INTERNATIONAL PROJECTS 2017

Foreword

Within their scientific research activities, the members of the Faculty of Mechanical Engineering have run and took part in the implementation of many international projects. This publication presents the projects that took place between 2007 and 2017. The featured projects can be divided into those supported under EU funding programmes (e.g., FP6, FP7, H2020), in the framework of multilateral and bilateral cooperation, and those commissioned by companies from abroad. This continued the Faculty of Mechanical Engineering's tradition of contributing to international projects that represent a significant segment of activities conducted by past and present generations of professors and researchers.

Participation in international projects has always been an excellent opportunity to initiate collaboration with colleagues from universities, research institutes, and companies from around the world. In addition to creating conditions for expanding knowledge, this facilitated exchange of experiences and introduction of new methods, software packages, and ways of organizing scientific research activities, as well as development of team work which is of extreme importance.

This publication has been prepared as an electronic document that will be updated with new projects every year. In certain circumstances and if necessary, the publication will be printed.

Over the years, we have had the pleasure of working with colleagues from abroad on different projects, which we hope to continue and grow through new projects.

Belgrade, November 2017

DEPARTMENT

PRODUCTION ENGINEERING

PROJECT TITLE	HUMAN-ROBOT CO-WORKING AS A KEY ENABLING TECHNOLOGY FOR THE FACTORIES OF FUTURE
ACRONYM/ PROJECT ID	PGR02921
FUNDING PROGRAM	Joint research projects within the executive programme of cooperation in the field of science and technology between the Italian Republic and the Republic of Serbia for the years 2016-2018
PROJECT COORDINATOR	Prof. Dr. Calogero Maria Oddo, Sant'Anna, School of Advanced Studies, The BioRobotic Institute, Pisa, Italy
PROJECT COORDINATOR AT UB-FME	Prof. Dr. Petar B. Petrović
PARTICIPANTS FROM UB-FME	Assoc. Prof. Dr. Bozica Bojović, Ivan Danilov, PhD student, Nikola Lukić, PhD student, Miloš Milivojević, PhD Student

PROJECT DESCRIPTION

The envisaged initiative will bolster the bilateral relationships between Italy and Serbia in the domain of advancedmanufacturing technologies, namely robotics, mechatronics and factory automation, following the successful collaborations which were established between the two Countries. This domain is recognized as especially important for fostering technological readiness of Serbian companies and thus enhancing the general ambient for further sustainable development of economic relations through more intensive collaboration and partnerships between Italian and Serbian industrial companies, especially in high-value added manufacturing.

The project addresses human-robot co-working for the factories of the future and is structured along three general objectives: joint research and technological development activities, knowledge transfer via dissemination and educational initiatives, and long term sustainability. Four specific topics will be addressed in the multi-annual RTD plan of the project, covering scientific challenges such as: the achievement of smart manipulation capabilities via robot arms integrated with artificial tactile and proximity sensors, the experimentation of smart sensorized suits for humans and robots to enhance safety in the workplace, the reduction of musculoskeletal loads for the workers via exoskeletons, and the programming of robotic manipulators through multimodal sensory fusion of visuo-proximity-tactile information and cognitive interaction with humans.

With respect to the dissemination and educational objectives, a workshop and a summer school will be organized annually on the topics of the project, with hosting location alternating between Serbia and Italy.

Scientific and technological long-term vision and General Objectives (GOs):
The primary objective for the proposed bilateral collaboration is to support business activities of Italian and Serbian industrial companies operating at Serbian market, by specific knowledge transfer actions which include a well-balanced mixture of research, dissemination and education/training content. According to that, the GOs of the proposed project are chosen to be dominantly focused on industrial/manufacturing technologies innovation through the mechanisms of horizontal technology knowledge transfer between Italy and Serbia, and vertical technology transfer between research and industry. GOs are grouped into 3 action lines:

- GO1: joint development and experimentation of human-robot co-working technologies coherently with the roadmaps traced by the SPARC and FoF EU PPPs.
- GO2: knowledge transfer via periodic educational initiatives with particular focus on advanced manufacturing technologies, namely robotics, mechatronics and factory automation.
- GO3: sustainability of the initiative, by settling up joint laboratories involving research institutions and companies and applying to competitive H2020 EU calls.

INTERNATIONAL PROJECTS

KEY WORDS

Human-Robot Co-Working, Factories of the Future, Human Centered Manufacturing

CONSORTIUM

1. Sant'Anna School of Advanced Studies, The BioRobotic Institute, Pisa, Italy;
2. University of Belgrade, Faculty of Mechanical Engineering, Production Engineering Department, Laboratory for Cyber-Manufacturing Systems, Belgrade, Serbia;
3. Institute of Industrial Technologies and Automation ITIA-CNR, Milan, Italy;
4. AIdAM Associazione Italiana di Automazione Meccatronica, Milan, Italy;
5. Institute Mihailo Pupin, Robotics Laboratory, Belgrade, Serbia

COUNTRIES

2 - Italy, Serbia

DURATION
(start – end)

2016-2018

PROJECT WEBSITE

CONTACT AT UB-FME

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INDUSTRIAL ENGINEERING

PROJECT TITLE
SMART PROCESS INDUSTRY CRANES

ACRONYM/ PROJECT ID
SPRINCE

FUNDING PROGRAM
SAFERA ERA NET

PROJECT COORDINATOR
Assoc. Prof. dr Maria Francesca Milazzo, Universita degli Studi di Messina, Italy

PROJECT COORDINATOR AT UB-FME
Prof. Dr. Vesna Spasojević Brkić

PARTICIPANTS FROM UB-FME
Asst. Tamara Golubovic, Prof. Dr. Nikola Dondur, Prof. Dr. Tasko Maneski

PROJECT DESCRIPTION

The SPRINCE project is based on the idea that crane accidents caused by obstructed view and visual tension problems are preventable, thus it promotes a real-time computer-aided visual feedback and gives its risk assessment. The project aims to find the best platform which can improve the positioning phase performance of industrial cranes by offering high execution speed, ease of integration, low cost, low power consumption, less computer memory and good support with precise position visual guidance (video tracker with web cameras) used to navigate the object into the correct position.

The main goal is to reduce the number of incidents due to situations that can be prevented by promoting a real-time computer-aided visual feedback, based on the following observations:

- typical crane operator interfaces are simple in terms of the number of controls, thus an exceptional sense of its dynamics is needed, including how to effectively stop the moving mass
- there is the necessity to reduce the productivity drop due to human-machine interface problems, the large financial losses due to the cost of accidents, the costs for frequent repairs, the disturbance in material handling schedules and the increased work-load on other equipment and their consequent quicker downtime and break down
- there is a need to manage emerging risks, derived by the increased use of integrated operations/remote operations in process industry and transport of hazardous materials, by means of an improved virtualization technology.

The outputs expected include:

- a platform that allows improvement of the positioning performance of industrial cranes (high execution speed, ease of integration, low cost, low power consumption, less computer memory and good support with precise position visual guidance)
- scalability information, related to the display configuration and the ergonomics, by using and testing different screen types in crane cabins through case studies
- risk indicators which are context specific (derived through the analysis of Italian and Serbian case studies) and operator-specific (account for organizational and human factors by means of the response of operators to the questionnaire).

INTERNATIONAL PROJECTS

KEY WORDS

Risk indicator, industrial crane

CONSORTIUM

1. D epartment of Electronic Engineering, Industrial Chemistry and Engineering, University of Messina, Italy
2. University of Belgrade Faculty of Mechanical Engineering
3. Faculty of Military Technologies, Brno University of Defence, Czech Republic

COUNTRIES

3 - Republic of Italy, Republic of Serbia, Czech Republic

DURATION
(start – end)

2015 - 2017

PROJECT WEBSITE

https://projects.safera.eu/project/15

CONTACT AT UB-FME

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PROJECT TITLE

DEVELOPMENT OF NEW GENERATION OF CRANE CABINS AS INTEGRATED VISUAL SYSTEMS FOR ENVIRONMENTAL DETECTION & INTERPRETATION

ACRONYM/ PROJECT ID

CABIVS

FUNDING PROGRAM

EUREKA

PROJECT COORDINATOR

Prof. Dr. Goran Putnik, Universidade Do Minho, Portugal

PROJECT COORDINATOR AT UB-FME

Prof. Dr. Vesna Spasojević Brkić

PARTICIPANTS FROM UB-FME

Prof. Dr. Nikola Dondur, Prof. Dr. Zorica Veljković, Prof. Dr. Dragan Milanović, Prof. Dr. Aleksandar Žunjic, Prof. Dr. Tasko Maneski, Prof. Dr. Milorad Milovančević, Prof. Dr. Aleksandar Brkić, Asst. Tamara Golubović, Dragan Krstić, M.Sc. Mech.Eng.

PROJECT DESCRIPTION

Human error is the cause of almost 60% of lifting operation related accidents. It is not surprising since crane operators still work in ergonomically unadjusted surrounding with very high visual tension in stressful working conditions due to both physical stress (shocks, vibrations and accelerations), and psychological stress (the sway of the load, extremely low visibility of cranes, etc.). According to previous research results a new solution for crane cabins is needed and it is CABIVS' aim to develop a new generation of crane cabins able to solve the aforementioned problems. The goal is to develop crane cabins as ergonomically adjusted, light weight and integrated visual systems for the detection and interpretation of environment based on the translation of user needs into functional requirements. We propose the following: 1) To develop smaller and lighter ergonomically adjusted crane cabins with appropriate safety features using physical, cognitive and organizational ergonomics and modelling, and static and dynamic calculations using the finite element method 2) To develop integrated visual systems for the detection and interpretation of environment which will solve the operator's visibility problems; 3) To develop a simulation crane cabin, based on Virtual Reality technology, to replicate a real crane cabin together with the instrumentation and control of crane operations for the purposes of training and enhancing the cognitive abilities necessary for the effective and efficient use of integrated vision systems, and 4) To develop a prototype remote control for cranes which will include a remote control console. The main innovative idea behind this project consists of synergetic contributions from the following entities as the main fields of development: a) The development of a model with the minimal dimensions of the cabin where the operator will be accommodated in an ergonomically adjusted way based on an anthropometric study; b) The development of a model for the cabin interior including well-designed controls and the control station layout according to the principles of ergonomics and biomechanics which will ensure good safety features, c) The further optimization of the cabin by designing a light weight cab supporting structure with the application of the finite element method (FEM) for the analysis of load distribution, membrane and bending stresses, strain energy and the distribution of kinetic and potential energy to groups of elements of cab structure; d) The development of visual systems for the detection and interpretation of environment; e) A Virtual Reality based simulation cabin, and f) A crane remote control prototype setup. The most important is the synergetic contribution, which yields solutions to the safety problems on sites where cranes operate. The other benefits of this project lie in offering solutions to the following problems: (I) lower productivity due to human-machine interface problems; (II) large financial and other losses resulting from the direct and indirect costs of the accidents caused;(III) damage to the materials as well as to the material handling equipment; (IV) the unnecessary cost of frequent repairs and consequent loss of production; (V) disturbance in material handling schedules and (VI) an increased work-load on the other equipment and their consequent quicker downtime and break down. The development of CABIVS is a cost-effective solution where financial savings in reducing the weight booth will be used for modernization in the field of control. This new generation of cabins will reduce the human operator's fatigue and stress, increase the productivity of the crane and improve safety and security while decreasing insurance costs, in such a way as to widely and evidently justify the investment costs.

INTERNATIONAL PROJECTS

KEY WORDS

Crane, ergonomics, light weight

CONSORTIUM

1. Universidade Do Minho, Minho, Republic of Portugal
2. University of Belgrade Faculty of Mechanical Engineering, Republic of Serbia
3. Innovation Center of the Faculty of Mechanical Engineering, Republic of Serbia
4. Paralel Planes Lda, Braga, Portugal
5. Vaming d.o.o., Republic of Serbia
6. Electrum d.o.o., Republic of Serbia
7. Protent, Republic of Serbia

COUNTRIES

2 - Republic of Portugal, Republic of Serbia

DURATION
(start – end)

PROJECT WEBSITE

http://www.eurekanetwork.org/project/id/6761

CONTACT AT UB-FME

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PROJECT TITLE

DESIGN AND EVALUATION OF USER INTERFACES FOR DISTANCE COLLABORATIVE MANAGEMENT OF PRODUCTION SYSTEMS

ACRONYM/ PROJECT ID

FUNDING PROGRAM

Bilateral Cooperation

PROJECT COORDINATOR

Prof. Dr. Goran Putnik, Universidade Do Minho, Portugal

PROJECT COORDINATOR AT UB-FME

Prof. Dr. Vesna Spasojević Brkić

PARTICIPANTS FROM UB-FME

Prof. Dr. Dragan Milanović, Prof. Dr. Aleksandar Zunjić

PROJECT DESCRIPTION

Available previous research shows that ergonomics and some human related disciplines have to be added to traditional engineering disciplines to cope with such growing complexity of manufacturing systems. Therefore, the main project objectives are:
a) to develop different end-user interfaces for remote collaborative control of manufacturing systems, in order to support effectiveness and efficiency of the control process in environments of globally distributed factories and
b) to evaluate the designed interfaces in terms of interfaces performance measures considering interaction require ments such as usability, navigation and readability, that include aspects such as friendliness, efficiency, robustness, acceptance, etc.
The main project objectives will be realized through the following phases:
a) Analysis of related works about available interfaces between the Clients, Brokers and UMS from the aspect of screen types and sizes, video-cameras and VC systems
b) Defining the methodology for experimental testing of all types of interfaces (sample size, method, study design)
c) Defining the procedure of experimental testing (task+questionary)
d) Statistical data analysis (usage of ANOVA, factor analysis etc. for explaining the differences and generalizing the results)
e) Results discussion and conclusions development – evaluation of interfaces from the aspect of performance measures
f) Ideas for future work in the field.

The most important results of this project include exact quantitative evaluation of interfaces in manufacturing control from the aspects of interaction requirements (usability, navigation and readability, as well as the aspects of friendliness, efficiency, robustness, acceptance friendliness, efficiency, robustness, acceptance, etc.), and recommendations for their usage. Quality, innovative approach and original scientific objectives of this project:
a) Offer a solution to the priority problems of user interfaces in the field of collaborative remote control of manufacturing systems,
b) Encourage further networking and regional integration and new bilateral and international projects, in order to implement an experiment on a larger sample of participants
c) Require the inclusion of a greater number of younger scholars.

Actuality of this project is reflected in the design and evaluation of user interfaces for collaborative remote control, as under-researched area. A similar, multi-disciplinary research is rarely carried out and is rarely available. That is the reason why expected results include new projects application (FP7), papers publication on conferences and in journals with IF, book chapters, seminars for academic community and industry etc.

INTERNATIONAL PROJECTS

KEY WORDS

User interface, collaboration, production

CONSORTIUM

1. Universidade Do Minho, Minho, Republic of Portugal,
2. University of Belgrade Faculty of Mechanical Engineering, Republic of Serbia

COUNTRIES

2 - Republic of Portugal, Republic of Serbia

DURATION
(start – end)

2011 - 2012

PROJECT WEBSITE

http://www.mpn.gov.rs/medjunarodna-naucna-saradnja/portugal/

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THEORY OF MECHANISMS AND MACHINES

PROJECT TITLE
HUMAN-TOOL INTERACTION NETWORK

ACRONYM/ PROJECT ID
HUTON

FUNDING PROGRAM
Tempus

PROJECT COORDINATOR
Prof. Dr. Aleksandar Sedmak, University of Belgrade Faculty of Mechanical Engineering, Serbia

PROJECT COORDINATOR AT UB-FME
Prof. Dr. Aleksandar Sedmak

PARTICIPANTS FROM UB-FME
Prof. Dr. Ljubomir Miladinović, Prof. Dr. Aleksandar Veg, Asst. Prof. Dr. Emil Veg

PROJECT DESCRIPTION
The technological developments, especially in the domain of health, in parallel with the growth and integration of information and communication technologies in the life play today an important role in the restructuring of the whole area of the Southeast Europe.

This curriculum development project aims at providing educational background, dedicated to the following two aspects being of a general importance for the Republic of Serbia (RS):
1. Development of a modern and efficient evidence based rehabilitation services integrated into an improved health-care system based on up-to-date medical technologies; and
2. Provision of know-how to professionals for the optimized use of new technologies in rehabilitation and assistance to elderly population communication technologies.

KEY WORDS
walkaround, human sensors, human tools, rehabilitation

CONSORTIUM
1. University of Belgrade (multiple partners), Republic of Serbia
2. University of Novi Sad, Faculty of Technical Sciences, Republic of Serbia
3. State University of Novi Pazar, Republic of Serbia
4. Clinic for rehabilitation "Dr Miroslav Zotović", Republic of Serbia
5. Child and Youth Health Care Institute of Vojvodina, Republic of Serbia
6. Special Hospital for treatment of Neuromuscular Diseases NP, Republic of Serbia
7. University of Ljubljana, Republic of Slovenia
8. University of Genoa, Republic of Italy
9. University of Patras, Hellenic Republic

COUNTRIES
Republic of Serbia, Republic of Slovenia, Republic of Italy, Hellenic Republic

DURATION (start – end)
2013-2016

PROJECT WEBSITE
http://www.huton.org/

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THERMAL POWER ENGINEERING

PROJECT TITLE
FLEXIBLE FOSSIL POWER PLANTS FOR THE FUTURE ENERGY MARKET THROUGH NEW AND ADVANCED TURBINE TECHNOLOGIES

ACRONYM/ PROJECT ID
FLEXTURBINE

FUNDING PROGRAM
HORIZON2020

PROJECT COORDINATOR
Dr. Lubos Prchlik, Doosan Škoda Power, Czech Republic

PROJECT COORDINATOR AT UB-FME
Prof. Dr. Milan Petrović

PARTICIPANTS FROM UB-FME
Prof. Dr. Milan Petrović, Asst. Prof. Dr. Milan Banjac, Miloš Ranković, M.Sc. Mech. Eng., Asst. Srdjan Milić, Asst. Srećko Nedeljković, Mag. Dejan Djukanović

PROJECT DESCRIPTION

FLEXTURBINE will lead to innovations able to enter into service before the end of this decade underpinning the overall ambition of the consortium to deliver solutions enabling flexible operation of thermal power plants and thus a more flexible electricity grid. This desired grid flexibility will not be possible by optimising power distribution on the grid alone. It will also need technical developments of the plants themselves to allow highly flexible operation.
FLEXTURBINE expects to deliver the following (technical) results:
Improved aero-mechanical stability of large aspect ratio turbine blades

- Improved design of flutter-free blades
- Allowing turbines to support fast start-ups and the load ramps required
- Improvement of the steam turbine performance

Improved seal and bearing design

- Increase in efficiency by 0.5 points by better understanding the displacement mechanism in transient turbo machinery operating conditions
- Lower secondary flows (leakages between combustor and turbine could either be translated by a reduced NOx level (-15% for 1% leakage reduction) or an increase in Hot
- Gas Temperature (+10 K) leading to an additional improved efficiency of 0.2 points
- Increasing the equivalent operating hours between service intervals by 30% to 50%

Improved fatigue life time method

- Improved life time method development program
- Improved failure prediction to immediately reduce maintenance cost through more flexible service intervals and maintenance scheduling

Thanks to the results of FLEXTURBINE, the European turbine OEMs will be able to build power plants capable of better complying with the requirements of a safer and greener power production strategy allowing the final utilities to operate without risks of any forced outage of the plants. Moreover, FLEXTURBINE will provide new and cost-effective solutions for highly flexible new and existing power plants.

FLEXTURBINE technologies will be compatible with existing infrastructure without impeding CCS (Carbon Capture & Storage) readiness.

INTERNATIONAL PROJECTS

FLEXTURBINE will improve the innovation capacity and integration of new knowledge, as FLEXTURBINE innovations will be part of the next generation turbine design, targeting an entry into service by 2020.
Finally, FLEXTURBINE will give competitive advantages to the European industry in multiple views:

- Improved bearing design is estimated to result in power loss reduction potential for a utility CCPP steam turbine as high as 200 kW, which, at evaluation factors of 800-1500€/kW, can equal up to 300 000 € business benefit and an estimated increase of plant efficiency of 0.1%.
- Improved seal design for flexible operation will result in reduced wear and leakage flows at key locations by up to 80% with an associated efficiency increase of 0.5 points.
- Extended lifecycles of power generating units support the grid stability with the impact of less outages and less stand-still. Higher lifecycles of parts mean less resources are required to produce replacement parts. This reduces costs of operation and hence, costs of energy production.
- Reduced leakages increase power units efficiency, and hence, result in lower fuel consumption in the power generating industry and finally less costs for the energy consumers.

KEY WORDS

steam turbines, gas turbines, fossil power plant, flexible operation

CONSORTIUM

1. NUOVO PIGNONE SRL
2. ARTTIC
3. DOOSAN SKODA POWER SRO
4. POLITECNICO DI MILANO
5. LULEA TEKNISKA UNIVERSITET
6. TECHNISCHE UNIVERSITAT DARMSTADT
7. GENERAL ELECTRIC DEUTSCHLAND HOLDING GMBH
8. UNIVERSITY OF BELGRADE - FACULTY OF MECHANICAL ENGINEERING
9. KARLSRUHER INSTITUT FUER TECHNOLOGIE
10. LINKOPINGS UNIVERSITET
11. TECHNISCHE UNIVERSITAET DRESDEN
12. RUHR-UNIVERSITAET BOCHUM
13. MAN DIESEL & TURBO SE
14. ZAPADOCESKA UNIVERZITA V PLZNI
15. UNIVERSITA DEGLI STUDI DI FIRENZE
16. TECHNISCHE UNIVERSITAET MUENCHEN
17. GENERAL ELECTRIC (SWITZERLAND) GMBH
18. COMTES FHT AS
19. ANSALDO ENERGIA SPA
20. ANSALDO ENERGIA SWITZERLAND AG
21. SIEMENS AKTIENGESELLSCHAFT
22. CESKE VYSOKE UCENI TECHNICKE V PRAZE
23. UNIVERSITA DI PISA

COUNTRIES

Republic of Italy, Republic of France, Federal Republic of Germany, Republic of Serbia, Chech Republic, Kingdom of Sweden, Swiss Confederation

DURATION
(start – end)

2016 - 2018

PROJECT WEBSITE

http://www.flexturbine.eu/

CONTACT AT UB-FME

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flexturbine
powerplant technologies

PROJECT TITLE	FLOW ANALYSIS AND PERFORMANCE CALCULATION OF A NEW SIEMENS GAS TURBINE
ACRONYM/ PROJECT ID	
FUNDING PROGRAM	Industry research project
PROJECT COORDINATOR	Siemens Mellinghofer Str. 55, 45473 Mülheim/Ruhr, Germany
PROJECT COORDINATOR AT UB-FME	Prof. Dr. Milan Petrović
PARTICIPANTS FROM UB-FME	Prof. Dr. Milan Petrović
PROJECT DESCRIPTION	In scope of the aerodesign of the Siemens new gas turbine SGT8000H, the calculation of flow, performance prediction, off design behavior prediction, behavior of the turbine in region of power limit.
KEY WORDS	gas turbines, aerodesign
CONSORTIUM	2
COUNTRIES	Republic of Serbia, Federal Republic of Germany
DURATION (start – end)	2009-2013
PROJECT WEBSITE	
CONTACT AT UB-FME	mpetrovic@mas.bg.ac.rs

INTERNATIONAL PROJECTS

PROJECT TITLE	AERODYNAMIC CALCULATION OF SIEMENS GAS TURBINE SGT4000F
ACRONYM/ PROJECT ID	
FUNDING PROGRAM	Industry research project
PROJECT COORDINATOR	Siemens Mellinghofer Str. 55, 45473 Mülheim/Ruhr, Germany
PROJECT COORDINATOR AT UB-FME	Prof. Dr. Milan Petrović
PARTICIPANTS FROM UB-FME	Prof. Dr. Milan Petrović
PROJECT DESCRIPTION	In scope of the aerodesign of the Siemens new gas turbine SGT8000H, the calculation of flow, performance prediction, off design behavior prediction, behavior of the turbine in region of power limit.
KEY WORDS	gas turbines, aerodesign
CONSORTIUM	2
COUNTRIES	Republic of Serbia, Federal Republic of Germany
DURATION (start – end)	2009-2013
PROJECT WEBSITE	
CONTACT AT UB-FME	mpetrovic@mas.bg.ac.rs

PROJECT TITLE	PERFORMANCE TEST CONCERNING IP TURBINE EFFICIENCY IN TE MORAVA
ACRONYM/ PROJECT ID	
FUNDING PROGRAM	Industry research project
PROJECT COORDINATOR	GE Power sp. zoo, Al. Jana Pawela II nr 12 , 00-124 Warszawa, Branch in Elblag, ul. Stoczniowa 2. 82-300 Elblag, Poland
PROJECT COORDINATOR AT UB-FME	Prof. Dr. Milan Petrović
PARTICIPANTS FROM UB-FME	Prof. Dr. Milan Petrović, Asst. Srdjan Milić, Asst.Prof. Dr. Milan Banjac, Asst. Srećko Nedeljković, Mag. Dejan Djukanović, Miloš Ranković, M.Sc. Mech. Eng.
PROJECT DESCRIPTION	The new IP part of the steam turbine delivered by GE Power was installed in TE Morava in November 2015. The performance tests were carried out in October 2016. witrh the aim to determine the efficiency of the new IP turbine. The tests were performed by the Faculty of Mechanical Engineering, Belgrade. The test results shows that the guarantee was fulfilled.
KEY WORDS	steam turbines, peformance tests
CONSORTIUM	2
COUNTRIES	Republic of Serbia, Republic of Poland
DURATION (start – end)	2016
PROJECT WEBSITE	
CONTACT AT UB-FME	mpetrovic@mas.bg.ac.rs

INTERNATIONAL PROJECTS

PROJECT TITLE
PERFORMANCE GUARANTEE TEST ON IP TURBINE IN TPP NIKOLA TESLA B2

ACRONYM/ PROJECT ID

FUNDING PROGRAM
Industry project

PROJECT COORDINATOR
GE Power AG Boveristr. 22
D-68309 Mannheim, Germany

PROJECT COORDINATOR AT UB-FME
Prof. Dr. Milan Petrović

PARTICIPANTS FROM UB-FME
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PROJECT DESCRIPTION
After installation of the IP turbine in TPP Nikola Tesla in November 2016, a performance test was carried out with the aim to determine efficiency of new IP turbine. Test was carried out by the Faculty of Mechanical Engineering, Belgrade. The test results show that the guarantee was fulfilled.

KEY WORDS
steam turbines, peformance tests

CONSORTIUM
2

COUNTRIES
Republic of Serbia, Federal Republic of Germany

DURATION
(start – end)
2016 – 2017

PROJECT WEBSITE

CONTACT AT UB-FME
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PROJECT TITLE
FINE OPTIMIZATION OF THE FLOW PATH OF A 14 STAGE STEAM TURBINE AND OPTIMIZATION OF THE STACKING OF THE LAST 3 STAGES

ACRONYM/ PROJECT ID

FUNDING PROGRAM
Industry project

PROJECT COORDINATOR
Escher Tec AG Technoparkstrasse 1, CH - 8005 Zürich , Switzerland

PROJECT COORDINATOR AT UB-FME
Prof. Dr. Milan Petrović

PARTICIPANTS FROM UB-FME
Prof. Dr. Milan Petrović, Asst. Prof. Dr. Milan Banjac, Miloš Ranković, M.Sc. Mech. Eng., Asst. Srdjan Milić, Asst. Srećko Nedeljković, Mag. Dejan Djukanović

PROJECT DESCRIPTION
For given thermodynamic inlet conditions, back pressure, rotational speed, extraction mass flow as well as the pressure at which each extraction an industrial steam turbine should be designed.
In scope of this task the fine optimization of the turbine and and optimization of the stacking of the last 3 stages should be performed.

Starting baseline geometry with: flow path hub and tip geometry at all LE and TE edges as well as inlet and outlet (diffuser extension), exit angle, radial clearances standard values, pitch/chord ratios, chord length at the mid radius and blade count, radial clearances and type of sealing (shrouded/unshrouded) is specified. The provided case is comprised of 14 stages (14 stators and 14 rotors).

KEY WORDS
steam turbines, peformance tests

CONSORTIUM
2

COUNTRIES
Republic of Serbia, Swiss Confederation

DURATION
(start – end)
2017 – ongoing

PROJECT WEBSITE

CONTACT AT UB-FME
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PROJECT TITLE
3D CALCULATION OF FLOW THROUGH A SINGLE BLADE ROW INCLUDING LABYRINTH SEALS

ACRONYM/ PROJECT ID

FUNDING PROGRAM
Industry project

PROJECT COORDINATOR
Escher Tec AG Technoparkstrasse 1, CH - 8005 Zürich , Switzerland

PROJECT COORDINATOR AT UB-FME
Prof. Dr. Milan Petrović

PARTICIPANTS FROM UB-FME
Prof. Dr. Milan Petrović, Asst. Prof. Dr. Milan Banjac, Miloš Ranković, M.Sc. Mech. Eng., Asst. Srdjan Milić, Asst. Srećko Nedeljković, Mag. Dejan Djukanović

PROJECT DESCRIPTION
For given thermodynamic inlet conditions, back pressure, rotational speed, Two cases are foreseen namely:
a) a standard blade and labyrinth with 3 castallations and 3 seals,
b) the same blade placed asymmetrically on the shroud including 5 castellations and 5 seals
Target:

- To determine the flow coefficient of the labyrinth cavity in both cases
- To demonstrate the effectivity of the asymmetric shroud arrangement and make sure that the benefit is not out-weighed by additional secondary loss
- To determine the leakage mass flow
- To determine the overall loss

Modelling and Mesh topology, mesh quality and resolution, as well as all numerical aspects such as the most appropriate turbulence model to be used, is completely left under the responsibility and competencies of the Laboratory.

KEY WORDS
steam turbines, peformance tests

CONSORTIUM
2

COUNTRIES
Republic of Serbia, Swiss Confederation

DURATION (start – end)
2017 – ongoing

PROJECT WEBSITE

CONTACT AT UB-FME
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PROCESS AND ENVIRONMENTAL PROTECTION ENGINEERING

PROJECT TITLE
QUALITY IMPROVEMENT OF MASTER PROGRAMS IN SUSTAINABLE ENERGY AND ENVIRONMENT

ACRONYM/ PROJECT ID
QIMSEE

FUNDING PROGRAM
International Relations Office of the Ministry of Foreign Affairs of the Kingdom of Norway - Programme in Higher Education, Research and Development (HERD) in the Western Balkans – Energy sector

PROJECT COORDINATOR
Norwegian University of Science and Technology, Norway

PROJECT COORDINATOR AT UB-FME
Prof. Dr. Aleksandar Jovović

PARTICIPANTS FROM UB-FME
Prof. Dr. Aleksandar Jovović, Prof. Dr. Dejan Radić, Prof. Dr. Dragoslava Stojiljković, Prof. Dr. Nenad Zrnić, etc.

PROJECT DESCRIPTION

This project aims to contribute to educating a national work force at WB countries that has adequate innovative qualifications in the energy sector by building sustainable capacity of higher education institutions. The project is a continuation and it builds up on results obtained in the project "Sustainable Energy and Environment in the Western Balkans" recently conducted under the same HERD Programme. The project specific objectives are to:

- develop and establish three new internationally recognized master study programs for the field of "Sustainable Energy and Environment", at University of Banja Luka, University of Skopje and University of Montenegro,
- establish close cooperation between WB participants for mutual support in achieving better quality of master studies,
- increase the quality of the newly established master programs at four WB Universities in order to enable international transparency, recognition of qualifications and international mobility of learners and graduates. The tree new network members will also participate in all quality improvement processes,
- contribute to the development of outstanding and innovative master thesis projects that solves problems of industry and public sector in achieving energy and resource efficiency and/or zero emissions, application or research on new materials and new technologies for renewable energy,
- increase institutional quality and capacity of the WB Universities in the field of teaching staff improvement,
- laboratory organization and logistics, networking and supplementing expertise's to match closer to the Norwegian partners,
- establish and support interconnection of the WB Universities with industry and public sector in the WB region.

KEY WORDS
Quality, Master, Sustainable, Energy, Environment

CONSORTIUM
University of Tuzla, Tuzla, Bosnia and Herzegovina
- University of East Sarajevo, Lukavica, Republic of Srpska, Bosnia and Herzegovina
- University of Banja Luka, Banja Luka, Republic of Srpska, Bosnia and Herzegovina
- University of Belgrade, Belgrade, Serbia
- University of Montenegro, Podgorica, Montenegro
- Ss. Cyril and Methodius University in Skopje, Skopje, Macedonia
- Sør-Trøndelag University College, Trondheim, Norway

COUNTRIES
Bosnia and Herzegovina, Republic of Srpska, Bosnia and Herzegovina, Republic of Serbia, Republic of Montenegro, Republic of Macedonia, Kingdom of Norway.

DURATION (start – end)
2014. - 2017.

PROJECT WEBSITE

CONTACT AT UB-FME
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PROJECT TITLE
SECOND NATIONAL COMMUNICATION TO THE UNFCCC FOR SERBIA AND SERBIA'S FIRST BIENNIAL UPDATE REPORT

ACRONYM/ PROJECT ID
SNC - FBUR

FUNDING PROGRAM
The United Nations Development Programme (UNDP) and Global Environmenatal Fund (GEF)

PROJECT COORDINATOR
UNDP Serbia

PROJECT COORDINATOR AT UB-FME
Prof. Dr. Aleksandar Jovović

PARTICIPANTS FROM UB-FME
Asst. Prof. Dr. Dušan Todorović, Prof. Dr. Dejan Radić, Asst. Prof. Dr. Marko Obradović, Prof. Dr. Miroslav Stanojević, Prof. Dr. Dragoslava Stojiljković

PROJECT DESCRIPTION

The Second National Communication to the UNFCCC for Serbia project aims to enable the Republic of Serbia to prepare and submit its Second National Communication (SNC) to the Conference of the Parties of the UNFCCC according to Decision 17/CP.8 and other guidance provided. The SNC will update and strengthen information provided in the Initial National Communication regarding national circumstances, greenhouse gas inventories, climate change mitigation, vulnerability to climate change and steps taken to adapt to climate change, information on public awareness, education, training, systematic research and observation and technology transfer.

The Serbia's First Biennial Update Report project aims to enable the Republic of Serbia to prepare and submit its First Biennial Update Report (FBUR) to the Conference of the Parties of the UNFCCC according to Decision 2/CP.17. The FBUR will update and strengthen information provided regarding national circumstances, greenhouse gas inventories, climate change mitigation, as well as identify constraints, gaps, and financial, technology and capacity building needs. The FBUR will also result in appropriate arrangements for domestic Measurement, Reporting and Verification.
The preparation of the SNC and the FBUR will support achievement of the national environmental objectives in several ways, i.e. it will enhance the ability of Serbia to participate actively in addressing the global environmental threat of climate change, while developing capacity in climate change-related research and analysis that can support effective environmental policies and provide important data related to environmental challenges to sustainable development in Serbia that go beyond climate change.

Enhancing the framework for implementation of mitigation measures is part of project activities, including design and delivery of a set of policies and mitigation measures aimed at integrating climate change into the country's development strategy and sector programs.

The projects will also contribute to the development and enhancement of national capacities in fulfilling the country's commitments to the Convention on a continuing basis, as well as enhance general awareness and knowledge of government planners on issues related to climate change and limitation of greenhouse gas emissions, thus enabling them to take due consideration and mainstream climate change issues while programming the national development agenda and priorities.

KEY WORDS
climate change, SNC, FBUR, GHG,

CONSORTIUM
University of Belgrade, Faculty of Mechanical Engineering , Serbia
EKONERG – Energy Research and Environmental Protection Institute , Croatia

COUNTRIES
2 - Republic of Serbia, Republic of Croatia

DURATION (start – end)
2014 – 2015

PROJECT WEBSITE
https://www.klimatskepromene.rs/

CONTACT AT UB-FME
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INTERNATIONAL PROJECTS

PROJECT TITLE	SUSTAINABLE ENERGY AND ENVIRONMENT IN THE WESTERN BALKANS
ACRONYM/ PROJECT ID	SEEWB
FUNDING PROGRAM	International Relations Office of the Ministry of Foreign Affairs of the Kingdom of Norway - Programme in Higher Education, Research and Development (HERD) in the Western Balkans – Energy sector
PROJECT COORDINATOR	Norwegian University of Science and Technology, Norway
PROJECT COORDINATOR AT UB-FME	Prof. Dr. Goran Jankes
PARTICIPANTS FROM UB-FME	Prof. Dr. Aleksandar Jović, Prof. Dr. Dejan Radić, Asst. Prof. Dr. Marko Obradović, Prof. Dr. Miroslav Stanojević, etc.
PROJECT DESCRIPTION	The collaborative project "Sustainable Energy and Environment in Western Balkans" aims to develop and establish five new internationally recognized MSc study programs for the field of "Sustainable Energy and Environment", one at each of the five collaborating universities in three different WB countries. The scientific objective of the project is to contribute to development of sustainable and environmentally friendly energy systems in WB countries. In the long term this support the economic and social development of the region.
KEY WORDS	Sustainable, Energy, Environment, Western Balkans
CONSORTIUM	Norwegian University of Science and Technology, Faculty of Engineering Science and Technology, Department of Energy and Process Engineering University of Belgrade, Faculty of Mechanical Engineering, Department for Process Engineering University of East Sarajevo, Study program for technical disciplines, Faculty of Mechanical Engineering University of Sarajevo, Faculty of Mechanical Engineering University of Tuzla (UNTZ)
COUNTRIES	5 - Republic of Serbia, Kingdom of Norway, Bosnia and Herzegovina, Republic of Srpska, Bosnia and Herzegovina, Republic of Croatia
DURATION (start – end)	2011-2014
PROJECT WEBSITE	
CONTACT AT UB-FME	ajovovic@mas.bg.ac.rs

PROJECT TITLE
GLOBAL MARKET TRANSFORMATION FOR EFFICIENT LIGHTING

ACRONYM/ PROJECT ID
En.lighten initiative

FUNDING PROGRAM
United Nations Environment Programme "UNEP"

PROJECT COORDINATOR
United Nations Environment Programme "UNEP" Regional Office for Europe
11-13 Chemin des Anémones, CH-1219 Chatelaine, Geneva, Switzerland

PROJECT COORDINATOR AT UB-FME
Prof. Dr. Aleksandar Jovović

PARTICIPANTS FROM UB-FME
Asst. Prof. Dr. Dušan Todorović, Prof. Dr. Dejan Radić, Asst. Prof. Dr. Marko Obradović, Prof. Dr. Miroslav Stanojević

PROJECT DESCRIPTION
The United Nations Environment Programme (UNEP) project entitled "Global Market Transformation for Efficient Lighting" (or: en.lighten initiative) aims at accelerating global market transformation to environmentally sustainable lighting technologies by developing a coordinated global strategy and providing technical support for the phase-out of inefficient lighting. This will reduce global greenhouse gas emissions from the lighting sector and mercury release from associated fossil fuel combustion. The efforts supported within this project will lead to a raised understanding of energy saving effects from the increase in efficiency of lighting through the demonstration activity.
The project has convened governments and lighting experts from over 40 international organisations to deliver guidance on the development and successful implementation of national and regional efficient lighting strategies. A global target of 2016 has been set for all countries to have phased out, be in process of phasing out, or have policies in place to phase-out inefficient incandescent lamps.
A national team, formed within the en.lighten initiative, that includes representatives from the University of Belgrade Faculty of Mechanical Engineering, Ministry of Energy, Development and Environmental Protection of Republic of Serbia and the company OSRAM, with active support of UNEP, had identified Atrium A of University of Belgrade Faculty of Mechanical Engineering, as the first demonstration site in Serbia.

The replacement of all inefficient lighting in the Atrium will result in saving, annually, up to 75 per cent of the electricity consumption and will lead to the reduction of 63.4 tonnes CO2 emissions per year, compared to the previous situation. This pilot project is a step in the right direction, a first demonstration project within the en.lighten initiative that could be replicated in the country, paving the way towards efficient lightening in Serbia

KEY WORDS
efficient lightening, environmentally sustainable lighting technologies, CO^2

CONSORTIUM
1. United Nations Environment Programme "UNEP",
2. Ministry of Development and Environmental Protection of Republic of Serbia,
3. University of Belgrade Faculty of Mechanical Engineering,
4. OSRAM GmbH.

COUNTRIES
3 - Republic of Serbia, Germany, UNEP Europe (Switzerland)

DURATION (start – end)
2012 – 2013

PROJECT WEBSITE
http://www.enlighten-initiative.org/

CONTACT AT UB-FME
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INTERNATIONAL PROJECTS

PROJECT TITLE
SUSTAINABLE MATERIALS AND PRODUCTS FROM POULTRY FEATHER WASTES

ACRONYM/ PROJECT ID
FEVAL

FUNDING PROGRAM
EUREKA

PROJECT COORDINATOR
University of Maribor – Faculty of Technology

PROJECT COORDINATOR AT UB-FME
Prof.Dr.Aleksandar Jovović

PARTICIPANTS FROM UB-FME
Prof. Dr.Aleksandar Jovović, Prof. Dr. Dragoslava Stojiljković, Prof. Dr. Dejan Radić, Asst. Prof. Dr. Nebojša Manić, Asst. Prof. Dr. Dušan Todorović, Asst. Prof. Dr.Vladimir Jovanović, etc.

PROJECT DESCRIPTION
The main objective of this project is to perform a wide study of the possibilities of achieving "zero waste" concept in feather wastes of poultry industry, i.e. use of waste feather in development and production of various types of side products of higher added value.

KEY WORDS
Sustainable, Material, Poultry, Waste

CONSORTIUM
Belgrade University/ Faculty Of Technology And Metallurgy, Serbia, Intelectro Iasi Srl, Romania,
Icecon S.a., Romania, Peleti D.o.o., Serbia, Milbis Agrar D.o.o., Serbia,
Oikos, Svetovanje Za Razvoj, D.o.o., Slovenia, Perutnina Ptuj, D.d., Slovenia
Belgrade University / Faculty Of Mechanical Engineering, Serbia

COUNTRIES
Republic of Serbia, Republic of Slovenia, Romania

DURATION
(start – end)
2010-2013

PROJECT WEBSITE

CONTACT AT UB-FME
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THERMOMECHANICS

PROJECT TITLE	INNOVATIVE USES OF LOW-TEMPERATURE GEOTHERMAL RESOURCES IN SOUTH EAST EUROPE
ACRONYM/ PROJECT ID	GeoSEE
FUNDING PROGRAM	South East Europe Transational Cooperation Programme
PROJECT COORDINATOR	Bostjan Krajnc, KSSENA, Velenje, Slovenia
PROJECT COORDINATOR AT UB-FME	Prof. Dr. Mirko Komatina
PARTICIPANTS FROM UB-FME	
PROJECT DESCRIPTION	The GeoSEE project involves 16 partners from 8 countries and will run for 24 months between December 2012 and December 2014. From a technological point of view, GeoSEE intends to demonstrate that innovative and sustainable uses of low-temperature (also called low-enthalphy) geothermal resources (less than 150°C) are possible when they are combined with further renewable sources to provide solutions for heating/cooling and electricity production. These hybrid uses will contribute to making the utilization of lower temperature geothermal fluids more economically viable and reduce business risk thus improving market pull and attracting private investors. From a technological point of view, GeoSEE intends to demonstrate that innovative and sustainable uses of low-temperature (also called low-enthalphy) geothermal resources (less than 150°C) are possible when they are combined with further renewable sources to provide solutions for heating/cooling and electricity production. These hybrid uses will contribute to making the utilization of lower temperature geothermal fluids more economically viable and reduce business risk thus improving market pull and attracting private investors. With its concrete actions and pilot demonstration projects GeoSEE will define a methodology and a strategic framework that will contribute to the implementation of the paradigm shift on the energy market which represents one of the main priorities of the 20-20-20 targets set by the European Energy and Climate Change Policy. The final stages of GeoSEE also include actions and analyses aimed at informing policy makers about the benefits of adopting and utilizing low temperature geothermal energy.
KEY WORDS	Geothermal, renewable sources, heating/cooling, electricity production.
CONSORTIUM	LP KSSENA(Slovenia), ERDF PP1 TESAF(Italy) ERDF PP2 IGR(Romania)ERDF PP3 UM(Slovenia) ERDF PP4 PADUA(Italy) ERDF PP5 REAP (Bulgaria) ERDF PP6 SORO (Hungary) ERDF PP7 CEV(Italy) ERDF PP8 BP18 (Hungary) IPA-I PP1 REAN(Croatia) IPA-I PP2 MF(Serbia) IPA-I PP3 KOCANI(Former Yugoslav Republic of Macedonia) EU ASP1 PRA(Bulgaria) EU ASP2 NND (Hungary) OP1 EZS (Slovenia) OP2 KRIZ (Croatia) OP3 MOL(Croatia)
COUNTRIES	8 - Republic of Italy, Republic of Slovenia, Republic of Bulgaria, Hungary, Republic of Croatia, Republic of Serbia, Republic of Macedonia
DURATION (start – end)	2012 - 2014
PROJECT WEBSITE	http://www.geosee.eu/project-partners/
CONTACT AT UB-FME	mkomatina@mas.bg.ac.rs

PROJECT TITLE
SMART BUILDING – SMART GRID – SMART CITY

ACRONYM/ PROJECT ID
DTP1-502-3.2 3Smart

FUNDING PROGRAM
Interreg Danube Transanational Programme

PROJECT COORDINATOR
Prof. Dr. Mario Vašak, University of Zagreb Faculty of Electrical Engineering and Computing

PROJECT COORDINATOR AT UB-FME
Prof. Dr. Mirko Komatina

PARTICIPANTS FROM UB-FME

PROJECT DESCRIPTION

Current tendencies in the Danube Region (DR) to integration of energy-efficiency (EE) measures and renewable energy (RE) are not followed by EE&RE adequate interactions to enable cost-optimal operation of the building as a whole. Distribution system operators (DSOs) are reluctant in allowing additional capacities of intermittent RE in the grid as they engage investments into the grid and a costly reserve for secure operation. DSOs are interested in introducing coordinated energy exchange with prosumers through dynamically changing conditions, e.g. via optimized price profiles for netto energy exchange. Currently neither of the countries in the DR has regulatory/technology framework developed for inception of building-grid cross-spanning energy management schemes.

The main objective of the 3Smart project is to provide a technological and legislative setup for cross-spanning energy management of buildings, grids and major city infrastructures in the DR. It will provide optimal economical value to EE&RE investment in the building and optimized costs on the grid side and motivate installation of distributed storages for improving energy security in the DR.

The project outputs are: (i) Modular software tool for energy management on building and distribution grid side, (ii) Five pilot actions in different DR countries including buildings and grids with intersected technology/regulatory setups and (iii) Strategy to enable city-wide energy management at the regulatory level in the DR.
Main target groups are regulatory energy agencies/ministries (for updating regulatory set-up), DSOs and suppliers (improving grid effectiveness), local authorities and regional energy agencies (reducing RoI for investments in RE&EE); R&D institutions (new modules development).

Major innovative moment is in vertical two-way synchronization through all the modules via simple interfaces to attain optimal operation of the buildings and the grid, and easy modules add-on to the existing systems.

KEY WORDS
Geothermal, renewable sources, heating/cooling, electricity production.

CONSORTIUM
University of Zagreb Faculty of Electrical Engineering and Computing, Hrvatska elektroprivreda d.d., E 3, ENERGETIKA, EKOLOGIJA, EKONOMIJA, d.o.o., Municipality Idrija, Elektro Primorska d.d., European Centre for Renewable Energy Güssing Ltd., Municipality of Strem, Energy Güssing Ltd., University of Debrecen, E.ON Tiszántúli Áramhálózati Zrt., University of Belgrade Faculty of Mechanical Engineering, JP Elektroprivreda Hrvatske Zajednice Herceg Bosne, University of Mostar Faculty of Mechanical Engineering and Computing, Croatian Energy Regulatory Agency, Jožef Stefan Institute, Goriška Local Energy Agency, Regulatory Commission for Energy in Federation of Bosnia and Herzegovina, Hungarian Energy and Public Utility Regulatory Authority.

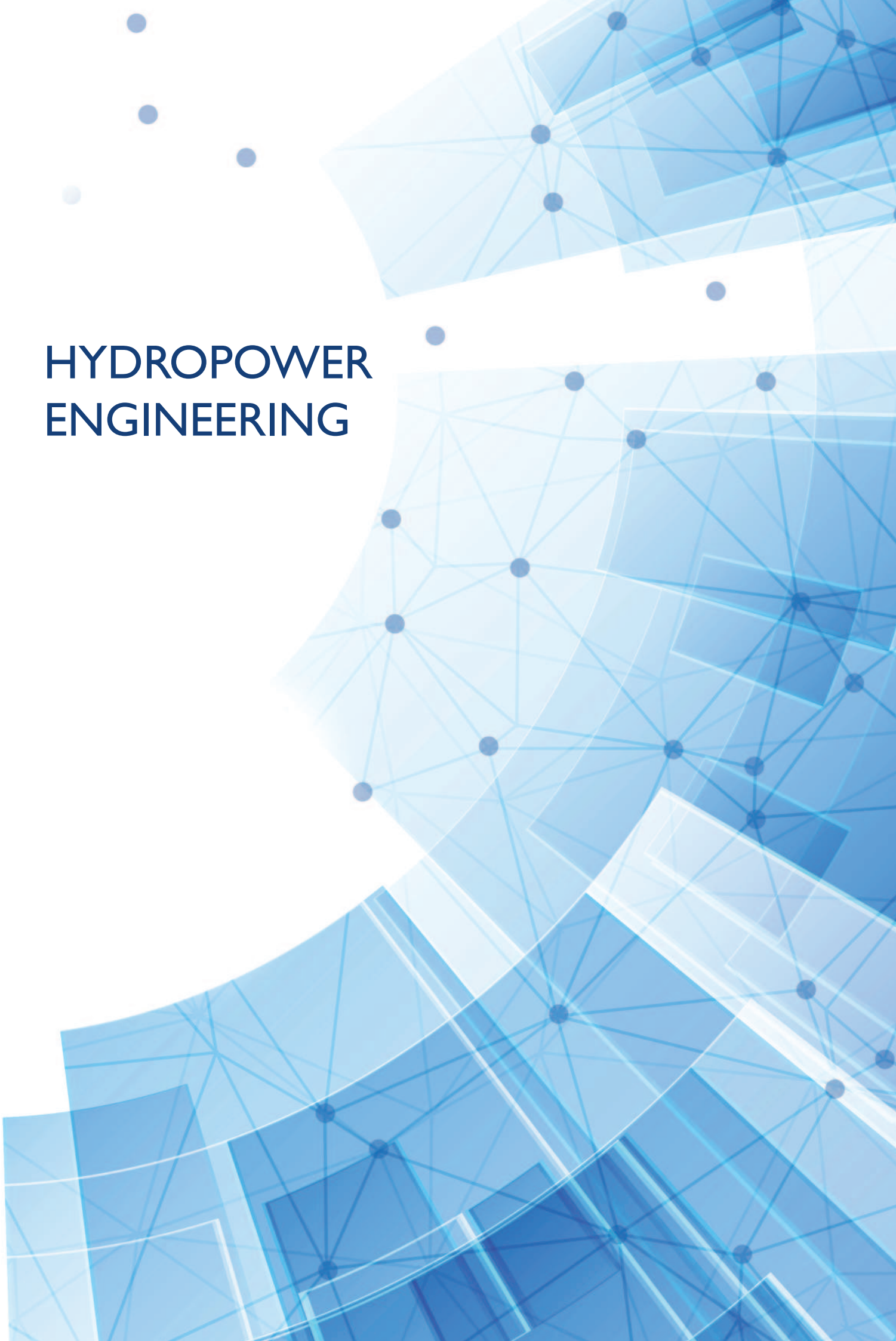
COUNTRIES
6 - Republic of Croatia, Republic of Slovenia, Republic of Austria, Hungary, Republic of Serbia, Republic of Srpska, Bosnia and Herzegovina

DURATION (start – end)
2017 - 2017

PROJECT WEBSITE
http://www.interreg-danube.eu/approved-projects/3smart/partners

CONTACT AT UB-FME
mkomatina@mas.bg.ac.rs

HYDROPOWER ENGINEERING



PROJECT TITLE	INTERNATIONAL ACCREDITATION OF ENGINEERING STUDIES
ACRONYM/ PROJECT ID	IAES
FUNDING PROGRAM	TEMPUS project IAES 144856-TEMPUS-2008-RS-JPGR
PROJECT COORDINATOR	University of Belgrade, Coordinator: Prof.Dr. Miloš Nedeljković
PROJECT COORDINATOR AT UB-FME	Prof.Dr. Miloš Nedeljković
PARTICIPANTS FROM UB-FME	numerous
PROJECT DESCRIPTION	The aim of the project was the necessary improvement at beneficiary universities concerning all relevmlt faculty/university processes and relevant engineering study programs with all of their characteristics, in order to reach a new and relevant quality in engineering education verified by international accreditation of these study programs. Planned activities were: Quality assurance and enhancement system for engineering education (Review of existing national and international quality assurance and enhancement systems for engineering ducation; Establishment of Committee for quality of engineering education; Proposal of quality assurance and enhancement system for engineering education; Promotion of necessity of quality assurance and enhancement system based on the best international practice; Implementation of quality assurance and enhancement system at beneficiary faculties), New flxible study program models in order to reach interdisciplinarity and new qualifications frmneworks (Review of current standards in engineering education and contemporary qualifications frameworks; Creation of new flexible study program models in order to reach interdisciplinarity and new qualifications frmneworks), New laboratory, library, learning and teaching facilities as well as administrative/ student services improvement (Selection, procurement and installation of laboratory software and equipment; Library facilities and administrative/student services improvement; Developing of partnership with enterprises through student practice organization), Pilot project of international accreditation of engineering studies (Accreditation of at least two selected study progrmns with ASIIN).
KEY WORDS	Accreditation of Engineering Studies; ASIIN: EUR -ACE: Technology transfer: Knowledge triangle
CONSORTIUM	1.TU Munich 2.KIT - Karlsruhe Institute of Technology (Uni-Karlsruhe) 3.ASIIN (Akkreditierungsagentur fuer Studiengaenge der Ingenieurwissenschaften, der Informatik, der Naturwissenschaften und der Mathematik e.V.) Duesseldorf 4.Imperial College London 5.Polytechnical University of Catalonia – Barcelona 6.German University in Cairo 7.University of Belgrade, Faculty of Mechanical Engineering 8.University of Kragujevac, Faculty of Mechanical Engineering 9.University of Nis, Faculty of Mechanical Engineering 10.Serbian Ministry of Education 11.Robotina-Slovenia 12.Institute Mihajlo Pupin 13.Informatika 14.IvDam Process Control
COUNTRIES	6 - Republic of Serbia, Federal Republic of Germany, The United Kingdom, Kingdom of Spain, Arab Republic of Egypt, Republic of Slovenia
DURATION (start – end)	2009 - 2013
PROJECT WEBSITE	
CONTACT AT UB-FME	mnedeljkovic@mas.bg.ac.rs

INTERNATIONAL PROJECTS

PROJECT TITLE
ENABLING WEB-BASED REMOTE LABORATORY COMMUNITY AND INFRASTRUCTURE

ACRONYM/ PROJECT ID
EWBRLCI

FUNDING PROGRAM
SCOPES project

PROJECT COORDINATOR
Dr. Denis Gillet, EPFL, Switzerland

PROJECT COORDINATOR AT UB-FME
Prof. Dr. Miloš Nedeljković

PARTICIPANTS FROM UB-FME
Prof. Dr. Miloš Nedeljković, Asst. Prof. Dr. Djordje Cantrak, Novica Janković, M.Sc. Mech. Eng., Asst. Prof. Dr.Dejan Ilić

PROJECT DESCRIPTION

The SCOPES programme (Scientific co-operation between Eastern Europe and Switzerland), which is financed by the Swiss National Science Foundation (SNSF) and the Swiss Agency for Development and Co-operation (SDC), promotes scientific co-operation between research groups and institutions in Switzerland and Eastern Europe as well as the new independent states of the former Soviet Union (NIS).

This project aims at developing institutional partnerships between Switzerland, Serbia and Slovakia to develop the next generation infrastructure integrating Web-based remote laboratories (Labs) and supporting online engineering education in Europe. Targeted applications are STEM (Science, technology, Engineering and Math) Education in Secondary Schools, Higher Education, and future Massive Open Online Courses (MOOCs) integrating hands-on activities.

KEY WORDS

CONSORTIUM
1.EPFL Lausanne
2.Uni-Trnava
3.University of Belgrade Faculty of Mechanical Engineering
4.University of Kragujevac

COUNTRIES
3 - Swiss Confederation, Slovak Republic, Republic of Serbia

DURATION (start – end)
2015 - 2018

PROJECT WEBSITE

CONTACT AT UB-FME
mnedeljkovic@mas.bg.ac.rs

PROJECT TITLE

INVESTIGATION OF THE TURBULENT STRUCTURE BEHIND THE AXIAL FAN IMPELLERS BY USE OF THE HWA, LDA AND PIV MEASURING TECHNIQUES AND CFD ANALYSIS

ACRONYM/ PROJECT ID

FUNDING PROGRAM

Bilateral project Serbia-Germany, Ministry for science and technology development and DAAD

PROJECT COORDINATOR

Prof.Dr.-Ing. Martin Gabi, Karlsruhe Institute of Technology
Prof.Dr. Svetislav Čantrak, University of Belgrade Faculty of Mechanical Engineering

PROJECT COORDINATOR AT UB-FME

Prof.Dr. Svetislav Čantrak

PARTICIPANTS FROM UB-FME

Prof. Dr. Milan Petrović, Asst. Prof. Dr. Milan Banjac, Miloš Ranković, M.Sc. Mech. Eng., Asst. Srdjan Milić, Asst. Srećko Nedeljković, Mag. Dejan Djukanović

PROJECT DESCRIPTION

- Investigation of the turbulent vortex structures belongs to the class of the most complex problems of energetic and turbulence and has, not only theoretical, but also practical significance. According to the main aim, contents and research methods of this Project following results are expected:
- Defining flow and energy characteristics of the turbulent swirl flow field behind the axial fan impeller, by use of the modern measuring techniques such as HWA, LDA and PIV, and analytical and numerical methods and hypothesis.
- Physical interpretation of the measured and calculated energy parameters and turbulence statistics characteristics in the swirl flow field in the circular straight pipe behind the axial fan.
- On the basis of the physical important interpretation functional relations and correlation relations among flow, construction and energy characteristics of the examined system are expected to be obtained.
- Experimental and theoretical identification of the vortex structure and vortex shear layer behind the axial fan. It is expected that results of this complex analytical-experimental-statistical analysis significantly contribute to the modern investigations of the vortex core precession, vortex structures and vortex fields in the inner turbulent swirl flow field.
- Development of the new mathematical procedures and analytical methods in the area of correlation and turbulent variation theory, which should enable closer insight into physics of the flow processes, as well as more sophisticated forming and use of the mathematical models of turbulence and vortex theory.
- Given content and aim of the investigation clearly point out to the significance of the proposed tasks in technical praxis. Expected applied engineering results are following:
- Determining of the energy-constructive characteristics of the system fan-pipe based on the integral characteristics of the formed flow field behind the fan impeller. This should provide more accurate choice of the fan impeller type in the technical praxis.
- Phenomenon of the swirl flow field and flow in rotating systems is present in various engineering systems including turbomachines, cyclones, vortex separators, burners, combustions systems and etc. in the way that swirl flow problem, including boundary layers on the rotating surfaces, is of great practical interest. In this Project are expected results which can enable taking into consideration swirl effects, rotation and vortex structure in the computation and construction of the technical systems and units where the swirl flow is generated. Investigated vortex structures are closely related with the problems of noise and vibrations in thermotechnical installations and other energy plants.
- Development of the measuring and calibration methods and use of sophisticated measuring techniques in energy measurements.
- Development and use of software for designing axial fan impeller geometry.

INTERNATIONAL PROJECTS

KEY WORDS

CONSORTIUM

1. University of Belgrade Faculty of Mechanical Engineering
2. Karlsruhe Institute of Technology

COUNTRIES

2 - Republic of Serbia, Federal Republic of Germany

DURATION
(start – end)

2011-2012

PROJECT WEBSITE

CONTACT AT UB-FME

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PROJECT TITLE	KNOWLEDGE TRIANGLE IN SERBIA
ACRONYM/ PROJECT ID	KNOWTS
FUNDING PROGRAM	TEMPUS project KNOWTS 158881-TEMPUS-JPHES
PROJECT COORDINATOR	Prof.Dr. Ivan Milentijević, University of Niš
PROJECT COORDINATOR AT UB-FME	Prof.Dr. Milos Nedeljković
PARTICIPANTS FROM UB-FME	

PROJECT DESCRIPTION

Having identified needs and problems in the Serbian society, and having formed a competent consortium for demonstration of knowledge triangle power in modern European society the wider objectives of the project are defined:

- to straighten the role of Universities in the Serbian society by using University capacities in economy development,
- to improve synergy between research, education and innovation in Serbia, and
- to enhance the quality of organization in research, education and innovation.

To realize wider objectives, the following specific objectives were set:

- to gather all relevant stakeholders in research, education and innovation in Serbia
- to establish national platform for knowledge triangle
- to rise awareness on knowledge triangle importance
- to develop links between policy-making bodies, higher education, research institutions and companies
- to develop organizational structure for knowledge transfer at the main Serbian Universities.

Consortium members from Serbia were four biggest universities from the main centres of Serbia (Nis, Belgrade, Novi Sad and Kragujevac), but also institutions that would, together with participating universities, ensure full competence for the undertaken activities at national level (National Council for Higher Education, Serbian Economy Chamber, Ministry of Science and technology Development, Ministry of Telecommunications and Information Society). Participating universities from EU countries (Germany, Austria, Spain, Portugal and UK) have offered their expertise, based on experience in knowledge transfer area in their countries and in their own institutions. Their main contribution were be in terms of promoting their best practice, providing retraining for Serbian professors, researchers and Knowledge transfer center staff, participating in joint review of the material prepared at Serbian universities, quality control of Knowledge transfer centers and project management.

INTERNATIONAL PROJECTS

KEY WORDS

CONSORTIUM

1. TU Dortmund
2. TU Vienna
3. Uni-Alicante
4. European Centre for Soft Computing, Spain
5. Canterbury Christ Church University, UK,
6. TEI Athens, Greece
7. Instituto Superior Tecnico, Portugal
8. University of St Cyril and Methodius, Skopje
9. University of Niš, University of Belgrade
10. University of Novi Sad
11. University of Kragujevac
12. Serbian Ministry of Science and Technological Development
13. Serbian Ministry of Telecommunications and Information Society
14. Serbian Chamber of Commerce

COUNTRIES

8 - Republic of Serbia, Federal Republic of Germany, Republic of Austria, Kingdom of Spain, The United Kingdom, Hellenic Republic, Republic of Portugal, Republic of Macedonia

DURATION
(start – end)

2010-2013

PROJECT WEBSITE

http://projects.tempus.ac.rs/en/project/679

CONTACT AT UB-FME

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PROJECT TITLE	GOVERNANCE AND MANAGEMENT REFORM IN HIGHER EDUCATION IN SERBIA
ACRONYM/ PROJECT ID	GOMES
FUNDING PROGRAM	TEMPUS project GOMES 158926-TEMPUS-2009-RS-SMGR
PROJECT COORDINATOR	Prof. Dr. Radmila Marinković-Nedučin, University of Novi Sad
PROJECT COORDINATOR AT UB-FME	Coordinator for University of Belgrade - Prof. Dr.Vera Dondur
PARTICIPANTS FROM UB-FME	Prof. Dr. Miloš Nedeljković

PROJECT DESCRIPTION

The Project GOMES has been designed to support the structural reform of higher education in Serbia and the strategic framework development adopted at the national level by the National Council of Higher Education (NCHE), Ministry of Education (MoE) and the Conference of Serbian Universities (CSU). In the last years, the higher education reform in Serbia has been conducted entirely in the spirit of the Bologna Process and has encompassed the principal aspects of this Process, including ECTS, curriculum development, external and internal quality assurance, accreditation, qualifications frameworks. The reports presented at the Ministerial Conferences related to the Bologna Process stocktaking have demonstrated undeniable successes in this process. However, the Serbian higher education system is faced with the need to critically reconsider the obtained results and continue the reform processes, enhancing the quality and relevance of higher education institutions, as well as the convergence with the current EU developments. Accordingly, this project is oriented towards several selected lines, in accordance with both the priorities of Tempus and the decisions adopted at the level of NCHE.

Within many aspects of this complex activity, this project was focused on the problem of functional integration of the Serbian universities. Integration of Serbian universities represents, according to the recent conclusions of NCHE and CSU, one of the main obstacles in the improvement of quality of both education and research at Serbian universities, divided into faculties which possess a high degree of autonomy. Adequate measures were proposed, so that the partner universities were in the position to implement them and provide an adequate feedback. Within this part of the project, attention were paid to the adaptation of the LHE to the needs of the continuation of the reform of the higher education system.
The project objectives were:

Modernisation of the governance and management system in Serbian HE through the improvement of the HE policy, strategy and regulations;
Strengthening the role of universities as a driving force in the society through their transformation into strong integrated institutions;
Enhancement of the role the National Council for HE and Rectors' conferences in a transition process towards the integrated university;
Development of the policy, structure and action plan for placing students in the centre of the learning process;
Development of the National Qualifications Framework for HE.

INTERNATIONAL PROJECTS

KEY WORDS

CONSORTIUM

1.University of Novi Sad, SRB Project coordinator
2.University of Belgrade, SRB
3.State University of Novi Pazar, SRB
4.University of Arts in Belgrade, SRB
5.Singidunum University, SRB
6.University of Nis, SRB
7.University of Kragujevac, SRB
8.Conference of Universities of Serbia - KONUS, SRB
9.Student Conference of Serbian Universities - SKONUS, SRB
10.National Council for Higher Education of the Republic of Serbia, SRB
11.Ministry of Education, Science and Technological Development of the

COUNTRIES

6 - Republic of Serbia, Republic of Italy, French Republic, Republic of Poland, Hellenic Republic, Czech Republic

DURATION
(start – end)

2009 - 2013

PROJECT WEBSITE

http://projects.tempus.ac.rs/en/project/679

CONTACT AT UB-FME

mnedeljkovic@mas.bg.ac.rs

PROJECT TITLE	COMPUTATIONAL AND EXPERIMENTAL INVESTIGATION OF THE AIRFLOW IN THE HUMAN NASAL CAVITY
ACRONYM/ PROJECT ID	PIVNAS
FUNDING PROGRAM	Bilateral Project between Ministry of Education, Science and Technological Development Republic of Serbia and DAAD, Germany
PROJECT COORDINATOR	In Serbia: Asst. Prof. Dr. Đorđe Čantrak, University of Belgrade-Faculty of Mechanical Engineering In Germany: Prof. Dr.-Ing. habil. Gunther Brenner, Institut für Technische Mechanik, TU Claustahl
PROJECT COORDINATOR AT UB-FME	Asst. Prof. Dr. Đorđe Čantrak
PARTICIPANTS FROM UB-FME	Asst. Prof. Dr. Đorđe Čantrak, Asst. Prof. Dr. Mirjana Stamenić, Asst. Prof. Dr. Aleksandar Ćoćić, Ph.D. student Novica Janković, Research Assistant

PROJECT DESCRIPTION

The goal of the present project is to investigate the airflow in combination with the transport and deposition of particulate matter such as dispersed drug particles or dust in the human uppermost respiratory tract. Nasal septum is a midline structure in the nasal cavity, oriented vertically in the median sagittal plane. It builds the medial wall of each nasal cavity and separates the right and the left nasal cavities from each other. Nasal septum is a supporting structure of the nasal cavity and has a roll in determining the shape of the nasal cavity. Simple classification of the septal deformities, by Chen et al. (2009) is: I, S and C shaped. The performance of the nasal cavity functions, normal or disordered, is under the strong influence of the airflow pattern, so the scientific aims of the Project are following:

- characterization of the flow pattern by use of the particle image velocimetry (PIV),
- analysis of the influence of the human nasal cavity geometry on the fluid flow dynamics,
- statistical and structural analysis of the fluid flow filed in the normal and disordered nasal cavity,
- numerical models for future fluid flow prediction,
- CFD verification on the basis of the obtained experimental results,
- better understanding of the nasal airway transport,
- a step towards the numerical simulation for drug delivery in human nasal cavity.

Presented aims of the research above clearly point out to the great significance of these problems in medical practice. Nasal septal deviation can be treated by medications (decongestants), surgery (septoplasty) and both approaches combined. There are no standard criteria for making decision what therapy suites the most for each patient. It is up to doctor to decide by intuition or experience. Septoplasty is generally performed to improve quality of life (lee et al., 2013., Sedeghat et al., 2013., Gandomy et al., 2010.). It is the third most commonly performed surgical procedure by otolaryngologists in the USA (Sedeghat et al., 2013). Many questions occur, like:

- Shall we treat every patient with deviated nasal septum operatively?
- Or, how long patients should use medications (decongestants)?
- Is it right therapy?
- Who and when should be operated?
- etc.

Financial side of the operative or medical treating of the nasal septal deviation is not analyzed here. Thus, defining the proper indications for septal surgery is very important. By fluid flow study in nasal cavity this Project will help resolving some of these issues.

It can be concluded that realization of theoretical, experimental and numerical researches in Project and planned doctoral thesis would contribute not to only to scientific and practical knowledge, but also to the future development of the complex researches in this significant field of science and technique, as well as their use in technical practice. This Project is also a good example of collaboration of the engineering and medical institutions in the era of biomechanics.

INTERNATIONAL PROJECTS

KEY WORDS

fluid flow, nasal septal deviation, particle image velocimetry, CFD

CONSORTIUM

1.Institut für Technische Mechanik, TU Claustahl,
2.University of Belgrade, Faculty of Mechanical Engineering

COUNTRIES

2 - Federal Republic of Germany, Republic of Serbia

DURATION
(start – end)

2016 - 2017

PROJECT WEBSITE

CONTACT AT UB-FME

djcantrak@mas.bg.ac.rs

PROJECT TITLE
INVESTIGATION OF THE INFLUENCE OF TURBULENT SWIRL FLOW ON THE ENERGY PARAMETERS OF THE AXIAL FANS BY USE OF THE CONTEMPORARY MEASUREMENT TECHNIQUES

ACRONYM/ PROJECT ID
AXMES

FUNDING PROGRAM
Bilateral Project between Ministry of Education, Science and Technological Development Republic of Serbia and Ministry of Science, Republic of Montenegro

PROJECT COORDINATOR
In Serbia: Asst. Prof. Dr. Đorđe Čantrak, University of Belgrade-Faculty of Mechanical Engineering,
In Montenegro: Prof. Dr. Uroš Karadžić, University of Montenegro, Faculty of Mechanical Engineering

PROJECT COORDINATOR AT UB-FME
Asst. Prof. Dr. Đorđe Čantrak

PARTICIPANTS FROM UB-FME
Asst. Prof. Dr. Đorđe Čantrak, Prof. Dr. Milan Lečić, Asst. Prof. Dr. Dejan Ilić
Ph.D. student Novica Janković, Research Assistant

PROJECT DESCRIPTION

Project focus is on complex theoretical, experimental and numerical investigations of complex turbulent structures behind the axial fans and their Relations to geometry and energetic characteristics of the fan, as well as their application in ventilation energy efficient buildings. The project also considers ways of energy efficient ventilation. The research takes place in several stages. The first stage is the research of energy and design characteristics of axial fans, as well as statistical characteristics of turbulent swirl flow behind axial fans using modern experimental and CFD (Computational Fluid Dynamics). According to valid international standards there are different ways of installing axial fans. Unit efficiency rate depends not only on the geometry, but also of the way it is installed. Several technical solutions are planned for the realization of this phase. Analysis of the vorticity dynamics, deformation fields and coherent vortex structures as well as formation of the corresponding theoretical models are the second stage. Measurements are planned with the most up-to-date measurement techniques PIV (particle image velocimetry), LDA (laser Dopler anemometry) and original hot-wire anemometry probes.

KEY WORDS
axial fan, turbulence, particle image velocimetry, CFD

CONSORTIUM
1. University of Montenegro, Faculty of Mechanical Engineering
2. University of Belgrade, Faculty of Mechanical Engineering

COUNTRIES
2 - Republic of Montenegro, Republic of Serbia

DURATION (start – end)
2016 - 2018

PROJECT WEBSITE

CONTACT AT UB-FME
djcantrak@mas.bg.ac.rs

MATHEMATICS

PROJECT TITLE
DIFFERENCE EQUATIONS AND CONSTRUCTIVE APPROXIMATION: THEORY AND APPLICATIONS

ACRONYM/ PROJECT ID
DECATA

FUNDING PROGRAM
Programa Estatal de Fomento de la Investigación Científica y Técnica de Excelencia

PROJECT COORDINATOR
Dr. Dolores Barrios Rolanía, Universidad Politécnica de Madrid, Spain

PROJECT COORDINATOR AT UB-FME
Prof. Dr. Miodrag M. Spalević

PARTICIPANTS FROM UB-FME
Prof. Dr. Miodrag M. Spalević

PROJECT DESCRIPTION

The overall purpose of this project is to obtain properties of families of solutions of linear difference equations. The focus is the study of solutions that are functions of one complex variable, and both algebraic and analytic properties of these families are studied. This study will allow to answer to some open problems in:

- Orthogonal polynomials on the unit circle.
- Construction and analysis of quadrature formulas
- Multiple orthogonality
- Integrable systems

Moreover, the application of the obtained results will be studied to find some answers corresponding to the theory of artificial neural networks.

As main tools, the theory of linear operators, numerical analysis and functional analysis will be used. The appropriate scientific software for experimentation and for the development of some new hypotheses will be used.

KEY WORDS
Difference equations, quadrature formulas, orthogonal polynomials, integrable systems, artificial neural networks

CONSORTIUM
1. Universidad Politécnica de Madrid, Spain
2. University of Belgrade, Faculty of Mechanical Engineering

COUNTRIES
2 - Kingdom of Spain, Republic of Serbia

DURATION (start – end)
2015 - 2017

PROJECT WEBSITE

CONTACT AT UB-FME
mspalevic@mas.bg.ac.rs

PHYSISCS AND ELECTRICAL ENGINEERING

PROJECT TITLE
SMART ECO-FRIENDLY NANOSTRUCTURES AND NANOCOMPOSITES

ACRONYM/ PROJECT ID
Project No 4510339/2016/09/13

FUNDING PROGRAM
Program of scientific and technological bilateral collaboration with France (2016-2017), within Partnership HUBERT CURIEN (PHC) Pavle Savić

PROJECT COORDINATOR
Project coordinator of the Serbian team: Prof. Dr. Vesna Rakić, University of Belgrade-Faculty of Agriculture, Serbia;
Project coordinator of the French team: Dr. Georgeta Postole, Institut de recherches sur la catalyse et l'environnemen de Lyon (IRCELYON), France;

PROJECT COORDINATOR AT UB-FME

PARTICIPANTS FROM UB-FME
Assoc. Prof. Dr. Vera Pavlović,

PROJECT DESCRIPTION
The objective of the project is development of smart nanostructures and nanocomposite eco-functional materials, which exhibit high-sensibility and intelligent response to harmful pollutants. Detailed phase and structural analysis of these materials, investigation of the influence of chemical modification on morphology, crystallinity and adsorption/ desorption capacity of the prepared adsorbents and determination of the thermodynamic parameters of ions sorption and influence of sorption-desorption cycles on sorption capacity will be performed.

KEY WORDS
Nanocomposites, adsorption, catalysis, biogas purification, wastewater, zeolites, nanocellulose, silica

CONSORTIUM
1. University of Belgrade (Faculty of Agriculture, Faculty of Mechanical Engineering, Faculty of Technology and Metallurgy),
2. Institute of Technical Sciences of SASA - Belgrade,
3. Institut de recherches sur la catalyse et l'environnement de Lyon-France

COUNTRIES
2 - Republic of Serbia, French Republic

DURATION (start – end)
2016 -2017

PROJECT WEBSITE

CONTACT AT UB-FME
vpavlovic@mas.bg.ac.rs

NAVAL ARCHITECTURE

PROJECT TITLE
MODERNISATION OF VESSELS FOR INLAND WATERWAY FREIGHT TRANSPORT

ACRONYM/ PROJECT ID
Move It!

FUNDING PROGRAM
Seventh Framework Programme, FP7

PROJECT COORDINATOR
Stichting Maritiem Research Instituut Nederland, MARIN, the Netherlands

PROJECT COORDINATOR AT UB-FME
Prof. Dr. Dejan Radojčić (Department of Naval Architecture)

PARTICIPANTS FROM UB-FME
Prof. Dr. Dejan Radojčić, Asst. Prof. Dr. Igor Bačkalov, , Asst. Prof. Dr. Aleksandar Simić, Prof. Dr. Milorad Motok

PROJECT DESCRIPTION

In response to the call's demand for cost effective modernization of the inland fleet for freight transport, MoVe IT! develops a suite of options for the modernisation of inland ships that meet the challenges of over-aging of the fleet, climate change and stronger environmental objectives and provides decision support regarding the application of these options. In this suite of options, knowledge gained from newbuildings, technology transfer from other transport modes, improvement of energy efficiency & ecological performance, transition to the post-fossil-fuel-era and adaptation to new ADN rules are prominent.

One of the main focal points of MoVe IT! is the modernisation of the ship's drive and power system in a way that is matched to the conditions it will face throughout its life. This will result in significantly better performance compared to the ship's old systems that are designed to fulfill a single design condition. First, the conditions the ship will encounter are established through full-scale measurements. Using the operational profiles resulting from these measurements, the ship's power systems and hydrodynamics are reviewed and optimal, integrated solutions are developed that minimize investments and ecological impact while maximizing efficiency. Research topics include new power system configurations, alternative fuels, retrofitting techniques for existing engines, improved hull and propulsors and assistance to the captain for efficient sailing. Further crucial modernization measures are to increase the vessel's main dimensions to achieve economical and ecological scale advantages and upgrade of old tankers to meet new ADN requirements.
MoVe IT! also invests heavily in assessing the economic viability of solutions as well as their contribution to environmental improvements. Subsequently, modernisation support for ship owners, policy support and (full scale) demonstrators will contribute to lowering the acceptance threshold for modernisation.

KEY WORDS

CONSORTIUM
1. Stichting Maritiem Research Instituut Nederland
2. Entwicklungszentrum fuer Schiffstechnik und Transportsysteme e.V.
3. Via donau – Österreichische Wasserstraßen-
4. Technische Universiteit Delft
5. Center of Maritime Technologies EV
6. Stichting projecten binnenvaart
7. Nederlandse organisatie voor toegepast natuurwetenschappelijk onderzoek
8. Ecorys Nederland B.V.
9. Autena Marine V.O.F.
10. S.M.I.L.E.- FEM GmbH
11. University of Plymouth
12. Universitatea Dunarea de Jos din Galati

COUNTRIES
The Netherlands, Republic of Austria, Federal Republic of Germany, The United Kingdom, Romania, French Republic, Republic of Serbia, Kingdom of Sweden, Hungary

DURATION (start – end)
November 1st, 2011 / October 31st, 2014 (36 months)

PROJECT WEBSITE
http://www.moveit-fp7.eu/

CONTACT AT UB-FME
ibackalov@mas.bg.ac.rs

INTERNATIONAL PROJECTS

PROJECT TITLE
INNOVATIVE DANUBE VESSEL

ACRONYM/ PROJECT ID

FUNDING PROGRAM
EU Strategy for the Danube Region, Priority Area 1a – Mobility and Multimodality

PROJECT COORDINATOR
DST Entwicklungszentrum fuer Schiffstechnik und Transportsysteme e.V., Germany

PROJECT COORDINATOR AT UB-FME
Asst.Prof. Dr. Igor Bačkalov

PARTICIPANTS FROM UB-FME
Asst.Prof. Dr. Igor Bačkalov, Prof. Dr. Dejan Radojčić, Asst.Prof. Dr. Aleksandar Simić, Prof. Dr. Milan Hofman, Asst.Prof. Dr. Milan Kalajdžić, Prof. Dr. Milorad Motok, Asst.Prof. Dr. Nikola Momčilović

PROJECT DESCRIPTION

The core R&D activities of the project relates to the elaboration and assessment of different new technology solutions as well as the development and assessment of first vessel concepts. The allocation of the majority of project resources is dedicated to these activities.

The improvement induced by the INNOVATIVE DANUBE VESSEL will become evident by the quantification of performance indicators (on energy efficiency, cost efficiency,…), enabling the shipping industry to evaluate and quantify the advantage of innovative ships. This additional economic value in comparison to existing Danube vessels will be the main incentive to stimulate the necessary investments by the shipping industry.
the captain for efficient sailing. Further crucial modernization measures are to increase the vessel's main dimensions to achieve economical and ecological scale advantages and upgrade of old tankers to meet new ADN requirements.
MoVe IT! also invests heavily in assessing the economic viability of solutions as well as their contribution to environmental improvements. Subsequently, modernisation support for ship owners, policy support and (full scale) demonstrators will contribute to lowering the acceptance threshold for modernisation.

KEY WORDS

CONSORTIUM
1. DST Entwicklungszentrum für Schiffstechnik und Transportsysteme e.V.
2. Schiffbautechnische Versuchsanstalt in Wien GmbH
3. Ship Design Group SRL
4. University of Belgrade, Faculty of Mechanical Engineering
5. Österreichisches Institut für Raumplanung GmbH

COUNTRIES
Federal Republic of Germany, Republic of Austria, Romania, Republic of Serbia

DURATION (start – end)
2012 - 2013

PROJECT WEBSITE

CONTACT AT UB-FME
ibackalov@mas.bg.ac.rs

INTERNATIONAL PROJECTS

PROJECT TITLE
NOVEL AND IMPROVED MARITIME TRANSPORT CONCEPTS

ACRONYM/ PROJECT ID
NOVIMAR

FUNDING PROGRAM
Horizon 2020

PROJECT COORDINATOR
Stichting Netherlands Maritime Technology Foundation, NMTF, the Netherlands

PROJECT COORDINATOR AT UB-FME
Asst.Prof. Dr. Igor Bačkalov

PARTICIPANTS FROM UB-FME
Asst.Prof. Dr. Igor Bačkalov, Prof. Dr. Dejan Radojčić, Asst.Prof. Dr. Aleksandar Simić, Prof. Dr. Milan Hofman, Asst.Prof. Dr. Milan Kalajdžić, Prof. Dr. Milorad Motok, Asst.Prof. Dr. Nikola Momčilović

PROJECT DESCRIPTION
NOVIMAR aims to adjust inland/short-sea shipping such that it can make optimal use of the waterborne system of waterways, vessels and ports/terminals. To achieve this NOVIMAR introduces the waterborne version of 'platooning', the Vessel Train. This is in essence a number of unmanned Follower Ships with own sailing/manoeuvring capabilities being temporarily led by a manned Leader Ship. Vessels will be able to join and leave such trains at places adjacent to their points of origin and destination at seaside or inland. Envisaged main benefits and impacts are: Reduction of crew costs result in up to 47% total cost reduction for IWT and up to 88% crew cost reduction for short sea transport, Enhanced Logistic flexibility, 10-15 % Less energy use/emissions, Solutions for overcoming barriers between transport modes and High potential for reducing road congestion and associated costs. Lower costs increase the attractiveness of small vessels at sea and inland, hereby increasing access to urban areas located at small waterways (CEMT I/II), with no need for sizeable investments in infrastructures. SME's benefits include enhanced competitiveness and improved working conditions for vessel owners/operators, and market opportunities for equipment suppliers. NOVIMAR technology developments include measuring, control and communication systems, and navigation aids for IWT use.

KEY WORDS

CONSORTIUM

1. VIA DONAU – ÖSTERREICHISCHE WASSERSTRAßEN-GESELLSCHAFT MBH
2. COMPAGNIE FLUVIALE DE TRANSPORT
3. STICHTING MARITIEM RESEARCH INSTITUUT NEDERLAND
4. AUTENA MARINE V.O.F.
5. UNIVERSITY OF BELGRADE - FACULTY OF MECHANICAL ENGINEERING
6. STICHTING PROJECTEN BINNENVAART
7. STICHTING BUREAU TELEMATICA BINNENVAART
8. VAN MOER GROUP
9. UNIVERSITEIT ANTWERPEN
10. BUREAU VERITAS MARINE & OFFSHORE REGISTRE INTERNATIONAL DE CLASSIFICATION DE NAVIRES ET DE PLATEFORMES OFFSHORE
11. SCANDINAOS AB
12. TOUAX RIVER BARGES
13. STICHTING DELTARES
14. PLIMSOLL ZARTKORUEN MUKODO R ESZVENYTARSASAG
15. TECHNISCHE UNIVERSITEIT DELFT
16. ENTWICKLUNGSZENTRUM FUR SCHIFFSTECHNIK UND TRANSPORTSYSTEME EV
17. IN-INNOVATIVE NAVIGATION GMBH
18. STICHTING NETHERLANDS MARITIME TECHNOLOGY FOUNDATION
19. DUISBURGER HAFEN AKTIENGESELLSCHAFT
20. ARGONICS GMBH
21. PRO DANUBE MANAGEMENT GMBH
22. MARLO AS

COUNTRIES
The Netherlands, Republic of Austria, French Republic, Belgium, Kingdom of Sweden, Hungary, Federal Republic of Germany, Republic of Austria, Kingdom of Norway

DURATION (start – end)
2017 - 2021

PROJECT WEBSITE
http://www.novimar.eu/

CONTACT AT UB-FME
ibackalov@mas.bg.ac.rs

ENGINEERING MATERIALS AND WELDING, TRIBOLOGY, FUEL AND COMBUSTION

PROJECT TITLE

S2BIOM— DELIVERY OF SUSTAINABLE SUPPLY OF NON-FOOD BIOMASS TO SUPPORT A "RESOURCE-EFFICIENT" BIOECONOMY IN EUROPE

ACRONYM/ PROJECT ID

S2BIOM

FUNDING PROGRAM

FP7

PROJECT COORDINATOR

Fachagentur Nachwachsende Rohstoffe e.V., Ferderal Republic of Germany
Ludger Wenzelides

PROJECT COORDINATOR AT UB-FME

Prof. Dr. Dragoslava Stojiljković

PARTICIPANTS FROM UB-FME

Prof. Dr. Dragoslava Stojiljković, Asst. Prof. Dr. Vladimir Jovanović, Asst. Prof. Dr. Nebojša Manić, Prof. Dr. Mirko Komatina, Prof. Dr. Aleksandar Jovović

PROJECT DESCRIPTION

The main aim of this project is to support the sustainable delivery of non-food biomass feedstock at local, regional and pan European level through developing strategies, and roadmaps that will be informed by a "computerized and easy to use" toolset (and respective databases) with update harmonized datasets at local, regional, national and pan European level for EU27, western Balkans, Turkey and Ukraine. It will do so by comparing and making use of the most recent relevant information from recent and ongoing EU projects by a set of carefully selected validation case studies and in concise collaboration with key stakeholders from policy, industry and markets. The project fits under the overall umbrella of the Europe 2020 strategy for the building of a bioeconomy, as well as the targets for deployment of renewable energies and reduction of greenhouse gas emissions. The project will build up a concise knowledge base both for the sustainable supply and logistics of nonfood biomass (quantities, costs, technological pathway options for 2020 and beyond), for the development of technology and market strategies to support the development of a "resource efficient" Bioeconomy for Europe. This includes industrial processes (i.e. bio-based industries) for manufacturing biomass-derived goods/products as well as energy conversion, both for large scale and small scale units.

KEY WORDS

sustainability, non-food biomass, resource efficient bioeconomy

CONSORTIUM

31
1. FNR - Agency for renewable Resources, Germany
2. IC- Imperial College London, UK
3. DLO - Stichting Dienst Landbouwkundig Onderzoek, The Netherlands
4. ALU-FR - University of Freiburg, Germany
5. JR - Joanneum Research, Austria
6. IIASA - International Institute for Applied Systems Analysis, Austria
7. EFI - European Forest Institute, Finland
8. Luke - The Natural Resources Institute Finland, Finland
9. VTT - Technical Research Centre of Finland, Finland
10. UniBo - University of Bologna, Italy
11. ECN - Energy research Centre of the Netherlands, The Netherlands
12. VITO - Flemish Institute for Technological Research, Belgium
13. IINAS - International Institute for Sustainability Analysis and –Strategy, Germany
14. CC - Clever Consult, Belgium
15. SYNCOM - Research and Development Consulting GmbH, Germany

16.WIP – Renewable Energies, Germany
17.BTG - Biomass technology group BV,The Netherlands
18.CEI - Central European Initiative, Italy
19.IUNG - Institute of Soil Science and Plant Cultivation, State Research Institute Poland
20.SDEWES - International Centre for Sustainable Development of Energy, Water and Environment Systems, Croatia
21.EU-SEI - Ege University Solar Energy Institute, Turkey
22.INRA - National Institute for Agricultural Research, France
23.JRC - Joint Research Centre, Italy
24.CENER - CIEMAT Foundation, Spain
25.CIRCE - Research Centre for Energy Resources and Consumption, Spain
26.SFI - Slovenian Forestry Institute, Slovenia
27.CERTH - Centre for Research & Technology Hellas, Greece
28.REA - Renewable Energy Agency, Ukraine
29.UBFME - University of Belgrade - Faculty of Mechanical Engineering, Serbia
30.Census-Bio, United Kingdom
31. Biomass Research,The Netherlands

COUNTRIES

Federal Republic of Germany,The United Kingdom,The Netherlands, Republic of Austria, Republic of Finland, Republic of Italy, Belgium, Republic of Poland, Republic of Croatia, Republic of Turkey, French Republic, Republic of Italy, Kingdom of Spain, Republic of Slovenia, Hellenic Republic, Ukraine, Republic of Serbia

DURATION
(start – end)

2013 -2016.

PROJECT WEBSITE

www.s2biom.eu

CONTACT AT UB-FME

dstojiljkovic@mas.bg.ac.rs

S2Biom

PROJECT TITLE
C33260/CEI2-2015-11-17 FOR SERBIA: INNOVATION VOUCHERS SCHEME FOR RESOURCE EFFICIENCY TECHNOLOGIES AND SERVICES: PROGRAMME PREPARATION AND DEFINITION OF POSSIBLE IMPLEMENTATION APPROACHES

ACRONYM/ PROJECT ID
TCRS 1654

FUNDING PROGRAM
European Bank for Reconstruction and Development (EBRD)

PROJECT COORDINATOR
POLITECNICO DI MILANO – Department of Management, Economics and Industrial Engineering
Enrico Cagno

PROJECT COORDINATOR AT UB-FME
Prof. Dr. Dragoslava Stojiljković

PARTICIPANTS FROM UB-FME
Prof. Dr. Dragoslava Stojiljković, Asst. Prof. Dr. Vladimir Jovanović,
Asst. Prof. Dr. Nebojša Manić

PROJECT DESCRIPTION

A voucher provided to a Serbian business, worth between EUR 5,000 and EUR 50,000, to partially or fully pay for an external expert to help the business innovate to adopt/expand their manufacture or use of resource efficiency technologies. The voucher will pay for between 50% and 100% of incurred costs.
Services that will be accessed: R&D– technology design, customisation, applied research, Testing, Certification, Market research, Developing and protecting intellectual property, business related to resource efficiency technologies.
Servicese providers: Universities and further education colleges, Research and technology centres, Intellectual property advisers.

KEY WORDS
innovation vouchers, resource efficient technologies, renewable energy sources

CONSORTIUM
1. POLITECNICO DI MILANO – Department of Management, Economics and Industrial Engineering
2. University of Belgrade – Faculty of Mechanical Engineering

COUNTRIES
2 Republic of Italy, Republic of Serbia

DURATION (start – end)
2016 - 2016

PROJECT WEBSITE

CONTACT AT UB-FME
dstojiljkovic@mas.bg.ac.rs

PROJECT TITLE

INNOVATION VOUCHERS SCHEME FOR RESOURCE EFFICIENCY TECHNOLOGIES AND SERVICES IN SERBIA - SUPPORT TO THE IMPLEMENTATION AND MARKETING OF THE INNOVATION VOUCHERS SCHEME IN THE COUNTRY

ACRONYM/ PROJECT ID

Ref. No. 1206.001-17

FUNDING PROGRAM

European Bank for Reconstruction and Development (EBRD)

PROJECT COORDINATOR

POLITECNICO DI MILANO – Department of Management, Economics and Industrial Engineering
Enrico Cagno

PROJECT COORDINATOR AT UB-FME

Prof. Dr. Dragoslava Stojiljković

PARTICIPANTS FROM UB-FME

Prof. Dr. Dragoslava Stojiljković, Asst. Prof. Dr. Vladimir Jovanović,
Asst. Prof. Dr. Nebojša Manić

PROJECT DESCRIPTION

The EBRD is currently working at the implementation of an innovation vouchers scheme to be run in Serbia. The purpose of the scheme is to support Serbian SMEs in adopting resource efficient (energy, water and material efficiency) technologies by providing vouchers for R&D services to be purchased in the country from accredited R&D suppliers.
Innovation Vouchers are an established mechanism for supporting businesses to innovate – especially small and medium-sized enterprises (SMEs). The first such scheme was set up in 1990, and by 2010, the number of schemes had increased to at least 25, implemented at national and regional levels all across Europe. Innovation vouchers help overcome the presence of information and co-ordination failures that inhibit businesses from investing in innovation. SMEs also tend to have many innovative ideas but often lack the necessary capital, technical expertise and/or business expertise to transform their innovation project into a market success.

In 2016 the Bank conducted a study (funded by the CEI) to confirm the relevance of such scheme in Serbia. The Consultants (Politecnico di Milano in cooperation with the University of Belgrade) have successfully completed the assignment and in the final report they have provided key inputs for the design of the scheme, which the EBRD is now keen to implement.
Considering this is one of the first scheme iIn this context, the EBRD plans to engage Politecnico di Milano, in association with the University of Belgrade, to implement the following tasks:
1. Organize and conduct the launching event/workshop to deploy the innovation vouchers scheme in Serbia.
2. Design the website for the innovation voucher scheme, to ensure the necessary visibility of the initiative and prepare the key application forms.

The scheme will be an opportunity for the EBRD to create new business opportunities. In fact, by closely monitoring the content of the innovation vouchers, the EBRD will able to identify potential investment opportunities associated to process improvements, increased resource efficiency, sustainable products development, etc.

KEY WORDS

innovation vouchers, resource efficient technologies, renewable energy sources

CONSORTIUM

1. POLITECNICO DI MILANO – Department of Management, Economics and Industrial Engineering
2. University of Belgrade – Faculty of Mechanical Engineering

COUNTRIES

Republic of Italy, Republic of Serbia

DURATION (start – end)

2017-2018

PROJECT WEBSITE

CONTACT AT UB-FME

dstojiljkovic@mas.bg.ac.rs

PROJECT TITLE

PROJECT TITLE DEMONSTRATION OF INNOVATIVE INTEGRATED BIOMASS LOGISTICS CENTRES FOR THE AGRO-INDUSTRY SECTOR IN EUROPE

ACRONYM/ PROJECT ID

AGROinLOG

FUNDING PROGRAM

H2020

PROJECT COORDINATOR

FUNDACION CIRCE CENTRO DE INVESTIGACION DE RECURSOS Y CONSUMOS ENERGETICOS, CIRCE, Spain

PROJECT COORDINATOR AT UB-FME

Prof. Dr. Dragoslava Stojiljković

PARTICIPANTS FROM UB-FME

Prof. Dr. Dragoslava Stojiljković, Asst. Prof. Dr. Vladimir Jovanović, Asst. Prof. Dr. Nebojša Manić, Prof. Dr. Aleksandar Jovović

PROJECT DESCRIPTION

The overall objective of AGROinLOG project is to implement and demonstrate the technical, environmental and economic feasibility of integrated biomass logistic centres (IBLCs) for food and non-food products. The IBLCs will be built on existing agro-industries to take advantage of unexploited synergies in terms of equipment and staff capabilities, diversify regular activity enhancing the strength of agro-industries and increasing added value delivered at those companies.

KEY WORDS

Integrated biomass logistic centres, food, non-food, agro-indrustries

CONSORTIUM

1. Agriconsulting Europe S.A.
2. Agroindustrial Pascual Sanz S.L.
3. Association "Ukrainian Agribusiness Club"
4. Centre for Research and Technology Hellas – CERTH
5. CIRCE Foundation
6. Cooperativas Agro-alimentarias de España
7. Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria (CREA)
8. Fundación Zaragoza Logistics Center – ZLC
9. Instituto agrotikis kai synetairistikis oikonomias inaso-paseges
10. Lantmännen
11. Nutria S.A.
12. RISE Processum AB
13. RISE Research Institutes of Sweden AB
14. StichtingWageningen Research(WFBR)
15. University of Belgrade, Faculty of Mechanical Engineering i
16. Fundacion Circe Centro de Investigacion de Recursos Y Consumos Energeticos

COUNTRIES

Kingdom of Spain, The Netherlands, Belgium, Kingdom of Sweden, Republic of Italy, Hellenic Republic, Republic of Serbia, Ukraine

DURATION (start – end)

2016. – 2020

PROJECT WEBSITE

http://agroinlog-h2020.eu/en/home/

CONTACT AT UB-FME

dstojiljkovic@mas.bg.ac.rs

INTERNATIONAL PROJECTS

PROJECT TITLE
CAPACITY BUILDING FOR IMPROVED MINERAL FUELS MONITORING SYSTEM – TRANSFER OF BEST PRACTICES AGAINST GREY ECONOMY

ACRONYM/ PROJECT ID
FUELPAGE

FUNDING PROGRAM
CEI-KEP

PROJECT COORDINATOR
Prof. Dr Ivan Soucek, Czech Association of Petroleum Industry and Trade, Czech Republic

PROJECT COORDINATOR AT UB-FME
Prof. Dr. Dragoslava Stojiljković

PARTICIPANTS FROM UB-FME
Prof. Dr. Dragoslava Stojiljković, Asst. Prof. Dr. Vladimir Jovanović, Asst. Prof. Dr. Nebojša Manić

PROJECT DESCRIPTION
Supervision of implementation of fuel quality monitoring is carried out by the ministry in charge of energy and the ministry in charge of trade, the visit continued with a meeting with the Market Inspection of the Serbian Ministry of Trade, Tourism and Telecommunications, where the Czech fuel quality monitoring system was presented to the project Working Group and the market inspectors with specialisation in inspection of quality of petroleum products. The visit ended with meetings with SGS Serbia, the accredited company selected for rendering fuel marking and monitoring services in cooperation with state authorities and companies.

KEY WORDS
Fule quality, monitoring, Market inspection, Fuel marking

CONSORTIUM
1. Faculty of Chemistry and Technology, the Prague
2. Czech Association of Petroleum Industry and Trade
3. Serbian Ministry of Mining and Energy
4. Serbian Ministry of Trade, Tourism and Telecommunications
5. National Petroleum Committee of Serbia – World Petroleum Council
6. University of Belgrade – Faculty of Mechanical Engineering

COUNTRIES
2 - Czech Republic, Republic of Serbia

DURATION (start – end)
2015-2016

PROJECT WEBSITE
http://www.cei.int/content/kep-italy-fuelpage-project-screening-visit-strengthening-fuel-quality-monitoring-practices-sing-practices-s

CONTACT AT UB-FME
dstojiljkovic@mas.bg.ac.rs

PROJECT TITLE	BLENDING SCIENCE AND PRACTICE AGAINST FUEL QUALITY DEVIATIONS AND ILLEGAL TRADE IN THE SERBIAN ENERGY SECTOR
ACRONYM/ PROJECT ID	BLEND4QUALITY
FUNDING PROGRAM	Czech Republic government funds
PROJECT COORDINATOR	Goran Radosavljevic, National Petroleum Committee of Serbia – World Petroleum Council (NNKS-WPC), Serbia
PROJECT COORDINATOR AT UB-FME	Prof. Dr. Dragoslava Stojiljković
PARTICIPANTS FROM UB-FME	Prof. Dr. Dragoslava Stojiljković, Asst. Prof. Dr.Vladimir Jovanović, Asst. Prof. Dr. Nebojša Manić
PROJECT DESCRIPTION	The BLEND4QUALITY project is focused on the development of a support study and tools of legislative and technical nature intended for a more effective functioning of state administration and energy business in Serbia in line with the requirements of EU. Serbia is also one of the priority countries supported by the Czech Republic in the framework of the Aid for Trade Programme, and the BLEND2QUALITY project fits in the objectives of AfT projects that are dedicated to transfer of experience and know-how from the Czech Republic on specialized topics to facilitate trade, to aid state administration in the formulation and implementation of rules of the domestic market, to remove administrative barriers and to improve the overall business climate.
KEY WORDS	Legislative, fuela quality, deviations, illegal trade, Eneregy sector
CONSORTIUM	1. Faculty of Chemistry and Technology, the Prague 2. Czech Association of Petroleum Industry and Trade 3. National Petroleum Committee of Serbia – World Petroleum Council 4. Ministry of Mining and Energy of the Republic of Serbia 5. Market Inspection of the Ministry of Trade, Tourism and Telecommunications of the Republic of Serbia 6. University of Belgrade - Faculty of Mechanical Engineering
COUNTRIES	2 - Czech Republic, Republic of Serbia
DURATION (start – end)	2017-2018
PROJECT WEBSITE	http://www.cei.int/content/kep-italy-fuelpage-project-screening-visit-strengthening-fuel-quality-monitoring-practices-s
CONTACT AT UB-FME	dstojiljkovic@mas.bg.ac.rs

PROJECT TITLE

BALANCED EUROPEAN CONSERVATION APPROACH – ICT SERVICES FOR RESOURCE SAVING IN SOCIAL HOUSING

ACRONYM/ PROJECT ID

BECA

FUNDING PROGRAM

CIP-ICT-PSP [ICT for energy and water efficiency in social housing]

PROJECT COORDINATOR

EMPIRICA GESELLSCHAFT FUER KOMMUNIKATIONS- UND TECHNOLOGIEFORSCHUNG MBH, Germany

PROJECT COORDINATOR AT UB-FME

Prof. Dr. Miroljub Adzić

PARTICIPANTS FROM UB-FME

Prof.Dr. Miroljub Adzić, Prof. Dr. Vasko Fotev, Prof. Dr. Maja Todorović, Asst. Prof. Dr.Aleksandar Milivojević, Vuk Adzić, M.Sc.Mech.Eng.

PROJECT DESCRIPTION

The BECA (Balanced European Conservation Approach – ICT services for resource saving in social housing) project addresses the need to reduce energy consumption in European social housing by a very significant amount to meet overall emission reduction targets. To substantially reduce peak and overall demand for energy and water across EU social housing, BECA will develop a full set of innovative services for resource use awareness and resource management. Balance is achieved by addressing not only energy but water, by including all key energy forms - electricity, gas and heating - and by including strong activities in Eastern Europe as well as in the North, South and West of the EU.

Social housing organisations in 7 European countries (Germany, Italy, Spain, Sweden, Bulgaria, Czech Republic, Serbia) and their partners are cooperating in the project to provide ICT-based energy management and energy awareness services directly to social housing tenants and service operators. Services will be piloted by approx. 5,000 social housing tenants across 7 sites in 7 European countries. Sustained reductions in resource use are to be achieved through usable ICT-based services directly to tenants, as well as by effective monitoring and control of local power generation and, for district heating, the full heat delivery chain. Intensive work will be addressed to optimising services for tenants and maximising impact on resource use behaviour. Service requirements will be investigated with tenants and staff and service prototypes based on initial use cases will be subject to user testing within the first year of the project. Results are used to finalise service design in a second iteration of use case definition and service specification lasting some 8 months, cumulating in implementation of operational services at all the 7 pilot sites. Pilots at sites will operate for at least 14 months; lead sites will be identified to being operation early and provide example solutions to others. The consortium, led by social housing providers and public authorities includes global ICT and service providers and distribution network operators working with local consultants and specialist advisors to carry out all steps in service implementation.

KEY WORDS

ICT services, social housing, energy efficiency, ecology

CONSORTIUM

1. EMPIRICA GESELLSCHAFT FUER KOMMUNIKATIONS- UNDTECHNOLOGIEFORSCHUNG MBH
2. DELPHIS DEVELOPPEMENT ETUDES POUR LE LOGEMENT LA PROMOTION DE L'HABITA L'INNOVATION ET LE SOCIAL ASSOCIATION
3. CENTRE INTERNACIONAL DE METODES NUMERICS EN ENGINYERIA

4. PICH-AGUILERA ARQUITECTOS S.L.P
5. FOMENT DE LA REHABILITACIO URBANA DE MANRESA SA, ASSOCIATION MUNICIPAL ENERGY AGENCY RUSE
6. UNIVERSITY OF ROUSSE ANGEL KUNCHEV
7. Ruse Municipality
8. Agenzia Territoriale per la Casa della Provincia di Torino
9. MESTSKA REALITNI AGENTURA SRO
10. STU-K AS
11. University of Belgrade - Faculty of Mechanical Engineering
12. BEOGRADSKE ELEKTRANE
13. PREDUZECE ZA INFORMACIONE TEHNOLOGIJE I ELEKTRONSKO TRGOVANJE BELIT DOO
14. ÖrebroBostäder AB
15. bauverein AG
16. Techem Energy Services GmbH
17. INSTITUT WOHNEN UND UMWELT GMBH
18. POLITECNICO DI TORINO

COUNTRIES

8 - Federal Republic of Germany, French Republic, Kingdom of Spain, Bulgaria, Republic of Italy, Czech Republic, Republic of Serbia, Kingdom of Sweden

DURATION
(start – end)

2011 – 2013

PROJECT WEBSITE

http://beca-project.eu/home.html

CONTACT AT UB-FME

amilivojevic@mas.bg.ac.rs

PROJECT TITLE
SAVING ENERGY IN EUROPE'S PUBLIC BUILDINGS USING ICT

ACRONYM/ PROJECT ID
SMARTSPACES

FUNDING PROGRAM
CIP-Pilot actions

PROJECT COORDINATOR
EMPIRICA GESELLSCHAFT FUER KOMMUNIKATIONS- UND TECHNOLOGIEFORSCHUNG MBH, Germany

PROJECT COORDINATOR AT UB-FME
Prof. Dr. Miroljub Adzić

PARTICIPANTS FROM UB-FME
Prof. Dr. Miroljub Adzić, Prof. Dr. Vasko Fotev, Prof. Dr. Maja Todorović, Asst. Prof. Dr.Aleksandar Milivojević, Vuk Adzić, M.Sc.Mech.Eng.

PROJECT DESCRIPTION

To substantially reduce peak and overall demand for energy and water across EU public buildings, the project will develop a service comprising innovative ICT-based energy decision support, awareness and management service components. Decision support is provided directly to city energy managers and other professionals responsible for building performance, and to building users, both staff and visitors to the building, including school pupils and university students and the general public, enabling all to optimise their energy-related behaviour based on up-to-date meter feedback on energy consumption. Management components of the service include effective ICT control of local renewable power and the full heat delivery chain for district / building systems. The SMARTSPACES service will enable public authorities in Europe significantly to improve their management of energy in the buildings they occupy. In operational terms, the consortium will carry out intensive work on optimising services for all user groups and maximising impact on resource use behaviour. Within the first year, requirements will be investigated with users, use cases agreed and service prototypes subject to rigorous user testing. Test results help finalise service components in a second design iteration lasting some 8 months, cumulating in implementation of operational services at all 11 pilot sites with more than 550 buildings in 8 countries (UK, FR, DE, IT, ES, NL, TR, RS) with almost 20,000 professionals and staff users and reaching an estimated more than 6,000,000 visitors annually.
Pilots at all sites will operate for at least one year; lead sites will be identified to being in operation early and provide example solutions to others.

The consortium, led by public authorities includes global ICT and service providers and distribution network operators working with local consultants and specialist advisors to carry out all steps in the project service implementation process.

KEY WORDS
Public buildings, Energy Decision Support and Awareness Services, Smart Metering, Building Management Systems, Energy Management Systems and Services, ICT for Energy Efficiency, Energy Savings

CONSORTIUM
1. EMPIRICA GESELLSCHAFT FUER KOMMUNIKATIONS- UND TECHNOLOGIEFORSCHUNG MBH
2. University of Belgrade - Faculty of Mechanical Engineering, BEOGRADSKE ELEKTRANE
3. PREDUZEĆE ZA INFORMACIONE TEHNOLOGIJE I ELEKTRONSKO TRGOVANJE BELIT DOO
4. BIRMINGHAM CITY COUNCIL

5. BRISTOL CITY COUNCIL
6. SYSTEMSLINK 2000 LTD
7. STADT HAGEN
8. INGENIEUR-UND PLANUNGSGEMEINSCHAFTENVI GMBH
9. Istanbul Sport Events Inc.
10. LEICESTER CITY COUNCIL
11. DE MONTFORT UNIVERSITY
12. FUNDACIO LLEIDA 21*AGENCIA DE L'ENERGIA DE LLEIDA AEL
13. CENTRE INTERNACIONAL DE METODES NUMERICS EN ENGINYERIA
14. GASSO AUDITORES, SLP
15. COMUNE DI MILANO
16. IBM ITALIA SPA
17. CISCO SYSTEMS INTERNATIONAL B.V.
18. BT Italia SpA
19. VILLE DE MOULINS
20. MOULINS HABITAT
21. EDF Optimal Solutions
22. REAL PROJECT PARTNER SARL
23. LYONNAISE DES EAUX FRANCE SA
24. CONSORCIO AGENCIA LOCAL DE LA ENERGIA Y EL CAMBIO CLIMATICO DE MURCIA
25. EXPLOITATIEMAATSCHAPPIJ VILLA FLORA BV.

COUNTRIES

8 - Federal Republic of Germany, French Republic, Kingdom of Spain, The United Kingdom, Republic of Italy, Republic of Serbia, Republic of Turkey, The Netherlands

DURATION
(start – end)

2012 – 2014

PROJECT WEBSITE

http://www.smartspaces.eu/

CONTACT AT UB-FME

amilivojevic@mas.bg.ac.rs

PROJECT TITLE

EFFICIENT USE OF RESOURCES IN ENERGY CONVERTING APPLICATIONS

ACRONYM/ PROJECT ID

EURECA

FUNDING PROGRAM

SEVENTH FRAMEWORK PROGRAMME

PROJECT COORDINATOR

EWE-Forschungszentrum für Energietechnologie e.V., Germany

PROJECT COORDINATOR AT UB-FME

Prof. Dr. Miroljub Adzić

PARTICIPANTS FROM UB-FME

Prof. Dr. Miroljub Adzić, Prof. Dr. Vasko Fotev, Prof. Dr. Maja Todorović, Asst. Prof. Dr.Aleksandar Milivojević, Vuk Adzić, M.Sc.Mech.Eng.

PROJECT DESCRIPTION

EURECA develops the next generation of µ-CHP systems based on advanced PEM stack technology. The idea is to overcome the disadvantages of complex gas purification, gas humidification and the low temperature gradient for the heat exchangers in a heating system. EURECA will develop a new stack generation based on PEM technology with operating temperatures of 90°C to 120°C. Thus results in a less complicated and therefore in a more robust µ-CHP system with reduced costs. The development of a new stack generation includes various parallel working tasks. EURECA will optimize materials to operate in that temperature range – including membrane and bipolar plate materials. Also the catalyst will be improved with a lower platinum loading – design target < 0.2g/kW. The stack design and the flow field of the bipolar plates will be optimized for the operating conditions. All development steps will be supported by state-of-the-art modeling. As the final step the developed stack will be integrated in an adapted µ-CHP system to achieve proof-of-concept in the target application. Important part of the project is the validation of the design targets. The µ-CHP system – including the reformer
– is expected to operate at an electrical efficiency of 40%. Lifetime tests with defined test procedures on single cells and short stacks will indicate a stack lifetime of approx. 12.000 h. In all development processes the partners
have agreed to a design-to-cost approach. This includes the producibility in series production processes. A cost assessment will indicate the cost savings by the less complicated system. The consortium is well balanced along the supply chain. Component suppliers and system designers are backed
by research institutions. High quality of the development process is of top priority to all partners. Therefore the consortium will agree at the beginning of EURECA on specific quality and management procedures – including contingency planning measurements.

KEY WORDS

Fuel Cell, CHP system, micro-CHP, PEM, MT-PEM, new stack and cell design, medium temperature fuel cell, MEA design

CONSORTIUM [2]

1. EWE-Forschungszentrum für Energietechnologie e.V.
2. Eisenhuth GmbH & Co. KG
3. UNIVERZITET U BEOGRADU
4. COMMISSARIAT A L ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES

5. FOUNDATION FOR RESEARCH AND TECHNOLOGY HELLAS
6. INHOUSE ENGINEERING GMBH
7. CELAYA
8. EMPARANZA Y GALDOS INTERNACIONAL, S.A.
9. FUNDACION CIDETEC
10. FRAUNHOFER-GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V

COUNTRIES

5 - Federal Republic of Germany, French Republic, Kingdom of Spain, Hellenic Republic, Republic of Serbia

DURATION
(start – end)

2012 – 2014

PROJECT WEBSITE

http://www.fch.europa.eu/project/efficient-use-resources-energy-converting-applications

CONTACT AT UB-FME

amilivojevic@mas.bg.ac.rs

PROJECT TITLE	THE ENERGY DATA INNOVATION NETWORK; USING SMART METER DATA, CAMPAIGNS AND NETWORKING TO INCREASE THE CAPACITY OF PUBLIC AUTHORITIES TO IMPLEMENT SUSTAINABLE ENERGY POLICY
ACRONYM/ PROJECT ID	EDI-NET
FUNDING PROGRAM	H2020
PROJECT COORDINATOR	De Montfort University(UK)
PROJECT COORDINATOR AT UB-FME	Asst. Prof. Dr. Aleksandar Milivojević
PARTICIPANTS FROM UB-FME	Asst. Prof. Dr. Aleksandar Milivojević

PROJECT DESCRIPTION

Accelerate the implementation of sustainable energy policy. It will do this by increasing the capacity of EU public authorities to act quickly and decisively. The capacity will be increased by the provision of just the right amount of intelligible information, by training and exchange of experiences of Public authorities and by provision of tools and support to implement and monitor their sustainable energy plans.

The innovation is in the way public authorities use information from smart energy and water meters. To move beyond the traditional technical energy manager approach to use the information to engage with decision makers, finance mangers and building users. To make energy more "visible". To make energy and water data "more exciting" to buildings users. Innovation in terms of using big data analytics to address issues at scale. Big data; thousands of EU public buildings; information for decision makers, finance managers and building users; benchmarking of EU public buildings; and monitoring implementation of Sustainable Energy Action Plans or local Climate Protection Plans.

The core of EDI-NET is the analysis of smart meter data from buildings, from renewable energy systems and from building energy management systems (BEMS) using Big Data analytics technologies. The attractive fruit around this core is an online forum to spread knowledge and facilitate exchange of experience and best practice through peer to peer education in a friendly and useful way. The tree that supports and ripens the fruit is the existing European network of Climate Alliance that builds the capacity of EU public authorities to more effectively implement sustainable energy policies.

The ultimate impact will be not only in terms of energy savings across the EU public sector, but also in terms of the increase in knowledge and networking resulting from the exchange of experience. Using information from smart meters to make more effective use of renewable energy, more successfully implement sustainable energy action plans and local Climate Protection Plans, more effectively set financial budgets for energy and water and help implement EU energy policy in the public sector.

Overall the project will help public authorities define and evaluate their energy efficiency and renewable energy plans. It will directly engage with and influence over 600 decision makers, financial professionals, and energy managers and over 3,000 public authority staff. It is expected to reach many more (over 25 500 public officers, 0.5 million public staff and millions of people). The tools developed will enable public officers to (1) target the energy and water consumption of a huge number of buildings and monitor progress against these targets; (2) establish more effective energy and water budgets for financial managers; (3) implement Sustainable Energy Action Plans and local Climate Protection plans more effectivelyand (4) enable knowledge transfer between energy professionals and building users.

INTERNATIONAL PROJECTS

KEY WORDS

Fuel Cell, CHP system, micro-CHP, PEM, MT-PEM, new stack and cell design, medium temperature fuel cell, MEA design

CONSORTIUM

1. De Montfort University(UK) - co-ordinator
2. Empirica (DE)
3. CIMNE (Centre Internacional de Metodes Numerics en Enginyeria) (ES)
4. Departament de Territori i Sostenibilitat - Generalitat de Catalunya – (ES)
5. Leicester City Council (UK)
6. Stadt Nurnberg (DE)
7. Climate Alliance (DE)
8. University of Belgrade - Faculty of Mechanical Engineering – part of Advisory Group

COUNTRIES

5 - Federal Republic of Germany, French Republic, Kingdom of Spain, Hellenic Republic, Republic of Serbia

DURATION
(start – end)

2016 – 2018

PROJECT WEBSITE

http://www.edi-net.eu/en/home.html

CONTACT AT UB-FME

amilivojevic@mas.bg.ac.rs

PROJECT TITLE	UNDERSTANDING AND CONTROLLING NANO AND MESOSCALE FRICTION
ACRONYM/ PROJECT ID	COST
FUNDING PROGRAM	Prof. Dr. Nicola Manini, Universita degli Studi di Milano, Italy
PROJECT COORDINATOR	Prof. Dr. Aleksandar Vencl
PROJECT COORDINATOR AT UB-FME	
PARTICIPANTS FROM UB-FME	Prof. Dr. Aleksandar Vencl, Filip Vučetić, M.Sc.Mech.Eng.
PROJECT DESCRIPTION	Recent years have seen widespread efforts to understand the mechanisms of friction and tribology in micrometric structures (mesoscale) down to the realm of atoms and molecules (nanoscale), with the ultimate goal of controlling friction, adhesion and wear by design. This research has generated an interdisciplinary scientific area, nanotribology, with great potential impact on technology and everyday life. Applications include safety, economy, life quality, energy and material saving, toward a sustainable development. Europe has a strong scientific nanotribology community spreading over physics, materials science, chemistry, earth and life sciences. So far, this community lacks a chance to interact closely enough: it is in urgent need of better networking, to favor collaboration among groups and exchange of complementary expertise. A COST Action, operating beyond the national horizons, can indeed mobilize and put together the critical mass of existing human and technical nanotribology resources at a modest price, thus representing a unique opportunity for an efficient scientific investment.
KEY WORDS	
CONSORTIUM	Republic of Austria, Republic of Bulgaria, Czech Republic, Denmark, Republic of Estonia, Republic of Finland, French Republic, Federal Republic of Germany, Hellenic Republic, Republic of Ireland, Israel, Republic of Italy, Republic of Latvia, Republic of Lithuania, The Netherlands, Kingdom of Norway, Republic of Poland, Republic of Portugal, Republic of Serbia, Kingdom of Spain, Kingdom of Sweden, Swiss Confederation, Republic of Turkey, The United Kingdom
COUNTRIES	2 (two) - Czech Republic, Republic of Serbia
DURATION (start – end)	2013 – 2017
PROJECT WEBSITE	http://www.nanofriction.orging-practices-s
CONTACT AT UB-FME	avencl@mas.bg.ac.rs

cost
action MP1303

PROJECT TITLE	EXPERIMENTAL DETERMINATION OF THE WEAR MECHANISMS AT THE NANO AND MACROSCALE – BRIDGING THE GAP BETWEEN TWO SCALES
ACRONYM/ PROJECT ID	
FUNDING PROGRAM	Pavle Savić – Partenariats Hubert Curien
PROJECT COORDINATOR	
PROJECT COORDINATOR AT UB-FME	Prof. Dr. Aleksandar Vencl
PARTICIPANTS FROM UB-FME	Prof. Dr. Aleksandar Vencl, Filip Vučetić, M. Sc. Mech. Eng.
PROJECT DESCRIPTION	The wear of the materials has a significant economic and social impact. Wear is a phenomenon that occurs both in the mechanical degradation of materials, limiting the lifespan of machine tools, the increased risk of accidents due to breakage through wear, etc. Despite the critical issues, the description of wear phenomena remains empirical because the physical and chemical interactions involved at the interface of sliding contacts are still poorly understood. Among the models, widely applied, both for the macroscopic and microscopic systems, the Archard wear equation established in 1953, assumes that the volume of material removed by wear is directly proportional to the applied load and sliding distance. However, the miniaturization of systems and, more generally, the development of nanotechnologies, requires a better understanding of the wear phenomena and most relevant laws that predict these phenomena. In particular, recent experiments done at this scale showed that Archard equation could be faulty.
KEY WORDS	
CONSORTIUM	
COUNTRIES	2 - Republic of Serbia, French Republic
DURATION (start – end)	2016 – 2017
PROJECT WEBSITE	
CONTACT AT UB-FME	avencl@mas.bg.ac.rs

PROJECT TITLE	MODERN TRENDS IN EDUCATION AND RESEARCH ON MECHANICAL SYSTEMS – BRIDGING RELIABILITY, QUALITY AND TRIBOLOGY
ACRONYM/ PROJECT ID	CEEPUS
FUNDING PROGRAM	Assoc. Prof. Dr. Juliana Georgieva, University of Chemical Technology and Metallurgy, Bulgaria
PROJECT COORDINATOR	Prof. Dr. Aleksandar Vencl
PROJECT COORDINATOR AT UB-FME	Prof. Dr. Aleksandar Vencl
PARTICIPANTS FROM UB-FME	
PROJECT DESCRIPTION	The mostly used definition is that Tribology is the science and engineering of interacting surfaces in relative motion. It includes the study and application of the principles of friction, lubrication, wear and other process between contacting surfaces. Looking at tribology from the modern point of view we could say that Tribology is the name given to the scientific concept with embraces processes at surfaces and interfaces, as friction, wear, lubrication, tightness in the contact zone, called also contact body or third body, generally revealing the interaction in contact. There are recently basic reasons for the growing importance of tribology: the control of friction and wear leads to economical, ecological advance and sustainable development in industry, very large energy saving factor, and as one of the most important practical issue – improvement of the reliability and quality, becoming thus a recognized topic acknowledged during the last thirty years as an important educational, scientific and technological conception.
KEY WORDS	
CONSORTIUM	
COUNTRIES	Republic of Austria, Bosnia & Herzegovina, Republic of Bulgaria, Republic of Croatia, Hungary, Republic of Moldova, Republic of Poland, Republic of Romania, Republic of Serbia, Slovak Republic
DURATION (start – end)	2012 –
PROJECT WEBSITE	http://mmu2.uctm.edu/ceepus/index.htmling-practices-s
CONTACT AT UB-FME	avencl@mas.bg.ac.rs

PROJECT TITLE
CONTEMPORARY MANUFACTURING AND MEASURING TECHNOLOGIES IN QUALITY MANAGEMENT SYSTEMS

ACRONYM/ PROJECT ID

FUNDING PROGRAM
CEEPUS

PROJECT COORDINATOR
Prof. Dr. Stanislaw Adamczak, Kielce University of Technology, Poland

PROJECT COORDINATOR AT UB-FME
Prof. Dr. Aleksandar Vencl

PARTICIPANTS FROM UB-FME

PROJECT DESCRIPTION

The main aim of the Project is to prepare the theoretical and practical fundamentals of measurement techniques applied in quality management systems. Since the basis of a market economy is to provide quality goods and services, it is essential to constantly improve the performance and reliability of measuring, testing and controlling equipment. The other aims include: increasing the development of the partner universities by focusing the research on measuring techniques in quality management systems; facilitating the activities within other international (DAAM, TEMPUS) and national (SIMP, PAN) programmes; enhancing the involvement of the collaborating universities in national and international research projects so as to increase cooperation with industrial partners.

KEY WORDS

CONSORTIUM

COUNTRIES
Republic of Austria, Bosnia & Herzegovina, Republic of Bulgaria, Republic of Croatia, Hungary, Republic of Moldova, Republic of Poland, Republic of Romania, Republic of Serbia, Slovak Republic

DURATION (start – end)
2005 –

PROJECT WEBSITE

CONTACT AT UB-FME
avencl@mas.bg.ac.rs

2017

www.mas.bg.ac.rs