

Megatrends and the Energy Horizon

By Mark Gabriel, Executive Consultant and Principal, R. W. Beck, Inc.

The energy enterprise – from electricity and gas, to oil and its potential replacements – is more radically altered now than in the past 100 years. Such a dramatic change has not taken place since the initial discovery and expansion of energy systems in the late 1800s; and since that time there has not been as many opportunities and challenges. This change provides energy companies with a remarkable opportunity. By identifying the key elements of this transition and examining the experiences and successes of stakeholders, energy companies can take advantage of the market forces driving change.

The concept of a Megatrend is simple: it occurs regardless of the personal, corporate or governmental amount of “will” or “desire” to change its outcome. In fact, rarely can Megatrends be stopped or altered in any major way, and yet they will inevitably have an astounding impact on the nature of the industry.

The goal is to find the overarching, absolute Megatrends and analyze current business and capabilities in light of these. Against this backdrop, energy companies can create successful business strategies, tactics and practices that will support the changes required.

There are five Megatrends in the energy business:

- The Destiny of Demographics
- The Destiny of Intelligent Infrastructure
- The Destiny of the Carbon/Capacity Conflict
- The Destiny of Customer Engagement
- The Destiny of Business Model Evolution

They are referred to as “Destinies” in that the potential for changing them is limited and their impact is far-reaching and universal for all market participants. The following is a brief look at each of these Megatrends.

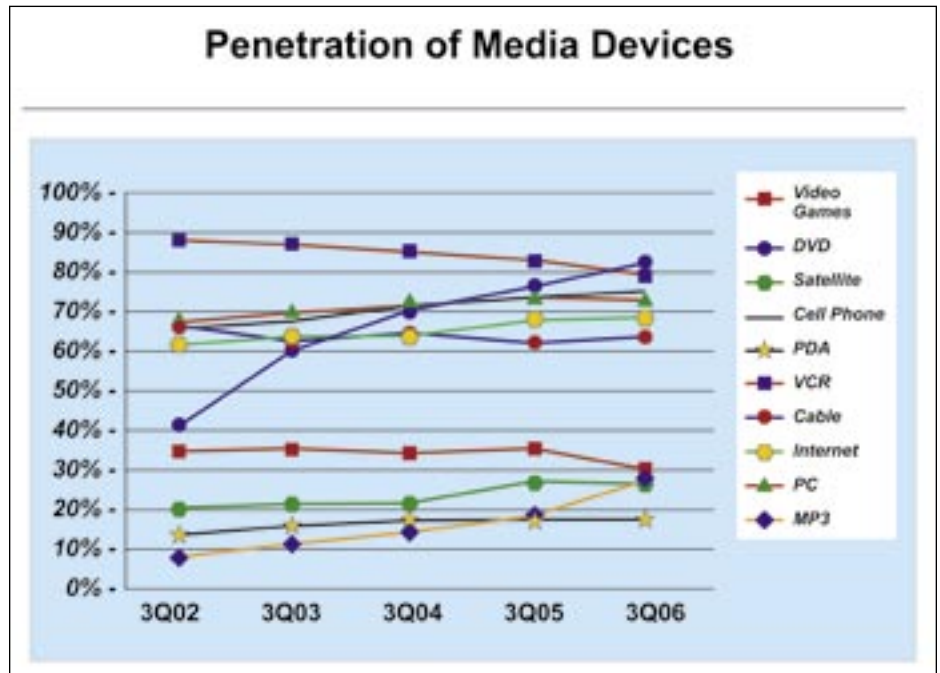


Figure 1. Penetration of Media devices in the United States 2002 through 2006. Source: Consumer Electronics Association Consumption Report

The Destiny of Demographics

Three issues will impact the electricity, oil and gas industry over the next 20 years more than any others: an aging workforce, movement of an aging population to warmer climates and increased demand for high quality power to support lifestyle expectations.

The lack of trained personnel and the current pressure to reduce staff comes at a time when the industry needs additional human resources to meet the demands of infrastructure expansion, environmental controls and increasingly complex system operations. In addition, as the population shifts to warmer climates, areas already in short supply of energy will experience increasing stresses on their systems. Finally, the lifestyle expectations of high quality power, to support ever-expanding electric technologies, will increasingly strain system capacities.

The Destiny of Intelligent Infrastructure

One approach to mitigating the aging workforce challenge is by developing more sophisticated and reliable tools and technologies for system operations. From production and delivery to system management and consumer interfaces, industries are being revolutionized by communications, the microchip and advanced computational tools.

This trend is occurring across all markets; from the smart oil field to the intelligent electricity grid (“Intelligrid”). Meshing intelligence with physical systems will impose significant new demands on companies.

The Destiny of the Carbon/Capacity Conflict

The need for expanding electric power production and the movement toward a

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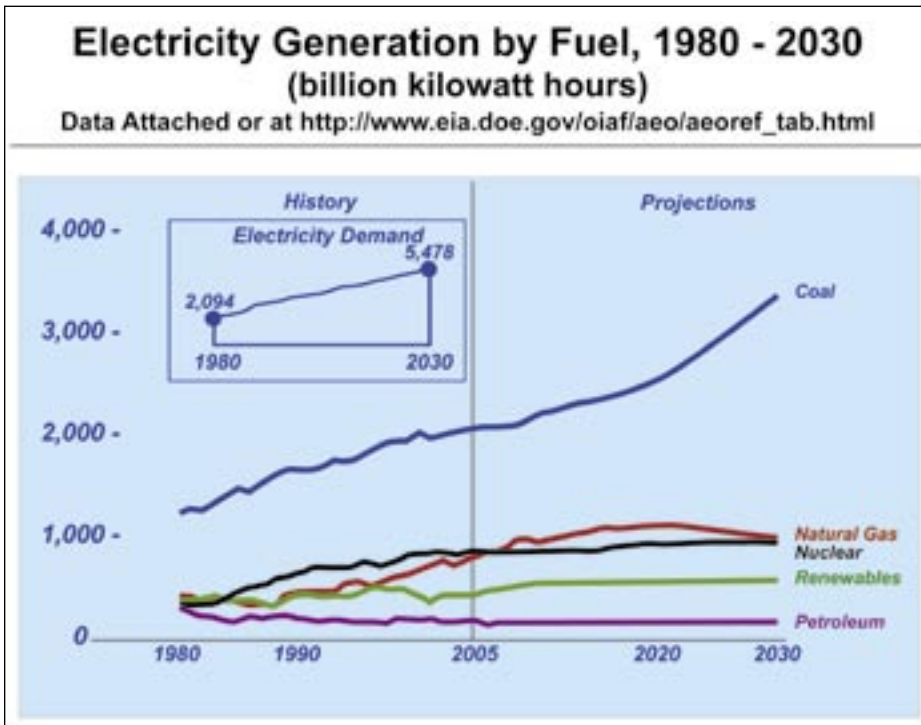


Figure 2. Electricity generation by fuel, 1980 – 2030 (billion kilowatt hours) Source: *The Energy Information Administration*

carbon-constrained world are on a direct collision course in the next five to 20 years. Nearly 35 percent of the U.S. will be short on electricity generating capacity by the year 2014 – even assuming that the rapidly escalating demand curve in electricity is ameliorated by energy efficiency, demand response and active management of the Intelligrid.

Disturbingly, the lack of new power plant construction (other than natural gas-fueled facilities, for which the economics are

becoming more questionable) is matched with an unproven expectation that renewables and efficiency will be able to keep up with the growing electricity usage.

The capacity needs of the country must be balanced against the growing call for carbon constraints. The debate over global warming is apparently over and the general public perception is that action is needed. The electricity and oil markets are being forced to act; however, the public does not understand the immediate, significant

and almost unmanageable impacts of such actions. Industry, and therefore consumers, will incur huge economic costs even if the benefits are not realized. The scope and scale of projects, complexity of operating systems and the need for significant influxes of capital into the energy industry will continue to drive dramatic changes for global business.

The Destiny of Customer Engagement

Every market has undergone a dramatic evolution in which the customer is more engaged and involved than ever before. This change in customer interaction means expectations are raised in terms of value, time and knowledge of an individual customer's situation. This also means that the demands of the marketplace can quickly outpace the energy industry's ability to keep up with that market – resulting in turmoil.

Besides the societal "training" of consumers to have more choice in everything, the technology of demand has changed as well. This is rapidly requiring the energy business to develop customer choice-based services and practices such as demand response, time-of-use-rates, advanced purchases of natural gas and oil for the winter and pre-payment of energy costs.

Customers are beginning to engage in markets in new and unusual ways, creating opportunities as well as challenges for those companies supplying the marketplace. Customer choice in electricity will not require formal deregulation; clients will deregulate themselves, disengaging from the market via energy efficiency, renewables and even independent production.

The Destiny of Business Evolution

The scope and scale of projects, complexity of operating systems and the need for significant influxes of capital into the energy industry will continue to drive dramatic changes in doing business across the globe. After 70 years of relatively calm and stable energy business models, the changes over the last decade have set dramatic forces in motion that will require electric, gas and oil entities to continually reinvent themselves to stay competitive and profitable.

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The staid model of vertically integrated utilities is gone forever as the investment community continues pushing players toward economic efficiencies. This is occurring down to the smallest player in the marketplace as the availability of capital hinges on terms and conditions that require market model changes. The delamination of both the electric and gas industry has led to the creation of new entities that, in turn, developed new funding and financing approaches. Financial guarantees now require a level of complexity unheard of in the past with the simple balance of debt to equity ratios overtaken by deals involving a host of new financial tools.

Implications for Planning

Planning around these Megatrends is significantly different from traditional scenario development. Scenarios that are developed are never realized in their entirety; therefore, those that follow a Market Trend are always behind. The resultant modeling via scenario development is useful for examining possible outcomes, but creates an environment of looking from today's perspective forward, rather than understanding tomorrow and looking backwards to see what it will take to achieve the desired goals. The opportunity, therefore, lies in recognizing a Megatrend, envisioning a "future state", and then building strategic direction around it. Proceeding in this way will give rise to new sources of revenue, improved ways of doing business and company sustainability, as demonstrated in Figure 3.

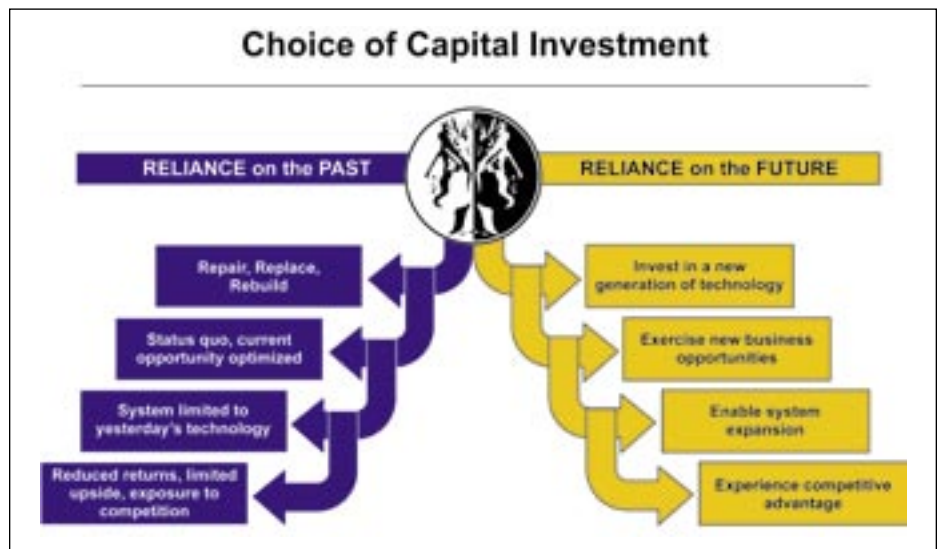


Figure3. Megatrends provide choices for companies. Investing in future technologies provides new opportunities. *Paving the Way to a Sustainable Energy Future, Mark Gabriel*

The energy business has a long history of falling into the scenario trap by following the Market Trend. Whether it was the predictions in the 1970s of the depletion of oil by the year 2000, the forecast of nuclear power being too cheap to meter or the estimated natural gas price stability occurring at \$2-\$3 an MMBTU – the scenarios created anticipated outcomes based on the past, not on the future.

If the energy industry plans its scenarios around carbon taxes (now estimated at \$7-\$37 a ton by 2015), it may miss the opportunity for carbon injection in saline aquifers. If it plans on scenarios relying on natural gas as its main fuel source, it may miss the impact the smart grid will have

on consumption and the demands of the customers. And if the industry plans on a consistent regulatory compact, it may soon find that conventional business model assumptions were wrong; therefore, rather than scenario planning, anticipating Megatrends is at the heart of building a sustainable energy business for the future.

Numerous examples of companies that make money by following Market Trends can be found, being second to the market with a product or service; however, this is not true in the electric industry. Some firms recognize the nature of their business in terms of duration and limits to market share. There are also many examples of companies that establish a Market Trend, only to follow it too long to their demise. However, in the electricity industry – where investments are huge, the product is critical and the timelines are long – following a Market Trend can yield particularly disastrous results.

It is not only the utilities that follow Market Trends but often the regulatory and financial communities as well. Deregulation is perhaps the clearest example of a Market Trend (not a Megatrend, because it was changed). This Market Trend plunged parts of the country into chaos. The Megatrend of Customer Engagement was lost in the Market Trend push toward customer choice. There was a mistaken belief that what customers wanted was a choice of suppliers, when, in fact, customers want a choice in levels of service in order to lower their bills or special power needs.

Success will come to those companies that recognize Megatrends and take advantage

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of the ensuing opportunities. This will require taking some risk; creating a future based not on the past, but on aspirations.

The following are 10 suggested ways to take advantage of Megatrends:

1. Stop waiting for the perfect solution and perfect technology.
2. Ensure that business decisions focus on building your new commodity or service annuity, even at the risk of hurting the old.
3. Invest in infrastructure with no regrets; it may be costly in the short run but will pay off in the long run.
4. Embrace new technology; if you do not, your competitors will.

5. Begin speaking to your customers about your business in ways the general public will understand.
6. Use a best practices approach that targets the highest level of service and maximum operating efficiency; this will be more advantageous than a cheaper alternative.
7. Maintain regulatory relations; they will pay dividends in the future.
8. Take action in the right direction; organizations in pursuit of a new future will bypass companies standing still or looking back.
9. Buy/build a business that allows for expanded opportunity; adjacency will beat synergy any time, especially for

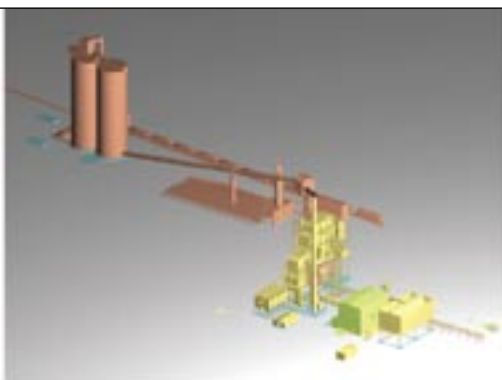
companies seeking synergy for savings and not to reinforce the commodity business.

10. Be ready for a dramatic shift in the functioning, profitability, reliability and sustenance of the current business model of the electric industry. ■

With more than 20 years of experience, Mark Gabriel provides organizational leadership and strategic planning services to the energy industry, both domestically and internationally. An Executive Consultant and Principal with R. W. Beck, he is proficient at leveraging people, technology, product/service offerings and competitive market positions to achieve organizational success.

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