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How vulnerable to oil shocks are we, really?

Posted by Prof. Goose on August 12, 2007 - 10:00am
Topic: Supply/Production
Tags: oil prices, oil production, oil shock, peak lite, peak oil [list all tags]

This is a guest post by user Davidyson, who is living in Potsdam, Germany, peak oil aware since May 2004, computer scientist, journalist, consultant, project manager and web specialist, currently freelance consultant, closely acquainted with several senior people in the Potsdam Institute for Climate Impact Research.

When oil prices reached last year's maximum without causing more than a slight slowdown of economic growth, many pundits claimed publicly that the absence of severe consequences were due to a growing independence of GDP creation from oil in our more efficient and more service-oriented economies.

The following analysis tries to reason to what extent this is really true, and at what point serious consequences will set in.

Unless our governments undertake rationing of oil use and/or tax to destroy demand, the main effect of peak oil will be a rising oil price. Under fundamental market mechanics, it will rise so high that it destroys all the potential demand that can no longer be satisfied with the declining flow of oil. In free market economies, demand always equals supply. If oil production slides, something's got to give. But who is going to give?

Demand destruction comes to the people and from the people. All product and service industries, and even the bureaucracy and the military ultimately exist to fulfil some (often only perceived) consumer need. Only if price increases can no longer be passed on through the supply chain to the end user because a too large number of potential buyers can no longer afford the product, pressure to deal with the oil shortage is exercised.

There are three strategies that an end user can use to deal with rising energy prices:

1. Continue your lifestyle on credit and hope the crisis is going to go away soon.
2. Reprioritize spending – stop or reduce spending in one area to be able to continue spending in another. Of course, people would usually assign a higher priority to satisfaction of the more basic needs and the retaining of the more important status symbols. Spending for other needs would be scaled back. Most people would rather hold on to their homes than continue their weekly visits to the nail studio.
3. Increase efficiency and conserve – downsize, use things longer, eliminate frivolous waste, invest in more efficient technology, recycle.

Now what if you cannot seriously reprioritize, because most of your spending is vital? And you cannot increase efficiency, because the technology is not available in your country or you cannot afford the upfront investment for more efficient technology, even if it exists? And of course,

because you had to get by with a minimum of oil/energy/goods so far, you have already squeezed out all behavioural efficiency you can. Waste is a privilege of the affluent.

So, first, high oil prices destroy demand from people who physically just cannot pay the price, no matter how urgently they would need the stuff. This will mainly apply to very poor people around the world (not necessarily only in developing countries) with a dependency on oil but without capacity to compensate for drastically rising prices. (Of course, people living without any oil dependency will be the least directly affected.)

Imagine you own a small vegetable farm in Africa. You really need this one tank full of gasoline to transport your ripe produce to a market to make money and so to be able to buy vital supplies. You drive to the petrol station on your last couple of drops and find that the price has risen significantly since last week and you just don't have the money to pay for enough gallons/litres to get you to the market and back again. Your produce will quickly rot in the sun, destroying your investment and probably even your livelihood. Even if you make it to the market somehow by quickly borrowing money to buy the fuel, your potential buyers will likely be so stretched that they cannot afford the usual amount of shopping and certainly not at the increased prices you have to ask for to compensate for the more expensive gasoline and to pay back your loan.

The inflation imported with the oil cannot easily be compensated by the local economy – the country's value creation just cannot keep pace with the rapid energy price increases. Your farm becomes unprofitable: You must ask for high prices, which most of the market cannot bear. A perverse situation: some food still finds buyers at very high prices, but their demand is limited. Most of the food is unsaleable at a profitable price. In poor countries, if you don't have a family to support you, going broke as a small farmer is an existential threat: you loose your farm, get displaced, perhaps in your desperation you must take on slave-like work for the remaining affluent, and/or even send your children into the streets as beggars or sell them as prostitutes or child soldiers.

And what if significant parts of the rural population get caught in the death spiral of economic decline? Less and less food reaches the urban areas due to reduced transport and given-up farms, food prices explode even more. People starve; the urban survivors eventually get dependent on foreign food aid – if it ever comes. The "developed" countries can't send corn anymore; they need it to substitute ethanol for gasoline.

How does the soon ensuing chaos in the poor countries affect the developing or the developed countries? "Poor" countries are actually often wealthy in terms of resources which the developed countries need. The more chaos in the countries of origin of these resources, the more likely supply disruptions and therefore unanticipated shortages become – see Nigeria.

Okay, now let's pretend these problems are far away and the side-effects for "us" in the developed world can be handled – even if only by military intervention. But now the thumbscrew of depletion turns again: demand destruction that happened among the poorest gets overtaken by a further decline in oil supplies. Who's next?

At some point, the three strategies described above to deal with rising prices will have to be adopted in the developed world, too.

Increasing efficiency and conservation can both have a stimulating and a depressing effect on the economy: If investments in new technology (cars, appliances, energetic home improvement etc.) are made, this acts as stimulation. One dampening side-effect: The energy embodied in the old technology must be considered "stranded". Even recycling, if it ever happens, can only recover a

part of it, according to the laws of thermodynamics. So there would be a surge in energy demand to develop and build all this new technology, increasing price pressures even further.

Adopting behavioural efficiency, even if just as a reduction in discretionary spending, most likely acts as a depressing factor for the economy: as products get used longer, energy gets used with more awareness, and less and less luxury products and services get consumed, whole industries loose their viability, starting with those with a low original profitability.

Now does a reduced energy intensity (the amount of energy used to produce one unit of GDP) make us less vulnerable to oil price shocks?

As is the so often the case, it depends.

Clearly, it makes product prices less volatile – if energy makes up only, say, 2 percent of a product's price, doubling the energy price will make the product only about 2 percent more expensive. This sort of price increase can often be compensated by optimising other inputs into the product or by just lowering the expected profit margin.

But there is another scenario. For many products, especially in highly competitive markets of commodity products, profit margins are low, and often, energy contributes much more than 2 percent to the price. This would not be a big problem if producers all suffered the same and if they could change their product's price quickly to just pass on the price hike to their clients. Some manufacturers will have made longer-term fixed-price energy contracts which protect them from price volatility, some other producer's contracts will just happen to end as the price jump happens and yet others will be generally less energy efficient than their competitors or operate on a smaller profit margin or according to a tight amortisation plan.

Also, the price for the products they sell cannot always be adjusted with short notice, especially in volume product industries.

So, the effect of sharp price increases is not being felt evenly within any given industry. Manufacturers with bad timing for recontracting energy purchases, with fixed sales prices, low energy efficiency and small margins will suffer the most. If they cannot adapt quickly, they might withdraw now unprofitable or uncompetitive products from the market or even go bust.

A real shortage of these products could result, as the competitors who are still in business cannot arbitrarily increase production to compensate. If the products are part of a longer manufacturing chain, the consequences would "spill" to all dependent manufacturers – and possibly their complete value creation would be endangered.

The luxury products, the consumer service industries and the entertainment industry will probably suffer most, in fact, they will suffer a double whammy: their energy bills will increase while clients are less likely to use their often not-so-vital services, due to re-prioritisation of their spending. Here, some fairly high "value" creation (or: GDP creation) gets threatened due to relatively small energy price increases.

Another facet is the likely behaviour of the credit industry. How likely is it that you as an investor get cheap credit (or any credit at all) if the bank is fully aware that the economy is under increasingly serious strain? And even if you get and take the expensive, risk-adjusted credit, how likely is it that you will be able to pay it back in a shrinking economy?

Would you even dare to invest, once you become aware that no one can tell you with any useful

degree of certainty a ceiling for energy prices that you can use as input for your business plan?

Of course, actual shortages ("you can't get the energy almost no matter how much you pay") would wreak the biggest havoc: complete industrial value creation chains would be paralysed even if only a single, but vital raw material or half-finished product would no longer be available due to energy supply disruptions. With just-in-time manufacturing, many manufacturers could survive such a blow only for days or maybe weeks at best.