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Q&A: Experts debate the market outlook for renewable energy and other 'green' initiatives

Q. What if any innovations are taking place in North Texas in use of or investment in renewable energy?

H. Sterling Burnett: Real innovation and breakthroughs are taking place in biofuels from algae. Industry is investing significantly in this technology, as fuel from algae may be easier and less expensive to produce, extract, refine and work better in engines than ethanol from corn, sugar or even switch grass. On the electric power front, because of government mandates and huge tax subsidies, renewable are growing. However, the real need for innovation and development needs to come from the distribution side — we can build all the wind turbines and solar arrays we want, but if we can't get the power from where it is generated to where it is needed, it's just an exercise in expensive futility. Southern Methodist University is doing some interesting work in geothermal energy, a growing field. In addition, more and more municipal landfills are turning trash into power.

Harold Green: Before we discuss renewable energy we need to look at natural gas. While there has been some controversy, the Barnett Shale has made North Texas a major player in helping secure America's energy independence. With new drilling

techniques we have seen new gas discoveries across the United States. We now have over 100 years' supply of clean efficient natural gas. It is time for federal energy legislation to encourage the use of this cheap plentiful resource for both electric generation and for powering our cars, trucks and buses.

Now as for renewable energy, Texas is leading the way with wind power. In fact demand and competitive markets have delivered more wind generation at a faster pace, than required by state regulations. But the issue with delivering wind resources from West Texas is transmission-transmission-transmission. The Texas Legislature and our state regulators have recognized the need for providing new and improved transmission lines to bring the state's wind generation to North Texas and to the other major metropolitan areas of the state. And companies like Energy Future Holdings are working hard to build the transmission highways necessary to bring that wind energy to North Texas consumers. Texas is well ahead in establishing the model for transmission for the rest of the country and investors should feel confident in making investments in wind generation.

One way to reduce demand for new electric generation is the use of roof-based solar

panels on business facilities. The use of roof mounted solar heating and solar electric systems can have a significant impact on Texas' future energy requirements and help improve our environment. The tax incentives are in place; all we need is for more companies and individuals to move to solar power. There are also good incentives for single business wind turbines, so at this point it really is up to us to move toward our own energy independence.

My one final point in this area however, is that the country still needs to drill for oil. Oil is the life blood of this country's energy needs and its economy. And there really is no excuse for not drilling or pursuing new oil discoveries across America. Couple new oil supplies with our abundant natural gas and expanded use of renewable wind and solar energy, add in new nuclear power plants and we can truly make America's future energy independent. All we need included in this mix is clean coal technology for electric power plants. And hopefully some day the promises of that technology will be fulfilled.

Bryan Urban: North Texas has a unique position in the advancement for renewable energy in the state and nation. T. Boone Pickens has certainly brought significant attention to the continued need for large amounts of renewable energy and transmission infrastructure, and his initiatives have stimulated significant attention to the renewable industry both locally and at a national level. North Texas is currently and will continue to realize the benefits of the large scale wind farm development in West Texas. At the same time, North Texas companies, many with significant Barnett Shale development programs, are promoting a balanced approach to U.S. energy needs involving the

utilization of cleaner conventional sources, such as new natural-gas fueled generation.

There is also an interesting initiative, spear-headed by SMU's Geothermal Laboratory, which promotes the development of renewable geothermal energy from existing oil & gas properties, many of which are past their production stage. The concept brings the interests and knowledge of the oil & gas industry together with the benefits of renewable energy from the earth. In essence, the process involves the utilization of existing abandoned wells with substantial down-hole temperatures, significant pressure and high water volume to generate power through the flow of fluids to the surface. Although it is still in the commercialization stage, it could provide a significant long-term source of base-load renewable energy for Texas.

Q. How important do you think renewable energy will become in the next decade, and what percent of electricity do you think it can achieve?

Burnett: Government mandates are forcing power companies to use renewable energy even when it does not otherwise make economic sense. In addition, subsidies are making the business profitable for some. Whether the growth we've seen in the industry continues is almost solely a factor of two things: the price and price volatility of traditional fuels; and the government's continued commitment to forcing or enticing companies and individuals to invest in renewable energy development. If government support wanes and the price for traditional fuels are low and largely stable, then renewables will fade. On the other hand, if the government continues to back costly, unreliable sources of energy, and the price for traditional fuels remain high or swings wildly between highs and lows, then

renewables will continue growing. After all, if the government leaves companies no choice but to use a technology, if they wish to stay in business, they will use it. The government can create thousands of jobs in the window and glass industry by paying people to smash windows – that doesn't mean it's a productive use of scarce resources. That's how I see this push for green jobs. Government policies can create and sustain them, they did in Spain, which is far ahead of us in this regard, but what they have found, is that for every green job created, 2.2 jobs were lost in other sectors of the economy – Texas will be especially hard hit by this since these job losses will come in energy intensive industrial sectors including oil, gas, chemical refining, concrete production, and agriculture, which make up a significant portion of the economy.

On the other hand, much of what is driving the current growth in renewable energy is climate change or fear of climate changes legislation. If the scientific tide shifts – and I do see some evidence of this – and global warming ceases to be of much public concern, and federal and state legislatures and administrative agencies haven't locked us into long-term policies that create vested interests who will fight to continue the policies regardless of their efficacy or continuing need, then industry and public demand for renewables will fade as costs and reliability once again become the dominant concerns.

Regardless of legislative intent, however, I don't believe renewables absent a huge breakthrough in energy storage (including battery) technologies will account for more than 10 to 15 percent of the electric power market simply due to the fact that the public will not long put up with legislators that don't understand that people want their

lights to come on every time they flip the switch, that they never want to come home and find the food thawed out in their refrigerators and freezers because it was cloudy or raining for a few days running or because the wind didn't blow for a while, and they will absolutely revolt – especially in Texas, if the air conditioning doesn't run as desired in the summer. Reliability is even more important to electric power users than price, and renewable are unreliable and in large amounts absent a significant investment in the transmission grid, they make it less reliable as well.

Green: If the United States Congress passes a national renewable portfolio standard or places limits on carbon emissions, then renewable energy, especially wind and solar will increasingly become more important. However wind can only produce power about 40% of the time and it often only blows at night. And solar only works when the sun is out. That means that for every kw of wind or solar energy, there needs to be a kw of energy produced from natural gas, coal or nuclear power. And we may find it difficult to get companies or investors to build plants that only run when the wind and solar facilities cannot operate.

In order to solve the problems associated with the availability of wind and solar power, technology advances need to be made in battery storage of electricity. Without the ability to store electricity until it is needed, our use of renewable electricity will continue to be limited and it cannot become a significant part of the State's base load energy supply.

Urban: Renewable energy has, and will continue to become very important to the domestic and global energy landscape. Continued growth in overall energy use, particularly in Asia, is putting significant

pressure on traditional sources of energy. Combine that with more stringent environmental policies worldwide and the need for new, clean, renewable sources of energy will be very important. In the next decade, renewable energy in the US could grow to around 20% of total electric production and 15% of transportation fuel (from 10% and 8% in 2008, respectively). It is obvious that, certainly in the next ten years, renewable energy is only part of the solution. There continues to be a significant need to grow, or at least maintain, the current levels of traditional, fossil-fuel based energy sources. This demands a balanced approach to continued energy development. It is important to stimulate the growth of renewables, but at the same time there is a need to incentivize investment in clean sources of traditional power and fuel production. That includes promoting the better use of our current energy platform with things like SmartGrid technology, energy efficiency programs, battery development and engine efficiency standards.

Q. Has the market for biofuels faded, or is this still a viable market for some North Texas companies to consider using or investing in and why?

Burnett: The short-term the market for biofuels is dim. The industry ramped up quickly with the passage of various energy acts during the Bush administration which required that increasing percentages of ethanol be blended into gasoline. However, the sector was overbuilt in a very short period of time, that's why so many ethanol distilling plants were cancelled before or even during construction, and why some that were built now sit idle and the companies formed to operate them are bankrupt. Demand increased but not nearly as fast as supply. In the long-term, the future for

biofuels is brighter, especially if laws already in place mandating ever greater amounts of biofuels are not rescinded. In addition, innovations and technologies currently being developed that can turning non-traditional feedstocks into fuel, (e.g., algae, manure, etc...) may make biofuels profitable and efficient when compared to corn-ethanol and perhaps even traditional fossil fuels (though that is a long way off).

Right now, the current economic downturn is significant factor in limiting new investment in biofuels and other renewable energy sources. Investment capital from both banks and venture capitalists for either traditional and "green" projects is much more limited than it otherwise would be under normal economic conditions.

Green: There is still a need to keep in place a substitute for MTBE and ethanol does that. However the market for corn-based ethanol in fuels like E 85 as a substitute for petroleum based gasoline does appear to have faded. This is because the "food to fuel" movement may have been good for farmers, but it had negative tradeoffs for the rest of the economy. However the price of oil just reached its 2009 high, and will continue to rise as the economy improves. So biofuels such as ethanol can become very important once we find an economical way to make ethanol, or other biofuels, from sources other than food crops.

One biofuel that I believe has a very bright future is Biodiesel. There are several North Texas companies and cities leading the way in this effort. Taking used cooking oil grease and turning a waste product into a fuel makes a lot of sense. Cities can use methane gas from municipal landfills to power biodiesel plants. The plant then turns waste cooking oil from restaurants into biodiesel that can be used to fuel the city's trucks and

buses. I find that potential exciting and a great future for renewable energy.

I again want to bring up natural gas, which is now plentiful, efficient and clean, and produced in North Texas. We need to be focusing on using it to power our homes and businesses as well as our governmental fleets of cars, trucks and buses. Which is why DART should be commended on moving in that direction for its new buses. We also need to encourage Congress to add incentives to any future energy bills for the construction of new natural gas power plants, a natural gas infrastructure for fueling motor vehicles, for the conversion of our existing fleets and for the development of new cars and trucks powered by natural gas. This will not only help our environment but it will also help the economy of our state and region.

Urban: No. The past few years have been extremely difficult for biofuels as evidenced by numerous bankruptcies in the industry. The problems were the result of a combination of factors including: (1) excessive leverage, (2) rampant commodity speculation which drove feedstock cost higher, (2) poor risk management practices on the part of many facility owners and (4) rapid expansion in production capacity that outpaced the build out of distribution infrastructure. There are currently, however, many positive things happening which should strengthen the biofuels industry and result in biofuels continuing to be a part of the overall U.S. energy supply.

The biofuels industry is in the process of going through a period of consolidation in which many of the weaker players are being replaced by stronger, better capitalized owners. This has become evident lately as major refiners such as Valero, Sunoco and Murphy Oil have all stepped up and

acquired facilities in the ethanol space. The entrance of the oil and gas industry into the space lends much needed credibility to the biofuels industry that it did not have in the beginning. Not only are stronger players stepping into the industry, but they are acquiring these facilities at significantly discounted prices and with less debt, making the plants much more economic on a go forward basis. In addition, commodity speculation has abated as of late and corn crop yields and production have continued to increase, resulting in feedstock prices dropping significantly and margins coming back into the business.

Supply and demand fundamentals have improved as distribution infrastructure has continued to be built to handle greater volumes of biofuels. Additionally, the recent troubles in the biofuels industry combined with poorly functioning financial markets have brought new capacity additions to a halt. Both factors will assist in stabilizing the current production economics. Biofuels demand continues to be strongly supported by the federal government as evidenced by the blender credits and the renewable fuels standard which calls for a minimum amount of biofuels to be blended with gasoline each year. In addition, corn based ethanol supply growth should be limited in the future as current supply stands at approximately 13 billion gallons and the renewable fuel standard places a 15 billion gallon cap on starch based ethanol.

Going forward, the U.S. biofuels industry is not likely to see the wide margins that it experienced during the time of major expansion; however, margins should be high enough in the future to continue to attract an appropriate level of capital and allow biofuels to remain a viable solution for part of our domestic energy needs.

Q. With stimulus grants available for energy efficiency initiatives, including renewable energy sources such as wind and solar, how viable are these options for North Texas businesses in terms of short- and long-term cost?

Burnett: Even with grants, incentives and tax credits and deductions, it is unclear how worthwhile investment in energy efficiency initiatives and new energy sources are for most businesses. Let me use a newswire story that ran in the Houston Chronicle and the Austin American Statesman two weeks ago to reinforce this claim. The story reported on a study which claimed that building all new homes with solar power “net-zero homes” would dramatically clean Texas skies and save billions in utility bills. The report examined a 40-house net-zero development under construction about 2 miles from downtown Austin. The average house there is about 1,450 square feet with a price tag of about \$270,000. The energy efficiency upgrades (solar panels, super insulation, etc) were estimated by the builder to add 15 percent to the price of the home or approximately \$40,000. The study also estimated it would save the average homeowner about \$500.00 annually on their energy bill. A back of the envelope calculation shows that at that rate, it would take 80 years to recover the initial costs. Worse, solar panels deteriorate over time and the power they produce declines over time. Indeed, their entire useful life is about 20 years, so the homeowner would never recoup the additional costs of the solar panel rather by replacing the panels every 20 years the homeowner throws good money after bad. And this is a best case example, if the energy savings aren’t as great as expected, or the panels or other efficiency improvements break or wear out sooner than expected, the net loss to homeowners will be even greater. Businesses would be no more

likely to recoup their investments in energy efficiency than the homeowners in the above example.

Green: Incentives have been instrumental for the development of wind and solar energy. In Texas they have been one of the major keys to the development of large scale wind projects. The other factors have been a competitive market structure and a robust and growing transmission grid. Incentives will continue to play a major part in the development of renewable energy. And stimulus grants should be viable options for North Texas businesses for both short- and long-term cost. I think this is especially true as we improve transmission from West Texas to the growing communities of North Texas.

Urban: North Texas businesses will benefit from the continued development of large scale renewable energy projects throughout Texas, mainly large wind farms. The stimulus grants are making these types of projects easier to finance and complete. An example of this is the recent announcement of \$72.5 million in federal grants awarded to a large developer for a 120 MW project in Jacksboro County. That represents nearly 30% of the capital cost of the project, which allows for the competitive pricing of the power production in the wholesale market. Ultimately, that means lower-cost renewable energy options for North Texas businesses.

Alternatively, the incentives for installation of smaller applications (such as rooftop solar) are not as strong in Texas. The cost-benefit analysis needs to be enhanced with additional state incentives to make distributed solar installations more viable to businesses in the short-term. Certainly there are additional political and social benefits from installing residential or commercial scale wind or solar projects (which have

long term benefits), but in the short term, the economic benefits are limited, especially with natural gas prices at current levels around \$3-4 range. As natural gas prices rise to \$6-7 levels, which drives power pricing in Texas, the short-term economic benefits of renewable energy alternatives will become more apparent.

Q. How popular do you see Leadership in energy and environmental design certification and Energy Star ratings becoming in existing or new buildings in North Texas, especially given the current tough economic climate?

Burnett: Some criteria, conditions or technological specifications that can be used to garner LEED certification would almost certainly make sense for new construction for some businesses under any economic conditions. However, to the extent that the LEED certified buildings and products with the energy star rating are more expensive than less energy efficient construction and products – and they are -- , in the current economic climate they are less attractive. Rather than purchase a energy star new computer or appliance families and businesses will use the older ones longer. There are a lot of non-LEED certified commercial and industrial buildings sitting empty. In hard economic times, all other things being equal, companies in the position to expand or begin a new start up will likely look to rent or purchase underutilized existing facilities before building new ones.

This is even more true when one realizes that the energy savings touted by the most fervent advocates of energy efficiency either fail to materialize or are not as great as advertised which means a company's or family's utility bills are not reduced by the expected amount. For instance, a few years

ago, as part of a study on future electric power needs in Texas , I examined two studies produced by or for environmental lobbyists which claimed that Texas did not need new coal fired power plants or really much new energy production at all, rather Texas could meet its future electric power demand almost entirely through conservation. In addition, they claimed it would save consumers money since as they put it “the cheapest kilowatt, is the one you don't have to produce.” The problem is, I looked at the five states that they claimed set the bar for efficiency gains and thus proved their case , each and every state faced power shortages and their consumers paid more for electricity than in Texas – and this was when natural gas prices were at an all time high. Their analyses suffered from several weaknesses one of which being, they ignored the fact that the efficiency gains from conservation mandates made it cheaper for people to use power, thus they used more of it. Efficiency creates energy demand, counterintuitive but it proves out time and again.

Green: I am not a builder nor am I an expert in building construction. However bottom line issues will continue to be bottom line issues, especially in a down economy. In new buildings the cost of energy may very well become the overriding factor. If it looks like energy will remain cheap, then builders might not look at the additional investment needed to get LEED certification or use products that have Energy Star ratings.

However builders and companies thinking long term may find that both the LEEDs certification and the Energy Star ratings programs are valuable for two very important reasons. First money spent up front in construction may very well pay off in time, especially if the cost of energy goes up. Second, for marketing purposes they

may want their customers to know that they are taking steps to lower their energy use and improve their environmental footprint. One additional factor may help determine if builders and companies decide to get both LEEDs certification and use Energy Star rated products and materials. The very real potential of CO2 regulation could easily increase energy costs by 50% to 100%. This makes both programs very attractive for new buildings and for the retrofitting of existing buildings. Only time and legislation will tell.

Urban: Energy consumed in buildings and homes is responsible for nearly 43% of U.S. carbon emissions. One study by the American Solar Energy Society estimates that by 2030 over 50% of the nation's reduction in greenhouse gas emissions could come from improving energy efficiencies in our buildings and home. Therefore building retrofits and improved building designs represent a large opportunity for lower energy consumption and environmental improvement.

Many of the projects associated with existing buildings can also have reasonable payback periods as well. Most notable examples include use of Energy Star compliant electronic devices, changing to high efficiency lighting, weatherization and heating and cooling system retrofits. Despite current economic conditions, we will continue to see a trend toward energy efficient building designs and developers seeking LEEDs certification for new buildings. Buildings such as Roy Lee Walker Elementary School in McKinney use energy efficient design features like daylighting, high efficiency lighting, solar water heating and wind energy. Despite the incremental upfront cost that can come with an energy efficient design, the benefits can provide significant savings over the life of the building.