Open Sea Operating Experience to Reduce Wave Energy Cost

Résultats

Informations projet

OPERA

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10.3030/654444

Projet clôturé

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Ce projet apparaît dans...

8 Septembre 2020

CORDIS fournit des liens vers les livrables publics et les publications des projets HORIZON.

Les liens vers les livrables et les publications des projets du 7e PC, ainsi que les liens vers certains types de résultats spécifiques tels que les jeux de données et les logiciels, sont récupérés dynamiquement sur OpenAIRE.

Livrables

Documents, rapports (26)

Communication material (final version)
Final version of the communication material at Month 18. Output from: T8.3. Success indicator: Final version of the communication and promotion material documented.

Evaluation of dissemination and communication activities (first version)
Impact Analysis and assessment of the dissemination and communication activities. Output from: T8.2 and T8.3. Success Success indicator: First assessment of the dissemination and communication activities available.

Data management plan (update)
Update of the data management plan at Month 18. Output from: T8.2. Success indicator: Second issue of the data management plan.

Open-sea performance and reliability of OWC turbine and electrical equipment
As D3.3 but for floating OWC at bimep. Output from: T3.3. Success indicator: Detailed results and recommendations documented for the operation of the turbine-generator set on the floating OWC at bimep.

Data management plan (first version)
A plan describing what data will be collected / generated, which methodology and standards will be used and how this data will be shared, curated and preserved. Output from: T8.2. Success indicator: First version of the data management plan available.

Recommendations and guidelines for offshore operations for wave energy converters
Report on the lessons learnt, recommendations and strategies for cost reduction of offshore operations. Real operations will be analysed to reduce time and associated equipment to produce a more cost-effective and risk-free solution that can be applied to other floating wave energy converters. Output from: T6.3 and

T6.4. Success indicator: Report contains recommendations and guidelines that are actionable in other wave energy projects.

Turbine and electrical equipment performance and reliability in shoreline OWC wave plant

Performance, documented failure and risks, early engineering mistakes and solutions, maintenance requirements, recommended wiring, operating parameters. Output from: T3.3. Success indicator: Detailed results and recommendations documented for the operation of the turbine-generator set at Mutriku.

Mooring open-sea operating data analysis

Analysis of shared mooring demonstration with and without elastomeric tether, including data quality assessment, logical presentation and interpretation, documentation to data management. Output from: T2.4. Success indicator: Evaluation of shared mooring open-sea operation in two configurations completed.

Operating data input for models of levelised and society cost and life cycle assessment for wave energy

Methodology for integration of open-sea experience and operating data into models for levelised cost of energy (LCOE), life cycle assessment (LCA), and society cost of energy (SCOE). Update models with real data and compare with previous state of the art, provide practical OPEX estimation methods for wave energy. Output from: T7.2. Success indicator: Methodology documented for the estimation of LCOE, LCA and SCOE from the operating data collected in the project.

Turbine-generator set laboratory tests in variable unidirectional flow

Performance characteristic, operating range specifications, assessment of CFD model. Output from: T3.2. Success indicator: Laboratory tests results that cover the range of flow characteristics expected in open-sea operation.

Plan for dissemination and communication (update)

Update of the plan for dissemination and communication at Month 18. Output from: T8.2. Success indicator: Second issue of the dissemination and communication plan with revised target audience, dissemination activities and metrics per channel.

Recommendations to TC114 from real-case applications of wave energy technical specifications

Based on real application of IEC 62600-100, 62600-102, 626200-30 regarding power performance and yield, proposed improvements for next editions of the corresponding IEC Specifications. These will be forwarded to the relevant Technical Committee of the IEC (TC114). Output from: T5.2(a)(b)(c) and T2.4.

Success indicator: Final recommendations sent to TC114 based on documented real-case application of IEC specifications.

Floating OWC control algorithms

Assessment of control strategies, decision-support for control selection and proposed best in class adaptive and predictive control, control hardware design requirements, priorities for improving control strategies and hardware. Output from: T4.4. Success indicator: Detailed results at bimep and practical applicability of OWC control algorithms to floating applications documented.

Plan for dissemination and communication (final version)

Final version of the plan for dissemination and communication. Output from: T8.2. Success indicator: Final version of the plan documented.

H2020-OPERA final project assessment and recommendations

Synthesis of OPERA contributions and technological improvements from a wave energy sector perspective, energy sector perspective, business and investment decision and policy support perspective including SME support, R&D priorities, recommendations for effective support to early deployments. Output from: T7.4. Success indicator: Final project assessment and recommendations for the sector documented and ready to be disseminated.

Evaluation of dissemination and communication activities (update)

Update of the evaluation of dissemination and communication activities at Month 30. Output from: T8.2 and T8.3. Success indicator: Update assessment of the dissemination and communication activities.

Tracking metrics for wave energy technology performance

Open-sea performance of innovations tested within OPERA (incl. shared mooring, elastomeric tether, biradial turbine, latching and predictive control) will be analysed with LCOE, LCA and SCOE model outputs as metrics. Assessment of OPERA contribution with these metrics. Output from: T7.3. Success indicator: Economic, life-cycle and social impact metrics defined and the 4 main project innovations assessed.

Extending wave energy converter power quality dataset

Documents the validation of a model that complies with IEC/TS62600-30 on power quality and its application to an extended assessment of power quality. Output from: T5.5. Success indicator: Model that complies with IEC/TS62600-30 on power quality has been validated.

Mutriku and bimep operating data collection experience

Lessons learned on adequate instrumentation and robust sensors and configurations, failure information following protocol from WP7 (to permit

subsequent root cause analysis and/or minimise risk of or at avoid repetition), updated risk matrix for instrumentation and inspection and maintenance logistics. Output from: T1.2 and T1.3. Success indicator: Key lessons documented and explained in practical ways for the open-sea instrumentation and its offshore operation.

Shoreline OWC wave power plant control algorithms

Assessment of control strategies, decision-support for control selection and proposed best in class adaptive and predictive control, control hardware design requirements, priorities for improving control strategies and hardware. Output from: T4.3. Success indicator: Detailed results at Mutriku and practical applicability of OWC control algorithms documented.

Wave energy measurement methodologies for IEC/TS

Documents real case deployment of measurement methodologies for power, power quality and wave resource to comply with IEC Technical Specifications. Output from: T5.1. Success indicator: Methodologies to conform to IEC wave energy technical specifications together with practical and technical issues in their application to a real deployment.

Uncertainty in wave energy converter power performance assessment

Evaluation of the various sources of uncertainty, recommendations for uncertainty reduction and evaluation of this reduction. Output from: T5.4. Success indicator: Results documented on the evaluation of power performance prediction modelling at multiples sites and scales.

Evaluation of dissemination and communication activities (final version)

Final version of the evaluation of dissemination and communication activities at project end. Output from: T8.2 and T8.3. Success indicator: Final assessment of the dissemination and communication activities documented.

Plan for dissemination and communication (first version)

The plan for the dissemination and communication of project results defining the goals, target audience, methods, schedule and complementarity of the activities, measures to assess the impact of the dissemination activities, and conditions to ensure proper dissemination of the generated knowledge, related to confidentiality, publication, and use of the knowledge. Output from: T8.2. Success indicator: Full version of the dissemination and communication plan available.

Recommendations for WEC mooring guidelines and standards

Report on the assessment of gaps in knowledge based on findings from open-sea demonstrations to inform about possible additional requirements towards existing or new wave energy codes or standards (to be integrated to the overall recommendations for standards from WP5/D5.2). Output from: T2.4 and T5.2(c).

Success indicator: Technical recommendations for WEC mooring design and certification gained from open-sea testing.

Communication material (first version)
Visual identity conforming to H2020 requirements, press releases, interviews, videos, brochures, and posters for publicity of the project to a variety of audiences. Output from: T8.3. Success indicator: First version of the communication and promotion material available.

Open Research Data Pilot (1)

Data management plan (final version)
Final version of the data management plan at Month 30. Output from: T8.2. Success indicator: First version of the data management plan documented.

Autres (1)

Operational model for offshore operation for wave energy converters
Operational model for site accessibility, analysis and optimisation of maritime methods and calculation of cost of offshore operations as an aid in decision making. Output from: T6.2. Success indicator: Model is operational as demonstrated by use on offshore operations in the project.

Sites Web, dépôts de brevet, vidéos, etc. (2)

Dedicated project website
A dedicated website for dissemination and communication purposes will be produced at the beginning of the project and updated throughout the project, including updated information about the project, news, events, and downloadable material. The web-site will be linked from and to the partners' web-site and relevant scientific communities. The communication strategy involving the website channel will be delivered at the same time as the project website and later integrated in the first version of the plan for dissemination and communication (D8.2). Output from: T8.2. Success indicator: Plan for the dissemination through the web defined and website operational with initial contents.

Online data query tool

To provide open-access to operating data database for 5 years after project end. Output from: T1.4. Success indicator: Query tool ready to download 2 years of open-sea operating data for both Mutriku and bimep.

Démonstrateurs, pilotes, prototypes (1)

Fault ride-through demonstrator

Prototype using validated model, complying with IEC/TS62600-30 and operational for use in wave energy projects. Output from: T5.5. Success indicator: Fault emulation demonstrator connected to the dry-lab test rig.

Publications

Articles approuvés par les pairs (6)

A high-order Discontinuous Galerkin Method with mesh refinement for optimal control

Auteurs: João C.C. Henriques, João M. Lemos, Luís Eça, Luís M.C. Gato, António F.O. Falcão
Publié dans: Automatica, Numéro 85, 2017, Page(s) 70-82, ISSN 0005-1098
Éditeur: Pergamon Press Ltd.
DOI: 10.1016/j.automatica.2017.07.029

Assessing the performance durability of elastomeric moorings: Assembly investigations enhanced by sub-component tests

Auteurs: T. Gordelier, D. Parish, P.R. Thies, S. Weller, P. Davies, P.Y. Le Gac, L. Johanning
Publié dans: Ocean Engineering, Numéro 155, 2018, Page(s) 411-424, ISSN 0029-8018
Éditeur: Pergamon Press Ltd.
DOI: 10.1016/j.oceaneng.2018.02.014

O&M Models for Ocean Energy Converters: Calibrating through Real Sea Data

Auteurs: Tianna Bloise Thomaz, David Crooks, Encarni Medina-Lopez, Leonore van Velzen, Henry Jeffrey, Joseba Lopez Mendia, Raul Rodriguez Arias, Pablo Ruiz Minguela
Publié dans: Energies, Numéro 12/13, 2019, Page(s) 2475, ISSN 1996-1073
Éditeur: Multidisciplinary Digital Publishing Institute (MDPI)
DOI: 10.3390/en12132475

Comparative assessment of control strategies for the biradial turbine in the Mutriku OWC plant

Auteurs: François-Xavier Faÿ, João C. Henriques, James Kelly, Markus Mueller, Moahammad Abusara, Wanan Sheng, Marga Marcos
Publié dans: Renewable Energy, Numéro 146, 2020, Page(s) 2766-2784, ISSN 0960-1481
Éditeur: Pergamon Press Ltd.
DOI: 10.1016/j.renene.2019.08.074

Sea trial results of a predictive algorithm at the Mutriku Wave power plant and controllers assessment based on a detailed plant model

Auteurs: François-Xavier Faÿ, Eider Robles, Marga Marcos, Endika Aldaiturriaga, Eduardo F. Camacho
Publié dans: Renewable Energy, Numéro 146, 2020, Page(s) 1725-1745, ISSN 0960-1481
Éditeur: Pergamon Press Ltd.
DOI: 10.1016/j.renene.2019.07.129

Design of oscillating-water-column wave energy converters with an application to self-powered sensor buoys

Auteurs: J.C.C. Henriques, J.C.C. Portillo, L.M.C. Gato, R.P.F. Gomes, D.N. Ferreira, A.F.O. Falcão
Publié dans: Energy, Numéro 112, 2016, Page(s) 852-867, ISSN 0360-5442
Éditeur: Pergamon Press Ltd.
DOI: 10.1016/j.energy.2016.06.054

Ensemble de données

Ensemble de données via OpenAIRE (7)

Ds_Wave_Mutriku: Wave Resource At Mutriku (Spain)

Auteurs: Berque, Joannès; Txarterina, Iñaki
Publié dans: Zenodo

Ds_Wave_Bimep: Wave Resource At Bimep (Spain)

Auteurs: Berque, Joannès; Lopez-Mendia, Joseba
Publié dans: Zenodo

Voltage and current data for IEC 62600-30 power quality monitoring from the Mutriku Wave Power Plant and Lir National Ocean Test Facility electrical laboratory

Auteurs: Kelly, James F.
Publié dans: Zenodo

H2020 OPERA Project: Power Take-Off and Control Law testing in MARMOK-A-5 Wave Energy Converter at BiMEP
Auteurs: Aldaiturriaga, Endika; François-Xavier Faÿ; Ruiz-Minguela, Pablo
Publié dans: Zenodo

DS_Ctrl_Mutriku: Controllers assessment at Mutriku OWC plant (Spain)
Auteurs: Faÿ, François-Xavier
Publié dans: Zenodo

Ds_Wave_Mutriku: Wave Resource At Mutriku (Spain)
Auteurs: Berque, Joannès
Publié dans: Zenodo

H2020 OPERA Project: Mooring System Experimental data from MARMOK-A-5 Wave Energy Converter at BiMEP
Auteurs: Borja de Miguel Para; Lars Johanning; Endika Aldaiturriaga; Pablo Ruiz-Minguela
Publié dans: Zenodo

Logiciel

Logiciel via OpenAIRE (1)

H2020 OPERA Project - Mutriku database
Auteurs: Joaochenriques
Éditeur: Zenodo
DOI: 10.5281/zenodo.3228108; 10.5281/zenodo.3228107

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