



Will Natural Gas Fuel America in the 21st Century?

Posted by [nate hagens](#) on May 16, 2011 - 10:51am

This is Richard Heinberg's Foreword to the new report 'Will Natural Gas Fuel America in the 21st Century?' by Post Carbon Fellow [David Hughes](#). [Download the report here](#) (1.3MB).

Post Carbon Institute undertook this report in order to examine three widespread assumptions about the role that natural gas can and should play in our energy future:

- Assumption #1: That, thanks to new techniques for hydraulic fracturing and horizontal drilling of shale, we have sufficient natural gas resources to supply the needs of our country for the next 100 years.
- Assumption #2: That the price of natural gas, which has historically been volatile, will remain consistently low for decades to come.
- Assumption #3: That natural gas is much cleaner and safer than other fossil fuels, from the standpoint of greenhouse gas emissions and public health.

Based on these assumptions, national energy officials at the Energy Information Administration (EIA) foresee a major expansion of natural gas in the coming decades. President Obama touted natural gas as a cornerstone of his Administration's "Blueprint for a Secure Energy Future"^[1] and endorsed plans for converting a sizable portion of the vehicle fleet to run on natural gas.^[2] Some environmental groups, rightfully concerned about the greenhouse gas emissions of coal, have called for large-scale replacement of coal-fired power plants with those that burn natural gas, despite increasing concern over the environmental impacts of hydraulic fracturing.

As this report details, all of these assumptions and recommendations need to be re-thought. What emerges from the data is a very different assessment.

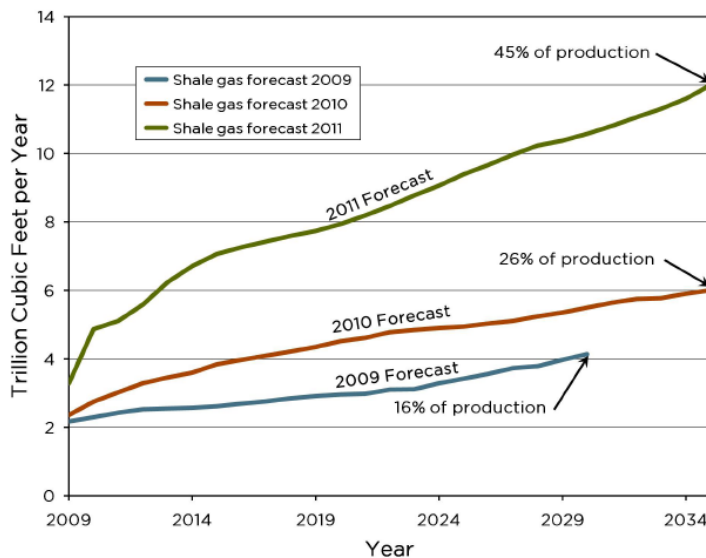


Figure 17. Forecast growth in U.S. shale gas production in the 2009, 2010, and 2011 EIA reference case forecasts.⁶⁹ Shale gas production is now forecast at 45% of U.S. supply by 2035, up from 16% in 2030 in the EIA's 2009 forecast.

But if this report is right, then how could mainstream energy analysts have gotten so much so wrong? It is not our purpose to analyze in detail the social, political, and economic process whereby public relations became public policy. Nevertheless it is fairly easy to trace the convergence of interests among major players. First, the shale gas industry was motivated to hype production prospects in order to attract large amounts of needed investment capital; it did this by drilling the best sites first and extrapolating initial robust results to apply to more problematic prospective regions. The energy policy establishment, desperate to identify a new energy source to support future economic growth, accepted the industry's hype uncritically. This in turn led Wall Street Journal, Time Magazine, 60 Minutes, and many other media outlets to proclaim that shale gas would transform the energy world. Finally, several prominent environmental organizations, looking for a way to lobby for lower carbon emissions without calling for energy cutbacks, embraced shale gas as a necessary "bridge fuel" toward a renewable energy future. Each group saw in shale gas what it wanted and needed. The stuff seemed too good to be true—and indeed it was.

The biggest losers in this misguided rush to anoint shale gas as America's energy savior are members of the public, who need sound energy policy based on realistic expectations for future supply, as well as sound assessments of economic and environmental costs.

Implications for the National Energy Conversation

It is understandable that the shale gas industry would fudge supply and price forecasts in the interest of drumming up investment capital. However, the EIA is supposed to be an impartial purveyor of data and analysis. Yet that organization has historically been overly optimistic with regard to fossil fuel supplies and prices. During the past decade several non-profit energy groups, including Post Carbon Institute, warned that depletion of giant oilfields and declining oil discoveries would lead to a situation of higher petroleum prices and tight supplies beginning before 2010. Indeed, a leveling off of world crude oil production and a simultaneous steep rise in oil prices during the past few years have arguably marked the most significant shift in the history of the petroleum industry—a shift whose consequences continue to ripple throughout the entire global economy. Yet EIA oil forecasts in the early years of the decade contained no hint of this impending and wholly foreseeable supply-price shift. In our view, the EIA is making similar mistakes in its too-rosy projections with regard to shale gas supplies and natural gas prices.

With mounting evidence of the environmental and human health risks of shale gas production, environmental groups are rightfully questioning the “cleanliness” of shale gas. But if these groups focus their arguments only on the contamination of ground water supplies of shale gas without at the same time questioning the economics of shale gas drilling, they will have helped set up conditions for a political battle that could undermine their own influence and credibility. Political interests traditionally funded by the oil and gas industries will once again claim that environmentalism is the only thing standing between Americans and energy security. And if environmentalists are successful in enacting regulations to minimize the risks of water contamination without clarity about the full lifecycle greenhouse gas emissions of natural gas, they may inadvertently exacerbate the very crisis they are trying to address.

The stark reality we face is that humanity has embarked on the era of extreme energy, where there are no simple solutions. The inexpensive, high-yield fossil fuels that powered the industrial revolution and that helped make the U.S. the world’s wealthiest and most powerful nation are dwindling, and all of them emit dangerous levels of greenhouse gases. While enormous amounts of natural gas, oil, and coal remain, the portions of those fuels that were cheapest and easiest to produce are now mostly gone, and producing remaining reserves will entail spiraling investment costs and environmental risks. Moreover, while alternative energy sources exist—including nuclear, wind, and solar—these come with their own problems and trade-offs, and none is capable of replicating the economic benefits that fossil fuels delivered in decades past. There is no likely scenario in which the decades ahead will see energy as abundant or as cheap as it was in decades past.^[3]

None of the major participants in our national energy discussion wants to utter that dismal truth. Yet continued appeals to wishful thinking merely squander opportunities to pre-adapt gracefully and painlessly to a lower-energy future.

The Unavoidable Solution: Energy Conservation

It is past time for policy makers to get serious about the most important strategy we can and must adopt in order to succeed in this new era—energy conservation. Reducing demand for energy and using energy more efficiently are the cheapest and most effective ways of cutting carbon emissions, enhancing energy security, and providing a stable basis for economic planning.

Unfortunately, energy supply limits and demand reduction do not support robust economic growth. This is probably the main reason why policy makers and many energy analysts and environmentalists shy away from conveying the real dimensions of our predicament. However understandable this response may be from a political perspective, it is one that only compromises our prospects as a nation and a species. There is much we can do to ensure a secure social and natural environment in a lower-energy context, but we are unlikely to take the needed steps if we are laboring under fundamentally mistaken assumptions about the amounts of energy we can realistically access, and the costs of making that energy available.

[1] The White House, [Blueprint for a Secure Energy Future](#) (Washington DC, 2011)

[2] Dave Michaels, “[Obama Endorses Pickens Plan for Natural Gas Vehicles](#),” *The Dallas Morning News*, March 30, 2011, accessed May 3, 2011.

[3] See Richard Heimberg, [Searching for a Miracle: “Net Energy” Limits and the Fate of Industrial Society](#), A Joint Project of the International Forum on Globalization and the Post Carbon Institute, September 2009.

[Full Report here](#)

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Here is a sampling of some of the graphics from the main report:

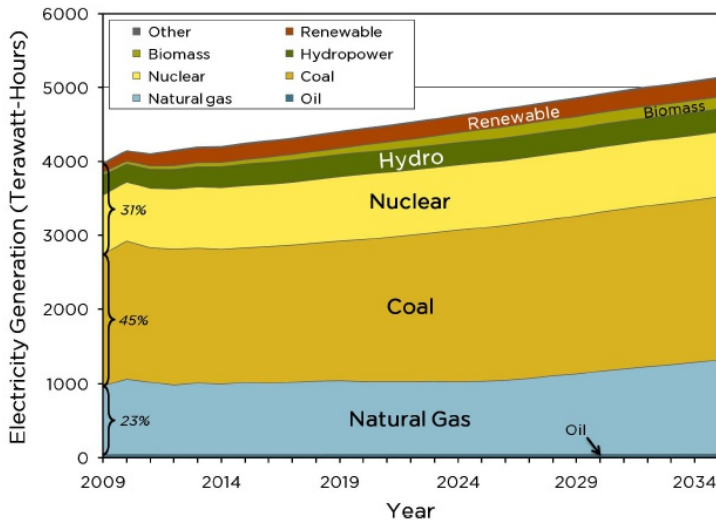


Figure 7. U.S. electricity generation by fuel projected through 2035. This is the EIA's reference case projection from its *Annual Energy Outlook 2011*.¹⁷ Coal in this scenario is expected to be the major fuel source for electricity generation through 2035, growing in real terms but declining in terms of market share. Gas use will increase both in real terms and slightly in terms of market share.

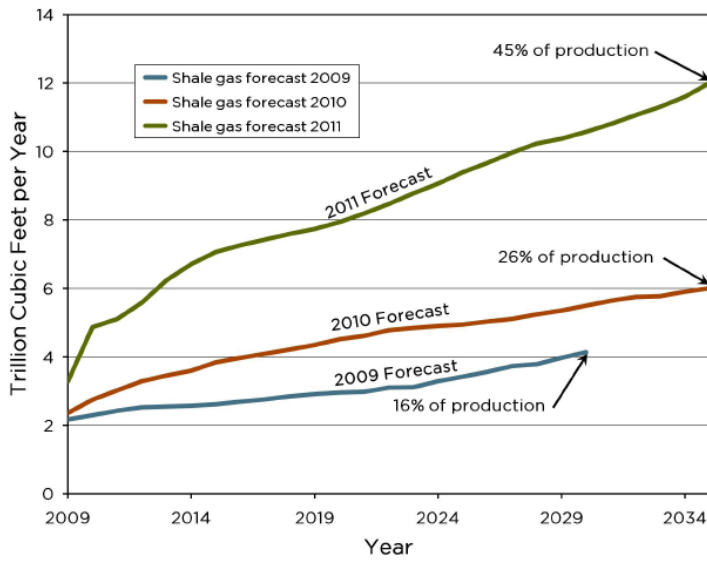


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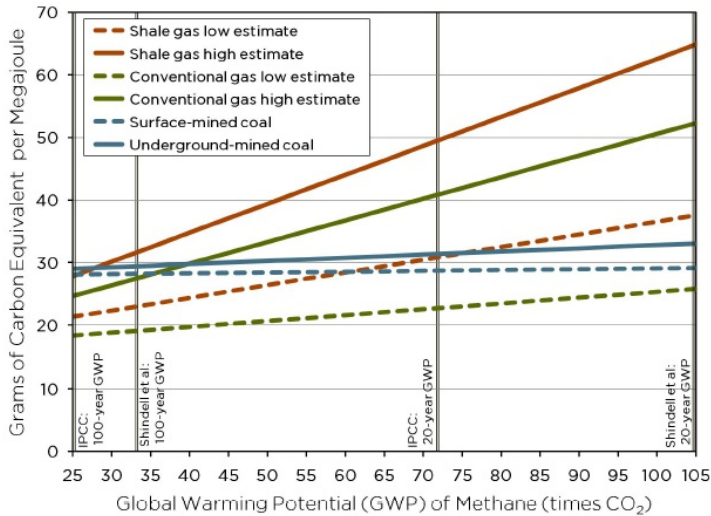


Figure 22. Comparison of Howarth et al.⁹⁴ estimates for shale gas, conventional gas and coal in terms of carbon emissions per unit of heat versus Global Warming Potential (GWP) using the estimates of the IPCC⁹⁵ and Shindell et al.⁹⁶ on 20- and 100-year timeframes.

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J. David Hughes is a geoscientist who has studied the energy resources of Canada for nearly four decades, including 32 years with the Geological Survey of Canada as a scientist and research manager. He developed the National Coal Inventory to determine the availability and environmental constraints associated with Canada's coal resources. As team leader for unconventional gas on the Canadian Gas Potential Committee, he coordinated the recent publication of a comprehensive assessment of Canada's unconventional natural gas potential.

Over the past decade he has researched, published, and lectured widely on global energy and sustainability issues in North America and internationally. He is a board member of the Association for the Study of Peak Oil and Gas-Canada and is a Fellow of the Post Carbon Institute. He recently contributed to Carbon Shift, an anthology edited by Thomas Homer-Dixon on the twin issues of peak energy and climate change, and his work has been featured in Canadian Business, Walrus, and other magazines, as well as through the popular press, radio, television, and the Internet. He is currently president of a consultancy dedicated to research on energy and sustainability issues.



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