



RunningOnEmpty

The petroleum oil & gas decline: Local preparations

About this guide

This paper suggests practicalities for coping with the global decline of petroleum oil & gas. Petroleum is becoming scarce and expensive as the world's oil and gas wells become depleted. (References to data sources are quoted on page 2.)

Things may happen quite fast

Plans by the International Energy Agency (EIA) in 2005 prepared for 'temporary' scenarios of only 7% shortage and 12% shortage of crude oil. However, the depletion of oil wells will reduce global supply much more - halving the global supply by 2040. Natural gas wells decline even faster than oil wells. Note: The works and operations needed to *prepare* for the energy decline will themselves require energy. As energy gets scarcer and dearer, the preparations are therefore obstructed. This means that preparing early is much better.

A NZ government-sponsored report suggests that rationing by governments may be applied with only a week of official notice/public education.

Benefits of local conferring

If residents and local business discuss local priorities and action, the decisions and implementation is more 'owned' by locals - motivating happier compliance.

Local decisions to consider

WHO MANAGES THE PROJECTS

You need to choose who leads each programme for coping, the budgets and staff resources. For each project, decide the performance indicators that will measure actual success.

CATEGORIZING ENERGY CONSUMERS

Class the local energy consumers into a 'priority allocation system' (PAS) according to importance. The factors can include 'size, 'importance', 'flexibility', e.g who can be spread to off-peak loading. Note: Where permanent rationing allows *trading* of rations there is more flexibility and fairness. Plan for extra generators where those will be extremely useful.

PUBLIC TRANSPORT FACILITIES

The volumes of both public & private traffic are declining as fuels get more expensive and scarce. (A fuel-restricted economy sees progressively less money and mobility for shopping - and business is limited both by fewer sales and operating fuel/energy.) Finance for road expansion for motorised transport is therefore better switched to

more beneficial projects. Today's train and bus capacity are mostly sufficient, except in suburbs designed to be so car-dependent that they are 'fuel stranded' without public transport installed for them. Reversing urban sprawl can helpfully compact towns and cities, reducing transport/energy needs.

Car pooling and park-and-ride systems can be set up. See <http://www.carpoolnz.org> or <http://www.carshare.co.nz>

Greater *awareness* of consumption of fuels can be achieved by installing more meters on electricity and water supply equipment. This awareness not only promotes restraint by the some users, but can help managers see who (or what) is consuming how much. Better-targeted conservation efforts, and 'user-pays' billing become possible.

Public announcements reporting consumption can also increase conservation.

RETHINKING PROJECTS IN HAND

An example is roading where local traffic at present goes over a high hill (heavily consuming fuel). Although tunnelling consumes lots of energy and money, a horizontal tunnel through the hill may be very welcome in a future of more cycling & walking. Similarly, in very cold areas proposed new suburbs (with high demand for heating) or sweltering areas (electric air conditioning) may be redesigned with much greater emphasis on energy, or simply cancelled.

WALKING & CYCLING

Safer cycleways/ walkways allow more 'active' transport. 'Walking bus' systems enable kids to walk safely to school in a sociable group with all their luggage on a shared trolley. Beautifying streets & parks can make it nicer to live and shop in home neighbourhoods.

WORKPLACES IN NEIGHBOURHOODS

Community centres can install telecom facilities for email and web, telecommuting and video conferencing. These reduce 'stranding' by fuel problems. Some employers may permit telecommuting (staff working from home) and compressed work weeks (less days at work, longer hours on those days).

LOCAL FOOD PRODUCTION

Instead of transporting food in, home gardeners and community gardens can produce cheap vegetables and fruit locally. These gardens and food co-ops provide work for people of all ages. They promote good morale. Even public trees can be food-producing trees.

MORE-VEGETARIAN DIETS

Because a meat-centred diet requires about five times the land that a vegetable-centred diet does, agriculture is better to favour vegetables and fruit, rather than cycling vegetation through animals to produce meat. Note also: Producing beef requires a hundred times the water, per kg, that wheat does, and 12 times the energy of bread, per kg.

COPING WITH DECLINE OF FERTILISERS

As (petroleum-based) fertilisers become scarcer and dearer, agricultural yields from the land are falling. Therefore the capture of organic wastes for producing safe types of compost is increasingly important. The resources to salvage include food scraps and garden waste, and animal manures including humanure.

SUPPLY OF CLEAN WATER

An important use of energy is in pumping and purifying water for drinking. Disruption of energy supplies can stop pumps that supply the water. Water security/conservation options include new rainwater collection tanks; standby stores of household bleach to sterilize water; low-flow shower heads and taps and composting toilets that don't require water (30% of city water supply just flushes toilets.)

PROTECTING BREATHABLE AIR

Unless public education persuades the public to restrict the burning of wood and coal in fireplaces, there is serious smoke pollution. It causes choking lung diseases that include asthma, bronchitis and emphysema. There are many alternatives for keeping warm, see below.

KEEPING WARM WITH LESS ENERGY

The best items are: extra-warm clothing, building insulation; passive solar collection into buildings; solar water heating & solar electrical systems, and wind generation of electricity (where possible). Mortgage systems can pay off solar/wind equipment from future savings in gas/electricity bills. Installing metering equipment helps increase 'visibility' of energy/water use (and enables 'user-pays, saver-saves'). Smaller rooms need less heating. Sharing rooms does too. Low-flow showerheads help.

ROAD SPEED LIMITS

Restricting road speed saves fuel and makes traffic safer. Opposition to speeding fines is less if there's publicity that the fines pay into fuel

conservation programmes in the community (better public transport, cycleways, etc).

TOURISM NEARER HOME

Tourism (both incoming and outgoing) will decline as fuel price/scarcity, and the slowed economy take effect. This justifies developing new nearby recreational activities and facilities that compensate, preferably with little energy needed to build/run them.

OTHER PETROLEUM-BASED ITEMS

Apart from transport, there are countless by-products of petroleum, such as plastics, asphalt, tyre rubber, textiles, food (agricultural fertilisers, chemicals, machinery), and cooking & heating gas. Dependence on these can be reduced, e.g., switching to older natural materials, home-grown food, reusable shopping bags/bottles/other packaging, and resource recovery centres, as described below.

Because of the embodied energy in creating and delivering goods, you can conserve energy (and money, and security) by buying better quality, more durable items rather than cheaper, throw-away ones.

RECYCLING AND RESOURCE RECOVERY

Local 'resource recovery centres' are warehouses of discarded goods for cheap exchange/repair/reuse. This includes household items, tools, building materials and business resources. As petroleum gets scarcer, reusing already-manufactured/ delivered materials and objects is important. The system can offer free collection of large items like stoves and fridges off the street if neighbourhood passers-by don't want them after a few days.

Public education can teach how to avoid *buying* packaging and other throwaway material, how to create less waste, and how to salvage all possible recyclable/compostable materials. Then garbage collection is less frequent.

MORE-LOCAL SOURCING, WORKING

Items imported long distances are more affected by petroleum cost and scarcity than those sourced more locally. Changing to 'buy local' reduces the costs and the risk of shortages.

INCREASING LOCAL STORAGE

Increased storage space reduces the need to deliver goods as often. Bulk buying also reduces packaging cost and waste. New shelves/floors add storage without adding area.

To prevent panic buying that needlessly exhausts supplies of fuel/other goods, systems can be devised to ensure supply is steady and reliable. This can include better physical security to discourage theft, especially in conditions of civil unrest and reduced ability of police to respond.

DELIVERY ROUNDS

Some retailers can deliver milk, bread, vegetables, meat, and other goods. Teleshopping options enable residents to shop online instead of driving.

ACCUMULATING SAVINGS

The economic downturn related to the decline of petroleum will not only make mobility dearer, but will see unemployment and inflation. It is therefore good security to accumulate savings.

Choose modest/safer investment options, such as paying off your mortgage, using a savings account, and developing a simpler, cheaper lifestyle.

NEIGHBOURHOOD VOLUNTEERING

To help minimize property taxes and rates and rents, it is possible for residents to do some volunteer work that reduces official workload and transport. This is already happening in the New Zealand Police Department. The volunteer work can include litter removal, area security, street & park weeding and gardening, waste management, building maintenance, circulating notices, etc. These efforts add to the social life and self-respect of all concerned.

DEALING WITH EMOTIONAL IMPACTS

The realities of restricted energy supplies can be disappointing, but there are good strategies for staying happy:

- Yourself: Get busy with useful action rather than worrying. Preparations can be very satisfying. Try not to assign blame - the quantities of petroleum in the planet have always been confusing and uncertain. The decline could actually never be known until it actually happened. We are all in this together. And in fact, not everything is worse .
- Telling others: Although you may be aware of what's coming, be considerate when telling others:
 - 'Ask' their opinion (rather than 'telling them').
 - Invite them to help - discuss their usefulness.
 - Be ready to retreat. There will be other times, and other people.

PUBLIC MESSAGES, PUBLIC GUIDANCE

In the IEA's *Oil Demand Restraint Report* there is guidance on what to say to the public, and how to communicate it. The media have enjoyed relaxed freedoms of broadcasting in times of prosperity and abundance. But, while remaining truthful and interesting, media will need to be careful about sensationalizing events in a way that causes destructive reactions.

FAMILY PLANNING

Parenting and childhood can be satisfying. But human population is exceeding the limits of the planet's ability to support us. This increases hardship on families, especially children. Contraception is very relevant. For men, a vasectomy is a safe, easy, low-cost option that has no effect on sexual ability or enjoyment. (The author had one in 1985.) The equivalent for women is invasive surgery with more risks & cost.

WHAT THIS PAPER IS BASED ON

- A report *Saving Oil in a Hurry*, released in 2005 by the International Energy Agency 2005 to help governments cope with disruptions in the supply of crude oil, see www.iea.org/bookshop/add.aspx?id=197
 - A NZ report by Covec (consultants), based on that, at http://www.med.govt.nz/ers/oil_pet/demand-restraint/report/report.pdf
 - Five years of internet discussion archives in the RunningOnEmpty and other 'peak oil' investigation groups. Their 6,000+ members have stored many tens of thousands of messages.
 - Extensive scientific literature. A bibliography is at <http://quasar.physik.unibas.ch/~fisker/401/oil/hubbheir.html>
- The www.peakoil.net website shows current events.
- A background paper *The Oil & Gas Crash and You*

summarizes the global decline of petroleum, see www.geocities.com/RunningOnEmptyNZ

This *Local Preparations* paper was created in January 2006 by Bruce Thomson, technical writer, and moderator of the internet group RunningOnEmptyNZ2. bthomson@e3.net.nz There are no political or commercial allegiances associated with this document. It was created as a personal enquiry, and in the public interest.

COPY THIS DOCUMENT FREELY TO OTHERS

Examples of factors to work around (You can find the equivalent facts for your own country):

Oil imports into New Zealand

"Most petroleum crude is still imported from Saudi Arabia, with additional quantities from Australia, Malaysia, Oman and United Arab Emirates."

Mj/Tonne km	
Road transport	1.18 - 4.5
Rail	0.49 - 0.6
Ship	0.12 - 0.25

Embodied Energy (MJ/kg)

Crude oil	45
Petrol, LPG or Diesel	46
Coal	25
Wood	15

(Energy Data File, NZ Ministry of Economic Development)

Embodied Energy (MJ/kg)

Cement	7.8
Concrete, in situ	1.6
Concrete block	0.9
Steel, virgin	32
Steel, recycled	12
Timber rough	2
Plywood	18
Hardboard	41

(Department of Chemical Engineering University of Sydney – 4th Yr thesis J Glover http://www.boralgreen.shares.green.net.au/resea_rch3/chap3.htm)

NZ EXPORTS (NZ\$ MILLION)

Nth Asia	8,200.31
Australia+Pacific	6,495.75
Nth+Central America	6,248.79
Europe	4,967.78
SthE Asia	2,925.69
M.East+SthAsia+Afric	1,671.54
Sth America	533.66
Other	397.93
CIS	32.58

(Trade NZ: www.nzte.govt.nz/common/files/stats-jan03.xls)

Top exports from NZ (\$NZ million)

Milk powders	247
Lamb	200
Beef	141
Butter	113
Cheese	108
Wood/pulp	99
Fish	93
Aluminium	85
Indust/Elect Mach	71
Casein	66
Other primary products	57
Other foods	55
Wool	52
Mineral Fuels/Oils	51
Iron, Steel and Other Metals	45
Mutton & Hogget	39
Wood Sheets	39
Vegetables	39
Marine Equipment	36

(Trade NZ: www.nzte.govt.nz/common/files/stats-jan03.xls)

