

REGENT UNIVERSITY

GREAT LAKES ENERGY

BUSINESS POSITIONING FUTURE SCENARIOS

SCHOOL OF LEADERSHIP STUDIES

LMOL616 FUTURES STUDIES TOOLS AND METHODS

NOVEMBER 21, 2004

JOSEPH C THOMAS

CONTENTS

| | |
|------------------------------------|----|
| I INTRODUCTION | 1 |
| II FOCAL POINT ISSUES..... | 4 |
| III KEY ENVIRONMENTAL FACTORS..... | 7 |
| IV DRIVING FORCES..... | 8 |
| V SCENARIOS AND IMPLICATIONS..... | 10 |
| VI LEADING INDICATORS..... | 21 |
| VII CONCLUSION..... | 22 |
| REFERENCES..... | 24 |

INTRODUCTION

This paper presents future scenarios for a mythical company in the energy industry that sells electricity and other types of energy and energy services within a specific service territory. This company finds itself embroiled in the middle of an untenable situation in which the state government is deregulating electricity generation and distribution. With the best of intentions, the company and the state entered into an agreement several years ago regarding the process of deregulation; however, the situation did not unfold in the way anticipated by either the company or the state. The company now must chart its future in terms of what's likely to happen and in terms of what the company might prefer to happen looking out ten to fifteen years or more. Once likely and preferable futures are envisioned, then the company can determine an appropriate course of action designed to improve the likelihood of achieving its preferable future. This paper considers the current situation, analyzes factors that could contribute to the future situation, and describes possible future scenarios.

A scenario planning approach adapted from that proposed by Peter Schwartz (Schwartz, 1996) consists of eight steps:

Step 1 – Identification of Focal Point Issues. Identify and describe the key concerns currently impacting the organization.

Step 2 – Identification of Key Factors in the Local Environment. Identify and describe factors within the organization and the environment within which it operates that influence the focal point issues from Step 1.

Step 3 – Identification of Driving Forces. Identify and describe the trends in the energy industry and general environment impacting the key factors from Step 2.

Step 4 – Ranking of Driving Forces by Importance and Uncertainty. Rank the relative significance and likelihood of the trends from Step 3.

Step 5 – Selection of Scenario Logics. Identify and describe various scenarios based upon the most important and most uncertain driving forces from Step 4.

Step 6 – Fleshing Out the Scenarios. Develop potential stories around the various scenarios from Step 5.

Step 7 – Implications of Scenarios on Focal Point Issues. Consider how the scenarios are likely to affect the focal point issues from Step 6.

Step 8 – Selection of Leading Indicators and Signs. Identify trends and factors that need monitoring as a means to detect which scenario or aspects of scenarios are likely to occur as future events unfold.

The results of applying these scenario planning steps to the energy company and its situation is the subject of this paper. The results are presented in these sections:

Focal Point Issues. This section describes the key concerns currently impacting the organization (Step 1).

Key Environmental Factors. This section describes factors within the organization and the environment within which it operates that influence the focal point issues described in the first section (Step 2).

Driving Forces. This section describes the trends in the energy industry and general environment impacting the key factors described in the second section and considers the relative significance and likelihood of each trend (Steps 3 and 4).

Scenarios and Implications. This section examines the interrelationships between the two most important driving forces, develops a story for each scenario, and considers how the scenarios are likely to affect the focal point issues (Steps 5, 6, and 7).

Leading Indicators. This section identifies trends and factors that can be monitored as a means to detect which scenario or aspects of the various scenarios are likely to occur as future events unfold (Step 8).

Conclusion. This section makes observations and draws conclusions regarding appropriate next steps or likely actions for the energy company .

II

FOCAL POINT ISSUES

This section describes key issues facing the organization both now as well as in the near and longer term future. All of these issues are critical to the success and long term prosperity of the company; however for the purpose of analyzing the impact of future scenarios, a single critical issue is selected.

The single critical issue selected for the purpose of analyzing the impact of future scenarios is:

- Investment in Future Electricity Generation Capacity

Other key issues that the company faces include:

- Deregulation and Marketplace Competition
- Alternative Energy Sources
- Environmental Impact
- Non-Regulated Business Investment

The remainder of this section describes each of these issues

Investment in Future Electricity Generation Capacity. The company desires an abundant supply of inexpensive and clean energy for sales and distribution to its customers. Development of additional electricity generation capability requires significant investment (two to four billion dollars) and is a long lead item (five to ten years or more), so the timing of decision making for delivering this capability is critical. If delivered too soon, excess capacity sits idle and if delivered too late, opportunity to sell energy is lost. Additionally, the type of electricity generation capability in terms of centralized versus decentralized is also a critical decision. Centralized means a big plant (fossil fuel or nuclear) generating electricity for perhaps millions

of people across the service territory (the traditional model) while decentralized (or distributed) means many smaller plants (fossil fuel or alternative energy sources such as wind, solar, hydrogen, etc.) located around the service territory. These smaller plants could range from regional plants, municipal plants, and even neighborhood or individual building or consumer generation units. Distributed generation is an emerging technology in which the company has equity positions in several start up companies.

Deregulation and Marketplace Competition. A critical issue is remaining competitive and profitable in the face of energy market deregulation while meeting state and federally mandated requirements that include maintaining the energy distribution and transmission infrastructure, meeting environmental standards, providing adequate power reserves to cover potential demand, and ensuring that all customers (including low income) are served. Deregulation of utilities fosters much needed competition in the marketplace, yet in the current situation third party energy generators and marketers (competitors) do not share equitably the cost burden of state and federally mandated requirements.

The state public service commission, appointed by elected officials, by law controls the rates (tariffs) that the company charges its customers. Historically, the commission has set residential rates 20% below the actual cost of service, and subsidizes the difference through higher rates charged to commercial and industrial customers. Under current deregulation laws and because of the higher subsidized rates that the company must by law charge commercial and industrial customers, competitors are able to profitably offer electric service to commercial and industrial customers at significantly lower rates. Provided with this opportunity, competitors “cherry pick” commercial and industrial customers. This has significantly reduced company

profits while the company must continue its obligation to serve residential customers at below cost (Beaubien, 2004; CLEAR, 2004).

Alternative Energy Sources. Alternative energy sources, which to date are low volume or largely experimental, loom on the longer horizon as viable especially as current fossil fuel sources become depleted, increasingly expensive to extract, and increasingly recognized as harmful to the environment. In the face of these issues, resurgence in the use of nuclear fission for electricity generation seems plausible. Alternative energy sources include solar, wind, biomass, hydrogen fuel cells, sea currents/tides, and nuclear fusion. As these technologies mature and become viable as well as cost effective, they will become increasingly attractive to energy providers and consumers alike and promise to revolutionize current methods of energy generation, delivery and consumption.

Environmental Impact. The company desires to be a good corporate citizen by providing low environmental impact in terms of air and water pollution and consumption of limited natural resources such as land, water, and fossil fuels. A major uncertainty is the funding sources for the massive investments associated with installation of technologies to reduce or eliminate particulate contamination in the atmosphere from aging coal fired electric power plants.

Non-Regulated Business Investment. The company seeks to diversify its revenue base to cover the significant uncertainties around the regulated electric and gas business. It's important to long term success to be positioned for the future energy markets and this requires sometimes speculative investments in new technologies. The company desires to leverage its core business expertise in energy products and services to position for the future.

III

KEY ENVIRONMENTAL FACTORS

This section identifies and briefly describes current factors that directly impact and matter most to the issues identified in the first section.

Public Acceptance of New Nuclear Plants. There has been a moratorium on building nuclear plants in the United States since 1978 (Perry, 2004), yet nuclear power is one of the cleanest ways to generate electricity. The public has safety concerns and a not-in-my-backyard sentiment around nuclear power plants. Storage of nuclear waste is also a problem, and, until a national solution is found, this problem is solved on a local level by storing nuclear waste on the premises of the nuclear power plant.

Nuclear Regulatory Commission Rules and Regulations, Authorization, and Certification. While current rules are well understood since the company currently operates a nuclear plant, there is uncertainty around the regulations for building a new plant since it's been nearly thirty years since one has started construction.

Source of Investment Funds. The massive investment necessary for new power plants presents significant financing challenges. The rates set by law have traditionally provided for this kind of funding, but changes in the regulatory environment have made this kind of funding difficult to secure. Public participation in this investment may be needed.

New Technologies and Costs Associated with Controlling Emissions from Coal Fired Plants. Technologies are improving in their capability to scrub the emissions from coal fired electricity generating plants, but the costs keep increasing significantly. Retrofitting existing plants requires billions of dollars, and the source of this funding is uncertain.

IV

DRIVING FORCES

This section looks at trends in the environment that affect the fortunes of the company in terms of the key factors and decisions and considers the relative significance and likelihood of each trend.

State Regulation of Energy Marketplace. This is a major concern of the company, yet it is difficult to project what the state legislature will do and when decisions to reform the deregulated marketplace will occur. Reform of current legislation is necessary for the company to compete on even terms with competitors. Reforming deregulation legislation is extremely important so that the company can compete on even terms with its competitors. Yet there is a great deal of uncertainty about what types of reforms to the existing laws the state legislature will enact, if any, and the timeliness of these changes.

Growth of Energy Demand. The growth in the demand for energy within the region depends on economic expansion and weather. In terms of the key decision of when and how to invest in developing additional electricity generation capability, the likely demand and when the demand arrives is critical yet difficult to predict. The growth in the demand for energy within the region depends on both economic expansion and weather.

Environmental Regulation. Increasing local, state, and federal environmental regulations severely hampers the availability of cash for other investments. The company assumes that the popular demand and government mandate for lessening environmental impact will continue. The uncertainty is when new technologies become viable, how much they cost, and when they'll be required.

Viability of Distributed Generation Technologies. There is much research and development in the use of fuel cells for generating electricity using natural gas as the fuel. This technology generates electricity for individual homes or buildings. Trends show that these capabilities will continue to grow and mature, but they are not likely to make a significant contribution to the overall energy needs of customers in the company's service territory in the near to mid term timeframe.

Viability of Alternative Energy Sources. There are efforts underway across the nation and around the world using solar, wind, thermal, hydro, and other energy sources to generate electricity, but these efforts are generally small scale and do not provide a significant portion of the electricity supply. Trends show that these capabilities will also continue to grow and mature, but similarly they are not likely to make a significant contribution to the overall energy needs of customers in the company's service territory in the near to mid term timeframe.

Acceptable Alternatives for Disposal of Nuclear Waste. Lack of viable sites and technologies for safe disposal of radioactive waste inhibit new construction of nuclear power plants. Since facilities and technologies exist for interim storage of nuclear waste material on the plant premises, this seems less important despite some advances in alternative handling and storage technologies.

Two of these driving forces are identified as both the most important and the most uncertain:

- State Regulation of Energy Marketplace
- Growth of Energy Demand

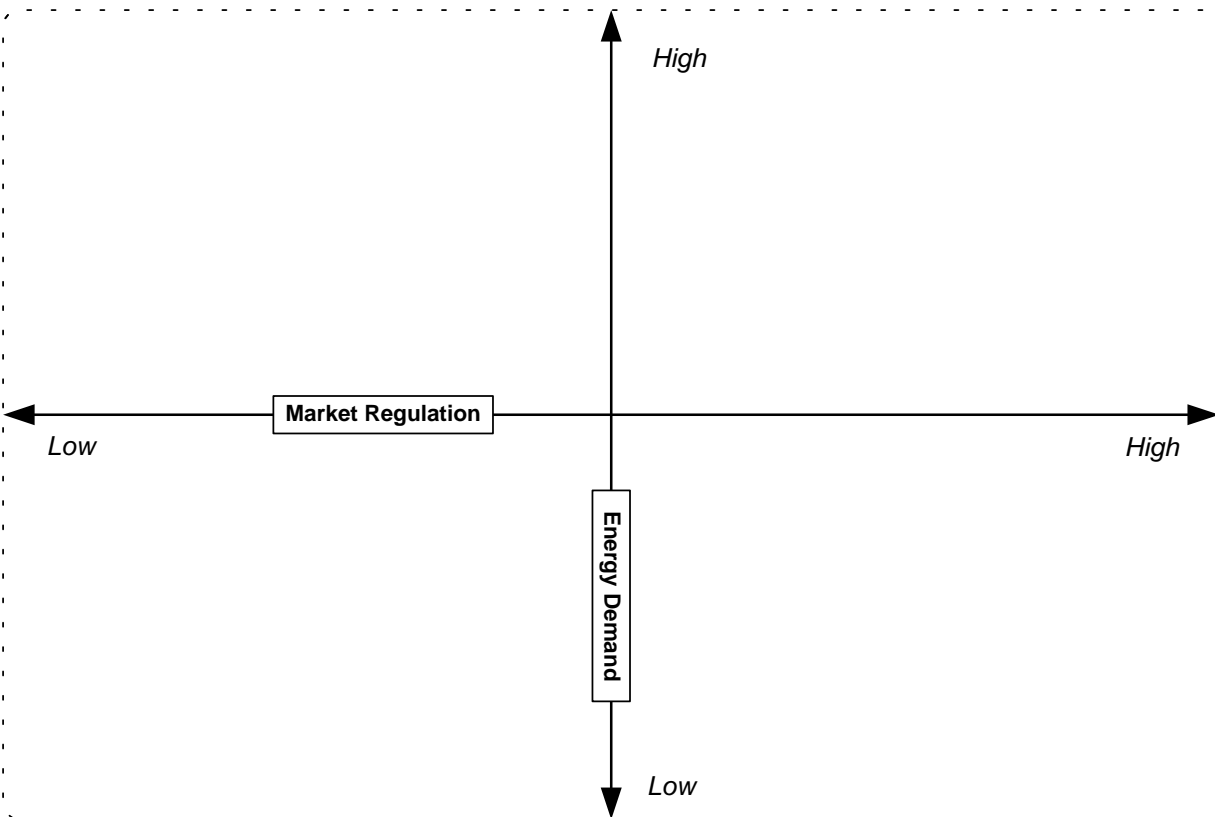
These two most important driving forces as well as the other driving forces are briefly considered:

SCENARIOS AND IMPLICATIONS

This section examines the interrelationships between continuums of the two most important driving forces, develops a story for each scenario, and considers how the scenarios are likely to affect the focal point issues.

Figure 1 depicts the two most significant driving forces, Market Regulation and Energy Demand, as two intersecting continuums that form a matrix with quadrants that represent four possible scenarios.

Figure 1



Market Regulation. Consider the Market Regulation force along a continuum from low to no change at one extreme and high or significant change on the other extreme.

No change would be a result of continued government regulation without reforming the current deregulation legislation: residential electricity rates remain subsidized by commercial and industrial rates, the preponderance of costs for operating the distribution network remain the responsibility of the company as well as providing energy reserves, serving low income customers, and other overhead costs such as bearing the burdens of uncollectible accounts.

Significant change means that the state government and the public service commission level the playing field by raising residential and lowering commercial/industrial electricity rates thereby eliminating the residential rate subsidy as well as providing an equitable formula for sharing overhead costs.

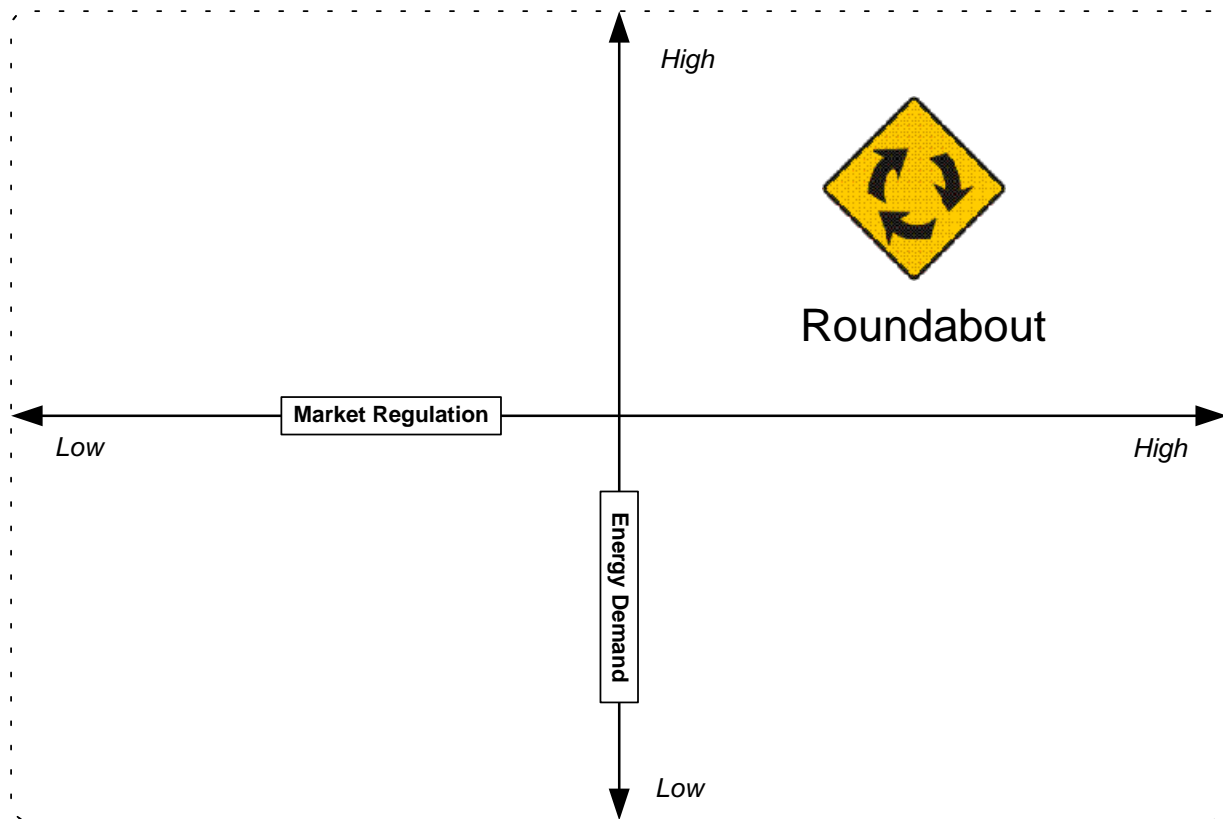
Energy Demand. Consider the Energy Demand force along a continuum from low to stable growth at one extreme and high or significant growth on the other extreme.

Stable growth could be a result of slow or negative economic growth, a decrease in new housing starts, an increase in the unemployment rate, a reduction in per capita income, a significant increase in fuel costs with accompanying reduction in energy spending by consumers, cool summers and warm winters, and increasing development and use of energy conservation technologies.

Significant growth could be a result of regional economic expansion, increasing individual prosperity, population growth, lower energy costs, hot summers and cold winters, and increasing consumer purchasing of energy using devices.

Each of the four scenarios are described in terms of the possible future that each represents. Each scenario is portrayed as a particular type of road condition as represented by a traffic sign.

Figure 2



Scenario 1: Roundabout (“Breaking Out of Going in Circles”). In the scenario represented by Figure 2, market regulation is high and energy demand is high.

The increase in energy demand by residential customers in conjunction with ever increasing fuel costs has pressured the public service commission to keep residential energy rates low. The public service commission has responded by dragging their heels in making any significant reform in the residential rate structure which continues to be subsidized by

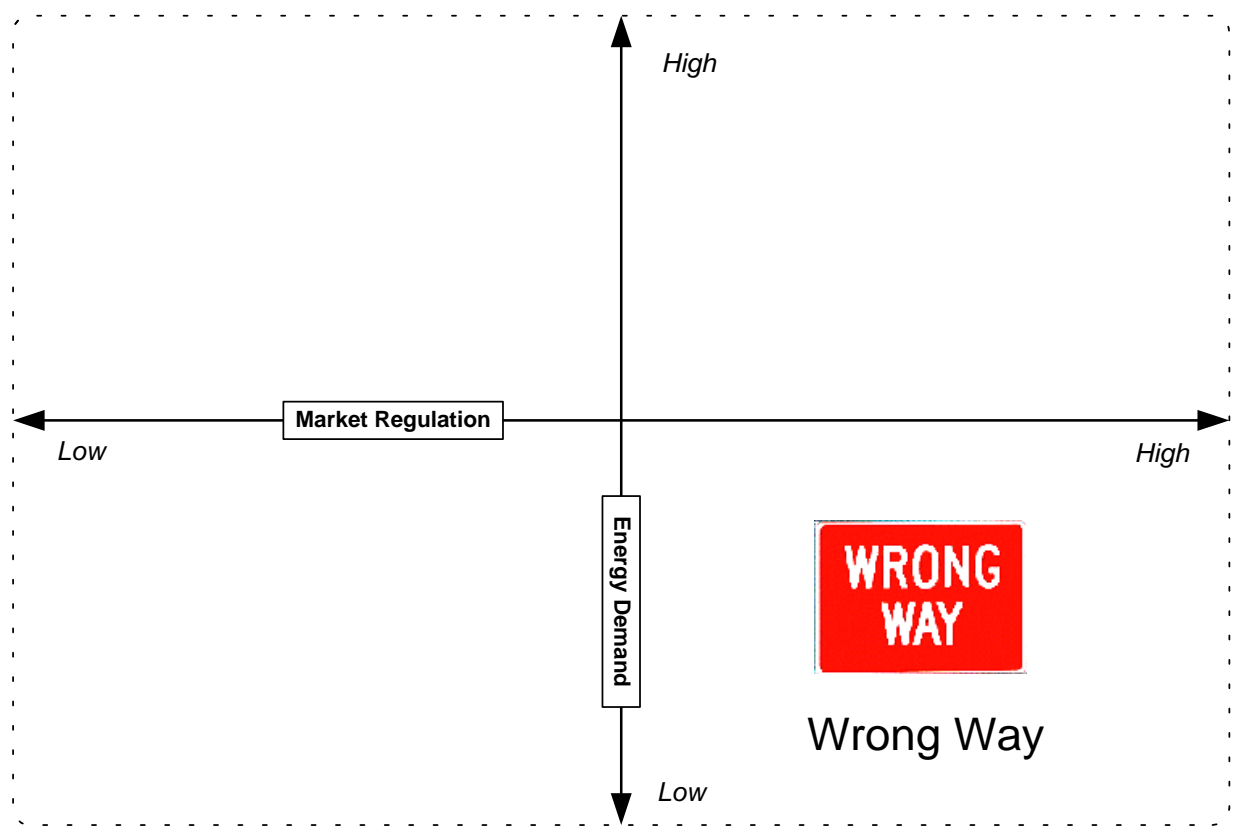
commercial/industrial rates. Significant legislative changes introduced by elected officials sympathetic with and understanding the plight of the company were debated for years before finally being watered down sufficiently to eliminate any significant change in the energy market deregulation legislation. Thus, the vast majority of the voting population is satisfied because electricity rates are low, and thus tend to keep the incumbents in office. Elected government officials and political parties are therefore also satisfied. This has generally served to maintain the balance of political power in the state government.

The bad news is that the company is stuck with unprofitable residential customers; however, cash flow is moderately increased due to higher revenue levels resulting from high demand. Although cash flow is increased, it is not sufficient to start a long term and risky project such as construction of a new nuclear power plant. Instead, a more feasible opportunity is to use these moderate increases in cash flow in conjunction with new debt to aggressively pursue investments in non-regulated businesses in the areas of distributed generation energy and alternative fuel sources. These investments specifically target distributed generation technologies for individual home or business size units, neighborhood, or municipality size units (or combinations thereof).

While pursuing development and implementation of distributed energy technologies, the company gradually reduces its position in large centralized generation assets. The least profitable and dirtiest generating plants are shut down to avoid maintenance and environmental quality costs. Other marginally profitable plants are sold to third party suppliers. This approach positively affects environmental quality through decreasing use of fossil fuels, reduces maintenance costs, and avoids mandated investment in implementation of new technology for cleansing power plant emissions.

When there is cash flow but it is not sufficient to fund needed investments, borrowing money is often employed to meet needs. In this scenario, a combination of moderate amounts of cash supplemented with debt fund development of distributed generation and alternative fuel technologies.

Figure 3



Scenario 2: Wrong Way (“This Road Leads to an Abrupt and Lethal End”). In the scenario represented by Figure 3, market regulation is high and energy demand is low.

The public service commission has responded to the problems of inequitable marketplace regulation by trying to please residential customers with rates below the actual cost of service, while also appeasing third party competitors and commercial/industrial customers by slowly

reducing rate subsidies through a series of small rate adjustments over the years. Thus, there has been no great hue and cry from the voting population. Elected government officials and political parties are initially satisfied because there has been no abrupt shift in the political composition of the state legislature.

However, this strategy backfires because low energy demand fails to provide the revenues and profitability necessary for survival. The company enters receivership to avoid outright bankruptcy liquidation. The state appointed a board of trustees to oversee the operation of the electricity generation business. The state purchases generating assets at a nominal cost to keep them operational as no other purchasers can be found because no company can profitably operate in the competitive environment. The state must initially raise funds through state guaranteed loans to infuse needed cash into operations. Electricity rates as well as taxes go up due respectively to increasing fuel costs and to finance the state's capital investment in electric generating plants as well as their maintenance.

Voters are incensed about electricity rate and tax increases, and vote incumbents out of office. These unexpected events force the newly elected legislature to appoint new members to the public service commission who begin a total rewrite of laws and regulations around energy rates and marketplace competition. Alas, the die has been cast and it is too little too late.

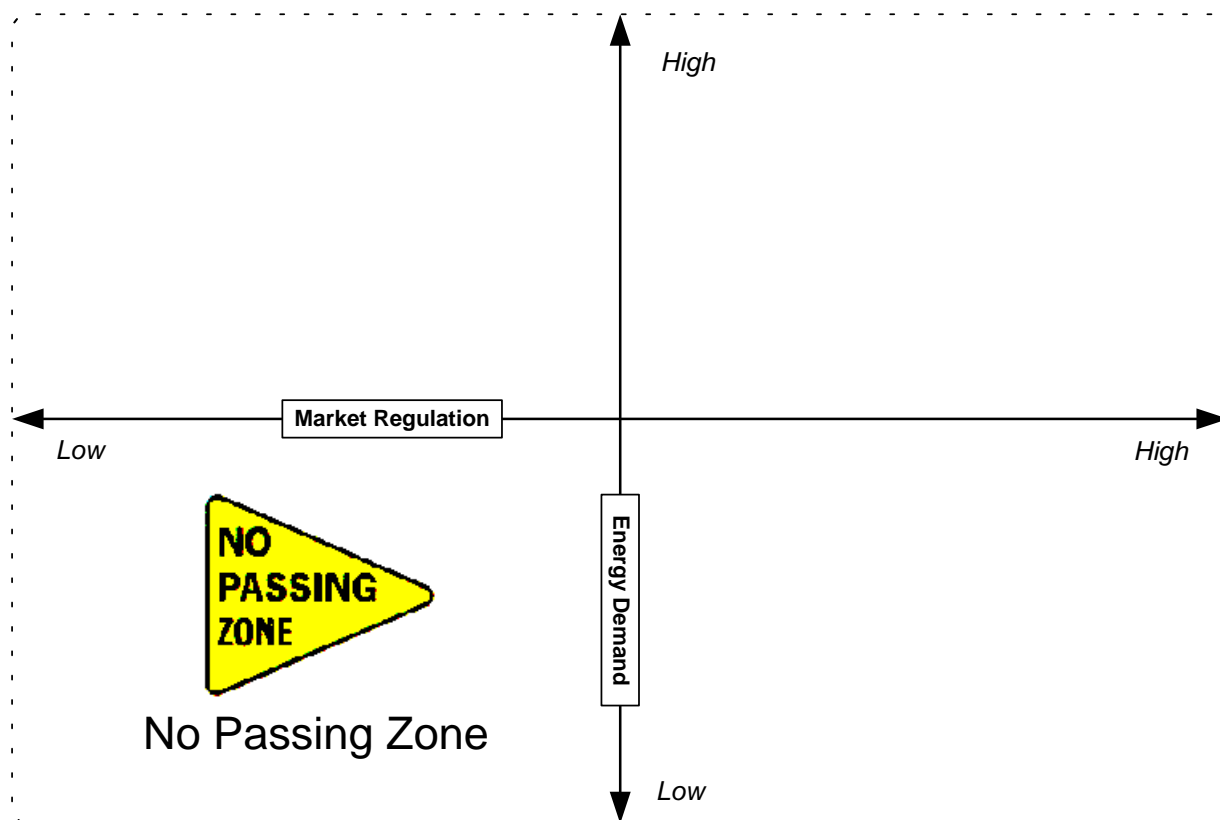
The company emerges from bankruptcy as a non-regulated business having shed the centralized fossil fuel burning power plants along with the high maintenance and extremely costly air scrubbing technology required by the federal government. The company is in position to compete effectively against the state owned power plants.

The company divested portions of their investments made in non-regulated businesses such as distributed generation and use of alternative fuel sources to generate cash. However,

equity positions were maintained in several of the most promising ventures, and these investments pay off primarily through leveraging the relationships by forging partnerships to sell electric generating devices and fuel throughout the country. “Green” nongovernmental organizations laude the small environmental footprint of the company’s products and the low fuel consumption of alternative fuels.

Drastic events are typically painful, but often opportunity emerges. This scenario employs a different strategy for investing in future generation technology since the company goes insolvent. In this situation, the company leverages its past investments, equity positions, and working relationships to establish partnerships with other companies in pursuit of implementing distributed generation and alternative fuel technologies.

Figure 4



Scenario 3: No Passing Zone (“Go Slow and Watch for Oncoming Traffic”). In the scenario represented by Figure 4, market regulation is low and energy demand is low.

The state legislature saw the light and passed significant legislative reforms in a timely fashion for rate laws and market deregulation. Residential and commercial/industrial rates both reflect actual costs with no subsidies. This enables the company to compete on an even footing with competitors in the marketplace.

Low energy demand diminishes the size of the market inhibiting competition because there is not much money to be made until the economy improves. Low demand keeps energy costs low as fuel inventories build, but fuel suppliers are losing money and fuel prices are likely to soar as soon as economic conditions improve.

Underutilization of centralized power plants coupled with low fuel costs and high inventory levels and lack of cash has made it necessary for the company to use debt to finance investments for distributed generation and alternative fuel sources. This is critical for strategic positioning of the company in the near future so it is ready to compete in the marketplace with additional capacity, distributed generation technology, and alternative fuel technology.

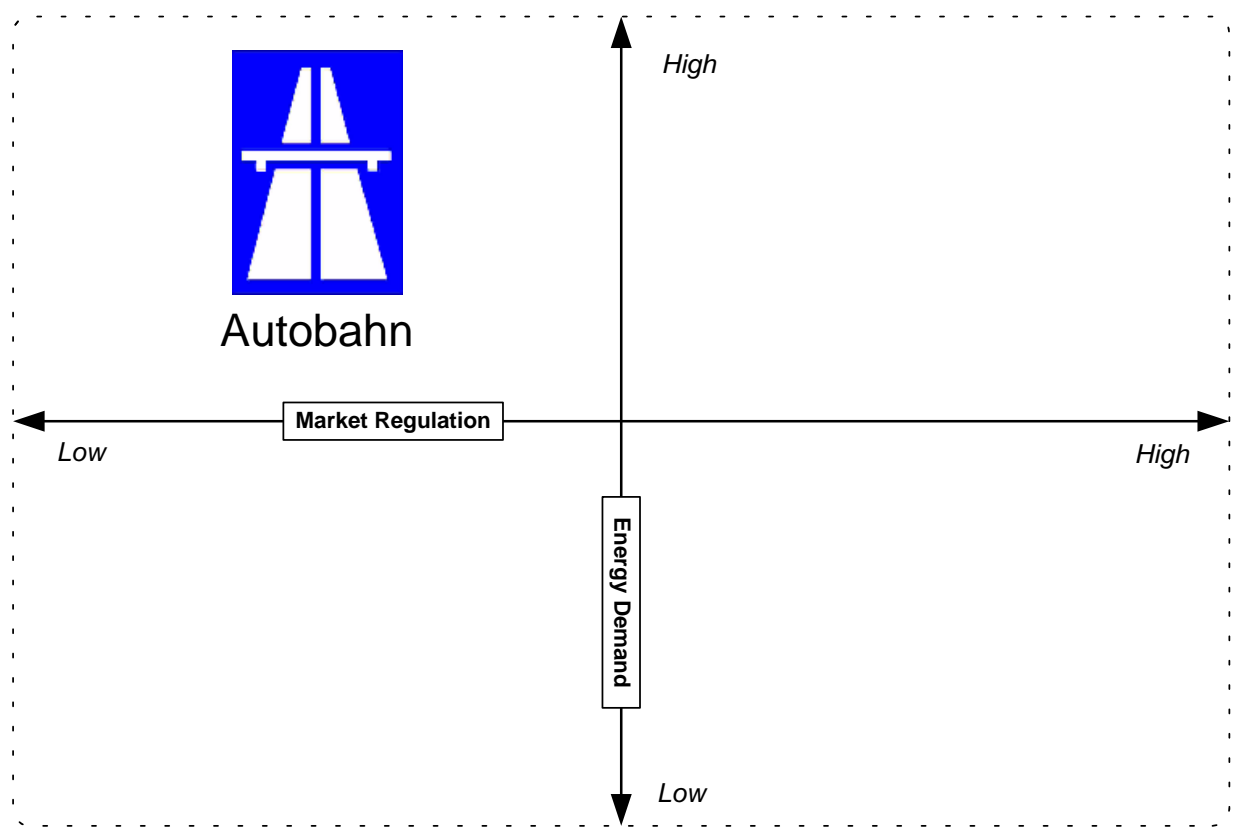
Underutilized plants also mean reduced environmental impact. Recognition of the reduced environmental impact in conjunction with the economic downturn has caused the federal government to weaken and defer new environmental regulation.

Although going through a period of substantial change, low marketplace regulation is a reason for optimism, and the company prepares for better times ahead.

Even with a lack of cash available to fund investments, sometimes it is necessary for survival or strategic positioning to borrow necessary funds. Cash flow is poor due to low energy

sales, but changes in deregulation legislation provides confidence to borrow money for investment in non-regulated business for distributed generation and alternative fuel sources.

Figure 5



Scenario 4: Autobahn (“Put the Pedal to the Metal”). In the scenario represented by Figure 5, market regulation is low and energy demand is high.

State government has quickly reformed market deregulation laws eliminating subsidized rates and leveling the competitive playing field. Although initially there were pockets of alarm in the voting population due to residential rate increases, elected officials and the governor did an excellent communication job with their constituents and disgruntled voters are the exception rather than the rule. As a result, incumbents in the state legislature and the public service

commission tend to remain in office and any new legislators are quickly assimilated into the program. State government has seen the wisdom in maintaining a healthy energy company, and an excellent working relationship exists between the company and the public service commission.

Energy demand is high and plant utilization is higher than it's ever been. The company has been working hard at becoming efficient and is now able to compete on price and service against other third party energy marketers. Fuel costs are high, but this does not seem to have an effect on demand due to the booming economy. Margins are low on residential customers, but sales are up resulting in cash flow. The company has been very successful in recapturing lost commercial/industrial customers due to the ability to compete on price. Margins are moderately better for commercial/industrial customers as compared to than residential customers, and high energy demand is also generating significant cash flow.

The availability of large amounts of cash has driven an increase in the investments in non-regulated businesses for distributed generation and alternative fuels. These investments are accelerating the viability of these technologies which are now being implemented on a limited basis across the service territory and the country. As distributed generation continues to expand to help meet high energy demand, it also is positioning the company to phase out fossil fuel fired generating plants once this growth cycle slows.

Additionally, large amounts of available cash in conjunction with a favorable regulatory environment makes construction of new nuclear power plants feasible. The company initiates a successful public relations campaign touting the value of clean energy from nuclear generations and begins the first phase of submitting paperwork seeking initial approvals of plans to the federal government.

High utilization of centralized power plants is having a detrimental effect on environmental quality, but this is being mitigated to some degree by investments in clean air technology. The company is working closely with the federal government seeking cooperation to avoid investing in retrofitting older plants with the latest clean air technology as these plants are slated to be the first to retire.

The decision to invest in electricity generation capacity is difficult because of the huge amounts of cash and extended lead times. Generally, when business is growing and there are sufficient profit margins, this generates cash for investment consideration in additional generation capacity and particular types of generation and alternative fuel technologies. The combination of conducive marketplace deregulation and rate structures coupled with high energy demand provides a period of unusually high profitability.

VI

LEADING INDICATORS

This section identifies trends and factors that the company can monitor as a means to detect which scenario or the various aspects of scenarios are likely to occur as future events unfold. The types of trends and factors that need monitoring include:

- The political composition of the state and federal legislature and their tendency to support or oppose positions favorable to the company
- The state and federal legislative processes and legislation under consideration
- The public service commission and its tendency to support or oppose positions favorable to the company
- The Environmental Protection Agency and changes in environmental regulations
- The Nuclear Regulatory Commission for new regulations and disposition toward new plant construction
- Public opinion about nuclear power plants and nuclear waste disposal
- Technology trends around nuclear waste disposal
- Cost and use trends for fossil fuels as a source for generating electricity
- Trends and technologies for energy management and conservation
- Technology trends for distributed generation
- Technology trends around alternative energy sources and fuels
- Environmentalist movements, their leadership, and their initiatives
- Ebb and flow cycle of economic trends

VII

CONCLUSION

It is obvious that the preferred future is low market regulation and high energy demand (Scenario 4); indeed, all commercial organizations seek a minimum of governmental interference in operations and high demand for its products. And the company should certainly work with appropriate government agencies and other constituencies for the purpose of influencing the end results of deregulation legislation.

However, given that the company finds itself in a highly regulated position resulting from 100 years operating as a regulated monopoly, and that it must deal with multi faceted government organizations that are fickle in nature due to changing composition from regular election cycles, it is unlikely that the end result will be entirely as desired or reach resolution in a preferred timeframe. On the contrary, it is likely that the end result will have characteristics that are not only undesirable, but unexpected and have negative repercussions. Interactions with the state government over the years have proven this to be the case.

It is prudent for the company to consider worst case and extreme scenarios (like Scenario 2) as a way to prepare for future eventualities. Dator's Axiom states "Any useful statement about the future should seem to be ridiculous" (Schultz, 2002). Perhaps a worst case scenario will not come about exactly as portrayed, but it gives insight into the possibilities. Schultz (2002) provides these guidelines for thinking about the future:

- Future thinking is not prediction, but exploration and provocation
- There are no future facts
- Tomorrow will be nothing like today
- Question assumptions when you hear, "That could never happen!"

Even in the worst situations, opportunity emerges and considerations of future scenarios help prepare for seizing those opportunities. That is the goal of futures thinking: make and realize opportunity when it presents itself.

REFERENCES

- Beaubien, J. (2004). State's Electric Choice Program will hurt residential customers. Oakland Press. September 23, 2004.
- CLEAR. (2004). Citizens for Long-Term Energy Affordability and Reliability. Retrieved September 21, 2004 from <http://www.clearmichigan.com/aboutus.asp>
- Perry, T. (2004). Nuclear Power Gets a Second Look. IEEE Spectrum Online. Retrieved November 18, 2004 from <http://www.spectrum.ieee.org/WEBONLY/publicfeature/nov01/nintro.html>.
- Schultz, W. (2002). Futures Studies: An Overview of Basic Concepts. Retrieved November 18, 2004 from <http://www.infinitefutures.com/essays/prez/overview/>
- Scwartz, P. (1996). The Art of the Long View: Planning for the Future in an Uncertain World. New York: Currency.