

ECONOMIC GROWTH: A ZERO SUM GAME¹

Cameron Leckie[©]

Understandably growth, growth and more growth is the mantra of politicians, economists and media commentators the world round. However, what if future growth is just not possible? The recently released World Energy Outlook (WEO) from the International Energy Agency (IEA) did not go so far as to say that future growth is no longer possible, but it does suggest that at the global level future economic growth is now a zero sum game. In short, China and India's gain is the OECD's loss. From the WEO 2010 Executive summary (p. 6):

All of the net growth [in oil demand] comes from non-OECD countries, almost half from China alone ... Demand in the OECD falls by over 6mb/d.

So what is the big deal? If you are an economist, this is not a problem, because increased efficiency in the use of oil will allow growth to continue while demand falls - problem solved. In the real world however, this is the least probable outcome. A more likely result is that a six million barrel a day (mb/d) decline in OECD oil demand will result in a corresponding drop in OECD GDP. Let's explore why this will be the case.

First some background. It wasn't so many years ago that the IEA scoffed at the idea of peak oil. The IEA simply predicted a rate of future economic growth and calculated the volume of oil required to meet this growth, resulting in widely optimistic projections such as oil production of 116 mb/d a day in 2030 according to the 2007 WEO. An interesting trend has however occurred over the last few years. Each year the WEO has become more pessimistic in its view of future oil production, this year being the most pessimistic yet with production in 2035 being only 99 mb/d and crude oil production having already peaked. Even this subdued forecast is likely to be optimistic. One of the IEA's mandates is economic development; it is therefore rather difficult for the IEA to suggest there is insufficient oil to allow growth to continue. The IEA has got around this little problem by suggesting that the oil intensity of the OECD economies will improve significantly over coming decades (Fig. 1):

Table 15.6 • Oil intensity by region in the 450 Scenario
(toe per thousand \$ of GDP at market exchange rates)

	2009	2015	2020	2025	2030	2035	Change 2009-2035
United States	0.058	0.049	0.041	0.034	0.027	0.020	-65%
European Union	0.036	0.030	0.026	0.022	0.018	0.015	-58%
Japan	0.038	0.032	0.026	0.022	0.019	0.016	-58%
China	0.077	0.057	0.046	0.040	0.035	0.030	-61%
India	0.117	0.088	0.073	0.064	0.058	0.051	-56%
Middle East	0.198	0.172	0.144	0.116	0.092	0.073	-63%

Figure 1: Projected oil intensity in the 450 scenario

¹ Online Opinion Australia, November 25 2010.
<http://www.energybulletin.net/stories/2010-11-25/economic-growth-zero-sum-game>

There is no doubt that improvements in the oil intensity (defined as the quantity of oil consumed per unit of GDP, the lower the better) can be made, but the difficulty of this challenge should not be underestimated, particularly given current circumstances. Many OECD nations have ageing populations, are heavily in debt, virtually all are dependent on oil imports with some notable exceptions (Norway and Mexico) and have in many instances outsourced much of their manufacturing industries to developing nations.

Take the United States for example. Drowning under government and private debt, with “real” under and unemployment at about 22 per cent, with nearly a quarter of mortgage holders “underwater” and consumers paying down debts, the result is reduced oil consumption due to fewer people transiting to work, fewer goods being exchanged and fewer holidays being taken (Fig. 2).

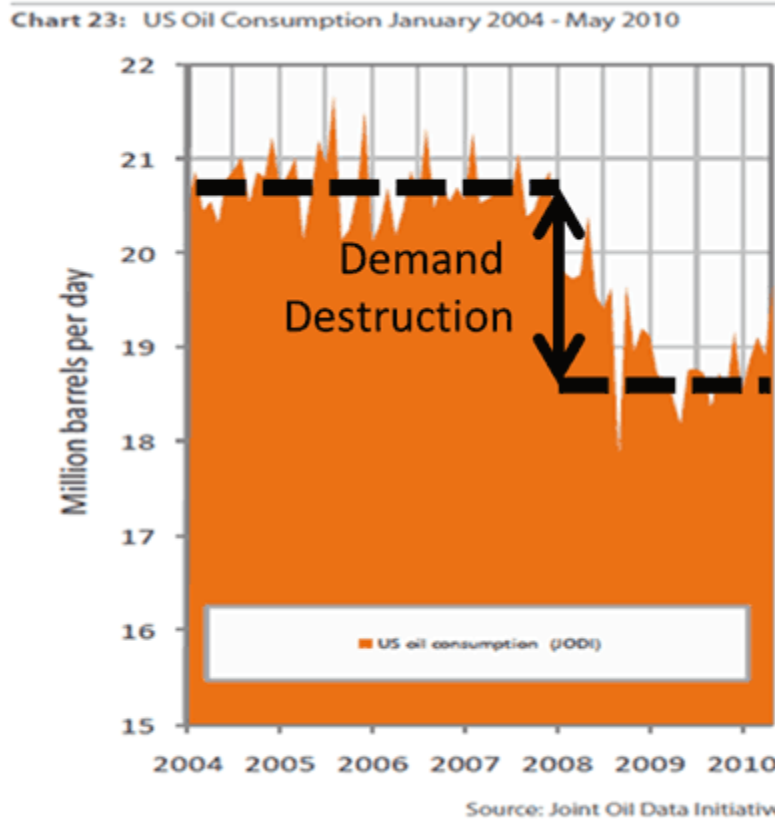


Figure 2: US oil consumption. A case of demand destruction

Reducing the oil intensity of an economy will require significant capital investment, something that in the weakened economic state of many OECD nations is unlikely. Reducing oil intensity is also subject to diminishing returns, each increment of improvement in oil intensity will become increasingly expensive and difficult to achieve. In this context, significantly reducing the oil intensity of the economy would be a monumental achievement. Perhaps history can provide an example of a more likely future scenario; the 2007-2008 oil price spike being such an example. Increasing demand combined with flat oil production from 2005 onwards led to the oil price reaching US\$147 a barrel in July 2008. At this price, oil (among other factors) induced a recession. The recession resulted in falling demand (demand destruction, Fig. 2) and hence a collapse in oil prices. It also led to significant cuts in oil/gas/renewable energy investments

(future supply destruction). This cycle is likely to repeat itself in the years ahead with each cycle increasing in intensity as demand destruction leads to future supply destruction. For this reason, many of the actions that could potentially assist in reducing the oil intensity of the economy, such as electric vehicles, are likely to be subject to the law of receding horizons.

Of course oil is a fungible globally traded commodity. At least currently! This situation is changing for two major reasons. The first is that the continuing growth in oil consumption by oil exporting nations, when combined with actual or projected declines in production of these nations will see the pool of oil available for importers decline. Jeffery Brown, the co-ordinator of the Export Land Model suggests that by 2015, based on current trends, for every three barrels of net oil imports non-Chindia countries purchased in 2005, these countries will have to make do with two barrels by 2015; a situation that will only continue to deteriorate.

The other factor is that some nations don't play by the free market game. China in particular has and is continuing to be aggressive in its securing of oil supplies (as well as other resources such as natural gas, rare earths, minerals and farmland) to meet its future needs from countries around the world. The net result is that those oil importing countries who continue to believe in the free market will be fighting amongst one another to secure a continually decreasing and ever more expensive pool of oil.

Unfortunately there is good reason to believe that the IEAs scenarios are actually quite optimistic. These reasons include:

- Expecting Saudi Arabia to increase its oil production by 5 mb/d from current levels, even though King Abdullah has said that exploration will be stopped to save the oil for future generations.
- We currently consume far more oil than we discover each year. A 30-year trend that is unlikely to reverse.
- Considering unconventional oil and natural gas liquids (NGLs) as an equivalent to crude oil without factoring in the reduced Energy Return on Investment of unconventional oil or the lower energy content of NGLs.

To summarise, using the IEAs scenario for future oil production, a scenario that is likely to be overly optimistic, the best that we can hope for is that future economic growth at the global level is a zero sum game. Obviously the implications arising from this are significant. How does Australia ensure that it is on the winning side of this equation? Here are a few ideas:

- Use less oil. Transforming our transportation system from one where the car and truck dominate to one where rail and public transport dominate is a logical risk mitigation strategy.
- Natural gas as a transition fuel. Australia has large natural gas reserves whilst our oil production is already in decline, a trend expected to continue, and insufficient to meet current or forecast demand. A major program aimed at transitioning portions of our vehicle fleet to natural gas would provide a buffer as the availability of oil imports becomes increasingly problematic.
- Food for oil. Relying on the free market to secure future oil imports, when other nations aren't playing the free market game is fraught with danger. Long term oil supply

contracts with major oil exporters, potentially in exchange for food or other resources would increase Australia's security of supply.

- The reversal of globalisation. The current level of globalisation has been achieved due to the low cost of transporting goods around the world. However in a world of triple digit oil prices, distance equals money. As the comparative advantage provided by low cost labour nations erodes, this provides an opportunity for manufacturing in Australia.
- Fractional reserve banking and fiat currencies. Our current financial system requires continual economic growth to sustain it. The economy either grows or implodes. There are other options however, such as the steady state economy proposed by former World Bank economist Herman Daly. Moving away from fractional reserve banking and fiat currencies will be vital in avoiding systemic financial crises in the future.

Reading between the lines of the IEAs latest World Energy Outlook suggests that whether we like it or not, the rules of the game are changing. The conventionally accepted economic wisdom, which was derived in an era where energy was cheap and seemingly inexhaustible, is becoming less and less relevant to our current and future situation. Successful countries will be those that understand that the game has changed and adapt accordingly.

It is time for reform, not the minor tinkering that constitutes reform in current political debate, but fundamental change. Business as usual can't and won't remain an option for much longer.