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DISCUSSIONS ABOUT ENERGY AND OUR FUTURE

Australia: The Place To Be (Part 1)

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This is a guest post by David Clarke. David has worked as a consultant analyst for almost 30 years, spending the last 15 years consulting mainly in IT. David has owned and sold an IT startup, but now prefers the pampered life of a manager in one of the Big 4 Accounting firms. He has close friends in the energy industry and blames them for introducing him to Peak Oil, and bursting his happy bubble. You might occasionally encounter him on TOD as aeldric.

Introduction

I am an analyst by training, profession and inclination. So when my son was born, 24 months ago, I decided to do a quick risk assessment. What would the future hold for him?

The answer was not quite as cheery as I had assumed.

I grew up at a time of unbridled optimism. I have never missed a meal, never fought in a war, and never had any need or want unanswered. As a result, I am a hopeless optimist.

We all instinctively assume that the best predictor for the shape of tomorrow is the shape of yesterday, so let me tell you about my yesterday: I attended my first meeting at 10:30 am. Looking to the right I had a view of the river, as it winds through the city. To the left I could look out at the bay and watch the ships come in. As soon as the meeting started one of our catering staff came in. The waiters and waitresses on our catering staff are attractive, well groomed, and they know that I like a small piece of white chocolate fudge with my coffee each morning.

Why am I telling you this? Because your life can color your outlook. Every writer about Peak Oil has prejudices. Some are "Doomers", I am not. Possibly my easy life colors my analysis, I leave it for you to decide.

This is the first of three articles in which I will talk about:

1. Where are we, how did we get there, what's in our immediate future? The next 5 years in Australia.
2. Scenarios and threat analysis. Australia out to 2020.
3. Social solutions and personal preparations.

So here is Part 1 - an introduction to our situation here in Australia, and an overview of the next 5 years.

For most readers of TOD there will be no surprises, but I would like to highlight that it is not all bad news – there is plenty of good news as well. Let's finish with the upbeat shall we? So, Bad News first:-

The Bad News

- We are entering a time of resource depletion.
- Jeffrey J. Brown (Westexas) and others at The Oil Drum have pointed out that oil exports are already starting to decline.
- Droughts and other events that are probably related to Climate Change have devastated crops in several nations (including Australia, Argentina and the US) in recent years. Global warming appears to be leading to worsening water shortage here in Australia
- Global grain reserves are at dangerously low levels, as the world has eaten more than we have produced for 6 out of the last 7 years (note that this trend should not be considered irreversible, grain levels are dynamic and subject to change)
- Fisheries are collapsing all around the world
- Sea levels could well rise dramatically in the coming decades – probably by at least 30 cm, perhaps by meters
- Other problems, such as a depressed economy and reduced soil productivity, circle us like hyenas around a wounded wildebeest.
- And the most worrying problem: The solutions for most of the problems above are blocked by one or more of the other problems. For example oil depletion can be partially addressed by using technologies such as coal-to-oil conversion – but this solution has dramatic and intractable climatic and CO2 problems.

So we face fewer solutions than we have problems.....what is the Good News?

The Good News

- Australia is a continent of coal, topped by mountains of Uranium. It is surrounded by a sea of Natural Gas punctuated by reefs of Shale Oil....OK, perhaps that is a little bit of hyperbole, but we are a very energy-rich nation. We are a net energy exporter.
- In addition to our energy resources, you can't seem to dig a hole in your garden without hitting a seam of iron, gold, zinc, or some other resource.
- We have a population of only 20 million in a country nearly the size of the US.
- We are completely self-sufficient in food; in fact we are a net food exporter.

If you have to live through a time of resource-depletion, this is the continent you want to be in.

Timeframes

So the world has a bunch of problems? And the solutions for the problems are blocked by the other problems? Fine. But the real crisis is decades away right? Aren't people talking about dates around 2030, or even later?

Well, I hope so. In fact I said exactly that in a newspaper article 18 months ago. But now I am not so sure. Things seem to have ratcheted up in the last 18 months.

There is a simple way to look at this. You only need three pieces of data:

1. The production and/or export of several key resources is diminishing measurably every month. For example: Oil exports are declining. Fisheries are collapsing. Grain production seems to be faltering. World production of several key minerals (such as lead) is down (though I should note that, unlike oil, lead can be recycled). Each month the quantity being produced (or exported) for each of these resources is declining while the quantity consumed is going up.
2. As a result, the reserves held in stockpiles around the world are declining just a bit more each month.
3. The reserves held in these stockpiles are measured in days. In the case of grain, we have less than 60 days of reserve left in stockpiles world wide.

If the trends continue, then these three simple facts add up to bad news. Based on this, my belief is that our timeframe for solutions is measured in years, not decades.

Worldwide: Location of the most severe impacts

We need to remember that although these are world-wide problems, the world is a very variable place.

- Resources are not evenly distributed
- Population is not evenly distributed
- Wealth is not evenly distributed.
- Carrying capacity (the ability to support a population) is not evenly distributed.
- Political stability is not evenly distributed.

Here in Australia we hit the jackpot. We have high resources, low population, good wealth, fair carrying capacity (when compared to population), and good political stability. Countries without those attributes are obviously more vulnerable when something goes wrong.

The list of vulnerable nations includes "The Usual Suspects": Parts of Africa, parts of Asia and portions of Latin America. This list sounds familiar because this is not the first time that the world has had problems. Every time we have a problem, these vulnerable areas get hit first and worst. This is not fair, and I am not going to try to find some kind of higher explanation, I am just going to leave this obvious inequality as an observation.

Let us review how things work when the world runs into scarcity. Suppose that next year high oil costs lead to high costs for fertilizer and transport. At the same time a climate-change drought occurs in food-growing nations and consequently a slight food shortage occurs.

If the problem is a 5% food shortage, then the price of food goes up, and economic principles take over. High prices lead to "demand destruction" and the world uses 5% less food next year. The areas that can't afford the price rise will suffer the most; that is how demand destruction works. We don't all consume 5% less food, instead most of us consume (perhaps) 1% less and the 4% who are most vulnerable consume almost nothing, leading to a catastrophe in the vulnerable area.

Nations hit like this frequently collapse. This does not surprise us, nor does it worry us because we don't believe that it could happen to us. However we should be worried - even relatively advanced nations can collapse.

In recent history we have seen collapses in Russia (after the fall of communism), Argentina (after an economic collapse) and Cuba (when the fall of communism led to the loss of most of Cuba's imports and exports), just to name three of the most high-profile casualties.

In a frighteningly short period of time Russia went from being one of the most powerful countries in the world to being a nation where the elderly froze and the children starved. If a political crisis can trigger a collapse in resource-rich Russia, we should not dismiss the notion that a crisis might trigger a collapse here in Australia.

But we should note that, while each of these nations suffered a collapse, each nation also recovered. My less optimistic friends point out that these nations recovered in a world that was not resource constrained. This is true. They also point out that Jared Diamond filled an entire book ("Collapse") with examples of collapses with little or no subsequent recovery. Rwanda is a recent example.

Before nations can recover, a new equilibrium has to be found and a new structure to support that equilibrium must be built. In each collapse the population found themselves living beyond the capacity of their resources - either because resources weren't available, or because of a failure of

support, production or distribution systems for the resources. New systems and practices were needed in order to bring the nation's consumption within the capacity of their resources.

In the examples that I provide the resource constraints in each nation were not severe. Russia and Argentina in particular are relatively resource-rich, their problems were more about systemic failures that led to dislocations in producing and distributing - essentially, the compex interdependencies between people broke down. Despite the fact that adequate resources were present, the recovery process was not pain-free. If resources are severely constrained in a future collapse, the pain is likely to be more severe.

I have already said that Australia is a relatively resource-rich nation. In a world where many nations are living a resource-deficit lifestyle, we are a resource (and energy) exporter. So finding a new equilibrium may not be as painful for us as it may be in some other nations. In other nations equilibrium may not be possible without a reduction in population. This thought is so unpleasant that I consistently shy away from it.

Population and Consumption: "Now this might hurt a bit...."

Everybody recognizes that the core of the world's problems is population and the associated levels of consumption. Most of the problems that we face as we approach a population of 7 billion people would simply vanish if the number of humans on Earth was lower or our consumption levels were more like India and less like the US. Certainly, we need to consume less. And unless we make a dramatic cut in consumption very soon, then some level of population reduction may also occur as a result of the situation that we are about to face.

As I grew up, I saw some behaviors change here in Australia. We gave up a lot of the silly, unnecessary things that our grandparents did. I remember that my grandma used to recycle milk bottles. She would also reuse jars, refilling them with home-made jam. She had a string bag for shopping, and a compost bin for vegetable scraps. She used to let the chickens out every morning so that they could scratch around in her back-yard veggie garden. Her garbage bin was always empty, because she never threw anything out. The lessons of The Great Depression and WWII never left her - she actively avoided unnecessary consumption.

Today we consume because we believe that consumption is a good thing – ever-growing consumption supports an ever-growing economy.

In hindsight the mistake is obvious – you can't have ever growing consumption if the things you are consuming only exist in limited quantities. Thirty years ago, when the question was first raised, the limits seemed a long way in the future. Now, a number of scientists and Engineers are crunching the numbers on how much oil, lead, zinc, gallium, tellurium, etc is left. The answers are terrifying.

We are now approaching the limits, and these limits are manifesting themselves in the form of high prices and demand destruction. Soon there will be a payment for our mistakes. But who will do the paying? We know the answer. Any country that is marginal for whatever reason – whether this is due to poor carrying capacity, bad leadership, or just bad luck. "The Usual Suspects", as always, will measure the price in human lives.

I don't want to dwell on this, but I do want to remind myself what this could mean - Fathers like myself could be unable to find enough food, and they may watch their young sons die. Mothers may mourn as their milk dries up and their babies slowly starve. If it gets to point where war and famine are the only options remaining, then real people are going to die. "Demand destruction" is not just a mathematical abstraction, as the economists seem to believe, it impacts real people in real ways. We cannot afford to be complacent. If we cannot balance the ledger on the "consumption" side, then "population reduction" is the other alternative.

Here in Australia, I believe we will pay a lower price for our laziness. But we may have to learn to do the silly things that my grandmother did. Water for our gardens comes from a tank, not a tap. Power is not something to rely on 24 x 7. Save your string. Let the chickens out to scratch in the veggie garden.

The alternative to falling population is equilibrium through conservation, not consumption. We know the answer, we see it every day: Reduce, Reuse, Recycle.

I was born in Australia. The fact that I may pay a lower price than "The Usual Suspects" is not due to any virtue on my part – it is luck. It is not for nothing that we are called "The Lucky Country".

Problems We Will Face in Australia

So Australia is the place to be? We have no problems to worry about as we transition to a post-carbon future? We all know that is crap. Here is a list:

Water

If you are living in Australia I don't need to tell you that Australia is dry. Many of our cities came close to power outages last summer because there was too little water to cool the power stations.

We are being warned that the same thing could happen this summer. Many politicians suggest that desalination will solve our problem. Desalination requires huge amounts of power. Our power stations need water for cooling, and this water is scarce in summer, so we are being told that we may need to cut back on power usage in summer, exactly when the demand for water is high, and thus when the desalination plants will need the most power.... Hmmm.....am I the only one who sees a problem here?

Population

Australia is comparable to the US in size (the contiguous bit - not counting Alaska) but we have a fraction of the US population, so we should be on Easy Street right? Not so fast. The US was a country of forests and prairies, while Australia is so hostile that half our native animals have learned to live without ever needing to drink, and the other half form a good starting point if you want to compile a list entitled "World's Most Venomous Creatures".

Living in the city, we sometimes forget that this is not a particularly verdant land. Our country has little arable land, and the arable land that we have is already showing signs of strain as Climate Change starts to bite. For the last 6 years we have started the year with optimistic predictions of huge crops, and finished the year with a fraction of the original forecast. Yes, I still think that Australia is the place to be. Yes, I think that we can make it. But it won't be easy. I expect to lose a little weight over the next 2 decades.

The Economy

Personal Debt has risen in Australia at an alarming rate. We now owe, on average, 3 times more (in real terms) than we did in the 1970s. We can't afford to feel too smug as we watch the economic carnage emerging in the US; we have our own economic risks to face.

Oil and Natural Gas

We are an energy-rich country, but the oil situation is Australia is not as good, or as simple, as our coal and gas situation. So here is an attempt to simplify it:

Although we produce oil that is equal to about 60% of our needs, the oil we produce is generally not used in Australia. After it is refined, our oil has a balance of heavy and light components that

does not match the market here in Australia. So we ship our oil off to nations that match our oil's profile, and we ship in oil that more closely matches our usage profile. Obviously, in event of a major disruption, our oil supplies are not guaranteed. Our refineries could be re-tasked to refine our own oil if necessary, but this process would be neither easy nor efficient.

Our oil is depleting at around 5% per year. (Give or take. Our depletion is relatively slow by world standards because small new fields are found from time to time, and good management has led to good oil recovery.) Our demand for oil is going up at around 1-2% per year (depending on factors such as economic development for each year). Given that we are already importing around 40% of our oil, mathematics would suggest that in 5 years we could be importing around 55% of our oil. So in 5 years we will need to increase imports from the current 40% of our total oil usage to 55%.

But there is a problem. The amount of oil being exported by producing nations is not increasing, it is dropping. Why? The governments in oil exporting nations are providing cheap oil to their domestic market. This leads to high domestic consumption in producing nations, and this local consumption is eating into their export numbers. As a result oil producing nations are exporting less.

The decrease is running at about 1% per year at the moment, but this is likely to increase. Current projections suggest 8% less oil will be exported from producing countries within 5 years (see the research paper by CIBC: http://research.cibcwm.com/economic_public/download/occrept62.pdf).

So oil imported from producing countries will not continue to rise, and thus will not meet 55% of our needs. If the mathematics can be believed then imported oil supplies will drop, to meet about 36% of our needs, not 55%. This is a 19% shortfall in Australia's oil needs, within 5 years!

Of course, this is just a mathematical exercise, designed to illustrate what will be happening all around the world. It does not take into account numerous possible factors – both mitigating and contributing (for a better analysis of Australia's specific oil depletion profile, see http://www.energybulletin.net/31980.html).

The purpose of this exercise is to give a feel for the scope and immediacy of the possible problem. If it was real, a 19% shortfall in 5 years would be a significant inconvenience (there goes my trip to Cairns), but not a life-threatening disaster. The reality will depend on what happens in the rest of the world. The same problems will be playing out in every importing nation, and we will be impacted by how they respond.

China and the US are importing nations. If their economies continue strong, they might have the economic capacity to take most of the oil, leaving us with a trickle. On the other hand, a world-wide economic downturn could leave the US economy crippled, unable to afford high oil prices, and leave us with a comfortable level of oil.

The outcome depends on economic, political, social and military factors far beyond my power to predict. Only one thing is certain – scarcity leads to higher prices. If we look further than 5 years in the future, it is likely that oil supplies will be impacted by more than just decreasing exports, but more on that in Part 2.

The natural gas situation is better. We have a LOT of natural gas. Over the next decade we are likely to need it. If oil supplies are low, then we will need to convert entire fleets of vehicles to gas, and build the necessary infrastructure to extract and distribute that much gas.

To avoid disruptions, this will need to be done in a short time frame, perhaps 5-10 years. The engineers I talk to feel that the project is achievable, but not in that time frame. Twenty years is a more achievable time frame.

So, although there is uncertainty, the mathematics provides a clear indicator – even in resource-rich Australia "Business As Usual" is not really an option, we are going to have some problems as infrastructure lags behind the demand created by resource constraints. If trends continue, then these problems will emerge in less than 10 years.

The problems we face have been significantly mitigated by our access to local resources. Taken in isolation, the Australian problems are not insurmountable; however the response of the rest of the world will undoubtedly impact on us. The precise nature of this impact is hard to predict, but is unlikely to be helpful to us.

So there we have it. Things change. Both of my parents went very hungry during the depression and then lost fathers and uncles in WW II. Following those hard times they saw things change, and witnessed the prosperity of the post-war boom years. Yet they speak with more fondness of the hardships in the depression and WW II than they do of the years of prosperity that followed.

In the years to come my own story could be a mirror-reverse of their experiences. From the day I was born I saw an era of unfettered growth, but in the years to come I will see things change. This does not need to be a bad thing – but it will be a period that we need to prepare for.

Summary

In Part 1, I presented these arguments:

- In the coming years, there will be good places to be and bad places to be.
- Australia is a better place to be than many of the other options
- However we will not be without problems.
- The events in the rest of the world could have a significant impact on us.

In Part 2, I will talk in more detail about how I see these problems panning out here in Australia.