

## JOB OFFER

Position in the project:	Graduate student
Scientific discipline:	Energy Engineering /Mechanical Engineering and/or similar
Job type (employment contract/stipend):	stipend
Number of job offers:	1
Remuneration/stipend amount/month (*X0 000 PLN of full remuneration cost, i.e. expected net salary at X 000 PLN*):	2 000 PLN
Position starts on:	01.10.2019
Maximum period of contract/stipend agreement:	01.10.2019 – 30.09.2020
Institution:	Division of Boilers and Steam Generators / Institute of Power Engineering and Turbomachinery / Faculty of Energy and Environmental Engineering / Silesian University of Technology
Project leader:	dr hab. inż. Sylwester Kalisz
Project title:	<i>Process optimisation and valorisation of combustion by-products in transition to circular economy (UPS-Plus)</i>  <b><i>Project is carried out within the TEAM-TECH Core Facility programme of the Foundation for Polish Science</i></b>
Project description:	The main object of the project is the realisation of circular economy ideas by optimising the combustion process in order to obtain combustion by-products likely to valorisation and usable in industry. Optimization of low-quality solid fuels combustion (e.g. biomass or refuse-derived fuel) will be based mostly on upgrading fuel properties with additives, especially connected with slagging, fouling and high-temperature corrosion and on a reduction of harmful compounds (e.g. NO <sub>x</sub> , Hg, HCl, HF, NH <sub>3</sub> ). The purpose of the optimisation is to produce specific by-products subsequently subjected to thermal and chemical functionalization resulting in obtaining useful materials, e.g. geomats, insulations or sorption medium. Project objectives will be carried through the usage of innovative, multifunctional Core Combustion Facility (CCF) – semi-technical boiler stand allowing to develop research service concerning modification of combustion process in order to receive most useful by-products.
Key responsibilities include:	Master thesis research: “Chlorine corrosion risk assessment and determination of fuel additives impact during combustion of low-quality solid fuels.” Research within Task 1.3 - Corrosion control during combustion of low-quality solid fuels (corrosion control measurements in relation to variable combustion parameters, determination of fuel additives impact on high-temperature corrosion).  Master thesis research will include following scope:  1. Preparing a plan of the research including necessary laboratory analysis related to chlorine corrosion during alternative fuel combustion. A research plan should consider chlorine distribution from fuel to combustion products.

	<ol style="list-style-type: none"> <li>2. Combustion research for selected fuels with and without fuel additives. The research will involve Core <i>Combustion Facility</i> research unit and will be divided into following sub-topics: <ol style="list-style-type: none"> <li>a) Determination of chlorine content in ash agglomerated on boiler's heating surfaces;</li> <li>b) Ash sampling, flue gas sampling;</li> <li>c) Laboratory research and fuel/combustion products analysis;</li> <li>d) Determination of chlorine balance during combustion of fuel with and without fuel additives.</li> </ol> </li> <li>3. Lab-scale corrosion tests: <ol style="list-style-type: none"> <li>a) Preparation of ash deposits and steel coupons;</li> <li>b) Tests of corrosion process conducted in muffle furnace with relation to real conditions;</li> <li>c) Samples collection and preparation for SEM/XRD analysis.</li> </ol> </li> <li>4. Conclusions that include assessment of chlorine corrosion risk and determination of fuel additives influence on corrosion in power boilers.</li> </ol>
Profile of candidates/requirements:	<ol style="list-style-type: none"> <li>1. Bachelor Degree in Mechanical Engineering/Energy Engineering or/and similar.</li> <li>2. A Master student status in a field of Mechanical Engineering/Energy Engineering or/and similar.</li> <li>3. Oral and written language skills in English (min. B2 level).</li> <li>4. Predispositions for experimental work and laboratory research, willingness to learn fuel analysis methods (inter alia: technical, elemental fuel analysis, ash composition analysis, TG analysis, sieve analysis, flue gas analysis).</li> <li>5. Basic knowledge of boiler technology, especially in the field of combustion process optimisation, corrosion control.</li> </ol>
Required documents:	<ol style="list-style-type: none"> <li>1. Covering letter including the reason of willing to realise the Master thesis within the UPS-Plus Project (max. 1 page).</li> <li>2. CV including relevant professional experience, students organization activities and knowledge (max. 2 pages).</li> <li>3. Copy of the Bachelor degree certificate(s) with grades list. Translations into English or Polish if the original documents are not issued in one of these languages.</li> <li>4. Confirmation of good oral and written communication skills in English (min. B2 level).</li> </ol>
We offer:	The possibility of realising Master research in a dynamic research environment in close cooperation with industries and advanced research centres in the world.
Please submit the following documents to:	ccf@polsl.pl (e-mail subject: CCF – Master Degree student application 5)
Application deadline:	30.05.2019
For more details about the position please visit (website/webpage address):	www.ccf.polsl.pl
Euraxess job/stipend offer (in case of PhD and postdoc positions):	

Please include in your offer:

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"I hereby give consent for my personal data included in my application to be processed for the purposes of the recruitment process within the project conducted by Silesian University of Technology which is the administrator of my personal data.

I am aware of the fact that providing personal data is voluntary and necessary in the recruitment process. I have the right to withdraw or limit the scope of consent to data processing.

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place, date and signature"