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## MUSINGS FROM THE OIL PATCH

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**Note:** *Musings from the Oil Patch* reflects an eclectic collection of stories and analyses dealing with issues and developments within the energy industry that I feel have potentially significant implications for executives operating and planning for the future. The newsletter is published every two weeks, but periodically events and travel may alter that schedule. As always, I welcome your comments and observations. Allen Brooks

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### German Economic Data Points To Slow Growth – Energy, Too?

**The May Ifo index was the lowest recorded for the year and raises questions about German energy demand**

The latest German Institute for Economic Research (Ifo) index of business-climate conditions for May fell to 110.4 from April's 111.2. Moreover, the May results missed the consensus expectation of 110.9. "The renewed fall in the Ifo in May suggests that the German recovery may be slowing," says economist Jennifer McKeown. She went on to say that growth will probably "not be strong enough to drive a rapid recovery across the Eurozone or to eradicate the threat of deflation." The May Ifo index was the lowest recorded for the year and raises questions about German energy demand and what impact the country's *Energiewende* is having on economic development. This may be an important data point given that the German Bundestag is debating legislation to modify the 2000-enacted Renewable Energy Resources Act (in German "EEG").

**Individual households have borne the brunt of the cost of EEG as the policy was structured to protect heavy export industries**

The EEG has been responsible for Germany's unprecedented boom in electricity generated from renewables. This is the most impressive aspect of *Energiewende*, but it has come at a significant cost to residents and the economy. Individual households have borne the brunt of the cost of EEG as the policy was structured to protect heavy export industries, especially the German auto companies. The reforms of this policy, designed by the new center-right coalition government, are being debated as green power generation is peaking. In 2014's first quarter, renewables generated 27% of all electricity produced in Germany. Renewable-generated power totaled 40.2 billion kilowatt-hours (kWh) in the quarter versus 35.7 billion kWh in the year-ago quarter.

The performance of the electricity industry on May 11<sup>th</sup> – a cloudless, windy day across Germany – when electricity from renewables accounted for 75% of the country's power is cited as an example of the problems associated with the EEG policy. It has

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**Renewable power's volatility has created serious problems**

been too successful in producing green power, but renewable power's volatility has created serious problems. These problems include: renewable generating capacity is running well ahead of the expansion of the power grid; consumer electricity prices have risen too quickly and too high; industry is struggling with what high electricity prices have done to its global competitive situation; and Germany's Eurozone neighbors have complained about unwanted transit of this renewable power on their grid systems. All of these issues are symptoms of a dysfunctional national power market.

**A coalition government that would include elements interested in reforming the *Energiewende* policy to force industry to pay more of its share of the energy industry transformation**

It was well-reported that the results of the German national elections would force Chancellor Angela Merkel to form a coalition government that would include elements interested in reforming the *Energiewende* policy to force industry to pay more of its share of the energy industry transformation, while maintaining its strong green-orientation. The reforms to the EEG currently being considered include: scaling down the feed-in-tariff rates; placing caps on the amount of compensation paid to different renewable energy sources; gradually introducing direct selling of renewable power outside of grid operators; re-evaluating which energy-intensive industries should qualify for EEG exemptions; and requiring self-generating power users to be required to also pay a part of the EEG surcharge.

**Electric utility company executives are enthusiastic supporters, while environmental groups are highly critical**

These changes are sparking sharply different reactions among parties to the energy business. Electric utility company executives are enthusiastic supporters, while environmental groups are highly critical. The challenge is that everyone – investors, regulators, power companies, industrial companies, renewable energy business, and the hydrocarbon industry in general – is trying to figure out what these reforms might mean for their business. The reforms certainly point to a slowing in the growth of renewable energy, but by how much? It is agreed by most observers that the reforms favor large producers over smaller ones, but at the moment small producers account for over half of all renewable energy production in Germany. There is debate whether the feed-in-tariff is the only alternative for shifting the cost burden. Lastly, there are views that the exemptions for energy consumers are actually being expanded despite the Social Democrats desire for industrial companies to pay a greater share of the cost of the electricity industry's transformation.

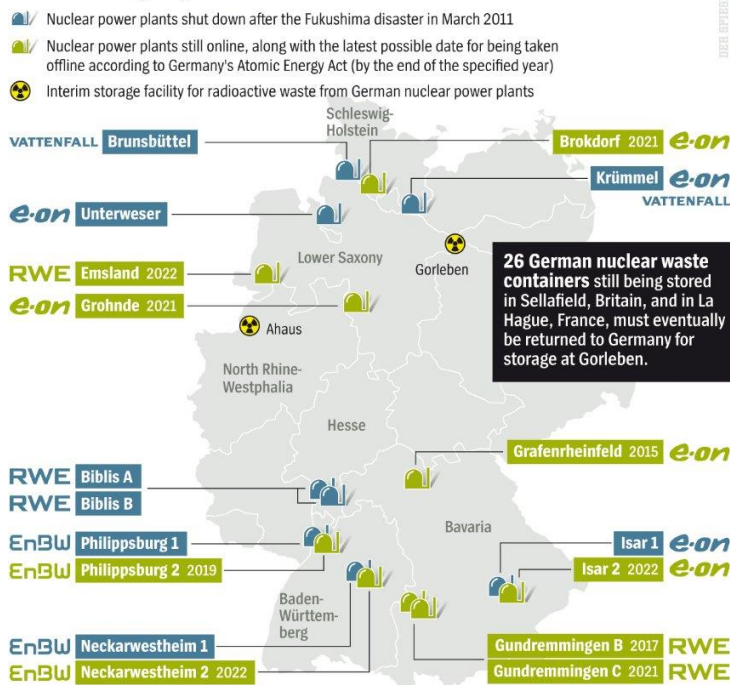
**Germany currently pays 24 billion euros (\$32.8 billion) a year through the EEG to subsidize renewable energy**

Contentious aspects of the reforms include restricting the amount of renewable energy that will receive subsidies. Germany currently pays 24 billion euros (\$32.8 billion) a year through the EEG to subsidize renewable energy. The average incentive of 17 cents per kWh will fall to 12 cents per kWh for new installations built after 2014. Starting in 2015, power facilities that generate more than 500 kilowatts (kW) will not be eligible for any remuneration. The threshold for losing subsidies falls to facilities producing 250 kW of power and then 100 kW in 2017. The idea is that only the most cost-effective renewable energies will be supported in the future.

**The new rules will force an examination of the exemption from the EEG surcharge that has been granted to around 2,000 businesses in Germany**

Caps will be put on the different renewable energy sectors, prescribing output quantities over which the EEG subsidies will no longer apply. For example, wind farms can continue to generate and sell power above the cap of 2,500 megawatts (MW) per year, but they will no longer qualify for subsidies. The new rules will force an examination of the exemption from the EEG surcharge that has been granted to around 2,000 businesses in Germany. This exemption has made their power costs among the cheapest in Europe, while German consumers pay the highest electricity costs on the continent. Making companies that generate and consume their own power pay a portion of the EEG surcharge will also change the competitive landscape for industrial enterprises.

**Exhibit 1. Germany’s Nuclear Power Plant Dilemma  
Nuclear Legacy**



Source: Spiegel online

**These dismantling projects may take 10-20 years to complete, subjecting them to potential cost over-runs**

Revising the EEG is not the only power industry debate ongoing in Germany. The electric power companies are dealing with the government’s decision to shut down its nuclear power industry. Estimates are that small plants may cost €500 million (\$684 million) to €1 billion (\$1.368 billion) for larger plants. While cost is one aspect of dismantling nuclear power plants, there are many unanswered questions about what to do with the nuclear fuel and components from the plant that are radioactive. Moreover, these dismantling projects may take 10-20 years to complete, subjecting them to potential cost over-runs. Because of these technical and cost challenges, the heads of the three utilities responsible for eliminating Germany’s nuclear power plants have developed a plan

**The cost of these policy changes has levied a financial toll on both Germany's manufacturing sector, which is heavily dependent on export competitiveness, and its citizens**

to get the government to establish a "bad bank" structure for the plants. The utilities would contribute the roughly €30 billion (\$41 billion) in reserves they were forced by the government to accrue for clean-up costs to the bank with the government (taxpayers) assuming all the technological and cost over-run exposures.

The decision by Ms. Merkel's government's decision to shut down its nuclear power plants cost the Germany utilities substantially. They were forced to absorb the balance sheet hit from the write-down of the plants' value, plus the additional costs of mothballing the plants while dealing with the costs of the dysfunctional power market due to the implementation of the EEG and *Energiewende*. They were forced to cut their dividends while suffering significant earnings hits, both of which hurt share prices. It is fascinating to watch the Germany energy industry deal with its mandate to completely shut down its nuclear power industry by 2022 while trying to meet the country's 2025 and 2035 goals of 45% and 60%, respectively, of renewable power generation. The cost of these policy changes has levied a financial toll on both Germany's manufacturing sector, which is heavily dependent on export competitiveness, and its citizens. Do the recent Ifo institute index results reflect ongoing fallout from these policies and if so, what might the proposed energy sector reforms mean for Germany's economic future?

## On the Road Again: Just Me And The Trucks

**A few less trucks, especially on the highways from Tennessee to Rhode Island, would have sped up our trip**

Two weeks ago, we embarked on our annual trek from Houston to Rhode Island for the summer. Under pressure to complete the drive quickly, given that there was only a brief window between airline flights and work commitments, we left Houston at an unusual time – a Saturday afternoon, but finished the trip in our usual two and a half days. A few less trucks, especially on the highways from Tennessee to Rhode Island, would have sped up our trip, although some other conditions added to it this time. So what did we see and observe?

**Fortunately, New Jersey Governor Christie (R) wasn't conducting a traffic study on the GWB when we were crossing it**

One of the surprising developments was that we encountered very little road construction. What we did run into was mostly in the Northeast. Having made this trip many times, we have been victimized by delays due to major construction projects such as the rebuilding of Interstate 10 (I-10) and I-40/I-75 and along various stretches of I-81. This year, our onboard global position service (GPS) took us across Pennsylvania and into New Jersey and then across the George Washington Bridge (GWB) to I-95 to travel through Westchester County, New York and Connecticut before reaching Rhode Island. Fortunately, New Jersey Governor Christie (R) wasn't conducting a traffic study on the GWB when we were crossing it.

For those not familiar with the GWB, there are two levels and because of how we approached the bridge, we wound up on its

**The traffic problem was a combination of construction for a new exit at Co-Op City in the Bronx and a New York Fire Department incident that had all the lanes on the Whitestone Bridge (an alternate route from Long Island to Westchester County) shut down and pushing all its traffic to the Cross Bronx Highway**

upper level, which interestingly had a sign saying that the time to cross was 11 minutes while it would take 14 minutes to cross on the lower level. We have to assume there was some construction on the lower level that contributed to the longer travel time. We did encounter construction on the Cross Bronx Highway that handles traffic coming off the GWB and heading to Westchester County, Long Island or Connecticut. The traffic problem was a combination of construction for a new exit at Co-Op City in the Bronx and a New York Fire Department incident that had all the lanes on the Whitestone Bridge (an alternate route from Long Island to Westchester County) shut down and pushing all its traffic to the Cross Bronx Highway. We had fun dodging the New York drivers who were all in a rush to nowhere.

The biggest issue on the trip, just as last year, was trucks. We have come to expect heavy traffic on I-10, as this is the prime highway running east/west along the Gulf Coast and the energy boom has boosted economic activity in Texas and Louisiana, which has contributed to additional truck traffic. However, as we headed north on I-59 and then I-40 and on to I-81, trucks remained a major component of the traffic flow, at least until evening when the time restriction on drivers' work days forces them off the road. Since the work restrictions for truck drivers have mandated more rest time each day, we experienced overflowing truck rest stops, a condition we encountered last year, too.

**As in recent years, we encountered virtually no travel trailers and/or recreational vehicles (RVs)**

The biggest surprise was that when we started out early Sunday morning from Meridian, Mississippi, we found that the trucks on the road outnumbered the cars. That condition lasted until about mid-day. Maybe many of the automobile drivers were in church. As in recent years, we encountered virtually no travel trailers and/or recreational vehicles (RVs). We continue to wonder whether American vacation patterns have changed (possibly due to longer school years, especially given the extra make-up days from winter closures) or if the "Snow Birds" (retirees who seasonally move back and forth from the cold to the warmth) had delayed their drives north. Unfortunately, there is no clear answer as to why there were so few travel trailers and RVs.

**Another surprise was how few police we encountered**

Another surprise was how few police we encountered. Occasionally we saw highway patrol cars in Louisiana, Tennessee and Pennsylvania, but Virginia was a different story – at least in one area where there was a sign stating it was a target enforcement area. There we saw multiple highway patrol cars sitting behind pulled-over cars, but not trucks. We have no idea what the highway patrol was enforcing, but it didn't seem that cars were driving fast in the area, so we wonder whether they were stopping cars for seatbelt reasons. We reached this area as night was falling, so the flashing blue lights on the patrol cars really lit up the night sky.



**During the entire trip, we saw fewer Wal-Mart Stores (WMT-NYSE) trucks than the fingers on our two hands**

A few other observations: During the entire trip, we saw fewer Wal-Mart Stores (WMT-NYSE) trucks than the fingers on our two hands. We thought that was odd, given that Wal-Mart is the largest retailer in the nation. Our observation maybe made more sense when a few days later Wal-Mart reported disappointing first quarter earnings results. Wal-Mart executives announced that revenues in the quarter were only up 0.8%, which would have increased to 2.1% if currency impacts are ignored. However, profits were 5.8% lower, year over year, and earnings per share came in five-cents below analysts' estimates, and down four-cents from the prior year. The company blamed the winter weather for three-cents of the shortfall, with a higher tax rate and other financial factors accounting for the final penny of shortfall. Wal-Mart also commented that comparable store traffic in the United States were 1.2% lower than a year ago, while same store sales declined 1.2%. On the financial news shows following the earnings release, there were various discussions about the Wal-Mart earnings miss and whether it was actually reflective of a weak economy or do all to the weather. One talking head asked a financial manager whether Wal-Mart was the new General Motors (GM-NYSE) in the old expression, "As General Motors goes, so goes the U.S. economy." A professional fund manager said that Wal-Mart's customers are at the lowest income levels and this segment of the population is struggling with stagnant income and higher living costs, suggesting they were not shopping and that this dynamic is what contributed to the company's earnings miss. Wal-Mart executives told analysts and investors on its earnings conference call that its outlook for its second quarter results was for them to be essentially flat, both for comparable store sales and for profits. Maybe only a handful of Wal-Mart trucks on the road in mid-May confirmed that outlook?

**The ethane-free gasoline cost 10-cents per gallon less than regular gasoline with 10% ethane**

We found gasoline prices surprisingly constant all along our route. While there are always a few pennies difference between states due to varying state tax rates, the rather uniform pump prices suggests the global oil market at work. It was only when we got to high-cost Connecticut and Rhode Island that we saw pump prices for regular gasoline touching the \$4 per gallon point. The one surprise was that at two gasoline stations we stopped at in Tennessee and Virginia, ethane-free gasoline was available. The ethane-free gasoline cost 10-cents per gallon less than regular gasoline with 10% ethane.

**The better economy, at least along our route, has contributed to higher hotel room rates**

We did find, however, that the better economy, at least along our route, has contributed to higher hotel room rates. Hotel chains where we secured rooms several years ago for under \$100 a night are now in the \$129+ range. We paid significantly more than that in Meridian due to the sold-out condition of the hotels. In the past, we have encountered sold-out hotels due to college graduations, but this time it seemed to be a state youth athletic competition.

In the food area, we commented last year on the dirty state of the McDonald's (MCD-NYSE) restaurants. This year, for whatever

**The crowd shows that Cracker Barrel restaurants, although located along the interstate, are successful local restaurants, which validates watching their activity levels as an indicator of the health of the local economy**

reason, we seemed to stop at modern locations, but they still weren't the cleanliest and we left one because its ice cream machine wasn't working. Imagine that! We also discovered a surprise at another one of our local indicators at dinnertime on Sunday evening. At 7 pm, we pulled into a Cracker Barrel (CBRL-Nasdaq) restaurant in Lynchburg, Virginia, figuring it would be a quick stop for dinner and we would be on our way north, hoping to make up some of the time lost to the heavy truck traffic we had encountered during the day. We were shocked to find a crowd standing outside and in the lobby (shopping area) of the restaurant. It was Mothers' Day! As we waited, they seated a party of 28! The crowd shows that Cracker Barrel restaurants, although located along the interstate, are successful local restaurants, which validates watching their activity levels as an indicator of the health of the local economy.

**Exhibit 2. States With Lots Of Smokers**

*States With the Highest Percentage of Smokers*

Percentage who smoke is 25% or more

	<b>% Smoke</b>
Kentucky	29
Missouri	26
Oklahoma	26
Louisiana	26
Mississippi	26
Arkansas	26
Ohio	26
Tennessee	25
Alabama	25
West Virginia	25
Indiana	25

January-June 2011  
Gallup-Healthways Well-Being Index

GALLUP®

Source: Gallup

**The trucks were colorfully decorated with advertisements and sporting brand names with which we were unfamiliar**

Another surprise was e-cigarettes. We have been aware of them from media stories and television advertisements, but we never appreciated their significance in the marketplace. That was until we encountered several trucks loaded with them. The trucks were colorfully decorated with advertisements and sporting brand names with which we were unfamiliar. Our ignorance is not surprising since we don't smoke. According to a Gallup-Healthways Well-Being

**An average of 21% of Americans smoke, a rate that has remained constant since 2008**

Index published in 2011, an average of 21% of Americans smoke, a rate that has remained constant since 2008. That rate is well below the peak rates registered during the 1940s to 1970s when 40% of Americans smoked (both my parents did). What was surprising on one hand, but not necessarily surprising on the other, was that it wasn't until we crossed the Mason-Dixon Line that we encountered the e-cigarette trucks. The Northeast contains states with the lowest smoking averages, and e-cigarettes are used to reduce smoking of conventional cigarettes.

**Exhibit 3. States With Few Smokers**

*States With the Lowest Percentage of Smokers*

Percentage who smoke is lower than 20%

	<b>% Smoke</b>
Utah	11
California	15
Hawaii	16
North Dakota	17
Massachusetts	17
Minnesota	17
New Hampshire	17
Idaho	18
New Jersey	18
Oregon	18
Vermont	18
Connecticut	18
Washington	19
Maryland	19
Kansas	19
District of Columbia	19
Virginia	19
New York	19

January-June 2011

Gallup-Healthways Well-Being Index

GALLUP®

Source: Gallup

Rhode Island continues to struggle economically. The state is still number one in unemployment, and its labor force continues to



**We have concluded that this area of Rhode Island is more closely tied to the more robust Connecticut economy along with benefitting from an improving tourist economy**

shrink. Businesses continue to leave due to the state's high taxes and poor labor market. Around us, in the southern part of the state, it looks and feels (after a week of traveling around) as if the local economy is improving – new stores, increased home building and renovations, and new and expanding restaurants. We have concluded that this area of Rhode Island is more closely tied to the more robust Connecticut economy along with benefitting from an improving tourist economy. We will be watching all of these trends during the balance of the summer and on our return drive, to be reported on in the fall.

## **Latest Development In Keystone XL Pipeline Approval Saga**

**If the Supreme Court rules against TransCanada and the governor, the company would need to re-apply for a route permit**

As we have speculated for a long time, the likelihood of TransCanada's (TRP-NYSE) Keystone XL pipeline gaining presidential approval to build a link across the U.S./Canada border is very slim until possibly a different president enters the office in January 2017. Since the Obama administration elected to extend the inter-agency review period for the permit approval until the Nebraska legal battle over the pipeline route is resolved, the question of approval timing has shaped the discourse. Because the appeal of the ruling to the Nebraska Supreme Court will not be heard until this fall with several additional months before a decision is rendered, a resolution in favor of the pipeline is not likely before late 2014 or possibly early 2015. If the Supreme Court rules against TransCanada and the governor, the company would need to re-apply for a route permit. The application would go to the state public utility commission, which has a mandatory seven-month period within which it must respond. That process, if needed, would take any approval well into 2015, at which time the State Department review would need to be re-started, further delaying any approval into 2016. In the interim, the permit for Keystone to cross South Dakota is due to expire this June. TransCanada's request for the permit to be extended has already been targeted by environmentalists who were instrumental in getting the Nebraska route approval overturned by the court.

**TransCanada CEO Russ Girling said that "We are absolutely considering a rail option"**

Canada has projects underway that will lead to more than a doubling of its oil sands output to five million barrels per day by 2020. This means that the energy industry needs to step up construction of crude oil take-away capacity. Last week, while attending an investment conference, TransCanada CEO Russ Girling said that "We are absolutely considering a rail option." He was referring to the idea of hauling oil sands output across the border by rail and then using existing pipelines to ship the oil south to the Gulf Coast refining center. As Mr. Girling pointed out, "Our customers have needed to wait for several years [awaiting approval of Keystone XL], so we're in discussions now with them over the rail option." His comments follow on remarks he made to reporters at the company's annual shareholder meeting at the end of April that the company was looking at ramping down its preparation for starting construction

**In order to move a similar volume of raw bitumen as currently contemplated by the Keystone pipeline, TransCanada will need a facility to load nine unit trains per day**

on Keystone. He indicated that the company was looking at beginning to lay off employees and contractors working on Keystone. At that time, we suggested that Plan B – the Energy East pipeline – would soon become the primary focal point of management's focus for expanding oil sands take-away capacity.

Key questions for TransCanada and its rail option are the volume it plans to move by rail and the cost. The company is considering moving the oil by rail from the industry's main storage and pipeline hub at Hardisty, Alberta to an existing pipeline at Steele City, Nebraska. Jarrett Zielinski, CEO of privately-owned TORQ Transloading, estimated that in order to move a similar volume of raw bitumen as currently contemplated by the Keystone pipeline, TransCanada will need a facility to load nine unit trains per day. What Mr. Zielinski worries about is that this facility, coupled with the terminals being constructed, could strain the railroad industry's infrastructure. Rail will cost more than moving the oil by pipeline, but that is less an issue given the Canadian oil price discount to U.S. oil.

**It seems evident that since the Obama administration's Keystone approval delay decision in late April, TransCanada has realized that it needs to begin implementing alternative strategies for moving oil sands output**

According to the National Energy Board, in the fourth quarter of 2013, Canada's oil shipments by rail averaged 146,047 barrels per day (b/d), an 83% year-over-year increase. Since Keystone is targeted to move 700,000 b/d, it would boost the 2013 year-end crude-by-rail volume five-fold. If we had to guess, we expect TransCanada will ship considerably less crude by rail than the proposed Keystone capacity. Instead, some of the volume would shift to the Energy East line, which is being designed to carry 1.1 million b/d. It seems evident that since the Obama administration's Keystone approval delay decision in late April, TransCanada has realized that it needs to begin implementing alternative strategies for moving oil sands output. The company needs new strategies in order to continue its growth while Canada needs transportation alternatives to provide outlets for its energy output and its economy.

## **Will The City Of The Future Be Automobile Free?**

**Be careful if you are walking in the Sunshine State where the four worst cities for pedestrians are located**

A recent report on pedestrian safety by the National Complete Street Coalition (part of Smart Growth America) finds that a majority of the 47,000 deaths between 2003 and 2012 could have been prevented with better road design. The paper ranks the states on a "pedestrian danger index." Be careful walking in the Sunshine State where the four worst cities for pedestrians are located. Those cities are Orlando, Tampa, Jacksonville and Miami. Houston ranked 7<sup>th</sup> in the list of unsafe cities for walking. The report highlighted that among the cities with the worst pedestrian traffic safety records are those that saw a huge post-World War II growth that "developed rapidly, with many low-density neighborhoods overly dependent on extra wide, fast arterials to connect homes, schools, jobs and shops."

This analysis is another attack on the energy business disguised as a safety issue. The environmental movement has made killing

**Suburbs are considered to be “energy hogs” in that they foster a lifestyle that consumes more energy than necessary, or at least as determined to be acceptable, compared to similar families living in urban areas**

suburbs a goal – the reason is to reduce energy consumption. Suburbs are considered to be “energy hogs” in that they foster a lifestyle that consumes more energy than necessary, or at least as determined to be acceptable, compared to similar families living in urban areas. Cities are perceived as a utopian energy environment since people do not need to own a car but have the possibility to walk to work, school and shopping or reach these locations by taking public transportation. Energy and cooling demands can be better managed by building more energy-efficient buildings in cities rather than less energy-efficient single-family homes. Housing in urban areas tends to be smaller than single-family homes, further benefiting the energy use patterns. The environmentalists point to the recent success in expanding the use of mass transit while limiting the growth in vehicle miles traveled. According to the American Public Transportation Association report on Public Transportation Ridership Report for the fourth quarter of 2013, mass transportation ridership increased 1.09% for 2013 compared to only a 0.61% increase in the 12-month moving average for vehicle miles traveled.

**Exhibit 4. Vehicle Miles Traveled Going Nowhere Now**



Source: St. Louis Federal Reserve

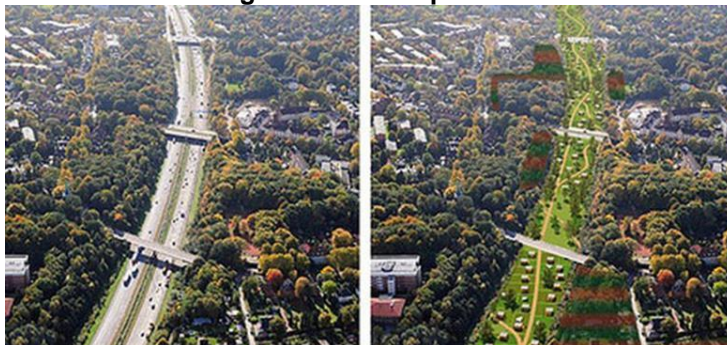
**When completed some 20 years hence, the “Green Network” plan will add 17,000 acres of green space representing 40% of Hamburg’s actual area**

Hamburg, Germany’s second largest city with a population of 1.8 million residents, is attempting to transform itself into a low-energy consumption location to help stave off the effects of climate change. The city’s plan is to completely eliminate automobiles from its streets. In February, the Hamburg city council said that by 2034 it would completely divert automobiles from parts of the city and would convert the existing highways into green spaces. When completed some 20 years hence, the “Green Network” plan will add 17,000 acres of green space representing 40% of Hamburg’s actual area. It will connect parks, recreational areas, playgrounds cemeteries and gardens with a comprehensive network of green paths, allowing people to fully explore the city on foot or bike.

**The idea is that rather than residents driving about the city, they will move via public transportation or on foot or by bicycle**

According to Hamburg city spokeswoman Angelika Fritsch, "We envision a network that doesn't just help residents to get from point A to B in a sustainable fashion. It will offer people opportunities to hike, swim, do water sports, enjoy picnics, restaurants, experience calms and watch nature right in the city." To achieve this plan, the city has a team of 30 city planners working full time to translate it into reality. The idea is that rather than residents driving about the city, they will move via public transportation or on foot or by bicycle. The picture of a highway transiting Hamburg after it is converted into green space is shown in the exhibit below.

#### Exhibit 5. Hamburg With Green Space Instead Of Roads



Source: Atlantic.com

**Although Hamburg is a major North Sea port, its median temperature has risen by 1.2° C (2.16° F) to 9° C (48.2° F) over the past 60 years**

Ms. Fritsch also commented that "Cities like London have a green belt, but the Green Network will be unique in covering an area from the outskirts to the city center. In 15 to 20 years it will be possible to explore the city exclusively by bike or on foot." The principle reason Hamburg is using to justify diverting automobiles is to reduce the impact of global warming on the city and allow it to absorb a greater amount of carbon dioxide emissions. Although Hamburg is a major North Sea port, its median temperature has risen by 1.2° C (2.16° F) to 9° C (48.2° F) over the past 60 years. In several media stories, the temperature increase was cited as the 9° C (48.2° F) figure, which certainly conveys a different view. Commensurate with a warming climate, sea levels have risen by 20 centimeters (7 7/8 inches) over the same period. City officials are worried by projections that sea levels will rise by another 30 to 110 centimeters (11 13/16 to 43 5/16 inches) by 2100. The city has spent significantly in recent years to protect against flooding from rising sea levels, which is important since the Elbe River goes through the city. Will this plan work? On paper it looks like it should, but will residents truly embrace a city without cars?

**The Danish capital city is currently building a network of 26 so-called "bicycle superhighways**

The only other major European city attempting to discourage the use of automobiles in favor of increased human-powered transportation is Copenhagen. The Danish capital city is currently building a network of 26 so-called "bicycle superhighways," which spread out from the city center to the outskirts. The project is part of Copenhagen's effort to become carbon neutral by 2050. The bicycle

**Exhibit 6. Hamburg Is A North Sea Port**

Source: *Wikipedia*

**The highways are more like bike paths than their superhighway title suggests**

superhighways are being designed and constructed to encourage more people to commute to and from Copenhagen by bike. This is a city where half the residents already bike to work or to school every day. The highways are more like bike paths than their superhighway title suggests, however, the planners are incorporating facilities and services specifically tailored to cyclists like highways do for cars. There are air pumps, public rest rooms, lighting, and rest stations, but maybe the most important development is direction assistance.

**An additional challenge is that the finished network will span twenty municipalities - each with their own design guidelines concerning signage, paint and color usage**

The two existing superhighway routes are not exactly coherent as there are numerous junctions where it is unclear which way to turn in order to stay on the route. An additional challenge is that the finished network will span twenty municipalities - each with their own design guidelines concerning signage, paint and color usage. It is a challenge to ensure a consistent, coherent and streamlined network. The normal way to assist cyclists for staying on track is to paint a line for them to follow. However, the Danish Road Directorate has strict regulations about signage and when or where paint can be applied to the road and/or cycle path. Because the superhighway planners viewed these directorate rules as car-centric and antiquated, they have had to develop another system, which has had mixed reviews.

As Hamburg's planners look around for guidance on implementing their Green Network, they can look to the exclusively green



**This is the same country that gave the world the Autobahn, and Mercedes-Benz and BMW, and their high-performance vehicles**

“Vauban” suburban development on the outskirts of the southwestern German city of Freiburg, which has managed to completely ban automobiles. Residents can only walk or cycle on its streets. If they insist on owning vehicles, they must rent spaces in a multi-story garage well outside the city center. The challenge for Hamburg in making the city vehicle-free is that it is located in Germany. This is the same country that gave the world the Autobahn, and Mercedes-Benz (216006.DE) and BMW (BMW.DE), and their high-performance vehicles. Will carless cities be as successful in Germany as its renewable energy policy that has inflated its residents’ energy costs while increasing the nation’s air pollution?

## **Driverless Cars Will Be Energy’s New Disruptive Technology**

**Energy executives, when putting their long-term business strategies together and assessing the risks to the sustainability of their organizations need to try to ascertain potential forces that could disrupt their strategies**

When we look to the future for energy, we are usually focused on supply and demand dynamics and how their interaction will influence the actions of energy executives. Sometimes there are other forces outside of energy demand and supply that disrupt the business, for example, hurricanes, nuclear power and government regulation, to name a few. Energy executives, when putting their long-term business strategies together and assessing the risks to the sustainability of their organizations need to try to ascertain potential forces that could disrupt their strategies. As we have come to appreciate, there are events that could never be anticipated, referred to as “Black Swans” and popularized by Nassim Nicholas Taleb in his book [The Black Swan: The Impact of the Highly Improbable](#). For people involved in the energy business, an example of a disruptive technology that can alter the future for energy demand will be autonomous driving (driverless cars).

**There are many hurdles related to issues such as regulations, liability, safety and technology that needs to be addressed and resolved before driverless vehicles can be on the roads**

Earlier this year, at the Detroit Auto Show, Nissan (NSANY-OTC) executive Andy Christensen, discussed with some reporters that the company planned to make autonomous versions of its cars available in the United States by 2020, a short six years from now. The Japanese automaker has been in extensive discussions with regulators in California, the best-selling state for the Leaf battery-electric vehicle, for allowing driverless vehicles to be on the state’s highways. There are many hurdles related to issues such as regulations, liability, safety and technology that needs to be addressed and resolved before driverless vehicles can be on the roads. The vehicle of choice for driverless cars will be the Leaf because it is completely battery operated, making the conversion to autonomy much easier.

Nissan has teamed up with the Massachusetts Institute of Technology, Stanford University and Oxford College among others to extensively test its “Autonomous Drive” concepts. Late in 2013, Nissan tested a driverless Leaf on Japanese public roads. The push behind perfecting driverless technology is that it can lead to increased vehicle safety, better fuel economy and improved traffic



**If vehicles can be made smaller and lighter, they will use less energy**

flow. Each one of these achievements will reduce energy demand. The auto company says that 93% of automobile accidents are caused by driver error. Safer cars will, among other things, enable them to be made smaller and lighter, both characteristics identified with unsafe cars. If vehicles can be made smaller and lighter, they will use less energy. Because robots will be driving the vehicles and setting the pace on the highways, they will be able to drive with less braking and acceleration, again suggesting less energy consumption. Lastly, if the cars can be spaced closer together (forget the rule of one car-length separation for every ten miles of speed) and speed better controlled, vehicle fuel-consumption will be enhanced, saving energy. How quickly will these energy savings be felt? That depends on how quickly autonomous vehicles enter the fleet – meaning how well they are received by the driving public. That will probably depend on the cost of the vehicles and their styling. We're not sure that everyone wants to drive a Google (GOOG-Nasdaq) car.

**Exhibit 7. The Stylish Google Car**



Source: Google

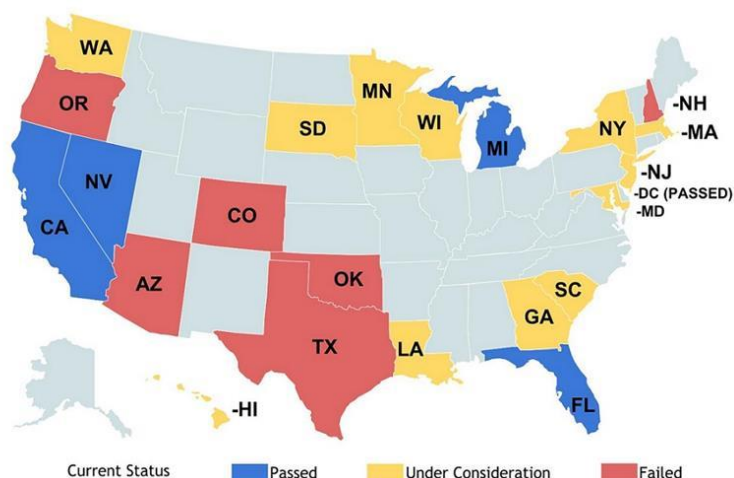
**The issue becomes who is responsible when a driverless car kills someone?**

A major concern will be the legal questions surrounding the operation of driverless cars on the nation's highways. The question is: Who is responsible when something goes wrong? As several people who have investigated this question point out, autonomous vehicles are supposed to be the safest cars on the road, but there will still be accidents. The issue becomes who is responsible when a driverless car kills someone? Or what happens when a vehicle following Google Maps is sent the wrong way down a one-way street? Less drastically, who pays the parking ticket when the car fails to observe a no-parking sign?

**Many lawyers, academics and auto companies say that current liability laws already provide some guidance with respect to these issues**

The bigger issue is how to govern and make accountable the robots and software that runs autonomous vehicles. So far, only four states and the District of Columbia have passed laws dealing with driverless vehicles, but in some cases the laws only allow auto manufacturers to test cars on that state’s roads. None of the laws, based on an examination of what is contained in the legislation enacted so far, deals with answering all the legal questions that might come up. Many lawyers, academics and auto companies say that current liability laws already provide some guidance with respect to these issues.

**Exhibit 8. Status Of State Laws On Driverless Cars**



Source: Green.autoblog.com

**In the case of parking or traffic tickets, the owner of the car would most likely be held responsible for paying the ticket**

In the case of parking or traffic tickets, the owner of the car would most likely be held responsible for paying the ticket, even if the car and not the owner broke the law. That is similar to how municipalities handle red-light camera traffic tickets. A response to that policy is why car rental companies require renters to acknowledge that they are responsible for traffic and parking tickets issued during the rental period and not the rental company.

**The responsibility flows from the traditional product liability law, which holds manufacturers responsible for faulty products**

Accidents are an interesting subject. Whenever there is an accident that injures or kills someone, there are usually numerous lawsuits filed. That will still be the case with driverless cars, but ultimately the car’s manufacturer such as Google or Nissan would probably be held responsible, at least for civil penalties. The responsibility flows from the traditional product liability law, which holds manufacturers responsible for faulty products. An aspect of accidents with autonomous vehicles is that all their knowledge that makes them work – video and sensor data – would be available to help reconstruct the event. As one opinion writer joked, the big loser with driverless car accidents will be trial lawyers.

**Since robots cannot be charged with a crime, how can a passenger in a driverless car be assigned responsibility if he is not “driving” the car?**

Another benefit for owners of driverless cars is that with reduced accident frequency, insurance rates should decline. Since the transition to lower insurance premiums takes time, as consumers benefit, the insurance companies are likely to benefit more and sooner. Probably the most difficult legal issue to resolve will be criminal penalties from accidents. The concept of criminality is a “guilty mind,” meaning that the person should have known better. Since robots cannot be charged with a crime, how can a passenger in a driverless car be assigned responsibility if he is not “driving” the car? Does that mean that laws will need to be written assigning responsibility/liability depending upon which seat in the car you occupy? Yelling “shotgun” may not be as popular in the future.

**This technology will be disruptive to the supply and demand dynamics for energy and the law will determine when it happens**

There is little doubt that the first accident involving an autonomous vehicle will be a big public relations problem for the manufacturer. While only four states plus the District of Columbia have actually passed laws about autonomous vehicle, albeit while not addressing all the legal questions, it is encouraging to see that many more states are working on accommodating legislation. A handful of states, mostly in the west have rejected proposed driverless car legislation, but we expect the topic will be continually revisited. The energy business needs to pay attention to the pace of development of both autonomous vehicle technology and also the legal arena. This technology will be disruptive to the supply and demand dynamics for energy and the law will determine when it happens.

## **Energy, Economics, And Liberty – An Energy Colloquium**

**We spent two and a half days with a group of 17 men and one woman, all of whom are involved with the energy business, discussing energy and its relationship to liberty**

Two weeks ago, we spent two and a half days with a group of 17 men and one woman, all of whom are involved with the energy business, discussing energy and its relationship to liberty under the sponsorship of the Liberty Fund. When we were approached about participating, we were unfamiliar with the Liberty Fund – its mission and history. Quoting from the fund’s web site, we learned that the “Liberty Fund was founded in 1960 by Pierre F. Goodrich, an Indianapolis businessman and lawyer, with the mission of encouraging a deeper understanding of the requisites for restoring and preserving the ideal of a society of free and responsible individuals. Upon his death in 1973, Mr. Goodrich left most of his estate to the Foundation for the purpose of exploring the many dimensions of liberty. Fifty years after its founding, Liberty Fund remains uncompromisingly committed to individual liberty in all of its dimensions.”

The colloquium was conducted under Chatham House rules, in which participants cannot be quoted directly, but which facilitates a very open dialogue. The mix of participants and their business backgrounds resulted in a series of engaging discussions about energy within the context of a set of probing questions posed by our facilitator. The colloquium consisted of five discussion periods over the two and a half day span touching on topics such as: Is there an

**We believe that our group's composition minimized discussion of the readings but instead focused it on more practical and experience-based aspects of the questions posed**

energy crisis?; What is the role of government in the economy and with mineral resources?; What is more important – the resource or its use?; Is the energy industry a threat to the environment?; and How can business leaders avoid addressing the issues of liberty, energy and property rights?

To prepare for the discussions, each participant was provided with a set of readings, including several older academic papers dealing with core principles involving energy policies. While what we learned from the readings was woven into several of the discussions, the provocative questions posed by our facilitator at the beginning of each session proved to be a more powerful stimulus for the conversation. We are not sure whether it was the quality of the readings or the composition of our group that influenced the direction of our discussions. We were told at the end of the colloquium that our group was considerably different from the composition of a typical group at a Liberty Fund function, of which the fund sponsors some 90 events a year and jointly sponsors another 90. Traditionally, groups are composed of academics with a spattering of business executives and representatives of think-tanks. Our group, on the other hand, was made up almost entirely of energy executives with only a few members from energy- and business-related institutes. Having never been to another Liberty Fund event, we are relying on observations from participants who have been to ones about the tenor of the discussions. We believe that our group's composition minimized discussion of the readings but instead focused it on more practical and experience-based aspects of the questions posed.

**One of the more fascinating discussions was about solar energy**

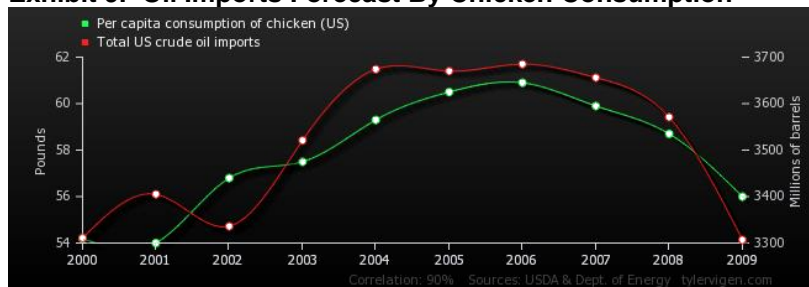
One of the more fascinating discussions was about solar energy. We were fortunate to have a Louisiana energy company executive who explained the workings of the federal and state subsidy programs as critical to the economics of solar installations in the New Orleans area. We also had an industrial solar energy entrepreneur who was highly critical of the economics of utility-based solar projects. He provides solar installations and products employing solar power for remote locations where conventional power is not available. To us, it was interchanges such as the one about solar power involving professionals actually engaged in making economic and business decisions that generated the greatest value from the colloquium. We understand there is an effort underway to host a similar energy-focused colloquium in Houston. Should any of our readers be approached to participate, we encourage you to do so. Not only will you gain from participating in the discussions, but you will meet an interesting group of people active in various aspects of the energy business. You will definitely learn from the experience.

## The Potential Trap Of Correlation Versus Causation

**By failing to understand the difference between these two concepts, one can easily fall into the trap of accepting spurious relationships**

It is always fascinating to see the lengths that social scientists and other will go to try to demonstrate how certain attitudes drive the actions of individuals. We were reminded of this by two recent columns we reviewed. One dealt with the new, hot topic of income inequality, a key talking point of the Democratic Party for the upcoming mid-term elections, and the other with the growth in the money supply and the increase in stock prices. The latter column contained a number of charts demonstrating high correlations among data series, but which clearly fail to establish any causation. By failing to understand the difference between these two concepts, one can easily fall into the trap of accepting spurious relationships. While neither of these columns dealt with energy per se, it was the use of several energy correlation charts that set up the discussion.

**Exhibit 9. Oil Imports Forecast By Chicken Consumption**

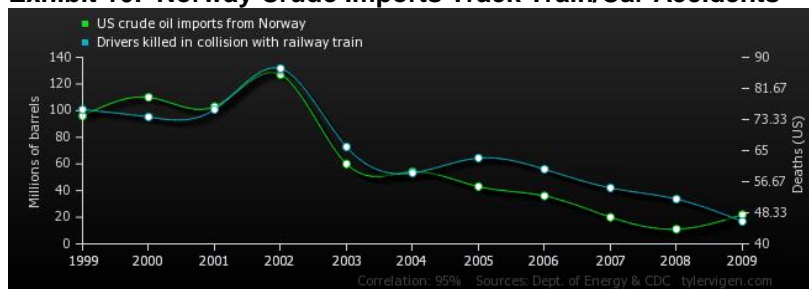


Source: Spurious Correlations

**The fact that the relationship between chicken consumption and crude oil imports had a high correlation of 0.899899, we cannot comprehend how these two data series have any relationship to each other**

When we first saw the chart in Exhibit 9 above, we were highly amused. The fact that the relationship between chicken consumption and crude oil imports had a high correlation of 0.899899, we cannot comprehend how these two data series have any relationship to each other. Another energy correlation chart with a high correlation factor (0.954509) involved U.S. crude oil imports from Norway and automobile drivers killed in collisions with trains. Again, the point is that these two data series have no realistic relationship even though they have a very high correlation.

**Exhibit 10. Norway Crude Imports Track Train/Car Accidents**



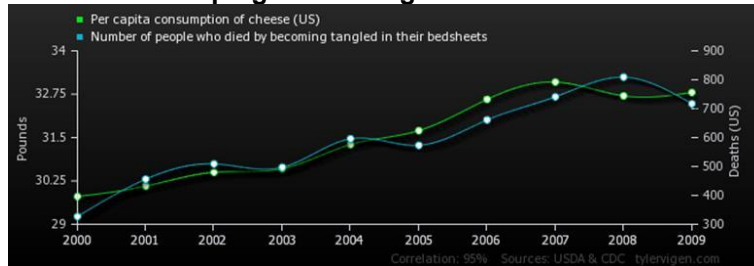
Source: Spurious Correlations



Maybe our amusement came from the idea that there were that many people who died from their bedsheets

We were entertained with two other spurious correlations for their sheer audacity. One chart showed that there was a 0.947091 correlation between per capita consumption of cheese and the number of people who die because they were tangled up in their bedsheets. Maybe our amusement came from the idea that there were that many people who died from their bedsheets, but it is beyond our comprehension how the two data series are related.

**Exhibit 11. Sleeping And Eating Cheese Are Similar**

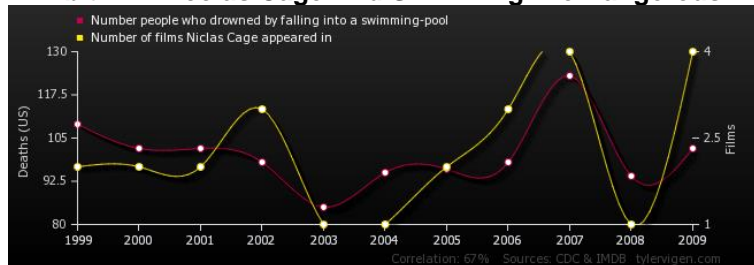


Source: Spurious Correlations

The humor comes from the idea that there is any relationship between drowning deaths and Nicolas Cage movies

The last chart plotted the number of people who drowned by falling into a swimming pool versus the number of films the actor Nicolas Cage appeared in. This relationship was not as strong as the previous ones as it only had a correlation factor of 0.666004. Again, the humor comes from the idea that there is any relationship between drowning deaths and Nicolas Cage movies. As we researched these charts, we found that there is a web site that highlights spurious correlations, which contained a number of interesting, albeit strange, correlations.

**Exhibit 12. Nicolas Cage And Swimming Are Dangerous**



Source: Spurious Correlations

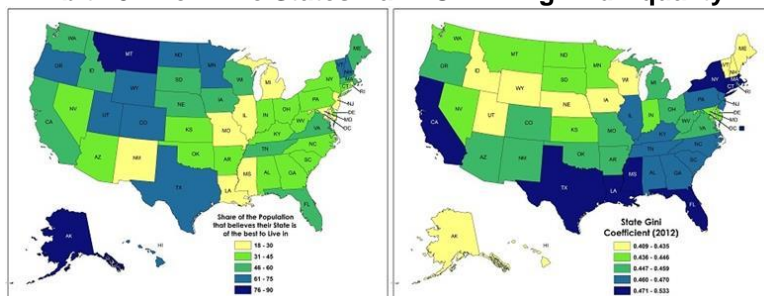
The heading for the story was “Americans Like Living in States With Less Income Inequality.”

We found this topic interesting when we saw an article from Citylab.com discussing income inequality and the quality of life in various states. The heading for the story was “Americans Like Living in States With Less Income Inequality.” We thought that was an intriguing headline. The subtitle for the article was even more interesting: “Residents of Alaska, Utah, and Wyoming say their states – which boast the lowest levels of income inequality in the country – are great places to live.” These three states happen to have low population density and fairly homogenous ethnic populations, which may have more to do with their ranking.



The analysis behind the article was interesting. A colleague of the author, an associate of the Martin Prosperity Institute, prepared two maps of the United States. The left-hand map in Exhibit 13 is based on a recent Gallup poll that asked state residents whether their state was among the best or the worst places to live. The right-hand map shows states by their Gini coefficient, the standard metric of income inequality that tracks the distribution of income across a state's population.

**Exhibit 13. How The States Rank On Living And Equality**



Source: Citylab.com

**Many of the states were on both lists with Wyoming, Alaska and Utah among the top three or four on both lists**

Because the article was attempting to promote the view of a widely inequitable economy, the author also presented a table showing the top 10 states based on their Gallup rating by residents about how well they rated as a place to live compared to the bottom 10 states in income inequality (2012 Gini Coefficient). Many of the states were on both lists with Wyoming, Alaska and Utah among the top three or four on both lists.

**Exhibit 14. Best/Worst States To Live And Earn An Income**

State	Best or one of the best possible states to live	State	Income Inequality/ Gini Coefficient (2012)
Montana	77%	Wyoming	0.417
Alaska	77%	Alaska	0.423
Utah	70%	Utah	0.424
Wyoming	69%	Hawaii	0.426
Texas	68%	New Hampshire	0.430
Hawaii	68%	Idaho	0.430
New Hampshire	67%	Iowa	0.433
North Dakota	66%	South Dakota	0.434
Colorado	65%	Nebraska	0.434
Vermont	61%	Delaware	0.436

Source: Citylab.com

**The author cautioned that correlation does not equate to causation but rather only to the association of variables**

To demonstrate that there is a relationship between income equality and the quality of living in a state, the author's colleague calculated the correlation between the two variables. The author cautioned that correlation does not equate to causation but rather only to the association of variables. Despite the warning, he went on to show that inequality was positively correlated with states where residents

**A problem for the author was Texas, which was fifth in the ranking of states that are the best to live in, yet was in the bottom half of all states when ranked from the lowest to the highest based on the states' Gini income-inequality measure**

said they were the worst place to live (.53). He also pointed out that income inequality was negatively correlated with the percentage of residents who said their state was among the best places to live (-.56).

The one state that presented a problem for the author was Texas, which was fifth in the ranking of states that are the best to live in, yet was in the bottom half of all states when ranked from the lowest to the highest based on the states' Gini income-inequality measure. The author called Texas an outlier, but never offered an explanation of how the state could be ranked as it was in the two surveys. Could it be that the state's demographics have impacted its income inequality ranking, especially given that the economy is in the midst of an energy boom, driven by the shale revolution. Some readers' comments attached to the article made disparaging remarks about the lack of beauty in Texas. We wonder, however, whether the views of people surveyed by Gallup on whether Texas was the best or one of the best states to live in happened to be shaped by the booming local economy and the opportunities it presents for individuals.

Although the author of the article cautioned about correlation leading to causation, the presentation of the data and the writing of the article suggested that he was trying to convince readers that income equality was the cause of residents citing their state for its quality of life. In our view, it would be a mistake to accept that conclusion given the low correlation of the data.

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