

Peak Oil

There are two reasons for acting now to reduce sharply our use of fossil fuel energy. Firstly, there is the contribution to global warming of carbon from burning fossil fuels. Secondly, there is *peak oil* which will force us to adapt – preferably in ways that do not worsen global warming.

What is peak oil?

Oil started running out when the first oil well started flowing. Peak oil is the time when oil extraction peaks worldwide and our ability to extract oil is overtaken by our demand for oil.

Once we reach peak oil, extractors will no longer be able to keep up with increasing or even steady demand. This sheet outlines possible problems this could present and suggests how we might deal with them.

When will peak oil occur?

Best estimates are that peak oil will occur around 2008, though some say 2005. The early effects of peak oil are being felt now; others may take years to appear.

Why should I be concerned about peak oil?

In the past century enough oil was extracted to meet the increasing demand because new discoveries offset depletion of existing wells. This will no longer be true after peak oil. So peak oil represents a change in the conditions that have underwritten economic growth as we know it and the growth of population from 1 to 6 billion.

After peak oil, there will still be recoverable oil left but the oil interval in human history will be over.

Will this just mean higher petrol prices?

Higher petrol prices will certainly be one consequence. But oil is so ingrained in the way we live that the implications reach much further. The material welfare of our society and our belief in progress is based largely on drawing down natural capital, including oil.

Transport of goods: Because oil is used to transport food and the goods of our consumer society from all over the country and globe, we can expect their prices to rise.

Transport for people: Living in a suburb will become more difficult when car use is less affordable than today. Air travel and tourism generally will be similarly affected.

The economy: Because energy prices and the economy are so closely linked, a recession is likely, accompanied by inflation, rising consumer debt and increased unemployment.

Food production and processing: It has been said that we are “eating oil”; think about that. Our accustomed food security is threatened.

Products and materials: Oil is used to produce plastics, medicines, packaging, synthetic fabrics, road surfaces, cosmetics, detergents and most modern comforts.

The environment: We use fuel oil energy in the repair of environmental damage. An oil shortage could lead to looser (or flouted) environmental controls and plundering of resources, including forests.

Security: Demand for oil is rising in Western nations and also from the growing economies of China and India. These nations allow themselves to be priced out of the market. The nations with oil reserves may become more assertive. Military forces are profligate users of oil.

Aren't we discovering more oil?

Yes, but not enough to keep up with what we're using. Worldwide discovery peaked in 1964. Since 1984 oil consumption has exceeded discovery – presently by a ratio of 4 : 1.

We have enough oil to last 40 years. What's the problem?

Though we will still be extracting oil for another 40 years, following the peak our oil extraction will decline steadily. 40 years is not a long time to come up with alternatives.

Surely they'll find a technological fix?

There is a difference between technology and energy sources. Technology provides ways to use energy; it can not create energy.

Alternatives to oil

- There are no alternatives to oil which provide a comparable amount of energy for the energy it takes to produce them – and to transport that energy to the user.
- **Oil** currently has an average EROEI globally of around 5:1, but it's declining (EROEI – energy return over energy invested. When EROEI becomes less than 1:1, it shows that more energy is used to produce the fuel than the fuel provides).
- **Bio-fuels** entail a tradeoff in the use of cropland and require fertilizers and oil for harvesting, processing and transport. They also require a stable economy for their large scale production and distribution.
- **Natural gas** (mainly methane) is also approaching its global peak estimated at 2019. The US has passed its peak. It is difficult to import and store in significant quantities and requires high-tech support and infrastructure.
- **Coal** is abundant and good for generating electricity. But it requires fuel oil for its mining, distribution and waste (ash) disposal; this places electricity supplies at risk. Coal is unsuited for powering cars and too dirty for domestic use. Burning more coal would worsen global warming.
- **Nuclear power** can generate electricity, but there is only about 40 years of disclosed uranium reserves. Mining uranium is oil-fuel intensive as is building (which takes ≈10 years) and decommissioning reactors. Safe storage of nuclear waste for thousands of years is an unsolvable problem.
- **Hydrogen** is not a source of energy; it's a carrier of energy, like a battery. There are no extractable hydrogen reserves. Hydrogen takes a lot of energy to produce, mainly from fossil fuels, and it is almost impossible to store. Fuel cells contain oil-based materials.

When and how to act

- Immediately. When the oil supply falls, the shortages, climbing prices, and disruptions of industry and transport may frustrate your most effective preparations. Make time now.
- You should act at three levels: nationally (even internationally), with leaders and NGOs, at your community level (however you choose to define your community) and at a family and personal level.

Nation and society

- Open discussion of peak oil (and climate change) by all governments and the media is needed. Politicians appear to be keeping silent deliberately as they shy away from breaking “bad news”; each party unwilling to flinch first.
- Until this discussion occurs, many people may deny – to others and themselves – the reality of peak oil. Perhaps governments shelter behind the deniers or interpret our silence as apathy.
- Disaster-relief for earthquakes, cyclones, bushfires, tsunamis, epidemics, floods etc. may be less effective (if 4WDs and helicopters are rare) and recovery far slower.
- Coping with climate change will be more difficult than people imagine now.
- Although other nations will, like ours, have less fuel to support military operations, their hunger for productive land may be the focus of diplomatic or even military action.
- As governments face new internal and external

challenges, they may legislate new powers.

Community

- Because governments are not preparing for peak oil we need to take the lead.
- Our lives will centre more on our local community, despite telecommuting. These communities will have to become more self-sustaining, reversing the process of economic globalization through economic re-localization.
- Your neighbours are your best insurance. Learn how to live with them and deserve their trust. This may mean changes in your own behaviour.
- Join actively in community groups including Neighbourhood Watch.
- Discuss bartering with your neighbours – vegetables for firewood, child-care for house minding, garden space for home help, swapping surplus items etc.
- Help the unemployed people in your neighbourhood to focus on activities which will benefit the community.
- Consider banding together to recycle grey water, work a community garden, preserve food, pool skills, care for elderly neighbours.
- Value older people. Nurses who trained before antibiotics, carpenters who trained with only hand tools are invaluable resources.
- Fire, ambulance, police and council services may be less responsive, so we should reduce our related risk exposures.

Economy

- As fuel prices rise and fuel shortages occur, supplies to shops will become unreliable and our spending patterns will change accordingly. Marginal businesses could suffer and their redundant staff will find it hard to secure other jobs if overall unemployment rises.
- Companies with large oil budgets for transport or for raw material (fertilizers, plastics), those which sell non-essentials (brand fashions, up-market audio, travel, gifts) or which rely on large car parks to attract customers may contract. Civil engineering, tourist motels and motor sports may be among those contracting when input prices rise or demand falls.
- As businesses are affected, their shares may lose value and people who depend on share income – including those on superannuation – may find their incomes falling. Businesses that cannot pay their debts often take some creditors down with them.
- People whose skills you depend upon (teachers, tradespeople, doctors) may have withdrawn from the workforce to make their own preparations for peak oil changes.
- We cannot predict for how long national currencies will remain stable and accepted. Local currencies and LETS may emerge.
- Families should put their finances in order: get out of debt, put aside enough to pay 2-3 months of mortgage or rent, keep up to \$500 in cash in case blackouts disable EFTPOS and ATMs.
- Property values will fall in urban areas, especially in commuter suburbs (which depend on cheap oil) and in apartment blocks (which lack scope for self-sufficiency and depend on gas or electric heating, air-conditioning and security).
- Property values of smallholdings that are environmentally well-endowed will rise.
- CBDs, which depend on affordable commuting and deliveries and energy intensive buildings, may suffer. Local businesses in low rent suburbs and towns will open.
- New businesses will start in renewables, retrofitting and local services. Cottage industries and co-operatives may form, staffed by recently redundant volunteers. Con-men will find opportunities.

Location

- Large concentrations of people (over 250,000) could become unstable faster than communities of less than 30,000 people. Do what you can to foster ruralization to smaller communities.
- If you can do so consider relocating – sooner rather than later. Relocating could help you to reduce your mortgage.
- Shifting to a warmer location may appeal but it could be subject to weather vulnerabilities due to climate change. Moving to the country may isolate you from specialist services: medical, cultural, family, religious, markets for your products.
- To relocate successfully, think first of what you can contribute to any new location, not what it can give you. Be open to ideas of common land ownership.
- Adequate soil, water, and growing seasons are more important than a nice view.
- Look for neighbours with complementary skills, interests and age groups.
- Most localities have laws that restrict your ability to prepare: siting of water tanks, home renovations, sewage treatment and disposal, keeping livestock in towns, growing hemp, tax disincentives.
- Houses could be shifted onto streets or back yards de-paved, freeing land for cultivation.

Shelter

- Retrofitting existing dwellings, energy-free home heating and cooling and much more are described in Derek Wrigley's *Making Your Home Sustainable*.
- Sharing homes with lodgers or extended family may increase, especially if by-laws and tax disincentives change.
- Heat for homes will not be as cheap and convenient as it is today; installing effective insulation is the first step. We won't be taking for granted cooking and hot drinks.
- Install a solar hot water unit.

Security

- The time of transition to a post-cheap oil world may be an unpleasant period. Those whose careers or lifestyles are threatened may act in bitterness or despair. Decide in advance how you will respond.
- Does your community have reasonable policies on work seekers, squatters, the ill, old people and the homeless? Rationing?

Health

- There will be fewer medicines and some hospitals may go from high-tech to low-tech.
- We'll be walking, cycling and using our muscles more. This should improve our health overall.
- Apply a continuing exercise program that will fit you for an active life, rather than body sculpting and slimness.

Water

- Expect that you will need to reduce your use of water. Washing water can be used on some plants, but generally should be treated to remove the chemicals in the detergents.
- Grey water systems that don't rely on electric pumps should be considered where water supplies are marginal. These systems are most effective in communities of 40-300 dwellings.
- The water connected to your home, even if pumping continues, may not be treated. You may want to filter water yourself.
- Reduce water use by installing a dual-flush or composting toilet.

Food

- Food and water shortages could lead to deficiency diseases, thefts and disturbances.
- Industrialized food production depends heavily on fertilizers and chemicals made from oil. Tractors and fishing boats are powered by oil as is food transport. We currently use ten calories of fossil fuel energy to produce one

calorie of food energy.

- Expect there will be fewer groceries, and that you may increasingly need to eat what you grow yourself or exchange with neighbours, possibly using the Community Supported Agriculture model.
- Permaculture provides a – and possibly the only – sustainable form of food production.
- John Jeavons' books show how to grow a healthy diet on an area as small as 100 sq metres per person. These techniques take effort and time.
- Consider transforming lawns to orchards. Familiarize yourself with storable low-effort staples like potatoes, beans and pumpkins.
- Your food program may have setbacks at times because of drought, neglect or lack of knowledge. You therefore need stored food. Food storage should not be dependent on electric refrigeration as blackouts are possible.
- By growing and bartering surpluses of foods you grow well you can help build community spirit.
- Pet food may be scarce.

Recycling

- Collection, sorting and recycling of domestic waste is dependent on oil. Expect fewer collection and recycling services for households and businesses.
- Learn to recycle *everything* on your own block or in your neighbourhood. Do not bring to your home anything you cannot recycle.

Electric power

- Most electricity is generated from fossil fuels. When fossil fueled centralized power-generation fails, the remaining hydro, wind and solar systems will be unable to meet the present demand.
- Approach the coming power shortages in three ways: progressively reduce your electricity needs, increase your muscle-power use and add home power generating capability.
- If you begin reducing electricity consumption now, you will learn how to cope in the way that best meets your needs and resources.
- Power failures will last longer if repair crews lack fuel.
- Solar photovoltaic panels continue to improve in efficiency but they cost about \$700/kw. Their output fluctuates with weather conditions and batteries are usually required. They are relatively expensive and require siting with a solar orientation.
- Windmills to generate electricity can be bought or built. But they generate power only when wind is blowing or use batteries.
- All systems for generating electricity, the batteries to store it and most of the machines and products that it powers use oil-based parts and need skilled people to produce and maintain them.

Self-sufficiency

- You should anticipate that our society could be less stable and ordered for a long period.
- There is information on technology for self-sufficiency in John Seymour's books and at www.allsun.com.au and www.inthewake.org.
- Consider a wind-up radio. Crystal sets need no batteries and can be made at home. Ham radio may help those with skills and supplies.
- With quality hand tools, a careful, patient beginner can make a real contribution, fixing a jammed door, repairing a tap or gardening.
- There are items available and cheap today that could reasonably be stored, but may soon become scarce: nails and screws, clothing, sewing supplies, hand tools – even bricks.
- Encourage your acquaintances to stock up so they don't need to call on you; ask them to pass the same message on to their acquaintances.
- Acquire now a stock of food to last three weeks

and encourage neighbours to do the same.

Transport

- Fuel for personal transport may be rationed or priced out of reach, as limited supplies are reserved for farming and emergency services.
- Heavy vehicles will remain for some time but, due to limited fuel, might be available only for large businesses or governments.
- In calories of food/fuel consumed per km, the bicycle is the most efficient vehicle. In its early development, it was seen as a serious means of transportation but became overshadowed by fossil fuel engines. Various bicycle designs, including load carriers, are used worldwide.
- Plan your 'neighbourhood' around achievable walking or bicycling distances.

Knowledge and skills

- Skills in survival, crafts and living have to be learned through experience; they cannot be quickly or fully picked up from books.
- Practical people will be at an advantage. Be flexible and adaptable; acquire, practise and master useful new skills.
- Books and other printed material are the simplest means of holding knowledge. Electronic media, CDs, tapes, disks, etc., all require a functioning player.
- Currently knowledge is just a click away on the web. Download all that appears helpful to you, and print the main items.
- Acquire the books you have valued in your education and subsequently; use your local library regularly including inter-library loans for books and articles not held locally.
- Protect stored documents from silverfish, moths and mould. Use acid-free paper.
- Secondhand bookshops and web sales can yield out of print resources.
Try www.booksandcollectables.com.au.

How long will problems last?

It may take years before many realize the age of cheap oil is over, and decades before we stabilize. Jim Kunstler's *The Long Emergency* has a telling title and is a guide to begin planning for a sustainable and positive future.

Isn't much of the above fanciful?

We cannot know what the future will bring, though we can predict that the future will be uncertain and, in some respects, volatile. The suggestions above are not firm, but they are all possible. They demonstrate how cheap oil permeates our economy, lifestyle and ways of thinking. But even in a worst-case scenario, peak oil pales beside the threats from climate change and the draw down of natural capital, which affect the entire biosphere, not just aspects of human society.

It is a human characteristic to concentrate on immediate threats and ignore those that lie further in the future. If you are concerned by peak oil, spare your best thoughts and most decisive actions for climate change.

More information on peak oil

The latest version of this sheet is at www.natsoc.org.au/html/peak_oil.html. Further information, references and links are at this site and pro and con arguments are also laid out when they are contributed.

Peak oil is explained at www.hubbertpeak.com and www.energybulletin.net with scientific, oil industry and media references.

There are active peak oil groups in Sydney: www.sydneypeakoil.com
Canberra: www.act-peakoil.org
Melbourne: http://groups.yahoo.com/group/MELBOURNE_PEAK_OIL/

This sheet: compiled by twenty Nature and Society Forum members from July through December 2005 to stimulate discussion and action in Australia.

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