



WorleyParsons

resources & energy

EcoNomics™

Select

**Hydrocarbons
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.

- Hydrocarbons
- Minerals & Metals
- Power
- 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*

Hydrocarbons *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.

Hydrocarbons *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. Hydrocarbons *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.

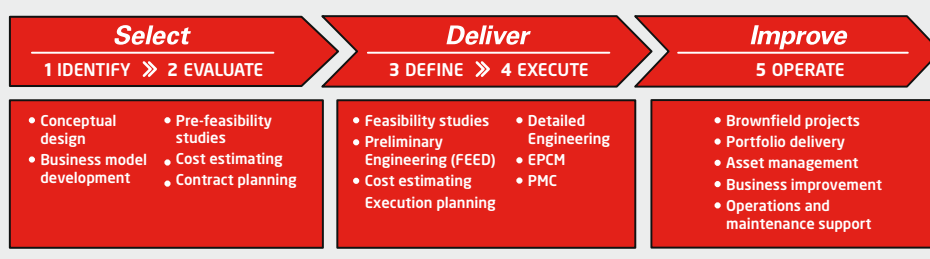
Our specialists have a thorough understanding of the total business value chain including market analysis, financial modelling, technology selection, greenfield site selection, approvals management, new plant configuration, existing plant optimizations and the development of the detailed project realization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



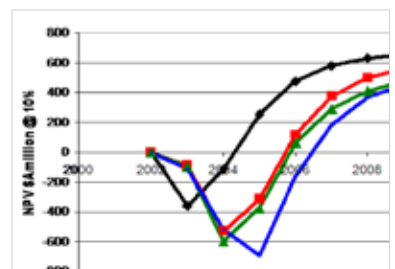
Value Adding

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

Fixed Platforms

WorleyParsons has designed platforms with minimal facilities decks ranging from less than 100 tonnes to large integrated topsides with a floatover weight exceeding 30,000 tonnes.



INTECSEA

INTECSEA is a global company within the WorleyParsons Group and combines all the group's capabilities for floating systems, offshore pipelines and subsea production.



Gas Processing

WorleyParsons has designed and built more than 400 gas processing plants around the world. Locations have ranged from deserts of the Middle East, the jungles of South-east Asia to the Arctic regions of Canada.



Onshore Oil & Gas Production

We provide innovative solutions to solve the problems associated with greenfield and revamp projects together with associated Enhanced Oil Recovery projects.



Heavy Oil & Oil Sands

As the world's oil resource is getting heavier, producers worldwide must find production solutions for heavy oil and in-situ bitumen production. WorleyParsons is a leader in this area with nearly 40 years of experience.



Onshore Pipelines & Terminals

WorleyParsons' dedicated Pipeline & Terminals group operates from centres of expertise in onshore pipelines, compressor and metering stations, Geomatics and SCADA systems.



Maritime Terminals

INTECSEA has provided engineering and construction management services on more than 60 SPM and CBM marine terminal projects used for the export/import of products and serviced by 40,000 to 300,000 dwt tankers.



LNG

LNG continues to be a growth business area for WorleyParsons. We have a long history of supporting world scale LNG facilities with experience in gas pre-treatment, liquefaction, storage, regasification and associated infrastructure.



Refining

With over 55 years of experience we have completed 23 grass roots refineries including supporting utility systems, product terminals and offsite facilities ranging in capacity from 5,600 bpd to 272,000 bpd.



Petrochemicals

With expertise gained over 600 projects in over 30 countries, our experience covers the manufacture or processing of over 65 types of chemicals and petrochemicals (from Acetic acid to Xylene crystallization).



Sulphur Management

Our sulphur recovery units account for approximately 60 per cent of the world's production of recovered sulphur. These facilities include the world's largest single-train units and apply processes developed and patented by WorleyParsons.





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Business Opportunity Realization

The realization of a business opportunity – be it the development of a new resource or an upgrade to an existing facility – involves a complex decision making process.

We present these options in a clear and concise manner, making it easier for our customer to compare and arrive at an informed decision. Business and operational objectives are set early in the life of a project, and successful operators are aware that their achievement is a prerequisite for a profitable operation. However, this is also the time when the least amount of information is available. It is this juxtaposition of the criticality of making the correct decisions, and the absence of detailed information on which to base them, that creates the challenge.

Select has been designed to answer these questions by drawing upon projects with similar attributes from our extensive database of recent works to supplement absent information, facilitating the development of accurate concepts. Our experience includes a wide range of technologies enabling us to offer unbiased advice, not only on technical aspects but also from a logistical, practical and operational point of view.

Select guides customers towards making only those key decisions that are essential in the formative early stages of a project. This strategy enables customers to reduce execution risk and improve cost and schedule performance, whilst retaining flexibility in areas where ongoing uncertainty will have no adverse affect on the final project outcome. This is particularly relevant in markets that are subject to change.

As we face a carbon-constrained future, with changing regulatory frameworks and an uncertain business landscape, *Select* is focused on working with our customers to future-proof their businesses through our knowledge of technologies and our environmental and carbon management techniques which are delivered through EcoNomics™.

60+

years in the hydrocarbons industry

Real world experience used to determine commercial

viability

of projects



Project: Browse Basin Development

Customer: Woodside Energy Ltd

Phases: IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

Australia

Woodside is currently considering options for the development of the Browse basin field.

The field lies 300 Km offshore in a water depth of 400m. The gas reserves are considered high enough to support a dedicated LNG facility. *Select* has been assisting Woodside to determine the optimal development scenario to best meet its business objectives. Possible development scenarios that have been considered include gas export to new onshore LNG facilities in either Darwin, or the Kimberly, transport to the existing LNG facilities on the Burrup or possible offshore LNG options including floating facilities or fixed offshore structures in neighboring shallow water.



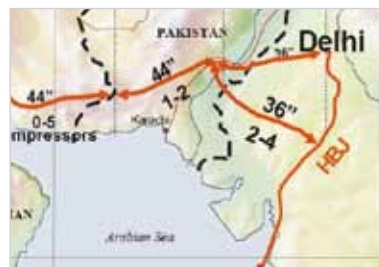
Project: Iran-Pakistan Gas Pipeline

Customer: BHP Billiton/NIGEC

Phases: IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

Iran, Pakistan, India

WorleyParsons through the APE joint venture completed the pre-feasibility study on the 2,600 km gas import pipeline taking South Pars gas to major consumption centers in Iran, Pakistan and India. The study report defined the development and refinement of selected pipeline options and estimated costs plus associated project technical and logistical implementation strategies. BHP Billiton has recently requested an update to the study to include increased gas demand and a possible extension of the pipeline through to China as the project continues to gain momentum.



Project: Arctic Islands Project

Customer: Petro-Canada

Phases: IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

Canada

Petro-Canada contracted WorleyParsons to perform a feasibility study for the surface facilities and logistics required to develop gas reserves in the Canadian high Arctic. Both fields lie partially onshore but both are expected to require future offshore wells and flowlines to fully exploit the reserves. The concept is to liquefy the gas and transport it to market in icebreaking LNG tankers. WorleyParsons provided a fully integrated *Select* team able to validate, and modernize the LNG concept previously studied circa 1980 as the Arctic Pilot Project.



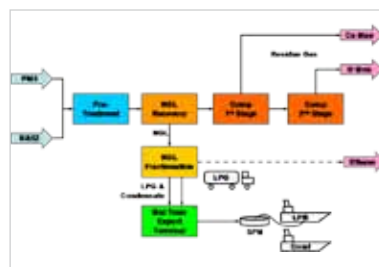
Project: CaMau Gas Processing Plant Enhancement Study

Customer: Petro Vietnam

Phases: IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

Vietnam

Petro Vietnam delivers gas from offshore gas reserves in Southern Vietnam via the CaMau pipeline to power stations and a fertilizer plant in the local CaMau area. WorleyParsons was engaged to investigate a gas processing plant to recover Ethane, LPG and Condensate from the source gas streams to enhance the value of Petro Vietnam's operation. WorleyParsons quantified and costed the facilities required to extract the commercial products and meet gas delivery requirements. The study found that PM3 and B&52 gas sources contained marketable quantities of LPG, condensate and demonstrated the commercial attractiveness of LPG recovery.





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Greenfield Development

Select adds value to our customers through independent expert advice on project assessment and selection.

WorleyParsons regional strength across all major international oil and gas centers ensures that *Select*'s specialist personnel are familiar with the challenges posed by greenfield developments – including those in remote, hostile and logistically demanding environments. Local knowledge, combined with extensive international experience, ensures that development options are reviewed at both a technical and practical level, and the opportunities, costs and risks are carefully evaluated at the concept selection stage.

Our core *Select* services offer choices to our customers that meet their business needs and support their greenfield developments. This starts with pre-feasibility and screening studies to determine the range of options available for any development, including independent technology assessment and selection based on practical experience via high level cost and risk analyses these options are then screened for viability. To provide a clearer understanding of the development we link with the clients' appraisal data interpretation team and provide high level facility sizing to determine CAPEX and project economics, taking into consideration sensitive parameters and associated risks. Developing probabilistic cost estimates and schedules then assists our customers to quantify the degree of certainty for subsequent investment decisions.

As the scope of the project is developed we provide advice on modularization and logistics management, considering site specific conditions to: minimize stick building where appropriate; identify infrastructure required for modular handling; optimize schedule; and access skilled labour forces. To increase the chances of project success we carry out project execution planning from a global perspective to ascertain the impact of competitors and market conditions on our customer's projects, identifying critical activities, potential risks and resourcing requirements. With the concept established we offer contract strategy development providing advice on contract structures that align with our customer's project activities and phases which is critical for maintaining schedule.

Select utilizes an extensive range of industry recognized and in-house developed tools, in conjunction with proven project management systems and processes, to deliver dependable results.

Services provided for greenfields developments totalling

\$430b+

CAPEX

250+

Select studies on greenfield developments



Project: North Rankin Redevelopment (NR2) Project**Customer: Woodside Energy Limited****Phases:** IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

Australia

The NR2 project is currently the largest offshore investment in Australia. The planned platform will consist of one of the world's largest integrated topsides installed by the float-over method.

The NR2 project consists of a new platform, North Rankin Bravo (NRB), that will be linked to the existing North Rankin Alpha (NRA) platform and provide gas compression and condensate pumping for the fluids produced from the NRA wells. Planned for installation in 2010, NRB will unlock low-pressure reserves from the North Rankin and Perseus offshore gas and condensate fields ensuring gas supply to the North West Shelf onshore liquefied natural gas production facilities. WorleyParsons *Select* provided the pre-FEED services for both the new platform (in joint venture with KBR) and significant modifications to NRA (in joint venture with Transfield Services).

**Project: Shenzi TLP****Customer: BHP Billiton Petroleum****Phases:** IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

Gulf of Mexico

Shenzi is the largest deepwater Gulf of Mexico (GOM) project operated by BHP, and the first Tension Leg Platform (TLP) designed to new, more stringent GOM hurricane criteria. The TLP is designed to produce 100,000 barrels per day of oil and is located in 4,300 feet of water. INTECSEA, the deepwater division of WorleyParsons was responsible for the conceptual design, model testing, tendon and hull system design. Our team was instrumental in re-configuring the TLP during the project to meet the more stringent hurricane criteria brought about from the severe 2004 and 2005 GOM hurricane seasons.

**Project: Sakhalin II Onshore Processing Facility****Customer: Sakhalin Energy Investment Company****Phases:** IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

Russia

The Sakhalin II project is located onshore and offshore from Sakhalin Island. The main components include three offshore drilling and production platforms, 1,000 km of parallel oil and gas pipelines, an onshore gas and condensate processing facility, a gas liquefaction plant, and oil and liquefied natural gas export terminals. WorleyParsons' completed the definition engineering design, and detailed engineering for the onshore processing facility. The definition engineering included preparing the 'Technical and Economic Substantiation of Construction' and environmental protection measures used to obtain approval for the onshore processing facility from Russian Federation and regional authorities.

**Project: Singapore LNG Terminal****Customer: PowerGas****Phases:** IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

Singapore

To increase the security of Singapore's domestic gas supply, PowerGas is constructing the nation's first Liquefied Natural Gas (LNG) regasification terminal on Jurong Island. WorleyParsons is providing PowerGas with a Basis of Design and Front-End Engineering Design. Key activities also include the development of the EPC contractor tender documents with their subsequent evaluation and recommendations for contractor selection. PowerGas' relationship with WorleyParsons spans over 15 years, during which we have provided a range of specialist engineering services. On this project, our expertise in hydrocarbons, power and infrastructure, coupled with a 20 year heritage in Singapore, enabled us to assist PowerGas on this important project.





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Brownfield Optimization

WorleyParsons, through our involvement in long term and integrated service contracts, is extensively engaged in the operation and maintenance of onshore and offshore facilities.

Having first hand experience of the demands placed on operators enables us to better understand our customer's requirements to balance aging assets with a need to increase production and maintain or improve safety and environmental performance. We take the experiences gained and translate them into our future designs to improve the operability of brownfield facilities.

Through these relationships *Select* has delivered a diverse range of solutions, customized to best meet our customer's business needs. This focus on business benefits ensures that the capital expenditure program will deliver the best results in both the short and long term, whilst meeting safety, availability and integrity objectives.

Select offers a variety of services to assist our customers in optimizing their existing facilities. Facility performance benchmarking provides an understanding of how a facility compares over a range of aspects to other similar sites in different locations. Through benchmarking we can therefore determine what can realistically be achieved through enhancements. Taking a more focused view of the facility in isolation, Reliability, Availability, Maintainability (RAM) modelling can be used to assess and optimize the production systems to maximize life cycle profit.

The complex nature of brownfield sites presents numerous other challenges for improving performance. For example, our skilled personnel perform feasibility studies to debottleneck plants, thereby increasing output, look at corrosion management and material selection to increase asset life and undertake Quantitative Risk Assessments (QRA) to understand the likelihood of events and provide recommendations for improving safety.

Once options for improving facility performance have been identified *Select* offers project ranking and prioritization. This ensures that the capital expenditure delivers optimum return on investment for our customers.

60+

international long term and integrated service contracts and alliances - both onshore & offshore

500+

debottlenecking and optimization studies performed annually

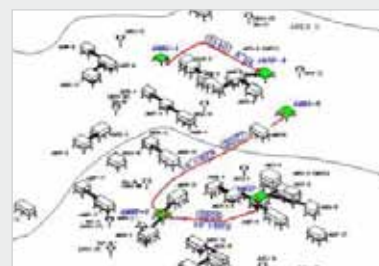


Project: East West Pipelines Replacement Project**Customer: Brunei Shell Petroleum (BSP)****Phases:** IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

Brunei

Brunei Shell Petroleum Company Sdn. Bhd (BSP) needed to replace 19 aging Brownfield offshore pipelines - ranging from 6 - 12 inch in diameter and with lengths of up to 25 kilometers - that transport multi-phase oil and gas and gas lift.

The existing pipeline network had reached its intended design life, putting a strain on increasing planned production. WorleyParsons was responsible for the conceptual design and detailed engineering of the project to re-establish a reliable offshore pipeline network to maximize BSP's short and long term production. The integrity of all aged pipelines has now been restored and a maintenance reference plan implemented.

**Project: Talisman Energy - Prime Alliance****Customer: Talsiman Energy Alliance****Phases:** IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

Canada

Since 1991 Talisman Energy Inc, through Talisman Prime alliance, has continuously engaged WorleyParsons to provide engineering; procurement and construction management services for its oil and gas assets in western Canada. The Prime alliance's core business objective is sustained, cost effective and efficient execution of Talisman Energy's yearly North American capital project plan. The secondary objective is operational and maintenance engineering support. As part of the alliance we have performed *Select* activities to evaluate strategic opportunities, complete government applications, assess plant relocation and expansion options, model existing processes and debottleneck facilities.

**Project: Yolla Mid Life Expansion****Customer: Origin Energy Resources****Phases:** IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

Australia

Originally Yolla was designed as an unmanned facility with the intention of operating with minimum intervention; however the customer identified that reliability issues with the platform were hampering production. To increase platform reliability and production up-time it was proposed to convert the platform to a normally manned facility, reducing helicopter flights and the associated safety concerns. WorleyParsons *Select* was commissioned to conduct a feasibility study including a conceptual design for the compressor and pumping equipment, subsea well tie-backs, new accommodation facilities, analysis of installation methodology including mooring of vessels, structural analysis of the impact of the proposed modifications, and a cost estimate.

**Project: Sipchem Olefins Complex****Customer: Saudi International Petrochemical Company (Sipchem)****Phases:** IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

Saudi Arabia

Sipchem is currently in the process of developing a world scale petrochemical complex in the Jubail Industrial City, Saudi Arabia. Four of the planned units will be located at Sipchem's existing site in Jubail Phase 1. The balance of up to fifteen process plants will be located on a Greenfield site in Jubail Phase 2. This will be the first petrochemical facility in Saudi Arabia to produce finished product, with the manufacture of HDPE pipe, HDPE pallets and both HDPE and LDPE film all planned. WorleyParsons is providing project management services to the project. These include feasibility studies, process technology evaluation, bid package development, front end engineering, procurement assistance, construction management and start-up, commissioning and operations assistance.





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Technology Selection

WorleyParsons carries out independent appraisal and selection of complex technologies to give our customers access to the widest range of available solutions.

As our customers seek out new opportunities to develop hydrocarbons projects, selection of the right technology for each application is critical for the project to succeed. WorleyParsons' technology neutral position allows us to work with our customers to independently evaluate and select the most appropriate technologies for their projects.

We provide assistance from early screening studies to full licensor selections with an evaluation process that is tailored to meet our customers' needs. Our involvement in emerging technology studies, along with our established relationships with technology providers, enables us to use technologies to transform technical and economic challenges into viable and profitable opportunities for our customers.

Our ongoing work with leading edge technology providers, governments and industry funded bodies ensures that we keep abreast of upcoming technologies which may assist our customers. Early screening studies focus on robust technical solutions whilst outlining the possible benefits and potential risks offered by different technology choices.

WorleyParsons works with our customers to produce an extensive set of weighted criteria for evaluating technologies. These include such factors as: commercial status; technical aspects; capital, royalty and operating costs; economic evaluation, preparation of duty specifications, operations and design evaluation; and technology risks.

Our role as an independent evaluator of technologies has helped keep us at the leading edge of technology developments across the broad range of industries that we service.

Benefits to our customers from this approach include:

- Independent advice during selection and screening process
- Access to the widest range of technology solutions
- Ability to package up different technologies
- Access to leading edge emerging commercial technologies
- Cross fertilisation of technologies across the industries that we service

Technology

Neutral

30+

global consulting practices operating within the greater WorleyParsons



Project: Jubail Chevron Phillips Petrochemical Complex**Customer: Chevron Phillips****Phases:** IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

Saudi Arabia

The Chevron Phillips Petrochemical Complex at Al-Jubail, Saudi Arabia, is adjacent to its existing SCP petrochemical complex.

The project is based on Saudi Aramco natural gasoline as feedstock. The complex produces styrene, propylene, and ethylbenzene as its final products. The complex also produces a by-product suitable for sale as motor gasoline blend stock. As part of this project WorleyParsons carried out the ethylene plant technology selection. The scope included developing duty specifications, preparing and completing an extensive list of weighted evaluation criteria, detailed bid evaluation including multiple clarification meetings and final technology selection in conjunction with the client.

**Project: Habshan 2****Customer: Abu Dhabi Gas Industries Ltd (GASCO)****Phases:** IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

United Arab Emirates

WorleyParsons is working closely with GASCO to develop the optimum processing scheme before producing the basic engineering design package for the sulphur recovery and acid gas treating units at Habshan. A comprehensive understanding of the technologies available for sulphur removal enables WorleyParsons to select solutions that will deliver the best operational and economic outcome for projects. In this case the project selected a special, proprietary, highly selective Flexsorb solvent, which minimized both equipment sizing and energy use. The Habshan facility will comprise four trains producing a total of 5,200 tonnes of sulphur per day, making this the largest sulphur recovery plant designed by WorleyParsons.

**Project: Cremona Upgrading Program****Customer: Tamoil Raffinazione S.P.A****Phases:** IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

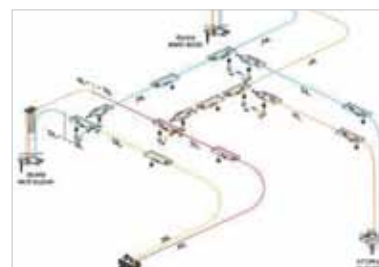
Italy

This project involved upgrading Tamoil's oil refinery at Cremona. The project's objectives were to increase refinery capacity and to reposition the refinery by altering the product range to better meet market requirements. This techno-economic study analysed the path forward in detail for the Cremona refinery, looking at the market situation for the next 25 years. This included technical evaluation of the licensors for a new hydrocracker unit. The evaluation consisted of developing a duty specification and then assessing the technologies offered on the basis of technical compliance, commercial compliance, CAPEX, OPEX and economic evaluation. This led to a final weighted evaluation of the licensors and recommendations being made to the customer.

**Project: Mardi Gras Transportation System****Customer: BP****Phases:** IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

United States of America

BP is developing the Mardi Gras Transportation System (MGTS), which is a system of large diameter pipelines that will transport gas and oil from its deepwater fields to shore. The export system consists of gas and oil steel catenary risers that are connected to host spars or semi-submersibles through water depths range from 4,300 to over 7,000 feet in deep-water sections and as shallow as 400 feet at the conventional platforms. INTECSEA, the deepwater division of WorleyParsons provided engineering services. This included identifying all the options available for the main components for the floating transportation concept and selecting the best technical combination taking in to consideration economics and schedules.





EcoNomics™ Assessment

WorleyParsons provides customers with 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: Leismer Expansion Project

Customer: Statoil Hydro

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

Canada

The EcoNomics™ DELTA tool allowed Statoil Hydro to select the most sustainable power and steam generation options for their SAGD plant both now and in the future.

WorleyParsons was requested to complete an EcoNomics™ assessment to determine the most sustainable combination of power generation, steam generation and carbon capture and storage to support the operation of a steam assisted gravity drainage (SAGD) plant with an associated 44,972 bbl/day of bitumen production. An EcoNomics™ framing workshop, risk analysis study and the EcoNomics™ DELTA tool provided insight into the overall economics and sustainability of the power and steam generation decision. Our analysts took into account the likely changes in policy and regulation in Alberta over the life of the project and the likely changes in the values placed on key external resources, notably carbon and water.





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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

