

Fuel Technology

HRL provides high-end consulting and technology services to clients in the coal and energy sectors with expertise that includes all aspects of fuel utilisation and processing.

HRL range of fuel technology services include:

- resource evaluation and characterisation
- desktop studies, computer modelling and laboratory investigations
- pilot-plant and full-scale trials
- environmental monitoring and compliance
- measurement and optimisation of process plant
- greenhouse consulting
- materials engineering and plant integrity services
- project management and implementation.

Fuel types include coal, biomass, oil-shale and wastes through to liquid and gaseous fuel streams. HRL specialist capability in low rank coals is internationally recognised.

Fuel processing technologies may include drying, size reduction or agglomeration, fuel upgrading, combustion, gasification and underground coal gasification (UCG), carbonisation, retorting and conversion of coal to liquids.

Plant types include boilers and power stations, rotary kilns, moving and fluidised beds, calciners, reduction furnaces and smelters.

Challenges

Understanding a fuel and its impacts on technology selection and process operation can be critical to a project's success. Specific challenges may include:

- understanding the fuel resource quality and variability
- selection of an appropriate utilisation technology
- optimisation or modification of existing processes
- development of new utilisation options
- addressing environmental issues and greenhouse gas impacts
- economic evaluation, risk analysis and project implementation.

Solutions

HRL works closely with its clients to understand their business objectives and the challenges they face, and then develops customised solutions to meet those needs. Some areas of capability are as follows:



Liquids from coal retorting

Resource evaluation and fuel characterisation

Performing comprehensive analysis and characterisation from a single sample through to a full-bore core analysis program, HRL can assist clients by drawing on capabilities that include:

- chemical, physical and thermal analysis of coals, biomass, wastes and other fuel streams
- inorganic, trace metal and leachability analysis
- particle size distribution, density and porosity characterisation
- rheological behaviour of liquid fuels and slurries
- combustion and gasification reactivity, and devolatilisation behaviour
- spontaneous combustion (self heating) testing and stockpiling advice.

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Process evaluation, design and implementation

Drawing on a fundamental and practical understanding of fuel and materials behaviour in processing plant, HRL can assist clients in designing and evaluating various fuel utilisation technologies. Specific services include:

- in-house testing of fuel behaviour including drying and milling, combustion or gasification, fuel upgrading, biomass co-firing, and conversion to liquid fuels
- constructing and operating bench and pilot-scale equipment to investigate fuel utilisation problems or to develop new solutions
- optimising and de-bottlenecking to improve fuel utilisation or increase plant efficiency
- dust explosibility, spontaneous combustion and self-heating
- investigating and controlling deposit formation and corrosion processes
- plant condition assessment, materials selection, root cause of failure
- evaluating options for mitigating emissions of pollutants and greenhouse gases including carbon capture
- developing process designs and completing technical and economic evaluations
- implementing technical solutions including design and construct.

Environmental and greenhouse consulting services

HRL assists clients to achieve an effective balance between economic and environmental outcomes with services that include:

- environmental analysis, audit and management services
- developing options to reduce environmental impacts
- providing assistance with the documentation and negotiation of environmental submissions with regulatory authorities.

HRL greenhouse consultants also provide a range of compliance reporting services and its process engineers develop options to abate greenhouse gas emissions.

Benefits

HRL's clients benefit from working with an organisation that has more than 40 years of experience in fuel utilisation and optimisation. These benefits include access to:

- a step-by-step investigation process that includes client engagement and continuous consultation
- commercially focused solutions with practical applications
- a full range of scientists, engineers and technicians
- modern fuels testing and analytical laboratory that is enhanced by specialist bench and pilot scale facilities

- an organisation with the capability to take a project from concept and initial investigation through to solution implementation.

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The company's NATA Accredited Laboratories number is 561.

HRL Technology Group's ISO 9001 Quality Management is certified by BSI under certificate FS605116

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