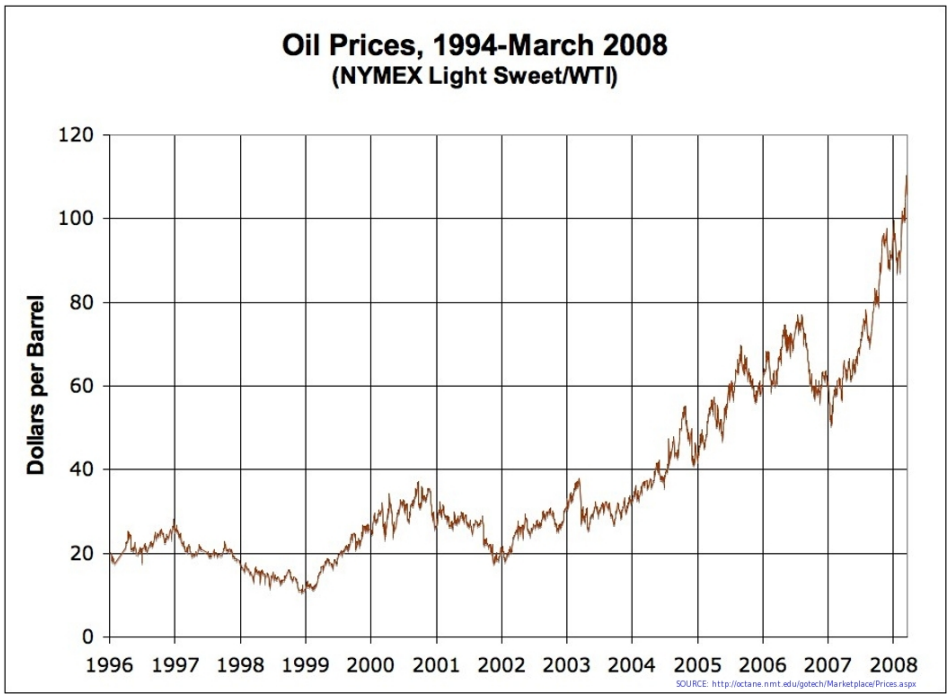
Montecito Private Asset Management, LLC

MPAM

THE CASE FOR $20 PER BARREL OIL

Okay, maybe $20 per barrel is a little optimistic, but I wanted the title to be an attention-grabber. Some of you may recognize this title, since I used the exact same title on a previous research piece I wrote a few years back. I thought then that oil was overvalued, and still do, although a lot has changed since that time. With oil above $140 per barrel, my expectation of oil going to $20 per barrel seems ridiculous at best. I agree. I do not expect to see oil at $20 anytime soon, if ever, but I think oil is vastly overvalued, and I do expect to see the price of oil drop dramatically from current levels, down to as low as the mid $70s, possibly before year-end 2008, and possibly as low as the $50s sometime in 2009.

Before you dismiss me as a complete fool after reading my title, and this report as wistful drivel, please give this paper a chance and read on. If nothing else, I think you will find the information of value, at least in terms of understanding what the true fundamentals in the oil markets are today.



With that said, and acknowledging that crude is trading above $140 per barrel right now, it wasn't all that long ago that oil was trading around $20 per barrel. We only have to go back to 2002— just six years ago—to find oil prices trading around $20. The chart above shows the price of WTI (West Texas Intermediate) going back to 1996. For 2008, it doesn't include the very latest price spike, which would show an ever steeper increase (parabolic curve) to the chart. In 2002, world oil consumption was 78 mb/d, so it is likely that consumption would have to at least start moving back in that direction, or supply would have to increase significantly, to get prices back down to $20, or something close to $20 per barrel.

In this paper, I will explore the statistics behind oil demand, with a focus on U.S. demand; its components and opportunities for reducing it. I will review the real fundamentals—meaning oil supply and demand—and separate the facts from the hype. I will also discuss some of the new technologies that are either being developed now, or are already available, which could help reduce demand, and therefore reduce oil prices.

THE CURRENT IEA PERSPECTIVE

First, let's look at where we are now in terms of global supply and demand, and also at some estimates for where demand is going. The IEA (International Energy Agency), in their most recent 'Oil Market Report', dated June 10, 2008, states the following:

Global oil product demand is expected to average 86.8 mb/d (million barrels per day) in 2008, 80 kb/d (thousand barrels per day) below last month's estimate, following the reduction of price subsidies in several non-OECD countries. Global growth is cut even more steeply by 230 kb/d to +0.9% or +800 kb/d when historical upward revisions to 2006 and 2007 data are factored in.

Global oil supply rebounded by 490 kb/d in May to average 86.6 mb/d, lifted by higher OPEC crude supply. The rise however comes after extensive downward revisions to 1Q08 non-OPEC production and lower biofuels and NGLs for the rest of this year. Despite this, a recovery in non-OPEC output is forecast for the second half of 2008.

OPEC May crude supply averaged 32.3 mb/d, 395 kb/d above April, on higher output from Saudi Arabia, Nigeria, Angola and with Iraqi output at a six-year high. Higher output and field commissioning delays pushed effective spare capacity below 2 mb/d. The call on OPEC crude and stock change in 2008 is revised up 300 kb/d to 31.6 mb/d.

OECD oil stocks fell 8.1 mb in April to 2,562 mb, in stark contrast to the typical build. An 11 mb draw in US gasoline stocks removed the large 1Q08 surplus while crude and

distillate cover tightened in Europe and North America. Total oil cover remains above average at 53.4 days.

Global refinery throughput increased by 0.2 mb/d in May to 73.3 mb/d, as strong US, Russian and Middle Eastern crude runs more than offset the decline in Chinese and European throughputs. Non-OECD regions could also drive 3Q08 global crude throughputs to 75.7 mb/d, 2.1 mb/d higher than 2Q08 and 1.0 mb/d higher than 3Q07.

The IEA revised-down combined non-OPEC plus OPEC NGL supply growth for the year to just 770 kb/d, with most of the growth taking place in the second half of the year. On top of that, with higher OPEC supply this month and delays to the Saudi Khursaniyah project, OPEC spare capacity fell below 2 mb/d in May for the first time since 3Q06. Projecting forward current supplies implies a 350 kb/d global stockbuild in the second quarter, but this would still be considerably smaller than the 900 kb/d seasonal norm seen in the OECD alone.

But come the third and fourth quarters, our projections show an unusual fall in the call on OPEC as non-OPEC supplies increase. So with the market starting to focus on deliveries for July and beyond, should we expect an easing of the current tight balance? Third-quarter supply growth comes from a number of areas. Signs that Canadian upgrader maintenance is concentrated in the first half of this year effectively boost 3Q supply growth.

More output is expected from Lukoil and the Sakhalin 2 project in Russia and small additions are seen from Brazil. However, there are risks. Maintenance problems can occur and the hurricane season hits its peak in the third and fourth quarters. The IEA report shows an allowance of 340 kb/d for peak-month storm disruptions, but cannot ever hope to fully offset the seasonal risks. The report further lowers demand growth for 2008 to under 1 mb/d, at 800 kb/d, following the decision by several non-OECD countries to reduce subsidies in the face of record oil prices.

There has, however, been little change to absolute demand following historical revisions to non-OECD countries that lift the 2006 baseline. But could demand be weaker? Every day there are reports about the impact of high oil prices. Airlines are cutting flights. Consumers are rushing to buy more efficient vehicles and car manufacturers are slowing SUV production (as long as SUVs are being produced, they will be discounted to clear in the market place). Public transport volumes are increasing and vehicle-miles travelled are falling, with supporting evidence from toll receipts. Consumers are protesting and politicians' statements reflect that mood. Changes are happening in the OECD, but they will take time to filter through. However, there are very few signs of slowing demand in non-OECD countries where GDP growth is far more significant than price in determining demand.

Global oil expenditures as a share of global GDP (a proxy for the cost of importing oil) remain lower than in the 1980s. The so-called oil burden stood at around 4.2% in 2007, compared with over 7.3% in 1980. It may sharply increase to as much as 6.0% in 2008 (assuming that prices remain at current levels for the rest of the year and based upon the IMF's most recent economic forecasts), but it would still be lower than in 1980. Stripping out of this calculation the GDP of both the FSU and the Middle East – which, given their status of net oil exporters, do not pay international market prices for domestically consumed oil – leads to very similar results (6.8% in 1980, 3.9% in 2007 and 5.6% projected in 2008).

The reason why the oil burden has not reached the levels recorded in the early 1980s is due to the fact that real global GDP grew at a faster pace than real oil prices during most of the 1980s and 1990s, with the exception of a few odd years. As such, income gains more than offset price variations. Since the late 1990s, however, the opposite has occurred: real oil prices have risen much more rapidly than global economic activity.

Will high prices destroy oil demand on a large scale? Here again, the answer must be qualified. In those regions where consumers are largely exposed to international oil prices – namely OECD countries and most of the world's poorest nations – oil demand is already stagnating or even falling, according to available data. In particular, as noted in this report, demand in the US – the traditional driver of oil demand growth in the OECD – is poised to contract markedly in 2008 as a result of the double squeeze provided by the slowing economy and higher prices. In the short term, discretionary driving is likely to contract further, while the use of public transportation (whenever it is available) should continue to increase. More significantly, in the medium to long term, as consumers realize that high prices are not due to temporary spikes and are therefore bound to remain at high levels, the structure of the vehicle fleet will arguably change gradually in favor of smaller cars and away from SUVs and light trucks. Such a trend would be further compounded by more stringent federal mandates on fuel efficiency and by the adoption of diesel-fuelled passenger cars, unthinkable in the recent past but now gaining attention given technological advances.

GASOLINE DEMAND

More interestingly, even if economic conditions were to improve sharply, it is unlikely that US demand – largely driven by transportation fuels, notably gasoline – would rebound sharply. Indeed, the US seems to be entering a 'post-Hummer' period – the gradual switch away from SUVs and light trucks to smaller, more efficient vehicles, largely prompted by the perception that oil prices will remain high for the foreseeable future. As such, the US could be following the consumption patterns observed in Europe and Japan, namely stagnating demand for transportation fuels as a result of steady efficiency gains.

Anecdotal data seem to support this hypothesis. In April, almost one in five vehicles sold was 'compact' or 'subcompact' (a decade ago, when SUVs were at their peak, only one in every eight vehicles was small). By the same token, sales of four-cylinder engines surpassed six-cylinder models for the first time ever. Moreover, SUV sales were 25% lower in January-April when compared with the same period last year. More symbolically, in early June General Motors announced the gradual closure over the next two years of four North American plants specializing in SUVs and light trucks production as domestic sales continue to plummet (-27.5% in May). The car manufacturer also hinted that it may sell its Hummer brand – the embodiment par excellence of large, gas-guzzler SUVs – and confirmed that it will launch its Volt electric car in 2010.

GLOBAL DEMAND – A HISTORICAL PERSPECTIVE

So that's the current state of oil and gasoline from the IEA's viewpoint. Let's now look at a little history for perspective. I recently sent-out an email commentary in which I quoted a statistic, which showed that in the United States, the average person uses 25 barrels of oil per year compared with 14 barrels for Japan, 2 for India, and 1 for China. Those numbers were very interesting, but they don't really tell us how changes in those consumption numbers might impact oil demand.

In the following tables, I show data for the United States, Japan, India, and China, in terms of oil and gasoline consumption. In the first table, we see that global demand for oil has risen from 83.8 mb/d in 2005 to the current estimate for 2008 of 86.8 mb/d. This represents an increase of just under 3 mb/d, or 3.54% over the four years. By contrast, one can see that during this same time-period, the price of oil has risen from an average of $47.50 per barrel in 2005 to the current $140 per barrel, which represents just under a 200% increase. Clearly something is wrong with this picture.

YEAR	GLOBAL DEMAND (MB/d)	CHANGE IN BARRELS (MB/d)	% CHANGE	AVG. PRICE OF OIL	CHINA OIL DEMAND (MB/d)	% CHANGE	U.S. DEMAND (MB/d)	% CHANGE
2005	83.8			$ 47.50			20.8	
2006	84.9	1.08	1.30%	$ 61.00	7.213		20.7	-0.48%
2007	86	1.09	1.30%	$ 69.00	7.542	4.60%	20.7	0.00%
2008	86.8	0.8	0.90%	$ 114.00	7.954	5.50%	20.43	-1.30%
CURRENT PRICE OF OIL				$140.00				
TOTAL CHANGE		2.97	3.54%	195%				

Speculators point to the potential for global demand to skyrocket over time with developing countries like India and China increasing their demand for gasoline and other oil-based products, as these countries' citizens improve their economic situations and demand more. In the table above, one can see that China, during the past three years, which have seen some of the fastest economic growth for any country in history, has increased its total demand for oil from 7.213 mb/d in 2006, to 7.954 mb/d in 2008. This represents a total increase of 741,000 barrels per day, or 10.3% over the three-year period. While the percentage is impressive, the number of barrels per day is not. In fact, over the past five years, China has only increased its total demand for oil by approximately 900,000 per day. Keep in mind that 900,000 barrels per day represents only 4.4% of total U.S. oil demand, and less than 10% of U.S. gasoline demand. (More on this later).

Also, speculators, that is, "investors" in oil futures contracts, have been responsible for an increase of approximately 850,000 b/d over that same time-period, meaning that speculators are having an equivalent impact on the price of oil as compared to all the growth from China over the past five years.

One other interesting point from the first table is that U.S. demand for oil, based on the IEA estimate for 2008, is expected to fall by 1.3% from 2007 levels. Since the IEA has stated that they may revise their demand numbers down further, it is likely that we will see even lower demand expectations prior to year-end.

In the next table, I show oil demand for the U.S, Japan, India, and China. Here you see the number of barrels per year that the average person demands in each country. This statistic is interesting, and can be very misleading. First, the populations of each country are vastly different, with the U.S and Japan having significantly smaller total populations than India and China. However, this information is useful, because it highlights two key points:

OIL DEMAND			
COUNTRY	2008 TOTAL OIL DEMAND (MB/d)	2008 BARRELS PER PERSON PER YEAR	2008 GASOLINE DEMAND
UNITED STATES	20.43	25	9.24
JAPAN	5.04	14	1.18
INDIA	3.07	2	0.28
CHINA	7.95	1	1.414

First, it would only take a very small increase in demand from each citizen of India or China to make a significant impact on global oil demand. For example, if each Chinese citizen increased their consumption of oil from the average of one barrel per year to two, you can see that China's daily demand would therefore double from about 8 mb/d to 16 mb/d. In practice, it isn't so simple, because taking an average over every citizen is not realistic. Oil is used for many different reasons; from aviation, to military, to cargo, to heating for homes, etc. Also, if we are counting every citizen, we are counting infants to the elderly. Clearly each person's demand for oil is not equal.

The second point is that, since the U.S. is by far the largest consumer of oil in the world, and because on average we consumer 25 barrels per person per year, a small decrease in consumption per person could have a very dramatic effect on total global demand. Again, just as with China, using an average doesn't really tell us much because oil is consumed for many purposes including military, commercial aviation, shipping, industrial production, etc. However, the average U.S. citizen has a much greater level of control over their consumption of oil than the average citizen in developing countries like India and China, especially with regard to gasoline consumption.

Speculators typically point to the Indians and Chinese who are becoming middle-class, and are therefore expected to buy cars and demand ever increasing quantities of gasoline. So let's look at India in terms of their emerging middle class. First, less than 1 percent of all households in India have a credit card. Less than 10 percent of all households have life insurance, which is traditionally the first form of savings for anyone with a reliable income flow and with dependants, and barely 1 percent of households have health insurance. Only one-sixth of all households have a refrigerator, probably because only about a third have electricity. Half of all television sets sold in India are either black and white, or very small, with screen of less than 14-inches. The only items of truly mass consumption remain daily consumables like cooking oil and washing and toilet soaps (which should really be classified as necessities, not options), followed some way behind by shampoos.

Among consumer durables, the ones used most often are not the stuff of contemporary middle class legend, and are either table/ceiling fans or bicycles. The first category sells about 37 million each year, the second about 25 million. In other words, what appears a normal lifestyle to the average city youngster working in an office is completely abnormal for the majority, in both towns and cities, just as it is completely abnormal to speak and write in English -- only about 6 per cent do that.

While developing countries are certainly making progress towards building the infrastructure and economic foundation that will support a higher standard of living for their citizens, we are still many years away from any significant growth in auto purchases at a level that will contribute meaningfully to global oil demand. Yes the standard of living in these countries will eventually rise, but the idea that oil should be trading today at prices based on demand 20 or 30 years into the future, is ludicrous. And, as I will assert in this paper, while I believe the demand for *energy* will grow significantly over the next 20 years and beyond in these countries, as well as in the developed world, I do not believe that this demand will necessarily be *only* for oil.

ANALYSIS OF GASOLINE DEMAND

Let's now look at gasoline demand for the four countries in the table below to see if we can discern anything useful from the data. You can see from the table above that in the United States we use about 9 mb/d of oil for gasoline, or about 45% of the total oil we use. As I stated above, China's total increase in oil demand over the past five years has been 900,000 barrels per day, which represents less than 10% of what we use for gasoline. What this means is that, if we could reduce our consumption of gasoline by 10%, we could more than offset five years worth of consumption growth in China.

The real question though, is not so much about growth in China's demand over the past five years, it's what will demand be in the future. It is that future demand potential that is providing speculators with their excuse for pushing crude prices ever higher. So let's look at gasoline demand in China, because that is the component of demand that speculators most often point to, for justification of current oil prices. In the table above, one can see that 2008 demand for gasoline in China, according to the IEA, is expected to be 1.414 mb/d, which represents about 17.8% of their total demand for oil. It is difficult to say how fast demand will grow for gasoline in China, but overall demand for oil is expected to rise 5.5% in 2008 over 2007. It is clear that demand for transportation fuels, especially gasoline, have contributed substantially to Chinas total oil demand over the past few years. It is less clear, without government subsidies, if demand for gasoline will continue at the previous pace.

Demand for gasoline will be difficult to predict, but interesting to watch, as the removal of subsidies will surely have a dramatic, negative impact on demand. Likewise, in India, Indonesia, and many other developing countries, the price of oil has risen to levels so high that governments are no longer able to afford these subsidies. Also, the upcoming Olympic Games in China are certainly having an impact on refining, availability, and prices, as the Chinese government is keen to show

the world that China is a modern and productive country (they certainly do not want to have gasoline shortages while so many foreign visitors are in their country). Therefore it is likely that the government is stockpiling gasoline and other fuels in anticipation of a spike in demand for the games.

The next table shows gasoline demand for the four countries over the past three years. One can clearly see that U.S. consumption dwarfs the other three countries. For China, demand for gasoline was relatively flat from 2006 to 2007, but has spiked this year, rising 12.5% (based on the IEA estimate). Again, I would contribute a large part of this spike to the Olympic Games, but we will have to review gasoline demand after the games have concluded to see if gasoline demand comes back down, especially in light of the removal of subsidies.

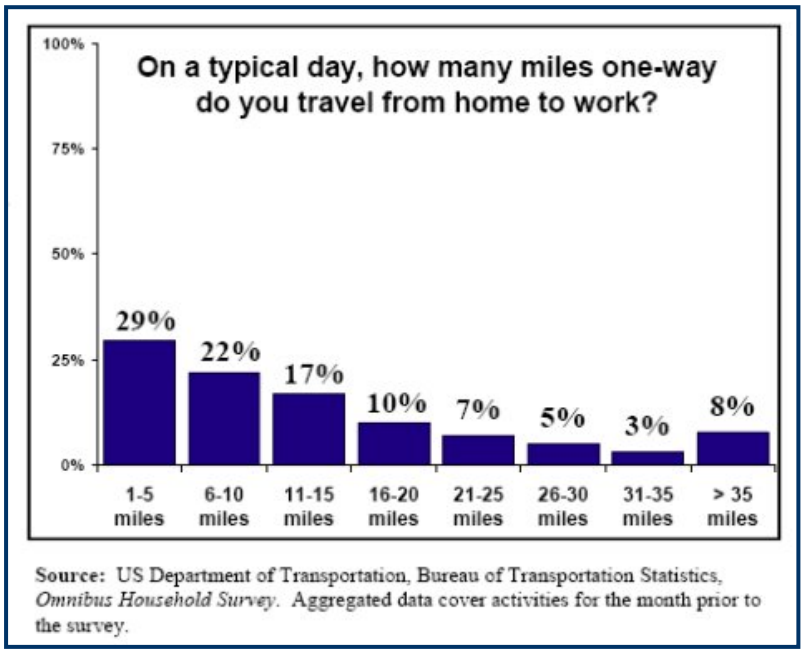
GASOLINE DEMAND			
COUNTRY	2006	2007	2008
UNITED STATES	9.25	9.29	9.24
JAPAN	1.035	1.015	1.01
INDIA	0.244	0.267	0.28
CHINA	1.221	1.257	1.414

What is clear from this table is that a relatively small decrease in U.S. consumption could have a dramatic impact on global oil demand, because our consumption number is so large as compared with the other countries. Again, just for perspective, India only uses 3% as much gasoline as we use, so even if they doubled their consumption, it would be virtually meaningless in global demand terms. However, if we could reduce our consumption by something significant but reasonable—say 25 percent—it could make a huge impact on global demand. A 25 percent reduction in gasoline demand in the U.S. would result in a 2.3 mb/d decrease in global demand. That is real! That is significant! And, most importantly, it is doable in the near term. (More on this below.)

HOW CAN WE REDUCE OUR CONSUMPTION OF GASOLINE

While it is certainly important for the environment that we conserve all types of energy, and to some extent oil is used to produce other energy sources like electricity with fuel oil, etc, it is gasoline consumption where we, as individuals, can make a meaningful impact. According to the Bureau of Transportation Statistics, the average mileage in the U.S. is about 17 miles per gallon. The table below shows that 93 percent of commuters in the U.S. drive less than 35 miles per day from home to work, or less than 70 miles per day, round trip. (GM is using this data as a guide to

produce their new car, the Chevy Volt, which they intend to be an affordable gas-electric hybrid plug-in that can provide a charge strong enough to cover a commute of up to 40 miles per day—the chart shows that 78 percent of commuters drive 40 miles or less round trip per day.)



Source: US Department of Transportation, Bureau of Transportation Statistics, *Omnibus Household Survey*. Aggregated data cover activities for the month prior to the survey.

In addition to the Toyota Prius, which is already on the market, and seems to be absolutely everywhere on the roads, and which gets better than 60 miles per gallon, there are a multitude of new full-electric and hybrid-electric cars slated for testing and delivery to dealerships over the next two years. The following is a short list of some models that I have seen, but is by no means complete.

- Toyota has already announced the production of its plug-in hybrid, based on the Prius, and to be called the Plug-in HV, slated for testing in 2009. It will basically be the same car as the current Prius model, but will house a larger battery pack with plug-in capability. So far, Toyota is being very conservative about their expectations, and unfortunately will be using the same nickel metal hydride battery as the Prius. The Plug-in HV will have a cruising range of only 8 miles on electricity, according to Toyota. Still, they are moving in the right direction, and when the lithium ion battery technology develops to a point where it is reliable, inexpensive, and will last for the required 150,000 miles, etc, all car manufacturers will no doubt produce plug-ins with much greater ranges.

- Cal Cars (www.calcars.org) already offers an aftermarket DIY battery pack that turns a current Prius into a plug-in hybrid. The PriusPlus conversion retains the OEM hybrid battery and its management computer while adding a lead-acid pack consisting of 20 BB Battery EVP20-12B 12V, 20 Amp-hour sealed AGM PbA batteries. The PbA battery chemistry is very inexpensive but leads to significant limitations. However, with this relatively inexpensive conversion (as little as $4000 parts cost, including the battery) a Prius can achieve 100+ mpg (plus electricity) for 15-20 miles/day. Reasonably-priced conversion options using Nilar NiMH packs of 3 sizes and possibly PSI Li-ion phosphate packs are now becoming available, as well as pre-built battery boxes and wiring harnesses.
- General Motors has already announced the release of the Chevy Volt, and is the only car company to provide a release date of sometime in 2010 for public purchase. As mentioned above, they plan to make the Volt affordable, and for it to have a 40-mile range on a single charge, which should cover up to 78 percent of all commuters.
- Honda just announced a pilot program for their new hydrogen fuel cell-powered car, the Honda FCX Clarity, which will debut in California as a $600 per month lease. Hydrogen filling stations will be provided and the cars will begin delivery in July of this year. There is no doubt that Honda is losing huge money on these cars, but as a pilot program, they are charting a course towards the development and commercialization of hydrogen fuel cell technologies. While I personally believe that electric-hybrids or full-electrics will be the winning technology, there is no reason why hydrogen fuel cells could not provide a partial solution to our energy problems.
- Toyota also offers a Camry hybrid, and a Highlander hybrid, both of which could be converted to plug-ins, and will likely be offered by Toyota as plug-ins in time. Here are some other current hybrid models on the market right now, or soon to come to market:
- Nissan Altima Hybrid
- Honda Civic Hybrid
- Ford Escape Hybrid
- Mercury Mariner Hybrid
- Mazda Tribute Hybrid
- Lexus RX 400h, Lexus GS 450h, and Lexus LS 600h L
- Chevy Tahoe Hybrid; GMC Yukon Hybrid; Cadillac Escalade Hybrid
- Chrysler Aspen Hybrid

- Dodge Durango Hybrid
- GMC Sierra Hybrid; Chevy Silverado Hybrid –gas mileage equivalent to a 6 cylinder car in the city
- Hyundai Accent Hybrid-estimated 45 miles per gallon and probable for 2009
- Honda Global Subcompact Hybrid
- BMW X6 Hybrid
- Porsche Cayenne Hybrid – 24 miles per gallon versus non-hybrid at 18. Not great, but hey, it's a Porsche.
- Honda Fit Hybrid
- Mercedes S400 Hybrid – may be the first production vehicle with a lithium ion battery
- Dodge Ram Hybrid
- Honda CR-Z
- Ford Reflex – Concept vehicle that married a turbo-diesel and hybrid drive technologies
- Mercury Meta One – a twin-turbo charged diesel engine made to run on biodiesel
- Toyota Volta – Concept sports car with hybrid technologies
- Toyota Sienna Hybrid
- Toyota Hybrid X – Concept for future design and styling for Toyota Hybrid cars
- Saab BioPower Hybrid – Saab is throwing everything into this model
- Volvo 3CCC- Concept for multiple alternative energy applications
- Toyota ABAT Concept Hybrid Pickup
- Audi Q7 Hybrid – production luxury hybrid
- Honda Insight – It's been retired, but they're still out there
- Tata Motors has just announced a compressed air-powered car, which will debut in India shortly, which will run approximately 125 miles on a single charge of air, and which will cost an estimated $2 per charge (electricity), and will cost about $12,500
- Finally, if you're into performance, there's a company in San Diego called HST International, that is building Shelby Mustangs and Cobra replicas that are all-electric. The Cobra has 300 horsepower, and 1,000 foot-pounds of torque, and is faster than the original big block Cobras. The only catch is that it cost $125,000, but hey, once you've paid for the car, at least you never have to buy gas.

Those were just some of the models either available now, slated for production soon, or in some cases, just ideas for possible future models. What is clear from this list is that virtually every major automaker is pushing hybrid technologies. Recently, GM, Ford, and Toyota have all cut-back on truck and SUV production, and have laid plans to increase car production, especially hybrid and other fuel efficient models. Carmakers are simply responding to consumer demand, and that demand has made a permanent shift toward fuel efficiency.

So we have seen all the new cars out there, which will allow us to reduce U.S. gasoline demand. Let's put some numbers to it, and see what kind of impact we could make if we continue to conserve and to trade gas guzzlers for more fuel efficient cars. In the table below, I have provided a range of possibilities, based on a few assumptions, which I think are appropriate. I mentioned above that the average car on U.S. roads gets about 17 miles per gallon today. The Prius Hybrid gets about 60. Since 93 percent of all commuters drive 70 miles per day or less, it is likely that within a very short time, we will have multiple car models on the road, which have plug-in capability, and therefore will allow the vast majority of commuters to commute daily with electric power alone, meaning they will not need to burn any gasoline. We are not there yet, and the battery technology needed for full-scale production of these cars is at least a few years away, but even with the current hybrid technologies we have, we should be able to reduce our consumption by dramatically increasing fuel efficiency.

In the U.S. in 2006, Americans drove 3,014,116,000,000 miles (this is the most recent data I could find, and is provided by the Bureau of Transportation Statistics). There are approximately 250 million cars on U.S. roads, and we will consume about 213 billion gallons of gasoline this year (using the IEA's estimate for U.S. oil used for gasoline production). There are about 42 gallons in a barrel of oil, but when you refine oil, you actually get about 23 gallons of gasoline. The rest is other stuff like fuel oil, jet fuel, lubricants, etc. By using the IEA estimate and the mileage from the Bureau of Transportation Statistics, I can reverse the numbers to get the estimated total miles driven

So let's just say that we could increase fuel efficiency from 17 miles per gallon to 34, just to make the math easier. Obviously this would cut our demand for gasoline in half, reducing oil demand from about 9 million barrels per day, to about 4.5 million per day for gasoline, or taking our total consumption in the U.S. from about 20 million barrels per day to 15.5 million. Take a look at the table below for a few scenarios that are not that outrageous, but could result in significant reductions in global oil demand.

I highlighted the last two rows because admittedly, they are a bit unrealistic, at least in the short-term. But the first few are achievable, especially if we look-out a few years, with all of the new hybrids coming to market. I don't see any reason why we cannot reduce our oil consumption by 2 million barrels per day, within the next few years. More importantly, we will set a standard for the world, and can export these new hybrid technologies, especially with regard to new battery technologies, that could allow countries like China and India to grow their economies while protecting the environment, and reducing global demand for oil. You can see in the chart below, that an increase in average mileage from the current 17 mpg to 22 mpg would reduce global oil demand by approximately 2 mb/d.

MPG	MILES DRIVEN	GALLONS OF GASOLINE (billion)	% DECLINE IN CONSUMPTION	U.S. GASOLINE DEMAND (mb/d)	U.S. OIL DEMAND (mb/d)	GLOBAL OIL DEMAND (mb/d)*
17 (current average)	3,613,000,000,000	213	0	9.24	20.43	86.8
20	3,613,000,000,000	181	15%	7.87	19.06	85.43
22	3,613,000,000,000	164.2	23%	7.14	18.33	84.7
25	3,613,000,000,000	144.5	32%	6.28	17.47	83.84
30	3,613,000,000,000	120.43	43.5%	5.24	16.43	82.8
34	3,613,000,000,000	106.3	50%	4.62	15.8	82.2
50	3,613,000,000,000	72.26	66%	3.14	14.33	80.7
100	3,613,000,000,000	36.13	83%	1.57	12.76	79.13

*Assumes demand outside the U.S. and U.S. demand for other oil products remain constant (not all that likely, but this assumption makes the data more manageable)

An electric plug-in with a lithium ion battery can get at least 100 miles to the charge (the Tesla all electric car with lithium ion batteries gets 250 miles to a single charge, although it costs about $100,000). The amount of electricity it takes to charge an electric car to go 100 miles-plus, costs approximately $2, and this is based on today's battery technology. Batteries are bound to become more efficient and less expensive as demand rises (economies of scale) and advancements are made in terms of quality, durability, etc. I cannot understand, if anyone—American, India, Chinese, or Martian—is given a choice of spending $2 on electricity or $100 on gasoline, why anyone would choose gasoline, never mind the political, terrorism, and environmental implications.

In the table below, I changed the number of miles driven annually to 3 trillion from the current roughly 3.6 trillion. This would represent about a 17 percent reduction in total miles driven annually, and would take us back to about the number of miles we

drove in 2006, so it's not unimaginable that we could cut back to that level. You can clearly see the dramatic impact of the combination of conservation and more fuel efficient cars. For example, if we could cut back to 2006 miles driven, and increase the average fuel efficiency of cars to 34 miles per gallon, we could reduce our demand, and therefore global demand, by 5.41 million barrels per day (86.8 mb/d now, less 81.39 mb/d at 34 mpg, and 3 trillion miles driven). As you can imagine, this would have a huge impact on the price of oil.

MPG	MILES DRIVEN	GALLONS OF GASOLINE (billion)	% DECLINE IN CONSUMPTION	U.S. GASOLINE DEMAND (mb/d)	U.S. OIL DEMAND (mb/d)	GLOBAL OIL DEMAND (mb/d)*
CURRENT LEVELS	3,613,000,000,000	213	0	9.24	20.43	86.8
17 (current average)	3,000,000,000,000	176.5	17%	7.67	18.68	85.05
20	3,000,000,000,000	150.0	30%	6.52	17.71	84.08
22	3,000,000,000,000	136.4	36%	5.93	17.12	83.94
25	3,000,000,000,000	120.0	44%	5.22	16.41	82.78
30	3,000,000,000,000	100.0	53%	4.35	15.54	81.91
34	3,000,000,000,000	88.2	59%	3.83	15.02	81.39
50	3,000,000,000,000	60.0	72%	2.61	13.8	80.17
100	3,000,000,000,000	30.0	86%	1.3	12.49	78.86

*Assumes demand outside the U.S. and U.S. demand for other oil products remain constant (not all that likely, but this assumption makes the data more manageable)

One could say that if everyone switches to electric plug-ins, there will be such a demand on the electric power grid, that it won't be able to handle the strain. Or, that we just don't produce enough electricity, either in the U.S. or abroad, to provide for that much demand. While that is certainly true to some extent today, we have the capability to increase electricity production through a variety of sources, including wind, solar, natural gas and most especially nuclear. France derives about 75% of its total electricity needs from nuclear power. By contrast, we only produce about 20% of our total. With that said, we have over 100 nuclear reactors producing electricity today, while China has eleven in operation, six under construction, and several more about to start construction. India is also investing heavily in nuclear power generation and plans to provide 25% of its total electricity needs from nuclear power by 2050. There is no reason to think that we, along with China and India, cannot expand our use nuclear power to produce the needed electricity to replace our dependence on oil, in combination with wind, solar, and natural gas.

SUPPLY

I have been focusing exclusively on the demand side of the oil issue so far. Let's turn our attention briefly to supply. Another claim of the speculators is that supply is waning, and we have already hit 'peak oil', meaning the point at which the world supplies of oil have been maxed-out, and production will decline from this point forward, no matter what we do. This is ridiculous. Every time someone says we have found all the oil out there, another huge discovery is made. The key is not so much identifying sources, but the economics of producing it. With technological advancements, both for drilling and production in new as well as existing fields, we can now, and in the future, access these reserves of oil.

Here are just a few recent discoveries and potential exploration areas, just off the top of my head, which show that there are still vast supplies of crude out there just waiting to be discovered and produced.

- The Saudis are producing 9.7 mb/d, including their latest two increases of a total of 500 kb/d. They had already planned to go to 12.5 mb/d by the end of 2009, and agreed at the recent meeting in Jeddah, Saudi Arabia, to get there sooner. They also stated that they will consider going to 15 mb/d if needed, which was previously off the table. Clearly, they do not have the kind of capacity constraints as many speculators had claimed, although I will admit that this additional capacity will require investment and time to build-out. This 15 mb/d would put another 5.3 mb/d on the market, or would represent an addition of 6 percent to global supply based on the current roughly 87 mb/d of production.
- Russia was actually the largest oil producing country in the world during the first quarter of this year at 9.5 mb/d. Only a few years ago, they were producing far less with the Yukos scandal. Putin just announced some major investments in oil producing capacity and maintenance for the Russian oil industry, which could place even more oil on the market.
- In 2000, at a time in which many so-called experts were suggesting that there were no more major oil finds possible, there was an enormous find in Kazakhstan of 12 billion barrels. Late last year, just off the coast of Brazil, another giant find of between 5 and 8 billion barrels was made. Brazil, only a few years ago, was importing 100 percent of their oil, within a few years, they will be a new exporter of a sizable amount of oil as this new field is developed.
- Iraq just announced last week that they will allow foreign companies to work on their oil fields again. Their current exports are at about 1.5 mb/d. Their peak oil production was 3.7 mb/d back in 1979, but they have allowed their

fields to deteriorate. With new technology and investment, they should be able to surpass their previous production, as they have some of the richest fields in the world.

- In Canada, the oil sands region has the potential for 4 million barrels per day of production. This oil is more expensive to get, but it's there.
- In Colorado and surrounding areas, oil shale represent three times the total proven reserves of Saudi Arabia, or put another way, 100 years of U.S. consumption at current rates. Again, like oil sands, this oil is more expensive to produce, and there are certainly environmental issues, but the oil is there.
- China's offshore region is known to have very rich oil reserves, but has yet to be explored due to political constraints. As their economy develops, those restraints should lessen, and if foreign companies are allowed into those areas, there are certainly billions of barrels of oil there waiting to be discovered.
- In the Gulf of Mexico, there have been major discoveries over the past few years as well, one of which is estimated to be as much as 40 percent of total U.S. proven reserves. This oil is in deep water, so again, the cost to produce it will be higher, but it's there.
- In the arctic sea, it is estimated that there could be as much oil as has been discovered throughout the world. Due to climate a, ice, etc, the cost would be higher to get the oil, but again, it's there. The North slope of Alaska and ANWR (the Arctic National Wildlife Reserve), are estimated to have huge oil deposits, which have yet to be explored. Again, there are issues, environmental and economic, but the oil is there.

And, as technologies improve so that more oil can be recovered from existing fields, along with exploratory and drilling technologies that will allow us to get oil from places we thought impossible only a few years ago, like deep water, and the arctic ocean, there is no reason to believe that oil supplies cannot continue to grow along with demand, especially if demand can be reduced through alternatives as mentioned above.

THE FOLLY OF SPECULATORS

The IEA has an estimate floating out there of global demand rising to 130 mb/d by 2030. I have written about speculators using this estimate to bolster their argument for the appropriateness of the current price of oil. This estimate is based on a host of assumptions; one of which is that current consumption rates will continue and even increase in some countries. While anything is possible, it is also possible that aliens will land on earth tomorrow and provide us with a new technology for converting sea water to energy with no environmental risks. I know that sounds stupid, but the

point is that no prediction 22 years into the future can be relied upon, and it certainly cannot be seriously considered to be justification for ***current*** prices.

ANCILLARY BENEFITS

Here are just a few ancillary benefits of the movement toward electric-hybrid and full-electric cars:

- Better fuel economy (obvious)
- Smaller cars on the road, so there will be less traffic (each car takes-up less space) , less accidents, more room for parking, fewer door dings, less wear and tear on roads and therefore less maintenance costs
- Less noise (electric motors are virtually silent and smaller cars weigh less, so they don't have as much tire noise, etc; you can hear your stereo better!
- Fewer moving parts resulting in less maintenance
- No oil changes, etc, so less need for lubricants (less demand for oil) and less environmental impact

CONCLUSIONS

I continue to believe that oil is grossly overvalued, and expect to see oil prices fall to below $100 in the short-term, to below $80 within 6 to 12 months, and hopefully to below $60 sometime within the next year or two. I realize this may seem crazy, but when I was predicting that the housing market was in a bubble and would burst two years ago, many thought I was a fool then as well. Now that the real estate bubble has burst, and housing prices have fallen by more than 20 percent in the hottest markets, it seems obvious. I believe oil prices will come down just as home prices have, and once they do, it will seem just as obvious.

Global demand for oil has risen 1 - 2 percent per year over the past few years, yet the price of oil has nearly tripled. There can be no fundamental justification for this price increase, therefore it must be due to speculation. Keep in mind also that those who are long oil futures contracts, should they want to lock-in their profits, must find a willing buyer to buy those contracts. If there are no buyers at the current price, the sellers will be forced to take a lower price if they want out. This problem is exacerbated by the incredible amount of leverage (borrowing) used in the future markets. Once a few major players decide they want out, the bottom will fall out. There have been many, many instances of this occurring in the futures and commodities markets over the years, and I expect to see the same in oil.

I have written also that I believe that oil, and all commodities, will come down substantially in price, either in the short-term due to speculators trying to get out and also trying to short commodities to make additional profits, or in the longer-term, if prices stay elevated for an extended period of time, because these high prices will force the U.S. and world economies into a deep recession. I still believe this to be true. My hope and expectation is that speculators will get cold feet and try to get out in the near-term, which will start commodities correcting down. Should commodity prices fall in the short-term, I believe that the stock market will perform exceptionally well, and that is why I am overweight equities as compared with all other asset classes. In the longer-term, with all of the new technologies developing for cars, and with solar, wind, nuclear, natural gas, wave, thermal, hydrogen, and all of the other alternative sources of energy, I believe it is just as likely if not more so, that oil demand will be lower in 20 years than it is today.

I hope you have found this research piece informative.

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June 30, 2008

Sources: www.iea.org; www.eia.doe.gov; www.bts.gov; www.world-nuclear.org; www.hybrodcars.com; www.worldenergyoutlook.org

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