Exploring the possibility of change in the US utilities' market orientation towards more renewable energy

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Abstract: This research examines the possibility of the US electric utilities' transition from closed to open systems, while taking steps towards new market orientation. By employing an inductive approach, it observes recent developments in two fronts: First, it observes that more renewable energy sources have been added to the power generation mix, and that utilities advertise their renewable energy related efforts through their websites. Second, it looks at the business environment from the perspective of market orientation. For this, the shifts in the business environment were put under the lens of four driving factors: customer support, regulation, competition, and technology.

Keywords: renewable energy; electric utilities; market orientation; power generation; sustainable development; USA.

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1 Introduction

Market orientation of an organisation centres around the development and implementation of an effective marketing strategy that focuses on its customers' needs and wants. A number of studies have found that successful market orientation generally results in positive business performance (Kennedy et al., 2003; McNaughton et al., 2001; Weerawardena and O'Cass, 2004). And, to achieve successful market orientation, companies must carefully identify target market segments and modify their product portfolios by designing new products or improving and streamlining the existing ones (Kohli and Jaworski, 1990).

What perpetrates the need for change in a company's market orientation usually has to do with external driving factors that can potentially have financial consequences to its stakeholders (Gebhardt et al., 2006; Beverland and Lindgreen, 2007). Jaworski and Kohli (1996) surveyed several earlier studies and concluded that market orientation focuses on not only the customers' needs and wants, but also competition, technology and regulations. Gebhardt et al. (2006) argued that literature was lacking in terms of research on the factors that initiate change in market orientation. The researchers, then, identified changes in competition and technology as two of the driving factors. Beverland and Lindgreen (2007) elaborated that negative financial consequences could be related to changes in technology and customer demand. In light of the literature above, this study considers the following as the driving factors of change in market orientation: *customer support*, *regulation*, *competition*, and *technology*.

Based on the definition of market orientation and the driving factors behind any changes in market orientation, it is possible to state that a market-oriented firm must be adaptable to change. And that change can be prompted by shifts in consumer support, competition and the overall business environment. That is to say, for a company to be market-oriented, it must be an open system rather than a closed one.

An open system can be defined as a group of inter-related sub-systems, which interacts with and therefore affects and is affected by the environment that surrounds it. A closed system, however, does not relate to other systems outside of its boundaries, and its awareness of internal sub-systematic relationships is often weak (Sireli and Mengers, 2009). Decisions in a closed system can be more tactical rather than strategic, while in an open system strategic decisions drive tactical decisions (Caulfield and Maj, 2001).

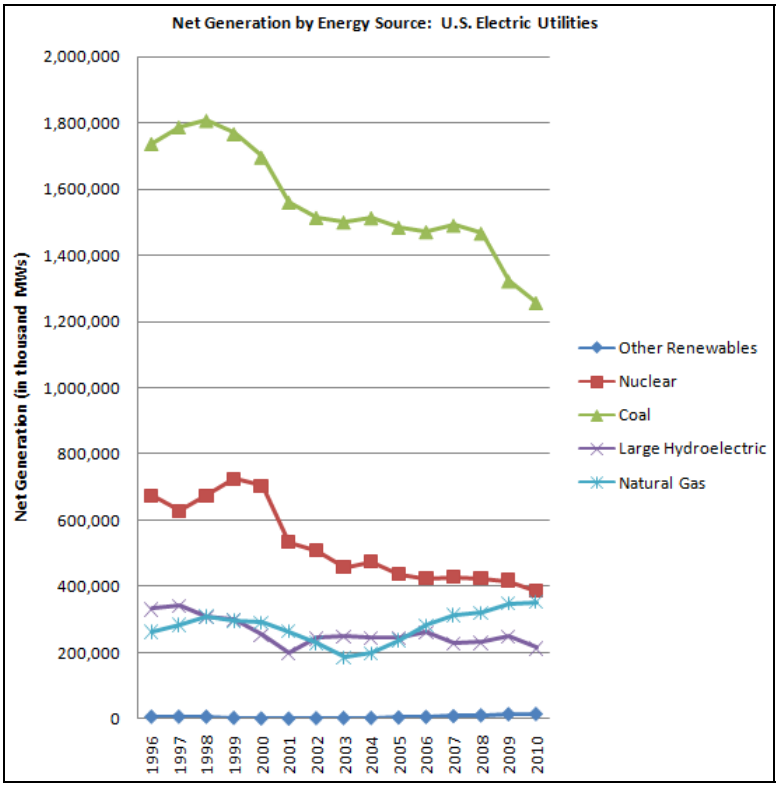
This study explores the possibility of the US utilities' transition from closed to open systems through the development of market orientation. For this, it, first, reviews a previous study (Sireli and Mengers, 2009), which investigated 23 US utilities, and concluded that adding more renewables was not a priority at the time the research was conducted. Then, it employs an inductive approach based on observing the rising market share of renewable energy in the USA, and the same utilities' efforts of communicating their renewable energy plans and applications to the public through company websites. After that, it investigates the business environment in terms of the four driving factors:

customer support, *regulation*, *competition*, and *technology*. And lastly, it concludes that the combination of the observations above fits into the definition of a changing market orientation in the energy sector.

2 The previous study: a brief summary

Sireli and Menger's (2009) research utilised a survey of 44 executive level decision-makers from 23 US electric utilities conducted through phone interviews between November 21 and December 16, 2007. The majority of these power companies had (and have) a combination of power generation sources including coal, nuclear, gas/oil, large hydro and other renewables. And, overall, conventional sources such as coal and nuclear are the largest ones while other renewables contain the smallest share, which is considered representative of the US power sources as shown in Figure 1.

Figure 1 A comparative summary of net generation capacity of different power sources between 1996 and 2010 (see online version for colours)



Source: Data from US Energy Information Administration (2011)

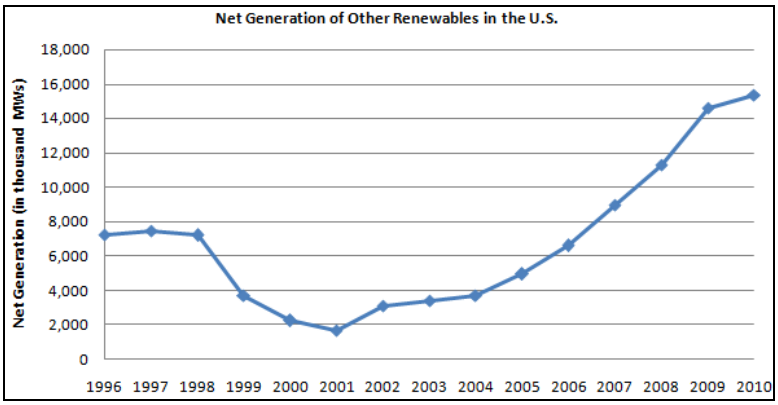
Among other conclusions, the analysis of the survey revealed that competitiveness of conventional power sources with new generation alternatives such as renewables was believed to be an insignificant issue by 71% of the survey participants. It was also found that new power generation alternatives such as renewables were not regarded as an urgent or challenging area that required immediate attention.

The following section investigates any developments in terms of this view of renewables by looking into the amount of renewable sources added to the national generation capacity since then. It also investigates the existence of any signs of marketing in terms of the selected utilities' renewable energy efforts. The list of utilities is the same as the one in the previous study (Sireli and Mengers, 2009) for comparability purposes and due to the fact that they constitute a representative group of US utilities based on the overall combination of power sources.

3 A look at renewable power generation in recent years

According to the US Energy Information Administration's Annual Energy Outlook for 2011 (US Energy Information Administration, 2011), currently conventional energy such as coal and nuclear remain the largest generation sources in terms of their market share. However, an early release of the Annual Energy Outlook for 2012 (US Energy Information Administration, 2012) predicts that the share of conventional sources such as coal and nuclear is projected to drop (from 48% in 2008 to 38% in 2035 for coal; from 20% in 2010 to 18% in 2035 for nuclear). Figure 1 includes a summary of the comparative net generation capacity values of conventional (coal and nuclear) and renewable (large hydro and other renewables) power generation sources between 1996 and 2010, which provides historical data that support these predictions (Data from the US Energy Information Administration, 2011). Figure 2 takes a closer look at the 'other renewables' segment during the same 1996–2010 time period (US Energy Information Administration Data, 2011). According to the definition provided by the US Energy Information Administration, other renewables include wood, black liquor, other wood waste, biogenic municipal solid waste, landfill gas, sludge waste, agriculture by-products, other biomass, geothermal, solar thermal, photovoltaic energy, and wind. From this collective data, even though renewable energy was not considered as a significant energy source in 2007 as a result of the previous study, it is possible to conclude that more renewable sources of energy were, in fact, added to US utilities power generation portfolios.

Figure 2 Power generation capacity of other renewables between 1996 and 2010 (see online version for colours)



Source: Data from US Energy Information Administration (2011)

Table 1 The utility list

Utility	*Website*
Exelon	http://www.exeloncorp.com/Pages/home.aspx
Entergy	http://www.entergy.com/
First Energy	https://www.firstenergycorp.com/content/fecorp/fehome.html
Duke Energy	http://www.duke-energy.com/residential.asp
Southern Company	http://www.southerncompany.com/
South Texas Project	http://www.stpnoc.com/
Nuclear Management Company → Xcel Energy	http://www.xcelenergy.com/
Nebraska Public Power District	http://www.nppd.com/
American Electric Power	http://www.aep.com/
Southern California Edison	http://www.sce.com/
Progress Energy	https://www.progress-energy.com/
South Carolina Electric and Gas	http://www.sceg.com/en/
Arizona Public Service	http://www.aps.com/
PPL	http://www.pplelectric.com/
Luminant	http://www.luminant.com/
Constellation	http://www.constellation.com/pages/default.aspx
TVA	http://www.tva.gov/
PSE&G	http://www.pseg.com/
Energy Northwest	http://www.energy-northwest.com/
Pacific Gas and Electric	http://www.pge.com/
Dominion	https://www.dom.com/
Omaha Public Power District (OPPD)	http://www.oppd.com/index.htm
DTE	http://www.dteenergy.com

In addition to the growing renewable share in power generation, this study observed 23 selected US utilities' marketing efforts of renewable energy based on the designs of their websites. The list of these companies along with the links to their web pages can be found in Table 1. The authors reviewed each website with the consideration of the three questions provided below.

1 Do any environmental efforts (implementation or plans) noticeably mentioned on the home page or easily accessible with clear visibility via the home page?

2 If the answer to the first question is 'yes', does the language include any or some of the following?
   - climate change
   - renewable energy
   - green power

- greenhouse gasses/carbon emissions.

3 Does the design of the home page suggest sensitivity to environment with overwhelming green colours and/or easily noticeable nature images and/or renewable energy-related images? (Very small images are out of consideration.)

Based on these questions, the following observations were recorded:

1 69.6% of the companies mentioned their environmental efforts or plans on their home page with easy access and clear visibility while 30.4% did not.

2 All of the companies that embodied the 69.6% in the first question used a combination of the renewable energy-related phrases included in the second question. And, the phrase 'climate change' or 'greenhouse gasses/carbon emissions' was often accompanied with 'renewable energy' or 'green power'.

3 47.8% of all the companies used home page designs suggesting environmental sensitivity as mentioned in the third question while 52.2% did not.

Considering that the majority of the selected utilities have a combination of power generation sources, and overall, conventional sources are the largest ones while other renewables have the smallest share, these observations are significant. They show that, regardless of the level of commitment to renewables, companies are eager to communicate their sensitivity and response to environmental issues with a focus on renewables.

4 Possible change in market orientation and its driving factors

This section investigates the changes in the business environment in terms of their fit into the definition of market orientation and its driving factors. What initiates the need for change in a company's market orientation is often an external push with financial consequences (Gebhardt et al., 2006). And, as discussed earlier, this study considers the following as the driving factors of change in market orientation: *customer support*, *regulation*, *competition*, and *technology*. These factors are discussed in the subsections below.

4.1 Customer support

As attention to renewable energy grew over the past decade, there have been a number of studies conducted on the US consumers' willingness to pay (WTP) and investors' preferences for renewable energy. Roe et al. (2001) surveyed 1,001 consumers from different parts of the USA and employed 835 useable inputs for a WTP analysis for green electricity. The survey analysis concluded that consumers were willing to pay for reduction of emissions even if the power generation mix did not include renewable sources. This study also found that US consumers appreciated alternative energy sources, which suggested that customer demand could sustain renewable energy generation, particularly if the price of renewable energy was reasonable. Borchers et al. (2007) studied the US consumers' WTP for green electricity as well as their preferences of different types of renewable energy. They found that there was a positive WTP for green

electricity in general; solar and wind energy being the most popular (the WTP was higher for solar energy compared to wind). Mozumder et al. (2011) investigated New Mexican households' WTP for renewable energy with a survey of 367 inputs. The researchers concluded that the residents were willing to pay a significant amount of price increase for renewable energy. Based on increasing consumer interest in green energy, Aguilar and Cai (2010) studied investors' willingness to invest in renewables. The analysis of a survey of 217 investors revealed that there was significant potential for investing in green energy; particularly in solar and wind sources of energy. As a result, the literature so far showed positive WTP for renewable energy and also indicated investors' interest in renewable energy.

One cannot review consumers' behaviour toward renewable energy without looking into their opinion on climate change. Brulle et al. (2012) assessed shifting public opinion on climate change between January 2002 and December 2010 by conducting 74 surveys over this nine-year time period. Based on the consumers' concern levels about this issue, the researchers modelled a climate change threat index. Their findings indicated that the most important factors driving public opinion were the democratic and republican partisan battle over this issue and the frequency of media coverage. Since there was a decline in partisanship on climate change in years 2006 and 2007, and due to the release of Al Gore's *An Inconvenient Truth* around the same time, public concern was on the rise. Beginning with 2008 through 2010, the politically motivated discourse that advocates the denial of climate change has gained traction and started to cause a shift in public opinion in the opposite direction. The economic downturn and the increased focus on the national security pushed the issue of climate change towards the bottom of the general public's agenda as this issue found increasingly less coverage in the popular media. Consequently, the public concern over climate change entered a decline phase between 2009 and 2010. Brulle et al. (2012) indicates that the climate change threat index peaked in 2007 to its highest level, and again to a lesser level in 2009. In 2010, however, it fell to the same levels that it had been before 2006 when the climate change awareness had begun to gain ground.

Although public concern over climate change seems to have declined since 2009, according to the studies covered above, the US consumers' WTP is on the rise as well as the net generation of renewable energy as shown in Figure 2. In addition, according to the US Energy Information Administration's Annual Energy Outlook (2012), the renewables' market share of power generation is expected to increase from 10% in 2010 to 15% in 2035, while the share of conventional sources such as coal and nuclear is projected to drop (by 10% from 2008 to 2035 for coal; by 2% from 2010 to 2035 for nuclear).

Based on the literature review above, although climate change concerns have subsided to a certain level, US consumers seem to continue to support renewable energy. At the time of this study, the authors did not find published research on the relationship between climate change concerns and support of renewable energy in the USA other than Culley et al.'s (2011) work. The researchers surveyed 277 undergraduate psychology students at a Southeastern university and concluded that there was a positive correlation between climate change concerns and willingness to support green energy. However, this study is rather limited in terms of its participant pool and representation of the US consumers. Consequently, although there is not enough data available for or against it at this time, it could be postulated that:

- The US consumers do not base their support of renewable energy on climate change. Therefore, their concern over climate change does not affect their rather positive opinion of renewable energy.
- The public do base their opinion of renewable energy on climate change. But, the belief in climate change and the concern related to climate change are separate concepts. The belief in climate change may cause the consumer to support renewables even though the consumer does not feel particularly concerned about it causing alarming consequences.

4.2 Regulation and competition

Federal and state governments' new policies and actions to encourage and regulate the generation of renewable energy are changing the business environment. While tax incentives and subsidies have an encouraging impact to add more renewable energy to the utilities' power generation portfolios, certain government mandates have a forceful effect. And, deregulation brings new competitive vigour to the environment. These are discussed below.

4.2.1 Tax incentives and subsidies

Recent federal government actions have created an environment that is favourable for the operators and investors of the renewable energy generation systems. One of the most notable of the legislative actions was the introduction of the American Recovery and Reinvestment Act (US Congress, 2009), which featured a number of incentives and subsidies for the renewable energy producers.

The tax section of the American Recovery and Reinvestment Act (US Congress, 2009) provides a three-year extension of the production tax credit (PTC) for most renewable energy systems. The tax incentives that depend upon subsequent congressional reauthorisation cover various renewable energy generation systems including wind, solid waste, qualified hydroelectric, and biomass-based power generation systems. In addition, utility companies are provided with an option to choose a 30% investment credit rather than the PTC. Alternately, utilities are offered an opportunity to apply for a grant that is equal to 30% of the tax basis for the production facility. The government incentives lowered the cost of building and operating renewable energy facilities and contributed to the expansion of renewables in the current fleet of power plants (US Congress, 2009).

4.2.2 Government mandate

A number of new developments and expectations in the area of government mandated requirements for the renewable energy generation have also played a significant part in shaping the recent shift in the composition of the national electric utility fleet. There are a number of indications that the renewable energy standards are in the process of being reviewed by the federal government and a change in standards is on the horizon.

The term 'renewable electricity standard (RES)' refers to the government requirement that forces qualified electricity retailers to offer a minimum specified share of their total electricity sales from qualifying renewable power generation (Sullivan et al., 2009). RES policies are designed to stimulate utility companies to build new renewable energy

generation facilities or purchase tradable renewable energy certificates (RECs) to demonstrate their compliance. There are a number of RES proposals that are being evaluated at federal level. The required targets for the shares of renewable sources vary between 20% and 25% with a compliance deadline ranging from 2021 to 2025 (Sullivan et al., 2009).

Renewable energy standards can also be regulated at state level. Currently, 30 states have renewable portfolio standards and an additional eight have voluntary goals for renewable energy generation (DSIRE, 2012).

Current proposals, initiatives, and dialogues in various legislative platforms at both state and federal levels, indicate that the stricter government regulations are likely to compel utilities to increase their renewable energy offerings dramatically. To illustrate, a new renewable energy standard bill was introduced on March 1, 2012 in the Senate of the USA to be enacted by the Senate and House of Representatives. The bill requires that, starting in 2015, a minimum of 24% of electricity sold by large utilities to be generated by using clean energy sources. The required portion of the clean energy will increase by 3% each year until 2035. The bill allows utilities to exclude their energy output based on nuclear and hydropower generation in the calculations of the required amount of clean energy (US Congress, 2012).

4.2.3 Electricity market under deregulation

Deregulation alters the electricity market such that while traditionally an electric utility was the active provider in its service area without competition, under deregulation, the customer is allowed to pick and choose their electricity provider among competing utilities (Rothwell and Gómez, 2003). This indicates a transition from monopoly to free market, which is a significant change in service provider – customer relationship.

In the regulated structure, the regulator (Federal Energy Regulatory Commission – FERC) determines the interstate tariff while state public utility commissions have authority over the consumer prices. The utilities are allowed to maximise profit subject to regulatory constraints by passing the cost to the customer. Therefore, in a regulated market where there is no competition; there is little incentive for utilities to reduce costs or to make investment decisions with consideration of risk. With deregulation, due to competition in the marketplace, the recovery of investment is not certain (Rothwell and Gómez, 2003).

According to FERC's latest strategic plan for the 2009–2014 time span, its first objective is to "ensure implementation of appropriate regulatory and market means for establishing rates" [FERC, (2009–2014), p.7]. And, the first strategy to accomplish this objective is to "establish rules that enhance competition by allowing non-discriminatory market access to all supply-side and demand-side energy resources" [FERC, (2009–2014), p.7]. FERC foresees that demand response can help put competitive pressure in the market to reduce prices, increase reliability, and with the help of emerging technologies, provide opportunities for new renewable energy sources. Integration of renewables is listed among FERC's long-term goals in the commission's strategic plan that spans fiscal years from 2009 to 2014. The commission is committed to explore the suitable 'market reforms which will allow renewable resources to compete fairly'. FERC's strategic plan also aims to implement such reforms in the markets within its jurisdiction [FERC, (2009–2014), p.11].

4.3 Technology

There have been developments in renewable technologies that have made this type of energy generation and usage more accessible and affordable than ever before. There is also considerable support behind the transformation of the industry toward a smart-grid structure.

FERC (2009–2014) is to administer the implementation of smart grid technologies as the future smart grid is expected to facilitate the free flow of energy between consumers and utilities. It also elevates the reliability, security, and efficiency of the grid by adapting the state-of-the art technologies used in computer networks and information systems to the field of energy generation and distribution. In October 2009, California became the first state that signed smart grid initiatives into a law, which features policies for electric utilities to create a smart electric grid in the state. At federal level, American Recovery and Reinvestment Act (US Congress, 2009) provided funds for smart grid related research and development projects. In addition, the Title XIII of the Energy Independence and Security Act of 2007 (EISA) (US Congress, 2007) supports DOE's activities in the field of smart grid by reinforcing its role in leading the efforts that modernise the national grid.

5 Conclusions and future work

This study explored the possibility of the US utilities' changing market orientation towards more renewable energy with an inductive approach. It observed the recent developments in two fronts: First, it reviewed that more renewable energy sources have been added to the power generation mix, and that utilities advertised their renewable energy related efforts (either in application or as a plan) through their websites. These were interesting observations since a 2009 study that included a survey of utilities in 2007 suggested that adding renewables was not a major goal at the time. Second, to examine what could have caused this change, the authors looked at the business environment from the perspective of market orientation. For this, the shifts in the business environment were put under the lens of four drivers, which were defined as customer support, regulation, competition, and technology.

Based on literature search, it was found that customer support seemed to exist for renewable energy in the USA as surveyed consumers in different studies were willing to pay a higher premium for renewable energy. Regulation was a reality due to the federal and state governments' new policies to compel utilities to increase their renewable energy offerings. In addition to mandates, the US Government also encouraged the energy sector to add more renewables through tax incentives and subsidies. The government's plans for deregulation promised to insert competition into the market as never before. And, finally, new renewable technologies have been introduced and become more accessible and affordable over the years.

The observations above indicate that there are all four of the driving factors of change in market orientation in the energy sector at the moment. This, and the fact that utilities seem to be responding with adding more renewables and marketing these efforts to the public, suggest that this is a case that could be viewed as a sign of new market orientation in this sector.

This study followed an inductive approach rather than a deductive one as the conclusions have been reached by observing recent developments. Since inductive reasoning carries a significant amount of uncertainty, future research could include a deductive approach to help base these conclusions on a more specific foundation.

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