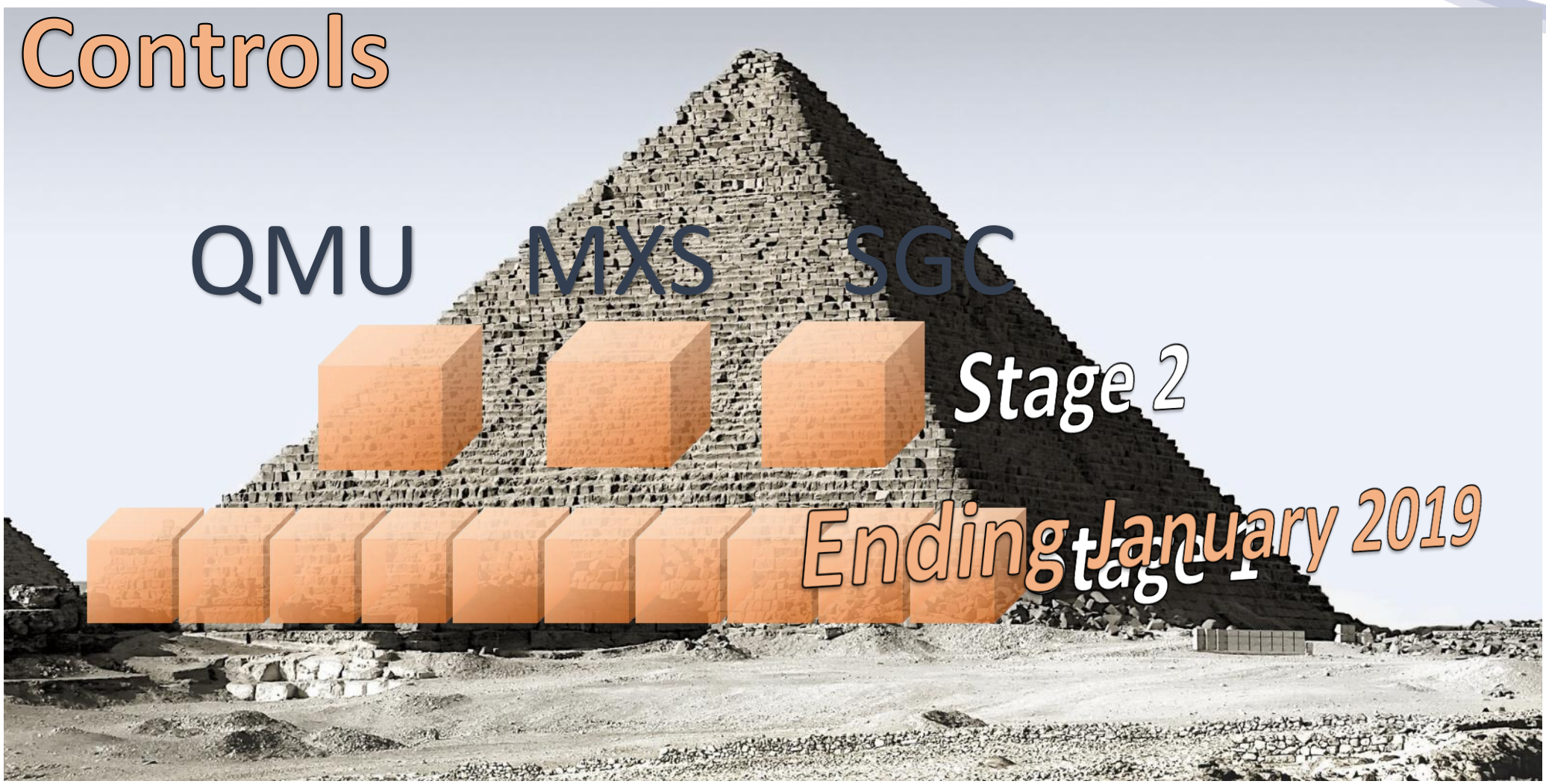
WES Programme

WES Programme

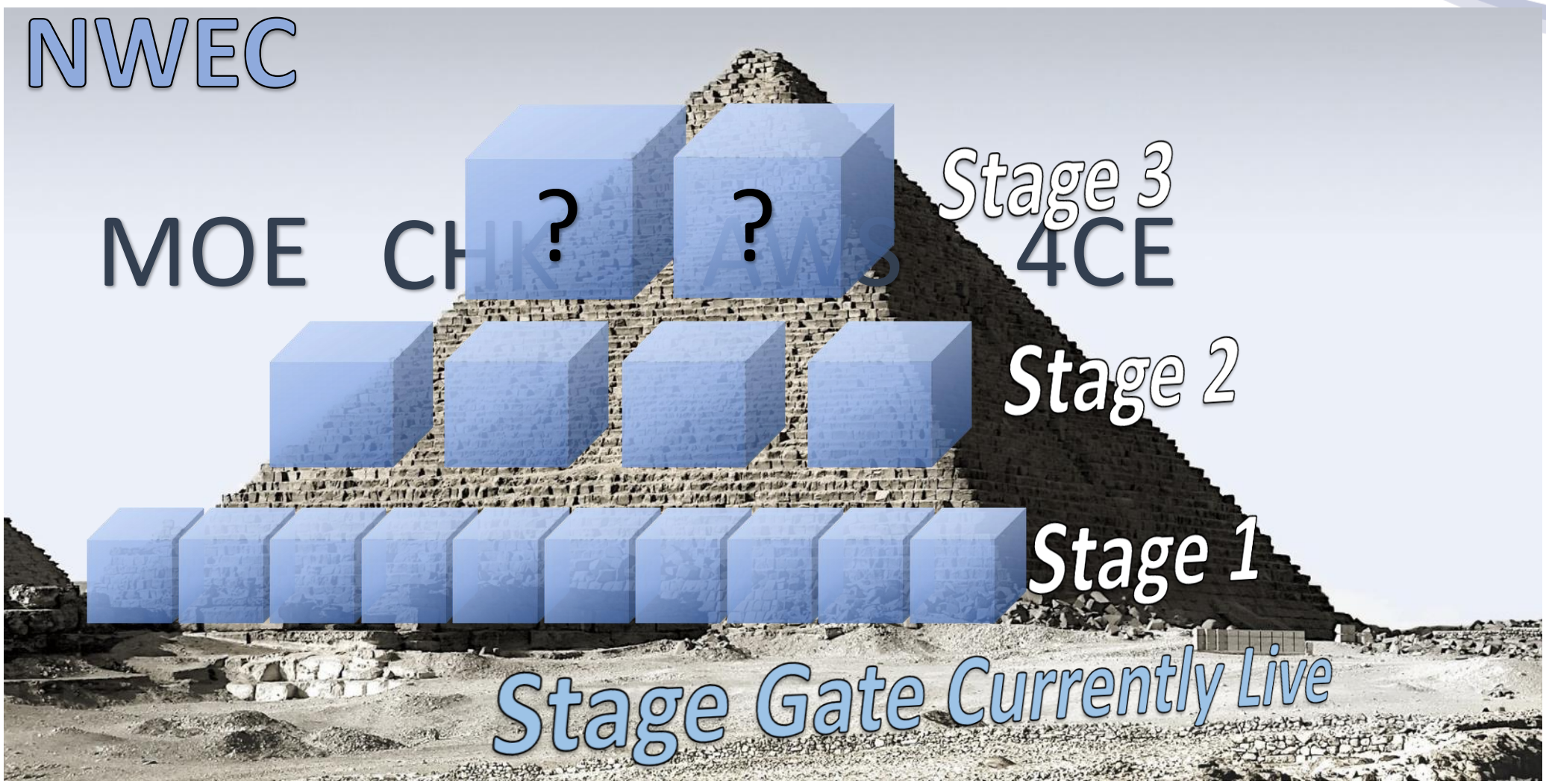
WES Programme



WES Programme



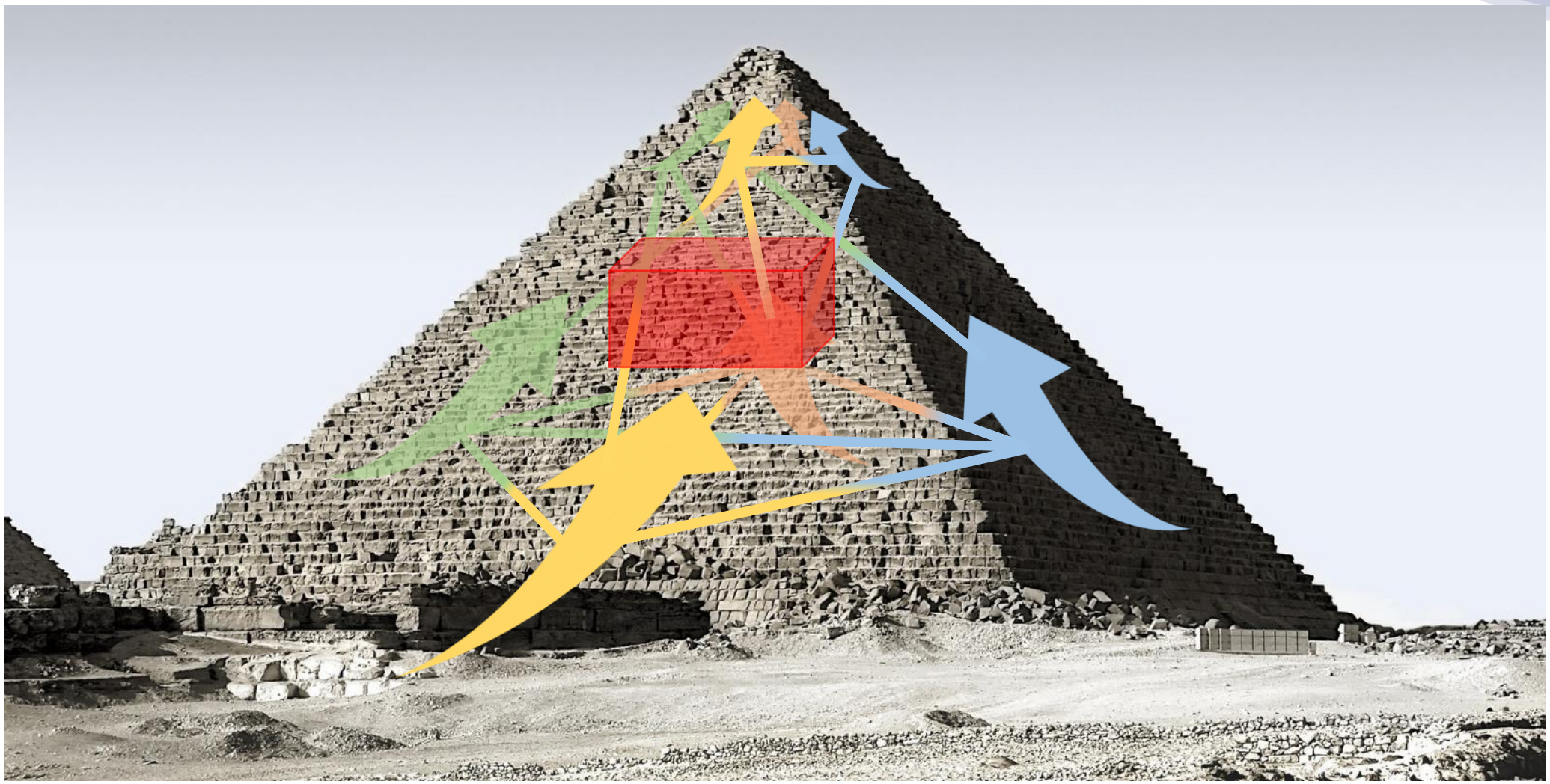
WES Programme



WES Programme

WES Programme

WES Programme



WES Programme

DTOcean+

Advanced Design Tools for Ocean Energy Systems Innovation, Development and Deployment

DTOceanPlus, an ambitious EU project to accelerate the commercialization in the ocean energy sector

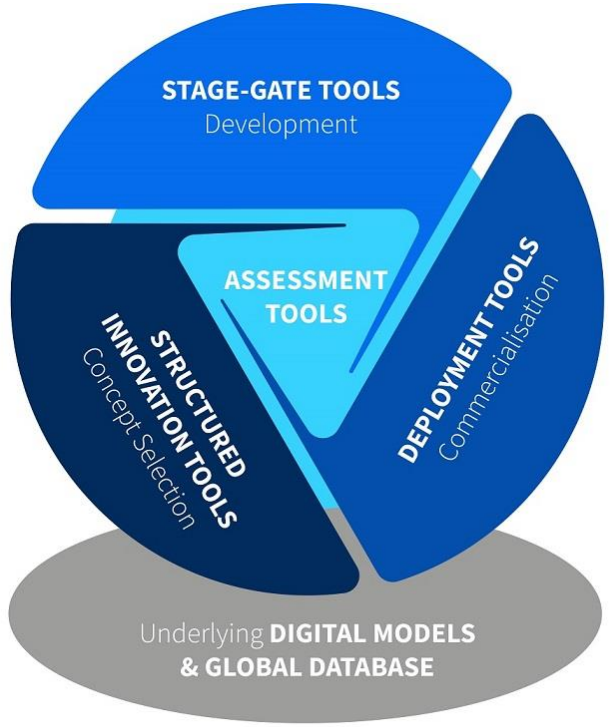
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 785921

Description

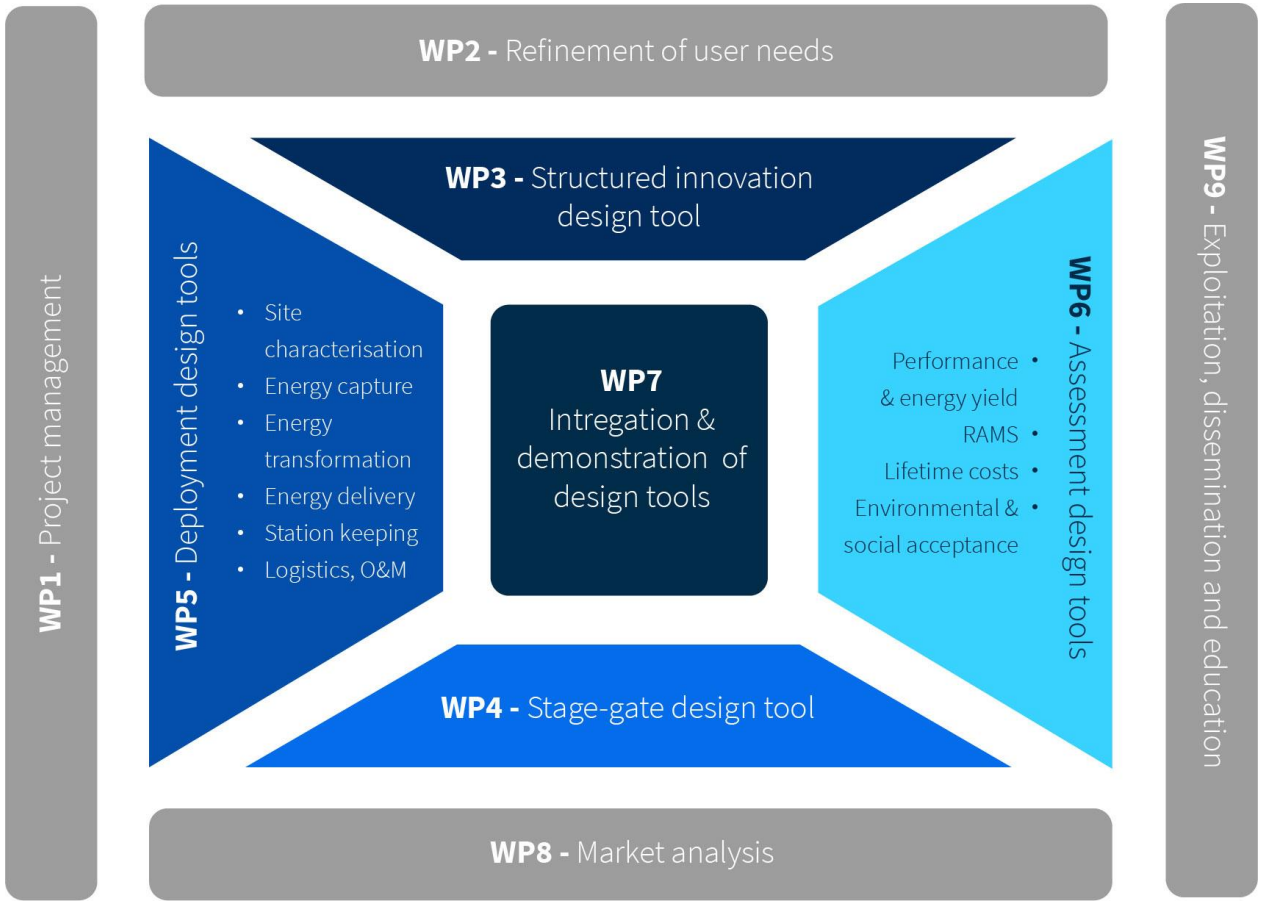
- An advanced **open source** suite of tools for the **selection, development, deployment and assessment** of ocean energy systems.

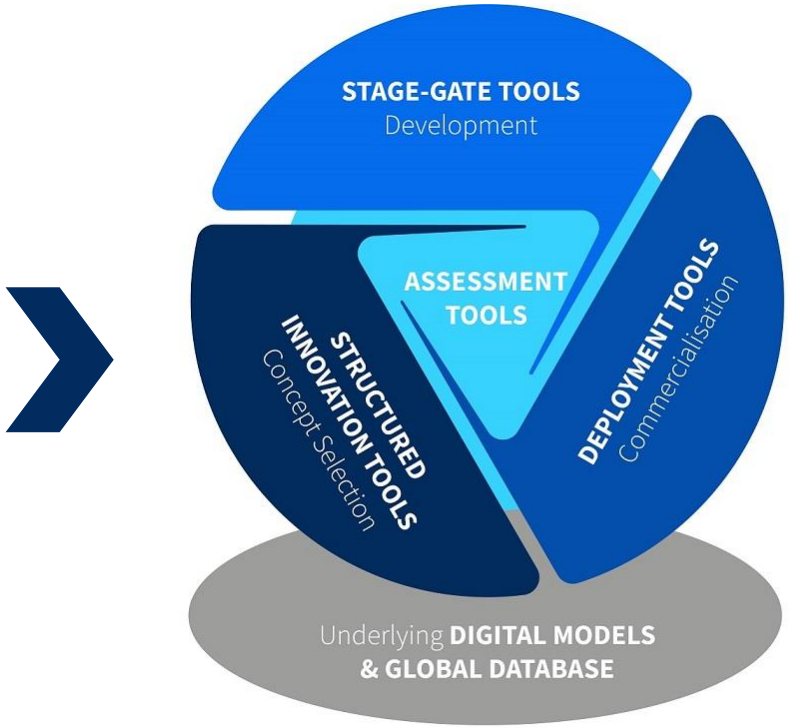
- A 3-year EU project (May 2018 - April 2021) with a total budget of **8 million euros**.

- Continuing **the development of DTOcean** which produced a 1st generation of freely available, **open-source design tools for wave and tidal energy** arrays.



Structure: from WPs to operational tools





Objectives

- To support the **entire technology innovation process**, from concept to deployment.
- To propose advanced design tools for **sub-systems**, **energy capture** devices and **arrays**.
- To bring tools to TRL6 by **demonstration scenarios in real world cases**.
- To make **freely available** tools as **open source** to the entire ocean energy sector.
- To develop an integrated suite of tools that will be a **professional user-friendly product**.

Exploitable Results

- **Structured innovation** tools

  Concept selection

- **Stage gate design** tools

  Development decision-making

- **Deployment design** tools

  6 modules: Site characterisation, Energy capture, Energy transformation, Energy delivery, Station-keeping, Logistics and O&M

- **Assessment design** tools

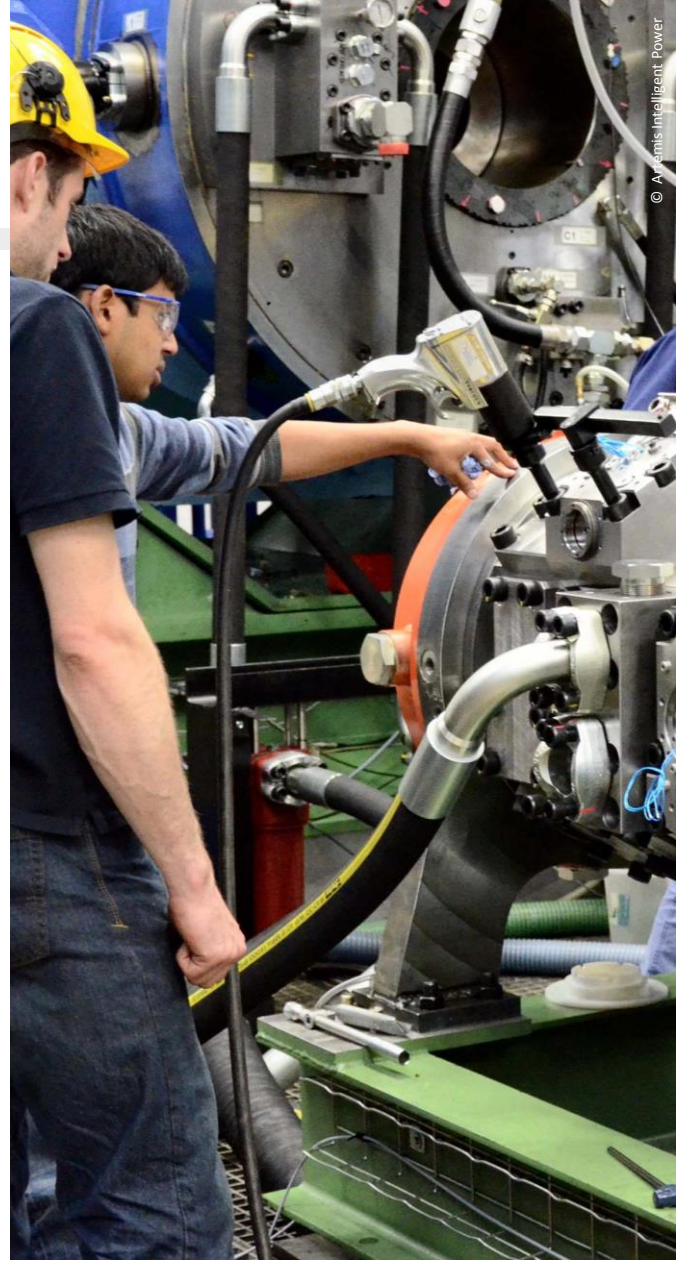
  4 modules: Performance & Energy Yield, RAMS, Lifetime Costs, Environmental and Social Acceptance

Partners

- Multidisciplinary team of 15 partners from 7 EU countries with the collaboration of 2 leading research laboratories from the USA.

Expected Impacts

- **Within 5 years** of completing the project, it's expected that the results will contribute:
  - to achieve a significant **increase** in the number of **ocean energy technologies** successfully **brought to market**
  - to improve performance uncertainty and support **reduction in Levelized Cost of Energy** (LCoE) for wave and tidal
  - to significantly **reduce operating and maintenance** (O&M) and installation costs.



DTOcean+

Advanced Design Tools for Ocean Energy Systems Innovation, Development and Deployment

Thank you for your attention!

Jonathan Hodges

Jonathan.hodges@waveenergyscotland.co.uk

Disclaimer: This presentation reflects only the author's views and the Agency is not responsible for any use that may be made of the information contained therein.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 785921

Innovation Landscaping Studies

Elva Bannon

6 December 2018

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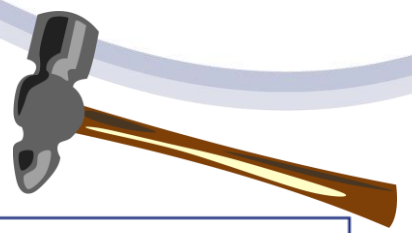


LOGIN

MEMBER REGISTRATION

Knowledge Library

Wave Energy Scotland is managing the most extensive technology programme of its kind in the wave energy sector. The Knowledge Library provides access to key information and documents generated through this world leading commercial and academic research & development.

Landscaping Studies 2016

- Structural Materials, Coatings and [illegible] Processes (Led by **University of Edinb[illegible]**
- Struct[illegible] Stresses for Wave Energy Devices (Led by **Ove A[illegible]rthers Scotland**)

- Application of Technology, Knowledge and Practice from Other Sectors (Led by **Offshore Renewable Energy Catapult**)

- Control Requirements for W[illegible]rgy Converters (Led by **Offshore Renewable En[illegible]**

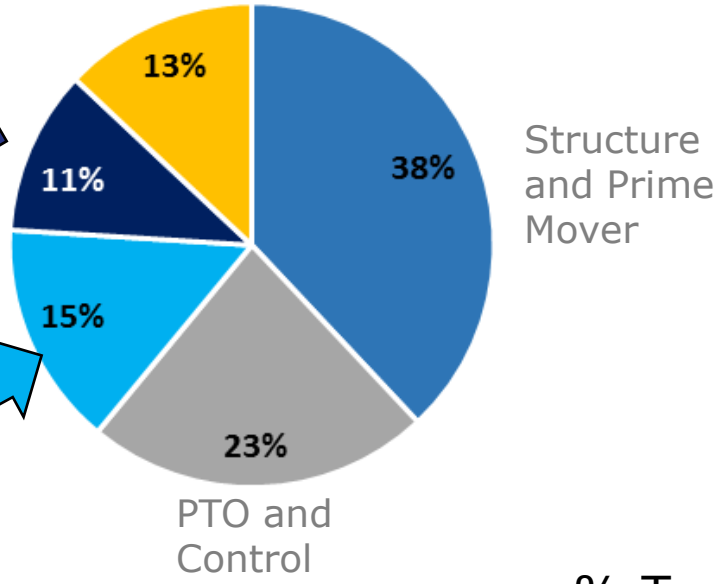
Structural Materials and Manufacturing Processes (2016)

Control Systems (2017)

Landscaping Studies 2018

1. *Electrical Connection*

2. *Moorings & Foundations*



% Typical CAPEX

Landscaping Studies 2018

wave energy SCOTLAND | HIE Highlands and Islands Enterprise Iomairt na Gàidhealtachd 's nan Eilean

ANALYSIS OF THE INNOVATION LANDSCAPE FOR COST REDUCTION IN SUPPORTING INFRASTRUCTURE

Electrical Connection

tnei | ITPENERGISED Earth. Smart. Solutions | JDR

Moorings & Foundations

TTI | University of Exeter | Black & Veatch

Landscaping Studies 2018

NEXT GENERATION TECHNOLOGIES

Very Large Scale Wave Energy Generation (>10MW)

ARUP cruz atcheson CONSULTING ENGINEERS UNIVERSITY OF PLYMOUTH

Alternative Generation Technologies

FRAZER-NASH CONSULTANCY

Electrical Connection

- **Methodology**: State of the Art investigation for electrical infrastructure.

  Cost scenarios used to assess electrical architecture choices
  - Device type (fixed, floating, near shore) & Array size (10MW and 100MW farm)
  - Collector & export system voltage
  - Wet/dry-mate connector
  - Array topology and redundancy
  - … 72 used.

- (One of many) **Conclusions**: electrical system design is project specific so requires careful consideration
- **Cost saving benefits possible from**
  - Improved cable design and understanding of seabed stability
  - Reduced O&M with use of wet mate connectors
  - Sharing of infrastructure to reduce components

Moorings and foundations

- **Methodology**: Case studies assessed the benefits of compliance (footprint, lines type, anchors, water depth) in mooring systems

- (One of many) **Conclusions**: Optimisation of whole system is required

- **Cost saving benefits possible from**
  - Load reduction through synthetic lines, shock absorbers
  - Low cost novel anchoring solutions with wide applicability to WEC types, uplift force capable, rocky/mixed/other seabed compatible
  - Quick-connect/release systems - combined mooring and electrical connection
  - Sharing of infrastructure is beneficial

Very Large Scale (>10MW)

- **Methodology**: Scaled up existing designs, investigate novel large and grouped devices.

  Investigate practical as well as hydrodynamic limitations

- (One of many) **Conclusions**:
  - Optimum devices 1-5MW but suits very high energy sites
  - Cost savings from grouping devices onto common support structure/infrastructure - *confirms conclusions from Electrical Connection and Moorings & Foundations*

- Identified characteristics of novel devices designed specifically for very large scale
  - Tuning, survivability, manufacture, transport, crane limits, reliability

Alternative Generation Technologies

- **Methodology**: Structured methods employed to identify promising energy conversion processes. Industry engagement and internal subject matter experts
  - Technical feasibility and maturity evaluated to down-select 4 technologies for economic assessment:
    - Piezoelectric
    - Magnetostriction
    - Triboelectric nanogenerators (TENGs)
    - Dielectric Elastomeric Generators (DEGs)

- (One of many) **Conclusions**: many interesting technologies discussed. DEGs concluded to be an opportunity for step-change cost reduction, especially where used to replace some/all of WEC structure.

Next steps

- Reports published on Knowledge Library

- PhD opportunity with ETP and University of Edinburgh (IES)
  - *Investigation of alternative generation technologies for wave energy*
  - Closing date of January 31st

- Future project to develop
  - Combined electrical & mooring quick-connect system – recommendation from both Electrical and M&F study (mid-2019)

Extension of current activities

- Drive and support related R&D efforts
  - Recent JRC report publication '**Workshop on identification of future emerging technologies in the ocean energy sector'**
- Contribute to development of wave energy specific standards and qualification processes (IEC 62600)
- Ongoing international collaboration including DTOceanPlus design tools, metrics and structured innovation processes
- Supporting multi-disciplinary optimisation tool PhD with UHI

Quick Links

Published reports

https://library.waveenergyscotland.co.uk/other-activities/landscaping-studies/

PhD Opportunity

https://www.eng.ed.ac.uk/studying/postgraduate/research/phd/investigation-alternative-generation-technologies-wave-energy

OCEANERA-NET COFUND
Second Joint Call

The Project

- 5 year programme: 2017 to 2021
- Co-financed by the European Union under Horizon 2020
- **Co-funded Joint Call** to support transnational, collaborative projects to demonstrate innovative technologies for ocean energy
- **Second joint call** to support R&D in ocean energy
- **Other joint activities** to support coordination of research programmes, knowledge transfer and exploitation of results

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 731200

Cofunded Joint Call - 2017

Total grant funding approved €8.2m, of which 33% EU

- INNOTEX: Naval Energies, OTEC, heat exchanger
- Sphorcis: Smalle Technologies WEC for small offshore
- WEP+: Wedge Global WEC + local energy system
- RESOURCECODE: EMEC - resource map, tools, platform
- TOPFLOTE: Orbital Marine – blade pitch regulation
- SEABLADE: Eire Composites – commercial tidal blade
- CF2T: Sabella – foundations tidal turbine
- UMACK: CorPower – anchoring and mooring system

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 731200

Second Joint Call - Timeline

OCEANERA-NET COFUND Additional Joint Call Timeline	
8th January 2019	Launch of the Joint Call
TBC	Brokerage Event (Bilbao MEW, mid Feb), Webinar
1st March 2019	Deadline for the Expressions of Interest
5th April 2019	Deadline for Proposals submission
October 2019	Communication of the funding decision

Call Topics

Development, demonstration and **validation** of technologies.
Progress from **TRL 3 to 6** through to **TRL 4 to 8**.

1. Ocean Energy Devices: novel or improved energy conversion device concepts

2. Components and Subsystems: including but not limited to power take-off, monitoring and control systems, foundations, moorings, and platforms,

3. Grid Connection and Power Systems: electrical architecture, components, power systems and grid connection, to facilitate connection of multiple devices .

4. Materials and Structures: novel materials or novel application of materials from other industrial sectors; anti-biofouling coatings, materials or techniques; manufacturing processes to produce materials with better properties for ocean energy applications.

5. Installation, Operations and Maintenance: new methods for installation, operations and maintenance to reduce costs and maximise safety and availably of ocean energy deployments.

6. Resource and Impact Assessment: Tools for determining resources, environmental conditions and their impact on reliability, survivability and performance, as well as the impact of ocean energy devices on the environment.

Indicative Funding

Funding Organisation	Country / Region	Indicative Funding
Scottish Enterprise	Scotland, UK	GBP 1M
Statens Energimyndighet	Sweden	SEK 15M
Centro para el Desarrollo Tecnológico Industrial	Spain	EUR 9.5M
Sustainable Energy Authority Ireland	Ireland	EUR 1.49M
Fundação para a Ciência e a Tecnologia	Portugal	EUR 300K
Région Pays de la Loire	Pays de la Loire, France	EUR 487K
Flander Innovation and Enterprise (TBC)	Flanders, Belgium	EUR 1M
	TOTAL	**EUR 6.8M**

Eligibility Criteria

- The project involves at least two independent organisations based/operating in **at least two different countries**;
- The project proposals should be **industry led**;
- **Relevance** to the scope of the call;
- European **added value**
- Contribution to national/regional programme / policies;
- All applicants can be funded on national / regional level, according to national/regional criteria;
- Partners from countries/regions not funding this call, can participate with their own funding.

Agency contacts

Organisation	Country / Region	Contact
Scottish Enterprise (Coordinator)	Scotland, UK	Karen Fraser: karen.fraser@scotent.co.uk
Région de Pays de la Loire, Agence de Pays de la Loire	Pays de la Loire, France	Charlotte Sugliani: c.sugliani@agence-paysdelaloire.fr
The Sustainable Energy Authority of Ireland	Ireland	Darren Coppinger: Darren.coppinger@seai.ie
Fundação para a Ciência e a Technologia	Portugal	Gonçalo Zagalo Pereira goncalo.zagalo@fct.pt Joana Margarida Pinheiro: Joana.Pinheiro@fct.pt
Centro Para el Desarrollo Technologico Industrial	Spain (national)	Gema Del Rio Castro: gema.delrio@cdti.es
Statens Energimyndighet (Swedish Energy Agency)	Sweden	Marit Marsh Strömberg: marit.marsh-stromberg@energimyndigheten.se Maria Olsson: maria.olsson@energimyndigheten.se
Flanders Innovation and Enterprise	Flanders, Belgium	Jozef Ghijselen: jozef.ghijselen@vlaio.be

For more information

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https://www.oceancofund.eu/

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 731200

Interreg
EUROPEAN UNION
North-West Europe
Marine Energy
Alliance
European Regional Development Fund

Project Introduction

Jamie Grimwade

Interreg
EUROPEAN UNION
North-West Europe
Marine Energy
Alliance
European Regional Development Fund

North West Europe Marine Energy Alliance

- What is it?
- What's in it for me?
- How do I apply?

Interreg
EUROPEAN UNION
North-West Europe
Marine Energy
Alliance
European Regional Development Fund

What is it?

"programme designed to progress the combined technical and commercial maturity levels of promising marine renewable energy developers."

EXCEEDENCE

MaREI
Centre for Marine and Renewable Energy

THE UNIVERSITY of EDINBURGH

DMEC Dutch Marine Energy Centre

EMEC ORKNEY
THE EUROPEAN MARINE ENERGY CENTRE LTD

MARIN

CENTRALE NANTES

INNOSEA
Marine Energy Engineering

navingo

Interreg
EUROPEAN UNION
North-West Europe
Marine Energy
Alliance
European Regional Development Fund

What's in it for me?

"provision of a set of tailored expert services to enable the realisation of selected developers' own ambitions"

Interreg
EUROPEAN UNION
North-West Europe
Marine Energy
Alliance
European Regional Development Fund

How to I apply?

- 1. EoI www.nweurope.eu/mea (17th Dec – 15th Feb)
- 2. Skype Interview (w/c 11th March)
- Benchmarking
- Projects start (June 2019)
- Eligibility
- Two calls planned

www.nweurope.eu/mea

Energy Technology Partnership

Norman Morrison

6th December 2018

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

energy technology partnership

What is ETP?

energy technology partnership

wave energy SCOTLAND

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

Edinburgh Napier UNIVERSITY

GCU Glasgow Caledonian University

UNIVERSITY OF ABERDEEN

UWS UNIVERSITY OF THE WEST of SCOTLAND

University of the Highlands and Islands Oilthigh na Gàidhealtachd agus nan Eilean

THE UNIVERSITY OF EDINBURGH

UNIVERSITY OF DUNDEE

GSoFA

University of Glasgow

RGU ROBERT GORDON UNIVERSITY ABERDEEN

HERIOT WATT UNIVERSITY

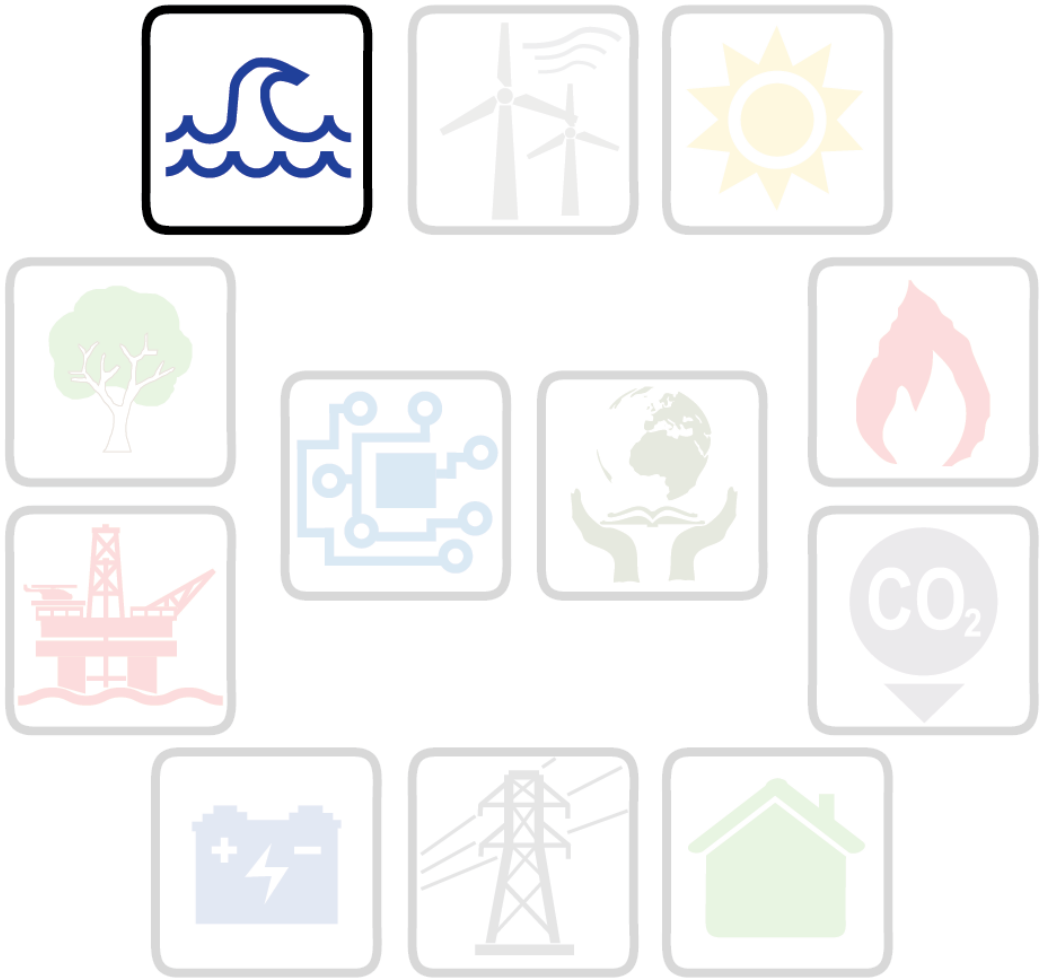
University of St Andrews

200
Academics

700
Researchers

University of Strathclyde Glasgow

ETP Energy Themes



Marine theme

Marine energy expertise

- Resource assessment
- Resource modelling
- Tank testing
- CFD modelling
- Economic modelling and assessment
- Moorings and foundations
- Subsea engineering
- Machine design
- Array design
- Environmental impact modelling

ETP Programmes

ETP Energy Industry Doctorate Programme

Funded by SFC & the Scottish Government
107 studentships supported over 7 years
12 studentships over the next 2 years

PECRE (Post-Graduate Early Career Researcher Exchanges)

Bursaries of up to £3k available for international exchanges
Available to all PECRs in ETP universities
39 grants awarded so far

KEN (Knowledge Exchange Network)

Team of **7** BDMs covering low-carbon sector
Foster and manage collaboration between industry and academia
169 KE projects carried out between academia and SMEs

ETP Industry Doctorate

- WES has partnered with University of Edinburgh and ETP to offer an industry doctorate
- *"Investigation of alternative generation technologies for wave energy"*
- Currently open for applications at University of Edinburgh or **www.findaphd.com**
- Builds on work from Alternative Generation landscaping study

THE UNIVERSITY of EDINBURGH

ETP PECRE

- UMBRA Group and University of Edinburgh participated in a PECR exchange
- Funded UoE researcher to spend a month working with UMBRA in Italy
- This helped UMBRA progress elements of their WES PTO project related to techno-economic modelling
- PECRE provides opportunities for overseas WES programme participants to host researchers from Scotland.

ETP KEN

- Supply Design is a subcontractor in multiple WES projects
- ETP is funding a small knowledge exchange project between Supply Design and University of St Andrews into the longevity of battery storage
- Investigation focusses on specific wave conditions to see if there are preferred chemistries
- KEN engagement fund provides opportunities for Scottish SMEs to work with universities

SUPPLYDESIGN

University of St Andrews

KEN continuation

- KENII is coming to an end and unable to accept new funding applications.
- KENIII starts in April 2019
  - £525k investment in collaborations, ***supports*** and consultancy
  - Engagement fund supports collaborative projects
  - Open to Scottish SMEs and ETP Universities
- KEN can support you with:
  - Funding applications
  - Introductions
  - Events

Thank you

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- www.etp-scotland.ac.uk
- www.waveenergyscotland.co.uk