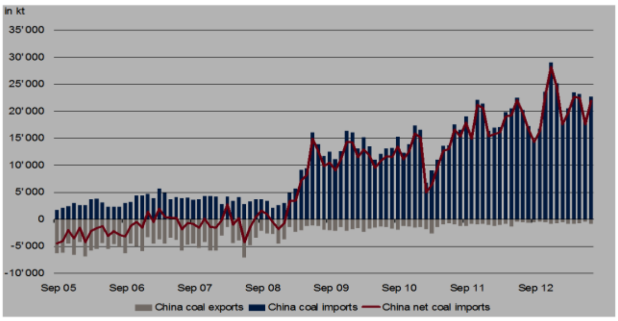
Global dense energy (fossil fuel) assets

From fossil fuels to dense energy infrastructure, harvesting "chokepoint scarcity"

November 2013

Chinese net Coal imports (red line) as of 9/2005



Power generating turbine

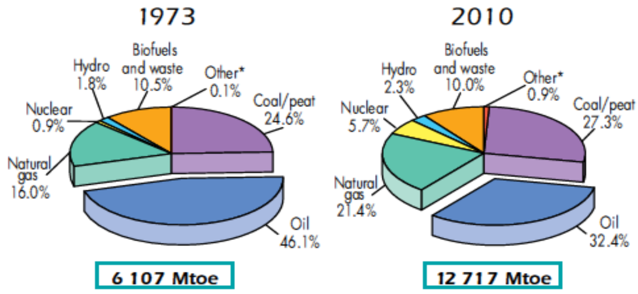
Offshore oil drilling rig

The supply challenge and the investor appeal:

In 2010, oil constituted 32.4% of our global primary energy supply, coal 27.3%, and natural gas 21.4% (please see chart below). As such, fossil fuels, also known as hydrocarbons, accounted for 81.1% of our global energy supply (vs. 86.7% in 1973); "ultra-dense energy" nuclear accounted for 5.7%; hydro for 2.3%; and "other," namely wind, solar, thermal, etc., generated a paltry 0.9% of the global energy supply, despite sustained and material developed nation government subsidies in this realm. "Other energy," as a group, is intermittent, nonstorable, nonscalable, and thus very expensive. For Teutonic insight, please consider this article: http://www.spiegel.de/international/germany/high-costs-and-errors-of-german-transition-to-renewable-energy-a-920288.html

Global primary energy supply in Mtoe terms

(Mtoe: millions of tons of oil equivalents)



(Biofuels are largely hydrocarbon fertilizer-based and waste is nothing more than a byproduct of fossil fuels; run out of fossil fuels, run out of waste to burn)

'*- Other includes wind, solar, geothermal, heat, etc. Source: BP

The depletion of our fossil fuel endowment amidst profound dependency on the leveraged economic output these dense (capable of producing a lot of heat and thus "work" per unit volume of fuel) energy sources enable is our societal/economic challenge. As investors, we know that increasingly scarce, vital assets rise in value over time, as do the infrastructure assets that, in this case, "unearth" them. That is our strategic allocation "energy scarcity" opportunity in a nutshell!

Since 1850, total energy consumption (typically measured in millions of tons of oil equivalent or Mtoe) is up 50-fold while the world population has increased 5.7-fold and per capita consumption has rocketed 8.8 times higher (sources: BP, UN). We have depleted the easily accessible half of our estimated oil endowment of some 2.5trn barrels, and 90% of all the oil consumed has been burned since 1960, a staggering 50% since 1988. Meanwhile, the Mideast's net oil exports have not increased in over a decade owing to strong regional energy demand growth associated with the region's globe-leading population growth. Plus, consumption of oil has exceeded discovery of new oil reserves consistently and by a wide margin -- by approximately 4:1 -- since 1988:

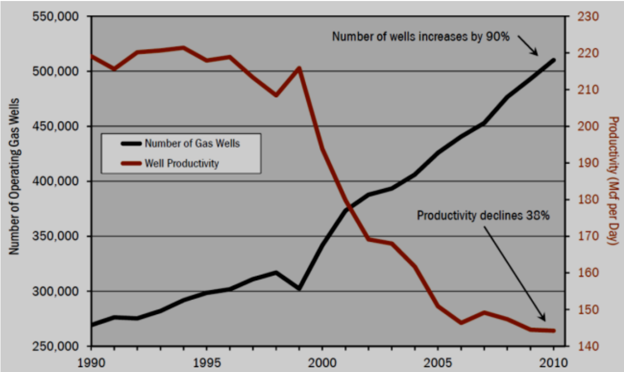
Year	Bn of barrels of oil found globally	Bn of barrels of oil used globally	Annual surplus/deficit
1930	10.0	1.5	8.5
1964	48.0	12.0	36.0
1988	23.0	23.0	0.0
2005	5.5	30.5	-25.0
2010	6.0	32.0	-26.0

Sources: BP, Weeden & Co., Dr. Colin Campbell, Macro Strategy Partnership

In addition, global oil production is declining by about 6%, or roughly 2bn barrels, per annum (sources: Weeden & Co.; J. David Hughes, Post Carbon Institute; http://en.wikipedia.org/wiki/List_of_oil_fields). This loss is the oil output equivalent of Iran, the world's fourth biggest oil producer. Why is this occurring? Because, 40 to 50 years after discovery, major oil field (greater than 1bn barrels of reserves) production tapers off. And, while Saudi Arabia controls a unsettling 95% of the globe's surplus oil capacity, new oil production over the past 6 – 7 years has been of the costly "tight oil" or shale oil variety enabled by hydraulic fracturing ("fracking")/horizontal drilling. In this regard, a broad consensus has developed that the US is on the way towards energy self-sufficiency and possibly a net exporter of oil and natural gas status courtesy of an unconventional drilling (fracking) bonanza. Let's look beneath the cheery headlines by offering a recap and an oil and natural gas production "reality check:"

- According to the EIA, US crude oil production has indeed risen stoutly from a post-1970 low of 5m barrels per day (bpd) average in 2008 to 7.3m bpd this year (6.5m bpd in 2012), a heady 46% increase thanks to shale (or tight) oil liberated by fracking/horizontal drilling; shale oil accounted for about 23% of all US oil production in 2012. That said, current aggregate oil production levels are still materially below the 9.6m bpd high reached in 1970 (http://www.eia.gov/countries/country-data.cfm?fips=US; http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=MCRFPUS2&f=A).
- In the latest year on record, 2012, the US imported an average of 7.5m bpd, fully 40% of its oil consumption -- and this despite a 10.8% reduction in daily average US oil consumption between 2005 and 2012 (EIA).
- More than 80% of tight oil production has come from two unique plays: the Bakken in North Dakota and Montana and the Eagle Ford in southern Texas. Tight oil plays are characterized by much higher decline rates than conventional wells, and it is estimated that 6,000 wells costing $35bn annually are required to maintain production (source: J. David Hughes, Post Carbon Institute). The accelerated decline in shale well production has not been lost on GE's Oil & Gas unit, which acquired maker Lufkin Industries for $3bn earlier this year, positioning the Oil & Gas unit to become GE's third largest manufacturing entity.
- The average recovery rate of oil shale of 8% pales compared with 30% or more of conventional fields (http://www.forbes.com/sites/christopherhelman/2013/07/24/how-an-enron-cast-off-became-one-of-americas-great-oil-companies/).
- In aggregate, it is perhaps not surprising that both the ultimate shale oil recovery potential and the marginal cost per shale barrel, the latter estimated by Bernstein to have reached $114 per barrel last year (the average cost per barrel is rising at a 22% rate), are going to be limiting factors on both the US and global oil supply augmentation front (similar or worse depletion and recovery rate experiences have been recorded in Poland and in China, for example). For perspective, consider current worldwide oil consumption of 90m bpd juxtaposed against an average *annual loss* of global conventional oil production of roughly *5.5m bpd*. By contrast, US shale oil production has lifted US oil output by roughly *2.3m bpd over a five-year period*; not exactly a supply panacea!

- Let us shift to US "shale gas:" despite a record "at the wellhead" natural gas price compression (http://www.eia.gov/dnav/ng/hist/n9190us3m.htm) associated with a surge in shale gas production thanks to fracking/horizontal drilling, the US still relied on imports to meet 6% of its natural gas consumption in 2012 (http://www.eia.gov/countries/country-data.cfm?fips=US).
- Shale gas production, while having grown explosively to account for nearly 40% of US natural gas production, has leveled off since December 2012.
- Fully 80% of shale gas production comes from five plays, e.g., Haynesville, Barnett, and Marcellus, several of which are in decline. The very high decline rates of shale gas wells (compared to conventional wells) require continuous and prodigious inputs of capital, estimated at $42bn per year to drill more than 7,000 wells, this just to maintain production (the value of shale gas produced in 2012 was just $32.5bn). Not surprisingly, the average breakeven cost of a shale well per Mcf (million cubic feet) is $4.85 (http://marcellusdrilling.com/2013/08/at-what-mmcf-price-do-shale-drillers-make-money/), above last year's average wellhead price. Given the ongoing shift to less "forthcoming" formations, marginal costs of $8 plus per Mcf have been reported. The graph below depicts the associated gas well productivity trend nicely:



Sources: http://www.postcarbon.org/reports/DBD-report-FINAL.pdf, EIA

- Continuing the sober reality of shale gas ROI, BHP took a USD2.84bn writedown on shale gas assets, the equivalent of 16.7% of last year's $17bn purchase price (source: Bernstein, August 2013).
- The industry is starting to have difficulty acquiring the water needed for fracking. Each shale well requires between 8m and 12m gallons of water each time it is fracked, or 12 to 18 Olympic sized swimming pools of water. During the summer, two Pennsylvania counties stopped issuing permits to draw water from rivers. Meanwhile, in Kansas, much of the water comes from wells owned by farmers that used to sell the water at 35 cents a barrel but now they are turning down offers of 75 cents per barrel (source: Bernstein, August 2013).
- In all, the bandied about explosion in proven shale gas reserves -- "100 years of gas" -- is to be considered with due caution, *and thus is gas price bullish.*

Setting aside the shale oil & gas global supply "blip" for a moment, let us consider the much more salient conventional drilling (where the vast majority of oil comes from) supply growth picture:

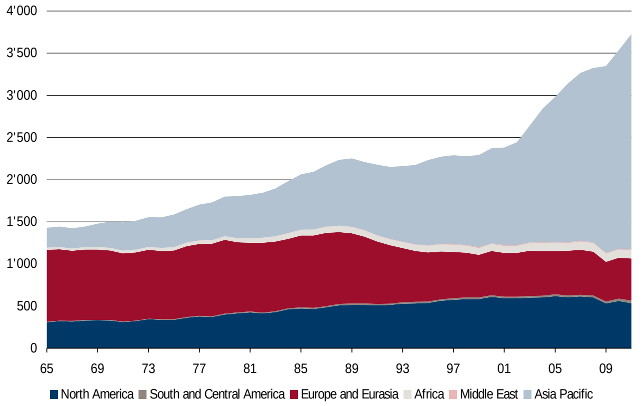
- Barclays has forecast that oil companies will spend $678bn on exploration and production (E&P) in 2013, up from $600bn last year and $300bn in 2005. Despite this doubling of cap ex since 2005, total oil equivalent production (crude, tar sands, shale, and gas) has only risen 4% over the past 7 years.
- According to an Energy Watch Group (http://www.energywatchgroup.org/) report, Saudi Arabia's Aramco has been increasing "infill drilling" (wells drilled between established producing wells in order to increase production from the reservoir) and enhanced recovery techniques to lift its recovery rate to 70%. The goal: stabilize reserves. This decade-old effort has seen a ten-fold increase in cap ex, speaking volumes about the rising cost of oil production even in the most hospitable "oil geography" of all, Saudi Arabia.
- Reuters reported in October that dozens of offshore and onshore oil and gas rigs are being lined up for Aramco next year, and that Schlumberger, Halliburton, and Baker Hughes are all expanding their presence. Meanwhile, leading steel pipe maker Tenaris expects the Saudis to purchase 200 rigs in 2014.

Finally, to add "insult to injury" on the strategic oil supply risk front, consider the following: current OPEC oil production equates to 42% of world supply. Six countries – Venezuela, Iran, the UEA, Kuwait, Iraq, and Saudi Arabia have produced 228bn barrels of oil between 1980 and 2010. Over the same 30-year period, reported reserves (economically accessible resources) by the same countries have risen by over 500bn barrels of oil, raising the question of whether this is "political" or geological reserve growth (source: BP's statistical review of world energy 2011).

A similar scarcity story is beginning to unfold for coal, as China's (chart on page one), India's, and Europe's growing net coal imports show. Worthy of mention: coal is the only affordable, 24/7 energy source for power generation in "re-emerging markets" such as China and India.

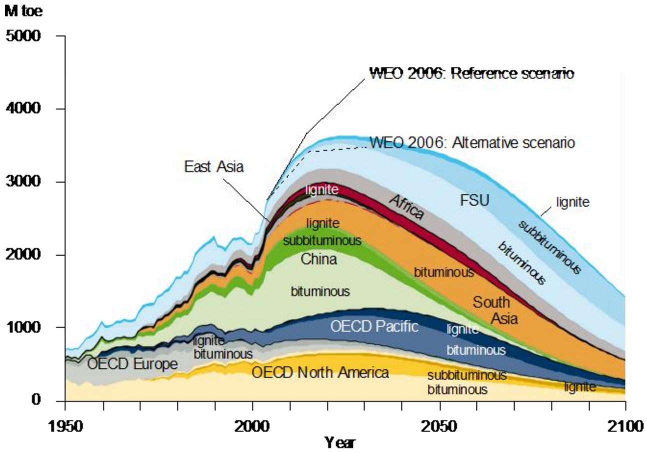
Somewhat ironic but true: coal is positioned to become the leading global energy supply source once again, displacing more energy dense oil. Oil's supply growth has proven elusive, while its cost per barrel has become increasingly prohibitive, especially in lower GDP per capita emerging markets. As an extreme example, consider 2008, when oil briefly reached $147 per barrel. During much of 2008, i.e., before the oil price collapsed, India was effectively priced out of the oil market, curtailing textile production, reducing transportation miles, and shutting down construction sites. Expensive and supply constrained oil has at least partly fuelled the stunning rise in coal-based energy (about 1,200 Mtoe, nearly all of it China-sourced) from 2000 to 2010, which in turn accounts for virtually the entire increase in the global energy supply over the same decade!

Global coal consumption in Mtoe (millions of tons of oil equivalents)



Source: BP Statistical Review

Projected trajectory of coal production and consumption in Mtoe



Sources: World Economic Outlook Reference Scenario, www.bgr.bund.de

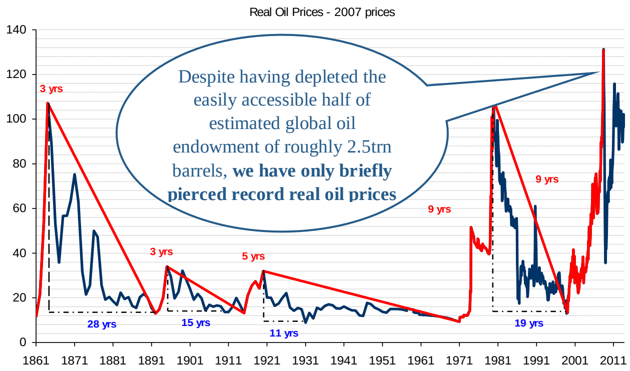
So what are the primary supply-related concerns about coal? The following:

- Declining rates of return on extraction. In April of this year, Rio Tinto put its thermal coal assets up for sale hoping to raise $3bn (proceeds of $1bn were realized in October). Between 2008 and 2012, the mining conglomerate increased cap ex in its Australian mines three-fold, but with prices moderating and unit costs up 77% over the same period, the return on investment plummeted by over 90% (in October, Glencore Xstrata, one of the world's biggest resource companies, told investors that 30% of the world's coal production is cash flow negative, so capacity will have to be removed).
- Mix: although US total coal production in short tons/volume terms for was up over the 10-year period through 2008, energy extraction in Mtoe terms peaked in '98 at 598 Mtoe. The culprit: an extraction mix shift

to 21% less energy dense "sub-bituminous" coal from the denser bituminous coal.

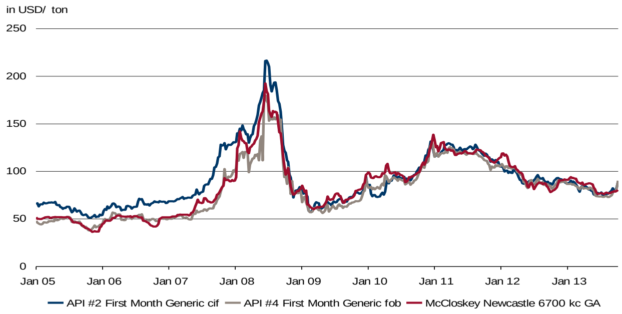
- Widespread concern about coal reserve reporting:
  - ✓ Reported Chinese coal reserves have been unchanged since 1992, unprecedented coal excavation between 2000 and 2010 notwithstanding.
  - ✓ German thermal coal reserves were marked down 99% from 23bn tons to 180m tons in 2004 (http://www.sourcewatch.org/index.php?title=Germany_and_coal).
  - ✓ (Note the poor overall coal reserve data quality, which is eerily reminiscent of OPEC reserve declarations.)

Yet despite increasing costs and difficulty of extraction, both oil, in real price terms, and coal, depicted in nominal price terms (real prices could not be sourced), are arguably not being priced as "non-substitutable scarcity assets:"



(Spot price of WTI at time of writing: $94.72 per barrel) Sources: DataStream, CS

Coal prices (API #2, API #4 and Newcastle)



Sources: DataStream, CS

(About 70% of China's and India's electricity generation, which has been growing 8-10% p.a., is affordable coal-based.)

Meanwhile, our global energy supply has been growing by 2.0% p.a. over the past four decades while real global economic growth over the same time has averaged 2.8% p.a. (sources: BP, World Bank). Ominously, GDP growth relative to Mtoe-based energy consumption growth has been declining for much of the past decade, reflecting both lower overall productivity or output per unit of labor growth (BLS and Hamilton Project calculations) as well as the increasing cost of extracting energy for use in the economy.

In other words, over the past 10 – 20 years since:

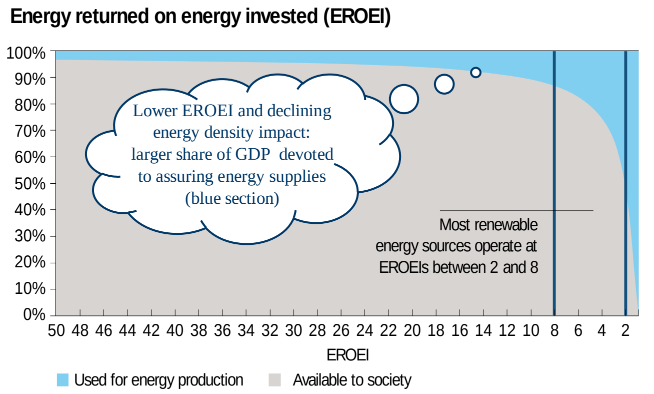
- Major legacy oil fields (North Sea, Norway, Russia, Alaska, Mexico, Iraq, etc.) around the world have been in significant decline
- Much more capital-intensive, nonconventional drilling (fracking, horizontal, offshore) has shored up supply
- A shift from oil to less dense coal supply has occurred
- Twenty six percent more energy dense bituminous coal has been increasingly replaced by less energy dense subbituminous coal
- And we've dramatically increased, thanks to legislative decisions, so-called renewable energy investments, which by definition tend to be huge and costly energy platforms offering only intermittent energy, …

… we've been witnessing a sustained decline in the "energy returned on energy invested" or EROEI (Sources: Dr. Charles Hall, SUNY College of Environmental Science and Forestry, http://vimeo.com/46989163; J. David Hughes, Post Carbon Institute, http://www.youtube.com/watch?v=z4aaOPWvw3I).

Said differently, we've had to allocate progressively more energy to make a unit of energy available to society:

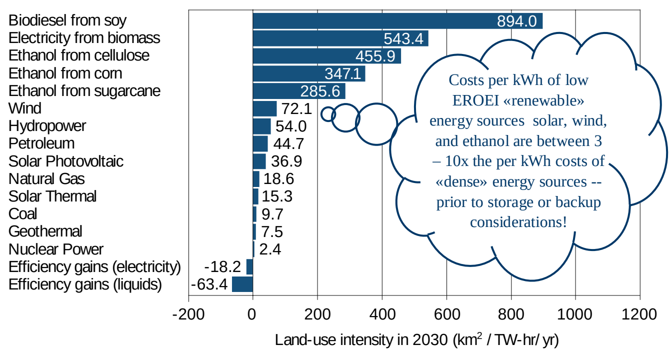
- 100 years ago, oil's EROEI was roughly 100:1 in "oil just below the ground" Siberia and Texas; compare this with current the offshore drilling EROEI of about 5:1!
- Over most of the past six decades, total energy production averaged "only" some 5% of global GDP, an approximate EROEI equivalent of 20:1.
- During the past ten years, our EROEI has dipped into the high teens, yet this is still considered an aberration by mainstream economists and investors. The reason: they don't realize that technology just allows us to deplete our fossil fuel resources more quickly, and that the easiest-to-access resources have been burned.
- A declining EROEI has been reducing overall productivity growth, boosting oil prices and dense energy E&P/infrastructure-related costs.
- The more that needs to be spent to secure leveraged output from dense energy, the more energy-centric our economy gets, meaning other sectors either stagnate or shrink.
- Upshot: dense energy/dense energy infrastructure should be strategic growth markets featuring a secular rise in asset prices: *a strategic allocation callout if there ever was one!*

This pivotal declining EROEI dynamic – the geological and the legislated variety -- and the related impact on kWh (power) costs is best captured graphically, and interpreted in conjunction with the bullet points immediately above:



Sources: Resource Insights, Dr. Charles Hall, http://vimeo.com/46989163; EIA; http://Gregor.us

Projected land-use intensity per TWh p.a.; the lower the EROEI, the greater the land use intensity (22,262 TWh of power globally in 2010)



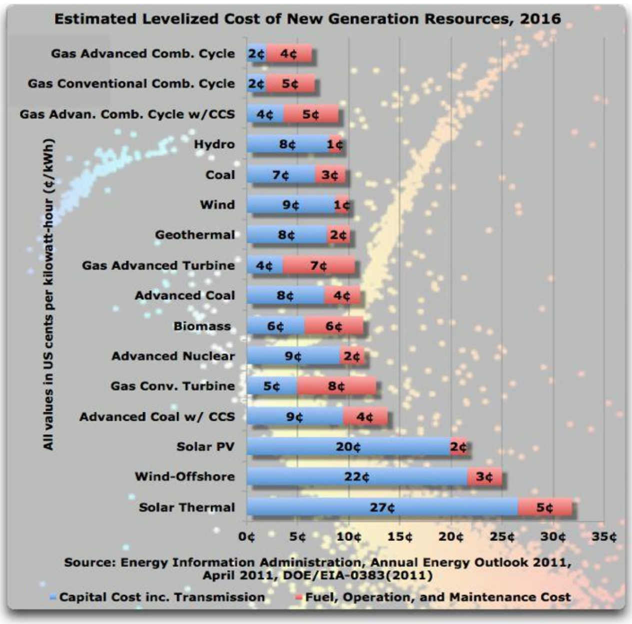
Source: http://www.plosone.org/article/info:doi/10.1371/journal.pone.0006802. Please note: values shown are for 2030, as measured in km² of impacted area in 2030 per terawatt-hour produced/conserved in that year.

For these reasons and more, renewable energy or "alternative energy" doesn't appear to be a viable backbone for our massive, 24/7 power generation requirements. Recent US Energy Information Agency data, despite that agency's alleged "renewal energy bias," suggests the same thing. Let us turn to EIA findings as concerns per kWh cost comparisons (related chart is in the other column).

Specifically, let us examine this by way of EIA's "levelized cost" analysis, which is a methodology that allows for a comparison between different electricity (power) generation technologies. Levelized costs are calculated by converting all of the capitalized costs and ongoing expenses for the project into current dollars, and dividing that by the projected energy that will be produced over the lifetime of the associated infrastructure. The resulting cost is the "all-in" cost per kWh of generated power.

Yet while the levelized costs depicted below include transmission costs, *they do not include the costs of backup power* (in essence coal or gas-fired power plants while "the sun isn't shining" and "the wind isn't blowing," which averages approximately 72% of the time) *for intermittent -- renewable -- sources*. This per kWh cost can be material due to the limited daily sun and wind "energy collection window" on the one hand, and because "grid backbone utilities" need to accept intermittent energy (e.g., the 1978 PURPA Act) when it is available on the other hand. This "forced acceptance" can cause utilities to scale back power production, pushing down plant utilization rates, thus triggering potentially large unit (per kWh) cost increases.

The estimated associated "intermittency backup cost" per kWh of wind, solar PV, wind-offshore, and solar thermal: approximately 2 US cents, according to Axiom Capital Research. Disconcertingly, the linked-in Spiegel article on this topic at the outset of this article points to markedly higher overall kWh cost inflation thanks to forced, widespread integration of renewable energy into the grid. The German experience: the equivalent of 6.5 US cents per kWh! Much of this spike is related to suboptimal utilization rates incurred by the mainstay fossil fuel-fired plants associated with mandated "grid acceptance" of intermittent or nonconventional ("renewable") energy; it is also due to a slew of offsetting government subsidizes, especially for Germany's vaunted manufacturing sector.



Sources: http://www.eia.gov/forecasts/aeo/electricity_generation.cfm; http://wattsupwiththat.com/2011/12/03/the-dark-future-of-solar-electricity/

Energy dependency and demand growth:

Fossil fuels, or dense energy sources (energy generating a lot of heat per unit volume and thus capable of doing a lot of work), are as economically vital as they are increasingly difficult/more expensive to unearth and make available to society. Our energy-leveraged economy/lifestyle, from agricultural output to transportation to HVAC to IT to manufacturing and construction, require dollops of hydrocarbons. Examples of our hydrocarbon dependency -- our leveraged output "business model" -- follow:

- Construction without excavators => massively increased labor requirements/falling productivity
- Manufacturing assembly lines without electricity => collapse in output and productivity
- Farming without tractors and fertilizers => huge yield per acre contraction and hunger

What powered the green revolution? What propelled a revolution that facilitated a population explosion from 1bn people in 1800 to 7bn by 2010, a population growth rate that was 10x that which existed prior to fossil fuel exploitation, which started in earnest in the 19th century? The answer: technology that harnessed oil and natural gas to massively increase planted acres and the yield per acre -- collectively, our field output. What is the work equivalent (ability to generate heat via combustion to "turn crankshafts") of one barrel or 42 US gallons of oil? Would you believe 11.5 years of agricultural work by one person toiling 40 hours per week or one horse in the fields for over 12 months at 40 hours per week? It's true. *In a related sense, 4.6 barrels of oil per capita p.a. supply only 33% of worldwide per capita energy needs* (sources: BP, DOE, IRS, IEA, David Pimentel of Cornell University)!

At the yield per acre level, the artificial synthesis of nitrates (fertilizer) was being researched early in the 20th century because of fears that the world's supply of fixed nitrogen, essentially sodium nitrate (NaNO3) from Chile, was being rapidly depleted. Nitrogen in its inactive, atmospheric gas form is very plentiful (about 78% of our atmosphere), but cannot be assimilated by plants. Agriculturally useful "fixed" nitrogen compounds were harder to come by; agricultural operations require liberal amounts of fixed nitrogen to produce elevated crop yields per acre.

The Haber-Bosch process provided a solution to the shortage of fixed nitrogen. Using extremely high pressures, natural gas (about 60% of the value added), and a catalyst composed mostly of iron, critical chemicals used in both the production of explosives and fertilizers were made highly accessible to Germany, making it possible for that country to continue fighting in World War I and setting the stage for a crop yield explosion. As the Haber-Bosch process "went global," it became the primary procedure responsible for the production of chemical fertilizers. And the population explosion began …

As of the early 21st century, the Haber-Bosch process was used to produce more than 500 million tons of artificial fertilizer per year. About one percent of the world's energy was used to initially produce this synthetic fertilizer; that has roughly quadrupled since.

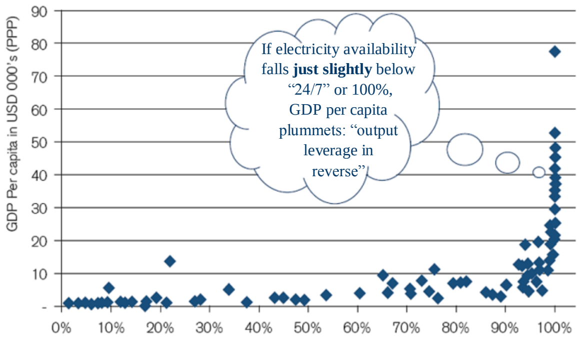
In a much broader sense, energy is an important input not just in growing (fertilizers, tractors, combines, etc.) food, but in processing, packaging, distributing, storing, preparing, serving, and disposing of it. A 2010 study by the USDA concluded the following:

- The use of energy along the food chain for food purchases by or for US households increased between 1997 and 2002 at more than six times the rate of increase in total domestic energy use.
- The use of more technology throughout the US food system accounted for half of this increase.
- A projection of food-related energy use based on 2007 total US energy consumption and food expenditure data and the benchmark 2002 input-output accounts suggests that food-related energy use as a share of the national energy budget grew from 14.4 percent in 2002 to an estimated 15.7 percent in 2007 (http://www.ers.usda.gov/publications/err-economic-research-report/err94.aspx#.UpH1TF0o6Uk).

With global grain demand expanding roughly 100% faster than global population growth thanks to increasing EM meat and dairy consumption, mounting resource (water and accessible arable land) and yield growth constraints suggest an even higher fossil fuel dependency going forward.

Let's move from grains to consider "leveraged GDP per capita" energy dependency along truly "electrifying" lines:

Output/electricity dependency linkage: GDP/capita (PPP terms) for 99 countries vs. electricity availability (horizontal axis)



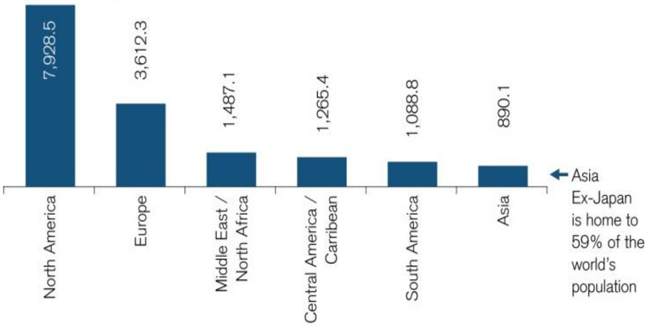
Sources: IAEA, CIA World Factbook, WNA, IIER 2010

Our dependency on hydrocarbons extends well beyond our energy supply. The following products are substantially made from/with oil: asphalt, candles, carpets, clothes, detergents, furniture, IT hardware, herbicides, makeup, medicine, plastics, pesticides, rubber, and, yes, huge solar thermal plants and 50-story high wind turbines!

Let us shift from dependency to potentially outsized energy demand growth prospects: urbanizing emerging markets, with roughly 80% of the world's population base, still consume a fraction of the energy OECD nations do, stout economic growth over the past 10 – 15 years notwithstanding:

2010 per capita energy consumption

Kilograms of oil equivalent (KGOE)



Source: World Resources Institute Earthtrends database

There are numerous EM energy demand growth drivers:

- 1bn more Asians are expected to move to the cities over the next 15 years; the associated infrastructure build outs (power, transportation, HVAC, etc.) will increase per capita energy consumption markedly.
- Consumption growth; EM GDPs are "consumption light" while EM balance sheets are "savings high."
- Productivity growth, which is positively correlated with more energy consumption as manual labor is replaced by machinery.
- The spreading global per capita water shortage (an estimated 600m Indians and 300m Chinese have no potable water) will call for a sharp rise in EM energy consumption. Desalination-related cases in point:
  - ✓ Saudi Arabia is set to spend more than USD50bn to construct very high energy usage desalination plants over the next ten years.
  - ✓ Making up for widening natural water shortfalls (via energy intensive desalination) in the rapidly growing ME region will reduce ME oil exports by an estimated 28% over 20 years, pressuring the global oil supply and, by extension, the oil price.
  - ✓ China is slated to build some 400 large-scale desalination plants in its coastal regions (sources: Matthew Simmons, The Marco Strategy Partnership's Andy Lees, www.chinadaily.com).

Noteworthy: if Asia's per capita energy usage rose from 25% to 33% of Europe's level, basic math shows that global energy demand would rise by 19%!

The opportunity:

To invest in increasingly scarce, vital assets that should rise in value over time, as should the infrastructure plays that, in this case, "unearth" them. Commensurately, oil, natural gas, and coal asset equities as well as the firms facilitating exploitation, production, and power generation should, in a diversified stock basket(s)/ETF format, offer constructive strategic return potential for investors.

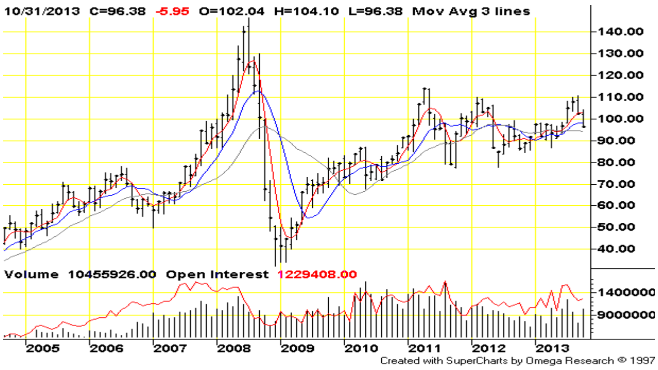
Such an exposure would be intended for qualified, strategically-oriented accounts capable of making satellite allocations and considering risk primarily as "long term impairment of capital/loss of purchasing power" instead of near-term market, sector, or stock price volatility. For such clients, we would be pleased to draw to your attention to the appropriate dense energy/dense energy infrastructure-based stock baskets (no synthetic, investment bank balance sheet-exposed baskets/ETFs) that we have identified for this strategic allocation purpose.

Dense energy allocation and stock market risks:

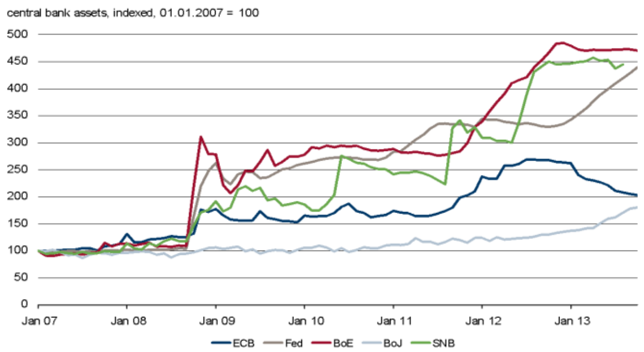
- A recession: historically, whenever the cost of oil has remained at 5% or more of world GDP, as is the case currently, the world economy has either flirted with or entered a recession (source: Bloomberg data).
- As the cost of finding oil keeps rising, both oil majors' and "independents'" profitability and, by extension, return on capital, could come under pressure, i.e., to the extent that they are unable to fully offset rising exploration costs with top-line growth stemming from rising oil and natural gas prices (oil-based volume growth will likely be at least modestly negative given widespread oil reserve depletion). Reduced profitability, if it manifests itself, could reduce dividend growth rate prospects, and, over time, dividend payments. Similar risks apply as concerns investments in coal assets and infrastructure vendors. (Source: www.exxonmobil.com/corporate/files/news_pub_sar-2012.pdf)
- Sharply rising interest rates -- from near generationally low, "QE-impacted" levels -- associated with pronounced increases in either government solvency or inflation issues could offer substantial equity valuation headwind, deeply pressuring NPVs/stock prices.
- "Reversion beyond the valuation mean" (P/Es dropping below the 108-year average valuation of 16 times trailing 12-month GAAP earnings); historically, new secular bull markets have commenced from P/Es of 7 to 11 times trailing 12-month GAAP earnings, not the current 18.8 multiple (source: S&P).
- Cessation of material stock repurchases would negatively impact, at least at the margin, the supply of and the demand for equities, implying lower valuations (http://www.factset.com/websitefiles/PDFs/buyback/buyback_6.19.13 http://www.forbes.com/sites/chuckjones/2013/07/01/share-buybacks-are-not-shrinking-sp-500-share-counts/).
- Reduced domestic (US) demand for equities associated with aging baby boomers increasingly selling stocks to either offset yield starvation-based income needs and/or to fund retirement may also create secular equity valuation (lower P/E) headwinds.
- The aging business cycle: as regards the post WWII period, we have been in an unprecedented fiscal/monetary stimulus-based economic "recovery" during the past 4.5 years. Historically speaking, at this stage of the business cycle, the likelihood that a recession will commence increases monthly, especially when considering the particularly unsustainable nature of this "recovery." Earnings, which are but "6% of top line residuals," tend to plummet (decline 30% – 50%) in a recessionary period, pressuring stock prices.

- A record high corporate profit to GDP ratio, which, historically speaking, suggests broad-based pressure on earnings power could be in the offing (http://greenbackd.com/2013/04/19/jeremy-grantham-profit-margins-are-probably-the-most-mean-reverting-series-in-finance/).
- Higher corporate tax rates to tap record corporate cash balances in order to "reduce" government deficits (bloated spending) would pinch earnings and, by extension, possibly dividend payments.

Conclusion:
Big cap oil/natural gas companies, big cap oil service (infrastructure) companies, and major coal asset plays currently offer a relatively attractive trailing 12-month GAAP earnings valuation. Specifically, a P/E discount of between 30% and 40% to the S&P 500 (18.8 times trailing 12-month GAAP earnings) is on offer in the "energy sector" thanks at least partly to lingering weakness in coal prices (overleaf) and to the recent WTI-based oil price consolidation:



While a sharp reversal in a booming equity market featuring increasing valuation froth can occur at any time, it is our conviction that the discussed "scarce dense energy" allocations not only provide for favorable relative and absolute *strategic return prospects* based on constructive dense energy supply/demand metrics, but that they also provide investors with valuable real asset exposure in an era of unprecedented global monetary base expansion/monetary inflation risks:



Sources: Datastream, Credit Suisse

Dan Kurz, CFA, senior portfolio manager, Naples Asset Management Company LLC

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My strategic allocation convictions:
The golden rules of client-centric investing are: capital preservation, purchasing power preservation, and the strategic attainment of a real yield (the reward for forgoing consumption).

Contrast this client mandate with today's monetary policy, which is made for the benefit of debtors, not savers. This holds true for the short end and the long end of the yield curve. At the short end, numerous leading central banks have moved overnight intra-bank interest rates to zero. At the long end, the same institutions have increasingly resorted to "printing money" with which to purchase 10-year government bonds, artificially lowering yields available to investors while bloating central bank balance sheets, thereby creating substantial long-term monetary inflation and misallocation risks. Add to this the fact that G20 government debt/G20 GDP has surpassed 100% with rising structural, aging-based government deficits ahead of us, and investors are also staring rising solvency risks in the face. Last but not least, with current government bond yields into the nominal to zero percent range, those instruments' durations have lengthened markedly, in extreme cases, to de facto "zero coupon bond" equivalence, thereby dramatically raising capital loss perspectives when benchmark interest rates rise.

In summary, then, today's strategic fixed income investors must contend with historical yield deprivation and even negative real yields across the yield curve, on the one hand, while having to come to terms with expanding inflation, solvency, and capital loss risks on the other hand. Meanwhile, in the wake of an unprecedented (post WWII) deficit spending/QE-induced four-year earnings recovery, equity investors must contend with what increasingly looks like a recession-induced earnings compression ahead as well as its implications for current valuations. Longer-term, shareholders face anemic real GDP growth -- and thus anemic profit growth -- associated with having to unwind the debt mountains referenced above.

So much for the problem. What about transparent and liquid investment-grade diversification, yield deprivation relief, inflation protection, capital preservation, and real yield solutions (themes) in today's investment landscape? I am convinced that I can help you identify some compelling, counterparty risk-free strategic asset allocation ideas via my investment depth and breadth and through my expertise in real or "scarcity assets," balance sheet compositions, and all-important asset valuations (during my Credit Suisse CIO Office tenure, these themes achieved an equally-weighted outperformance of 68% relative to the MSCI ACWI).