



## CARBON NEUTRAL ENERGY INDUSTRY

Combustion based energy production utilising fossil fuels is still dominant in our society. At the same time, there is significant expansion of alternative and renewable energy sources that help to reduce carbon emissions and can be a step forward in reaching carbon neutral or even carbon negative emissions.

### Competencies

- Analysis and qualification of energy carriers
- Technology analysis from an energetic point of view
- Designing and performing experiments at a laboratory, pilot, and industrial scales
- Development of new or significantly modified technologies
- Investigation of high-temperature furnaces, refractory materials, fault analysis
- Development of special and unique technologies, energy harvesting
- Seasonal heat storage
- Conversion of traditional vehicles into electric-powered vehicles
- Pyrolysis (plastic, RDF, ...), gasification (coal, RDF, biomass, ...)



### SERVICES

- Investigation of the combustion properties of fuels (fossil, waste, renewable, ...)
- Investigation of the energetic aspects of fuels
- Investigation of refractory materials and high-temperature furnaces (burners, furnaces, boilers, ...)
- Investigation of the properties of solid ashes (melting properties, carbon content, ...)
- Flue gas measurement, air pollution analysis (CO, NOx, ...)
- Performing combustion, gasification, and pyrolysis experiments, technology development
- Investigation of renewable energy technologies (solar, geothermal, hydrogen, ...)



### TOOLS

- Fireplaces, boilers, furnaces (up to 1600 °C) at laboratory and pilot scale
- CHNSO analyzer
- PARR 6500 calorimeter
- Analysis of ash melting properties in a heated chamber
- Gas calorimeter, flue gas analysers
- Pyrolysis and gasification reactors up to 5 kg/h capacity



### REFERENCES

- Feasibility study of energetic development in Miskolc (Study and report for MVM)
- Increasing the life-cycle of refractory materials in waste fueled furnace – recommendations (MOL)
- Conversion of VW Beetle and Lada into 100% electric powered vehicles
- Development of a post-processing tool for a Kuka KR15-2 industrial robot