



Bioenergy Consulting Services

A core expertise of Earth Systems is hands-on research capability, analysis and technology development and the identification of biomass to bioenergy opportunities. Earth Systems' specialist team of bioenergy engineering experts service the sustainable energy technology requirements of industry and utility suppliers.

Earth Systems personnel have worked with the private sector, governments and research organisations to develop solutions for sustainable use and supply of energy. Recent work includes:

- Worldwide review of commercial biomass gasification technologies and suppliers at scales up to 5 MWe for a commercial client.
- Technical trials and economic evaluation of the beneficial re-utilisation of biosolids (sewage sludge) via *hydrothermal* processing for water authorities in both Australia and China.
- Technology development and commercialisation project involving a mobile slow *pyrolysis* reactor based on a shipping container, designed for the production of char from stranded biomass wastes.
- Feasibility study for a medium-scale bioenergy plant utilising burnt wood residues through an *Organic Rankine Cycle* process for power and heat generation for a bushfire affected town.
- Comprehensive shire-wide renewable energy *resource* assessment (including biomass) and opportunity analysis for a Victorian Local Government Area.
- Development of various scales of downdraft *gasification* technologies for the conversion of woody biomass to renewable electricity generation.
- 15 years of experience in gas-solids *fluidisation* technologies and applications spanning biomass energy, food processing, drying, metallurgy, minerals, and thermal gasification.

SERVICES PROVIDED

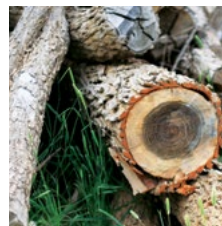
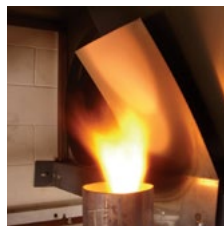
Earth Systems can help your organisation with bioenergy process development and consultation services such as:

- **Feasibility Studies:** Our process engineering team can provide an assessment of your proposed biomass-to-energy projects involving processes such as combustion, gasification, digestion or pyrolysis.
- **Specialised Engineering Design:** Earth Systems has specialist expertise in the design and application of various bioenergy



conversion systems, including fixed and fluidised bed gasifiers, pyrolysers, combustors, hydrothermal processes and other reactors. Earth Systems engineers are hands on, and are heavily involved in the design and manufacturing process of suitable technology solutions where applicable.

- **Analytical Services:** As part of the design process, analytical testing to evaluate feed stock properties, process performance and emissions will be provided. This forms a key part of the biomass risk assessment process.
- **Carbon Credits Generation Opportunity:** We provide services for the generation of carbon credits from bioenergy projects including liaising with potential carbon credit buyers and providing technical advice to project developers on risk management and value of the credits generated.
- **Independent Energy Advice:** Earth Systems is not affiliated with any particular technology suppliers; hence we are able to provide you with an independent review of any proposed bioenergy project regardless of the chosen technology.



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