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The Brief Candle of the U.S. Shale Gas Revolution

Natural gas export from the United States makes no business sense. The U.S. LNG industry has the worst investment track record in the energy sector and its present push to export gas is merely the latest installment of folly. Tens of billions of dollars were lost building import terminals in the 1980s and then shuttering them because it was cheaper to import pipeline gas from Canada. Tens of billions more were lost in the early 2000s re-opening those terminals and building more only to again shutter them because of a resurgence of domestic natural gas production.

Now, the same people who peddled those disastrous investment ventures want investment money again to export LNG. What they fail to disclose is that U.S. shale gas cannot compete with Russian pipeline gas on price either in Asia or Europe. Low oil prices magnify that problem.

The so-called shale gas revolution will be over before Philadelphia completes its doomed gas hub project. The United States does not have 100 years of proven natural gas supply and perceptions of a U.S. natural gas super power capable of exporting large volumes of LNG are unrealistic. Most gas produced from shale reservoirs is not profitable at present prices. Exploration and production companies are spending more money than they are making and many have tremendous debt loads. While domestic gas production continues to increase, the rate of rise has slowed and will likely flatten through the end of this decade, resulting in a significant price rise, making LNG export uneconomic.

These statements of fact are at odds with public perception. This is because government, the press, oil and gas company executives, and investment banks are telling a story about natural gas abundance that may serve their interests but is not supported by facts. The story stresses success based on resource estimates but not reserves, production volumes but not the cost of that production, the benefits of technology but not its price, and claims of profit that exclude important expenses and that do not explain the poor financial condition of most companies that drill and produce the gas.

The popular belief that the U.S. has 100 years of natural gas supply is based on resource estimates and is totally incorrect. Resources are the total volume of oil and gas in place within a particular reservoir. Reserves are the portion of those resources that may be commercially produced. The public, press and policy makers mistakenly believe that oil

and gas companies will drill and develop resources when, in fact, they will only develop the small subset of those resources that are reserves.

The Energy Information Administration (EIA) of the U.S. Department of Energy has published total gas and shale gas reserves through 2012. There are 129 Tcf of proven shale gas reserves—that translates to approximately 5 years of supply assuming 26 Tcf of annual consumption. All shale gas fields except the Marcellus shale are presently in decline. Projections by reputable third-party experts including Wood Mackenzie forecast that the Marcellus will peak by 2020. This means that U.S. gas production will be in significant decline by the mid-2020s.

I anticipate that increasing Marcellus and Utica gas production may sustain or slightly increase U.S. supply through the end of this decade assuming no significant rise in gas prices. Greater pipeline exports to Mexico and the beginning of LNG exports in 2016 may challenge supply, price or both particularly as coal-fired electric plants are retired beginning in 2015 and more electric power generation demand is shifted to natural gas. If gas prices increase, production growth should be more robust but reserves will be depleted faster and supply will be challenged sooner.

Gas-weighted U.S. exploration and production companies had cumulative free cash flow (cash from operations minus capital expenditures) of -$67 billion from 2010 through 2013. This means that they spent $67 billion more than they made over those four years. Their annualized free cash flow for 2014 is -$7 billion. These same companies had more than $84 billion in debt as of June 30, 2014.

U.S. SHALE GAS SUMMARY FINANCIAL DATA 2010-2013	
4-YEAR FREE CASH FLOW ($BN)	($67,271)
AVG GAS WEIGHT AS % MARKET CAP	69%
AVG CAPEX/CF AS % MKT CAP	129%
AVG DEBT/EQUITY AS % MKT CAP	68%
YEAR-END 2013 TOTAL DEBT ($BN)	$84,583

It is difficult to reconcile the claims of many analysts that shale gas is profitable at $4 per Mcf when the companies producing this gas are losing so much money.

Shale gas production to date from shale gas and associated gas from shale oil plays is approximately 42 Tcf. After all of the fanfare about a shale gas revolution that has forever changed the U.S. energy landscape, shale gas has so far provided only a year-and-a-half of total supply.

Shale gas has provided the United States with an additional decade or so of supply that was not recognized just a few years ago. The benefits have been many, including reduced imports, significantly lower price for an extended period which has led to a

manufacturing renaissance and regional economics advantages in employment and tax revenues. However, a rational look at future supply and price is necessary to enact policies that will maximize positive results. Policy makers should consider the possibility that our supply of natural gas may be less certain than most believe and consider the consequences.

Sincerely,

Arthur E. Berman, Director
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