
Special Energy Podcast: Addressing Current Political Topics

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Welcome to the Tortoise QuickTake podcast. Thank you for joining us. Today, Tortoise provides a timely update on trending topics in the market.

Brian Sulley: Hello. I am Tortoise Client Portfolio Manager Brian Sulley and I am joined by Tortoise Managing Director and Portfolio Manager Rob Thummel. It's still 2019 but the election season is upon us. We are 377 days from the 2020 United States presidential election but only 102 days from the Iowa caucuses on February 3rd, 2020. As the political season begins to heat up, there are several policies that will be debated across both parties such as Medicare-for-all, China and trade, big tech breakup, health care and financial industry regulation. One policy of national interest that is an interest to us here at Tortoise relates to how to address climate change. Most recently there has been a lot of discussion about oil and gas drilling specifically hydraulic fracturing or fracking in the U.S. In this podcast, we will answer some questions that many of you are asking related to this subject.

Rob, let's start with the number one question on everybody's mind. What are the key things to consider as democratic Presidential candidates' debate oil and gas drilling in the U.S.?

Rob Thummel: The first thing to consider is whether oil and gas drilling would be halted on Federal or public land or if an universal ban on fracking would be implemented. This is an important distinction.

Brian Sulley: Elizabeth Warren has said that were she to be elected, that on her first day as President, she would sign an executive order that puts a total moratorium on all new fossil fuel leases for drilling offshore and on public lands. What kind of impact would that have?

Rob Thummel: Most oil and gas drilling in the U.S. is done on private lands. But it is estimated that only about 10% of drilling occurs on Federal or public lands. U.S. oil and gas production would still grow into the future; however, growth is estimated to be 40% lower if a ban on drilling on Federal land was implemented. Overall, we expect the cash flows attributable to our investments would be 3 – 4% lower than current forecasts.

Brian Sulley: The second half of Elizabeth Warren's tweet says that she would ban fracking – everywhere. Quite a bold initiative. What impact would that have on the energy sector?

Rob Thummel: In my opinion, a period similar to the energy crisis experienced in the 1970s could occur if a universal ban on fracking occurs in the U.S. Commodity prices would increase. Analysts estimate that U.S. oil prices likely rise by 70% to at least \$85 per barrel and natural gas prices could rise by almost 300% to \$9 per mcf. A global economic crisis could be triggered by high commodity prices. Inflation would be significant. U.S. oil and gas production volumes would fall by 25% - 35% per year. Energy reliability could become an issue. We might not be able to keep the lights on consistently. Energy security would be threatened as the U.S. would be forced to rely on the Middle East as well as Canada as the primary suppliers of oil. Most significantly – we expect a frac ban would be bad for the environment. We expect an increase in global carbon dioxide emissions as coal would become economic again increasing its market share in the global supply mix.

Brian Sulley: So, what if the goal of a universal frac ban is to reduce global energy demand?

Rob Thummel: This will be difficult. Around the world, the middle class is growing and energy demand will grow with it. In addition, there are still over one billion people that don't have access to electricity. As more people experience the quality of life benefits that energy provides, it is likely that they will consume more energy.

Brian: And should a ban occur, what portfolio changes would the team consider?

Rob Thummel: From a midstream portfolio positioning perspective, our team would further shift the portfolio to pipeline operators whose customers are the users of the commodity like a petrochemical company or refiner. Canada would be made great again and Canadian energy infrastructure would become more valuable.

Brian Sulley: Some of these consequences seem pretty severe. Can one person really make that big of an impact?

Rob Thummel: An executive order could be used to ban drilling on Federal lands. It is expected though that Congressional approval is required to ban fracking everywhere. Alternatively, a newly elected President could use regulatory agencies such as the FERC and EPA to make permitting and other approvals challenging.

Brian Sulley: Why do so many people then react so strongly or even go so far as to say they hate fracking?

Rob Thummel: I don't think people hate fracking. I think they love the environment and are concerned about the future given the rise in global carbon emissions. Early on, there were concerns about fracking contaminating groundwater as well as causing earthquakes in Oklahoma. Most of these concerns have dissipated. Today, 670,000 of the 977,000 producing wells, that is 70%, were hydraulically fractured and horizontally drilled based on the latest data from the U.S. Energy Information Administration. Fracking today appears to be done safely.

Brian Sulley: So then looking out even more broadly, how has fracking changed the global energy landscape?

Rob Thummel: In my opinion, horizontal drilling combined with hydraulic fracturing has been the most significant technological advancement in the U.S. energy sector since the first oil well was drilled in Pennsylvania in 1859. Modern-day fracking began with Mitchell Energy in the early 1990s. Hydraulic fracturing has propelled the United States into the position as the largest producer of crude oil and natural gas in the world. As a result of fracking, the U.S. is now a net energy exporter. The economic benefits from fracking are substantial. According to the American Petroleum Institute, the oil and gas industry supports 10.3 million jobs in the U.S. and represents nearly 8 percent of the U.S. economy. Global energy consulting firm IHS forecasts federal and state government tax revenue will be \$113 billion in 2020. Fracking has turned the U.S. into a net energy exporter that has had a positive impact, reducing the foreign trade deficit by approximately \$400 billion. Fracking has allowed the U.S. to reduce carbon dioxide emissions. More on that in a minute. Lastly, hydraulic fracturing has reduced U.S. reliance on foreign sources of energy. For example U.S. crude oil imports from OPEC today have fallen to a 30-year low.

Brian Sulley: Are there any localized political consequences of proposing a ban on fracking?

Rob: Potentially, significant hydraulic fracturing occurs in the states of Texas, North Dakota, New Mexico, Oklahoma, Colorado, Ohio, and Pennsylvania. Of those states, the 18 Electoral College votes in Ohio and the 20 in Pennsylvania are the most coveted on the road to 270. Oil and gas production activities generate significant income for certain states. For example, in New Mexico, tax revenue from oil and gas production make up more than 35% of all revenue collected by the state. Increased state revenues in New Mexico from higher oil and gas production have allowed the state to increase teacher salaries as well as elevate spending for roads and highways.

Brian Sulley: Rob, does supporting the energy production enabled by fracking mean that you do not believe in or care about climate change?

Rob Thummel: No. Climate change is very important to Tortoise not just as investors but as human beings. We are concerned about our children as well as current and future grandchildren. Climate change is a global problem. In a whitepaper on our website titled *The Teal Energy Deal*, we provide a practical solution on how low cost, low carbon natural gas and renewables can reduce global carbon dioxide emissions during periods of rising global energy demand.

Brian Sulley: Although headlines surrounding drilling and regulations around that have been front of mind over the past week, U.S. policy to address global climate change can come in many flavors. What are the other potential ways that a newly-elected President might address climate change?

Rob Thummel: President Obama initiated several policies to curb climate change such as being a signatory to the Paris climate change agreement, adoption of the Clean Power Plan that restricted greenhouse gas emissions from future coal power plants, increasing fuel economy standards and banning oil and gas drilling on federally owned lands in the Arctic and Atlantic Oceans. All of these policies were reversed by President Trump. A democratic elected president would likely re-institute many of the Obama-era policies. Keep in mind that during President Obama's term, U.S. oil production increased by 1.7x and natural gas production rose by 1.3x.

Brian Sulley: The anti-fracking crowd is really concerned about the environment and believes that fracking makes the environment worse. It seems like the focus is primarily on carbon dioxide emissions. Rightfully so, carbon dioxide emissions are a concern as there were several news headlines earlier this year stating that carbon dioxide emissions reached an all-time high in 2018. People are attributing climate change to wildfires, tsunamis, flooding, etc. So this is a pretty important issue. Help our audience understand what is going on. Why exactly are global carbon dioxide emissions rising?

Rob Thummel: According to the U.S. Environmental Protection Agency, 76% of global greenhouse gas emissions most of which are carbon dioxide emissions come from electricity and heat production, industry, transportation, and buildings. The remaining 24% comes from agriculture and forestry – insert your cow joke here. The single largest source of global greenhouse emissions comes from burning coal, natural gas, and oil to generate electricity and heat. Currently, the global fuel supply mix includes 34% oil, 27% coal, 24% natural gas, 11% nuclear and hydro-electric, and 4% renewables primarily wind and solar. We expect global energy demand to continue to rise as population and global GDP rises. If the supply mix does not change then carbon dioxide emissions will continue to rise.

Brian Sulley: Who are the largest polluters?

Rob Thummel: The countries that generate the most carbon dioxide are also the world's largest economies and populations but not in the same order. The top five carbon dioxide emitters in order are China, United States, India, Japan and Russia.

Brian Sulley: What can or must be done to reduce carbon emissions?

Rob Thummel: There has to be a shift in the global energy supply mix. Coal produces two times the amount of carbon emissions compared to natural gas. Renewables emit no carbon emissions. In our Tortoise *Teal Energy Deal* whitepaper, we outline how low cost, low or no carbon supply sources can reduce carbon dioxide emissions in a period of rising energy demand. What this means is eliminating coal and replacing it with natural gas and renewables. This formula works! Not many people know this. But greenhouse gas emissions that include carbon dioxide in the U.S. are lower than 2005. You heard me right. According to the Energy Information Administration, U.S. carbon dioxide emissions have declined by 28% since 2006.

Brian Sulley: This seems like a stat that most voters, politicians, and even people in general don't know. How did this happen exactly?

Rob Thummel: The U.S. reduced carbon emissions by displacing coal with natural gas and renewables to generate electricity and heat. Today, coal as a percentage of the U.S. energy supply mix has declined from 51% in 2005 to 28% today. Solar and wind increased its market share from 1% in 2005 to 8% today. Natural gas became the largest supply source increasing its market share from 18% in 2005 to 34% today. The primary driver of the transformation in the U.S. was fracking reducing the price of natural gas making it cheaper than coal as a fuel source to generate electricity.

Brian Sulley: This is such a great story. Seemingly one of the biggest stories of the century in the U.S., yet it doesn't seem to get a lot of public attention even from the media. Why is this same type of thing not happening in other large economies like China and India?

Rob Thummel: Carbon emissions are a global challenge. You are right the U.S. is leading the charge in reducing carbon emissions and can always do more. However, China and India are adding to the global carbon emissions challenge every year as coal is used to generate 67% and 75% of its electricity in these countries. Coal is the primary fuel source because it is cheaper in China and India. However, China and India need to follow the U.S. lead in displacing coal with natural gas. Hydraulic fracturing in the U.S. will result in low cost U.S. produced natural gas being exported to China and India assisting both countries in reducing carbon dioxide emissions in the future.

Brian Sulley: Well if less is good, then zero must be better. Why not go all-in on renewables like the Green New Deal suggests?

Rob Thummel: As mentioned earlier, solar and wind supply about 4% of the world's energy supply. Add in hydro, you're up to 11% of total supply. The numbers in the U.S. are very similar. Moving to 100% renewables introduces some real challenges. First, wind and solar resources requires a significant infrastructure investment in new transmission lines. For example, the largest wind producer in the U.S. will only invest in wind projects in half of the 50 states. Second, energy reliability could be altered. Most of us expect our lights to turn and the A/C and heat to keep the temperature in our home and work constant throughout the day. A 100% renewable world would significantly reduce reliability. Lastly, research and development remains the key to a renewable future. If you don't believe me then maybe Bill Gates will persuade you. In a recent Bloomberg interview, Mr. Gates the costs of wind and solar aren't likely not to drop much further so research and development needs to be done in things like energy storage technologies. That is exactly what Gate's clean-energy fund Breakthrough Energy Ventures is doing.

Brian Sulley: So it sounds like in addition to a number of political headlines out there, there's also a number of ways to address these kind of issues over the long-term. To hear more about how we continue to look at that and look for ways to do so, visit our website at tortoiseadvisors.com for more about the Teal Energy Deal which Rob specifically mentioned earlier here. Thanks to all of you for listening, Rob thanks so much to you for your time today and keep coming back to the podcasts to hear more about Tortoise's thoughts in this area.

Thank you for joining us. And stay tuned for our next cast. Have topics you want covered or other feedback to share? Write us at info@tortoiseadvisors.com.

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