



Consultants to the Downstream Petroleum Industries

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**NEXIDEA Incorporated**

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Helping our clients achieve their unique objectives.

## *company profile*

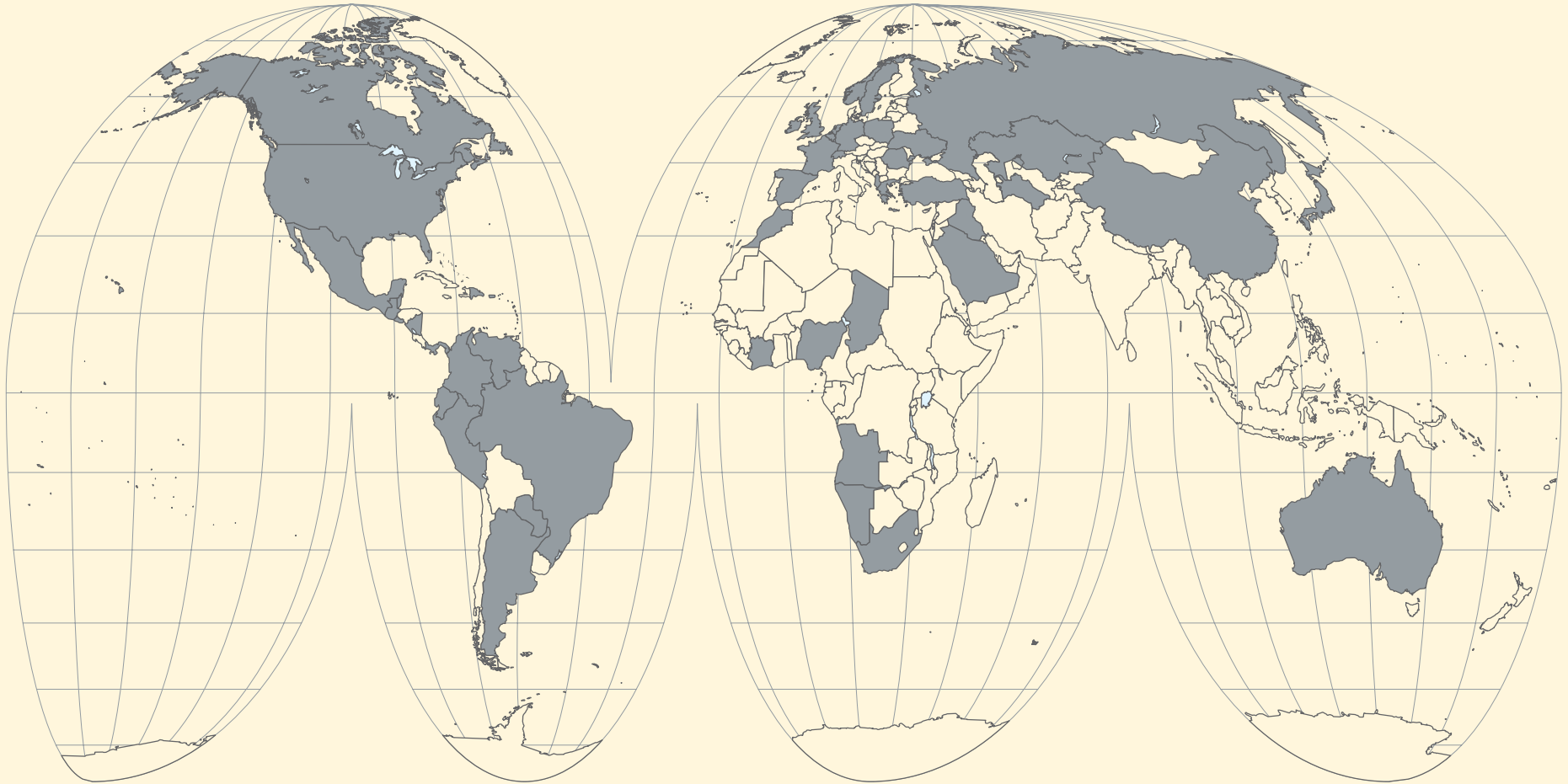
NEXIDEA Incorporated is a professional consulting firm specializing in the technical, commercial and economic aspects of the downstream petroleum industries – petroleum refining, transportation, marketing, petrochemicals, and electric power.

NEXIDEA holds a diverse set of capabilities to deliver multi-faceted services when addressing the needs of our clients. These capabilities center on four areas of expertise—technical, business, financial, and legal.

With combined backgrounds in chemical engineering and business, our consultants have strong records of accomplishments in industry encompassing process engineering, operations, research, economics, planning, and management. Our services integrate both technical and economic analysis to deliver our clients sound engineering solutions and clear and accurate understandings of commercial value.

- :: We strive for innovation in problem solving.
- :: We have extensive international exposure; our consultants have completed assignments in virtually all continents.
- :: We are committed to providing our clients value and the highest standard of quality.

*international perspective*



**Over 50% of Nexidea engagements are outside of the United States.**



technical

Addressing complex problems.

*engineering / project development / process improvement  
design, modeling, technology, safety, research, benchmarking*

## technical

Our consultants have the capabilities to assist clients in all front-end aspects of a project. We are routinely engaged at the conceptual level to determine the economic viability and optimal scope of a project. We are also able to assist clients with the development of project basis, scope definition, and process design. At the operations level, we can provide company engineering staffs assistance with capital planning, technology evaluation and selection, process design, plant utilities and off-sites, troubleshooting, and safety analysis.

### *Representative Engagements*

#### **Refinery Design**

NEXIDEA developed the process design basis and specifications for a grassroots 160,000 b/d condensate refinery and terminal facility. The work included detailed heat and material balances, major equipment specifications, development of storage and transshipment requirements, and facility layout.

#### **Flare System Studies**

NEXIDEA consultants have completed critical studies evaluating relief valves and analyzing hydraulics of flare header systems for refineries. These studies typically include simulation of all refinery towers, determination of relief loads, relief valve sizing, modeling of flare header hydraulics, and evaluation of flare capacity.

#### **Technology Evaluation**

NEXIDEA assisted a refiner with technical and economic analysis to select a process for compliance with EPA Tier II gasoline specifications. NEXIDEA evaluated available technologies selecting the one which minimized overall cost of compliance for the refiner. NEXIDEA also developed the process design basis and provided engineering coordination of the selected technology for the project.

#### **Vapor Recovery**

NEXIDEA evaluated an existing coker blowdown system, developed the process design to recover the blowdown vapors, and then worked with technology suppliers and refinery engineers to oversee the project implementation.

#### **Gasification and Power**

NEXIDEA consultants have managed the development and design of a range of power projects involving IGCC and /or direct-fired boiler technologies.

NEXIDEA consultants have experience in the development of projects encompassing all refining processes, gasoline reformulation, petrochemicals, terminal operations, and energy conservation. We have extensive experience with multiple simulation model platforms and lease Aspentech's PIMS linear program and HYSYS process simulator software.

### LP and Process Modeling

NEXIDEA has considerable expertise in modeling of downstream plants. Using PIMS, NEXIDEA has developed detailed linear program (LP) models representing complex refineries with propriety refinery process correlations that may be easily configured to the client's situation. NEXIDEA has also constructed LP models of petrochemical plants using the client's process data. NEXIDEA has developed process simulation models using HYSYS for an independent refiner's major process units.

### Acid Gas Processing

NEXIDEA consultants have analyzed and developed improvements for sour water strippers, sulfur plants, and amine treating. For example, NEXIDEA completed a project to incorporate an additional amine plant into a refinery to treat alkylation unit feed and refinery fuel gas. The project included development of the process design for re-configuration and relocation of a used plant.

### Benzene Reduction

NEXIDEA developed and analyzed configurations for processing full-range naphtha into petrochemical feedstocks and gasoline blendstocks. The study included development of strategies for reducing benzene from gasoline.

### ULSD Study

NEXIDEA developed processing schemes to select the lowest cost approach to comply with ULSD requirements for a Midwest refiner. The work included a test run at the refinery to evaluate the effectiveness of undercut strategies to produce ULSD using conventional hydrotreaters.

### SGP Study

NEXIDEA developed the work scope for the integration of a new saturated gas plant in a refinery. This assignment provided the project scope and basis for detailed mechanical design. The design basis included development of the heat and material balance, specification of primary equipment, and the evaluation of the suitability of used equipment.

Our affiliated company, NEXIDEA Systems, offers industry support software including crude oil assay management, refinery simulation, product blending and optimization, and relief valve management. These specialized tools are often used in our consulting activities.

## NEXIDEA Systems

NEXIDEA'S affiliate offers a range of software products for modeling and managing downstream petroleum assets.

### :: Crude Oil Assays

The crude oil assay management system allows easy cutting, blending, and updating of crude oil information. This Minicut Assay System includes a library of crude oil assays representing more than two-thirds of the world's oil production.

### :: Refinery Simulator

REFSIM is a spreadsheet model which provides the product yields and processing margins for a user-defined set of crude oils, refinery configuration, product specifications, and prices. The Refinery Simulator uses the Minicut Assay Library to provide crude oil input data and includes a processing capacities database of all of the refineries in the world.

### :: Support Tools

NEXIDEA Systems offers the following support tools: Gasoline Blender, Diesel Blender, Process Correlations, Handbook of Petroleum Refining Yields, and Guide to Petroleum Product Blending.

### :: Relief Valve Management System

NEXIDEA Systems' RVMS is a database system designed to assist refinery personnel with the consolidation, management, and reporting of relief valve process information and mechanical data required for compliance with US EPA, OSHA, and other regulatory agencies.





business

Creating value.

## business

Having combined engineering and business backgrounds, our consultants can take the technical and commercial issues of a given refinery or asset to accurate cash flow understanding. We excel at economic modeling of refineries and logistical systems, analyzing markets, developing price forecasts, estimating capital costs, and assessing feasibility of projects.

*economics / planning / optimization / negotiations  
markets, modeling, costs, logistics, contracts, trading*

### *Representative Engagements*

#### **Refinery Configuration Study**

NEXIDEA consultants developed the refinery configuration for a major upgrade to a South American refinery analyzing heavy oil conversion options in view of available crude supply. Using NEXIDEA's refinery LP model, existing assets were integrated into the proposed configuration while meeting certain contract requirements and maximizing return to the investors. The study evaluated the capital costs, incremental revenues, operating costs, and project economics.

#### **Restart of Idled Refinery**

NEXIDEA consultants analyzed the economic and technical feasibility of restarting a refinery in Sub Saharan Africa. The assignment examined the cost of the restart, profitability, capital requirements, operating costs, personnel requirements, and other local costs. The assignment included development of comprehensive business plan to support commercial negotiations.

#### **Market Studies**

NEXIDEA has completed customized market studies analyzing the supply and demand and pricing for crude oil and refined products. Typically, market studies examine demand by individual refined product, sources of supply for each product, regional pricing mechanisms, crude oil availability, and the outlook for these factors. Examples of markets studied include the Caribbean, China, Colombia, Germany, Ireland, Namibia, Nigeria, and Romania.

#### **Logistical Studies**

NEXIDEA consultants have developed storage and logistical requirements for new and existing refineries assessing potential supply or off-take disruptions and refinery operating factors. Logistical studies assess the adequacy of tankage and receipt/delivery systems considering individual feedstocks, intermediate product requirements, finished product grades, and inventory strategy.

We are experienced in negotiating contracts such as asset purchase/sale agreements, technology licenses, engineering and construction contracts, third-party operating agreements, toll processing agreements, laboratory service agreements, oil terminal agreements, product sales agreements, and feedstock supply agreements.

NEXIDEA consultants have extensive international experience having analyzed markets and assets in North and South America, Europe, Africa, and Asia. We maintain a worldwide database of crude assays, product prices, capital cost curves, and process economics models for use in our analysis.

### Power Supply Study

NEXIDEA consultants provided technical and economic assessment of the optimal power generation scheme for a major oil producer to expand crude production in South America.

### Commercialization of Technology

NEXIDEA evaluated the business potential of a novel desulfurization technology. Assistance included development of conceptual process designs, capital costs, economic advantages as well as assessment of potential markets in the US and EU. The assignment also called for the development of a detailed business plan for licensing the process to refiners.

### Refinery Feasibility Study

NEXIDEA consultants completed a feasibility study for a new grassroots refinery in Sub Saharan Africa to supply inland markets. The feasibility study comprised analysis of local markets, crude availability, refinery configuration, capital costs, project economics, and project finance. Refinery configurations were evaluated using NEXIDEA's LP model.

### Contract Negotiations

NEXIDEA consultants have provided commercial advice and support to our clients in negotiating a wide range of commercial agreements. Examples include agreements for crude oil supply, product off-take, terminal operations, EPC, process licenses, and laboratory services.

### Petrochemical Plant Configuration

NEXIDEA developed the processing configuration for a major new petrochemical complex in South America. The assignment entailed development of a LP model to analyze different levels of vertical integration. The study evaluated the capital costs, operating costs, and project economics to identify the best option.





financial

Focusing on accurate understanding.

## financial

NEXIDEA consultants have an in-depth knowledge of the technical and economic issues facing refineries and related facilities. We use this knowledge to provide our clients detailed cash flow analyses, market comparisons, confirmations of capital costs, financial assessments, and formal valuations to justify investments and financing.

*valuation / transaction / due diligence  
cash flow, appraisal methods, technical assessment, financing*

### *Representative Engagements*

#### Transactions

NEXIDEA consultants have assisted with many transactions in the downstream petroleum industry. The specifics of each assignment vary according to the unique situation of each asset and the client's objectives. Generally, NEXIDEA provides assistance in both the technical and economic analysis of the asset. Technical analysis focuses on understanding the capability, utilization, operating performance, condition, technologies employed, safety statistics, and other non-financial factors of the asset.

The economic analysis focuses on developing a clear picture of the historical and projected financial performance of the asset. This analysis often includes assessment of the market outlook for the asset from both a global and regional perspective, projection of feedstock and product prices based on this outlook, identification of capital projects needed to keep the asset competitive in the future, and development of a detailed cash flow model taking into account the expected performance of the asset. Expected future performance of the asset is often evaluated with NEXIDEA's LP model. The cash flow model is used to understand the sensitivity of the asset to market factors and to assess the value of the asset for use in negotiating a sales price.

Following are some of the transaction-related engagements performed by NEXIDEA consultants:

- :: Investor consortium's acquisition of Albania's 85% national oil company (ARMO)
- :: Equity investment in oil distribution facilities in Africa
- :: Glencore's 51% acquisition of Ecopetrol's Cartagena, Colombia Refinery
- :: Petroplus International's acquisition of refineries in Coryton, England; Ingolstadt, Germany; Cressier, Switzerland; Teesside, England; Antwerp, Belgium
- :: Trading company's analysis of a Caribbean refinery
- :: Investor group's analysis of a refinery in Ireland
- :: Equity investment in an oil terminal in the Arabian Gulf
- :: Investor group's analysis of a refined products terminal in the Caribbean
- :: Equity Investor's evaluation of a Far East oil storage and shipping company

Our consultants have particular expertise in the valuation of petroleum refineries and related facilities, due diligence involving either the acquisition or sale of assets, asset allocation, and acquisition financing. Our asset and business appraisals rely on thorough understandings of the income, market, and cost approaches to value.

### Business and Asset Valuations

Independent valuations of business entities or individual assets are often needed to support clients' activities. Valuation engagements seek to determine the fair market value of the asset. Understanding the technical capabilities along with financial performance of the underlying asset is paramount to reaching a reliable conclusion of value. Valuation engagements encompass technical review of the asset, how it will be used by prospective buyers, how it compares to similar assets, and analysis of the expected financial performance of the asset. NEXIDEA consultants have a proven record of valuation and appraisal engagements for many types of assets worldwide.

- :: Oil Refineries–Africa, Europe, Latin America, North America, Russia
- :: Oil Terminals–Africa, China, Europe, Latin America
- :: Chemical Plants
- :: Oil Tankers
- :: Pipeline Assets
- :: Ethanol Plant

### Due Diligence

NEXIDEA can support clients in all phases of the transaction process. Our consultants have assisted with offering memoranda, data room preparation, and assessment of value for sellers. Similarly, we have conducted detailed site reviews of assets, assessed historical operations, and assisted in developing offering prices on behalf of buyers. NEXIDEA's transaction services include a wide range of due diligence activities.

- :: Technical and Economic Due Diligence
- :: Commercial Due Diligence
- :: Market Studies
- :: Coordination of Legal and Environmental Due Diligence
- :: Financial and Cash Flow Modeling
- :: Reports for Bank Financing / Offering Memorandums





legal

Bringing clarity to difficult issues.

## legal

Relying upon our expertise and experience, we provide legal support in a wide range of matters associated with the downstream petroleum industries. Among the areas in which we offer guidance are assessment of regulatory changes, certification of fuel baseline submissions, property valuations, analysis of business interruption claims, fair value assessments, and incident investigation.

*litigation support / expert testimony / regulatory compliance  
incident analysis, property tax, economic damages, auditing*

### **Representative Engagements**

#### **Bankruptcy**

NEXIDEA completed a detailed assessment of a refinery operated by a debtor seeking to exit Chapter 11 bankruptcy. The assessment included market outlook and analysis, price forecasts, analysis of the refinery's competitive position, and valuation of the refinery.

#### **Refinery Tax Appeal**

NEXIDEA provided testimony regarding valuation of a US refinery as part of an ad valorem tax appeal. Work included the type and quality of information needed for different valuation methodologies, investigation of capital requirements for product quality compliance, and estimates using the comparable sales, cost and income approaches to value.

#### **Refinery Business Interruption**

NEXIDEA consultant testified on the economic damages relating to NW Europe refinery business interruption. The engagement considered the loss in production during the outage, the effect the outage had on market prices, and how the refinery would have been run during the outage.

#### **Chemical Plant Tax Appeals**

NEXIDEA consultant provided valuations of two chemical plants in property tax appeals as part of a multidiscipline team. Valuation of the first plant included both real and personal property and considered the comparable sales, cost, and income approach. Valuation of the second plant included only the real property and considered only the cost approach.

#### **Oil Tanker Valuations**

NEXIDEA consultant testified on the values of oil tankers for a property tax appeal. This analysis considered the demand for tanker capacity, rates, and the availability of tankers for charter.

NEXIDEA consultants also participate as team members in multi-disciplinary cases and provide expert testimony in connection with complex technical and economic issues.

### Contract Dispute

NEXIDEA consultant testified on the reasonableness of an oil trading agreement. This analysis evaluated the agreement within the context of the client's business and compared the terms of the agreement to typical industry practice.

### Regulatory Program

NEXIDEA presented a study, entitled "Cost Analysis of Colorado's Winter Oxygenated Fuels Program", which evaluated the economic impact of terminating the Winter Oxygenated Fuels Program in Colorado. The study explored the economic impact of ethanol blending by refiners supplying gasoline to the Colorado market.

### Incident Analysis

NEXIDEA provided testimony regarding the release of hydrofluoric acid from alkylation unit during a refinery fire. The engagement included a technical assessment of the amount of acid released considering changes in acid inventory before and after the fire, the amount of acid captured by spray water, and other unit losses.

### Dispute between Joint Venture Partners

NEXIDEA consultant testified on the value of a refinery in Northwest Europe during a dispute between joint venture partners. In addition to value, the testimony included option on how the refinery could be marketed, how it would be viewed by prospective buyers, and the factors affecting the value of refineries in Europe at that time.





Résumés

**Education**

B.S. Chemical Engineering, Iowa State University–1982

MBA, University of Houston–1990

Graduate of Conoco Management Development Program

**Work History**

NEXIDEA–Partner 2006–Present

Graybill & Co.– President 2005–2006

Stancil & Co.– Vice President 1996–2005

Goldman Sachs 1994–1996

J. Aron & Company (U.K.)  
Executive Director

Muse, Stancil & Co.– Consultant 1992–1994

AroChem Corporation – Manager 1990–1992

Conoco, Inc.– Senior Engineer 1983–1990

**Professional Organizations**

American Institute of Chemical Engineers

American Society of Appraisers

Accredited Senior Appraiser Specializing  
in Business Valuation.

Professional Engineer, Texas (# 76642)

**Profile**

Steve Graybill's combined technical and commercial experience facilitates a well-rounded approach to his consulting engagements. With over 25 years in the industry, Mr. Graybill's experience includes conducting numerous downstream asset valuations and transactions, managing the economics and planning of international refining operations, overseeing the design, construction, and operation of a grassroots condensate refinery, conducting technical and economic analyses using linear programs and other customized process models, and serving as an expert in the areas of processing, valuation, and economics.

**Career Highlights**

- Transactions and Due Diligence**– Conducted technical and economic due diligence for numerous refinery transactions throughout the world. The typical assignment required on-site assessment of the condition of the asset, supply/demand studies of the regional product markets served by the refinery, review of the refinery's crude supply situation, and analysis of refinery's business and capital plans.
- Valuation and Business Planning**– Completed valuations and business plans for refinery acquisitions or projects in Albania, Switzerland, England, Germany, Nigeria, Belize, the Caribbean, Belgium, and The United States. Prepared valuations of a variety of downstream assets including refineries, pipelines, oil tankers, and tank storage terminals in support of property tax disputes, asset transactions, asset allocations, bank financing, and litigation.
- Project Development**– Assisted in project development of refineries located in the United States, South America, Europe, Russia, and Iraq including grassroots refineries, petroleum coke-fired power plants, production field power generation, heavy crude processing investment, refinery hydrocracker investment, low sulfur gasoline and low sulfur diesel projects, plant expansions, and energy conservation projects.
- LP Modeling**– Conducted technical and economic analyses using linear programs and other customized models for the purpose of refinery acquisitions, toll processing, project development, process optimization, crude and product valuations, and pricing studies. Built national models for NW Europe, US West Coast and US Gulf Coast to assess crude sales performance and to evaluate potential refinery acquisition candidates.
- Asset Management**– Managed third-party contractors in the design, construction, and operation of the Euro-Splitter condensate refinery in The Netherlands. Established and integrated the refinery scheduling, economics, and planning functions with the trading operations of the refinery's parent company.

**Education**

B.S. Chemical Engineering, University of Missouri–1976

MBA, Oklahoma State University–1986

**Work History**

NEXIDEA–Partner 2001–Present

Baker & O'Brien, Inc. Vice President 1996–2001

Muse, Stancil & Co. 1991–1996  
Managing Director of  
London Office, Principal

Phillips Petroleum Company 1979–1991  
Process Engineer,  
R&D Supervisor, Principal Engineer

Engineer Gulf Oil Chemicals Company 1977–1979  
Operations Specialist

**Professional Organizations**

American Institute of Chemical Engineers  
The Energy Institute (UK)  
American Chemical Society  
Professional Engineer–Texas (#88732)  
Professional Engineer–Oklahoma (#13283)  
Professional Engineer–Michigan (#47054)

**Profile**

Phil Steed provides technical, economic, and business consulting services to the downstream petroleum industries. With over 30 years of experience in petroleum refining and related industries, Mr. Steed combines wide-ranging knowledge and business experience to serve his clients. He is often involved with project development, strategic and capital planning, asset valuation, due diligence, market/industry analysis, and financial analysis of refining assets. Mr. Steed's work has been a key part of the successful projects, ventures, and acquisitions worldwide. He has provided expert opinion matters relating to refinery operations, economic analysis, and valuation.

**Career Highlights**

- Strategic Analysis**–Assisted clients in the evaluation of refining opportunities to enhance the value of their businesses. Assignments covered many different business situations including review of existing assets given changes in markets, integration of shared facilities to exploit synergies, and development of capital plans to meet long-term strategic goals.
- Transactions and Due Diligence**–Conducted technical and economic evaluations of a wide-range of downstream assets during the due diligence phase of prospective transactions. The evaluations included on-site assessment of the condition of the asset, confirmation of historical performance and profitability, development of capital plans to address any weaknesses, and valuation of the asset.
- Project Development**–Evaluated large projects including grassroots refineries and major expansions in markets worldwide. Projects ranged in scope from \$50 million to more than \$3.5 billion. Work included analysis of prospective markets for the refineries, development of suitable processing configuration given regional crude supply and product mix, estimation of capital costs, and cash flow analysis of project rates of return on investment.
- Business Planning and Implementation**–Developed business plans for new ventures and assisted in implementation. Work included identifying resources needed to implement the venture, developing operating and capital budgets, preparing pro forma cash flows for financing, and negotiating agreements such as purchase/sale agreements, operating agreements, and technology licenses.
- Litigation Support**–Provided litigation support and expert testimony in a range of complex legal matters relating to the downstream industries. Cases involved economic and technical issues such as the value of a joint venture refinery, determination of the amount of hydrofluoric acid release in an incident, and fair market value of assets for ad valorem tax purposes.

## Education

B.S. Chemical Engineering, University of Wyoming–1987

## Work History

NEXIDEA–Partner 2001–Present

MK Shore & Company 1997–2001  
President

Qestek Engineering, Inc. 1991–1997  
Principal / Co-Owner

Phillips Petroleum Company 1987–1991  
Research Engineer

## Professional Organizations

American Institute of Chemical Engineers  
National Society of Professional Engineers  
Professional Engineer–Wyoming (#6399)

## Profile

Kip Shore specializes in technical and economic issues in the petroleum refining industry. He has over 20 years of professional experience which includes valuation of refinery and related assets, market research and analysis, strategic and capital planning, development and management of refinery projects, research and technical analysis of refinery processes, optimization of plant performance, evaluation of refinery operations and equipment, and process engineering and design. He also has experience with the commercialization aspects of technology development. Mr. Shore is knowledgeable of the day-to-day operations and workings of a refinery and, as a consultant, many of his assignments have required on-site study at clients' facilities.

## Career Highlights

- Transactions and Due Diligence**–Conducted due diligence and improvement analyses for asset transactions for idled and operating facilities including petroleum refineries, storage and terminalling facilities, ethanol blending facilities, and chemical production plants.
- Markets and Economics**–Conducted market studies, pricing studies and economic analyses of oil and refined products including asphalts, low sulfur fuels, and oxygenated fuels. Developed economic models for predicting price impacts due to changes in petroleum refinery configurations and regulatory requirements.
- Strategic Planning**–Assisted petroleum refiners with development of short and long range strategic plans for operating improvement, unit expansions, fuels regulations, and small capital budgeting. This work has typically involved LP modeling, economic analysis, technology evaluation and selection, and license negotiation.
- Business Planning and Implementation**–Developed business plans for new ventures and assisted in implementation. Work included identifying resources needed to implement the venture, developing operating and capital budgets, preparing pro forma cash flows for financing, and negotiating agreements such as purchase/sale agreements, operating agreements and technology licenses.
- Technology Development**–Assisted clients with development of new, proprietary technologies for petroleum refining industry including research planning and development, process simulation, economic evaluation, market analysis, business planning, capital funding options, and identification of early adopters.

## Education

B.S. Chemical Engineering,  
Universidad Simón Bolívar–1981

M.S. Operations Research,  
Universidad Central de Venezuela–1987

## Work History

NEXIDEA–Consultant 2006–Present

NCT Estudios y Proyectos C.A.  
Consultant 2003–2006

Petróleos de Venezuela (PDVSA)  
Planning & New Business Advisor 1998–2002

Maraven S.A–Strategies Major Advisor 1979–1998

## Professional Organizations

Colegio de Ingenieros–Caracas

## Profile

Eyra Salazar has extensive technical and economic experience in petroleum refining and hydrocarbons marketing, including market / industry analysis, strategic planning and international business, analysis and optimization of plant operations, and process engineering. With 23 years of experience at PDVSA and Maraven, she has particular expertise in refinery economic analyses using linear programming (LP) and other process models. Ms. Salazar has a Bachelor of Science degree in Chemical Engineering from Universidad Simón Bolívar and a Master of Science degree in Operations Research from Universidad Central de Venezuela.

## Career Highlights

⚡ **Refinery Optimization**–Provided technical and economic analysis to optimize refinery performance using Aspentech’s PIMS linear programming software and other process and economic models. Work included operations planning to maximize profit, crude oil selection, evaluation of new capital investments, and optimization of product blending.

⚡ **Process Engineering**–Provided day-to-day support of petroleum refinery operations and trouble shooting of alkylation, crude oil distillation and hydrotreating units. Completed front-end conceptualization studies including technical-economic evaluations, process definition, design basis, and technology selection for many projects. Participated in all project phases from basic design and detailed engineering to construction and start-up.

⚡ **Oil Market Analysis**–Monitored the worldwide supply and demand for crude oil, petroleum products, and refinery capacities to develop global petroleum market outlooks with detailed crude oil and refined product price forecasts for each of the major world trading centers.

⚡ **Economic Planning**–Conducted crude oil and feedstock evaluations, operations planning, production and profitability forecasting, products blending, and developed general refinery operating strategies.

## Education

HND Nautical Science,  
South Shields Marine & Technical College – 1987

BSc Honors Degree in Chemical Engineering,  
The University of Teesside – 1991

MBA Coursework, University of Durham – 2002-2004

## Work History

NEXIDEA–Consultant 2009–Present

4Gas – Operational Officer 2007 – 2009

Petroplus Refining Antwerp B.V. 2004 – 2007  
Managing Director

Petroplus Refining Teesside Limited 2001 – 2004  
Director of Refining

Phillips-Imperial Petroleum 1996 – 2001  
Operations Manager  
Technical Plant Manager

ICI North Tees Aromatics Complex 1994 – 1996  
Project Engineer

ICI Petrochemicals Research and 1991 – 1994  
Technology – Process Design Engineer

British Merchant Navy 1980 – 1987  
Navigation Officer

## Profile

Alister Walgate provides clients with industry perspectives founded upon a professional career of both technical and managerial successes. Early accomplishments as a senior engineer led Alister into successive refinery and project management positions serving a broad range of roles within major chemical, oil refining, and gas storage companies. Alister's key skills include operations and maintenance, project management, change management, the planning and execution of shutdowns, and the building and leading of complex teams.

## Career Highlights

∴ **4Gas**–Developed a competent organization capable of designing, building and operating 4Gas' five LNG import terminal projects. He held full responsibility for 4Gas' global operations and was accountable for the performance of all technical and operational staff. Specific responsibilities included full accountability for the financial performance of these projects worldwide, development of organizational capabilities, and governance and oversight of the ongoing projects.

∴ **Petroplus Refining Antwerp**–Responsibility for all refining activities at Petroplus' Antwerp facility. Specific accomplishments included the development of a refining strategy, managing a broad range of HSE improvements, operational and financial performance improvements, implementation of refining best practices at the facility, and managing shareholder expectations.

∴ **PRT Limited**–Managed the transition of the Teesside Refinery business from Phillips and ICI ownership to that of Petroplus. The sale of the company to Petroplus was successfully completed and the business performance continued to improve during this time, culminating in record profits and best in class performance for HSE and availability.

∴ **Phillips-Imperial Petroleum**–As Operation Manager, responsible for all aspects of the company's operations and maintenance along with the ultimate responsibility for all regulatory operational issues. As Technical Manager, responsible for the site's technical performance including development of equipment maintenance strategies, operating improvements, major maintenance activities, and investigation and rectification of plant failures, reliability problems and throughput constraints.

∴ **ICI**–Led a refinery wide re-instrumentation and advanced controls project, conducted other refurbishment and debottlenecking projects, and completed a design for a major aromatics revamp.

## Education

B.S. Chemical Engineering  
Kansas State University – 1975

MBA – Finance  
West Texas State University – 1978

## Work History

NEXIDEA–Consultant 2010–Present

ConocoPhillips 2001–2009  
 Manager, Planning & Analysis – Marketing  
 Manager, Clean Products  
 Optimization Project  
 Manager, Business Development  
 Commercial - Asia Crude

Phillips Coal Company 1996–2001  
 Manager, Business Development

Phillips Petroleum Company 1975–1996  
 Manager, Planning &  
 Analysis – Downstream  
 Administrator Crude Oil – Refining  
 Business Services Coordinator – Sweeny  
 Sr. Economics Analyst – Refining  
 Director Economic Analysis – Kansas City  
 Economic Analyst – Refining  
 Economic Analyst – Borger  
 Process Engineer – Borger  
 Process Engineer – Borger

## Profile

Ron Hunziker has developed expertise in refining, marketing, supply, commercial, transportation, and chemicals over his 34-year career. He provides clients with perspectives founded upon successes that cross organizational boundaries requiring buy-in from multiple layers in multiple organizations. Ron's career and accomplishments stem from detailed economic analysis that he developed early in his career running refinery LPs. Economic analysis provided insight into the workings of each organization and provided a common point of view for all organizations from which to solve problems objectively. Ron's last two assignments in Planning & Analysis and Clean Products Optimization tied all of the previous experiences together by requiring process and systems optimizations. Looking at systems from an economic optimization perspective highlights what is missing and what is truly important to management in running the business successfully day-to-day.

## Career Highlights

- Planning & Analysis**–Managed the planning and analysis group through a major reduction in staffing while increasing the number of reports and the support for the field marketing sales organization. Oversaw creation of reports to provide daily information on sales at very detailed levels. One of these new reports was a budget based on sales at the customer, terminal, and product level which created buy-in at the sales representative level for the budget.
- Clean Products Optimization**–Ron led the group responsible for identifying optimization opportunities in all areas of clean products supply across the downstream organization. The team came from all downstream organizations and was key in identifying opportunities and highlighting the most important areas to tackle first. The major success was in identifying areas where costs were not being properly accounted resulting in understatement of costs and overstatement of profits in the commercial organization.
- Business Development Commercial**–Provided business development support to identify and create refining opportunities for a heavy, high acid crude that would be produced offshore of China. Success came from creating 60,000 barrels per day of high acid crude processing in a competing country resulting in a significant improvement in the price received for the initial production volume prior to production being online.
- Planning & Analysis Corporate**–In this assignment Ron successfully worked with several technical peer individuals to identify and implement process changes to meet low sulfur diesel regulations that reduced capital investment requirements by ~\$400 Million. Ron also succeeded in soliciting a partner to place an underutilized gas pipeline asset into crude service and created a product pipeline from the Gulf Coast to the mid-continent.

## Education

B.S. Chemical & Petroleum Refining Engineering,  
Colorado School of Mines–1993

## Work History

NEXIDEA– Consultant	2006–Present
Frontier Refining Inc. Process Engineer	1998–2006
Qestek Engineering, Inc. Process Engineer	1997–1998
TriTechnics Incorporated Chemical Engineer	1994–1997
Marathon Refining Inc. Tech Service Engineer	1993–1994

## Professional Organizations

American Institute of Chemical Engineers

## Profile

Shannon Gefroh joined NEXIDEA as a consultant in 2006 and has demonstrated well-rounded consulting capabilities. Ms. Gefroh has over ten years of industry experience in the areas of process technology evaluation, process evaluation, process modeling, and optimization. She is experienced in petroleum refinery operations and participated in developing process designs and cost analysis for a number of refinery capital projects. Ms. Gefroh holds a Bachelor of Science in Chemical & Petroleum Refining Engineering from the Colorado School of Mines.

## Career Highlights

- :: **Transactions and Evaluation**–Assisted with technical due diligence for proposed sale of large scale oil terminalling and storage facility. The work included on-site review of the condition of the facility, assessment of the technical capabilities, and analysis of future capital requirements.
- :: **Process Modeling**– Modeled several refinery systems using AspenTech’s HYSYS process simulation software to evaluate charge rate expansions and provide recommendations for process modifications and operational improvement. Modeled hydraulics for a number of petroleum refinery flare systems using AspenTech’s FLARENET and Invensys Systems’ Visual Flow software.
- :: **Process Engineering**–Provided support for ongoing petroleum refinery operations and troubleshooting for hydroprocessing units. Assisted in refinery turnarounds for hydroprocessing units, crude distillation unit, and fluidized catalytic cracking unit. Evaluated current operations and recommended modifications for performance improvement.
- :: **Project Engineering**–Evaluated and made recommendations regarding licensed technologies for fluidized catalytic cracking unit, crude desalting and coker process equipment. Completed a number of technical-economic evaluations and designs for various small capital petroleum refinery projects.

## Education

B.S. Chemical Engineering,  
University of Texas at Austin–2000

MBA, University of Texas at Dallas–2007

## Work History

NEXIDEA–Consultant 2006–Present

Citigroup, Card Technology 2005–2006  
Lead Analyst

Quorum Business Solutions 2000–2005  
Senior Consultant

## Professional Organizations

American Institute of Chemical Engineers  
The Institute of Internal Auditors  
National Society of Hispanic MBAs

## Profile

Tiffany Daykin joined NEXIDEA in 2006 as a consultant. Ms. Daykin’s chemical engineering background compliments her previous experience with software design, project management, and project implementation. Her experience includes technical and economic analysis in support of asset transactions, market studies, new project development, and price forecasts. She has also provided software design, development, and/or implementation of software for natural gas accounting, refinery management of change, and crude oil assay applications. She holds a Bachelor of Science in Chemical Engineering from the University of Texas at Austin and a Master of Business Administration from the University of Texas at Dallas.

## Career Highlights

- ⚡ **Cash Flow Analyses**–Completed cash flow analyses and evaluated historical cash flow and financial performance of assets for the purposes of project feasibility studies and viability of asset transactions.
- ⚡ **Market Studies**–Created market studies assessing the refining markets in South America, Africa, and Europe. Studies included analysis of supply and demand trends as well as pricing forecasts.
- ⚡ **Refinery Configuration Studies**–Assisted in analyzing changes to processing configurations for new and existing refineries based on long-term strategic goals. Work included development of capital costs, forecasts of fixed and variable operating expenses, and completion of cash flow return on investment.
- ⚡ **Transactions and Evaluations**–Participated in due diligence relevant to the sale and acquisition of refineries in South America, Europe, and Asia. Work included analysis of historical pricing and margins, operating costs, and cash flow valuations.
- ⚡ **Software Development**–Assisted in multiple software development ventures related to the refining industry including a Crude Assay Management System and a Relief Valve Management System.

## Education

B.S. Chemical Engineering,  
Rose Polytechnic Institute–1968

## Work History

NEXIDEA–Consultant	2008–Present
Insight Engineers President	2000–2008
TPA, Inc. Project Manager	1991–2000
Stone & Webster Project Management	1989–1990
Ford, Bacon & Davis Project Management	1981–1989
Various Refining and Chemical Companies	1968–1981

## Professional Organizations

American Institute of Chemical Engineers  
Professional Engineer–Texas (# 45342)  
Professional Engineer–Oklahoma (#100371)  
Professional Engineer–Illinois (#10037)

## Profile

Tim Armstrong has over 40 years of process experience in petrochemicals, refining and sulfur recovery. Previous activities have included consulting, process design management, process design, project management and project engineering. Mr. Armstrong's experience includes operations technical service and engineering, as well as operating plant supervision. He has extensive experience with process safety and process safety systems in petroleum refineries and has been a presenter at sulfur seminars and amine conferences beginning in 1991.

## Career Highlights

- :: **Sulfur Systems**–Specialized in sulfur treating including sour water stripping, sulfur recovery, and tail gas treating. Expertise includes all aspects of these systems such as process and equipment design, problem troubleshooting, analysis and monitoring of performance, safety, and assessment of condition of units.
- :: **Project Engineering**–Served as process design manager for numerous petroleum refinery projects including tail gas treating, HF alkylation, crude distillation, coker revamp, saturates gas plant, hydrocracking, hydrotreating, waste incineration, and offsites.
- :: **Process Engineering**–Provided day-to-day support of process operations of petroleum refining units including HF Alkylation, catalytic polymerization, fluid catalytic cracking, and gas plants. Completed a number of technical and economic studies for various refinery process units.
- :: **Safety**–Facilitated and participated in numerous HAZOP studies including sulfur recovery units, tail gas treaters, sour water strippers, crude topping units, LPG extraction plants, and gas processing facilities. Evaluated and analyzed numerous flare systems.

**Education**

B.S. Chemical Engineering, Clemson University–1966

M.S. Chemical Engineering, Georgia Tech–1968

Executive MBA, Claremont Graduate University–1994

**Work History**

NEXIDEA–Consultant 2008–Present

California Clean Energy–President 2003–Present

Conoco/Phillips–Process Manager 1999–2002

Independent Project Development 1997–1998

Black & Veatch Pritchard  
Technology Manager 1995–1996

Brown and Root Braun  
Product Line Manager,  
Chief Process Engineer 1991–1994

Ultramar Refining Company  
General Manager of Refining 1980–1990

**Profile**

Bud Bell has a strong background in refining and power technologies, in operations, and in plant management. He has over 40 years of experience in the downstream petroleum and related industries, covering activities from research and development to plant operations and maintenance. He has held the position of General Manager of Refining for a prototype heavy crude oil refinery. In addition to consulting with NEXIDEA, Mr. Bell is currently developing a large coke-fired cogeneration complex in the Los Angeles basin. He holds a Bachelor's degree in Chemical Engineering from Clemson University, a Masters in Chemical Engineering from Georgia Tech, and an MBA from Claremont Graduate University.

**Career Highlights**

⚡ **Power Plant Engineering**–Assessed the viability of several direct-fired and IGCC power projects and participated in international business development in the power industry. The work included training of engineers from major oil companies in the basics of power production using various technologies.

⚡ **Owner's Engineer**–Served as Owner's Engineer on a world-scale gasification project for a fertilizer plant in North America. The plant was designed to make synthesis gas from coal or petroleum coke to be used by an IGCC unit and an ammonia/urea complex. The work included completion of economic models of the complex as well as preparation of a pro forma model for product off-takes.

⚡ **Project Development**–Acted as project developer for a 600 MWeq petroleum coke-fired cogeneration project in the Los Angeles basin. The project was designed to produce power and process steam in a petroleum coke fired boiler while meeting the most stringent air quality standards in the world. The project called for removal and sequestration of 90% of the produced CO<sub>2</sub>.

⚡ **Refinery Management**–Served as general manager of the Wilmington, California refinery and was responsible for all aspects of refinery performance. Successfully implemented programs which resulted in the best environmental record in the Los Angeles basin and one of the best safety records in the U.S. refining industry.

**Education**

B.S. Chemical Engineering,  
Colorado State University-1997

**Work History**

NEXIDEA – Analyst	2006-Present
Advanced Energy Senior Engineering Planner	2000-2004
Hach Company Contract Engineer	1999-2000
Merix Corporation Process Engineer	1998
Merrick & Company Process Engineer	1997-998

**Professional Organizations**

American Institute of Chemical Engineers

**Profile**

Kim Barrett joined NEXIDEA in 2006 as an analyst. Her past experience is focused on process engineering in the oil and gas industry and technical project management in the information technology manufacturing sector. As an engineering intern with ENSR and as a process engineer with Merrick & Company, Ms. Barrett was responsible for process flow and process instrumentation diagram development, equipment specification, and Title V development for the petroleum refinery industry. She holds a Bachelor of Science in Chemical Engineering from Colorado State University.

**Career Highlights**

- :: Project Planning**–Supervised project planning from engineering to production including project scheduling, cost updating and tracking, task re-alignment, meeting facilitation, and maintaining ISO certification. Proficient with SAP software.
- :: Product Development**–Conducted new product development including process improvements, prototype experimental design and testing, analyzing data, technical report writing, and quality control.
- :: Process Engineering**–Participated in development of process designs and equipment specifications for petroleum refineries. Created process flow diagrams, updated process instrumentation diagrams, and participated in HAZOP analyses.
- :: Environmental**–Assisted in the processing and cutting of crude oil assays for the purpose of crude selection and refinery acquisition.



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