

# Thesis/Master thesis

## Fluid mechanics simulation of a small-scale combustion plant



### BACKGROUND:

Heating with wood is the most widespread form of heat energy generation from renewable raw materials in Europe. The fluctuating prices of fossil fuels and the increasing awareness of climate change favor wood energy, especially for household heating systems. However, there are emission problems associated with wood combustion. The current challenge is to develop small-scale biomass combustion systems with high efficiency and low emissions. With the improvement of numerical methods and the increase of available computing power, CFD (Computational Fluid Dynamics) has become a widely used approach to study biomass combustion. The modeling of biomass combustion in a furnace includes the fuel bed on the grate and turbulent gas-phase reactions in the combustion chamber.

The objective of this study is to optimize a small-scale biomass furnace in terms of pollutant emissions by using CFD. The study is carried out using OpenFOAM.

### YOUR TASKS:

- Familiarization with the programs used
- Preparation, execution and evaluation of CFD simulations
- Evaluation of the concept and derivation of optimization approaches.

### YOU HAVE:

- Experience with fluid mechanics and thermodynamics, ideally previous CFD knowledge
- Good chemical and process engineering knowledge
- Willingness to work with complex software under Linux

### WE OFFER:

- A good technical introduction to the subject matter as well as competent and motivated support in working on the task at hand
- A family-friendly, modern working environment in a collegial working atmosphere
- A technically well-equipped workplace and an advanced laboratory and technical center
- Good public transport connections

### BEGINNING:

Immediately

### DURATION:

6 months

### PROCESSING LOCATION:

Deutsches Biomasseforschungszentrum, Torgauer Straße 116, 04347 Leipzig

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### APPLICATION DOCUMENTS:

Please submit your compelling application (in a single attachment, preferably as pdf, max. 5 MB)

**e-Mail:** [bewerbung@dbfz.de](mailto:bewerbung@dbfz.de)

For an encrypted transmission of your application you can use the upload form Cryptshare.

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