FUEL FLEXIBLE, NEAR -ZERO EMISSIONS, ADAPTIVE PERFORMANCE MARINE ENGINE

Wyniki

Informacje na temat projektu

HERCULES-2

Identyfikator umowy o grant: 634135

Strona internetowa projektu

DOI
10.3030/634135

Projekt został zamknięty

Data podpisania przez KE
17 Kwietnia 2015

Data rozpoczęcia
1 Maja 2015

Data zakończenia
31 Października 2018

Finansowanie w ramach
SOCIETAL CHALLENGES - Smart, Green And Integrated Transport

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€ 25 108 685,18

Wkład UE
€ 16 813 399,63

Koordynowany przez
ETHNICON METSOVION POLYTECHNION
Grecja

CORDIS oferuje możliwość skorzystania z odnośników do publicznie dostępnych publikacji i rezultatów projektów realizowanych w ramach programów ramowych HORYZONT.

Odnośniki do rezultatów i publikacji związanych z poszczególnymi projektami 7PR, a także odnośniki do niektórych konkretnych kategorii wyników, takich jak zbiory danych i oprogramowanie, są dynamicznie pobierane z systemu OpenAIRE.

Rezultaty

Dokumenty, raporty (15)

Modelling of multi-fuel ignition

D2.4 will cover documentation of both the simplified skeletal chemical mechanism for hydrocarbon and alcohol fuel oxidation, and of the simplified chemical engineering model of ignition for a variety of fuels. The report will also cover the work at validating both of those models, against experimental data both from laboratory and engine tests.

Progress review and results update of all Work packages

This Deliverable will include a short progress review of all Work packages after the end of Year 2 of the Project. Preliminary results of the Project will also be described shortly.

A method for measuring in-cylinder λ-distribution in medium-speed DF engines

The method for measuring the in-cylinder λ-distribution will be presented in this report. This includes the physico-chemical background as well as the necessary optical instruments and modifications on the single-cylinder engine.

Study the result quality of existing subspace-search methods on uncertain data

The deliverable gives an overview of the different methods of subspace-search and outlier-detection methods. Promising approaches will be described and tailored for medium speed applications and uncertain data.

TMF Model for new cylinder head

On the basis of experimental data of the considered cast iron material, the material properties of an advanced Chaboche-type viscoplastic constitutive model are determined. The comparison of different numerically complex material models will discussed. For the selected material and material model example calculation will be reported.

Overall review of Project results

This Deliverable will include a brief presentation of overall Project results at the end of the Project.

Emission measurement systems for SO3, NH3 and PM emissions to support integrated after-treatment technologies

Report on in-situ laser based SO3, particulate and NH3 measurements in exhaust gas and results of comparison of different exhaust gas sampling methods, including diluted and non-diluted methods. Technologies known from

on-road vehicle development and stationary powerplants will be taken into consideration.

Progress review of all Work packages

This Deliverable will include a short progress review of all Work packages after the end of Year 1 of the Project.

Report on Dissemination Activities at Mid-Term

This Deliverable will describe the Project Activities performed for the Dissemination of project work and results at Mid-Term (month 18).

Results from test with engine integrated SCR on two-stroke diesel engine

Report covering the findings from experimental investigations of SCR performance from an engine integrated SCR prototype.

Compendium of scientific papers published by the Consortium

This deliverable will include a list of the scientific papers published by the Consortium in international journals and conferences, as well as the first page of each publication with the Author's names and abstract.

Report on Dissemination Activities at end of Project

This Deliverable will describe the Project Activities performed for the Dissemination of project results at the end of the Project.

Interim presentation of overall project results

This Deliverable will include a brief presentation of overall Project results at mid-term.

Development and application of optical techniques for multi-fuel studies

D2.6 will describe the efforts of developing, adapting and applying optical and laser based measurement techniques to the conditions and types of optical access offered in the fuel-flexible test facility and on the test engine at MAN CPH. Measurement techniques will be geared towards characterisation of both liquid and gaseous fuel jets and sprays, as well as of ignition processes and combustion development.

Literature review regarding SCR engine integration and particulate abatement

Report on the state-of-the art regarding particulate emission reduction systems integrated with engines. This will in particular focus on mainstream marine fuels and medium speed engines and their particular impact on the particulate reduction system for instance due to elevated levels of sulphur and ash when compared to on-road fuels.

Demonstratory, piloty, prototypy (2)

Experimental assessment of SCR reduction agent injection systems with sensors for feedback control

Report on the feasibility of using hardware-sensor-based feedback control for optimized SCR reduction agent injection strategy. It is envisaged that focus areas are transient operation, long-term stability and cross-sensitivity of the sensor technology used for feedback control.

Study an alternative urea decomposition and mixer/SCR configuration and/or study in extended range of operation

Prototype set-up of an optimized design undertaken and described in the previous Deliverable 8.4. will be characterized on high speed marine engine on test bed. All results, test bed set-up, procedures and measurements will be summarized in validation report.

Witryny, zgłoszenia patentowe, filmy wideo itp. (1)

Public section of Project Website complete and operational

Public section of the Project Website complete and operational. The website will include description of the Project, structure of work, consortium, news and updates etc.

Publikacje

Materiały z konferencji (30)

Flow in axisymmetric expansion in a catalytic converter
Autorzy: E.Gotfredsen, K.E.Meyer
Opublikowane w: 12th International Symposium on Particle Image Velocimetry, 2017
Wydawca: The Korean Society of Visualization

Modeling of particulate matter emissions from engine combustion
Autorzy: K.Hentelä, O.Kaario, M.Larmi, V.Garaniya,L.Goldsworthy
Opublikowane w: SAE 2017 International Powertrains, Fuels and Lubricants Meeting, 2017
Wydawca: SAE

Investigation of the Combined Application of Water-in-Fuel Emulsion and Exhaust Gas Recirculation in a Medium Speed Diesel Engine
Autorzy: B.von Rotz, P. Kyrtatos, K. Herrmann, K.Boulouchos
Opublikowane w: 9th International Conference on Modeling and Diagnostics for Advanced Engine Systems (COMODIA 2017), 2017
Wydawca: The Engine Systems Division, The Japan Society of Mechanical Engineers

An Optical Investigation of Diesel-Pilot and Methane Dual-Fuel Combustion
Autorzy: Z.Ahmad , J. Aryal, O. Ranta, O. Kaario, M.Larmi
Opublikowane w: Nordic flame days 2017, 2017
Wydawca: Nordic flame days 2017

Investigation of the Cylinder Cut-Out for Medium Speed Dual Fuel Engines
Autorzy: Johannes Konrad, Thomas Lauer, Mathias Moser, Enrico Lockner, Jianguo Zhu
Opublikowane w: Heavy-Duty - On- and Off-Highway Engines, 2018, Strona(/y) 209-224
Wydawca: Springer Fachmedien Wiesbaden
DOI: 10.1007/978-3-658-21029-8_14

Control-oriented modeling of two-stroke diesel engines with EGR for marine applications
Autorzy: Llamas X., Eriksson L.
Opublikowane w: 2018, ISSN 1475-0902
Wydawca: Insitution of Mechanical Engineering

Engine Efficiency Optimization under Consideration of NO X - and Knock-Limits for Medium Speed Dual Fuel Engines in Cylinder Cut-Out Operation
Autorzy: Johannes Konrad, Thomas Lauer, Mathias Moser, Enrico Lockner, Jianguo Zhu
Opublikowane w: SAE Technical Paper Series, 2018
Wydawca: SAE International
DOI: 10.4271/2018-01-1151

Crank Shaft Torsional Vibration Analysis on the perspective of Improving the Crank Angle Measurement Accuracy for Closed-loop Combustion Control in ICES
Autorzy: Xiaoguo Storm, Jari Hyvonen, Heikki J Salminen, Reino Virrankoski, Seppo Niemi
Opublikowane w: SAE Technical Paper Series, 2018
Wydawca: SAE International
DOI: 10.4271/2018-01-1161

Engine knock margin control using in-cylinder pressure data: Preliminary results

Autorzy: Giulio Panzani, Olga Galluppi, Donald Selmanaj, Sergio Savaresi, Jonatan Rosgren, Christopher H. Onder
Opublikowane w: 2017 IEEE 56th Annual Conference on Decision and Control (CDC), 2017, Strona(/y) 256-261, ISBN 978-1-5090-2873-3
Wydawca: IEEE
DOI: 10.1109/CDC.2017.8263675

Predictive Control for a Marine Hybrid Diesel-Electric Plant During Transient Operation
Autorzy: N.Planakis, G. Papalambrou, N.P.Kyrtatos
Opublikowane w: 5th International Conference on Control, Decision and Information Technologies, 2018
Wydawca: CODIT

Investigation of Different Piston Ring Curvatures on Lubricant Transport along Cylinder Liner in Large Two-Stroke Marine Diesel Engines
Autorzy: Hannibal Christian Overgaard, Peder Klit, Anders Vølund
Opublikowane w: 17th Nordic Symposium on Tribology, Numer 14-17 June 2016, 2016
Wydawca: NORDTRIB

A model of a Marine Two-Stroke Diesel Engine with EGR for Low Load Simulation
Autorzy: Xavier Llamas, Lars Eriksson
Opublikowane w: EUROSIM 2016, Numer 12-16 September 2016, 2016
Wydawca: EUROSIM

From HERCULES A-B-C to HERCULES-2: A classic cooperative programme in large engine R&D
Autorzy: Nikolaos Kyrtatos, Gunanr Stiesch, Ilari Kallio
Opublikowane w: 28th CIMAC Congress, Numer 6-10 June 2016, 2016
Wydawca: CIMAC

SCR under Pressure-pre-turbochanger Nox abatement for marine 2-stroke diesel engines
Autorzy: Kristoffer Sandelin, Daniel Peitz
Opublikowane w: 28th CIMAC Congress, Numer 6-10 June 2016, 2016
Wydawca: CIMAC

Experimental analysis of fuel alternatives for marine propulsion systems
Autorzy: A.Schmid, R. Bombach, T. Yildirim
Opublikowane w: ICLASS 2018, Numer 22-26 July 2018, 2018
Wydawca: ILASS-Americas

NH 3 Sensor Measurements in Different Engine Applications
Autorzy: Timo Murtonen, Hannu Vesala, Paivi Koponen, Rasmus Pettinen, Tuula Kajolinna, Olli Antson
Opublikowane w: SAE Technical Paper Series, 2018

Wydawca: SAE International
DOI: 10.4271/2018-01-1814

Skip Firing in Medium Speed Dual Fuel Engines: Detailed Assessment and Engine Performance Optimization in Compliance with IMO Tier III
Autorzy: J. Konrad, T. Lauer, M. Moser, E. Lockner, J. Zhu
Opublikowane w: Rostock Large Engine Symposium, 2018
Wydawca: University of Rostock

SCR beschichteter Dieselpartikelfilter für schnelllaufende Vier-takt-Dieselmotoren im Marinebereich
Autorzy: M. Kleinhenz, A. Fiedler, A. Döring
Opublikowane w: "16. FAD-Conference ""Herausforderung - Abgasnachbehandlung für Dieselmotoren""", 2018
Wydawca: FAD

Eindüsung von Harnstoff-Wasser-Lösung mit Zweistoffdüsen für großskalige SCR-Systeme unter Druck
Autorzy: M. Höltermann, P. Roloff, F. Dinkelacker
Opublikowane w: 16. FAD-Conference, 2018
Wydawca: FAD

Robustness analysis of the next generation of EGR controllers in marine two-stroke diesel engines
Autorzy: X Llamas, L Eriksson
Opublikowane w: Proceedings of the International Ship Control Systems Symposium (iSCSS), 2018
Wydawca: IMarEST
DOI: 10.24868/issn.2631-8741.2018.009

Transient Simulation of a Large Two-Stroke Marine Diesel Powerplant Operation with a High Pressure SCR Aftertreatment System
Autorzy: M. Foteinos, N.P. Kyrtatos
Opublikowane w: 27th Aachen Colloquium Automobile and Engine Technology 2018, 2018
Wydawca: Aachener Kolloquium

Influence of the Backpressure on Urea Sprays Generated by an Air-Blast Atomizer for Large-Scale SCR-Applications
Autorzy: Markus Höltermann, Jan Wichmar, Friedrich Dinkelacker
Opublikowane w: SAE Technical Paper Series, 2019
Wydawca: SAE International
DOI: 10.4271/2019-01-0046

The HERCULES-2 Project of R&D on Large Engines for Ships

Autorzy: Nikolaos P. Kyrtatos
Opublikowane w: TRA 2018, 2018
Wydawca: TRA
DOI: 10.5281/zenodo.1451380

Measuring injection of urea solution into a high pressure hot gas test rig for SCR-applications
Autorzy: M. Höltermann, N. Kawaharada, J. Wichmar, F. Dinkelacker
Opublikowane w: Engine Combustion Processes: Current Problems and Modern Techniques, 2017
Wydawca: SAGE

Investigation of Ammonia Synthesis for Large Scale SCR-Applications by Means of a Hot Gas Test Rig
Autorzy: M. Höltermann, J. Wichmar, T. Wittenbreder, F. Dinkelacker
Opublikowane w: 8th European Combustion Meeting, Numer 18-21 April 2017, 2017
Wydawca: Adria Section of the Combustion Institute

Influence of the Al content on the aqueous corrosion resistance of binary Fe-Al alloys in H2SO4
Autorzy: J. Peng, F.Moszner, D. Vogel, M. Palm
Opublikowane w: 978-3-9816508-9-1, 2018
Wydawca: Intermetallics

Analysis of Cylinder Pressure Measurement Accuracy for Internal Combustion Engine Control
Autorzy: Xiaoguo Storm, Heikki J. Salminen, Reino Virrankoski, Seppo Niemi, Jari Hyvonen
Opublikowane w: SAE Technical Paper Series, 2017
Wydawca: SAE International
DOI: 10.4271/2017-01-1067

Design and experiments to investigate spray and impingement characteristics of a common rail type lubrication system
Autorzy: Matthias Stark, Arturo De Risi, Marcelo Giangreco, Simon Diggelmann
Opublikowane w: Proceedings ILASS–Europe 2017. 28th Conference on Liquid Atomization and Spray Systems, 2017, ISBN 9788-490485804
Wydawca: Universitat Politècnica València
DOI: 10.4995/ILASS2017.2017.4688

Spray Combustion Chamber: History and Future of a Unique Test Facility
Autorzy: Andreas Schmid, Naoki Yamada
Opublikowane w: Proceedings ILASS–Europe 2017. 28th Conference on Liquid Atomization and Spray Systems, 2017, ISBN 9788-490485804
Wydawca: Universitat Politècnica València
DOI: 10.4995/ILASS2017.2017.4734

Predictive Control for a Marine Hybrid Diesel-Electric Plant During Transient Operation
Autorzy: Nikolaos Planakis, George Papalambrou, Nikolaos Kyrtatos
Opublikowane w: 2018 5th International Conference on Control, Decision and Information Technologies (CoDIT), 2018, Strona(/y) 989-994, ISBN 978-1-5386-5065-3
Wydawca: IEEE
DOI: 10.1109/codit.2018.8394939

Artykuły recenzowane (20)

Transient Load Share Management of a Diesel Electric Hybrid Powertrain for Ship Propulsion
Autorzy: S. Topaloglou, G.Papalambrou, K.Bardis, N. Kyrtatos
Opublikowane w: International Journal of Powertrains, 2017, ISSN 1742-4275
Wydawca: Inderscience Publishers

Calibration method for the determination of the FAME and HVO contents in fossil diesel blends using NIR spectroscopy
Autorzy: L.Sherman, S. Heikkilä, K. Sirviö, S. Niemi, P.Välisuo, A.Niemi
Opublikowane w: Fuel Journal, 2017, ISSN 0016-2361
Wydawca: Elsevier BV

Influence of Al content and pre-oxidation on the aqueous corrosion resistance of binary Fe-Al alloys in sulphuric acid
Autorzy: Jian Peng, Frank Moszner, Julian Rechmann, Dirk Vogel, Martin Palm, Michael Rohwerder
Opublikowane w: Corrosion Science, Numer 149, 2019, Strona(/y) 123-132, ISSN 0010-938X
Wydawca: Pergamon Press Ltd.
DOI: 10.1016/j.corsci.2018.12.040

Kinematic viscosity studies for medium-speed CI engine fuel
Autorzy: K. Sirviö, R. Help, S. Niemi, S. Heikkilä and E. Hiltunen
Opublikowane w: Agronomy Research, 2018, ISSN 1406-894X
Wydawca: Estonian Agricultural University
DOI: 10.15159/ar.18.088

Properties of local produced animal-fat based biodiesel and its blend with fossil fuel
Autorzy: K. Sirviö, S. Heikkilä, R. Help, S. Niemi and E. Hiltunen
Opublikowane w: Agronomy Research, 2018, ISSN 1406-894X
Wydawca: Estonian Agricultural University
DOI: 10.15159/ar.18.083

High-pressure pyrolysis and oxidation of ethanol

Autorzy: Hamid Hashemi, Jakob M. Christensen, Peter Glarborg
Opublikowane w: Fuel, Numer 218, 2018, Strona(/y) 247-257, ISSN 0016-2361
Wydawca: Elsevier BV
DOI: 10.1016/j.fuel.2017.12.085

High-pressure oxidation of ethane

Autorzy: Hamid Hashemi, Jon G. Jacobsen, Christian T. Rasmussen, Jakob M. Christensen, Peter Glarborg, Sander Gersen, Martijn van Essen, Howard B. Levinsky, Stephen J. Klippenstein
Opublikowane w: Combustion and Flame, Numer 182, 2017, Strona(/y) 150-166, ISSN 0010-2180
Wydawca: Elsevier BV
DOI: 10.1016/j.combustflame.2017.03.028

Combustion Property Analyses with Variable Liquid Marine Fuels in Combustion Research Unit

Autorzy: M. Hissa, S. Niemi and K. Sirviö
Opublikowane w: Agronomy Research, 2018, ISSN 1406-894X
Wydawca: Estonian Agricultural University
DOI: 10.15159/ar.18.089

Impact of Catalyst Geometry on Diffusion and Selective Catalytic Reduction Kinetics under Elevated Pressures

Autorzy: Daniel Peitz, Martin Elsener, Oliver Kröcher
Opublikowane w: Chemie Ingenieur Technik, 2018, ISSN 0009-286X
Wydawca: Wiley - V C H Verlag GmbbH & Co.
DOI: 10.1002/cite.201700146

Towards a temperature dependent and probabilistic lifetime concept for nodular ductile cast iron materials undergoing isothermal and thermo-mechanical fatigue

Autorzy: Elena Garcia Trelles, Christoph Schweizer, Stefan Eckmann
Opublikowane w: MATEC Web of Conferences, Numer 165, 2018, Strona(/y) 19006, ISSN 2261-236X
Wydawca: MATEC Web Conf. Volume 165, 2018
DOI: 10.1051/matecconf/201816519006

Parameterizing Compact and Extensible Compressor Models Using Orthogonal Distance Minimization

Autorzy: Xavier Llamas, Lars Eriksson
Opublikowane w: Journal of Engineering for Gas Turbines and Power, Numer 139/1, 2017, Strona(/y) 012601, ISSN 0742-4795
Wydawca: American Society of Mechanical Engineers
DOI: 10.1115/1.4034152

Isothermal Oxidation Behavior of TribaloyTM T400 and T800
Autorzy: J. Peng, X. Fanga, V. Marx, U.Jasnau, M. Palm
Opublikowane w: NPJ Materials Degradation, 2018, ISSN 2397-2106
Wydawca: Springer Nature

Development of a shear ultrasonic spectroscopy technique for the evaluation of viscoelastic fluid properties: Theory and experimental validation
Autorzy: M. Schirru, X. Li, M. Cadeddu, R.S. Dwyer-Joyce
Opublikowane w: Ultrasonics, 2018, ISSN 0041-624X
Wydawca: Elsevier BV
DOI: 10.1016/j.ultras.2018.07.002

SCR Coated DPF for Marine Engine Applications
Autorzy: Manuel Kleinhenz, Axel Fiedler, Peter Lauer, Andreas Döring
Opublikowane w: Topics in Catalysis, Numer 62/1-4, 2019, Strona(/y) 282-287, ISSN 1022-5528
Wydawca: Baltzer Science Publishers B.V.
DOI: 10.1007/s11244-018-1115-y

Simulation of the transient thermal response of a high pressure SCR aftertreatment system for a Tier III two-stroke marine diesel engine
Autorzy: Michael Foteinos, Stavros Konstantinidis, Nikolaos Kyrtatos, Kræn Vodder Busk
Opublikowane w: Journal of Engineering for Gas Turbines and Power, 2018, ISSN 0742-4795
Wydawca: American Society of Mechanical Engineers
DOI: 10.1115/1.4042131

Adaptive Power-Split Control Design for Marine Hybrid Diesel Powertrain
Autorzy: Sergey Samokhin, Sotiris Topaloglou, George Papalambrou, Kai Zenger, Nikolaos Kyrtatos
Opublikowane w: Journal of Dynamic Systems, Measurement, and Control, Numer 139/2, 2017, Strona(/y) 021012, ISSN 0022-0434
Wydawca: ASME
DOI: 10.1115/1.4034804

Control-Oriented Compressor Model with Adiabatic Efficiency Extrapolation
Autorzy: Xavier Llamas, Lars Eriksson
Opublikowane w: SAE International Journal of Engines, Numer 10/4, 2017, Strona(/y) 1903-1916, ISSN 1946-3944
Wydawca: SAE
DOI: 10.4271/2017-01-1032

Engine Knock Margin Estimation Using In-Cylinder Pressure Measurements

Autorzy: Giulio Panzani, Fredrik Ostman, Christopher H. Onder
Opublikowane w: IEEE/ASME Transactions on Mechatronics, Numer 22/1, 2017, Strona(/y) 301-311, ISSN 1083-4435
Wydawca: Institute of Electrical and Electronics Engineers
DOI: 10.1109/TMECH.2016.2604920

Adaptive and Unconventional Strategies for Engine Knock Control
Autorzy: Donald Selmanaj, Giulio Panzani, Stijn van Dooren, Jonatan Rosgren, Christopher Onder
Opublikowane w: IEEE Transactions on Control Systems Technology, 2018, Strona(/y) 1-8, ISSN 1063-6536
Wydawca: Institute of Electrical and Electronics Engineers
DOI: 10.1109/tcst.2018.2827898

Model Predictive Control for Hybrid Diesel-Electric Marine Propulsion * *Authors GP, ST, NK gratefully acknowledge the support of EC/DG RTD H2020/HERCULES-2 project, as well as the support of Lloyds Register Foundation, within the LRF NTUA Centre of Excellence in Ship Total Energy-Emissions-Economy, for the development and extension work on the hybrid integrated propulsion powertrain and related
Autorzy: Georgios Papalambrou, Sergey Samokhin, Sotirios Topaloglou, Nikolaos Planakis, Nikolaos Kyrtatos, Kai Zenger
Opublikowane w: IFAC-PapersOnLine, Numer 50/1, 2017, Strona(/y) 11064-11069, ISSN 2405-8963
Wydawca: Elsevier
DOI: 10.1016/j.ifacol.2017.08.2488

Pozostałe produkty badawcze

Pozostałe produkty badawcze dostępne przez OpenAire (1)

Creating a Dynamic Model of a Gas Turbine in the MVEM Framework Using an Ellipse Compressor Model
Autorzy: Hansson, Edvin
Opublikowane w: Linköpings universitet, Fordonssystem

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