

Perry Sioshansi's Letter from America

US gas to overtake coal by 2035

The shale gas revolution will result in a cleaner electricity generation mix.

Coal is slowly retreating as natural gas and renewables gain market share in the electric power generation. That is old news. What is new is the accelerating speed in a sector not known for moving fast. The Energy Information Administration's (EIA) latest *Energy Outlook* projections, released on 16 Dec 2013, show increased projections for natural gas generation coupled with a deteriorating outlook for US coal.

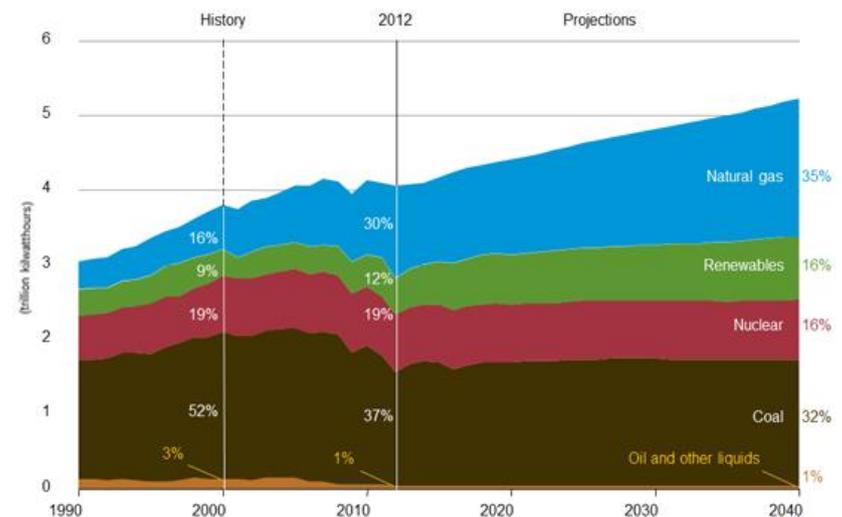
EIA's latest estimates of domestic natural gas production have risen 11% from the previous outlook a year ago, reflecting continued growth in shale gas development. While gas price estimates are slightly higher in the near term, the higher production levels are believed to result in lower price projections through 2040. According to the EIA, US will turn into a net exporter of gas by 2018, two years earlier than last year's projection.

According to the new forecast, natural gas will pass coal in the critical power generation sector by 2035. Gas' share is projected to rise to 35% vs. 32% for coal by 2040 (see graph above right)—an unthinkable scenario prior to the advent of hydraulic fracturing and the shale gas bonanza.

The prime driver, of course, is that higher gas production levels will keep prices low, thus making gas competitive with coal. The existing and expected environmental restrictions on coal plus the threat of more stringent regulations on greenhouse gas emissions from the Environmental Protection Agency (EPA) means that there will be virtually no new coal-fired plants built during the forecast period while existing capacity gradually falls off from 310GW in 2012 to 262GW in 2040.

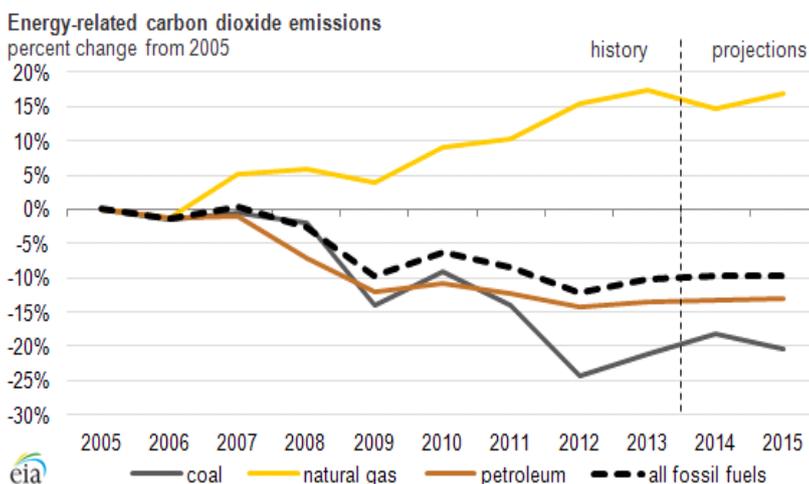
Gas beating coal by 2035

Historical & projected US power generation mix, 1990-2040, in %



Source: EIA

Gas cleaner than coal but not a fix to climate woes



Source: EIA

The impact of the substitution of cleaner burning gas for coal is evident in the US CO2 emissions since 2005 (see graph left). The dotted line shows total emissions from energy-related emissions, which has declined in recent years.

This means that the US can boast lower carbon emissions without even trying—there are no national binding targets as in the EU, no carbon pricing scheme—except in California—not even a whisper of federal legislation on climate change. Cheap natural gas is doing all the heavy lifting.

However, to those who think gas will offer a way out, the graph shows that there is still no

free lunch. Declines in CO₂ emissions from coal are offset by increased emissions from natural gas. In other words, if the choice is between coal and gas, the latter is certainly preferred—but it is no panacea for addressing the threat of climate change. As argued by Walt Patterson, humanity needs to think beyond the “Fire Age” and carbon emissions, sooner rather than later, and he claims, as do others, that we now have the means to wean off our fossil fuel addiction.

US nuclear generation is also projected to lose market share ever so slowly as new construction and uprates are offset by retirements. EIA estimates that total installed nuclear capacity will remain more or less at its current levels by 2040—a more bullish forecast than most industry analysts, who predict early nuclear retirements will result in falling capacity and generation.

Aside from natural gas, renewables are expected to enjoy continued growth, reaching parity with nuclear by 2040, if not sooner. Non-hydro renewables represent 28% of overall growth in US electricity production during the 2012-2040 period—a projection that is disputed as being too low by renewable advocates.

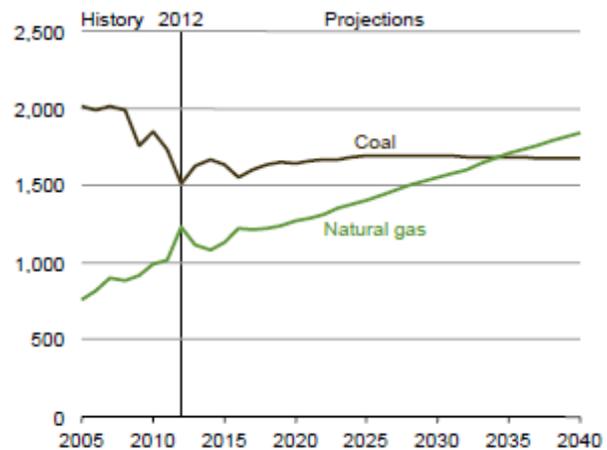
The combined growth of gas and renewables is projected to result in lower CO₂ emissions. EIA's 2014 Outlook envisions 2040 greenhouse gas emissions to be 7% below 2005, a 2% improvement over last year's projection.

Perry Sioshansi is a specialist in electricity sector restructuring, and he has been actively involved in discussions in a number of developed, developing and transition economies.

He is founder and president of Menlo Energy Economics and is the editor and publisher of EEnergy Informer, from which we have sourced this article, and which we commend.

Natural gas on top

Electricity generation from natural gas and coal, 2005-40 (trillion kWh)



Source: IEA, Annual Energy Outlook (AEO) 2014, early release



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