



## The Trouble With Energy - Part 4

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Topic: [Policy/Politics](#)

*This is part 4 of a series of posts co-authored by [phoenix](#), who is an Engineer heavily involved in the energy sector. It will be based on a submission we made recently to the Australian Government.*

*Part 1 is [here](#).*

*Part 2 is [here](#).*

*Part 3 is [here](#).*

### Introduction

In parts 1-3 we presented the problem. In essence, it is this:

- The migration to alternate and renewable energy sources will take a significant time to plan and implement.
- Due to the depletion of fossil fuel resources, we don't have enough conventional energy sources to support the building of this infrastructure if we assume continuing growth and "business as usual" for this period of time.
- The expense of the anticipated infrastructure will place an almost unendurable strain on GDP.

We now turn to solutions. We have not identified any "silver bullet", nor is our list of solutions exhaustive. In this section (part 4) we will look at the Australian situation and identify some of the types of questions that need to be asked. In part 5 we discuss some of the issues that the world in general may need to consider.

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### Exploring Solutions

Energy scarcity is a crisis that will unfold over an extended period of time. In order to deal effectively with this crisis the government needs to take strong decisive actions on a number of fronts encompassing:

- our energy reserves
- our energy supply
- our energy consumption.

The effort required to retool our economy to run on renewables is an exercise that will take decades. Conversely, the impact from an imbalance in energy supply and demand can have serious effects on economies within a matter of months. This was demonstrated by the oil shock in 2008.

Although market forces will certainly sort this problem out, we have seen in recent months that the market can be brutal. The government simply cannot stand back and allow market forces to operate to solve this problem.

The authors recognise that some of the following suggestions will present difficult political hurdles.

It must also be acknowledged that, even with the following actions being rapidly implemented, Australia will still have severe difficulties in making the timeframe for transition and timeframe for depletion match.

## General

From the analysis in this paper it is clear that the most effective government action that can be taken is to limit growth in the export of fossil fuels. If, in fact, we froze energy exports at their current levels while allowing domestic consumption to increase at 2.5% p.a. then we would have enough reserves to last till 2082 and thus allow a reasonable time frame for the economy to transition to a fully renewable base.

Implementing such restrictions to exports is politically very difficult. It has implications for our international reputation, creation and the maintenance of jobs, and ultimately for national security. On the other hand, allowing exports to grow unchecked and then attempting to restrict them when a crisis is imminent has even greater implications with regard to these considerations.

## Defining Resource Quality

Resource quality is a sliding scale, but is rarely referred to in this fashion. Rather, assumptions are made about price-points and resources are quoted in solid-sounding numbers, based on those assumptions.

It is currently not possible, for example, to get a clear answer to the question “How much oil is left in reserves worldwide?” The answer ranges from 650 Billion barrels to untold trillions, depending on the assumptions made by the estimator.

Given enough energy input, it is possible to turn even the lowest-quality oil shale into synthetic oil, so this range of answers is understandable, but the assumption that future energy infrastructure will be provided to support this conversion is never articulated, and thus is invisible to decision makers.

This lack of detail makes it very difficult for decision makers to generate decisions. Decision makers need reports that incorporate quality as part of the report.

## Public Awareness

Because of the lack of public awareness in relation to energy matters many of the actions necessary to be taken by government will be highly unpalatable to the general public and thus political suicide for any government attempting to do the right thing for Australia’s long term security.

Action : The federal government to commence a widespread media campaign to educate the public with respect to energy matters and the need for conservation. This campaign must extend beyond environmental impacts and address the significance of energy security.

## Maximising the public wealth

While we have indicated above the pending energy shortages for Australia looming over the next 50 years, it is clear that the international community will experience these shortages sooner and more severely. This implies that there will be very large increases in the value of all fossil fuels.

Other nations have demonstrated that building a Sovereign Wealth Fund based on windfall resource income can avoid the problems associated with “The Dutch Curse” ([http://en.wikipedia.org/wiki/Resource\\_curse](http://en.wikipedia.org/wiki/Resource_curse) ). This would ensure that the value of natural resources are returned to the Australian public purse to help fund the huge expenditure required in building renewable infrastructure.

Action : All Australian states to implement a sliding scale for the application of resource royalties. Under the sliding scale 80% of the change in the international traded price for fossil fuels is taken up by increases in royalty levied on the respective resource.

This one action is probably the most significant, as the single measure will provide public finance for the transition costs, incentive for domestic transition and limitation of the rate of resource exploitation. Of course it must be implemented cautiously in order to avoid serious damage to Australia's good reputation for sovereign risk.

### Australian Ownership of Resources

While the exact dates relating to energy depletion are unsure, two factors are certain. As depletion occurs, the value of energy resources will escalate dramatically and energy resources will become a major source of international disputes. Given that we are not a major world power Australia must take a strategic view and not allow a circumstance to be created that might cause us to be engulfed in a dispute over the development and allocation of our own resources. The first defense against such disputes is to limit, as far as possible, foreign ownership of in situ resources.

Action : All future development applications for extraction rights of fossil fuel resources to require a minimum 80% Australian ownership.

### Population

New situations require rethinking of previous paradigms. If unlimited growth is the dominant paradigm then force-growing Australia's population is arguably a good thing. However if resources are constrained then expanding the population can conceivably lead to social issues. Some current policies may need to be reconsidered. Some suggestions for discussion:

- Stop all but skill shortage based immigration. Or all net immigration.
- Drop the unmarried mother benefit.
- Stop the baby bonus.

Many recent studies have shown that if the entire world lived our first-world lifestyle, the resources required would equate to the resources of several planets.

The current population of Earth cannot live the way the first world lives, so we have three choices:

1. Reduce our standard of living.
2. Reduce the population of Earth.
3. Continue an inequitable system in which the first world lives well, at the expense of the rest of the population.

Ultimately, the rest of the world will want a lifestyle comparable with the lifestyle enjoyed by developed nations, continued inequality is not an option. If we do not want to compromise on standard of living, then we have to look at ways to address our population.

### Preservation of Gas Reserves

While our gas reserves are ultimately limited, they are abundant in comparison to our domestic demand. **Gas is the only readily exchangeable substitute for oil** in many transport and industry applications. A plethora of both domestic and international energy companies are generating proposals for the explosive expansion of Australian LNG exports. While it is unpalatable for Australian governments to limit this industry, the alternative of later having to curtail exports after the infrastructure is built would be devastating to the country's sovereign risk profile.

Action : The federal government to set in place a moratorium over the development of any new export contracts or facilities for the export of LNG.

## Oil Excise

The most immediate effects of energy depletion will be experienced in shortages and resultant price hikes of oil-based fuels. This was demonstrated in 2008 and will be repeated again as soon as growth from China and India outstrips the drop in demand resulting from the global economic crisis. The International Energy Agency has warned that a decrease in investment combined with economic recovery, particularly in China, is likely to create a "Supply Crunch" within 3-4 years (<http://www.bloomberg.com/apps/news?pid=newsarchive&sid=abnkGOUOzC3w>).

The approach by government to the issue of excise and tax on oil based fuels will be the most powerful message they can send to the general public concerning the gravity and impact of oil depletion. The general public do not have the knowledge or skills necessary to interpret the likely price effect of the future oil demand/supply imbalance. They will need simple guidelines concerning future price in order to make sensible personal decisions.

Action : Federal government to set up an Oil Excise Commission whose specific task is to maintain a forecast of future oil prices for a period of 20 years out. The oil excise will be set at a level that produces a linear increase in prices up to the forecast. The commission will act independent of the government and be charged with decreasing excise in the event of spikes in the international oil price and increase it when the international price falls. In order for this to be acceptable to the public the net tax take over time could be maintained at current levels.

Action : All fuel excise rebates including the Queensland government general rebate to be repealed immediately.

## Biofuel Excise

The government currently imposes an excise on the production of biofuels equivalent to 50% of the tax on oil based products. This tax is therefore imposes a 19c/L impost on the adoption of biofuels as an alternative to oil. It is totally illogical to be imposing special taxes on an industry where growth is critical to the national interest.

Action : Repeal all excise on domestically produced biofuels.  
Mandated Renewable Energy Target

Through the existing MRET scheme all of the required legislation and systems are in place for the government to encourage a progressive uptake of renewable energy. The problems that the generation industry have in delivering higher levels of renewables all relate to confidence in the consistency of government policy. This is understandable given the plant and equipment associated with generation has a useable life of 30 years or more.

Action : The MRET scheme to be modified to incorporate the following

- The target to be based on a percentage of electricity consumption and not on a set number of GWHrs
- The target implementation schedule to be extended by an increase of 2% per year from 2020 all the way out to 2050
- Removal of the penalty cap to the tradable value of the RECs. The RECs should be allowed to trade for their full value and the target should be truly mandated.

## Conversion to Plug-in Electric Vehicles

The government should facilitate the current trends towards hybrid and electric vehicles, thus encouraging a conversion of oil based energy demand to an electricity base. With future increases in the oil price there will inevitably be a transfer of energy demand on to the electricity generation system.

In the initial phase this will consist of increased load from public transport systems. Increases in

load will result from electrification of rail and increased use of conveyor systems in lieu of haul trucks in mining. The major change however will be as a result of the take up by the public of plug-in electric vehicles for commuter transport. Plug-in vehicles should not present severe difficulty for the electricity system to manage if they are confined to drawing power in off-peak times. However, the large uptake of off peak power will necessitate a rapid roll out of timed metering.

Action : State governments to legislate that distributors are to provide access to timed metering to all consumers upon request.

#### Gas Network System Management

At present power station developers are progressing with a major switch to gas fired generation based on the lower carbon emissions of this fuel. The aggression with which this switch is pursued will depend on the treatment of existing coal fired generators under the new CPRS regime. This switch to gas however is being considered in isolation of the requirement of gas to provide an interim substitute for oil. In combination with proposed LNG export facilities the gas industry is in real danger of an over commitment, resulting in a price hike and disruption to the market.

Action : Federal government to immediately establish a national body for the management of the eastern seaboard gas network. The body will be responsible for forecasting and managing future gas demand in a way similar to the way NEM (National Electricity Market) is used to manage the eastern states electricity market. This body should also oversee the effective roll out of an eastern states gas pipeline network so that this fuel can be used as an interim energy source to cushion the effects of oil depletion.

#### Vehicle Efficiency

While there is little that governments can do directly to effect the efficiency of motor vehicles there is significant measures that can be taken to influence the acceptance and take-up of high efficiency vehicles.

Action: Increase tariffs imposed on all imported vehicles using a sliding scale based purely on fuel consumption levels.

Action : Impose increased sales tax on all locally manufactured vehicles based purely on fuel consumption levels.

#### Conversion to Gas

The above mentioned action to restrict export of LNG will be extremely unpopular with gas resource developers. The industry may have already progressed on some facilities to the point where companies would expect financial redress from the state for their expenses.

One possible carrot that could be enacted by the government, is to encourage the expansion of the domestic gas market and therefore provide developers with an equivalent outcome. The development of a domestic market could also be deployed to mitigate disruption from oil supply issues which will take effect much earlier than other energy restrictions.

Action : Government rebates for the conversion of industrial vehicles to CNG.

#### Support for Australian Industry

The investment of \$50 - \$100 billion (depending upon which path we take) per year for 40 years represents a sizable portion of the national economy. Typically 20% of the cost of a new power plant is expended on technology and design, 60% on the supply of equipment and 20% on construction.

As a nation we cannot afford for half of this monetary investment to be siphoned off to foreign suppliers of equipment and technology. The government is currently making efforts to support local technology developers and this will be beneficial. There is also a roll for support of local suppliers/builders of the equipment associated with the plants concerned.

## Conclusion

We are faced with a number of energy problems. These problems are associated with exponential declines in the amount of energy available for productivity. These declines are additive, which is likely to lead to very sudden, unpredictable outcomes. The timeline for these problems is not known with any certainty, but the oil and gas price spike of 2008 and subsequent price volatility indicates that the market anticipates that a crisis is near.

In this series we have demonstrated that:

1. Our economic productivity is linked to energy availability.
2. Future supplies of energy may be subject to sudden curtailment
3. In Australia, we have the capacity to become Energy Independent, utilizing purely renewable resources.
4. The transition to infrastructure that utilizes renewable energy will itself require time, energy and resources. We will require most of our available resources to make this transition.

The clear conclusion is that if we export significant quantities of our energy resources we risk not having enough to make the transition. Part of our future export strategy should be to estimate how much of our energy bounty can be safely exported without jeopardizing a future transition strategy.

In this, section we have looked at solutions specific to the Australian situation. None are Silver Bullets.

If we want our grandchildren to enjoy a sustainable lifestyle, then it appears that we may need to go through a bit of pain. This period of pain is likely to happen whether we want it to or not...our choice is to manage it, or not.



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