Status: Forthcoming
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Call Identifier: H2020-EE-2016-2017
Topic: EE-01-2017 Waste heat recovery from urban facilities and re-use to increase energy efficiency of district or individual heating and cooling systems
Types of action: IA Innovation action
DeadlineModel: single-stage
Pillar: Societal Challenges
Work Programme Year: H2020-2016-2017
Work Programme Part: «Secure, Clean and Efficient Energy»
Planned opening date: 15 June 2016
Deadline: 19 January 2017 17:00:00

Acronim of the project: FOP-ParFin
Name of the project: New type of flat-oval pipes with partial finning for water economizers of heating boilers and dry cooling towers (gradierens)

Description of the project:

New, scientifically proved technology of finned flat-oval pipes with partial finning at manufacturing waste-heat boiler, used at heating, water or air cooling, can be widely used in the real European market, with demonstration of the Business Case, and an economic substantiation of the benefits received.

A new technology allows us to use recovery of waste heat in various technological devices more effectively: industrial and municipal Europe`s enterprises, where water economizers, caloriphers of boiler equipment, boilers-utilizes, regenerators, oil coolers of steam-gas and gas turbine units, air condensers and also dry cooling towers (gradierens) are applied.

The overall objective of new technology consists in raising efficiency and competitiveness of systems of primary energy production in individual central heating and cooling systems, cooling systems of machines at industrial enterprises (metallurgical, machine-building factories etc.), power supply units at thermal and atomic power stations for the account of more effective waste heat utilization.

Flat-oval pipes with partial finning have essential advantages compared to the ones currently used in industry:
- operating ability and low cost of manufacturing when the pin (contact) welding technology is applied;
- high degree of the surface development that reaches the values of the best samples of bimetallic pipes and is cheaper than carbon steels (in comparison with aluminum);
- high intensity of convective heat exchange due to the absence of an aerodynamic shade at which there is observed low local speed of a stream, and due to turbulization of a stream between the ribs;
- ideal thermal contact between the ribs and a bearing pipe due to the pin welding technology;
- low aerodynamic resistance due to configuration of bearing pipes.

Besides, the application of a new technology results in reduction of metal consumption for heating boiler designs, promotes ecology improvement due to the reduction of harmful emissions of carbonic gas and steam in atmosphere, the decrease of GHG level, improves working conditions and safety. It should also bring benefits to the Society, especially for the state and private enterprises, involved in primary energy production and energy management.

According to the project objectives there are described the following basic indicators:
- efficiency increase of a network of primary energy production, GHG decrease (emissions of hotbed gases), caused by the offered actions (in comparison with the best decisions existing today);
- increase in volume of unnecessary heat, used at heating plants, power stations, industrial enterprises;
- implementation scale of the offered decisions in the European Union countries.

The project focuses on reproducibility, scalability and modularity of enterprises that will facilitate introduction and fast expansion of the declared technology in the European Union countries.

The new technology assumes production of new pipes and replacement of a considerable amount of outdated heating boilers. This will help to create new working places in the European Union countries. During project implementation viable working models and organizational measures will be created, organizational and financial decisions will be developed for implementation of the offered technological decisions in EU that correspond to the current legislation of each country. Therefore, to solve this ambitious challenge there must be formed a strong consortium for generating the offered technology.

We welcome to join us the following partners: pilot cities (Smart cities with existing Smart Grid + DERs, Cities with non-electricity networks like power to heat/power to gas/fuel solutions, etc.), Regulators, Local governments/Public Administrations with Regulatory power, Technical/Business Partners, Companies that have Electric Vehicle Fleets, Social studies Companies/Universities, Manufacturers (of Batteries, Sensors, Smart Appliances, etc.) or Data acquisition companies (IOT, Smart Home, local intelligence, etc.).

The project is based on the previous projects supported by the Program FP7 and Horizon 2020. Now it is carried out at the machine making flat-oval pipes with partial finning at the TRL 6. The technology modernization is made, and TRL is expected to be 8-9 after the project accomplishment.

The technology is developed based on the discovery of the National Technical University of Ukraine "Kiev Polytechnic Institute" (the Dean of the Faculty: doctor, prof. Ye. Pysmennyy). Since 2013 the installation of finned flat-oval tubes (pipes) with partial (incomplete) ribbing (finning) has been developed in SE "EDTB of E.O. Paton EWI NASU". In 2015 the automation, adaptability to manufacture, profitability and welding operations quality of the available installation were improved.
The project is eligible for the Horizon 2020 projects:
EE-2017 (EE-01-2017, EE-02-2017), SMEInst-2016-2017.
We invite potential partners for cooperation in the program Horizon 2020.

Keywords:

Energy efficiency, GHG, pipes finning, water economizers, heating boiler, caldron-utilizers, dry cooling towers, gradierens, recovery of waste heat

PARTNER PROFILE SOUGHT

Required skills and Expertise:

Experts on manufacture of primary energy and it transfering to the heating plant; experts in heating recycling in boiler-houses; experts in cooling of units at the large industrial enterprises and power stations.

Description of work to be carried out by the partner(s) sought:

Role 1: Provide specification and testing operations of systems on manufacturing of primary energy for revealing technologies with large losses of heat and cool on the territory of the EU
Role 2: Provide specification and testing operations of power stations and nuclear stations with inefficient cooling systems and power supply units on the territory of the EU
Role 3: Provide specification and testing operations of the large enterprises with inefficient cooling machine systems on the territory of the EU
Role 4: State and private enterprises manufacturing primary energy, ready for introduction of a new technology on the territory of the European Union

Type of partners sought:

Role 1: Enterprises manufacturing primary energy and housing associations
Role 2: Power stations, thermal stations and nuclear stations, associations of energy manufacturers
Role 3: Large metallurgical and machine-building factories, associations of the industrial enterprises, etc.

Role 4: State bodies, municipalities, city councils, public organisations, concerned with the environmental improvement, GHG decrease.

PROPOSER INFORMATION

Type of Organisation: Research and design institutions in the area of innovative machines in welding
Country: Ukraine, Kyiv
Name of enterprise: State enterprise "Experimental Design and Technological Bureau of E.O. Paton Electric Welding Institute of the National Academy of Sciences of Ukraine" (SE "EDTB of E.O. Paton EWI NASU")
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