Co-combustion of refuse derived fuels (RDF) with coal in pulverized coal-fired power plants can potentially increase the
electrical efficiency of utilizing RDF and reduce the formation of some harmful pollutants such as dioxins. The objective of
this project was to provide a general assessment of the technical issues related to co-combustion of coal and RDF, and to
improve the fundamental understandings of this subject. The project was carried out in collaboration between the CHEC
Research Centre at DTU Chemical Engineering and DONG Energy Power A/S, and was financially supported by
Energinet.dk. The project work mainly involved conducting pilot-scale experiments in the CHEC entrained flow reactor,
carrying out full-scale aerosol measurements at the Esbjergværket (ESV), doing global equilibrium calculations, and
performing thermogravimetric experiments. Through performing co-combustion experiments in the CHEC entrained flow
reactor, the burnout, NO and SO2 emissions, the transformation of ash forming species, the formation of deposits, and
the partitioning of trace elements during co-combustion of coal and solid recovered fuel (SRF) were studied systematically.
The effect of different coal properties, SRF properties, and mass share of SRF on co-combustion was investigated.
Besides, global equilibrium calculations were conducted
to interpret the results of the entrained flow experiments. The formation of fine particles during cocombustion of coal and
SRF was also investigated, through performing full-scale aerosol measurements at the Esbjergværket (ESV). The
influence of co-combustion on the concentration and composition of the fine particles was evaluated, and the impact on
the dust emissions was discussed. In addition, a fundamental study on the interactions of coal and different waste
materials during pyrolysis was conducted through thermogravimetric experiments. In general, the results obtained from
this project have significantly improved the understandings of fuel conversion, ash transformation, ash deposition, and
pollutant formation during co-combustion of coal and refuse
derived fuels. These results have also provided essential knowledge regarding the fuel selection and process optimization
of co-firing refuse derived fuels and coal under suspension-firing conditions.