

VITAL ANALYSIS

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A Special Report from Vital Analysis



**Energy Service Sector
& ERP**
*Sector Overview and
SYSPRO Case Study*



The Energy Sector Overall

The energy sector is complicated, diverse and continuously evolving. Existing energy sources are using newer, better technology to be more efficient and cost-effective while all-new sources of energy are providing energy consumers more power choices. The impact of this innovation is more than just choice: it alters economies. Just look at the impact fracking has had on fuel prices, the railroad industry and, even automotive tourism.

There are seven broad types of energy sources that all require specialized parts and maintenance:

- Petroleum
- Wind
- Geothermal
- Solar
- Nuclear
- Coal
- Hydroelectric

Each of these energy sources has its challenges when it comes to equipping the people who implement and maintain these systems.

Most of these energy sources share one servicing and implementation challenge: remote, often forbidding locations. Many wind energy and oil & gas sites are in remote lands or offshore locations. Geothermal sites are frequently located above active geologic plates – some are near active volcanic locations. Solar farms are often in cloudless, sunny deserts while smaller solar operations are found high on the roofs of businesses and homes. And, of course, nuclear plants are often located far from large population centers.

In the petroleum, nuclear and geothermal sectors, firms need products able to withstand high pressures and highly corrosive or deadly compounds. For sub-sea oil & gas wells, the pressure on equipment placed on the ocean floor can be immense. Adding to the danger is the combustible nature of many underground gases.

In the wind energy arena, parts must be designed on a massive scale. A single fan blade in 2012 averaged over 308 feet in diameter (almost double the diameter average in 1998).¹ The generator is often installed at heights over 20 stories tall. Workers must contend with height and wind when installing or servicing these devices.

The products used in these energy sectors must meet exacting engineering and quality requirements. Parts and service suppliers don't compete solely on low cost. Offshore oil & gas exploration and production companies need suppliers that provide extremely high-quality goods

Parts Supplier Challenges: Energy Sector

- **Rapid Product Obsolescence**
- **Rapid Response Times**
- **Remote Service Locations**
- **Exacting Engineering Specifications**
- **Interaction with Deadly and/or Corrosive Elements**
- **Substantial Documentation Requirements**
- **High Costs Associated with Down Time**
- **Environmental, Legal and Safety Issues if Products Fail**
- **Complex Supply Chains**
- **Quality Control**

¹ Source: Data from U.S. Department of Energy, Energy Efficiency & Renewable Energy presentation, Wind and Water Power Program, pg. 26.

and services. If shortcuts are taken, workers lives are endangered and the environment could suffer dramatic and substantive damage.

These highly engineered products are often complex, one-off creations. In the quest to find new sources of energy, new, innovative solutions for the discovery, extraction and production of energy creates a constantly changing and evolving set of products and solutions.



Evolution is a fact of life in the energy sector. Solar technology has experienced almost continuous reductions in costs as products and production methods improve. New recovery methods (e.g., hydraulic fracking and slant drilling) appear with some frequency in the oil & gas sector. Likewise, new regulations alter the landscape triggering product and process changes. Tax code changes can also trigger wide swings in the demand for certain energy sources and this affects the entire supply chain for the sector.

Energy Sector Supply Chain

The supply chain for the energy sector is quite large. For example, in the wind energy space in 2012, there were approximately 81,000 people employed in development, siting, construction, transportation, manufacturing, operations, and services.² In the oil & gas equipment and services industry, the industry is estimated to have a market capitalization of over \$700 billion with 'several hundred billion dollars per year in revenue'.³

Suppliers to the energy sector must meet a number of criteria to earn the right to supply the drillers, operators and owners of energy equipment. Briefly stated, these suppliers must prove their products possess the following characteristics:

- High quality
- Documented and proven sources for raw materials
- Compliance with engineering specifications
- Certification for use in the specific environment
- Documentation on the product, its potential (and correct) usage/application, implementation instructions, etc.
- History of change order requests, if applicable
- Low price
- Rapid availability
- Service maintenance records on vital equipment and machinery

Suppliers often build their business revenues through word of mouth or positive reputation within their sector. It is quite common to hear of large energy firms bringing along their suppliers into new geographies.

How a supplier earns a great reputation though is often based on being able to service its clients via rapid and exact service. When power generation, drilling, refining or other systems are down due to preventive (or unplanned) product issues, the lost revenue or other damages a customer can incur are often a factor larger than a spare part's price. Energy producers greatly value firms that can make and implement replacement parts very quickly. This can be quite a challenge as many of the products needed in this supply chain are expensive, highly engineered, make-to-order items that often require fabrication via expensive, specialized machine tools.

"Manufacturing wind turbines is a resource-intensive process. A typical wind turbine contains more than 8,000 different components, many of which are made from steel, cast iron, and concrete. One such component are magnets made from neodymium and dysprosium, rare earth minerals mined almost exclusively in China, which controls 95 percent of the world's supply of rare earth minerals."

Source:

<http://instituteenergyresearch.org/analysis/big-winds-dirty-little-secret-rare-earth-minerals/>

Rarely are the parts and supplies for energy production located near their point of need. The remote location of many energy and power sites makes locally sourced/produced parts cost-prohibitive and impractical. Suppliers need access to specialized equipment and highly skilled personnel to design and manufacture these products. Once manufactured, these products must then be transported onsite often using one-off, creative means to place the products where

² <http://www.conserve-energy-future.com/various-wind-energy-facts.php>

³ "Oil and Gas Equipment and Services: Investing Essentials", August 4, 2014, Tyler Crowe, <http://www.fool.com/investing/general/2014/08/04/oil-and-gas-equipment-and-services-investing-essen.aspx>

needed. Parts may be shipped by massive aircraft, barges, helicopters and other modes of transportation.

Finally, the supply chain for energy products is quite global in nature. Energy sources (e.g., oil reserves, geothermal access, etc.) are not evenly distributed across the planet. Concentrations of specific energy sources often fail to match the concentrations of the Earth's population. This mismatch between sourcing and consumption means that complex distribution channels are needed to not just move the raw energy material or power but also the parts required to service and maintain this infrastructure.

Innovation & The Energy Supply Chain

The energy sector is driven by innovation. Innovation helps realize greater yields from specific energy sources, and it can enhance the recovery of specific energy sources. For example, wind turbines today produce 15 times more electricity than the typical turbine did in 1990.⁴ Innovations in one energy area can cause entire markets to move. Dropping prices for wind turbines, solar energy (photovoltaic) panels, etc. are making these options more popular with consumers, governments and providers. Likewise, innovations in exploration and extraction techniques have led to a boom in oil & gas production in the U.S. and Canada. As a result, rail shipments of crude oil, pipeline construction and other structural changes are occurring at a rapid clip.

The innovation in wind energy and other renewable energy sources has been significant. In fact, 42% of all new generating capacity in the U.S. in 2012 was from wind energy. Wind energy, at times, produces 25% of the power on the Texas electricity grid.⁵ Of the new electricity generation added in 2012, wind power represented 43% of the total additions (an investment of \$25 billion USD).⁶

Tax incentives and fluctuations in regulatory policies influence the tempo and direction of innovation in the energy sector. Favorable tax policies have been a boon to wind and solar technologies for several years. These programs have triggered additional purchases of power generation equipment, helped to drive economies of scale for the component manufacturers and spurred hiring in the services organizations that install and maintain this equipment.

⁴ <http://www.windenergyfoundation.org/interesting-wind-energy-facts>

⁵ ibid

⁶ Source: 2012 Wind Technologies Market Report (PDF 3.4 MB)

SYSPRO Case Study: Advanced Sealing

Time is money in the energy sector. When equipment fails or goes offline even for scheduled repairs, the cost of downtime can be significant. Energy firms need suppliers who can quickly deliver exceptional, high-quality parts and service.

Advanced Sealing is a maker of gaskets, seals and related parts for the refinery, oil & gas and energy sector. The company started in 1988 as a distributor of energy products but quickly expanded into the manufacturing of numerous, mostly one-off products.

Advanced Sealing chose SYSPRO a few years ago for a number of reasons including a need to better understand its available inventory, labor costs and other factors critical to the profitable pricing of deals and growth of the firm. Without a modern, integrated and complete financial *and* manufacturing software tool, the company's ability to scale and expand was limited.

Today, Advanced Sealing has approximately 80 employees in five locations with more expansion planned. Similarly, the company has seen its market expand from its original base in California across the United States and now globally.

The company uses SYSPRO inventory, work-in-process, bill of materials, labor, financial and other modules. The company may also bring on more applications in the future. One particular success area has been the accounting modules where users originally were concerned that the system was substantially more robust and challenging than the predecessor system. According to Rodney Naverette, VP of Manufacturing at Advanced Sealing, today "*everybody loves the switch*" from the old system to SYSPRO.

Software Prerequisites for Energy Product Producers

Energy product producers must possess strong, integrated processes and systems that are functionally rich and tightly integrated. These firms and their systems need to carefully track the products their customers use and the specifications for each product. In the end, these systems must support:

- The manufacture of high-quality items
- Rapid manufacture and implementation of finished goods
- Accurate raw, work-in-process and finished goods inventory
- Interaction with engineering systems (e.g., CAD/CAM)
- Interaction with machine tools
- Scheduling and workflow software
- Best-in-class financial accounting software

Many of these requirements can be met with an ERP (enterprise resource planning) software product.

We believe the key ERP modules that energy product manufacturers need include:

- **Full engineer-to-order product lifecycle management** - Short product life cycles dictate that component supplier firms possess superb supply chains and meticulous product lifecycle management systems. They must have a tight change control discipline that flows up and down the entirety of the supply chain. Every aspect of the engineer-to-order process must be accounted for and optimized. When correctly executed, energy parts suppliers avoid costly product shortfalls/overages and supply chain disruptions.
- **Mixed Mode Manufacturing** – Making high quality parts is only one requirement for some energy firms. The ability to manufacture other energy products (e.g., fuel, plastics, solvents, etc.) requires software capable of supporting process manufacturing environments, too.
- **Quality Control** – Energy parts must meet every requirement /specification for the product if catastrophic failures in the field are to be avoided.
- **Core Financials** - Strong financial and capital management tools are needed given the significant amounts of capital required to develop products and manage inventory.
- **Engineering Change Control** – The frequency of innovation in this space triggers numerous design changes to products. Creation of the correct replacement/maintenance part requires exact knowledge of the item to be manufactured.
- **Scheduling** – Production jobs must be scheduled so that customer down-time (and the associated cost of the down-time) is kept to an absolute minimum.
- **Inventory Control** – Critical raw material inventory components (e.g., alloys, rare earth components, etc.) are often expensive to acquire and hold. Maintaining just enough material to satisfy new and replacement part demand is key to satisfying key customer needs.
- **Product Configurator & Kitting** – Many components are part of larger, engineered products. Solving some customer needs may require a mix of standard and non-stocked inventory items. Additionally, materials like installation instructions and safety sheets may need to be part of the supplied item.

Key SYSPRO Modules

Manufacturing

- Engineering Change Control
- Work in Progress
- Lot Traceability
- Quotation/Estimating
- Projects and Contracts
- Factory Scheduling
- Bill of Materials
- Requirements Planning
- Electronic Data Interchange

Financials

- General Ledger
- Accounts Payable
- Fixed Assets
- Accounts Receivable
- Cash Book
- Activity-Based Costing
- Electronic Funds Transfer

Distribution

- Inventory Control
- Sales Orders/Invoicing
- Purchase Orders
- Sales Analysis
- Landed Cost Tracking
- Forecasting & Inventory Optimization
- Product Configurator
- Blanket Sales Orders & Releases
- Return to Vendor

Analytics

Customer Relationship Management Quality

Finally, we believe strong support for multi-national transactions should be present. The global nature of all of these energy sectors makes the acquisition of raw material, the development of parts and the implementation of these products a complex, global endeavor. Solutions should be able to handle multiple currencies, accounting standards and languages.

Who is SYSPRO?

According to SYSPRO - SYSPRO is an internationally-recognized, leading provider of enterprise business solutions for on-premises, cloud-based and mobile utilization. Formed in 1978, SYSPRO was one of the first software vendors to develop an Enterprise Resource Planning (ERP) solution. Today, SYSPRO is a global business solutions vendor, represented on six continents and by more than 1600 channel and support partners. Over 15,000 licensed companies across a broad spectrum of industries in more than 60 countries trust SYSPRO as the platform on which to manage their business processes.



Customer focus is a core component of SYSPRO's corporate culture and is one of the key reasons why SYSPRO maintains a strong leadership position in the enterprise application market. By focusing on people and building lasting relationships with customers and partners, SYSPRO consistently excels at guiding customers through all aspects of their implementation and ongoing utilization. SYSPRO's mission is to deliver world-class software that gives customers the control, insight and agility they need for a competitive advantage in a global economy. As such, SYSPRO provides a unique combination of robust, scalable technologies that ensure minimal risk and a high return on investment.

About Vital Analysis



Vital Analysis is a very different kind of technology research organization. We are the intersection set where exceptional technology market knowledge meets the executive suite. Where other 'analysts' replay vendor press releases, we give you the:

- impact new technologies will or won't have on your business
- reasons why you should or shouldn't care about specific emerging solutions
- business justifications why you may or may not want specific solutions

Vital Analysis was carved out of TechVentive, Inc. in 2007 as a new, but complementary business. As designed, Vital Analysis is the publishing, research and analytical arm of that company.

Our reach, like our blog readership, is truly global. We've consulted with top technology executives in Australia, Brazil, Canada, United Kingdom and the United States. We've been briefed by technology providers from virtually every corner of the planet.

About the Author

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