Partner Search offer in Horizon 2020

Date (2017/05/25)

(*) Description of the expertise offered (up to 1000 characters)

The research activities of the Resource Team of the Department of Process Engineering of Faculty of Manufacturing Technologies (TUKE) are focused on the theoretical and practical solution of basic and application-oriented research tasks in solved research and business projects in several areas.

The outputs of the scientific and research activities of the Department's staff are continuously published in domestic and foreign scientific and professional journals, and regularly presented at international conferences.

The Department of Process Engineering currently has 2 laboratories: Laboratory of Thermal Technology, and Laboratory of Multivalent Renewable Energy Sources that serve for the research in the following areas:

- Research on the use of renewable energy sources.

- Control of multivalent systems on the basis of predictive and optimization control algorithms,
- Research of SMART solutions based on renewable energy sources (RES),
- Data collecting for optimization of energy use and distribution within Industry 4.0 platform.

- Research of synergic effects of heat/electricity cogeneration.
- Low-potential electricity generation from waste heat.

- Research of waste utilization within Waste to Energy (WTE) in heat/electricity cogeneration with application of Organic Ranking Cycle (ORC) devices.

- Impact of heat production on air pollution.

- Use of sorbents to reduce the ratio of NO_x in exhaust gases of internal combustion engines and in flue gases of biomass-burning boilers. Development of materials with catalytic effects. Development of new zeolite products with modified external surface. Preparation of new generation environmental adsorbents that prefer natural matrices as functional group carriers.
- Combustion optimization in marginal conditions with an account to NO_x generation.

In the premises of the Department there are web-structured laboratories – Laboratory of Thermal Technology, and Laboratory of Multivalent Renewable Energy Sources, that are equipped with instrumentation suitable for monitoring/observing the effectiveness of combined renewable energy systems integration.

The Laboratories consist of the following main components:
- Heat pump -CLIVET WBAN162,
- Wood chips burning boiler – Herz Firematic 80 Biocontrol (rated power 90 kW),
- 2 heat accumulators - PSR 800 KKH and 1 heat accumulator VT-S 1000FRMR: 950 l,
- Heat regenerative unit- SABIANA ENY3,
- Solar thermal system – the field of four flat solar panels HERZ CS 100F, solar control unit Citrinsolar CS 3,2, and photovoltaic system (photovoltaic panels Light Way Green New Energy CO., Ltd. – module type LW235(29)P1650X990, accumulator set Rolls S530,
- Control system DESIGO INSIGHT (Siemens),
- Communication system DESIGO INSIGHT (Siemens),
- Computer simulation laboratory, software: ANSYS FLUENT, PROTECH, TECHCON
- Multivalent heat/cold consuming appliances, chilled ceiling panels, floor-mounted fan-coils COLL-HC, radiators,
- Halogen weights - METTLER TOLEDO HR83 (with moisture content analyzer),
- Weights - METTLER TOLEDO ML104 /M01,
- Calorimeter Parr 6200.

Keywords describing the expertise offered (up to 10 words)

Renewable energy sources, thermomechanic, solar system, photovoltaic, biomass, waste heat, eating bodies, air protection, nitrogen oxides reduction, optimization of combustion.

Potential Contribution to the Project Proposal:

- [x] Research development
- [ ] Innovation
- [ ] Prototype / Model
- [x] IPR Know-How
- [x] Dissemination and Outreach
- [x] Capacity Building
- [x] Hosting/Sending Secondments
- [x] Networking

☐ Other:

(*) Relevant topic in work programme

EE-01-2017: Waste heat recovery from urban facilities and re-use to increase energy efficiency of district or individual heating and cooling systems

EE-02-2017: Improving the performance of inefficient district heating networks

EE-06-2016-2017: Engaging private consumers towards sustainable energy

EE-15-2017: Increasing capacities for actual implementation of energy efficiency measures in industry and services

Former participation in FP or other international cooperation projects

Organisation information

Organisation and country:
Faculty of Manufacturing Technologies of Technical University in Košice, based in Prešov
Department of Process Engineering

The Slovak Republic

Type of organisation:
☐ Enterprise
☐ SME
☒ Academic
☐ Research institute
☐ Public Body
☐ Other:

Former participation in FP European projects?

☐ NO

Web address:
www.tuke.sk

Description of the organisation:
The Department of Process Engineering, based on its professional focus, offers cooperation in various areas of education and research in process technology with an emphasis on energy and gas industry. The focus of the Department members allows to solve demanding

projects in the measurement and control field of burners, boilers, and thermal systems, with no restriction concerning power size and fuel type. A part of our work is designing and fuel consumption optimization of technological and process fuel-burning devices with respect to emission limits compliance. The Department has up-to-date measuring equipment for determination of heat production/consumption effectiveness. Within the research and educational activities, the Department staff devotes considerable care to the proposals of measuring and evaluating methods for all fuel combustion processes, heat generation, combustion "greening" and air pollution. Recently, an emphasis has been placed on research of the effectiveness of multivalent, renewable-energies-based heat sources. The Department employees have developed long-term cooperation with leading companies in the heat and process industry, such as Testoterm, Siemens, Buderus, Herz, PBS industry, Schiedel, Siemens Control Systems, simulation software based on ANSYS/FLUENT, Matlab, Femlab, NI and other.

Target Partner Sought:

☐ Are you a coordinator of a project proposal looking for partners?
☒ Are you looking for participation in project proposal as a partner?

Organisation details:

☒ Academic

Target Partner Country:

☐ Any Country
☒ Third Country
☒ Member State or Associated Country
☐ Specific Country:

(*) Contact details

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(*) Mandatory

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