

# COMPETITIVE STRUCTURE OF THE GLOBAL DESIGN, BUILD, AND OPERATE (DBO) WATER SUPPLY INDUSTRY

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*“Water, water everywhere, nor any drop to drink.”*

Samuel Taylor Coleridge, Rime of the Ancient Mariner

In the United States we take for granted the fact water is readily supplied to us by a governmentally related entity or a private water company. We go to the faucet and with a turn, water is readily dispensed. There are water fountains for drinking in many public locations and venues, as well as fountains for aesthetic purposes. When the bill comes for the water service, we willingly pay the requested amount for this valuable commodity. When water service is disrupted due to a variety of events including natural disasters and pollution, we have the technology to return water service to normal within a reasonable amount of time. We rarely deal with permanent water supply shortages.

Globally, this may not be the case. Although industrialized countries enjoy a similar water scenario, other countries do not. Emerging and Third World countries have water infrastructure problems, some due to the apparent lack of development and others to cultural components. For example, many of our fellow citizens worldwide believe water is a free right, much like the air we breathe, and expecting monetary remuneration for providing water service is tantamount to taxing the air we breathe. Therefore, going to a water source and carrying water home is normal and expected – and free. However this causes multiple problems, including reinforcing poverty, as infrastructure development, that is developing undeveloped countries, hinges upon providing a stable supply of clean water.

Tension exists between those expecting free water and private companies entering a country and providing

water service, proponents of water privatization. Governments of those countries believe in the free-right concept and do not (or cannot) fund outright the development of water infrastructure. Their citizens expect free water. Moreover, non-governmental organizations (NGOs) regularly oppose and fund challenges to establishing water infrastructure of the type we in the United States and other industrialized countries presuppose.

The design, build, and operate (DBO) water supply industry is examined from the viewpoint of an international water supplier, a French company, Veolia Environnement. By examining the competitive nature of the industry, a larger picture of water supply is presented. Additionally, since economic development and water supply go hand in hand, Veolia's presence in China is portrayed as a case of the cultural imperatives of the water business. Assessing the competitive nature of the water industry from accepted strategic models occurs.

Water constitutes a basic need to sustain all life. Without water, all life as we understand it will die. Civilization's success relies on the ability to supply its citizenry with water, dating back historically to the aqueducts of the Roman Empire. Often undertaken as the responsibility of a government to provide water supply infrastructure, the nature of the industry evolved with private service providers designing, building, and operating water distribution systems. This collaboration

between public governmental entities and private subcontractors flourishes in today's global market environment.

Industrialized nations typically enjoy a stable pure supply of water that easily envelops daily living at the turn of a faucet. However, emerging and Third World countries have degraded water distribution, often impure, with an unstable supply. Approximately one billion people globally currently do not have adequate water supply (Anonymous, 2004). This translates to challenges and opportunities for firms providing design, build, and operate (DBO) services.

The combination of industrialized nations subcontracting water utility systems and developing infrastructure in emergent and Third World countries provides Veolia Environnement, currently one of the largest providers of DBO services, with ample market share opportunity. Cultivating appropriate strategic plans encompassing global, cultural, and political aspects ensures the potential for success. Examining component pieces of the competition of the water supply industry reveals expectations for strategically managing the firm. Evaluating Veolia's position in the industry reveals insights into the future role of developing global infrastructure in water supply that enables economic development.

Global economic development requires infrastructure enabling sustainable growth. The basic nature of water supply and other environmental services provided by Veolia indicate the importance of its services. Obsolescence occurs only in the technology employed, not in the customer demand. This ensures stability and growth as the population expands globally. Economic development in the former Soviet bloc countries, China, and Third World nations also guarantees the viability of the water supply, the water treatment industry, and Veolia Environment into the foreseeable future.

### **The Global Competitive Structure of Design, Build and Operate Water Supply Systems**

*Storied history.* Describing Veolia's heritage, Chairman and CEO Henri Proglio, states: "Founded at the dawn of the industrial era and the start of urban development, Veolia Environment has constantly adapted to the changes in our societies over the past 153 years." This illustrates the confidence through which Veolia conducts its operations. Founded in 1853 through an Imperial Charter of the French Emperor Napoleon III, the Compagnie Générale des Eaux (CGE) mission was providing water to French metropolitan areas and irrigating French farmlands. CGE accumulated other companies in a conglomerated portfolio of operations, including other environmental ventures dealing with waste management (Veolia History 2006).

After securing water supply rights to Venice in 1880, CGE began global operations by expanding across Europe. Ahead of the environmental curve, in 1884 the firm began treating wastewater, in contrast with the practice of discharging waste into nearby bodies of water. Throughout the twentieth century, CGE acquired companies in a variety of industries specializing in environmental processes. By 1980, CGE consolidated into a new organization known as Omnium de Traitement et de Valorisation (OTV), providing the design, build, and operate (DBO) aspect to its operations. The core companies of today's Veolia came together through acquisitions in the 1980s, including Connex, Onyx, and Dalkia. These holdings became Vivendi Environnement in the 1990s, part of Vivendi Universal, and became a separate company through an initial public offering in 2000.

Veolia maintains independence with no parent company and its stock trades on the Paris Bourse and the New York Stock Exchange. For fiscal year 2005, its water supply systems segment represented thirty-five percent of total sales, increasing as a percentage of total revenues. Sales volume increased to over thirty-five billion dollars in 2005, which amounts to over twelve billion dollars of sales for Veolia's water system segment. Veolia's operating income for the same fiscal period rose to almost three billion dollars and the water system segment constitutes half of Veolia's operating income. The company operates on all populated continents. Forty-eight percent of its total business is from its home country of France and is decreasing. Operations in Europe outside of France total thirty-three percent and is increasing. Sales in the Americas remain stable at ten percent while the nine percent of operations in the rest of the world is increasing (Veolia History 2006).

*Characteristics of the industry.* Although its origins rest in antiquity, centralized water distribution systems became commonplace through the industrial revolution and its concomitant urbanization (Chao & Chuang-lin 2007). Municipalities and regional governments often provide water systems through quasi-governmental entities. These authorities may own and operate their facilities, charging consumers for water consumption through a mechanized measurement meter. Outsourcing water supply capacity occurs where the governmental unit maintains ownership of the facilities and distribution network, but the subcontracted entity manages the operations. In a comprehensive approach, this concept results in the design, build, and operate (DBO) service: a municipality contracts the management of the entire project and maintains ownership. This public-private partnership, characterized by transparency, exists where there is no differentiation between the water utility provider and the municipality (Mann, C. C. 2007).

Private water holdings also exist where a company buys the water rights, then builds, and owns the water

distribution system. This concept causes global cultural concerns as the perception for the individual rights to water are the same as the individual rights to air. True water supply privatization, where a private firm owns the supply, the purification system, and the distribution lines, contains the possibility for exploitation of the end-user according to some opponents (Bate 2004).

As Asia, Eastern Europe, and Africa emerge economically, a stable, pure water supply is essential. The lack of a stable water supply precludes development. Since water supply infrastructure must be in place for economic development (Chao & Chuanglin 2007), these areas provide the growth opportunities for this industry. They represented nine percent of total sales in Veolia's sale volume and this percentage is increasing (Veolia History 2006).

To accomplish better efficiency in providing water, future incarnations as "Total Water Supply Systems" evolve where water purification and wastewater treatment will combine in producing potable water supplies (Anonymous 2001). Positioning the company for this eventuality, waste management represents the second largest segment of Veolia's business, with twenty-six percent of sales. Veolia also operates an institute for the purpose of innovation and educating people in environmental issues (Veolia History 2006).

Estimates place global market sales at approximately \$1.5 trillion dollars by 2015, doubling current market revenues. These growth expectations occur where Veolia conducts its smallest segment, but still represents a major presence (Anonymous 1999).

*Intensity of rivalry among competitors.* Economic competition consistently changes as companies strive to stay ahead of their competitors. According to Porter, "firms that gain competitive advantage in an industry are often those that not only perceive a new market need or the potential of a new technology but move early and most aggressively to exploit it" (1990). Two of the largest companies providing water supply systems are French, Veolia and Suez Lyonnaise. The French provide a favorable environment for water developers (Mann, C. C. 2007). This enables a national competitive advantage that translates to international success when moving into global territories (Porter 1990).

Companies compete for governmental contracts, voraciously attempting to increase revenues. When proposing any component of the operation, similar scoped projects require similar sized companies, and large firms encompass the economies of scale necessary to implement large projects. Some of the largest competitors regularly compete against each other: Veolia, Suez Lyonnaise, Berlin (Germany) Water, and Thames Water. In addition to competing in the contract bidding process, these companies buy shares in other companies or parts of quasi-governmental authorities. By purchasing shares of local entities, these firms accomplish a strategic goal in addition to

adding market share: obtaining an in-country cultural advantage for securing additional contracts (Zin 2004).

Currently, the number of water service providers totals twenty thousand. These range from large concerns operating multiple water systems trans-nationally to local authorities operating one water supply systems. By 2015, experts expect this number to decrease to five thousand as existing firms fuel growth in market share by merger and acquisition (Anonymous 1999). Expectations are that eighty companies will dominate the global market by 2015 with a sixty percent market share; the top-ten companies by sales volume will capture approximately forty percent of the global market; the smaller companies making up the remainder of the five-thousand will garner the remaining forty percent (Anonymous 1999).

*Porter's five forces.* Porter developed the model encompassing forces related to competition. His analysis outlines five important sources that determine competitive power and their relationship on competitive rivalry: bargaining power of suppliers, bargaining power of buyers, threat of substitution, threat of new entry, and competitive rivalry (1985).

Bargaining power of suppliers relates the ability of suppliers to affect market conditions and prices. Since supply factors consist of multiple sources in multiple countries the bargaining power of suppliers is determined to be low.

Figure 1, Porter's Five Forces (1985).



Bargaining power of buyers corresponds to the potential for customers to exert pressure on the firm. Although serving large numbers in urban areas requires expertise and only major water supply companies have the ability to maintain contracts, there are sufficient numbers of suppliers in the market. Additionally, customers could obtain their own knowledge and employ their own resources. Therefore, this force rates a medium power.

Threat of substitution corresponds to customers having the ability of substituting one product for another. Pertaining to water supply and distribution, this signifies governmental entities substituting a utility plant for another system, such as individual wells serving residential enclaves. Another substitution calls for customers to implement their own resources to develop water systems. Because these substitutions are possible and do occur, but do not characterize a major shift in the marketplace, this threat warrants a medium assessment.

Threat of new entry signifies new competitors coming into the market. Although many competitors exist, long-term contracts characterize the nature of the industry. This force assesses low because of the costly barriers to enter a market. The feasibility of establishing a second water utility in a given region determines this assessment, not only because of the cost for duplicate infrastructure but also because rights and franchises for distributing water are exclusive.

Competitive rivalry assessment results from the combination of the first four forces. Evaluating the contributive forces, the competitive rivalry in the water supply system is low to medium, warranting continued evaluation. If a significant amount of new water system development occurs in the twenty-first century reducing the growth potential, this may change (Porter 1985).

*Geographical influences.* Because of the urbanization resulting from industrialization occurring first in Europe, developing water supply infrastructure became paramount. Imperial decree set the French evolution in process, creating a favored industry.

Approximately one billion people currently do not have adequate water supply. The areas affected epitomize the geographic areas where future growth will occur (Anonymous 2004) and the major companies are poised to capture these markets. In many countries, controversy exists over true water privatization, where water companies actually own the systems they operate. Surprisingly, true water privatization is less common in the United States than in other countries and continents (Bate 2004).

The global competitive nature of the water supply system evolved over centuries, and industrialization expedited its growth. Economic development can only occur after the construction of primary infrastructure. Water supply services exist on a scale ranging from public utilities constructed, owned, and operated by governmental entities, to a public-private partnership between the governmental entity and firms such as Veolia, to completely privatized operations. The water supply design, build, and operate industry will continue growing, doubling in the next ten years. However, this growth occurs in geographic areas that now represent the smallest segment of current industry operations. Through mergers and acquisitions, the total number of suppliers will diminish by 75 percent in the next

decade. Analyzing competitive rivalry utilizing Porter's five-forces model reveals that competitive rivalry exists in a medium range as most of the contributing forces lie in that range.

Although over 90 percent of Veolia's current business takes place in Europe and the United States, the locations accounting for the remaining 10 percent represent the majority of future growth. Its current revenue base exists in industrialized nations; future revenue growth can only come from developing countries (Veolia 2006). Veolia is a global leader in this industry.

### **The Competitive Structure of Design, Build and Operate Water Supply Systems in China**

*DBO in China.* The People's Republic of China, governed as a communist state since its revolution in the 1940s, has allowed free-market transactions since 1978. Since then the resultant growth in their economy averages approximately 10 percent per year, almost three times the rate of major western nations. This growth shows no sign of abating and at times has reached 12 percent. China's growth continues to direct infrastructure development. Economic growth represents a primary focus for the government, expecting their blend of communism and capitalism to save them from the fate of the former Soviet Union. For continual economic development, infrastructure construction must occur first, and water supply systems represent the primary component of that infrastructure (Chao & Chuang-lin 2007).

The central government invites companies to negotiate the nature of their operations in China. This acts as tacit approval for local and regional governments to utilize these companies (Tan, Li, and Xia 2007). Operating in China since 1997, Veolia became the premier water supply systems provider in that country, investing over one billion dollars as of 2004. Other water supply system companies operating in China are Berlin Water, Thames Water, and the other French company, Suez Lyonnaise (Zin 2004).

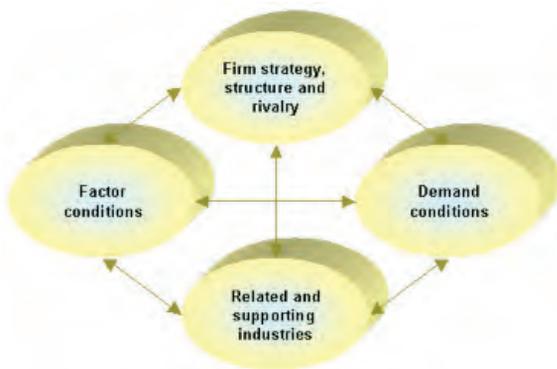
*Porter's diamond model.* In his book, *The Competitive Advantage of Nations*, Porter (1990) defines a model that provides reasoning why some companies succeed in the global competitive environment and others do not. Attributing success to characteristics in the home country of the organization, Porter defines these features and relates them in four points of a diamond, with bidirectional flows moving to and from each point. The four points are:

- **Factor conditions** are resources and inputs classically identified by economists as the factors of production such as skilled labor, developed infrastructure, and technological advances. These conditions aid in developing a competitive advantage for various industry segments. Porter defined several subcategories and demonstrated these initial advantages constitute building blocks

from which companies may build additional competitive advantages.

- **Demand conditions** prognosticate via home country customer wants and needs, products and services, signaling demand trends internationally. Market signals, Porter contends, provide national advantages if the signals extend to international trends.
- **Related and supporting industries** present in the home country offers competitive advantages. Often industries develop within a network of associated industries and the presence of these industrial partners aid in advancing a national competitive advantage.
- **Firm strategy, structure, and rivalry** encompass conditions in a home country that establish organizational structure, management methodologies, and the attributes of domestic competitiveness. In the home country, cultural aspects play a significant role in determining the competitive advantage in international operations.

**Figure 2, Porter's Diamond (1990).**



Utilizing Porter's diamond, companies' access and develop home country aspects enabling a competitive advantage on a global basis. At the national level, Porter's diamond enables governmental policy makers to favor developing competitive advantages in various industries.

Employing Porter's diamond to evaluate Veolia's home country competitive advantage that translates to an economic benefit in the Chinese market aids in developing corporate strategy. For example, France has a sufficient skilled labor pool, industrialized infrastructure, and enjoys groundbreaking technological advances related to the water system supply organization. Demand conditions for a pure and stable supply of water enabled Veolia to develop services comparable to those needed in China. Veolia also developed sewage treatment in France, again allowing for cross boundary trading in this particular service. Since the Imperial Decree by Napoleon III, governmental policy has favored the water supply system industry.

Refining Porter's diamond, Dunning (1993) distinguished parameters for international components. Defining multinational enterprises (MNEs) the author asserts companies enjoy a more pluralistic motivation for global trade. As this relates to Veolia in China, its status as a MNE allows a systematic advantage of lowering its transaction costs in international markets. Veolia's multi-national enterprise status (MNE) provides tools for continued strength in the marketplace (Dunning 1993).

Veolia's involvement in China requires strategic planning to enhance its competitive position. Part of that strategic planning is accessing the competitive advantage Veolia brings to China based upon competitive advantages enjoyed by Veolia in its home country, France. Porter's diamond presents a model for evaluating the competitive position translating from France to China. After analyzing the home country competitive advantage of Veolia, we can surmise the various attributes included in Porter's Diamond consisting of economic factors, factors of production, consumer demand, interrelated industries, and governmental policy, present Veolia a significant home country competitive advantage. This benefit translates globally particularly in its Chinese operations and contributes to the success of Veolia as the premier source for water system supply in China.

*Virtuous expanding cycle versus vicious cycle of decline on a sliding scale.* Global trade and the factors composing trade often further industries and their respective companies. These decision processes amplify in magnitude creating a composite affect. This affect sometimes represents positive momentum and Porter (1990) defines this as a virtuous expanding cycle where forward momentum causes positive benefits for companies, their industries, and the foreign countries in which they do business. Conversely, negative attributes expand in a cause and effect relationship as well. The amplitude and direction of these negative affects is the vicious cycle of decline. This cause and effect relationship, amongst multiple factors in the international trade environment, allow for economic growth or economic decay. Part of the reason Third World countries experience delayed development in comparison to the rest of the world rests partly with this theory. As various policies, procedures, and cultural attributes prohibit economic development, a vicious cycle of decline exists. Industrialized nations benefit from their related set of economic attributes that enable a virtual expanding cycle. This concept applies to industries, home countries, and international trading partners in its application (Porter 1990).

*Global environment.* A virtuous expanding cycle exists for the water system supply industry as globalization spurs potential development of previously underdeveloped countries. This positive cycle exists because of the human demand for stable and pure water supplies plus the fact positive developments in

any given society cannot take place without sources of water. This economic development of providing water supply infrastructure creates positive changes in culture and politics, thus fulfilling the definition of a virtuous expanding cycle (Porter 1990).

Exploitation is possible in super-poor countries in geographic areas such as Africa, where exploitation of resources and faulty policies may stifle benefits and the vicious cycle of decline continues. Attempts must be made at providing suitable water supplies, because current water situations permanently hinder any development.

*Chinese environment.* The circumstances providing for global virtuous expanding cycles or vicious cycles of decline exist with the Chinese market. Economic development begets economic development; there exists a virtuous expanding cycle in China, that supporters of capitalism claim provides benefits across an array of political and social issues. Hopefully, as their economic system expands through the benefits of water system infrastructure, positive advantages will occur in China within the human rights area. Concern continues over the intent of the central government in its policies toward personal liberties.

Benefits in trade processes contribute, in an amplified way, towards a benefit of human civilization. This virtuous expanded cycle presents itself in the global trade of water system suppliers. The opposite, embodied by the vicious cycle of decline presents itself when policies and applications of trade are convoluted for illicit means. For the most part, both globally and in China, water system development presents the virtuous expanding cycle. This important identification represents part of the strategic plan for Veolia as it continues its course in globalized trade, reaching transnational status.

### **Competitive Impact on Veolia Environment**

Organizations require strategic planning for successful foreign operations. Multiple attributes apply including cultural aspects of the firm, foreign environment, political ramifications of trans-global trade, and international trade relationships. Veolia must ensure its business process paradigms address multiple international characteristics with a systemic orientation. While trading in China, for example, Veolia must reasonably assure its stakeholders that effective corporate management enables globally consistent business processes. Factors potentially derailing Veolia and its competitive advantage require discernment and reconciliation for smooth operations. Potential factors causing problematic circumstances include government upheavals, anti-water privatization concerns, and the inability to anticipate and implement market place changes. As market growth includes factors new to Veolia management, an adequate framework established in strategic planning requires

implementation. This framework must include goal seeking scenarios for profit maximization and market penetration; reorientation of business processes; organizational metrics accessing foreign operations; and control mechanisms that alter unsuccessful programs. Various paradigms, such as Porter's five forces and diamond models present tools for assessing and managing foreign operations. Generating consideration for multiple attributes of the company related to transnational operations becomes part of the mission and vision of the firm.

Veolia must define its perception for sustainable growth in global situations, particularly its Chinese operations. Determining the attributes that govern appropriate courses of action in differing circumstances is a priority. Although predicting future events may prove futile in large part, discerning future economic patterns represents a prerequisite for long-term strategic planning. A model consisting of paradigms for at least a ten-year time frame must be included in organization policy. A combination of sensing market place evolutionary iterations based upon experience will enable Veolia continued leadership in its industry.

Veolia's background consists of a strong national advantage for its industry. This national advantage translates to economic advantages in foreign marketplaces. Veolia must foster this national advantage through its own operations in conjunction with the home country. Similarly, multiple home country advantages require development as each foreign operation contains the potential for a future home country, adding to its competitive strengths.

As a multinational enterprise, Veolia must strategically plan a "national diamond" (Dunning 1993) that creates a competitive advantage for the organization in the countries it operates. This is particularly true for its Chinese operations as the reduced transaction costs favoring Veolia may be explored for diversion to potential investment reaping additional profits. This presence in Asia serves as the origination for future ventures in this geographic locale.

Business change occurs constantly. Veolia must seek out, through market signals, the potential for change and innovation. The decision making of the firm requires a composition that embraces change initiatives. By sensing and embracing the possibilities for change, Veolia presents a continual leadership role in the global industry.

Veolia faces multiple considerations in managing its global operations, and in particular its Chinese operations. Differing strategic plans encompassing variations in its enterprises impart models that assess the competitive environment and allow the firm to plan accommodating scenarios for successful ventures. Veolia's embrace of substantive models that permit and encourage change consist of positions for policy and procedure development consistent with sustainable

growth. Its core strategic plan must comprise the following attributes:

- Expect and manage for sustainable growth, developing a consistent vision and mission, correlating to applicable models.
- Export the national advantage internationally (Porter 2000).
- Exploit its role as an MNE (Dunning 1993).
- Explore change initiatives.

### General Summary

Beginning with a rich history in antiquity as in the aqueducts of the Roman Empire, water distribution epitomizes the basic infrastructure requirement for society's economic development. Partly the responsibility of government and partly the undertaking of private enterprise, water supply systems provide tangible benefits across a given spectrum. The basic need for water will not diminish and the continual implementation of water system capabilities remains on the horizon.

Equally noble with the task of ensuring a water supply is the history of Veolia Environment. Pioneers in developing water supply system technologies, the firm evolved into a premier global producer of water supply systems. Its current operations ensure continued growth in foreign markets. Veolia maintains success in assessing and scanning its competitive environment.

The global marketplace for water distribution systems continues to expand, either as a forerunner to future economic development or as simply supplying the basic component of life that is water. Varied levels of water supply systems exist globally between the industrialized nations and its poorer counterparts. This supports multiple potential for the water supply DBO under either circumstance, continuing to supply industrialized nations or developing poorer geographical regions. The emerging economies of Asia present substantive opportunity, particularly its Chinese investment. As these opportunities evolve, this sector must adapt with the market place.

This industry encounters a mix of applicable structures for its operations. Water supply DBOs must exploit their market position to encompass any potential structure whether a public-private partnership or true water privatization. Eventually developing products encompassing sewage treatment with water supply in a unitary ecosystem provides benefits to the existing product mix. This potential model combining total water management better allocates economic resources.

Employing models, such as Porter's five forces that accesses competitive rivalry and Porter's diamond model accessing the home country's strengths fostering a competitive advantage abroad enables strategic planners a view of the necessary direction required for

managing the firm. Veolia shows considerable foresight by its early investment in China. Its collaboration with the Chinese warrants exploration for continued benefits. Veolia's national advantage and previous export of this advantage enables consistent capture of economic benefits from lower international transaction costs. Any water supply DBO Chinese relationship furthers the need for evaluation based upon the political ambivalence and direct nature of the communist country. Successful operations require devising plans that employ scenarios for any contradicting governmental developments. Veolia may export its competitive advantages as it discerns translatable concepts from dealing with the Chinese to other emergent ventures.

The water supply DBO products and services exist in a virtuous expanding cycle in both the countries it operates in and by the nature of its products and services; their operations convert to extended societal benefits. The potential exists, particularly with true water privatization, for exploitation in a given society specifically in Third World countries. Convoluting doctrine and policies may continue the vicious cycle of decline encountered in these poor nations; nations that can least afford negative implications.

This sector's tool kit in dealing with the global environment in total and individually with its Chinese operations consists of multiple strategic planning attributes. These attributes comprise goal-seeking scenarios for achieving management's intentions and incorporating multiple dynamic paradigms that require continuous improvement. Veolia's environment scanning capabilities derive from its home country advantage, adding competitive advantages because of the favorable home country environment.

Change in the water supply system industry remains continuous; therefore, management must expect and employ techniques seeking opportunities for change. Veolia must incorporate its varied history and success, and utilize its history as a springboard for growth and not an anchor. For example, any DBO must examine new technology and embrace the model of the total eco-system water management attribute. This strategic planning enables forward momentum for this industry and its global operations.

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