



WorleyParsons

resources & energy

EcoNomics™

Select

Power

Capability and Experience





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“There is no task so important or so urgent in our business, or our customers’ businesses, that it overrides the need to work safely...”

John Grill, WorleyParsons CEO

Zero Harm is our corporate vision for health, safety & the environment (HSE).

We are committed to our vision; it applies to all of our operations, at all times, in all locations, and at all levels of responsibility.

We will actively work to align our expectations and behaviors with those required to achieve our vision through a dedication to continuous improvement.

The launch of our HSE framework, OneWay™, enables us to further align and consolidate our global systems and procedures and continue to work with our personnel to reinforce a culture that underpins our drive to achieve our corporate differentiator of industry leadership in the HSE performance.



Corporate Overview

WorleyParsons is a leading global provider of professional services to the resources & energy sectors, and the complex process industries.

We cover the full asset spectrum, both in size and lifecycle, from the creation of new assets, to services that sustain and improve operating assets.

Our business has been built by working closely with our customers through long term relationships, anticipating their needs and delivering inventive solutions through streamlined, proprietary project delivery systems. Strong growth continues to characterize our performance both through organic development and through strategic acquisition as we strive to provide tailored services wherever our customers need us.

- Power
- Hydrocarbons
- Minerals & Metals
- Infrastructure & Environment

37
countries

114
offices

31,700
personnel

EcoNomics™ Delivering profitable sustainability

EcoNomics™ is our range of services and technologies that profitably embed environmental, social and financial sustainability into project delivery, across the asset lifecycle. It is a seamless extension of our established project delivery capability in the key areas of Assessment, Efficiency and Treatment & Mitigation.

We are committed to working with our customers to turn their sustainability objectives into good business practice.

WorleyParsons *Select*

Power *Select* is the specialist front-end division within WorleyParsons, focused on project viability assessment and development concept selection. *Select* supports decision making on critical front-end planning issues that enhance our customer's ultimate business objectives.

WorleyParsons operates in all five phases of an asset's lifecycle with our tailored business lines, *Select*, *Deliver* and *Improve* responding to our customers' individual needs in each project phase. *Select* brings real world experience into the front-end value adding phases to maximise investment return and underlying confidence. *Deliver* converts the highest potential value option identified by the *Select* division into a fully defined and successfully executed project. *Improve* supports and enhances customers' assets throughout the operating lifecycle.

Power *Select*, through its focus on the critical early phases of projects:

- Adds technical definition to reduce technical risk
- Optimizes the opportunity and maximizes the inherent value
- Creates the business case and assesses the probable life cycle costs
- Assists the customer in securing the necessary approvals and prepares for the *Deliver* business line

Through *Select*, we advise asset owners, operators, investors, financial institutions and governments on the best path forward by combining the niche specialist skills required within the front-end of projects with WorleyParsons' extensive, practical experience in total project delivery and plant operation. Power *Select* utilizes a global database of major capital projects to enable customers to make strategic investment decisions with accurate and reliable planning data, significantly increasing their confidence that the critical planning decisions will underpin their ultimate business objectives.

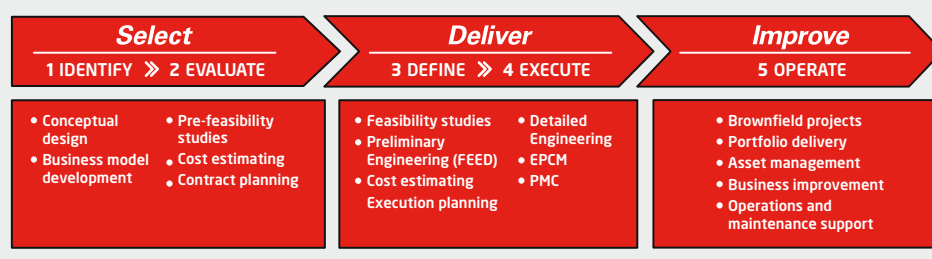
Our specialists have a thorough understanding of the total business value chain including market analysis, financial modelling, technology selection, greenfield site selection, approvals management, new plant configuration, existing plant optimizations and the development of the detailed project realization methodologies. The combination of strategic front-end planning skills integrated with extensive project execution capabilities, together with WorleyParsons' technological and commercial neutrality, differentiates Power *Select* in the consulting market as a market leader.

Technological and commercial
independence

Cost estimates for projects from
20k-20b
total installed cost

2,500+
studies per year

WorleyParsons' Project Phases



WorleyParsons' experience covers all five phases of the asset lifecycle. In each one of these phases we understand the critical issues and apply our specialist business lines, *Select*, *Deliver* and *Improve* to enable our customers to achieve their business objectives.

Our phased approach enables consistent project delivery worldwide and WorleyParsons' project systems are fully aligned to this process.



Services

Technical Development

Through the course of a *Select* study, specialist engineering staff add technical definition to the development concepts identified within the initial framing workshops. Traditionally this technical definition is constrained by the lack of data available on which to base a design. *Select* makes use of the extensive database of current design projects and archives of existing facilities to gain the analogues from which to quickly assemble the concepts for screening. Technology selection studies are undertaken from the company's stated position of technology neutrality, to provide our customers the information they require to compare the 'tried and tested' with the risk weighted 'new and emerging'.



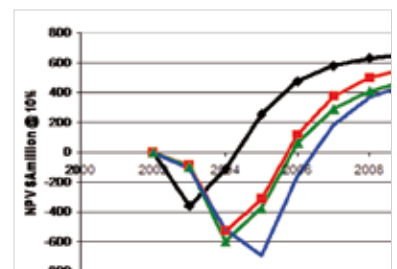
Value Adding

Phases 1 and 2 (Identify and Evaluate) are recognized as the value adding phases. It is within these phases that the opportunity to find the up-side of the development cases is found. *Select* works best by forming an integrated team with the customer's staff bringing technical development in line with operational know how to identify the areas of value enhancement. *Select* makes use of formalized Value Improving Practices to ensure our customers achieve the maximum possible front-end loading within the constraints of the development schedule and budget.



Business Model Creation

Select assists in the creation of the required Business Models in a number of ways. Firstly, by the creation of the Capital Expenditure (CAPEX) estimates using proprietary in-house tools designed to quickly assemble building block style estimates validated from past projects using up-to-date base rates. Secondly, *Select* typically works with our customers to build the ongoing Operating Expenditure (OPEX) models to enable the life cycle cost comparisons between competing development options to take place. Lastly, *Select* can provide risk based Net Present Value modelling using the EcoNomics™ DELTA tool. This modelling can include additional externalities (such as carbon taxes) for customers seeking to future proof their businesses by analyzing a broader range of possible futures.



Project Planning

The forming of the Decision Support Package (DSP) is the closing phase of *Select's* work and provides the beginning foundation for the *Deliver* phase. The DSP contains all required information upon which the decision to proceed with the project is made. The project execution planning skills of the broader WorleyParsons organization are made available through *Select*, giving our customers access to detailed planning engineers, senior procurement staff and field construction personnel. This enables *Select* to provide services such as Execution Strategy formation, long lead item identification and construction logistics planning by expert staff in these fields.



Sub-Sector Overview

Coal

Responsible for the design of 38,000 MW of successful coal-fired projects worldwide, WorleyParsons is an industry leader and continues to provide full-service consulting, engineering and design, procurement, construction management, and start-up to hundreds of customers. Our experience and expertise was developed through the design of hundreds of coal-fired units from 25 to 900 MW and stations as large as 2,700 MW that burn all types of coal.



Advanced Coal

WorleyParsons' experience in clean coal provides our customers with the optimal balance of costs and performance while future-proofing business in a carbon constrained future. From integrated gasification combined cycle (IGCC), oxy-combustion, pressurized fluidized bed combustion, to pre- and post-combustion carbon capture and sequestration (where our services can be combined with our global alliance partners Schlumberger and Baker McKenzie) *Select* offers a comprehensive approach to solving the complex issues facing the generating industry.



Gas Turbines

For decades, WorleyParsons' project teams have participated in leading edge applications using the latest gas turbine generation technology. Our projects include more than 35,500 MW of simple and combined cycle installations employing more than 120 gas turbine units. Applications include distribution, generation, district heating, cogeneration, simple cycle, combined cycle, plant conversions and upgrades to combined cycle plants and repowering of existing steam plants.



Nuclear

WorleyParsons provides a full range of nuclear services to utilities all over the world. These services include design and assessment programs for new and existing nuclear power plants, licensing, project and program management, owner's engineer, risk assessment, construction management, emergency planning, decommissioning planning, plant operations and support, quality assurance and radiological and safety analyses.



Renewable Energy

The power industry is motivated by rapidly increasing power demand, climate change concerns, growing public resistance to conventional power sources, fuel security and price concerns. Our Renewable Energy Program provides the most comprehensive team available to assure the success of your renewable power generation projects. Our experience covers solar, wind, biomass and geothermal.



Air Quality Control

WorleyParsons has provided services for over 15,000 MW of flue gas desulphurization (FGD) systems and 16,500 MW of selective catalytic reduction systems, 5,000 MW of mercury control baghouses, as well as over 80 air quality control system studies. Our FGD experience includes both wet and dry technologies.



Transmission Networks

WorleyParsons' experience covers overhead and underground transmission lines and substations around the globe and includes system analysis, engineering design and construction management. Our projects cover more than 50,000 MVA of new, upgraded, and retrofit substations based on more than 12,800 circuit kms of overhead high voltage transmission, 8,800 kms of extra high voltage transmission to 765 kV, and 900 circuit kms of underground and under water lines.



Advanced Energy Concepts

Within the rapidly changing Power environment and driven by the need to gain commercial advantage for our customers, *Select* increasingly assesses advanced energy technologies such as fuel cells, compressed air energy storage, pumped hydro, distributed generation, smart grids, HVDC and advanced energy management techniques.





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Strategic Planning & Financial Analysis

Access to current 'cross industry' experience and a global data base of major capital projects enables customers to make strategic investment decisions with accurate and reliable planning data.

Select provides strategic support services to clients based on a thorough understanding of the business value chain – providing options and solutions ranging from market analysis, technology option identification, financial analysis, fuel selection, siting studies through to project execution and operations planning.

Select's access to WorleyParsons' global experience in major capital project delivery enables customers to support their front-end strategic investment decisions with current real world experience. It is this combination of providing a front-end 'think tank' with access to senior technical staff that differentiates the *Select* offering within the front-end consulting market. Furthermore, WorleyParsons provides this integrated service from a platform that is technologically and commercially neutral across a range of contracting alternatives.

By providing our customers the decision support packages in a staged order - prioritized by schedule necessity - customers are required to make only those decisions demanded early in the conceptual stages of an investment opportunity. All remaining decisions are then left open to enable the WorleyParsons value enhancement process (VEP) to achieve the maximum value add allowed.

Specific services include:

- Business opportunity identification and option screening
- Load forecasting, generation, transmission capacity evaluation and grid analysis
- Master planning and regulatory approvals support
- Independent advisory services including, due diligence, engineering and technical support to the banking, investment, energy, legal, governmental and regulatory sectors
- Project cost and scheduling analysis including, screening and ranking to determine relative option costs based on a combination of CAPEX and OPEX modelling
- Benchmarking
- Project review and risk assessment (employing both qualitative and quantitative techniques)
- Technology selection, including current and future power technologies, carbon management and clean technologies
- Development of a tailored VEP process that is aligned with the particular business objectives of the customer
- Overall strategic and investment risk identification, assessment and management

100+

years of power industry experience

200+

specialist technical personnel



Project: Thai IPP Solicitation Evaluation**Customer: Government of Thailand****Phases:** IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

Thailand

WorleyParsons was the primary technical advisor to the Government of Thailand for the evaluation of bidders under the 2007 Second Thai IPP Solicitation resulting in 4400 MW of additional coal and gas capacity, with a committed commercial operation date of between 2012 and 2014. This work entailed the full review of technical and commercial offers from 20 bids for over 17,000 MW of new capacity. From a thorough understanding of the Thai power network, all bids were evaluated for suitability for interconnection to the Thai grid. The final determination of selected bidders was based on the summation of least cost power to the Thai consumers and achieving a sustainable fuel mix.

**Project: Belene Nuclear Power Plant Project Feasibility Study****Customer: Natsionalna Elektricheska Kompania (NEK)****Phases:** IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

Bulgaria

As part of an effort to restart construction, WorleyParsons was contracted to develop the Environmental Impact Assessment (EIA) for the Belene site and a technical and economic feasibility study for the completion of Belene Units 1 and 2. The feasibility study considered the technical and economic impacts of the entire life cycle for the facility, from initial construction through plant operation, nuclear radwaste disposal, and ultimate disposal or storage of the used nuclear fuel. In developing the EIA and feasibility study, WorleyParsons gained detailed and specific knowledge of the Belene site and plant and is now serving as A/E and project manager for project execution.

**Project: Power Purchase Assistance****Customer: MIM Holdings****Phases:** IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

Australia

With the setting up of the Queensland electricity market and the granting of contestability for consumers with an electrical energy usage over 40 GWh per annum, MIM faced both opportunity and risk. To better understand the possible impacts to their current and future business plans, MIM engaged WorleyParsons to conduct a survey of their operations to determine their electrical load characteristics and costs. This review determined the load magnitudes and daily patterns and possibilities for load shedding, thus providing MIM with the required platform from which strategic investment options could be considered.

**Project: Strategic Planning Benchmarking for New Generation****Customer: Confidential****Phases:** IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

United States of America

WorleyParsons assisted a power company in evaluating generation options over a ten year planning window. The first step of the analysis was to screen various options including unit upgrade, boiler replacement and new coal and natural gas plants. The second step investigated the business potential for the options that passed the screening. Hour-by-hour unit dispatch sequencing was modeled using our proprietary tool for those options, along with every existing unit within three independent system operating regions. The evaluation included the added complexity of increasing levels of CO₂ emission restriction and new renewable power. Future competitive wholesale electricity prices, annual capacity factors, and system-wide air emissions were accurately predicted.





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Meeting Future Demand for Electricity

From an in-depth working knowledge of all power generation options and technologies, WorleyParsons provides customers with the basis for selecting the best solution for future power generation.

Select provides strategic planning details, concept development and technology selection for meeting future electrical demand. *Select's* access to current project experience provides customers with a working knowledge covering a wide array of options and technologies. This, together with current capital and operating cost knowledge, provides the basis for the best solution tailored to the customers' abilities and needs.

Within a carbon constrained future, WorleyParsons brings technological know-how of sustainable power solutions (including both new generation options and improved existing plant performance coupled with environmental and carbon management techniques) to enable our customers to future-proof their businesses.

WorleyParsons' experience in generation technologies, current environmental regulations, and sustainable operational characteristics enables *Select* to provide in-depth analysis and evaluation of the various options available to today's generation market.

WorleyParsons' unique global coverage provides our customers with regional expertise and local contact with licensing boards, environmental agencies and permitting agencies. This enables *Select* to provide opportunities and constraints analysis, resources and revenue analysis, regulatory requirements analysis and environmental studies during the site assessment process. This in-country working knowledge of generation facilities provides the basis for site layout/balance-of-plant equipment selection, development of off-site interfaces, noise evaluations and recommendations, and geological, geotechnical, seismic and water analysis evaluations during the initial site selection process.

WorleyParsons' experience with major capital developments gives *Select* a clear understanding and insight into all facets of project execution and planning. Services include:

- Capital and operating cost analysis
- Financial pro-forma development reviews
- Existing asset additions and modernizations
- Full range of fuel options
- Renewable energy and sustainable development
- Co-development including power, heating, desalination, industrial process and chilled water

740

power generation units

100+

technology option studies



Project: Advanced Coal Site Evaluation and Selection**Customer: New York Power Authority****Phases:** IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

United States of America

WorleyParsons completed an evaluation for the New York Power Authority to identify suitable sites for hosting an advanced clean coal power plant. Using high-level screening criteria, numerous sites were evaluated. WorleyParsons specifically concentrated on the potential for utilizing existing power plant and brownfield sites based on site parameters and reasonable access to transmission, fuel supply, environmental attainment and CO₂ sequestration geology. WorleyParsons further analyzed the sites to determine if any fatal flaws were present. A profile document for each short-listed site was developed describing the feasibility and applicability for the proposed advanced clean coal power plant.

**Project: Kharkiv Heat Supply Improvement and Institutional Restructuring Study****Customer: Kharkiv Oblast State Administration****Phases:** IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

Ukraine

Serving the City of Kharkiv, this project involved a comprehensive city-wide feasibility study addressing economic improvements in capacity, configuration, performance, and reliability; hydraulic analysis of the entire city district heating network, as well as institutional aspects of the business of energy supply and institutional restructuring to support development of combined heat and power facilities in Kharkiv, Ukraine.

**Project: ZeroGen Feasibility Study****Customer: Queensland Government****Phases:** IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

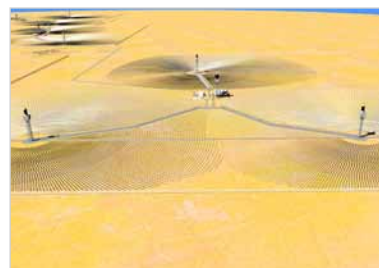
Australia

WorleyParsons has completed the pre-feasibility phase for the first Australian-based clean coal power demonstration project. We are assisting the ZeroGen project to meet its goals to create cleaner power and demonstrate the viability of integrating coal-based gasification, carbon capture and storage to achieve deep cuts in carbon dioxide (CO₂) emissions. The ZeroGen gasification plant is planned to be located near the existing Stanwell Power Station in Queensland, Australia. WorleyParsons' design includes the potential to reduce emissions in excess of 75 percent, which can be scaled up to 90 percent in full-scale commercial plants.

**Project: Ivanpah Solar Electric Generating Station****Customer: Bright Source****Phases:** IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

United States of America

As owner's engineer for Bright Source Energy, Inc., the Ivanpah project in California involves the development of three concentrating solar thermal central receiver power plants totalling 400 MW electrical generating capacity. When the project is complete, it will be the first commercial solar central receiver system in the United States. WorleyParsons' scope of work includes engineering support for the California Energy Commission (CEC) application for certification, conceptual design of powerblock, solar tower, high voltage transmission interconnections, and far field noise and air emissions modelling.





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Existing Plant Optimization

Our experience gained through long-term asset service agreements (managed through the *Improve* division), together with brownfield plant upgrades, enables our customers to effectively maintain and enhance aging asset value.

Select applies this operational know-how, condition assessment and business and engineering solutions to improve plant efficiency, increase output, improve environmental performance, and thus improve the “bottom line.”

Our experience in the design and operation and maintenance of power plants allows us to undertake a wider range of activities within the broad topic of plant optimization. Beginning with the initial condition assessment assignments, the life extension studies utilize the current project databank when considering the merits of integrating new technologies within existing plant.

The *Improve* division of WorleyParsons’ experience includes operation and maintenance of power plants where we have been able to demonstrate continuous improvement leading to cost reductions. Lessons learned are fed back into *Select*, thus completing the cycle of knowledge management. Within *Select*, our plant improvement front-end design activities utilize the same *Improve* processes which have become a benchmark in many industries.

In addition to the challenges of asset aging, the increasing focus on emissions and carbon management demands the ongoing consideration of all technologies to maximize return on investment, minimize emissions and reduce the greenhouse footprint. In these turbulent times, we are able to offer our customers a large range of options to cope with future challenges confronting power generators. We are able to share our experience with such technologies as post combustion carbon capture, Oxyfuel, combustors and coal beneficiation. In addition, our in-house AQC capability enables us to offer environmental compliance strategy development and planning.

36,500

AQC - MW

9,500

MW operated

28,500+

MW improved



Project: Senoko Power Station Stage 1 Repowering**Customer: Senoko Power Ltd****Phases:** IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

Singapore

WorleyParsons was the owner's engineer of this SGD670 million project at Senoko Power Station in Singapore. The project required the repowering of 3 x 120 MW condensing steam turbines (25 years old) within the conventional oil-fired steam power plants into multiple shafts combined cycle power plants (CCPP) of 360 MW each in two phases. An Alstom Power GT26B gas turbine was selected as the prime mover. Each block of CCPP has a configuration of 1GT+1HRSG+1ST. The gas turbines have dual-fuel (natural gas and diesel oil) capability, and were designed and optimized to fire natural gas from two sources.

**Project: Clean Smokestacks Program****Customer: Progress Energy Carolinas****Phases:** IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

United States of America

WorleyParsons is the Architect Engineer (AE) for Progress Energy's FGD program in North Carolina. The project will extend through 2012, with an estimated one million man-hours to install FGD systems on 11 of the company's coal-fired plants. Our alliance-based team for these projects is comprised of WorleyParsons, Progress Energy, the OEM and the constructor. Key challenges faced within the initial phases of the project included determining the optimal arrangements of the new facilities and the selection of the right technologies.

**Project: Collie Uprate; Collie Western Australia****Customer: Verve Energy****Phases:** IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

Australia

WorleyParsons undertook the initial definition of this project and the final design. The Collie Power Station was originally comprised one coal-fired unit with a nominal output of 330 MW. The plant upgrade was required to produce continuous output of 340 MW, which was achieved by increased the firing rate while increasing the thermal efficiency.

**Project: Due Diligence Review****Customer: Confidential****Phases:** IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

United States of America

Polestar Applied Technology, a WorleyParsons company, performed due diligence assessments for a client that was considering partial ownership of three operating nuclear plants. The goal of the due diligence evaluation was to identify key issues and vulnerabilities with particular emphasis on those that might lead to costly repairs or upgrades or that might threaten efficient operation and high capacity factor. Areas of concentration included: plant material condition; equipment reliability; regulatory issues; staffing and personnel; plant security and emergency preparedness; operational and outage history; training and budget and capital expenditures.





Renewable Power Solutions

The *Select* Power division is on the forefront of the rapidly expanding field of renewable power generation.

Concentrating Solar Power: *Select* has in-depth and current working knowledge on the four kinds of concentrating solar power systems (ie: power plants that produce electricity by converting the sun's energy into high-temperature heat using various mirror configurations) namely; parabolic troughs, dish/engines, power towers and compact linear fresnel reflector systems. These systems are increasingly including thermal storage to generate power during cloudy periods or at night, or combined with natural gas so that the resulting hybrid power plants provide high-value, dispatchable power.

Wind Power: *Select* accesses the broad range of skills within WorleyParsons to undertake the required front-end analysis across the environmental, electrical and civil/structural engineering disciplines to support the feasibility assessment and planning applications for new wind farms. Combining engineering with the global procurement and construction management capability has enabled WorleyParsons to deliver wind projects utilising wind turbines ranging from 50 kilowatts to several megawatts. Traditional land based experience with is now increasingly combined with the group's offshore oil & gas engineering capabilities to provide services for the shallow water (and emerging deepwater) offshore wind power industry.

Geothermal Power: It is well recognised that geothermal energy is a large, under-utilised heat and power resource that is clean, reliable and abundant. WorleyParsons provides a full range of plant engineering services to the geothermal power industry covering; Dry steam; Flash steam and Binary cycle plants. Our staff have experience with the specialized requirements of these plants, including non-condensable gas extraction and incineration, steam turbine selection, condensate abatement systems, chemical treatment systems, mercury abatement systems, and binary cycles.

Biomass Power: Customers are increasingly turning to biomass based utility power generation as an important part of an overall portfolio to future-proof their businesses and to mitigate the variability of their other renewable energy sources. *Select* accesses extensive experience in the design and construction of biomass power plants using a variety of fuels, combustion systems, and plant configurations including dedicated utility generation, coal/biomass co-firing and combined heat and power (CHP) applications.

Portfolio approach to an uncertain future: With expertise that spans all major renewable energy Technologies, *Select* can consider a portfolio of energy generation options, and recommend technologies and approaches that meet renewable energy targets in a cost-effective manner. Engineering skills, combined with knowledge of clean coal technologies, gasification, carbon capture and storage, gas-fired generation, energy storage, and multiple-fuel power facilities - together with real-time experience in navigating complex issues such as greenhouse gas emissions, renewable energy credits, carbon credits, federal and state tax credits, and licensing and permitting issues - enables *Select* to provide informed solutions to the power industry at a time when uncertainty abounds.

3,000

total renewable
MW in design

400

MW of Solar Power
at a single site



Project: Concentrating Solar Thermal Power Plant**Customer: Confidential****Phases:** IDENTIFY > EVALUATE > DEFINE >> EXECUTE >> OPERATE

United States of America

WorleyParsons is providing engineering support for development, conceptual design and CEC permitting for two – 250MW parabolic trough solar power plants located in southern California, an Integrated Solar Combined Cycle plant in Florida, and two – 50MW plants in Spain. The project scope includes preliminary engineering, site assessment, water acquisition, solar resource evaluation, permitting, and performance modeling for these solar thermal power plants utilizing concentrating solar trough collectors.

**Project: ILEC Wind Farms****Customer: Iowa Lakes Electric Cooperative****Phases:** IDENTIFY > EVALUATE > DEFINE >> EXECUTE >> OPERATE

United States of America

WorleyParsons is providing Owner's Engineer and Construction Management services for two wind farms developed by Iowa Lakes Electric Cooperative (ILEC). The total size is 21 MW of generation which consists of 14 GE turbines. There were several unique and ground breaking actions taken for this project, located near ethanol production facilities in their service territory. ILEC used CREB bonds for financing of the project. Commissioning will take place in February and March 2009.

**Project: Sugar Mill Biomass Project****Customer: Sunshine Energy - Australia****Phases:** IDENTIFY > EVALUATE > DEFINE >> EXECUTE >> OPERATE

Australia

WorleyParsons determined the viability of using biomass waste from the sugar mills and other sources as fuel for a cogeneration plant. The study included concept designs, calculation of mass and energy balances, and the assessment of preliminary capital and operating costs. WorleyParsons is developing tenders received for the construction contractors and is now assisting Sunshine Energy with the development of these projects toward financial close. WorleyParsons exceeded client expectations at identifying and developing opportunities for renewable power generation and providing support through project implementation.

**Project: 8MW Waste Gas Cogeneration and Mii Hydro Plants****Customer: Sydney Water Renewable energy Generation Program****Phases:** IDENTIFY > EVALUATE > DEFINE >> EXECUTE >> OPERATE

Australia

ARA WorleyParsons is assisting the CNE in the technical and economical evaluation of 80 non-conventional renewable energy project proposals presented to Chile's state development agency for implementation funding. Evaluations include 45 wind parks, 8 mini hydraulic units, 6 biomass cogeneration facilities, 6 biogas digester units and 5 geothermal facilities.





EcoNomics™ Assessment

WorleyParsons provides customers with invaluable strategic decision making support by quantifying project sustainability during the critical *Select* phase.

EcoNomics™ enables our customers to properly consider the social, ecological, community and financial impacts of existing and planned facilities. The key to long-term profitability for projects is increasingly dependent on ensuring these issues are considered in the *Select* phase and embedded into the subsequent delivery phases of the project.

We work closely with our customers in framing workshops to agree on the key project objective, identify project options, and determine the financial and external assets to be assessed and risks to be evaluated. This early interaction with the widest possible range of stakeholders provides a clear focus for the assessment and assists in building relationships.

WorleyParsons has developed a suite of proprietary assessment tools with the ability to consider any combination of financial, environmental and social issues for project analysis on a range of possible future conditions and relate them to the customer in the single universal metric of money. Quantifying these different elements is made possible by using the latest available economic studies, literature and research, along with current market costs, to value externalities. All external values are taken from reputable organisations such as the UN, World Bank, and other government and industry bodies worldwide.

We use likely ranges of values for external assets which allow uncertainties to be harnessed, providing better decision making, risk mitigation and a more robust project outcome. Evaluating project options in this way assists our customers to optimize their environmental and social spending to avoid unnecessary expenditure driven by outside parties.

1

common metric for comparing all solutions - money

30+

external and internal variables to consider

100+

EcoNomics™ assessments completed on projects worldwide

Project: Power Generation - Renewable Energy Study

Customer: SinoSteel

Phases: IDENTIFY >> EVALUATE >> DEFINE >> EXECUTE >> OPERATE

Australia

The EcoNomics™ Assessment group unertook an analysis of the viability of various renewable energy technology alternatives for power generation at a proposed iron ore mine.

Solar thermal, phoovoltsic wind and traditional diesel technoglies were assessed and compared for their financial viability both currently and inclusive of likely future conditions (potential fuel price increases and a carbon trading system). The analysis identified the least cost solution for th emine under a range of conditions and demonstrated the potential value of renewable energy in an applicaotn traditonally serviced by fossel fuels.





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Our Vision

WorleyParsons will be the preferred global provider of technical, project and operational support services to our customers, using the distinctive WorleyParsons culture to create value for them and prosperity for our people.

Leadership

- Committed, empowered and rewarded people
- EcoNomics™ - Delivering profitable sustainability
- Integrity in all aspects of business
- Energy and excitement
- Minimum bureaucracy

Relationships

- Rapport with all stakeholders
- Open and respectful
- Collaborative approach to business

Agility

- Smallest assignment to world-scale developments
- Local capability with global leverage
- Responsive to customer preferences
- Optimum solutions customized to needs

Performance

- Zero harm
- Results for our customers and other stakeholders
- World-class resources, capability and experience



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EcoNomics™

**For further information about
our global capability email:
select@worleyparsons.com**

www.worleyparsons.com

