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Special Report: The Coming Bust of the U.S. Shale Oil & Gas Ponzi

In just the past four years, oil production in the U.S. has grown a staggering 46%, adding 2.5 mbd — all due to shale oil production.

With this huge uptick in domestic oil production, there are an increasing number of reports stating that the U.S. will become energy independent.

According to the article, "The Energy Revolution 'Made In America'":

- **Citibank** -- *U.S. independence from energy imports could even begin at the end of this decade.*
- **NIC** -- *National Intelligence Council -- U.S. could become a significant energy exporter from 2020 on.*
- **IEA** -- *International Energy Agency -- U.S. could become a net exporter of gas beginning in 2020, and practically develop into a complete self-sufficient energy provider by 2035.*

So there we have it... three official organizations with forecasts of U.S. energy independence by 2020 or complete self-sufficiency by 2035.

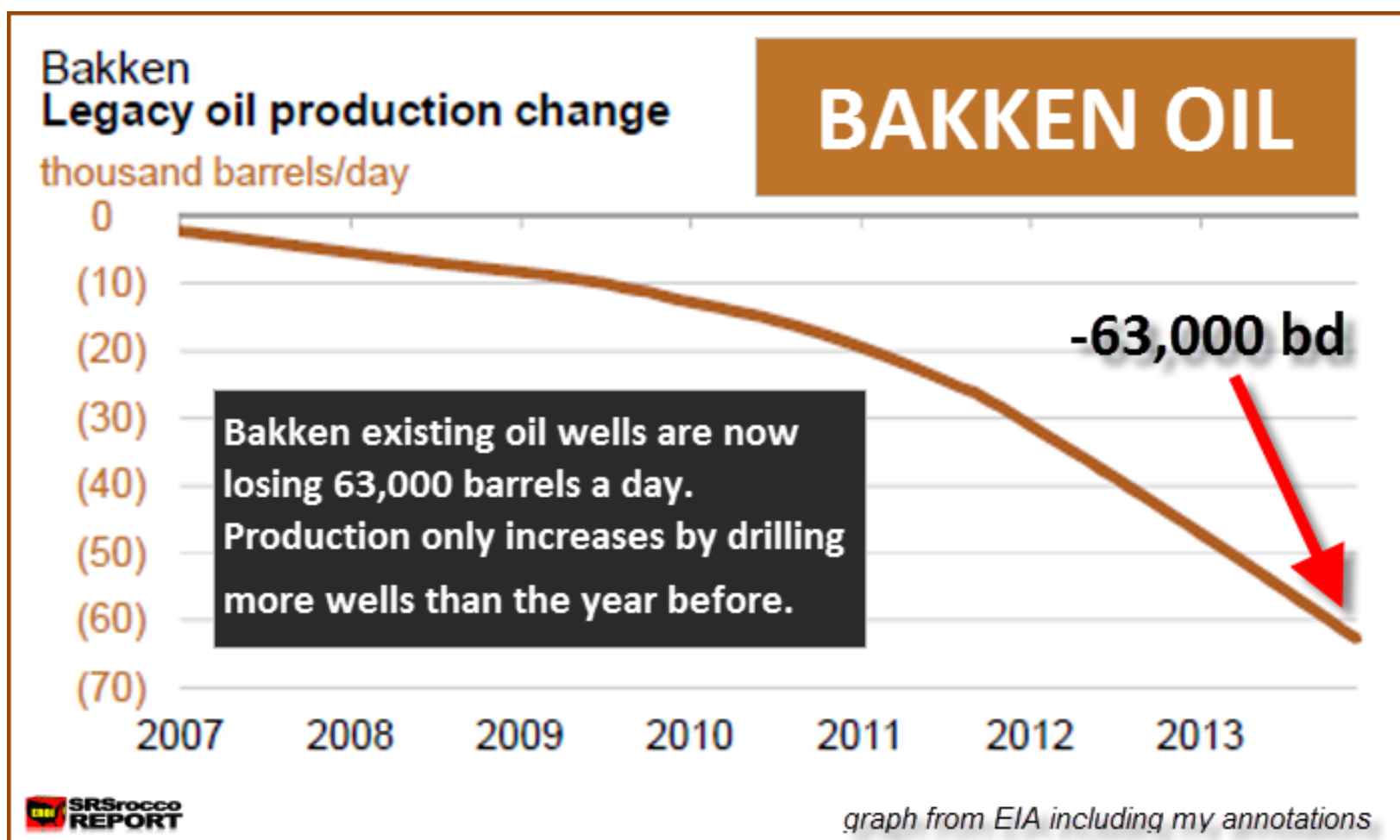
These forecasts provide a very optimistic outlook for U.S. energy production far into the future... so why should we worry?

The Coming Bust of the U.S. Shale Oil Boom

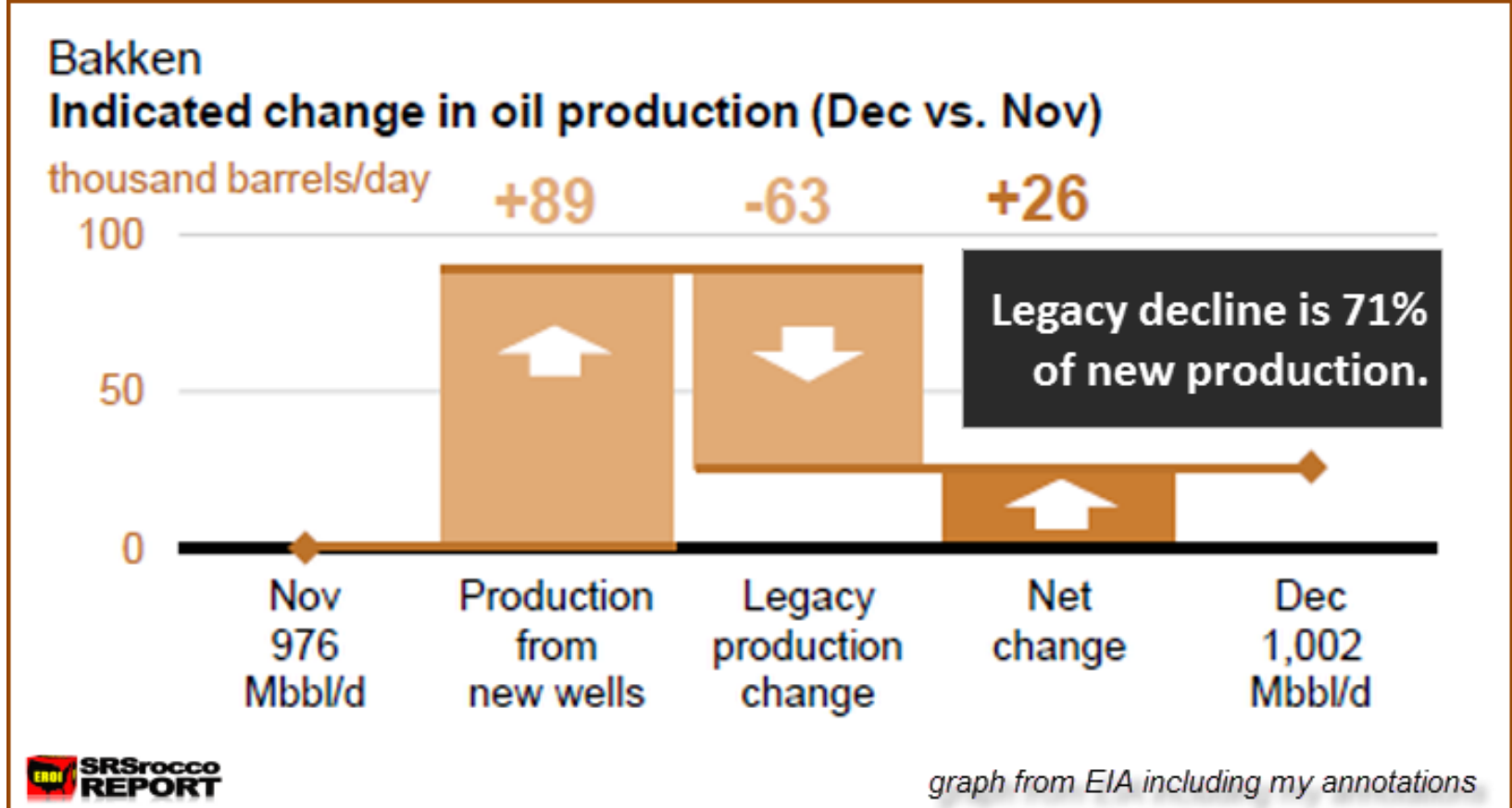
With all booms comes the inevitable bust. This is no different with shale oil. The majority of shale oil production in the U.S. comes from two fields — the Bakken & Eagle Ford. While production has increased significantly in these two fields, it comes at a huge cost.

The typical Bakken oil well declines approximately 40% per year. That's right — oil wells in the Bakken are declining nearly ten times faster than the global 4-5% average discussed previously.

The chart below shows that the Bakken is losing an amazing 63,000 bd (barrels per day) of production as of December 2013. The trend remains unbroken through today.



This means the oil companies drilling in the Bakken had to add more than 63,000 bd in December if they wanted to increase production... and they did. According to the U.S. Energy Information Administration (EIA), the Bakken added 89,000 barrels of new production in December 2013. If you look at the chart below, you will see the +89,000 bd of new production minus the 63,000 bd of declines to equal a net increase 26,000 bd in December.



You will notice on the left side of this chart that in November, the Bakken was producing a total of 976,000 bd. When we add the 26,000 bd of net new production for December, the new overall total is 1,002,000 bd, or over 1 million barrels a day.

Even though the Bakken is now producing over 1 million barrels of oil per day, take a look how much worse the declines in oil production will get in the next few years. If we assume the current trend will continue, we can see how much production will decline by the end of 2015:

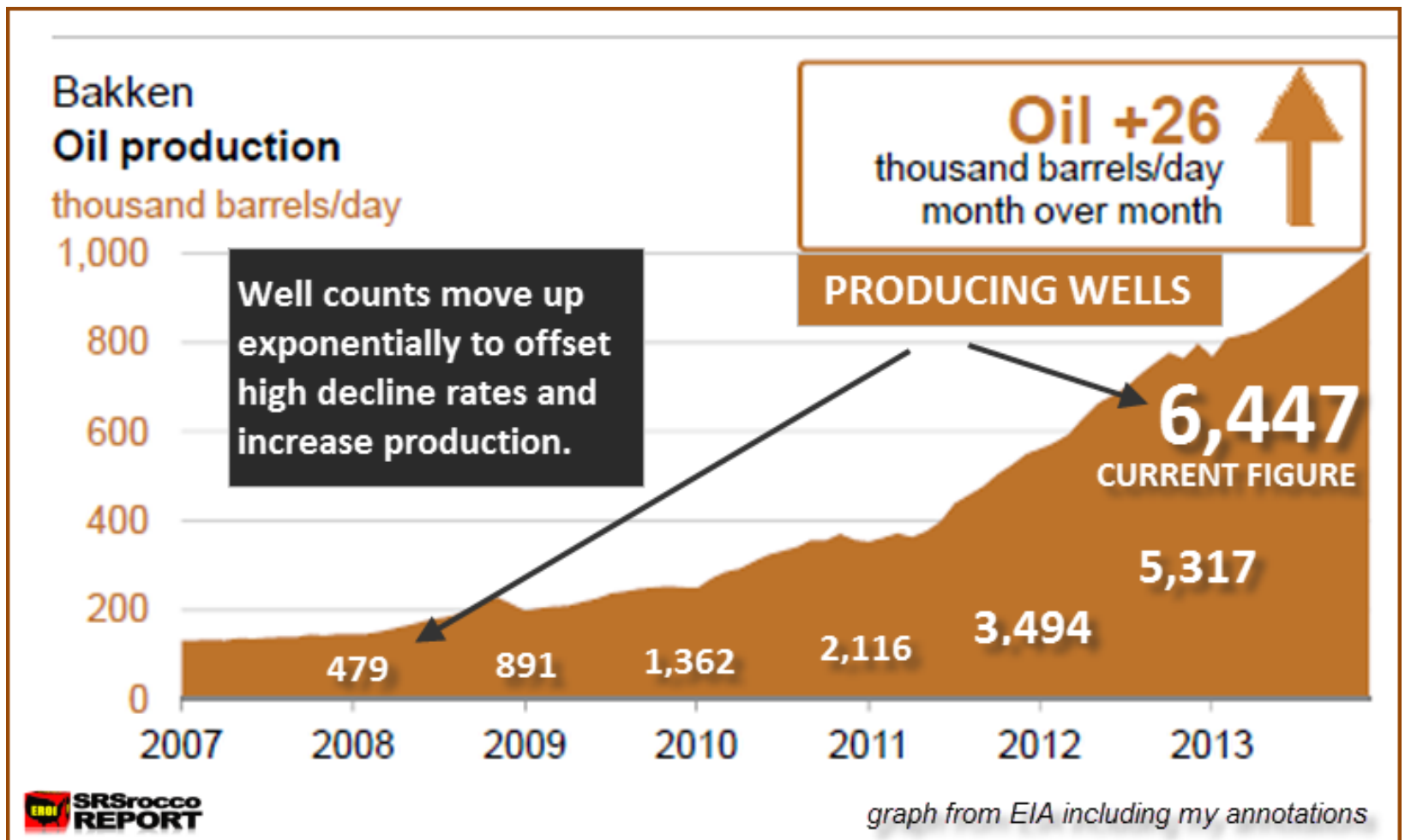
Bakken Oil Production Decline Rate:

- Dec 2009 = -13,000 bd
- Dec 2010 = -20,000 bd
- Dec 2011 = -30,000 bd
- Dec 2012 = -47,000 bd
- Dec 2013 = -63,000 bd
- Dec 2014 = -80,000 bd
- Dec 2015 = -97,000 bd (estimated)

The Bakken is currently losing about 17,000 bd each year of production. So by 2015, the oil companies in the Bakken will have to drill even more wells to surpass that 97,000 bd estimated decline rate if they want to increase production. This is exactly what they have been doing ever since they started drilling the Bakken oil field.

I don't want to get into too many numbers here, but the graph below shows how many new wells have been added in the Bakken since 2007. The total well figures below are for the North Dakota portion of the Bakken, which produces +90% of Bakken oil. A small portion of the

Bakken is located in Montana, but the state does not publish monthly updated information.



As you can see, there were only 479 wells producing in 2008. This nearly doubled in 2009 to 891 wells and by last count was 6,447. The total number of wells will have to keep increasing if they want the Bakken to continue to grow.

The huge fall in production that is taking place in the Bakken is also occurring in the other large shale oil field in the U.S. — the Eagle Ford.

The Eagle Ford shale oil field is experiencing an even higher rate of decline than the Bakken. According to the EIA, the Eagle Ford is estimated to have a decline rate of 83,000 bd in December. This is 20,000 bd more than the Bakken, and it will continue to fall even further in the next several years. This is the elephant in the living room that no one in the oil industry wants to talk about — the huge decline rates.

Shale oil fields only contain so many sweet spots and a certain amount of total drilling locations. Moreover, the farther out from the sweet spot the company drills, the less productive the well. So once the sweet spots are exploited and the best locations are drilled, production peaks and declines.

David Hughes, a geoscientist with nearly 4 decades of experience studying the resources in Canada, including 32 years at the Geological Survey of Canada, recently wrote a report titled "The Shale Revolution: Myth and Realities." Hughes forecasts that production from the Bakken and Eagle Ford will peak in approximately 2016. This is only a few years away.

So much for the notion that we are going to have decades of a cheap and abundant domestic oil supply.

Now that we know production from U.S. shale oil fields will more than likely peak within the next few years, keeping the country from achieving energy independence, what about that supposed 100-year supply of natural gas that the shale industry has been hyping in the media?

The U.S. Shale Gas Industry Has Been a Commercial Failure

The subhead line above is an actual statement from another excellent energy analyst that I will get to in a moment. However, I wanted to first list a few of the points as they pertain to conventional wisdom regarding the U.S. Shale Gas Industry from David Hughes' report:

- Shale Gas production will continue to grow for the foreseeable future (2040 at least) and prices will remain below \$4.50 for the next 10 years and below \$6.00 for the next 20 years.
- Shale Gas can replace very substantial amounts of oil for transportation and coal for electric generation.

Basically, the overall view concerning U.S. shale gas by the industry is, "We got lots of it at real cheap prices."

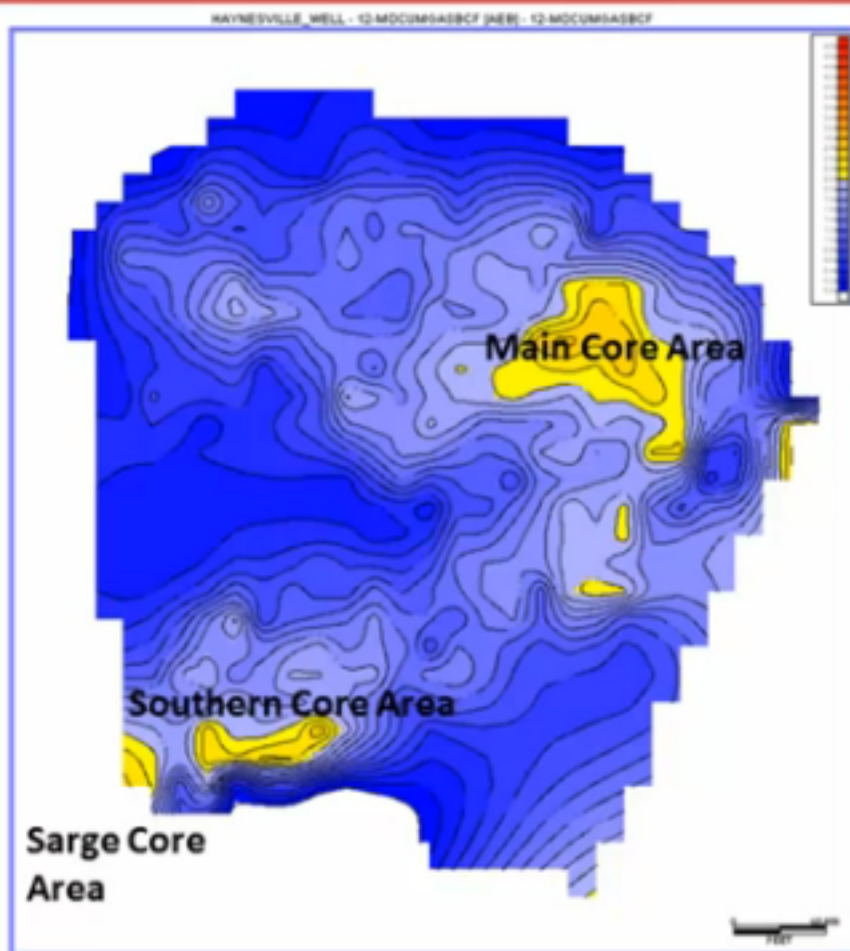
While I see nothing better for the United States than to become energy independent with decades of cheap oil and natural gas, it looks like the shale gas industry is in much worse shape than its shale oil counterpart. This is according to our next shale-hype slayer and energy analyst, Art Berman.

Art Berman, Director of Labyrinth Consulting Services, is a petroleum geologist with 34 years of oil and gas experience, including 20 years with Amoco (now BP) and fourteen years as a consulting geologist. Art has been one of the most outspoken critics of the shale energy hype for the past several years.

Recently, Art gave a presentation to the Houston Geological Society called "Reflections of a Decade of U.S. Shale Gas Plays."

In his presentation, Art discusses the slides below, revealing the truth about the profitability of the Haynesville shale gas field. He says that with natural gas at \$4.00 (as they were at the time) **there are no commercially viable areas in the Haynesville.**

Haynesville Shale Contour Map of 12-Month Cumulative Production: Yellow to Red Contours Exceed 2.2 Bcf (Breakeven at \$6.00/MMBtu)



POLYGON	AREA	NO. WELLS	Mean 12-Month Cumulative, Bcf
MAIN CORE	211,325	738	2.5
SARGE CORE	823	1	5.1
SOUTH CORE	55,044	42	2.5
CORE 1	4,240	6	2.5
CORE 2	5,492	8	2.5
TOTAL	276,924	795	2.5
TOTAL PLAY	4,400,403	2,986	
CORE/PLAY	6%	27%	

- **Only 6% of Haynesville active area is commercially viable at \$6/Mcf (4.7 Bcf EUR).**

Art shows that at \$6.00 natural gas, only 6% of the Haynesville (in yellow) is commercial. This data is significant because the price of natural gas has been trading at a low range of \$2-\$4.50 for the past three years.

Basically, the companies drilling and extracting shale gas in the Haynesville have been losing their shirts... selling their product for less than it costs to produce

Furthermore, what is taking place in the Haynesville is also occurring in the majority of the other shale gas fields in the country.

The Barnett shale gas field was the first to be exploited in a large way in the United States. Labyrinth Consulting Services did an in-depth study of Barnett, which Art included in a presentation titled "Shale Gas - Abundance or Mirage." In this report, it stated that of the 9,100 wells surveyed (between 2003-2009) of the total 15,000 wells in the Barnett, less than 6% met minimum economic threshold levels.

Moreover, Mr. Berman believes the average break-even price for the shale gas industry is somewhere between \$6-\$7. This proves that the so-called conventional wisdom that the U.S. will produce natural gas for 10 years below \$4.50 and for \$6.00 for the next 20 years is pure nonsense.

You see, this is the common theme in the shale gas industry — a reality not understood by the American public. Shale gas wells are suffering the same, or even higher, annual decline rates as shale oil wells. This means the shale gas drillers have to continue to drill more wells each year to keep overall production from declining. By doing so, the industry has brought on a great deal of natural gas supply that has depressed the price.

This is known as the "Drilling Treadmill." Once you start, you can't get off or else gas production falls off a cliff. Interestingly, this turns out to be the brontosaurus in the living room that the shale gas industry doesn't want to talk about.

So how is this non-commercial shale energy disaster impacting the largest shale gas companies? A great deal, as you are about to find out.

The Great Shale Gas Ponzi Scheme

Those in the energy industry probably wouldn't use a term like "Ponzi Scheme" to label what is occurring in U.S. shale gas production; however, I believe it is a perfect description of what is taking place. Because the shale gas companies have to spend an increasing amount of money on capital expenditures to keep production from falling, they are swimming in debt.

The data below also comes from Mr. Berman's most recent presentation. Here we can see that the major shale gas companies — Chesapeake, Southwestern, Devon and EOG — are spending a great deal more money on capital expenditures than they are receiving in cash flow from operations.

Financial Results of Major Unconventional Gas Players					
Five Year Period 2008-2012, \$Millions					
	Chesapeake	Southwestern	Devon	EOG	All Four Companies Combined
Cash Flow From Operating Activities	\$23,570	\$7,557	\$28,878	\$20,079	\$80,084
Capital Expenditures	\$57,142	\$10,014	\$35,957	\$29,691	\$132,804
Free Cash Flow	-\$33,572	-\$2,457	-\$7,079	-\$9,612	-\$52,720
Impairments	\$17,682	\$2,848	\$18,323	\$3,525	\$42,378

Source - 10k SEC filings for each company

- These four companies had \$53 billion more in expenses than in earnings.
- They had \$43 billion in ceiling test impairment write-downs, an amount that represents 53% of their cash earned from operations.

The combined capital expenditures from these four major shale gas companies in the five-year period between 2008-2012 was \$133 billion, while their operational cash flow was only \$80

billion. Thus, their free cash flow was a negative \$53 billion. Which means these companies had to acquire additional funds to continue the "Drilling Treadmill."

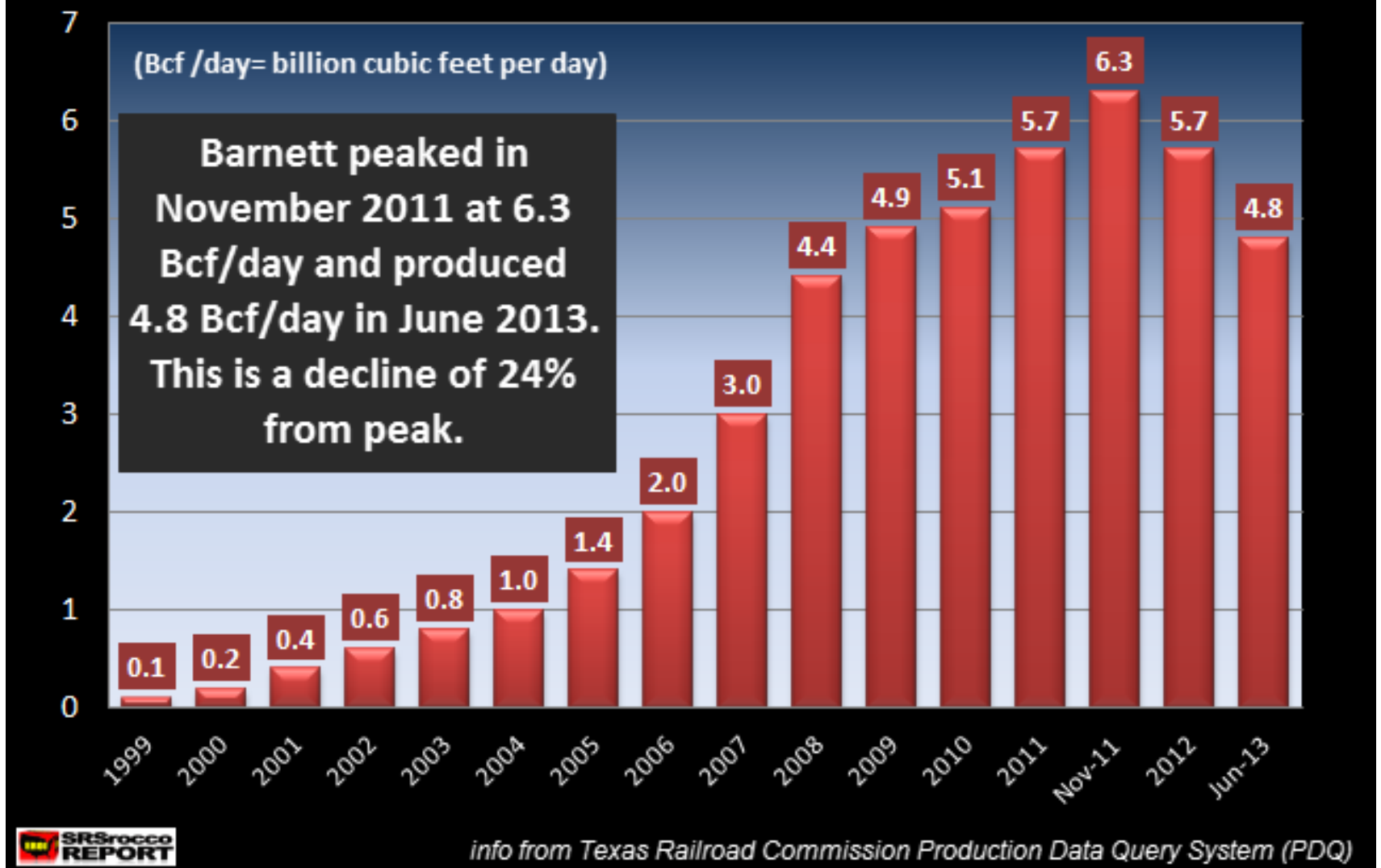
One of the major problems companies face with capital expenditures in the shale energy industry is that they can't sit back and reap the rewards by collecting a great deal of revenue for many years like companies in other industries are able to do. This is due to the rapid decline of the shale gas wells and the considerable loss of revenue as time goes by. Many of these shale gas wells could be capped and shut after 6-10 years of production.

Also, shale gas fields, just like shale oil fields, have only so many sweet spots and a finite number of drilling locations. So at some point in time (much sooner than later), these shale gas fields will peak and decline. And wouldn't you know it... that's exactly what's happening right now. Bill Powers (another top notch energy analyst), in his recent interview, "Give Up The Shale Gas Fantasy And Profit When The Bubble Bursts," had this to say about the peaking of several shale gas fields:

The facts are starting to show that declines for the older shale plays such as the Barnett, Haynesville, Fayetteville and Woodford are very serious.

This can be clearly seen in the chart below showing the peak of gas production from the Barnett Shale Field. Gas production increased steadily since 2000, peaking in November 2011 at 6.3 Bcf/day (billion cubic feet per day). It fell 24% to 4.8 Bcf/day by June 2013. This provides more evidence revealing just how dire the future energy predicament will be for the United States.

Barnett Field Shale Gas Production



Very few Americans are aware that the production from these shale oil and gas fields will not continue to grow and last for several decades.

When we look at all the data presented here, it is clear to see that the shale energy industry in the United States is behaving more like a Ponzi scheme rather than a long-term viable economic energy system. Shale oil and gas companies have to spend more money each year to increase production or it will fall off a cliff.

While it is true that there is a great deal of supposed shale oil and gas resources in many countries around the globe, several of the analysts quoted in this report do not believe this short-term U.S. shale revolution can be replicated throughout the world. This is due to several factors, such as the lack of infrastructure, water, and technical expertise, and reduced property and mineral rights.

Once the U.S. peaks in shale oil and gas production in the next several years, there is no Plan B. Art Berman got it right when he made this remark about shale energy during his presentation: "Folks, this isn't a new Energy Revolution.... it's a Retirement Party."

The peak and decline of U.S. and global oil production will have a devastating impact on the world's economies and the majority of paper assets. While some individuals already see the writing on the wall, unfortunately the majority of investors have not yet connected the dots.

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