

From the Archives

# Voya Global Perspectives

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## A Global Perspective on Tectonic Shifts in Energy and the Current Bull Market

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Short-term market forecasts typically ignore slow-moving trends

## Executive Summary

The equity market has been surprising forecasters since it hit bottom in March 2009; three years later, little has changed. Reminiscent of the initial turning point in 2009, most 2012 forecasts have been bearish and thus far just plain wrong in terms of both direction and magnitude. Market seers have missed a relentless bull market by underestimating the resilience of business and consumer fundamentals (i.e., the private economy) and overestimating the global risks.

In our ING Global Perspectives 2012 forecast we explored the long-term drivers of market prices that we call “tectonic shifts”; these explosive long-term trends have clearly impacted the “unpredictable” market rallies we have seen this year, adding fire to already hot fundamentals and a soothing chill to overheated global risks. These tectonic shifts can be found in four broad areas: global trade, technology, frontier markets and energy.

This report focuses on the impact energy has had on the private economy this year as well as our expectations for its long-term influence.

- Tectonic shifts in energy — led by the development of horizontal fracturing (“fracking”) to tap into natural gas stores deep under the surface of the earth — are expected to lead the United States to energy independence by 2020.
- Cheap and abundant natural gas is not a panacea for our energy needs, however; given the already-vital and still-growing role it plays in the global economy, energy must be diversified across all available sources to ensure it’s there when we need it.
- Over-regulation and misplaced government priorities threaten to stymie natural market forces and blunt the impact of the energy tectonic shift.
- The energy transformation will reduce the basic costs to run a society, freeing up capital for deployment in other parts of the economy.
- Many investors have failed to recognize fully the profound impact that the energy revolution — in concert with our other tectonic shifts — is having on market fundamentals and thus asset prices.

## The Missing Link in Forecasting

Forecasting dynamic and complex global markets is difficult at best and can be folly at worst. To understand the deeper forces at work, we believe readily gathered and tracked financial data must be supplemented by longer-term analysis with more comprehensive breadth and depth. Toward that end, we seek to identify trends that may not be apparent in daily financial statistics but have the power to profoundly influence economic growth, employment and ultimately markets.

Traditional short-term market forecasts typically ignore trends that are slow moving, hard to measure and veiled in their influence on the global economy. Disregarding these sub-surface themes is a critical gap in forecasting methodology because, like continents colliding, their explosive intensity may have the power to change the face of the earth. We regard these tectonic shifts as a meaningful part of the “surprise” in advancing corporate earnings, broadening manufacturing, unanticipated consumer strength and global market resilience in the face of the Armageddon scenarios favored by the financial press.

Of the four tectonic shifts described in our annual forecast, none has had a more profound and immediate impact than energy, which has progressed even faster than we anticipated at the beginning of the year.

### Independence and Integration

While tectonic shifts are important independently, their influence on the global economy is even more powerful when integrated. While the featured tectonic shift for this article — energy — is all the rage, less attention has been paid to the impact the other tectonic shifts are having on the energy industry. For example:

- Technology advances in fracking are having an enormous impact on energy-market dynamics...
- ...helping to drive North American energy independence and ultimately transforming global trade, as the region transforms from net importer to net exporter...
- ...and presenting frontier markets with the choice of broadening their economies with natural gas fracking, deepwater drilling and/or coal mining.

## Tectonic Shift: Energy

Transformations in energy tend to be multi-decade phenomena. In 2011, energy rose to prominence in our Global Perspectives research as it became apparent that the transformative change occurring in energy would culminate in energy independence for North America (and for the United States in particular). Not only is the U.S. the Saudi Arabia of natural gas, we also have the largest recoverable sources of coal. These two astounding advantages have the potential to transform our economy. Coal, while being replaced by natural gas in America's electric utility industry, is the preferred energy source for emerging market power plants due to the significant cost advantage it offers. "The United States holds the world's largest coal reserves, but China, with the world's third-largest share, is tapping more of its own reserves and boosting imports from Australia, Indonesia and even Colombia as its economy continues to grow. India, too, is hungry for coal. U.S. coal exports have more than doubled in the past two years to reach a record nearly 29 million tons in the first three months of the year. Roughly a quarter of that already heads to Asia, mostly via Gulf Coast ports."<sup>1</sup>

While America is increasingly shunning coal, Europe can't seem to get enough of it. The *Financial Times* reports, "U.S. coal exports rose 24% — hitting a record of 66.2 million short tons — in the first half of the year, according to the U.S. Energy Information Administration. Sales of U.S. coal have been booming in Europe as power generators there ditch more expensive natural gas in favor of coal."<sup>2</sup>

Natural gas certainly deserves the attention it has received, but it would be a mistake to miss the global opportunity that coal represents. As we have tracked its progress throughout 2012, the pace of change has accelerated; in fact, forget about the multi-decade impact we mentioned earlier — natural gas is transforming the global economy as we speak. Here's some evidence of the shift:

- With natural gas in the U.S. nearly 80% cheaper than it is in other developed countries, U.S. manufacturers have a competitive advantage.

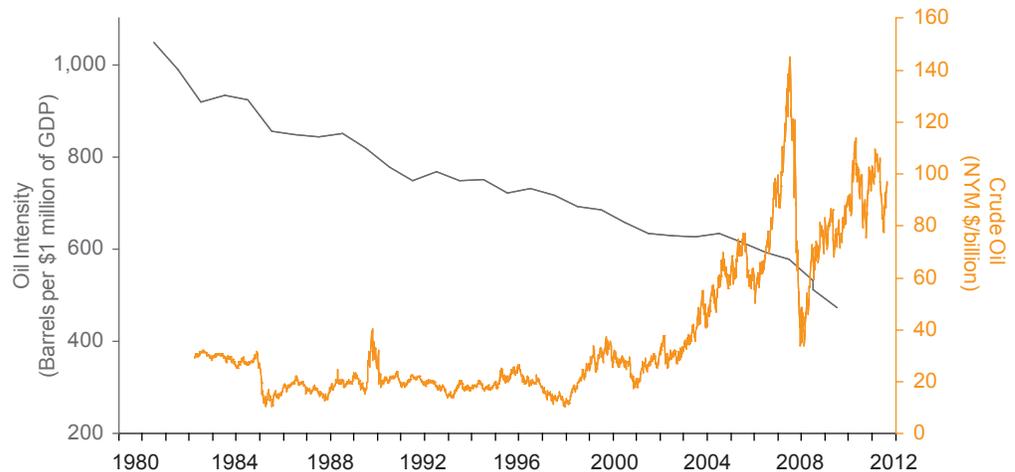
Oil intensity continues to decline — it's down by almost two-thirds since 1980

<sup>1</sup> Patrick Rucker, "Coal Fight Looms, Keystone-Like, Over U.S. Northwest," Reuters, September 23, 2012.

<sup>2</sup> Ed Crooks and Sylvia Pfeifer, "U.S. Coal Exports to Europe Soar," *Financial Times*, October 3, 2012.

- Natural gas prices are down 35% in the past year — creating a double-barrelled bonus for the steel industry:
  - Increased demand for steel: Shipments of tubular goods increased 87% from 2009–11
  - Lower manufacturing energy costs: Production cost cut by \$8–10/ton (1.6%)
- Power plants are converting from coal to natural gas. The need for energy to generate electricity will remain the single biggest driver of demand. By 2040, electricity generation will account for more than 40% of global energy consumption.<sup>3</sup>
- By 2025, natural gas will be the second most widely used source of energy worldwide.<sup>4</sup>
- A consortium of energy companies said in early October that they are moving forward with plans to export natural gas from Alaska’s North Slope in a project that could cost as much as \$65 billion.<sup>5</sup>
- Natural gas is an accepted alternative to oil and regular gasoline as an auto and truck fuel; for example, fleets of UPS trucks readily run on natural gas today.
- Compliance with federal fuel efficiency standards (Corporate Average Fuel Economy, or CAFE) will dramatically shorten the time until the U.S. exports more energy than it imports (i.e., reaches energy independence).
- Oil Intensity, the amount of oil required to produce a unit of GDP, continues to trend down, falling almost two-thirds since 1980. This decline has been driven by a transition to a more service-oriented economy, as well as significant advances in the efficiency of U.S. passenger vehicles.

**Figure 1. Oil Prices Fluctuate, but Oil Intensity Has Steadily Declined Since 1980**



Note: Oil Prices are West Texas Intermediate light crude spot price (NYMEX).  
 Source: U.S. Department of Energy, FactSet

3 2012 *The Outlook for Energy: A View to 2040*, ExxonMobil.

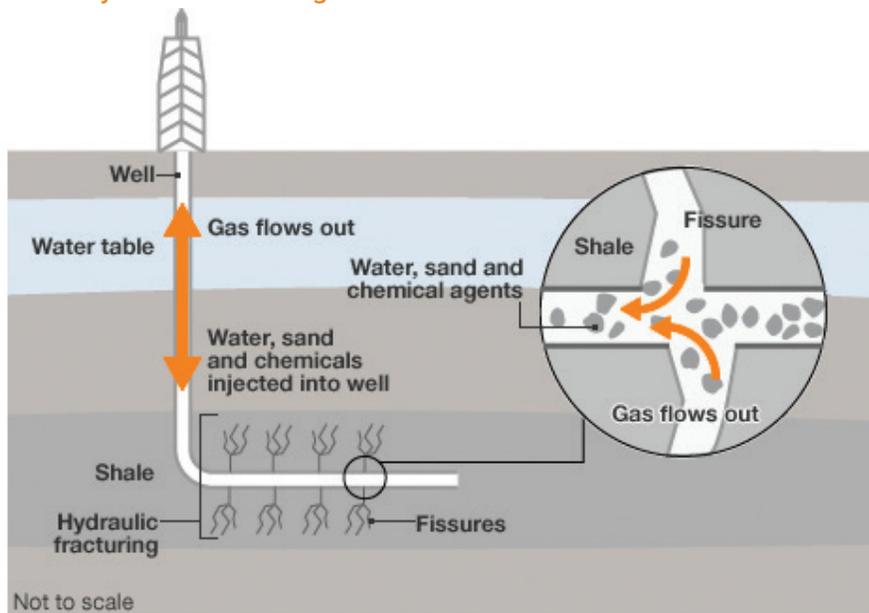
4 2012 *The Outlook for Energy: A View to 2040*, ExxonMobil.

5 Daniel Gilbert and Tom Fowler, “Natural Gas Glut Pushes Exports,” *Wall Street Journal*, October 5, 2012.

## Fracking Is Changing the Energy Landscape

Until recently, few people knew what fracking was or how it would change our energy landscape — practically overnight — from plans to build *import* terminals to plans to build *export* terminals to ship natural gas. Surprisingly, it was not the big energy firms that made fracking a success; entrepreneur George Mitchell of Mitchell Energy pioneered development of horizontal drilling techniques. An innovative, relatively simple technique that could even rejuvenate existing oil wells suddenly became phenomenally productive by drilling down (sometimes for miles), turning horizontally and injecting water and sand under pressure to release natural gas in abundant quantities. You can see a visual of fracking in Figure 2.

**Figure 2. How Hydraulic Fracturing Works**



Source: BBC

While fracking has come under fire due to environmental concerns — including the risk of earthquakes, the potential for aquifer pollution and the release of methane gas; its extraordinary use of water; and other, more extreme fears — progress has been made to assuage the public’s qualms. For example, we have already seen the invention of waterless fracking; LPG (liquid petroleum gas) fracking was developed by Robert Lestz, founder of GasFrac in Calgary, Canada.

Some research has suggested that fracking itself is not the real problem, instead blaming careless, low-technology cementing around the drill pipe that is intended to prevent leaking gas from being released into the environment or the aquifer. By all means, let’s establish and enforce standards on this low-cost problem. As reported in the *Wall Street Journal*, “Some energy companies, state regulators, academics and environmentalists are reaching consensus that natural-gas drilling has led to several incidents of water pollution — but not because of fracking. The energy officials and some environmentalists agree that poorly built wells are to blame for some cases of water contamination. In those cases, they say, wells weren’t properly sealed with subterranean cement, which allowed contaminants to travel up the well bore from deep underground into shallow aquifers that provide drinking water.”<sup>6</sup>

<sup>6</sup> Russell Gold, “Faulty Wells, Not Fracking, Blamed for Water Pollution,” *Wall Street Journal*, March 25, 2012.

Fracking has been the primary contributor to the potential realization of North American energy independence by 2020

## Fracking: Evolution or Revolution?

The extraordinary success of fracking has been the primary contributor to the potential realization of North American energy independence by 2020. But does that prospect constitute an energy evolution or revolution? Here are some opinions.

- “The transformation, which could see the country become the world’s top energy producer by 2020, has implications for the economy and national security — boosting household incomes, jobs and government revenue; cutting the trade deficit; enhancing manufacturers’ competitiveness; and allowing greater flexibility in dealing with unrest in the Middle East.”<sup>7</sup>
- “Energy independence could make this the ‘New American Century’ by creating an economic environment where the United States enjoys access to energy supplies at much lower cost than other parts of the world. Such an advantage, combined with construction of new advanced manufacturing facilities and competitive domestic labor costs, could give the U.S. economy an unprecedented edge over other nations, particularly China and northern Europe. The energy cost advantage was highly visible in January 2012, when U.S. firms paid less than \$3 per million Btu for natural gas while South Korean buyers paid \$13.50.”<sup>8</sup>
- “My basic conclusion is that achieving energy independence will revolutionize the U.S. and global economies over the next decade. As a consequence, many firms that have played an important role in the energy sector for the last forty years will diminish in importance or vanish.”<sup>9</sup>
- “With little other positive news to grasp onto in recent months, shale gas offers a welcome diversion from the torrent of euro zone crisis headlines. But unlike some other studies, we believe shale gas is unlikely to be revolutionary, rather evolutionary in its impact on the U.S. economy, and elsewhere. It will be less ‘silicon chip’ or ‘internal combustion engine’ therefore, and more ‘energy saving light bulb’”<sup>10</sup>
- “We have a revolution here. In 47 years in this business, I’ve never seen anything like this. This is the equivalent of a Category 5 hurricane.”<sup>11</sup>
- “The United States has become the fastest-growing oil and gas producer in the world, and it is likely to remain so for the rest of this decade and into the 2020s. The economic consequences of this supply-and-demand revolution are potentially extraordinary. We estimate that the cumulative impact of new production and reduced consumption could increase real U.S. gross domestic product (GDP) by 2–3.3%, or by \$370–624 billion, by 2020.”<sup>12</sup>
- “Although the surge in U.S. natural gas production from the shale gas ‘revolution,’ combined with new environmental regulations are limiting growth in coal’s use for domestic power generation, worldwide steam coal demand is rising. Research from the International Energy Agency forecasts world demand for steam coal to rise by over 1 billion metric tons in 2016 from 2010 consumption levels.”<sup>13</sup> You can see the IEA data around steam coal demand in Figure 3.

7 Bloomberg, “North Dakota Oil Boom,” June 19, 2012.

8 Phillip K. Verleger, Jr., “The Amazing Tale of U.S. Energy Independence,” *The International Economy*, Spring 2012.

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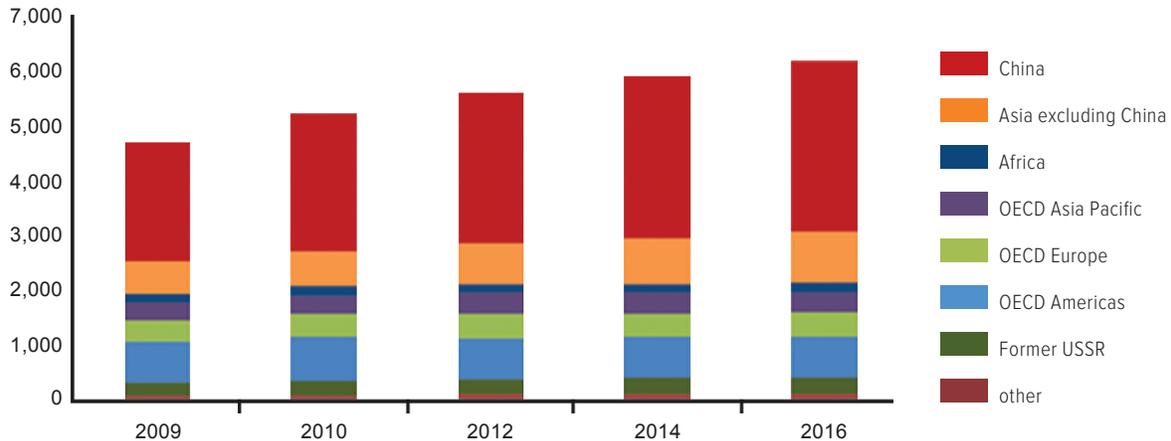
10 ING Economics Financial Markets Research, “Frack in the USA,” June 27, 2012.

11 Larry Goldstein, Director of the Energy Policy Research Foundation, New York, NY

12 Ed Morse, “Move Over OPEC — Here we Come,” *The Wall Street Journal*, March 19, 2012.

13 Energy Policy Research Foundation, Inc., “The Economic Value of American Coal Exports,” August 2012.

**Figure 3. Demand for Steam Coal Is Expected to Continue to Rise**



Source: Energy Policy Research Foundation, Inc.

## The Energy Power Gap: Risks in Energy and the Case for Diversified Sources

One of the most basic necessities of life along with food, oxygen and water is electricity. Without electricity, life as we know it stops. It may be an inconvenience when gas at the pump goes to \$4, \$5, \$6 or \$10 per gallon, but what if you couldn't get it at any price? What if the supply evaporated? What if the power simply wouldn't work?

In October 2011, the lights went out in stodgy old Connecticut due to a sudden severe snowstorm when trees were still heavy with leaves. In a few short hours, thousands of trees fell on power lines and transfer stations, wreaking havoc even where power lines were underground. The impact was intensified because the state's electric utility had failed to pay its cleanup bill after the last mild storm (management had outsourced this critical job); as a result, the contractors needed to clean up after this latest storm put Connecticut last in line to get relief. It took 11 days — even longer in some locations — to restore power. A blistering cold spell subsequently settled over the region, leaving many roads impassable, and pumps at gas stations quickly exhausted their back-up generator power. In the dark and cold, residents with empty fuel tanks converged on the few gas stations that were open, enduring lines for several hours. Many families who could, simply left the state. But many others were stranded with no power, no fuel, no grocery stores and no water. No doubt, a taste of Armageddon.

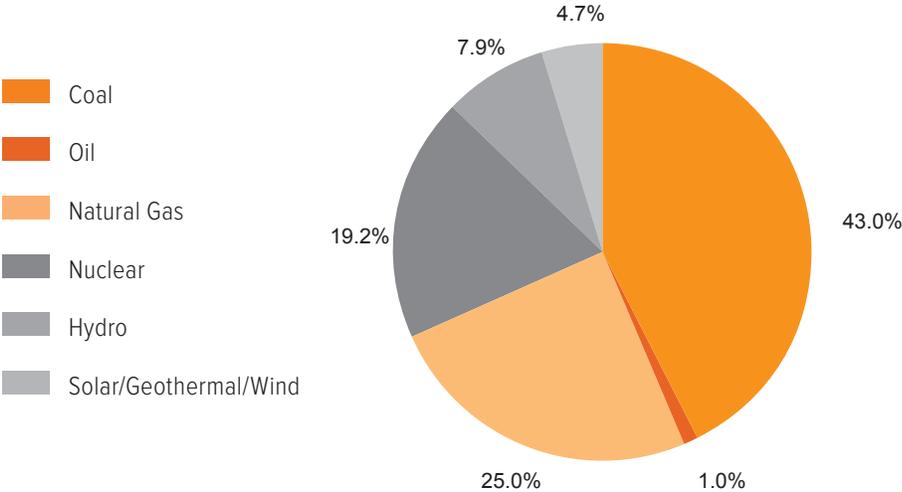
Electricity is one of the most basic necessities of life

That is just Connecticut; in India, over 250 million people recently were without power for a month. Oh, that could never happen here? Well, let's hope not. But it takes foresight and substantial, expensive disaster back-up and recovery planning. In fact, we saw much worse than our Connecticut example only a few years ago, as Hurricane Katrina found the Federal Emergency Management Agency (FEMA) totally unprepared and under-resourced despite the well-known and highly publicized risk that New Orleans' levees would not hold even in a Category 3 hurricane. Facing the near-certainty of disaster, little was done in preparation for the savage storm. Few observers have recognized the threat that the United States may be exposed to a "power gap" — not just the lack of power, but the consequences of very limited diversification in terms of the sources of energy to produce that power.

Currently, the combination of regulation by the Environmental Protection Agency and market forces that favor cheap natural gas are putting coal out of business in America. Coal currently is used to generate 43% our electric power supply. Due to concerns about clean air — even though coal is cleaner than it has ever been — and the benefits of abundant, clean and cheap natural gas, diversity of our available sources of electric power is shrinking.

The other source of “real” electric power — nuclear energy — is nowhere near its potential as a reliable diversifier of electric power despite recent approvals for new plants. And “government energy” (renewable energy like wind and solar) accounts for a mere 5% of America’s energy supply even with the vast government subsidies that support it.

**Figure 4. U.S. Electricity Production by Source**



Source: U.S. Energy Information Administration. Data as of 2012.

Diversity of our available sources of electric power is shrinking

Risks that hit the market in a pervasive way cannot always be predicted; Nassim Taleb has famously dubbed these unexpected risks “black swans”. The risks to energy can be seen, however, and more important they can be mitigated by both energy independence and extensive back-up and redundancy in the system. Our sense is that many studies misunderstand the importance of fracking and the natural gas revolution. These studies incorrectly assume that the availability of “clean” natural gas means we should immediately reduce coal’s 43% share (down from over 50%) even lower. This would be an incredible mistake that could raise the probability of systemic power outages. Energy is critical to power generation and to economies globally, and it must be diversified across sources.

Another risk about which we need to be vigilant is the vulnerability of our power grid to a terrorist attack. Just days ago, Defense Secretary Leon Panetta warned that “the United States was facing the possibility of a ‘cyber-Pearl Harbor’ and was increasingly vulnerable to foreign computer hackers who could dismantle the nation’s power grid, transportation system, financial networks and government.”<sup>14</sup>

## Regulatory Malaise Has Negatively Impacted Energy and Electric Power

Whether the fracking-led expansion of energy supply constitutes resurgence or revolution, it should spark a singularly virtuous cycle for the economy. While few would argue that government regulation is unnecessary, over-regulation or clumsy regulation is the bane of smooth and efficient markets. Moreover, risk and uncertainty about government regulation are making for a rough ride for entrepreneurs and investors alike. For example, one could

<sup>14</sup> Elizabeth Bumiller and Thom Shanker, “Panetta Warns of Dire Threat of Cyberattack on U.S.,” *The New York Times*, October 11, 2012.

argue that the Basel II regulations — an accord finalized in 2006 by a group of international central banks and national regulators in response both to the assorted banking crises that battered the global economic system in the 1990s and to criticisms of the original Basel agreement — have contributed to, rather than mitigated, the worst financial scare since the Great Depression. Just as outdated regulation first sowed the seeds of the financial crisis in the U.S. by inducing lenders to offer subprime, no-documentation loans to under-qualified borrowers, Basel II has left many of Europe’s banks on shaky ground by promoting heavy investment in sovereign debt that has proven to be not as risk-free as anticipated. Meanwhile, only time will tell what unintended consequences Basel III — a potential overreaction in the wake of the financial crisis that is being phased in globally through 2018 — will have on banks and the economy.

The common regulatory error is to mandate like behavior from a diverse market place

Over-regulation of the energy industry by the EPA could lead to similarly unfortunate results. The common regulatory error is to mandate like behavior from a diverse marketplace; that is, to require all industry participants to follow the same course with no diversified paths or outcomes. If the electric power industry is obliged to replace abundant “dirty” coal with “clean” natural gas, well-meaning authorities will have in effect directed or incentivized the industry to eliminate natural backups in energy supply, potentially increasing costs and jeopardizing dependability.

## Energy Troubles Brewing in Developed Countries

Any country that fails to diversify its power sources sets itself up for foreseeable social and economic calamities. Recent reports that exemplify our concerns include:

- Japan will phase out nuclear power by 2040 in reaction to the Fukushima nuclear disaster.
- German Chancellor Angela Merkel ordered half of her country’s nuclear plants shut down, pledging to replace them with renewable energy sources over the next decade.
- France’s President Francois Hollande ordered the rejection of seven “fracking” applications intended to take advantage of the country’s shale deposits while at the same time setting a goal to sharply reduce nuclear power from 75% to 50% of the nation’s supply.
- The Czech Republic and Bulgaria have considered or have already banned fracking.
- On August 21, 2012, a U.S. appeals court overturned a key EPA rule to reduce harmful emissions from coal-burning power plants, sparking a rally in coal company shares and relief among utility firms. But some analysts pointed out that dozens of coal-fired plants are already slated for closure due to other EPA regulations. The power industry in Texas had warned that the EPA’s proposed rules could result in peak-season blackouts.

As you can see from the first two points above, the most recent nuclear accident in Japan once again cast the technology in an unfavorable light. However, nuclear energy remains an important piece in the overall energy landscape puzzle.

- Nuclear energy generates 20% of U.S. electricity.
- America’s reactors operate around the clock, thereby stabilizing the entire country’s electricity distribution system and electricity marketplace.
- In normal operation, nuclear power plants don’t burn anything. They produce no combustible gasses, are emission free and thus do not contribute to climate changes. Admittedly, the real hazards of nuclear power occur when “normal operation,” for whatever reason, is interrupted.

A transformative reduction in the basic costs to run a society is on the horizon

- The U.S. will demand as much as 28% more electricity by 2035, according to the Energy Information Administration's recent forecast. Therefore, the U.S. will need all the sources of electricity generation available, including renewables, coal, natural gas and nuclear energy. Nuclear energy currently is the only large-scale, emission-free energy source that can be widely expanded.<sup>15</sup>

## Energy's Transformation Is Mispriced by the Market

Whether revolutionary or evolutionary, the transformative trend in energy is big, and its impact is being felt now across sectors, consumers and businesses as a positive contributor to fundamentals. It is also reducing the global risk outlook, increasing profits of small and large businesses, lowering consumer costs and reducing the risk of future supply bottlenecks, while offering a more environmental alternative to “dirty” energy.

The pace of this transformation is astounding the markets and spreading at a speed that makes it impossible to definitively price because of complex effects on energy prices, economic growth, energy security, government revenues and new uses. It is also impacting and being impacted by the other tectonic shifts of global trade, frontier markets and technology.

Most revolutions are not fully perceived until well after the fact, and our view is that it is imperative to not underestimate this important trend. Revolutionary changes, though, must have a systemic impact across most, if not all, sectors of the economy. Without a doubt, energy has systemic impact on the global economy for businesses and consumers alike. Beyond a potential increase in supply, a transformative reduction in the basic costs to run a society is in the offing. This enormous amount of savings can be spent more productively elsewhere, and it will only get better from here. The irony is that high oil prices, by kick-starting the development of new technologies, have spurred progress toward North American energy independence and a reduced reliance on the Middle East for one of our basic necessities.

## Tectonic Shifts as Catalysts for Growth

Globally diversified portfolios of risky assets, including both equity and fixed income investments, have experienced a bull market for almost four years, returning over 11% annualized. Investors who accepted normal volatility have been handsomely rewarded even as many — to the tune of \$7.5 trillion — have remained on the sidelines. But how have investors missed the signs of this bull market, which has been characterized by strong fundamentals and moderating global risks? Why does unwarranted pessimism still grip the markets? Our research indicates that today's fundamentals represent capitalism at its best, with a marginal impact by catalysts for growth from our four tectonic shifts, and energy in particular.

## Conclusion: Integrating Tectonic Shifts to Improve Forecasting

Energy may or may not be a revolution. It may not be the solution to GDP growth and employment problems. It may not resolve our deficit issues. And it may not guarantee the security of the United States. But it is a big step in the right direction, and it is but one of the four tectonic shifts that we expect to work together to build potential for upside surprises in the markets.

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<sup>15</sup> *Nuclear Energy: Just the Facts*, Nuclear Energy Institute, October 2010.

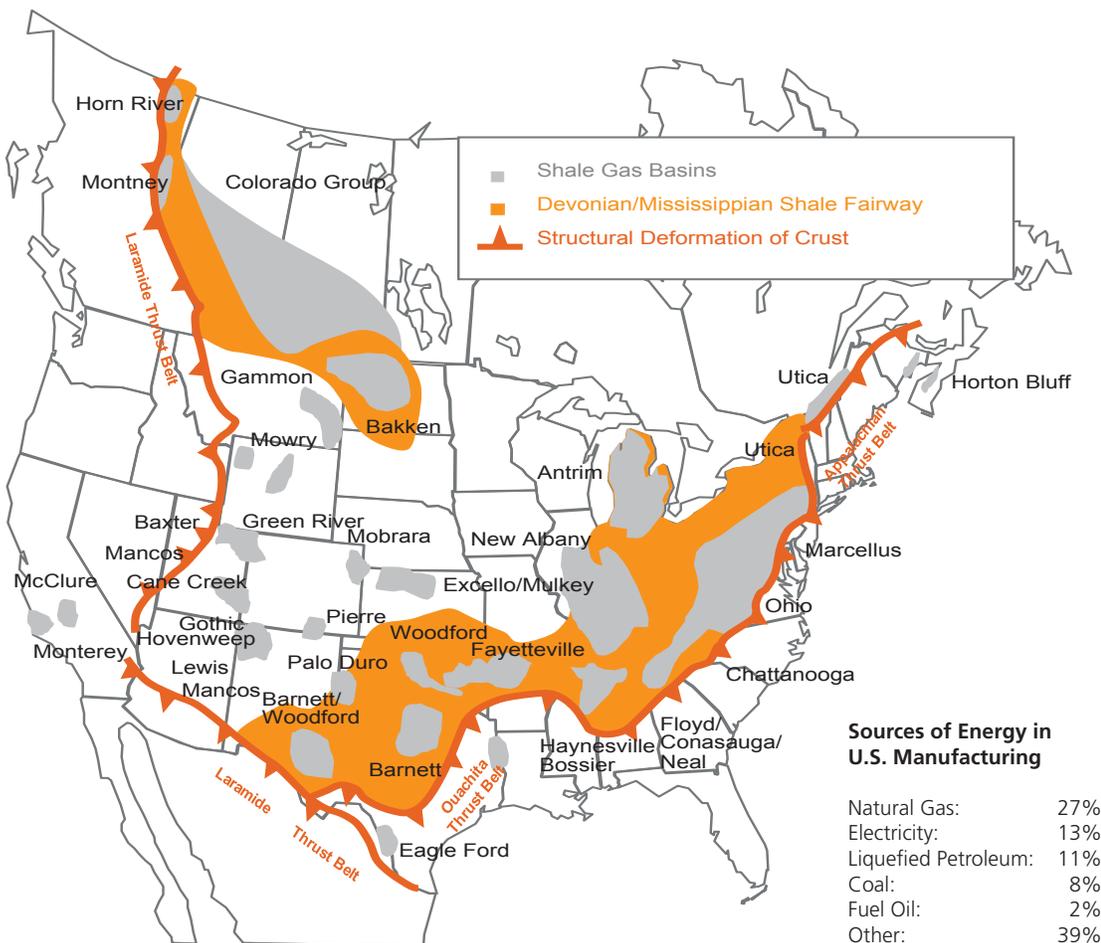
The common thread across the tectonic shifts is they are driving changes that are powerful, inevitable and good for the private economy, but in many cases are hampered by the absence of supportive government growth policies. Entrepreneurs will continue to work hard, but unenlightened government regulation may slow the progress or even sow the seeds of the next crisis by forcing common behavior among diverse market participants.

We expect the private economy to continue to progress toward more abundant and cheap energy, with the byproducts of more jobs, more economic growth, abundant electric power and expanding global opportunity. We doubt that the energy opportunity and the attendant reduction in risk are suitably priced into global markets, representing an opportunity for investors to build wealth.

Many forces — private capitalism, state capitalism, government stimulus — interact to make forecasting capital market returns a challenging process; notwithstanding the limited appreciation of their impact by investors, the four tectonic shifts we are following have bolstered market fundamentals during the current bull market and should continue to do so going forward. Though Armageddon-level fear may dominate investors' better judgment in the short term, fundamentals prevail over the long sweep of financial market history, and the broader underlying trends ultimately determine — and transform — the range of possible outcomes.

Tectonic shifts are driving changes that are powerful, inevitable and good for society

Figure 5. A Tectonic Shift in Energy Is Driving U.S. Energy Independence



Source: Advanced Resources, Ziff Energy Group, U.S. Department of Energy, FactSet, U.S. Census Bureau

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