

Partnering Opportunity

Profile Status: Published

Research & Development Request

H2020 FTI company search to optimize and develop a market niche (families living in EU mountain areas) innovative cogeneration system fueled by very low cost energy source as forestry wastes

Summary

An Italian mechatronics engineering company is developing a proposal for H2020-FTI cut-off 22-10-2019 to validate an innovative micro-cogeneration system fueled by forestry wastes having Stirling engine. Searched partners (by 15 September) - SME skilled in production and sale of biomass boilers - SME / Research Center skilled in heat exchange / Stirling systems - commercial distributors.

Creation Date	05 July 2019
Last Update	08 July 2019
Expiration Date	15 September 2019
Reference	RDIT20190705001
Public Link	https://een.ec.europa.eu/tools/services/PRO/Profile/Detail/e60cc95b-7b69-4ac0-be3a-97e934fd5ceb

Details

Description

The AIEL-Italian Biomass Association estimates that the average annual demand for single-family heating systems ($\leq 40\text{kWt}$) is more than 50,000 biomass boilers referring to the main EU markets (Germany, Italy, France, Austria). Pellet is now the biomass most widely used having cost about 50-70% lower than that the diesel oil and liquefied petroleugas. Wood chipped is even less expensive: 50% lower than that of pellets and 35% lower than that of wood logs. For families living in mountainous and rural areas it is undoubtedly cheaper to use wood chipped given its availability on site and the lower cost ($\text{€}/\text{kWt}$). AIEL estimates that about 5-10% of rural and mountain families who buy biomass boilers for heating are interested also to cogeneration, but currently they do not have a suitable solution on the market using wood chipped. After some

Ref: RDIT20190705001

years of R&D activities, the Italian proposer engineering company has developed a micro-cogeneration system (mCHP) having boiler fuelled by low-cost agro-forestry waste (wood chipped) integrated with a Stirling engine operating a 2.5 kW electric generator. Stirling is the best solution to co-generation by heating system biomass powered, because it absorbs heat directly from the boiler and it is more reliable and less noisy than an internal combustion engine. The solution will be proposed to a market niche made up of the families of small farmers living in mountainous areas of the main EU biomass market.

The project objective is to optimize, test, patent and start market introduction of an innovative mCHP having low operating costs and competitive market price compared to competing micro-cogeneration systems.

The mCHP must have energetic performances and total life costs (investments + operating) unique to solve the pain point of the market niche represented by families living in EU mountainous and rural areas.

The proposer is an Italian mechatronics engineering company, skilled also in EU R&D projects. It will be the project coordinator. Its role in the project will be to industrialize produce and test the Sterling engine integrated with the electric generator.

Main partner sought is a SME company skilled in biomass boiler heating, that will develop the boiler system wood chipped fueled suitable to be integrated with the Stirling engine. This partner must will be able to introduce the mCHP system on the EU main markets.

Other partners:

- a SME or Research Center skilled in heat exchange systems and / or Stirling systems to optimize the engine performances;
- consultant company to implement a market analysis and trends about domestic cogeneration and biomass heating, and/or
- commercial distributors to analyze the potential market and sell mCHP in their countries

The proposal will be submitted to the Horizon 2020 Fast Track to Innovation cut off date of 22 October 2019

The partner search deadline is 15th of September.

Advantages and Innovations

On the market are currently available various technologies for domestic cogeneration (mCHP): traditional systems with internal combustion engine (powered by diesel oil or liquefied petroleugas), innovative systems by fuel cells or with Stirling engine powered by pellet or methane gas. Compared to the Stirling mCHP system pellet fueled actually on the market, the new system target strengths will be: 20% lower price, 40% lower fuel price, electrical power 2,5 higher.

The proposed system will be able to produce thermal and electric energy to satisfy until 100% of the energy needs of the target customers (estimated in 30.000 kWh thermal and 6.000 kWh electric). The energy needs of the target customers will be met with a boiler having thermal power 35 kWt coupled to a Stirling engine having 2,5 kW of the electrical power, that will absorb about 35% of the boiler heat.

The proposed solution will have energetic and environmental performances and total life costs (investments +operating) unique to solve the pain point of the target market niche.

Technical Specification or Expertise Sought

TECHNICAL SPECIFICATION. The expected features from the new mCHP system are:

- thermal power of the hearth boiler: 35 – 40 kWt;
- max electrical power: 2,5 kWe (at Stirling pressure of 28-30 bar);
- minimum starting temperature of Stirling: 350-400 °C.

The industrialized Stirling will have max manufacturing cost 6.000€.

The mCHP must be sold at a price lower than 25.000 € (gross of government grants)

PARTNERS EXPERTISE SOUGHT:

- principally a company skilled in production and sale of biomass boilers;
- a company or Research Center skilled in heat exchange systems and / or Stirling systems
- commercial national distributors to analyze the potential market and sell in their countries

Stage of Development

Proposal under development

Comments Regarding Stage of Development

The applicant developed a Stirling engine prototype in collaboration with Research Italian Centres by a project funded by Italian Development Ministry Economic Innovation Technology Found.

The tests performed on the Stirling prototype have allowed to identify how to optimize the Stirling energy performances. Patent Database preliminary survey performed by consultant Agency ABM confirmed the freedom to operate and the patenting viability of the technical solutions selected by the applicant.

IPR Status

Granted patent or patent application essential

Comment Regarding IPR status

The applicant has exclusive intellectual property on the Stirling design developed by an R&D project co-funded by the Italian Ministry of Industry

During the FTI project the applicant aims to deposit patents regarding the technical solutions adopted on the Stirling engine.

Keywords

Technology

04002006	Heat exchangers
04002010	Combined heat and power (CHP) engines
04002011	Micro-generation and grid connection
04005006	Solid biomass
04007003	Process optimisation, waste heat utilisation

Market

06003006 Combined heat and power (co-generation)
06003009 Biomass and Biofuels
06010001 Energy for private/domestic housing

NACE

M.72.1.9 Other research and experimental development on natural sciences and engineering

Network Contact

Issuing Partner

ZACHODNIOPOMORSKI UNIWERSYTET TECHNOLOGICZNY W SZCZECINIE

Contact Person

Pawel Zebrowski

Phone Number

+48 91 449 43 64

Email

pzebrowski@zut.edu.pl

Open for EOI : Yes

Client

Type and Size of Organisation Behind the Profile

Industry SME 11-49

Year Established

1991

Turnover

1 - 10M

Already Engaged in Trans-National Cooperation

Yes

Experience Comments

The company designs and manufactures innovative mechatronic products and machinery for industrial and medical customers. It participated in several European R&D project and also coordinated R&D national projects in collaboration with Universities and Research Institutes.

Languages Spoken

English
French
Italian

Client Country

Italy

Partner Sought

Type and Role of Partner Sought

Main Partner sought will be a SME company skilled in biomass boiler or micro-cogeneration and already operating on EU market of the biomass domestic heating and /or micro-cogeneration.

Partner tasks during the FTI project will be:

- to develop the boiler system wood chipped fueled suitable to be integrated with the Stirling engine produced by the coordinator; and to test and certify the new mCHP system;
- to validate the analysis of the EU potential market and to define a marketing strategy and commercial plan to introduce the new mCHP on the EU market;
- to define a agreement with the applicant to produce and sell on EU market the new product.

Other searched partners :

- a SME company or Research Center skilled in heat exchange systems and / or Stirling systems to optimize the engine performances;
- a SME consultant company to implement a market analysis and trends about domestic cogeneration and biomass heating;
- commercial distributors to analyze the potential market and sell in their countries the new mCHP.

Type and Size of Partner Sought

SME 11-50,R&D Institution,SME 51-250

Type of Partnership Considered

Research cooperation agreement

Program - Call

Framework Program

H2020

Call title and identifier

Fast Track to Innovation : EIC-FTI-2018-2020

Anticipated Project Budget

1400000

Coordinator Required

No

Deadline for EOI

15 Sep 2019

Deadline of the Call

22 Oct 2019

Project Duration

104 week(s)

Weblink to the Call

<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/eic-fti-2018-2020;freeTextSearchKeyword=Fast%20track%20to%20innovation;typeCodes=0,1;statusCodes=31094501,31094502;programCode=null;programDivisionCode=null;f>

Project Title and Acronym

Domestic Biomass-fired micro-COGENeration (DomoBioCOGEN)