



... FROM FUNDAMENTAL TO APPLIED RESEARCH ...

The uniqueness of **Lagre Research Infrastructure (LRI) ENREGAT** lies in the ability to perform **basic and applied research** focused on several **waste-to-energy technologies** from the laboratory up to pilot plant scale for a wide range of waste and thus to assess the suitability of the technology for the selected type of waste. Additionally, it allows research on a number of technologies for the abatement of different gaseous pollutants (e.g. nitrogen oxides, carbon dioxide, organic substances) through **laboratory tests up to pilot scale verification** for waste incineration, which is available here.



VSB - TECHNICAL UNIVERSITY OF OSTRAVA

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LARGE RESEARCH INFRASTRUCTURES



MINISTRY OF EDUCATION, YOUTH AND SPORTS

VSB TECHNICAL UNIVERSITY OF OSTRAVA

CENTRE FOR ENERGY AND ENVIRONMENTAL TECHNOLOGIES

INSTITUTE OF ENVIRONMENTAL TECHNOLOGY

LRI ENREGAT



ENERGY WASTE RECOVERY AND GAS TREATMENT

# LRI ENREGAT

LRI ENREGAT offers access to the facilities and technological units focused on energy recovery of waste and off-gases treatment and cleaning.



LRI ENREGAT represents a unique base for the comprehensive research of combustion, thermochemical processes and anaerobic digestion of waste materials, as well as the catalytic, sorption and photocatalytic cleaning and membrane separation of the resulting gases. In addition, LRI ENREGAT also allows research in related areas and provides complex analytical services.



LARGE RESEARCH INFRASTRUCTURES



MINISTRY OF EDUCATION, YOUTH AND SPORTS

Since 2019, the ENREGAT (LM2018098) has been **included in the Czech Roadmap of Large Infrastructures for Research, Development and Innovation** endorsed by the Czech government and financially supported by the Ministry of Education, Youth and Sports of the Czech Republic.

**Access** to the Large Research Infrastructure Energy Waste Recovery and Gas Treatment (LRI ENREGAT) **is free of charge for students and researchers**. For further information about the call and for technical details regarding the use of particular infrastructure please see [ceet.vsb.cz/iet/en/enregat](http://ceet.vsb.cz/iet/en/enregat) and contact the responsible person:

Ing. Barbora Grycová, Ph.D.  
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## SERVICES OF ENREGAT INFRASTRUCTURE AVAILABLE IN FOLLOWING FIVE MAJOR AREAS

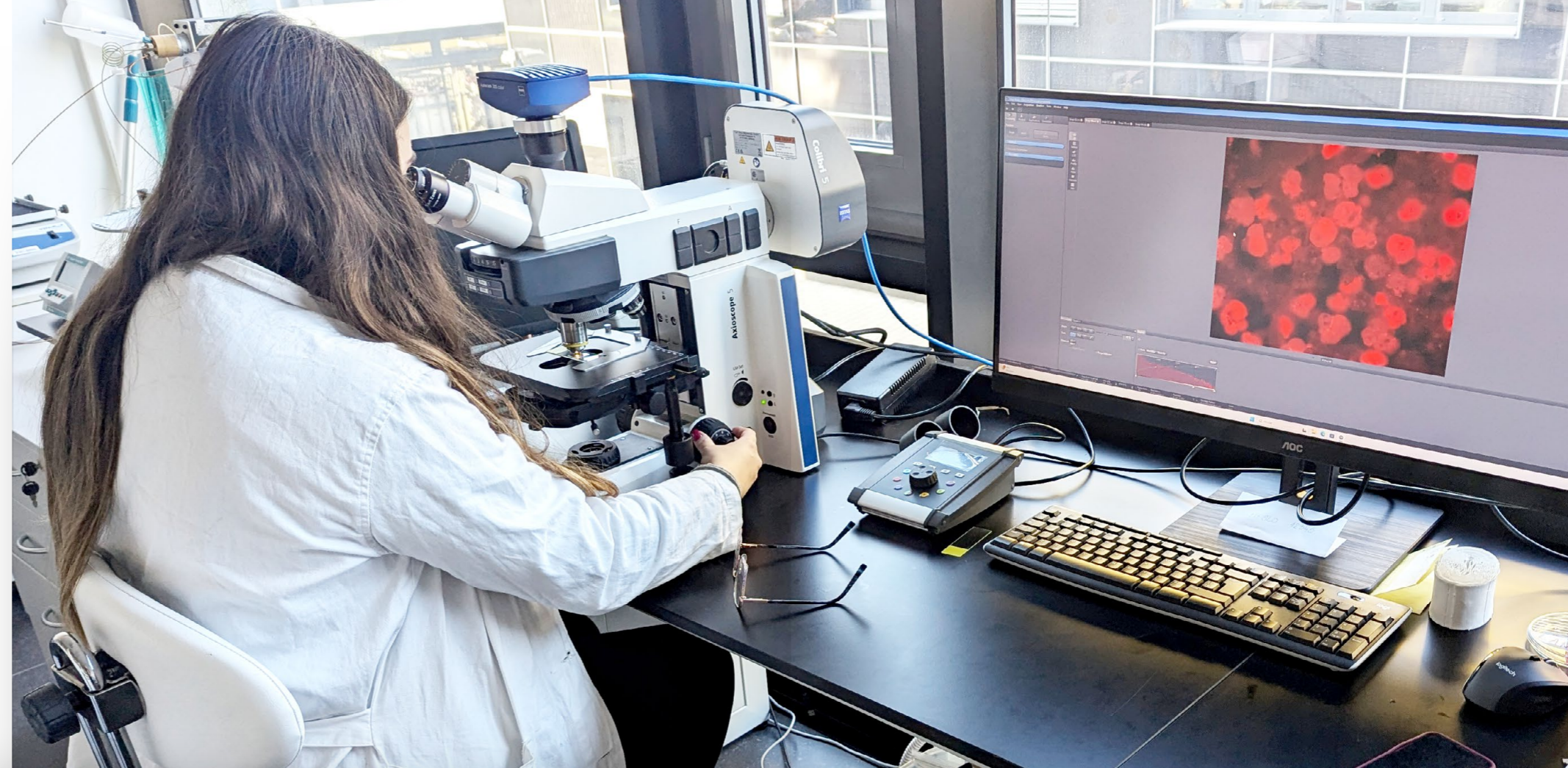
### WASTE INCINERATION IN A PILOT

### SCALE INCLUDING COMPLEX

### ANALYSIS OF FLUE GASES

**Combustion tests**, assessments of waste **combustibility**, **complex analysis** of processed waste.

**Assessment of emission load** in waste incineration, the **energy balance** of the combustion process.



### THERMOCHEMICAL PROCESSES

### UP TO PILOT SCALE INCLUDING COMPLEX

### ANALYSIS OF PRODUCTS

**Material and energy balance**, **optimization of pyrolysis process** (torrefication, slow and fast pyrolysis, microwave and catalytic pyrolysis) in terms of **utilization** of individual output **products**, consulting in the **scale-up**.

Complex analysis of **processed waste and gaseous, liquids and solid pyrolysis products**.

### ANAEROBIC DIGESTION

### AND PROCESS DEVELOPMENT

### UP TO A PILOT

Preparation of **raw materials** (crushing, hydrolysis, acidification).

Complex analysis of biowaste, digestate and biogas.

**Physical modelling** of anaerobic (co)digestion and adaptation of process conditions (loading, retention time, mixing), evaluation of the impact of additives (trace elements, microorganisms, buffers, enzymes).

### ANALYTICAL SERVICES

Determination of **thermochemical parameters** (moisture, volatile matter, fixed carbon and ash contents, elemental composition, total calorific value).

**Comprehensive characterization of materials** for catalysis, photocatalysis and adsorption (chemical and texture, redox, phase composition, acido-basic and electron properties).

**Material tests** of refractory materials and utilization of slag and ash.

**Pre-analytic** sample and waste **handling/ preparations**.

**Analysis of gases** (process gas, emissions, imissions), **waste waters and liquids**.

# LRI ENREGAT ENERGY WASTE RECOVERY AND GAS TREATMENT



### CATALYTIC AND PHOTOCATALYTIC

### GAS CLEANING - CATALYSTS

### PREPARATION AND TESTING

**Testing** of laboratory and commercially prepared **catalysts and photocatalyst** (powder, tablets, monoliths, foams) for SCR NO<sub>x</sub>, N<sub>2</sub>O decomposition, VOC oxidation, NH<sub>3</sub> oxidation, and CO oxidation **to determine activity, selectivity and stability/deactivation**, fast screening using **photocurrent** with Kelvin probe.

**Determination of the adsorption capacity** of a wide range of gases and vapours.

**Preparation of mixed oxides, semiconductors** and **active coal sorbents** tailored for air protection.