

F R O S T & S U L L I V A N

FROST & SULLIVAN BEST PRACTICES AWARD

FRAC WATER QUALITY MANAGEMENT - NORTH AMERICA

Competitive Strategy Innovation
& Leadership 2019

HYDRÖZONIX

FROST & SULLIVAN

2019

BEST
PRACTICES
AWARD

Contents

<i>Background and Company Performance Industry Challenges</i>	<i>3</i>
<i>Strategy Innovation and Customer Impact</i>	<i>4</i>
<i>Conclusion.....</i>	<i>6</i>
<i>Significance of Competitive Strategy Innovation and Leadership</i>	<i>7</i>
<i>Understanding Competitive Strategy Innovation and Leadership</i>	<i>7</i>
<i>Key Benchmarking Criteria</i>	<i>8</i>
<i>Strategy Innovation.....</i>	<i>8</i>
<i>Customer Impact</i>	<i>8</i>
<i>Best Practices Recognition: 10 Steps to Researching, Identifying, and Recognizing Best Practices</i>	<i>9</i>
<i>The Intersection between 360-Degree Research and Best Practices Awards.....</i>	<i>10</i>
<i>Research Methodology</i>	<i>10</i>
<i>About Frost & Sullivan</i>	<i>10</i>

Background and Company Performance

Industry Challenges

The US frac water management industry, especially in the Permian Basin in Texas, is often described as the Wild West. The market presents a great deal of opportunity in water management, but locating that opportunity and knowing what is needed to access it can be opaque. As a result, many service providers are pushing a wide array of treatment technologies and solutions to a customer base that is equally as varied in their water management needs. While this environment is positive for innovators and emerging technologies looking to gain traction with early adopters, growing the market share and developing repeated, sustainable business can be challenging. The following three core challenges describe this marketplace: Customer requirements are highly variable; the pressure in a cyclical industry is to offer flexibility and business models; and the market is one of low transparency, thus making overcoming the first two challenges even harder.

In water management for produced water in the hydraulic fracturing industry, customer requirements are unavoidably variable. Because physical conditions inside a fractured well can change, the produced water exiting the well can change as well. This variable changes in water quality means that different intensities in treatment are required. Furthermore, different sites and localities as well as disposal methods require different degrees of treatment, which can be a nightmare for conventional manufacturers that seek efficient practices and costs through standardization. Manufacturers need to provide variability in their treatment solutions and in business agreements cost competitively to align with the variability in customer requirements.

In addition to the variability in treatment requirements, the industry itself is cyclical. For example, the drop in oil prices in 2014 resulted in chaos for both the industry and the treatment technology suppliers supporting it. This drop in oil prices meant customers tightened their budgets and decreased their investments in treatment technology as they tried to extend their equipment lifecycles and seek cheaper options for treatment. This scenario delivered mortal blows to businesses and start-ups that typically base their growth on equipment and solution sales. Agility is critically important in this industry, in terms of ensuring a robust strategic plan to adapt to the cyclical nature of oil prices. Market participants must diversify their business models to refocus their business development efforts when times are tough.

Complicating both of these challenges is the high degree of fragmentation, both in terms of customers and competitors, which reduces trust and limits transparency and information sharing. The variability in customer needs and the industry's cyclical nature are compounded by the lack of information exchange between stakeholders, thereby limiting the ability of market participants to tailor their organizations effectively to ensure sustainable growth. While market participants in some growth industries increase the level of information sharing because they all acknowledge that there is enough room to grow without stiff competition, the frac water management industry retains a level of secrecy and competitive focus, which only serves to hold back market growth and any efforts to build on success. Instead, organizations hold on to their internal knowledge to avoid others from capitalizing on it.

Addressing these challenges is key to succeeding in a 'Wild West' industry. Market participants must deliver a high degree of internal agility, both in terms of their technologies and solutions and in their business models. This agility ensures that an organization has the largest addressable market possible, which is critical given the level of fragmentation. Furthermore, market participants need to build up a level of information exchange with customers and the market that supports internal intelligence, research and development, and business development. Organizations that can overcome these challenges will be best positioned to achieve sustainable growth in a complex and variable industry.

Strategy Innovation and Customer Impact

Texas-based Hydrozonix LLC, formed in 2010 from a strategic alliance between Phillips & Jordan Inc. and Siboney Contracting Co, with collaboration from John Ely of Ely and Associates, licensed Ecosphere Technologies Inc's Ozonix® technology to design, build, and provide frac water solutions based on ozone. In addition to equipment, Hydrozonix now provides services and consulting, including hydraulic fracturing operations, flowback and produced water recycling, central water recycling facilities, water transfer logistics, and reclamation pond remediation.

Strategy Execution and Effectiveness

Hydrozonix understood the need to evolve after surviving the lows of the 2014 oil price drop. Before the price drop, businesses were profitable because of highly active exploration and production companies, as the US hydraulic fracturing market grew exponentially. The industry experienced strong, linear growth, and solutions suppliers were busy filling orders. The price drop, however, tested the entire market as each organization was required to be profitable with less revenue. Many market participants and peers of Hydrozonix had to shutter their operations because they were unable to handle the sudden, sustained drop in business.

Realizing that the hydraulic fracturing industry was as cyclical as conventional oil and gas operations, Hydrozonix embarked on a radical transformation with the development of its flagship HYDRO₃CIDE solution. Instead of being hampered by the commitment to acquire technology patents, Hydrozonix took a whiteboard approach and completely redesigned the solution to lower the capital cost to under \$1 million, reaching roughly \$700,000, which is a 70% cost savings that benefits both customers and Hydrozonix. This efficiency offers a bulwark against future cost competition and market lows. With the introduction of the improved cost-competitive HYDRO₃CIDE, the company sold two units in 2017 and 15 in 2018 and is on track to sell 20 to 30 units in 2019.

Stakeholder Integration

Hydrozonix, at its core and in its evolution, is characterized by stakeholder integration. The business is the result of a strategic alliance in the joint ambition to deliver environmental solutions and clean technologies to the fracking industry. Hydrozonix is the reality of a shared vision to respond to market demand and deliver new solutions that improve the status quo. Hydrozonix originally achieved its strategic market position by licensing the Ozonix chemical-free ozone technology from Ecosphere, but pivoted and developed its own solution that is currently Patent Pending in HYDRO₃CIDE.

Hydrozonix has continuously incorporated customer feedback and opinions into its strategic development, evident by the successful engineering and design of its HYDRO₃CIDE solution. Customer insights and feedback on the technology, pricing, and use have allowed the company to shape the retooling of the solution. Whether leveraging the combined strengths of investor stakeholders, acquiring the license to a unique and innovative technology, or working with customers to reengineer the end solution, Hydrozonix places stakeholder integration at the center of its competitive strengths.

Price/Performance Value

Hydrozonix has pushed the competitive pricing for its capital HYDRO₃CIDE solution and ensures operating costs are competitive against chlorine dioxide, which is the industry's conventional solution offered by competitors. Whether the solution is built to handle a capacity of 20,000 barrels per day (BPD) or 40,000 BPD, operating costs are kept lower than \$0.05 per barrel (BBL). This competitive operating cost presents a savings of over 60%, compared to chlorine dioxide systems. While chlorine dioxide has a strong hold on the market, exploration and production customers and emerging midstream companies are increasingly interested in advanced technologies because of their competitive efficiencies and efficacy.

Hydrozonix's HYDRO₃CIDE benefits from this growing interest, evident by its competitive pricing and growth in recent contracts.

Figure 1: Average Pricing Models for Various Flow Rates (Hydrozonix)

	Purchase Price	40,000 BPD	30,000 BPD	20,000 BPD
HYDRO ₃ CIDE				
250 lbs/day	\$850,000.00	\$0.012*		
200 lbs/day	\$750,000.00		\$0.014*	
150 lbs/day	\$650,000.00			\$0.018*
Monthly O&M	\$ 12,000.00	\$0.01	\$0.013	\$0.020
Utilities		\$0.005	\$0.005	\$0.004
TOTALS		\$0.027/BBL	\$0.032/BBL	\$0.042/BBL

Image Source: [Hydrozonix](#)

Customer Ownership Experience

In addition to Hydrozonix's focus on delivering best practices in solution engineering and capital costs, the organization has diversified its business model and the way customers can work with the company. Instead of offering only solution sales, Hydrozonix now offers rental and service contracts for HYDRO₃CIDE, in addition to offering consulting services.

This change increases Hydrozonix's resiliency in a cyclical market. As customer budgets wear thin and capital equipment purchases are avoided, rentals offer customers with a smaller budget access to Hydrozonix's solution. Moreover, maintenance servicing contracts provide Hydrozonix with an additional means of revenue generation and continued customer contact.

These changes provide customers with the flexibility in how they work with Hydrozonix, including the ability to move from one contract style to another as conditions change. While the initial objective may have been to improve Hydrozonix's revenue resiliency, it has improved customer resiliency as well, as customers cope with a cyclical industry. Hydrozonix's evolution in business model ultimately delivers a better reflection of the industry itself, thus resulting in an improved customer experience.

A recent development has been the utilization of the HYDRO₃CIDE operating system as a platform for complete automation. Hydrozonix had the foresight to develop an operating system that allowed for additional systems and equipment to be added to the operating system, but did not expect that customers would ask for complete facilities, including pumps and valves to be integrated and controlled by their operating system. Today the HYDRO₃CIDE operating system is a platform allowing for complete facilities to be automated and controlled from a PC or cellphone.

Brand Equity

Hydrozonix is a consortium of bright minds and highly efficient solutions and is on a mission to improve the status quo of hydraulic fracturing fluid chemicals and their regular trucking. Frac fluids that are replaced by HYDRO₃CIDE include biocides, iron control and sulfide control chemicals. The company's innovative solution allows customers to access mobile or on-site ozone units that do not use liquid chemicals and eliminates the trucking of frac fluids, thereby improving customers' green credentials in an industry that is often considered controversial to sustainability.

Hydrozonix is well positioned as a strong, greener alternative to conventional partners that deliver chemical-based solutions.

Conclusion

Hydrozonix is positioned as a partner that overcomes key industry challenges related to variable customer requirements, a cyclical industry, and limited customer and vendor transparency. With its core structure as a consortium of invested founding organizations, investment in a unique proprietary technology and the complete overhaul of its HYDRO₃CIDE solution and business model, Hydrozonix has evolved into a leading industry participant that delivers a greener solution in advanced oxidation.

With its strong overall performance, Hydrozonix has earned Frost & Sullivan's 2019 Competitive Strategy Innovation and Leadership Award in the North American frac water quality management industry.

Significance of Competitive Strategy Innovation and Leadership

Any successful approach to achieving top-line growth must take into account what competitors are and are not doing; meet customer demand with a comprehensive, value-driven product or service portfolio; and establish a brand that resonates deeply with customers and stands apart from other providers. Companies must succeed in these 3 areas—brand, demand, and positioning—to achieve best-practice levels in competitive strategy.



Understanding Competitive Strategy Innovation and Leadership

Driving demand, brand strength, and competitive differentiation play critical roles in delivering unique value to customers. This three-fold focus, however, must ideally be complemented by an equally rigorous focus on Strategy Innovation and Customer Impact.

Key Benchmarking Criteria

For the Competitive Strategy Innovation and Leadership Award, Frost & Sullivan analysts independently evaluated Strategy Innovation and Customer Impact according to the criteria identified below.

Strategy Innovation

Criterion 1: Strategy Effectiveness

Requirement: Strategy effectively balances short-term performance needs with long-term aspirations and vision for the company.

Criterion 2: Strategy Execution

Requirement: Adoption of best-in-class processes supports the efficient and consistent implementation of business strategy.

Criterion 3: Competitive Differentiation

Requirement: Unique competitive advantages with regard to solution or product are clearly articulated and well accepted in the industry.

Criterion 4: Executive Team Alignment

Requirement: The executive team is aligned with the organization's mission, vision, strategy, and execution.

Criterion 5: Stakeholder Integration

Requirement: Strategy reflects the needs or circumstances of all industry stakeholders, including competitors, customers, investors, and employees.

Customer Impact

Criterion 1: Price/Performance Value

Requirement: Products or services offer the best value for the price, compared to similar offerings in the market.

Criterion 2: Customer Purchase Experience

Requirement: Customers feel they are buying the optimal solution that addresses both their unique needs and their unique constraints.

Criterion 3: Customer Ownership Experience

Requirement: Customers are proud to own the company's product or service and have a positive experience throughout the life of the product or service.

Criterion 4: Customer Service Experience

Requirement: Customer service is accessible, fast, stress-free, and of high quality.

Criterion 5: Brand Equity

Requirement: Customers have a positive view of the brand and exhibit high brand loyalty.

Best Practices Recognition: 10 Steps to Researching, Identifying, and Recognizing Best Practices

Frost & Sullivan analysts follow a 10-step process to evaluate award candidates and assess their fit with select best practices criteria. The reputation and integrity of the awards are based on close adherence to this process.

STEP	OBJECTIVE	KEY ACTIVITIES	OUTPUT
1 Monitor, target, and screen	Identify Award recipient candidates from around the world	<ul style="list-style-type: none"> • Conduct in-depth industry research • Identify emerging industries • Scan multiple regions 	Pipeline of candidates that potentially meet all best practices criteria
2 Perform 360-degree research	Perform comprehensive, 360-degree research on all candidates in the pipeline	<ul style="list-style-type: none"> • Interview thought leaders and industry practitioners • Assess candidates' fit with best practices criteria • Rank all candidates 	Matrix positioning all candidates' performance relative to one another
3 Invite thought leadership in best practices	Perform in-depth examination of all candidates	<ul style="list-style-type: none"> • Confirm best practices criteria • Examine eligibility of all candidates • Identify any information gaps 	Detailed profiles of all ranked candidates
4 Initiate research director review	Conduct an unbiased evaluation of all candidate profiles	<ul style="list-style-type: none"> • Brainstorm ranking options • Invite multiple perspectives on candidates' performance • Update candidate profiles 	Final prioritization of all eligible candidates and companion best practices positioning paper
5 Assemble panel of industry experts	Present findings to an expert panel of industry thought leaders	<ul style="list-style-type: none"> • Share findings • Strengthen cases for candidate eligibility • Prioritize candidates 	Refined list of prioritized award candidates
6 Conduct global industry review	Build consensus on award candidates' eligibility	<ul style="list-style-type: none"> • Hold global team meeting to review all candidates • Pressure-test fit with criteria • Confirm inclusion of all eligible candidates 	Final list of eligible award candidates, representing success stories worldwide
7 Perform quality check	Develop official award consideration materials	<ul style="list-style-type: none"> • Perform final performance benchmarking activities • Write nominations • Perform quality review 	High-quality, accurate, and creative presentation of nominees' successes
8 Reconnect with panel of industry experts	Finalize the selection of the best practices award recipient	<ul style="list-style-type: none"> • Review analysis with panel • Build consensus • Select recipient 	Decision on which company performs best against all best practices criteria
9 Communicate recognition	Inform award recipient of recognition	<ul style="list-style-type: none"> • Present award to the CEO • Inspire the organization for continued success • Celebrate the recipient's performance 	Announcement of award and plan for how recipient can use the award to enhance the brand
10 Take strategic action	Upon licensing, company may share award news with stakeholders and customers	<ul style="list-style-type: none"> • Coordinate media outreach • Design a marketing plan • Assess award's role in strategic planning 	Widespread awareness of recipient's award status among investors, media personnel, and employees

The Intersection between 360-Degree Research and Best Practices Awards

Research Methodology

Frost & Sullivan's 360-degree research methodology represents the analytical rigor of the research process. It offers a 360-degree view of industry challenges, trends, and issues by integrating all 7 of Frost & Sullivan's research methodologies. Too often, companies make important growth decisions based on a narrow understanding of their environment, resulting in errors of both omission and commission. Successful growth strategies are founded on a thorough understanding of market, technical, economic, financial, customer, best practices, and demographic analyses. The integration of these research disciplines into the 360-degree research methodology provides an evaluation platform for benchmarking industry participants and for identifying those performing at best-in-class levels.

360-DEGREE RESEARCH: SEEING ORDER IN THE CHAOS



About Frost & Sullivan

Frost & Sullivan, the Growth Partnership Company, helps clients accelerate growth and achieve best in class positions in growth, innovation and leadership. The company's Growth Partnership Service provides the CEO and the CEO's growth team with disciplined research and best practices models to drive the generation, evaluation and implementation of powerful growth strategies. Frost & Sullivan leverages nearly 60 years of experience in partnering with Global 1000 companies, emerging businesses and the investment community from 45 offices on 6 continents. To join Frost & Sullivan's Growth Partnership, visit <http://www.frost.com>.