

# GREEN CHIP STOCKS

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## Indigestion over Gas

By Chris Nelder

Last week was just full of unpleasant surprises for natural gas. It looks like we have some serious supply issues on our hands, starting now and growing worse over the next 20 years or so.

First, the International Energy Agency (IEA) issued a warning that it's very concerned about an impending supply gap in natural gas.

This is important because about one quarter of our electricity in the U.S. is generated from natural gas, and that share is expected to increase.

That spells higher grid electricity prices for this country . . . and an even better outlook for solar and wind generation.

For the last decade, the vast majority of new electrical generating capacity in IEA countries has been natural-gas-fired plants. And they believe that it will remain the fuel of choice for the next decade.

What's got them worried is that the supply outlook shows neither the natural gas production capacity nor the additional coal-fired and nuclear-fired capacity to fill an impending shortfall between now and 2015.

The problem? I've covered it in these pages before.

[Receding horizons](#), massive cost increases, and lack of construction materials and skilled labor all contribute to [delays and cancellations](#) in new power plant construction. It's just not a friendly environment for investing in new plants.

"A heavy investment cycle in power generation is looming in most IEA countries and governments need to play an assertive role in reducing uncertainty and making sure appropriate investment takes place," said Claude Mandil, executive director of the Paris-based International Energy Agency (IEA).

"Combined cycle gas turbines and wind power are necessary, but a continued almost exclusive focus on these technologies is a cause for concern for the future generation mix," he warned.

I think that's a soft-pedaled way of saying "don't count on being able to get more gas!" He emphasized that governments must reduce the risk to potential power plant investors, because the time frames are so long and the price tags so high.

"Uncertainty about policy on climate change and CO2 abatement is the principal risk factor when investors choose technology today," Mandil said.

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He also called for reducing regulatory barriers, streamlined trade, greater transparency, diversified supply and, most importantly, a clear indication from governments as to the direction of their future energy policy.

Apparently, nobody's interested in putting up hundreds of millions of dollars for a new LNG plant if it's going to be continually subjected to political whimsy, or made obsolete by incentives for renewables.

As if to reinforce his comments, ExxonMobil, BP and ConocoPhillips told Alaskan lawmakers last week that they didn't want to help build a proposed natural gas pipeline from Alaska's North Slope because there are too many demands and not enough return in it.

And an energy broker at Man Financial indicated that British Gas and Powergen were taking a wait-and-see approach to further investment, waiting for clarity in the government's future energy policy.

Ironically, it seems that uncertainty about the fuel alternatives of the future is causing investment to lag in the fuels of the present.

So that was the first surprise.

## **Futures Rally Under Way**

The second surprise of last week was that the June New York natural gas contract revisited the \$8/MMbtu level, in a rally apparently driven by hedge fund activity.

Natural gas prices have been sort of off the radar in the last few months, since most of the U.S. experienced an unusually warm winter this year. No sustained cold temperatures until early February made natural gas consumption lower than normal. Inventories rose and prices dropped.

But as you can see from the chart below, it looks like they're beginning their upward march once again.

Once the natural gas market recovered from the Katrina-induced shortage of late 2005 and early 2006, it had a chance to catch its breath during the relatively warm winter we just had, and it "based" for a while.

But it looks to me like it's resuming its previous trajectory and is now headed for \$10:

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With that chart in mind, let's now look at the underlying reasons for concern about natural gas supply in the U.S.

## A Yawning Gap

According to noted peak oil observer James Howard Kunstler, the gas supply-demand gap in the U.S. over the next decade will be equivalent to our current oil imports--about nine million barrels equivalent per day.

Generally accepted supply and demand forecasts indicate that a serious shortfall in natural gas supply is coming. Like, to the tune of 11 trillion cubic feet (Tcf) per year, *or about half of our current usage* of 22Tcf/year.

The depletion of domestic natural gas wells is relentless. Despite a tripling of producing gas wells since 1971--from approximately 100,000 to more than 300,000--gas production has declined in North America since 2002 . . . the inevitable result of mature gas basins reaching the end of their productive lives.

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Making matters worse, there has been an exodus of drilling rigs from Canada over the last year as they are called away to work for higher day rates on more productive wells elsewhere.

And because it's difficult to store, there is little storage or reserve capacity in our nation's web of gas pipelines. We have only about a 50-day supply of "working storage" of natural gas in the U.S. So there isn't much cushion in the system.

The whole system operates on a "just in time" inventory basis, and so market pricing does too.

In short, the natural gas market does not price in the possibility of long-term shortages, or a sharp drop-off in production from mature fields.

The reason for this is that natural gas is mainly a landlocked affair. Natural gas is most easily transported by pipeline, from the source to the user.

In order to import it by sea, it must be turned into liquefied natural gas, or LNG. To do this, it must be carefully cooled to minus 260 degrees Fahrenheit, at which point it condenses into a liquid. It then must be kept under controlled temperature and pressure to stay liquefied, with some of it "boiling off" along the way, and transported in super-insulated, very expensive, pressurized tanker vessels, of which there are only so many in the world. Then, when it reaches its destination, it must slowly be warmed back up before it can be sent through a pipeline to the end user.

Obviously, all of this requires significant inputs of energy. The whole LNG process, from cooling to transporting to regasification, entails a 15 to 30 percent loss.

Of the natural gas imported into the U.S., 86% is transported by pipeline from Canada and Mexico. Only 14% is imported in the form of LNG, primarily from Trinidad, Egypt, Nigeria and Algeria.

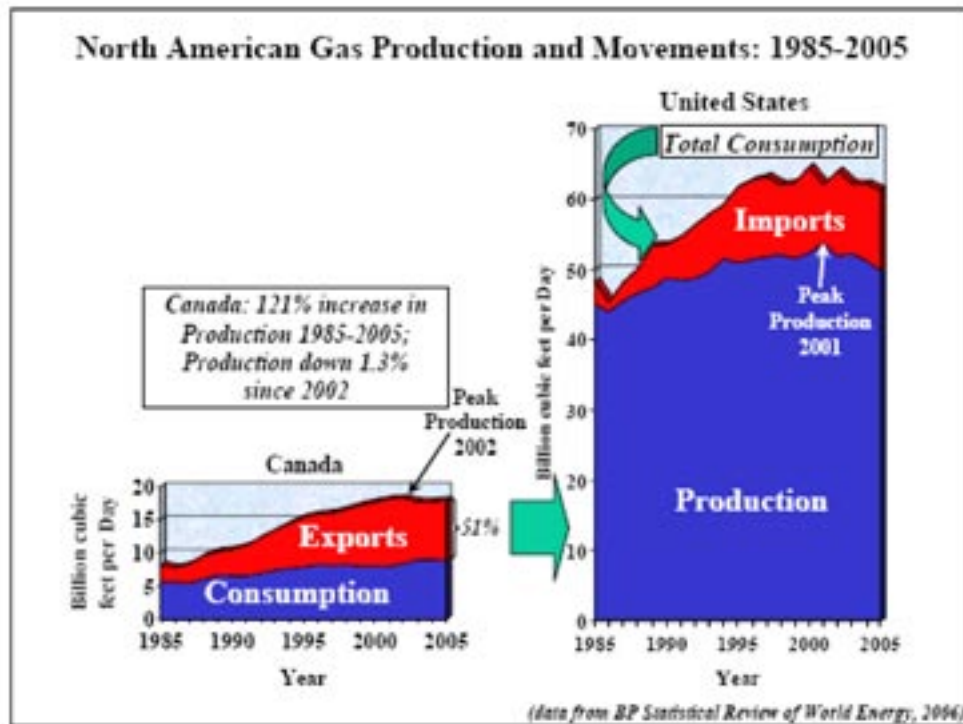
But imports account for only about 19% of U.S. natural gas consumption. The remainder--81% --is produced domestically.

When it comes to natural gas, we're pretty much on our own.

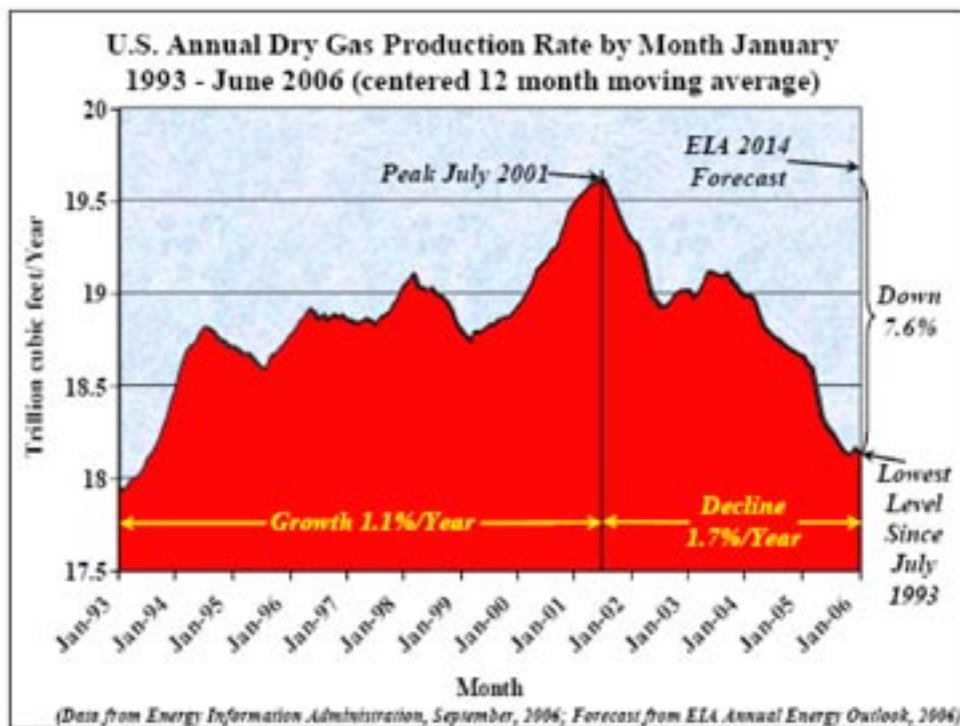
Unfortunately, the peak of natural gas production in North America was around 2002, and it has been mostly flat ever since:

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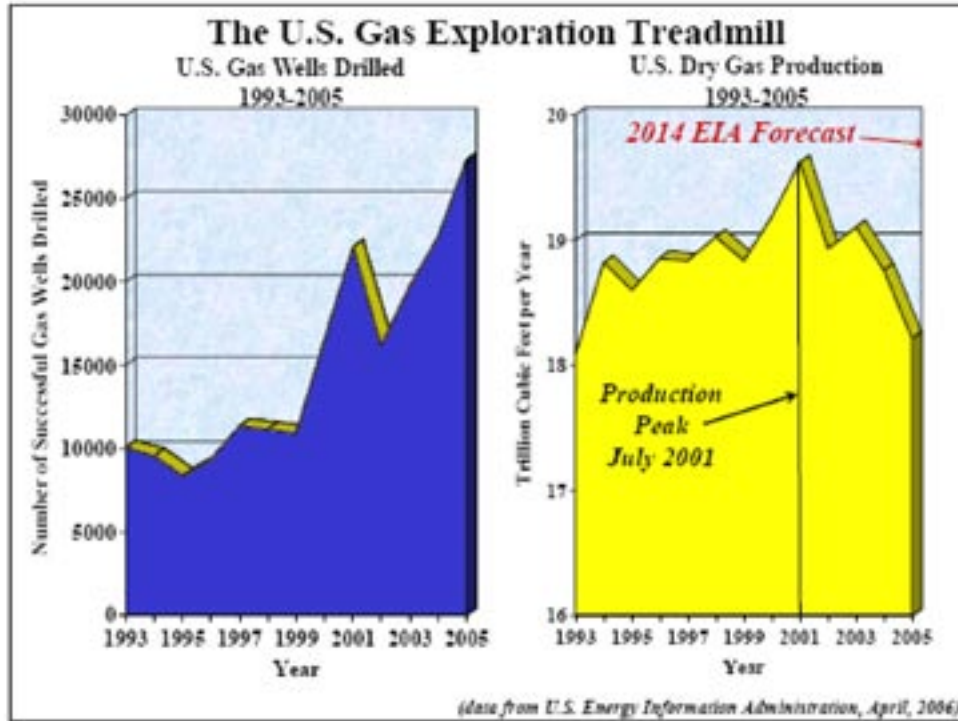
The U.S. production peak was in 2001, and production is now declining at the rate of about 1.7% a year:



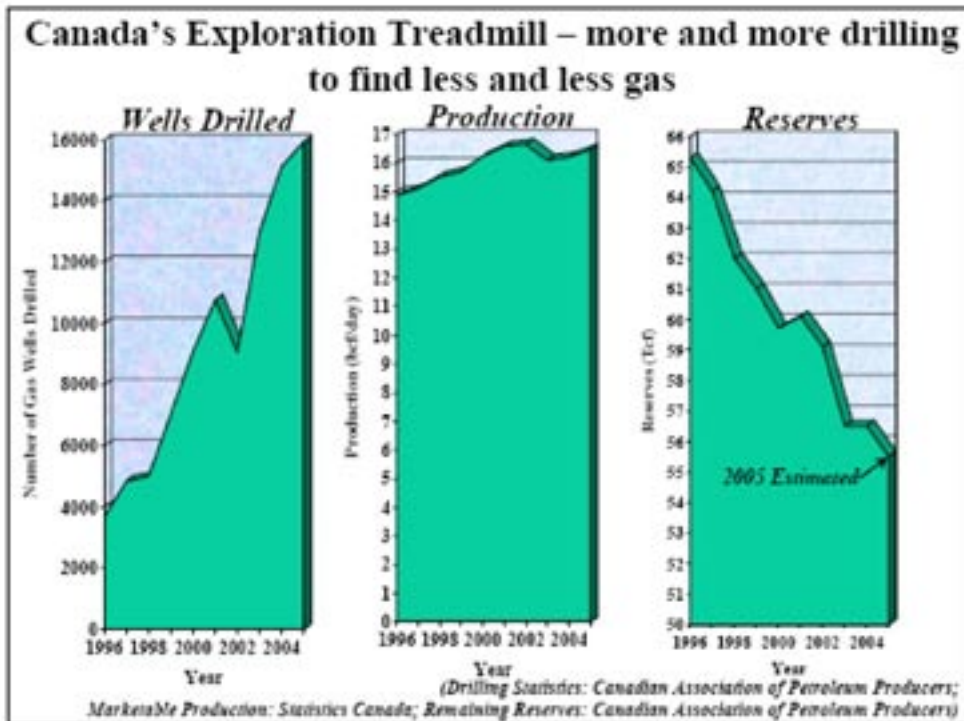
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Despite a record level of drilling:



And the same is true for Canada:



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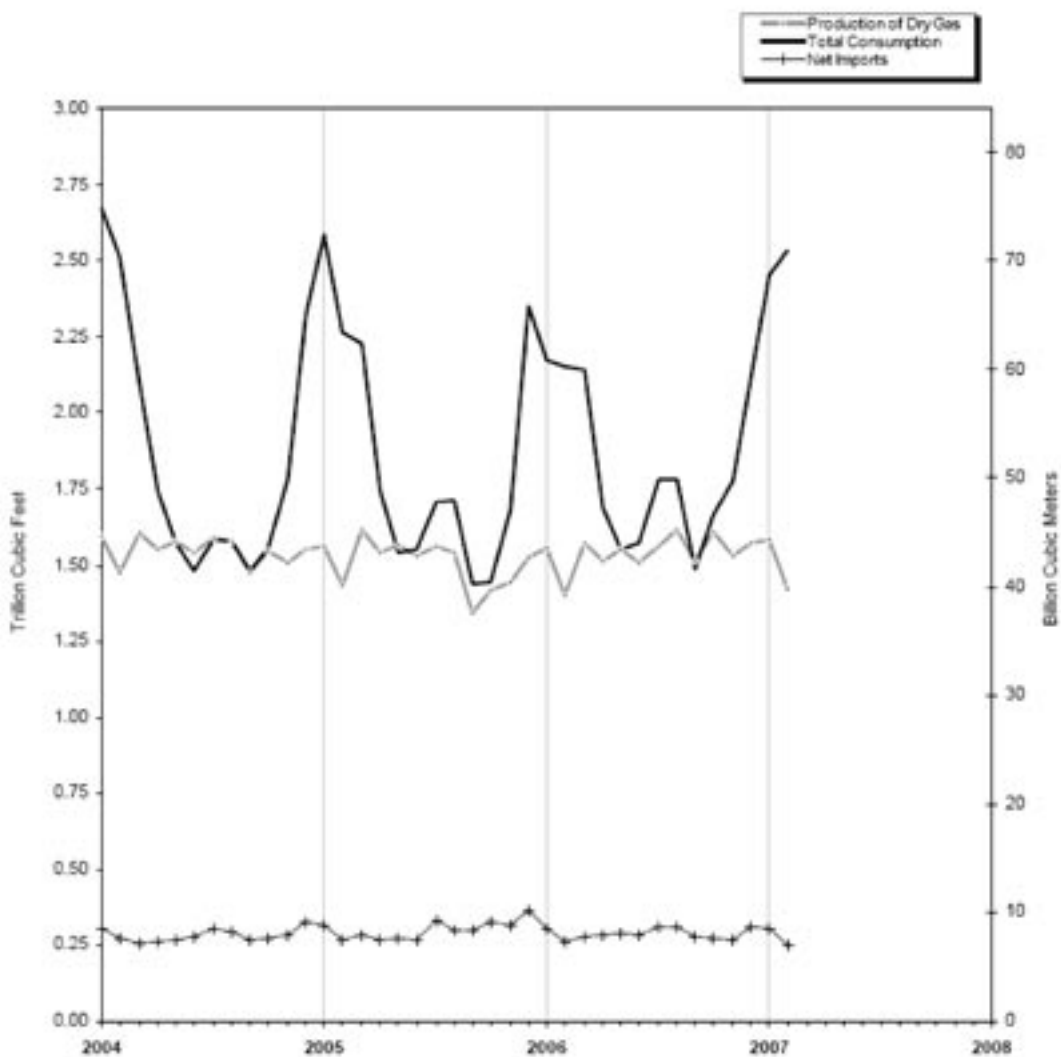
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So the supply outlook in our neighborhood is not good.

What about LNG imports, then?

For the last three years, imports, like domestic production, have been pretty flat, while consumption spikes up sharply during the winter and less sharply during the hot summer months:

**Figure 1. Production, Consumption, and Net Imports of Natural Gas in the United States, 2004-2007**



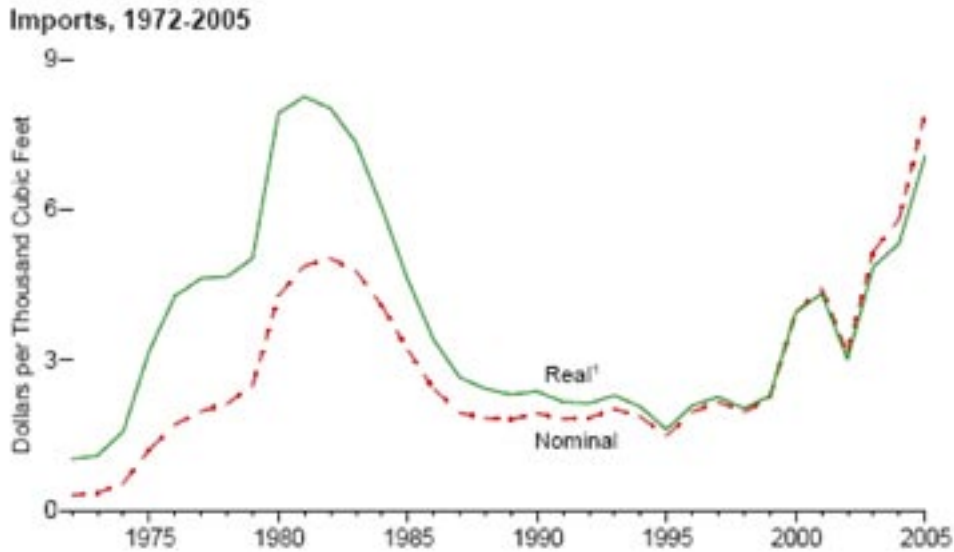
Source: EIA Natural Gas Monthly April 2007

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Now let's look at the cost of gas imports over the last 30 years:



Source: EIA Annual Energy Review 2005 Fig. 6.7

In inflation-adjusted dollars, the cost of imported natural gas is at an all-time high, and is going exponential.

And thanks to declining domestic production, imports are becoming an ever-larger part of the supply:



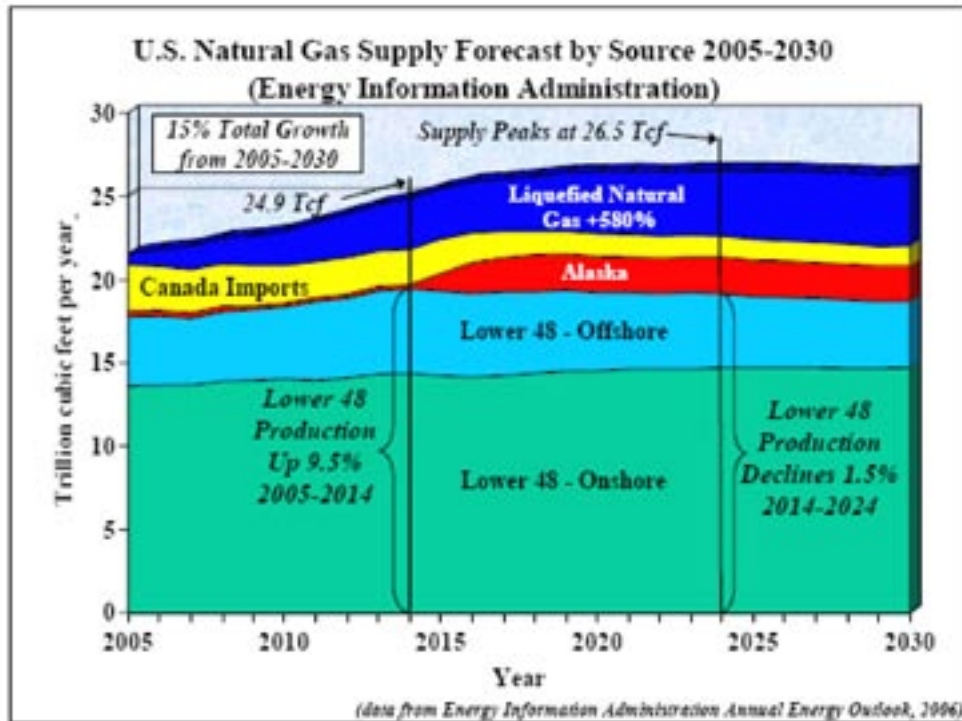
In short, every year we need more imports, but we're getting about the same amounts and paying more for them. And this trend shows no signs of abating, because we can increase neither domestic production nor imports.

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That leaves the prognosticators at the Energy Information Administration (the U.S. government's official energy data keeper) in a real pickle: How can we tell a positive story about this? Where can we make up the loss in North American gas production?

Their answer? You guessed it: production from Alaska and a 580% increase in LNG:



Mmm-hmm.

If I had that kind of optimism, I'd bet the farm on cold fusion right now.

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***Here's why I don't think LNG can fill in the supply gap.  
It's "like technology investing circa 1976, when computer hardware was just starting to be introduced. Bet on the next Intel, and the sky's the limit."  
-Business Week***

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## Getting Real About Gas

Here's what I think is realistic:

Canada's production has been falling for several years and can't fill the supply gap.

Mexico is no help either.

Drilling in the Gulf (and eventually in Alaska) will produce some additional gas, but not nearly enough to change the basic production picture.

And LNG can't ride to the rescue either.

What options does that leave us with?

Switching fuels. That's it.

We already know what the alternatives are: coal, nuclear and renewables.

So how do we place our bets?

Natural gas is clearly always going to be in high demand, and the increasing price trajectory we've seen over the last few years will surely continue and sharpen. So I like having a little natural gas exposure via well known producers like Chesapeake (CHK) and Encana (ECA).

Thanks to all of the above constraints, nuclear generation seems destined for a renaissance, as it's one of the last remaining Big Energy alternatives. So as some of my colleagues have suggested, I want some uranium exposure (it's currently about 10% of my personal energy portfolio). I like USU, URZ and USEG.

Coal also seems destined for intensified demand, and I believe it's underpriced right now, but it can be difficult to play unless you're a "set it and forget it" long. I like the usual big names for coal: BTU and ACI.

But I think there is going to be much more NIMBY resistance to building new coal plants than most forecasters anticipate, so I don't see it coming out on top as the next big electricity producing fuel. I don't believe that the 59% projected increase in its use will ever come to pass.

In the long run, I think the big winner from natural gas depletion is going to be the clean green money machine of renewables. Solar, wind, oceanic, geothermal . . . we haven't even begun to see the best days for them. They're just getting started.

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A window that is yawning wider every year as we reach the end of the line for natural-gas-fired power plants.

Watch this space for the best-of-breed alternatives that will fill that vacuum in the market.

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