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Introduction

EIPlus is a company with highly skilled Engineers and Project Managers who have extensive knowledge and experience in solving complex and technical challenging projects across Australia and Overseas countries including Malaysia, Philippines and Indonesia.

Supporting our capabilities are industry experts in power plant design, fuel technology, combustion optimisation, materials engineering and metallurgical services that enhance EIPlus capacity to deliver whole of concept developments through to engineered implementation and commissioning of plant and equipment.

Our expertise has been applied to Thermal Power Stations, Mineral Processing, Aluminium Refinery, Cement manufacture, Oil and Gas, Water, Timber and Waste Recovery industries as well as providing expert advice to insurance companies and legal firms.

Recently, EIPlus completed its registration as a supplier of engineering services to Engie (formally GDF Suez). Engie have several operating assets in Australia including LYB and Hazelwood Power Stations in Victoria.

EIPlus has also recently entered into an agreement with Laborelec to collaborate on projects across Australia and Asia Pacific region. Laborelec is a leading service provider in energy technology. Established in 1962, it acts worldwide, delivering solutions and provides independent advice in the field of power generation, electricity transmission and distribution.

EIPlus Engineers and Project Managers have decades of experience gained from working on a range R&D projects, to establish process parameters for designing demonstration and commercial scale plants, leading to the successful construction and operation of first of a kind Gasification of low rank coals, Steam Fluidised Bed Drying, Hydrothermal dewatering of coal slurries, Combustion simulation and more recently the Attemperation of combustion gases in thermal power stations.

The highlights of some of projects that EIPlus Engineers and Project Managers have worked on include:

- Optimisation of thermal power plants resulting in improved thermal heat transfer, steam cycle efficiencies, economiser performances, and condenser and cooling tower performances;
- Design of material transfer systems to ensure reliable flow of bulk solids in pressurised vessels, and pneumatic conveyancing of slurries in long distance piping;
- Design of cost effective, practical solutions to compensate for changes in in operating conditions including changing coal quality on reduced energy conversion, higher ash fouling rates, poorer boiler combustion and reduced plant availability over the life of the power plants
- Retrofitting of Dry Bottom Ash Handling Plant that is capable of extracting large volumes of clinkers. Dry Bottom Ash is a cost effective, efficient and safe alternative to wet ash hoppers and submerged scrapper chain systems;
- Surveying of hangers and re-floating of high energy steam piping using displacement data captured using video imaging to compare results against historical data from previous inspection to determine deviations in movements against baseline flexibility analysis results;
- Managing the performance testing of boiler and turbine plant, establishing rates of unburnt carbon in ash, measuring temperature and velocity profiles in ducts to identify maldistribution in gas passages used to design of flow straightening vanes in primary and secondary air ducts, high temperature turning vanes in Heat Recovery Steam Generator (HRSG) and fuel distribution vanes in mills;
- Developing low temperature attemperation spray systems to cool flue gases exiting air heaters in thermal power plants. Cooling the flue gas during periods of high ambient temperatures has many direct benefits for power plants using both fabric filter and precipitators for particulate

collection, including extending life of expensive fabric filter bags, providing greater flexibility in the choice of less expensive filter bags, improving collection efficiencies in precipitators and lowering power consumption of Induced Draft (ID) fans. The system, installed on all 4 x 600MW units at Bayswater power station was fully integrated into the stations DCS and used to adjust for high moisture content coal during winter;

- Design of Waste-to-Energy plants for producing hot water, process steam and to generate electricity, reducing reliance on fossil fuels and the increasingly costs NG and LPG. Waste sources include wood recovered from timber sawmills and forestry operations, timber recovered from building construction and demolition, bio-waste from agriculture (e.g. poppy seeds, macadamia nut shells), and municipal waste diverted from landfill sites.
- Design of Circulating Fluidized Bed (CFB) power plants providing flexibility in the choice fuels.
- Develop processes to convert coal into high value industrial products such as syngas and char. EIPlus' expertise and experience include drying, carbonising, and in particular gasification.
- Briquetting and agglomeration of various materials include coal, biomass, ilmenite, manganese and other base ores and minerals. Briquetted materials can be easily handled and transported, and can be used as supplementary and/or alternative feed stock for various processing plants. EIPlus has extensive experience in laboratory trials of briquetting options (including particle size, moisture content, and additives), develop agglomeration processes, and design plant and equipment.

Complementing our engineering capabilities is our knowledge of ISO 9001 Quality Assurance. Our rigorous approach to quality assurance is captured in EIPlus' Quality manual covering key activities including due diligence of company's capacity to deliver approved services and conducting audits of design and manufacturing workshop. Particularly relevant where services and equipment are sourced from developing countries such as China, India, Vietnam, etc. Our accredited inspectors provide verification during surveillance of manufacturing activities, ensuring documentation is complete and traceable and equipment is released after satisfactory factory acceptance testing.

We focus on safety and measure our success on achieving zero LTI's and MTI's when we execute major Projects. We have developed a suite of comprehensive procedures supporting our Site Safety and Environmental Management Plan that can be customised to incorporate site safety specific requirements.

EIPlus holds both Professional Indemnity and Public Liability insurance policies, covering its activities and the services provided by approved subcontractors and equipment suppliers. Certificates of Currency can be provided. We are also able to secure Contract Works insurance and can provide Bank Guarantees for major projects.

EIPlus can offer competitively low pricing and can structure flexible payment terms. Its staff are able to be mobilise resources at short notice and have experience in working in autonomously in remote areas.

For more information about EIPlus, refer to our webpage, <http://www.eiplus.com.au>. For all enquiries, including requests for quotations, please contact Tom Stephanou on +61 409 416 711 or via email tomstephanou@eiplus.com.au.

Our Purpose

To work collaboratively with our clients to provide cost effective, innovative engineered solutions that improve and stabilise the operating performance and reliability of plant and equipment, whilst maximising profitability to the business.

Our Values

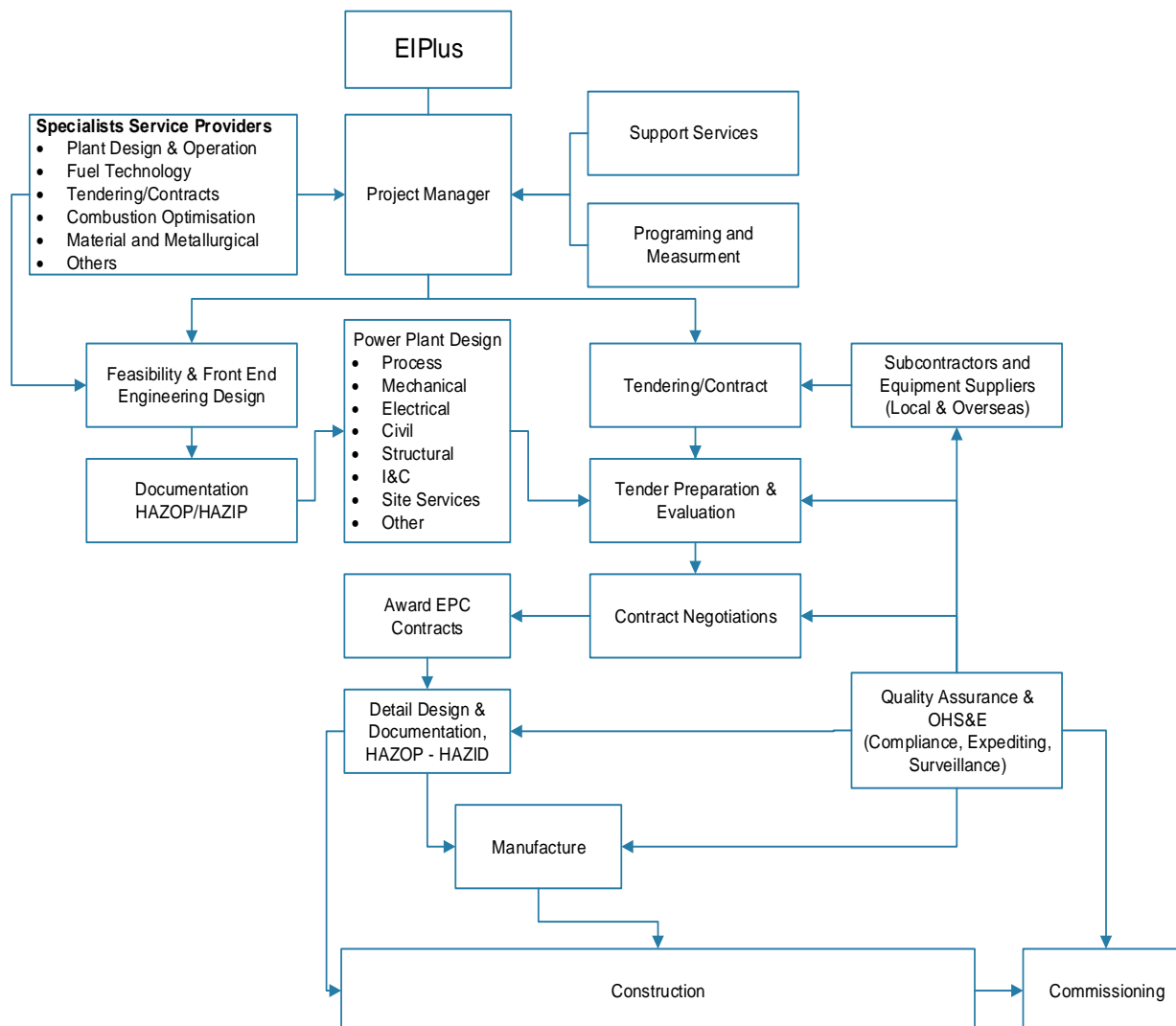
- To Deliver Services without compromising Quality or Safety, whilst
- Build Open and Honest Relationships, that
- Embrace and Drive Change in order to
- Strive to achieve Excellence and
- Have Fun in what you do and to be
- Be Adventurous, Creative, and Open-Minded to others in the
- Pursue Growth and Learning to
- Build a Positive and Rewarding Team Environment that allows us to be
- Be Passionate and Determined to Achieving your goals.

Our Resources

The expertise of EIPlus is provided within a small group of highly skilled engineers, project managers and quality inspectors that have a demonstrated record of working together to solve complex and technically challenging problems.

Our capabilities are augmented by a network of specialist collaborators who possess expert knowledge in fuel technology, boiler combustion optimisation, process plant design, mill performance testing, gasification, materials engineering and metallurgical assessments, environmental plant performance testing and evaluation, greenhouse gas emission monitoring and regulatory reporting, drying and agglomeration of coal, biomass and waste materials and the design of waste to energy conversion plants.

In addition, EIPlus has access to equipment suppliers and subcontractors that can provide qualified labour to undertake construction activities, being managed by EIPlus to deliver major design and construction projects on time and budget without compromising safety or quality.



Equipment Suppliers

EIPlus has access to equipment suppliers and to construction firms to carry out manufacture and supply of qualified labour to undertake construction activities, being managed by EIPlus, to deliver major design and construction projects on time and budget without compromising safety or quality.

We also have established relationships with equipment manufactures that can supply a range of plant and to provide budget estimates to assist developing pricing for power generation projects, including:

- High Voltage distribution systems and power management systems from NARI Group Corporation
- CFB boilers from Taiyuan Boiler Group Co., Ltd.;
- Steam Turbines from Hangzhou Steam Turbine Co., Ltd;
- Dry Bottom Ash Extraction Plant, Water treatment plants, Dense Phase Pneumatic Conveying plant and Overland Pipe Conveyors from NARI Beijing Guodian Futong Science and Technology Co. Ltd

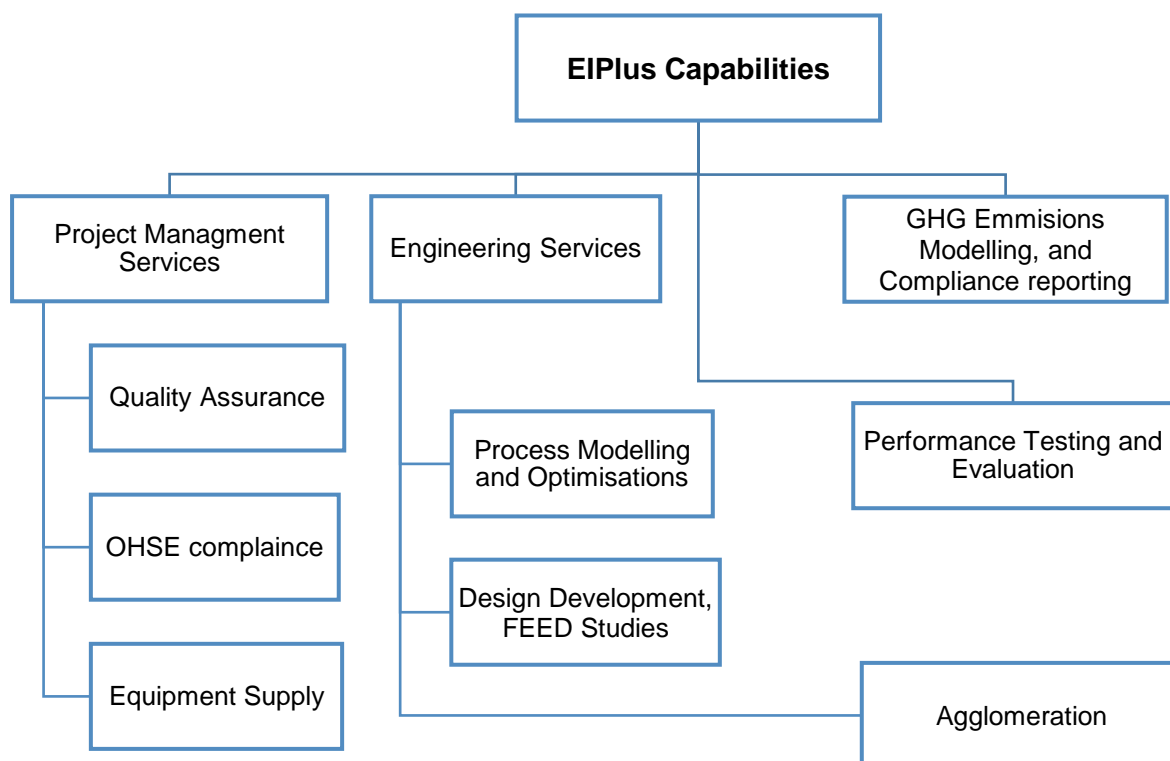
We work with asset owners to maximise the involvement of local services providers where projects are executed overseas. To assist in enhancing the prosperity within the region, providing a source of training and development of the local workforce, particularly where projects are undertaken in remote locations.

SERVICES TO INDUSTRY

Our range of Services are summarised below.

- Management of Major EPC Projects
- Engineering Design and Modifications of Power Plants
- Procurement Services
- Tendering & Contract Administration Services
- Process Modelling and Optimisation
- Performance Testing and Evaluation
- Greenhouse Gas Emission Modelling, Accounting and Reporting
- FEED and Prefeasibility Cost Studies
- Agglomeration of biomass, coal, minerals, waste materials
- Quality Assurance and OHSE Services
- Plant and Equipment Supply

The core expertise is retained within a small group of staff, depending on the project size, complexity, and scope, our in-house expertise is augmented by specialist collaborators matched to specific project requirements.



Augmented by Specialist collaborators and industry experts



Industry Experts

EIPlus has access to industry experts that augment the capabilities of EIPlus in areas of Power Plant Design and Operations, Fuel Technology, Electrical and I&C Design, Construction Management, Contract Administration, Combustion Optimisation, Material Engineering and Metallurgical inspections and failure analysis. We also have access to laboratories that can provide analysis of coals and other materials.

Bernard Anderson (Process Modelling Optimisation)

With over forty (40) years of experience in providing technical and engineering advice in relation to performance, process optimisation, process modelling, and control troubleshooting in the power and large process industries. Experience includes writing detailed test procedures, test methods and reports, conducting complex process optimisation, modelling and control projects.

Dr Anthony Campisi (Fuel Technology and Coal Analysis)

A chemist with over thirty (30) years' experience in all aspects of coal and biomass utilisation including drying, briquetting and agglomeration, pyrolysis and carbonisation, gasification, carbonisation, coal reactivity and self-heating, ash behaviour and emissions to environment. Thermal analysis techniques and thermodynamic modelling of detailed process chemistry. Development of bench scale test rigs to simulate thermal processes.

Steve Marland (Agglomeration Technologist & Heater Testing)

An expertise in agglomeration, briquetting, extrusions, pelletising of various materials, coal, biomass, minerals and wastes residues to recover and produce fuels and feedstock, improving handling and transport. Expertise in solid fuel appliance heater testing.

David Kearns (Greenhouse gas compliance, environment management systems (EMS), process energy efficiency)

Experienced engineering and sustainability professional with 18 years of experience across the power generation, cement, mining, minerals processing, oil & gas (upstream and downstream) and petrochemicals sectors. Expertise in carbon measurement and reporting, greenhouse gas scheme compliance and audits, environment management systems (EMS), process energy efficiency, process design (feasibility, FEED and detailed design), simulation and modelling (PRO/II, HYSYS / Aspen), process troubleshooting and operations support, and process safety systems. David is also an experienced educator and trainer, having coordinated and lectured in chemical engineering and sustainability at Monash University and the University of Melbourne.

EIPlus is able to engage other experts to support the activities required to deliver exceptional services to our clients

EIPlus Project Management Services

EIPlus has extensive experience in delivering major construction projects across many industries. Our detailed understanding of coal chemistry, thermal dynamic process and fluid dynamics has enabled us to develop innovative, first-of-a-kind projects that have been successfully implemented, achieving rapid return on investment. Collaborating with the Asset Owners, we have successfully delivered projects on time and budget without compromising quality or safety. Our expertise in the implementation of engineered solutions, complemented by our demonstrated knowledge of power

plant operation and maintenance, allows us to offer custom solutions in a cohesive team orientated environment.

Our project management processes are benchmarked against proven academic and industry standards, following proven principles that can be applied to managing contracts, shutdown outages or administering the tendering process on behalf of its asset owners.

We have expertise in the tendering processes, including the drafting of tender documents, administrating the process and developing the necessary contracts to procure services and equipment and services suppliers.

Our knowledge of contract law, in particular the interpretation of various conditions of contracts, enable us to effectively manage contractors and the issues that generally arise during the course of a project, i.e. modifications to scope of work, quality, OH&S compliance, Variations and Extension of Time (EOT) claims, warranty and issues arising from insurance and liquidated damages where delays can cause the client to receive less than the benefits that have been contracted to be delivered on time and budget.

To support our Project Management capability, EIPlus have developed control processes and measures to mitigate risks and ensure the project performances are delivered to the client's expectations. We manage the procurement of materials and services, administer all contracts, providing site supervision, and monitoring and reporting of progress.

At EIPlus we collaborate with our all stakeholders to clearly define the project scope and performances. We ensure plant and equipment are manufactured and constructed to Australian and/or International Standards. We seek approvals and provide opportunities for input from the client at various stages, in particular obtaining feedback during hazard and operability (HAZOP) studies, developing detailed schedules and plans for manufacture. We provide surveillance reports during manufacture, factory acceptance testing, packaging, and construction workflows.

EIPlus has established systems and procedures that assures all activities are documented and traceable, meeting the requirements of ISO9001 – Quality Management Systems – Requirements.

We develop a full suite of project documentations, including engineering drawings, O&M and training manuals, Quality documentation such as Inspection and Test Plans (ITP's), Manufacturers Data Reports (MDR's), and other relevant documentations as required for each project.

EIPlus has also developed a comprehensive Site Safety and Environmental Management Plan (SSEMP) that demonstrates our commitment to ensure that its activities are conducted in a safe and responsible manner, tailored to meet regulatory and client specific requirements.

We manage all works to ensure safe work practices are followed, staff are dually qualified and competent and prepare and manage the documentations including Work Method Statements (WMS) and Job Hazard Analysis (JHA). A copy of EIPlus' Operating Manual and SSEMP can be provided upon request.

Our Project Life Cycle Methodology for Implementing an Engineered Solution

We engage with clients throughout a project life cycle, following a proven stage wise approach with to deliver exceptional services. From Concept to Feasibility / FEED studies to EIP / Works Approval to Investment / Financial Closure to Tendering / Award of Contract to Implementing the Engineered Solution.

Tender Activities

- Establish Clients Requirements (Scope, Reporting, Timeframe, Risks & Liability limitations, Approvals, Governance)
- Prepare Specifications, Schedules, Tender Documentation
- Evaluate submissions, conduct reference checks, prepare recommendations
- Negotiate and Award Contracts

EPC Activities

- **Prepare All Engineering designs**
 - Ensure compliance against Standards and Regulatory
 - Undertake Safety in Design reviews, hazard identification, risk assessment, Operability studies, (HAZID, HAZOP)
 - Produce issued for construction drawings, specifications etc
- **Quality Assurance**
 - Develop Subcontractor MDR's, details and contents for capturing data (Material and Welding certificates and NDT reports) and develop ITP's for manufacture)
 - Audit Subcontractor QA system as being comparable to that required for the project
- **OHS&E**
 - Develop Project Specific Site Safety & Environment Management Plan
 - Develop JSEA and WMS and Catalogue in a register
- **Procurement & Manufacture**
 - Places orders for Sub-Contractor Work
 - Raise Orders for materials, Instrumentation etc.
 - Produce Q/A Inspection & Test Procedures (ITP's), witness & hold points
- **Construction**
 - Manage Contracts
 - Manage Sub-contractors
 - Manage crews
 - Manage Safety
 - Manage Stakeholder interest
 - Manage Communications
 - Mobilisation Site Work Crew
 - Manage FAT's
 - Project Reporting
- **Testing & Commissioning**
 - Produce Test Procedures, RT permits, assign Commissioning team
 - I&C loop checks, Hydro-tests, System & Functional testing/simulation,
 - Report outcomes of commissioning
- **Practical Completion & Handover**
 - Produce Punch List
 - Secure PC Certificate and Return of Security
 - Issue final as-built drawings, O&M Manuals, QA and Safety Documentation

Operational Reliability and Performance Testing Activities

- Prepare test procedure and methodology for the verification of guaranteed performances
- Benchmark performance testing

- Post-performance testing carried out under similar operating conditions to those for benchmark tests after plant has been installed to confirm performance against performance criteria Reliability Testing (30-days)

Warranty Period Activities

- Set up Defect Register, including single point of contact for notifications to subcontractors
- Manage rectifications of defects as required
- Secure Final Certificate and Return of Security

EIPlus Procurement Services

EIPlus has expertise in procuring services from equipment suppliers and from companies that undertake specialised activities. Our engineers are able to prepare specifications and ensure compliance with standards for design and operation and compliance with government regulations to prepare detailed specification

We have knowledge in how to prepare a tender to procure competitive pricing from equipment suppliers and services providers (Contractors and Consultant), using Australian Conditions of Contract or contracts amended to suit client risk profiles. Our experience in procurements activities extends to Government Tendering processors ensuring good governance during evaluation and recommendations for award of contract

Our tendering skills have been used in:

- Seeking competitive firm and fixed pricing from construction and maintenance services providers, equipment and packaged plant manufactures under various conditions of contracts;
- Obtaining budget pricing as part of Feasibility Studies, as prerequisites for submission to various levels of management for funding approvals to proceed to more detailed FEED studies and ultimately project financial closure and award of contracts; and
- Evaluation and negotiation of tender submissions for procurement of mechanical and electrical power plant and mining equipment to ensure comparable supply against technical specifications and commercial terms and conditions.

EIPlus Contract Administration Services

EIPlus staff have extensive experience in Superintending Government infrastructure projects, acting as their administrators and Owner's Engineer. These services have been provided to City West Water, AGL-Macquarie Generation, Santos, BHP-Temco and others covering D&C, Outage Maintenance and Refurbishment Contracts.

Using EIPlus proven procedures and document control systems it was able to effectively liaison and correspond to all stakeholders of its activities including progress and disputed and provide copies at the conclusion of its assignments.

EIPlus has working knowledge of various Australian Standard's Conditions of Contract including:

- AS4000 – 1997; General Conditions of Contract
- AS2124 – 1992; General Conditions of Contract
- AS4305 – 1996; Minor Works Contract Conditions
- AS4902 – 2000; General Conditions of Contract for Design and Construct Projects
- AS4122 – 2010; General Conditions of Contract

EIPlus Process Modelling and Optimisation Services

EIPlus has access to expert mathematical software modelling capabilities including Thermoflex, Steam Pro, GTP Pro, Fluent enable complex system to be evaluated high temperature, high pressure thermodynamic and transient behaviours in solid and fluid transport processes.

Operating a boiler and auxiliary plant that is not optimised can result in reduced boiler efficiency, plant availability, adverse conditions on pressure components, higher ash fouling rate, greater maintenance demands, increased fuel consumption, increased ash production with associated disposal costs, and increased emissions. All these factors ultimately result in reduced electricity generation and greater operating costs, a double reduction on the bottom line. Variables such as coal quality, mill performance, furnace gas composition and temperature, and exit gas composition and temperature can be modelled together with the effects of seasonal changes. The effects of summer and winter conditions can be assessed in addition to the standard operating variables.

By setting up models for varying operating conditions and using performance data to validate the results, EIPlus can develop designs for plant modifications to optimise performance. EIPlus can also evaluate the potential commercial benefits of the plant modifications. Where performance data is not available or additional data is required for validation, EIPlus can organise and manage the tests to be undertaken, ensuring high accuracy data is obtained. Having accurate information to make informed decisions is essential as part of any decisions to justify operating and capital expenditures.

EIPlus Engineering Design and Documentation

EIPlus has expertise in power plant design and optimisation, prefeasibility and detailed Front-End Engineering Design (FEED) studies; producing specifications, drawings and other documentation to evaluate the economic benefits of proposed development projects.

Supported by our project managers, EIPlus is able to fully document the solution creating scope documents that define the extent of equipment required, their specifications to achieve an operational result and produce detail costing in support of project funding and financial investments.

EIPlus has access to resources that can:

- prepare engineering designs and produce specifications and drawings for manufacture or for inclusion in tenders in order to secure funding and achieve financial signoff from all stakeholders;
- conduct prefeasibility engineering cost studies and detail FEED studies with complete documentation including process flow diagrams with state conditions under various operating scenario, P&ID's, equipment lists, general arrangement drawings (both 2D and 3D models), etc.;
- investigate improvements in plant performance and reliability by developing mathematical models using CFD, SteamPro and Thermoflex software to simulate operating conditions of boiler, turbines, mills, HRSG's, ducts, bulk solid transfer vessel etc.;
- carry out due diligence on suppliers of equipment and companies providing construction activities to assess technical and commercial risks in their ability to undertake the services.

EIPlus Performance Testing and Evaluation

EIPlus has expertise to undertake the performance testing of boiler, turbines and other plant and equipment to determine whether the plant is operating correctly, providing data to correct issues such as poor combustions and process efficiency losses.

We have access to calibrated instruments that together with its staff can be mobilised at short notice. Working with EIPlus' engineering and greenhouse emissions staff, solutions can be identified and implemented

EIPlus Greenhouse Emission Modelling and Reporting

EIPlus has experience in Greenhouse Gas (GHG) accounting, GHG emission modelling, sampling, and reporting of emissions.

We have experience with regulations including National Greenhouse & Energy Reporting System (NGERS), National Pollutant Inventory (NPI), Environmental Protection Authority (EPA) and have access to tools to undertake energy assessments.

We are able to evaluate and provide correction to weightometer and coal analysis equipment to offset data errors in line with industry best practice.

We are also able to conduct audits of greenhouse gas inventories and associated records, methodologies and equipment to ensure compliance with regulatory requirements.

EIPlus Agglomeration

EIPlus has experience developing solutions for recovering, recycling and re-using (RRR) waste materials by means of agglomeration and briquetting (AB). The AB product can be used in a variety of applications including as recovered feed stock for blending with raw materials, as alternative fuel for supplementing combustion processes, or creating new products by combining additives.

Agglomeration and briquetting products can be easily handled and transported long distances from its emplacement and recovery operations. EIPlus can undertake tests to determine the suitability of materials and develop recipes with and without binders.

Recovering and reusing waste materials also reduces costs by diverting waste from landfill sites, avoiding cost for transport and landfill levy fees.

Typical materials that can be agglomerated/briquetted include:

- Coal washery residues;
- Forestry timber waste, construction and demolition timber and other wood products;
- Plastics from recycling of municipal waste;
- Waste from mineral processing and refining operations such as rutile, ilmenite, magnesium, manganese, silica;
- Precious metals; and
- Other various ores from mining operations

If required, EIPlus can include a drying step in the agglomeration/briquetting process, the waste materials can be received wet.

EIPlus has experience in the providing engineering support and design of briquetting plant for various mineral processing and mining companies including Anglo Coal, QERL, BHP-Temco and Aurion Energy.

EIPlus also has experience in pelletising and briquetting of biomass, producing value added products. In particular, we are highly experience in the process of recycled timber or waste from saw mills or forestry that can be on-sold as fuels for domestic heating or for small scale industrial boilers.

We also have access to manufactures of briquetting plant including Palmer Pellet Mills, Kopperrn and Komarek briquetting machine and other equipment suppliers in China.

EIPlus Quality Assurance Services

We have competencies in developing Quality Assurance Documents, Procedures, Non-Conformance Records (NCR's), Inspection & Test Plans (ITP's), and other quality assurance documentation as a part of Manufacturing Data Reports for major projects. EIPlus can undertake audits of companies that supplying services and equipment to ensure their Quality Assurance Systems, Procedures and Documentation are compliant with ISO9001.

We also and carry out surveillance monitoring and reporting to ensure equipment are manufactured and constructed against approved designs.

To remain competitive, more equipment is being sourced outside of Australia, requiring more stringent management of the processes to ensure equipment complies with Australian and International Standards. Of particularly importance is the auditing and surveillance of workshop practices and the use of approved materials for manufacture that may have different mechanical properties/strength than those specified by designers in Australia.

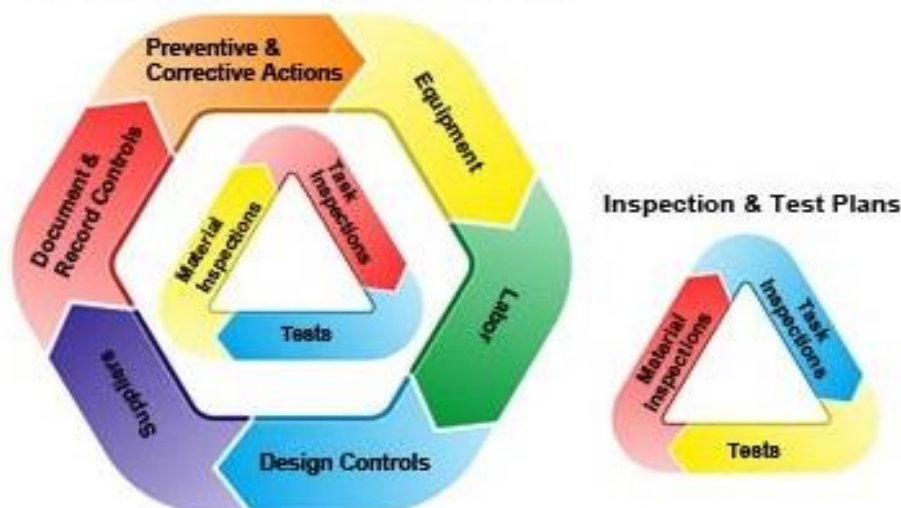
The procurement of equipment with remote management of overseas manufacture has many challenges:

- Lack of oversight by owners/operators during design/manufacturing,
- Lack of familiarity with Australian Standards and specifications,
- Difficulty in accurately conveying purchaser's requirements to the manufacturer,
- Lack of confidence in manufacturing progress and quality control.

At EIPlus we understand these challenges and deploy our Quality Engineers and inspectors to assess and implement corrective actions earlier in the project life cycle to ensure asset owners quality expectations are achieved and thereby avoiding costly rework and delays.

EIPlus Quality Engineers have extensive knowledge of International and Australian Standards, as well as Australian statutory and regulatory requirements and can be mobilised at short notice to manage and control the quality of your product, from design through to delivery in Australia.

Construction Quality Control Plans



Our Quality Assurance capabilities include:

- **Auditing** Quality Management System and Procedures against acceptable standards including ISO9000 and that there is adequate capacity and qualified resources to undertake the manufacture and construction activities. Review processes are adequate and flowed for the traceability of documentation, material certificates, welder's qualifications, non-destructive test (NDT) results, weld maps, approved for construction drawings are captured and recorded in MDR and management of non-conformances.
- **Expediting and Surveillance** of project activities and documentation supplied during manufacture and construction are complete against approved designs and standards. All equipment is thoroughly inspected and tested before being approved for release for packaging and transport.

EIPlus Supply of Plant and Equipment

EIPlus can design and supply quality plant and equipment, meeting client's specifications and engineered to comply with Australian and international standards, backed by manufactures warranties.

Dry Bottom Ash Handling Systems capable of continuously extracting large volumes of furnace ash, in a safe, reliable and controlled manner under varying operating conditions. Under an exclusive agreement with NARI Beijing Guodian Futong Science & Technology Development Co., Ltd (Futong), EIPlus can design and construct customised systems, providing ongoing technical support and aftersales supply of spare parts to Asset Owners.

Working with Futong's designers, EIPlus' Engineers have developed a number of new innovative improvements that have been incorporated to their patented dry bottom ash equipment. Devices that improve heat transfer at low extraction rates, using high wear resistant materials to extend wear life of crushing plant, modifying tooth plates improve handling and reduce field maintenance activities and modifying structures to reduce time and effort during assembly and construction of pre-assembled components.

Under license from Futong, EIPlus can engineer modifications to existing dry bottom ash extraction installations to incorporating some of the patented designs where operational changes such poor combustion or coal quality leads to the formation of large clinkers.

We overseeing every step to ensure that:

- designs are reviewed and approved by our qualified engineers and inspectors to ensure compliance with Australian standards for design, manufacture and operation;
- designs undergo a Hazard review and approved by the client before manufacture commences;
- manufacturing workshops, Futong's' and those of other equipment suppliers are audited and processes inspected and approved before manufacturing is allowed to proceed;
- surveillance is undertaken by qualified inspectors, undertaking inspections at all manufacturing facilities to ensure equipment is manufactured according to approved designs and quality records captured and presented in MDR's;
- equipment is factory tested and approved for release being before packaged and transport to the nearest Port, where it is further inspected by customs and released for transport to site;
- upon arrival at Site, equipment is unpacked and inspected for damage before being released for construction. NCR's are raised for damaged equipment and if necessary replaced or repaired.

EIPlus has developed strong relationships with Futong at all level of management and has direct access to Futong's designers to assist in troubleshooting technical issues for installed plant.

For Asset Owners who are contemplating

- retrofitting new dry bottom ash plant for asset owners that are considering replacing their existing wet ash hoppers and scrapper chain systems.
- supplying spare parts for existing installations, offering equipment that is designed to extend the life of wear components such as crusher teeth, steel belts and pans, scraper chain assemblies and other rotating parts;
- implementing modifications under license from Futong to existing dry ash plants to improve operation and maintenances, performance and reliability. Particularly in circumstances where operational changes impose more onerous duties on existing plant such as poor coal quality leading to formation of large clinkers.
- implementing modifications to wet ash extraction systems to improve operational reliability and control, overcoming blockages in downstream plant in circumstances where poor coal quality results in higher volumes of sanding material being extracted or the formation of large clinkers that places higher demands on crushing and conveying plant;
- developing preventative maintenance programs in consultation with client's Operation and Maintenances staff; and
- provide training to Operation and Maintenance staff in the technology and correct operation of dry ash plant.

Dense Phase Pneumatic Conveying Systems capable of transporting bulk solid materials several kilometres using innovative transport technology that assures uninterrupted flow.

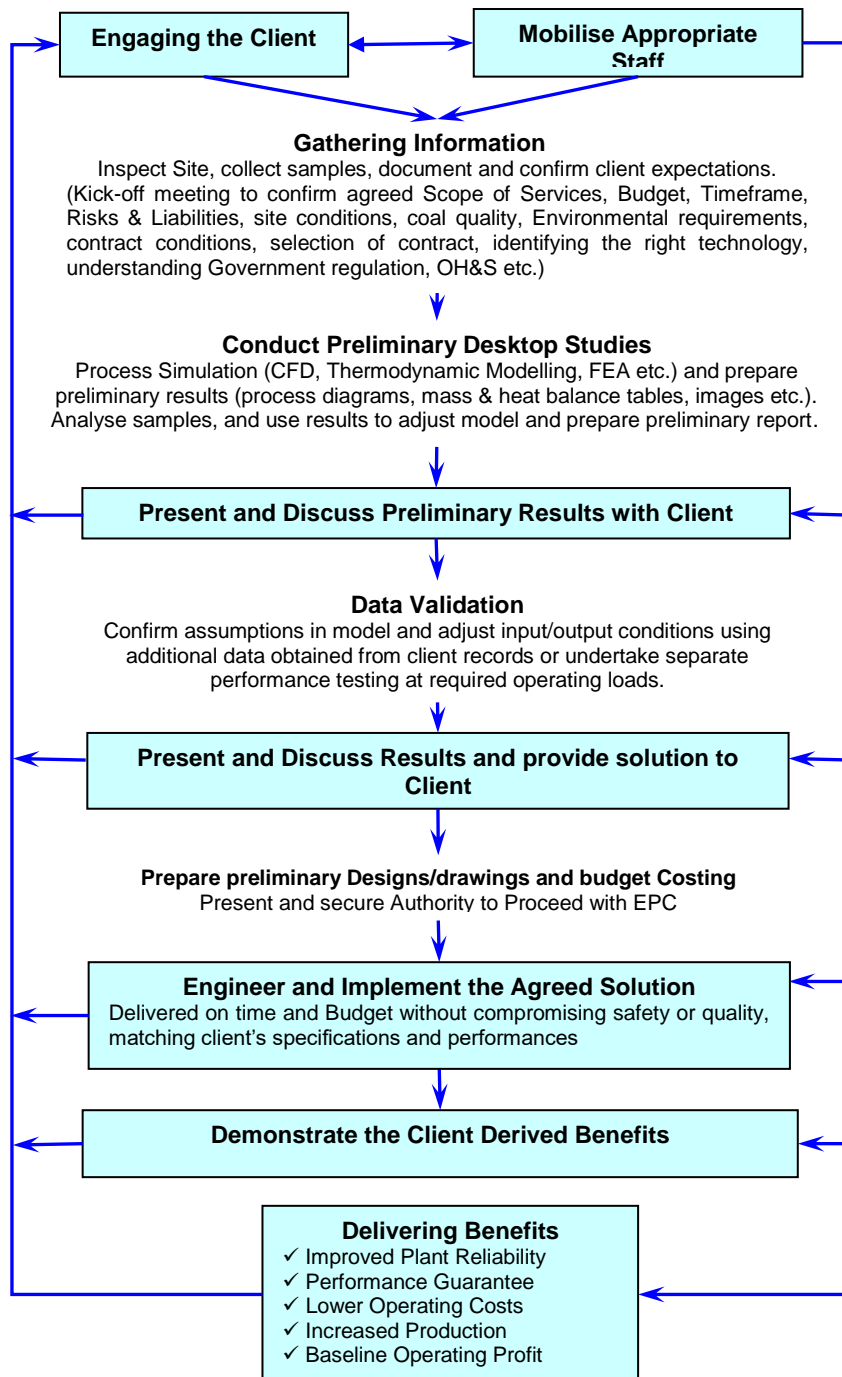
Industrial Packaged Boilers and Turbine Plant for small scale operations. Ideally suited for generating combined heat and power using a variety of fuels including coal, LPG and biomass.

We manage the entire supply chain process, working with our manufactures to ensure equipment is correctly designed, manufactured and factory tested according to our Clients' specifications, taking responsibility for delivering performances, backed by warrantees for workmanship and bank guarantees.

For a more information about Futong's Dry Bottom Ash Handling equipment, including supply of spare parts, refer to our website, www.eiplus.com.au.

Our Methodology and Approach for Developing Solutions to Complex Problems

By collaborating with our clients, EIPlus is able to develop practical solution to complex technically challenging problems following a proven stepwise approach, to develop new processes and to improve the stability and performance of existing operating plant.



Our Engineering and Project Management Experience

The breadth of our experience can be demonstrated by the involvement of EIPlus Engineers and Project Manager in a wide range of projects, delivering benefits to Asset Owners of Power Stations, Mineral Processing Plant and Refinery Operations across Australia and overseas.

Design, Construction & Commissioning Projects

- Salt Reduction Plants and chemical handling plant, Werribee Recycled Water Treatment Plant
- Laverton Stormwater harvesting Low Lift Pumps, Hobson Bay City Council
- Stormwater Harvesting for State Baseball Softball Centre
- EPC of Units 6, 7 and 8 Dry Bottom Ash Handling Systems at Synergy's Muja Power Station. Required management of all works, local subcontractors and overseas equipment suppliers, and site construction activities including demolition of existing ash hoppers
- Investigation into air distribution around a vertical spindle mill. Designed new vane wheel which improved air distribution, helped to eliminate low temperature zones (avoiding corrosion), high particle velocity and concentration zones (reducing erosion), and improve classification performance.
- Investigation into erosion patterns on an integrated centrifugal mill exhaust fan (part of a hammer/attrition mill). The model predicted the same wear patterns as experienced on the actual unit and matched as new performance. The model was later used to predict the loss of performance, allowing the operators to extend the time between overhauls to when the blades were close to losing structural integrity, rather than the assumed performance limitation. The results were used to redesign the blades profile and thereby reduce the rate of erosion without affecting performance.
- Investigation into the effects of wind box damper positions on the performance of tangentially fired furnaces. The model was used to produce an optimum set of damper positions for specific mills in service. This optimum set up was confirmed using a detailed set of measurements that confirmed improvements in efficiency (through reduced excess air and carbon in ash) and temperature distribution.
- Development of an improved method for undertake Hanger Survey using video imaging to record hanger displacement from existing walkways, improving the accuracy of the data and significantly reducing the extent of scaffolding required during outages. This technology led to the development of a comprehensive Hanger Database that allowed asset owners to verify the integrity of high energy piping by comparing the historical results against flexibility analysis criteria as part of a life extension program.
- Re-floating High Energy Piping System of 4 units at Synergy's Muja Power Station. Involving modifications and repairs to piping and hangers
- Redesigned and EPC the main steam condensate drains and Steam Coil Air Heater (SCAH) upgrade work for Muja Units 5, 6, 7 and 8.
- Designed and project managed a restraint for Unit 6 steam chest at Kwinana, involving strain gauging to determine loads for designing structural steelwork.
- EPC Turnkey of first of a kind Attemperating spray system on all 4 x 600MW units at Bayswater Power Station, for AGL Macquarie Generation. Requiring total management of all works, local and overseas procurements and site construction supervision.

- Investigations into superheater tube performance upgrades at Muja Power Station to determine the benefits of extending Stage C's superheater circuit to match Stage D's performance and how this change would impact steam and flue gas temperatures, steam side pressure drop, and heat rate.
- Modelling Muja Power Station's parallel draft plant to determine likely causes of higher particulate emissions, increasing particle resistivity and velocity through the precipitator that could exceed their Environmental Protection Authority (EPA) discharge limits. The investigations considered the use of atomised spray water as an effective approach to lowering flue gas temperature.
- Modelling minimum steam flow required to maintain the minimum amount of superheat to avoid sootblower piping corrosion problems from rainwater. Cost of steam production was also determined in terms of the increased fuel consumption required to maintain that steam flow.
- EPC a novel wastewater recovery system, engaged contractors, provided on site supervision, procured equipment and materials and commissioned the system at Loy Yang B.
- Refurbishment of 2 x Brine Concentrators for AGL Macquarie Generations' Bayswater Power Station, involving replacement of major sections affected by stress corrosion cracking. Acted as both Owners Engineer for designs stage and Superintendents Representative during the modifications and recommissioning activities
- Engineering design, project management and commissioning of briquetting plant for Anglo Coals at its Moura and Capcoal mine sites.
- Design, construct and commission of a 5tph carbonation and briquetting plant as part of the SASE demonstration plant, Whyalla, SA for the Aurian group.
- Design, construction and operation of a 10 MW scale Coal Gasification Development Facility, and also mathematical modelling of pilot-scale and full-scale IDGCC plants.
- Design, construct and commission of a new steam condenser for Energy Brix Australia to enhance its operations and improve MW generation.
- Designed, Constructed, Commission and operated various Pilot Plants under the SECV's strategic Research Program including the solar dried coal slurry pilot plant, Coal combustion test furnaces and High Pressure coal slurry combustor pilot plant, Hydrothermal dewatering plant
- Developing tenders and award of contracts for the design and construction of a coal washery, mining/excavation operations as part of a rehabilitation project of old mine sites in the NSW Hunter Valley region.
- Build, Own and Operate 2x30MW briquette fired boilers each at Leongatha & Cobram supplying steam over the fence to Murray Goulburn and Muja (VIC). Development from concept through to operations including tendering & contract formation; project management & administration of contractors; submissions for securing an EPA, EIS applications/works approval.
- EPC of the Automation Upgrade Packages for Morwell, Mirboo North and Boolarra Water treatment plants on behalf of the Gippsland Water Supply Authority.
- Project Management and site supervision of Hot Re-heat pipe NDT Contract on behalf of Stanwell Power Station. Acting as the Principals Superintendent, of a contract that involved the interaction of many contractors, to ensure timely completion of performances during fixed outage period, for all units.

- Project Management and site supervision of Turbine Aux. Survey and Repair Work Contract on behalf of AGL Macquarie Generation. Acting as the Principals Superintendent, managing the day to day activities, raising purchase orders and directing contractors, to ensure timely completion of performances during fixed outage period, Units 2 & 3.
- Project management and contract administration of Alstom Power's contract with Energy Brix Australia for major overhaul of No5 Turbo-generator

Design Upgrades

- Designed High Pressure, high temperature coal slurry digestion pilot plant for QAL.
- 200MW Co-generation project with carbon credits, detailed engineering and cost benefit analysis for the NZ Refinery Company, Marsden Point utilising biomass and bi-product fuels. Complete power plant engineering design, encompassing IGCC, HRSG Gas turbine, Boilers, etc.
- 6MW waste heat recovery Gas turbine pre-feasibility engineering and cost benefit, SEAV and Blue Circle Southern Cement co-funded
- Engineering design and construction of modifications to Simcoa's incinerator. Project Management of manufacture, installation and commissioning
- Process and control system design and development for 10 MW and 600 MW IDGCC gasification project including gas turbine control and integration
- PF Burner design on boilers and test furnaces.
- Diagnosis of the causes of Muja Stage D Flue gas flow and temperature imbalances and design of water spray attemperation system to eliminate the imbalance and resulting dust emission issues.
- Evaluation of superheater upgrades for Muja Stage C
- Evaluation of steam heating of Muja Stage C sootblower piping.

Cost Engineering and FEED Studies

- 60MW Biomass and waste heat recovery project with carbon credits, full engineering and cost benefit analysis for Carter Holt Harvey – Whakatanie Paper Mill, NZ
- Development of a 120MW IDGCC plant, supplying syngas for KHI's Hydrogen production facility.
- FEED study for Tasmania Alkaloids for a BOO co-gen plant using waste feedstock to fuel a boiler supplying process steam over the fence.
- Scoping study for BHP TEMCO, to design and construct a briquetting plant at its Bell Bay smelting operation and to operate that plant to process 9,600tonnes of waste material (ferroalloys, ferromanganese and silio-manganese), reclaimed from its various waste dams.
- Design of commercial scale underground coal gasification gas turbine combined cycle plant.
- Investigated cause of damage to ductwork around auxiliary burners in a heat recovery boiler inlet. Design corrective measures for flow mal-distribution that was the root cause of the problem.
- Development of the Integrated Drying and Gasification Combined Cycle (IDGCC) processes for Dual Gas, 600MW power plant and KHI's Hydrogen Supply plant for Latrobe Valley.

Process Modelling and Performance Upgrades

- Designed new internals for an existing mill classifier that provided superior particle separation and reduced pressure losses.
- CFD modelled flow correction baffles for various primary air system to correct pulveriser control problems caused by flow instabilities and poor flow distribution. Baffles plates were designed and installed by client under supervision.
- NOx formation modelling in a gas turbine combustor.
- Development of CFD model of furnace zone to address poor combustion performance of a power station boiler, and of subsequent tuning exercise.
- Investigated minimisation options for Particulate Emission Minimisation for power stations by balancing flows and temperatures through parallel sections of the draft plant.
- Undertaken Higher Order Carbon Dioxide Accounting in order to lower a cement manufacturer's carbon tax liability with the implementation of a fuel sampling and analysis regime using a higher-order carbon dioxide accounting method under NGERs.
- Completed gap analyses, written procedures and developed reporting tools to ensure compliance with NGERs on projects across different industries. Helped implement data capture and record keeping methodologies to minimise compliance and business risk. Audited data prior to submission into the Emissions & Energy Reporting System (EERS).
- Completed a techno-economic study into utilising timber pallets as a fuel to produce utilities such as electricity, steam and chilled water.
- Completed a techno-economic study into diverting waste plastic from landfill and converting it to a synthetic crude oil using breakthrough pyrolysis technology
- Conducted investigation as to cause of severe ash fouling in the waste gas clean-up system.
- Conducted economic evaluation of alternative auxiliary fuels for a brown coal power station and their relative costs.
- Conducted evaluation of changing fuel specification on boiler performance.
- Conducted study into pressure spike from material cascading off the walls of a reactor. Model results were used to correctly design pressure relief and protection systems.
- Conducted pilot scale study of combustion of hydrocarbon/water emulsions as low NOx producing liquid fuels for internal combustion.
- Modelling and design of boiler modifications for PJB Paiton, Indonesia and Alcoa Alumina.
- Modelling of gas turbine/HRSG, gasification and biomass boiler options for NZRC project.
- Modelling of gas turbine/HRSG options for UCG and IDGCC project studies.
- Modelling of Steam supply boilers at Leongatha and Cobram and also tuning of boiler and deaerator control loops.
- Investigations into boiler fouling, slagging and electrostatic precipitator with recommended solutions implemented by asset owners.
- Coal mill performance and explosion investigations.
- Supervision of coal combustion trials in the Philippines, Malaysia, S Korea, Hong Kong and China for several coal supply companies and power station operators.

Greenhouse Emissions Modelling and reporting

- Emissions Reduction Fund (ERF) feasibility studies for Peabody Energy, Australian Paper, NDEVR Environmental, and AHG.
- ERF Safeguard Mechanism consulting and audit projects for Origin Energy (Upstream) and Peabody Energy.
- NGER Carbon and Energy Reporting Consulting for dozens of organisations, including AGL, Origin Energy, Peabody Energy, Rio Tinto Coal, ExxonMobil, Woodside, Cement Australia, Ecogen Energy, Boral, and the Australian Government.

Benefits for Engaging EIPlus

EIPlus offers expertise in all aspects of power plant design, manufacture, construction and during operations where for example changes in coal quality may cause plant and equipment to perform below design expectations or where asset owners seek to increase generation through implementation of efficiency upgrades.

Asset Owners that have benefited from our experience, include:

- **Thermal Power Generators** - Western Power (Synergy), AGL-Macquarie Generation, Delta, Engie (formally GDF Suez), Energy Australia, Intergen, Stanwell, Engie Energy International, AGL-Torrens, Atco Power, Ignite Energy, Ergo Energy etc.
- **Mineral Processors and Refineries** - BHP-Temco, Tiwest, Alcoa, Queensland Nickle, Iluka, Tasmanian Alkaloids (Pharmaceuticals), NZ Refinery etc.
- **Mining** - Santos, Conoco Phillips, QREL etc.
- **Cement Industries** - Cement Australia, Adelaide Brighton, Boral Cement etc.
- **Milk Producer** – Murray Goulburn and Meiji Industries etc.
- **Waste Recovery** - Smart Recycling, C&D Recyclers, Veolia, Transpacific, Gippsland Water etc.
- **Pulp and Paper** – Australian Paper (Maryville), Carter Holt Harvey (Australia and NZ) etc.
- **Manufacturing** – Manildra Starches and Ethanol production etc.

We have proven experience and knowledge in range technologies including gasification and syngas clean-up, large scale boilers, including CFB and grate boilers fired using a range of fuels, ROM bituminous & sub-bituminous, lignite coals, industrial brown coal briquettes, biomass and other waste derived fuels such as RDF.

- EIPlus can assemble a team of highly skilled engineers, project managers and quality inspectors that have proven experience in the design, manufactured, construction, testing and operation of a number of technology-based power plants.
- EIPlus can deploy skilled engineers, project managers and quality inspectors at short notice offering competitive flexible pricing structure.
- Our engineers and project managers have completed a number of FEED studies, producing documentation used to seek suitably qualified EPC contractors.
- We can deliver Turnkey EPC projects, managing all processes to ensure outcomes are delivered without compromising safety or quality, on time and budget, meeting client's specifications;
- We can carry out modifications to existing plant to implement Engineered solutions that improve operational performance and reliability in operating plant;

- We can prepare tenders and seek competitive pricing, undertake evaluation of offers and negotiate technical and commercial terms and conditions of contracts through to award of contract.
- Our project managers have prepared tenders and sought competitive pricing, undertaking the evaluation and negotiations of both the technical and commercial through to award of contract for both private and public authorities.
- EIPlus can prepared legally binding Contracts for engaging contractors and equipment manufacturers, based on Australian Standards as well as Conditions of Contracts developed by solicitors where back to back conditions are warranted.
- Our project managers have completed turnkey EPC Contracts, managing all processes to ensure outcomes are delivered without compromising safety or quality, on time and budget, meeting client's specifications, including projects for AGL-Macquarie and Western Power (Synergy).
- Our project managers have administered contracts on behalf of asset owners, including AGL-Macquarie as their Superintendents Representative and Owners Engineers;
- EIPlus has established knowledge of various Australian Conditions of Contract and has developed special back to back subcontractor terms and conditions, working with various legal firms.
- EIPlus can undertake environmental performance testing of power plant equipment, to establish boiler and turbine performance prior to and post upgrades and compliance against EPC license discharge limits (air/water/land).
- We have access to Thermodynamic and CFD modelling software that can assist in the development and design of power plants, including CFB boiler plant. Being able to simulate various operating conditions including coal quality allows asset owners to fully evaluate the benefits of proposed upgrades or modifications.
- Our capabilities in Greenhouse gas emissions, plant performance and evaluation means that we understand the importance of responsible environmental practices and the need for selecting the right technology early in the design stages.
- EIPlus has proven skills in managing the design and manufacture of equipment sourced from overseas suppliers, ensuring compliance against Australian Standards and codes of practice for design, manufacture and operation. Undertaking audits of their quality systems, implementing checks, gathering and approving ITP's MDR's etc. and providing surveillance during manufacture.
- EIPlus has expertise as Owners Engineers and can provide technical advice in the development of conventional and CFB thermal power plants utilising a range of fuel sources;
- EIPlus Quality and OH&S systems and procedures, including a comprehensive SSEMP that comply with ISO9001 and other regulatory requirements.

Pricing

We charge \$160/hr fixed for all consulting hours. Timesheets can be provided.

Additional charges will apply for industry experts, travel expenses and fees for modelling software.

Our terms are strictly 28-days from date of invoice.

Insurance

EIPlus has Public Liability and Professional Indemnity Insurances and can arrange Contract Works Insurance on a Project basis with terms and conditions meeting our customers' requirements. Copies of Insurance Certificates can be provided upon request.