



# EnergyWatch

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## Editorial

### Peak Oil - An Important Issue?

This issue of EnergyWatch features the Peak Oil issue and includes a summary of the findings (dated February 2007) of the Australian Senate report on an inquiry which included extensive public hearings held between April and August 2006.

This inquiry produced a 200 page report which appears to your editor to present a reasonably calm and balanced assessment of the Peak Oil situation from an Australian perspective.

Whereas politicians of most parties in NZ now accept that global warming/climate change is an important issue to be faced up to (not least because of the "food miles" debate), when the issue of Peak Oil is raised, government ministers and officials now tend to adopt a rather negative, if not hostile reaction to the suggestion that this is a serious future problem for NZ which needs to be addressed now.

Perhaps some of this opposition to the Peak Oil concept might arise from a negative reaction to the rather dire future global predictions coming from some of the more enthusiastic Peak Oil proponents?

But in the same vein, some people are now predicting much more dire and immediate future outcomes from rapid global warming than can be reasonably inferred from the various

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IPCC reports, without receiving such a negative reaction in official circles.

Could it be that the Government is comfortable with the NZ population becoming increasingly worried about future global warming/climate change impacts because it will be of assistance to Government in taking what could need to

be tough and unpopular future actions? On the other hand, if there was to be a serious future resource shortage of a fossil fuel, past history suggests that in such circumstances the population tends to blame their government for the problem!

Perhaps the expression “Peak Oil” has now become too emotive and a replacement term such as “Oil Depletion” might engender a more sympathetic response?

The previous Minister of Energy and Climate Change, Pete Hodgson, was prepared to talk seriously about the prospects for and possible impacts of Peak Oil. The present Minister, David Parker, doesn't appear to be at all comfortable talking about this subject in any depth.

At a meeting held in Dunedin on Friday 16 March this year, Mr Parker indicated that Peak Oil was not accepted by the Government as a consideration to be given detailed coverage in the draft NZ Energy Strategy (NZES). In fact, Peak Oil was only given a brief 3 paragraph mention in that document (on pages 18-19), although this has been somewhat modified in the final version of the NZES.

The draft NZES said “The Government believes that the more immediate and serious challenge is climate change”. This appears to be in contrast to Australia where up until very recently, Peak Oil has been taken much more seriously by Government (including preparation of the 200 page report referred to above) than is climate change.

It can certainly be strongly argued that Peak Oil is at least as serious a problem as climate change for countries to cope with and may present a more immediate challenge.

In NZ, the Government and its officials appear to have some difficulty in accepting the notion that our future rate of economic growth could be considerably constrained by lack of availability of resources (and especially of some fossil fuels). This conflicts with the free market ideal that economic growth will not be so economically constrained because the market will ensure that sufficient resources will always be made available to enable economic growth

to happen in accordance with the Government's stated aims and objectives.

Perhaps that is why some people within the Government (Ministers and officials) are still promoting the notion of using the extensive lignite deposits in Southland and Otago to create liquid fuels, possibly in combination with carbon sequestration (or CCS - carbon capture and storage), as a short-to-medium-term answer to the Peak Oil problem.

CCS would indeed be necessary to try and at least partially offset the serious greenhouse gas emissions issues arising from the use of these lignite deposits (Refer to Energy Watch Issue 42 pp10-12).

The one-day conference of Engineers for Social Responsibility held in Auckland on 24 March 2007 formed the view that Peak Oil is just as serious a problem to be faced up to as climate change/global warming. The “good news” is that there is a lot of synergy between these two concerns as regards actions which need to be taken.

As the draft NZES states, “Fortunately the actions planned to reduce oil consumption and cut levels of greenhouse gas emissions will also lower our dependence on fossil-based oil”. So addressing the future problems raised by the concept of Peak Oil will by-and-large go hand in hand with addressing the challenges raised by the global warming/climate change issue.

Planning is now in the preliminary stages for a one-day conference in Auckland around mid-2008 to be organised jointly by Engineers for Social Responsibility and SEF which will consider in some detail the obvious synergies which exist between planning for future actions taking Peak Oil into account, and planning for the future actions on global warming/climate change matters which we must face up to as well.

*John Blakeley*

## **The Future of Oil** by *Tim Jones*

Oil prices have grown strongly since 2004, and recently spiked at over US\$90 per barrel. Speculation, international politics, exchange

rate changes, and the risk of terrorism and war have all played a part. But the basic reason is that world oil production has not grown since 2006, while demand continues to increase.

We know that world oil demand is growing rapidly, spurred by economic growth in countries such as China and India. But what's happening to oil production?

According to the US Energy Information Administration (EIA), total world crude oil production reached its maximum to date in May 2005 at an average of 74.3 million barrels per day (bpd). When "unconventional" liquid fuel sources are added, the maximum production to date was 86.13 million bpd in June 2006. By September 2007, total liquids production had declined slightly to 85.1 million bpd.

So, after rising steeply up to 2005, world oil production has levelled off. Saudi Arabia, the biggest oil producer, and its fellow members of OPEC sometimes make pledges to raise production. If June 2006 was the all-time peak, or if the peak is close, then the implications are serious. Following the peak, production rates are expected to decline at rates somewhere between 2% and 8% per year.

Other possibilities are:

- That production has entered an "undulating plateau," neither rising nor falling significantly for some years, or
- That the high oil prices will spur investment in exploration and production and bring major new oil fields online

The second possibility is the expectation of the New Zealand Government, and until recently of the International Energy Agency (IEA). But there is no sign yet of this increased production, and in its latest report, the IEA says that it expects the oil supply position to tighten during the period 2008-2012.

There are several reasons why it won't be easy to increase world oil production, even if there is sufficient oil left on the ground to do so.

1. According to the IEA, production from existing oil fields is declining at an average of 4% per year. This means that 3.2 million bpd of new production must be found each year just to keep production levels stable.
2. There is a shortage of drilling rigs and other equipment to get at the remaining oil, which tends to be in smaller fields that are harder to access.
3. Production from "unconventional" oil sources such as the Alberta oil sands has not met projections.
4. Exporting countries are using increasing proportions of their oil within their own borders, meaning that there is less available for export.

Oil prices have always fluctuated, but the underlying upward trend is clear. Geopolitical events, such as a possible US attack on Iran, may lead to additional sharp upward spikes and supply disruptions.

As demand outstrips production, New Zealand, at the end of a long oil supply chain, is vulnerable to supply disruptions as well as much higher prices. Even if a significant oil find was made within New Zealand waters, New Zealanders would still have to pay the world price for this oil.

Transport, agriculture, tourism, fishing, forestry and many other aspects of New Zealand life are heavily dependent on oil. Whether the peak of world oil production is already upon us, or still a few years off, the scale of the problem means that the Government should already be planning for its consequences, just as it is for climate change.

Reference: Abridged from Dominion Post article, 2/11/07.

## What we need is "Peak People"?

The human population is now more than 6.7 billion, and each year 78 million more people are added to that number. When will the world be ready to acknowledge the importance of this issue?

Continued growth in human numbers is greatly complicating efforts to stabilize concentrations of greenhouse gases. It also contributes to a lack of clean water, exploited natural resources, and high proportions of young people who lack meaningful prospects in countries with rapidly growing populations.

Reference: From [www.worldwatch.org](http://www.worldwatch.org), 31/10/07

Commenting on the above, SEF member Ian Shearer said:

“We have been talking about peak oil, peak gas, peak water etc. What we need is peak people.”

## Changes to EnergyWatch

Your editor has been grappling with the problem of how to keep the costs of producing EnergyWatch within budget without reducing the frequency of publication, and therefore its topicality.

The proposed solution from January 2008, as discussed at the recent 15 November AGM of SEF in Wellington, is to send each issue electronically (pdf file) to all SEF members. A hard copy version will still be produced to be sent to libraries, those people on our complimentary distribution list, and SEF members for whom we do not have an email address.

Any other SEF member who wishes to continue receiving a hard copy by mail is welcome to send an email to [treasurer@sef.org.nz](mailto:treasurer@sef.org.nz) advising us, and no additional charge for this will be made in 2008.

Also, this is the last EnergyWatch to be produced at the current length of 28 or 32 pages. All future issues will be slimmed down to 20 pages and we will aim to increase the frequency of publication from four issues to five issues per year.

*John Blakeley*

## Electric Vehicles in NZ

Electric vehicles are hitting the news regularly these days. But are they really the answer - or an answer - to our transport problems? And can electric public transport also help to lessen

transport's wretched greenhouse gas emissions record and make us less vulnerable to Peak Oil?

SEF held a seminar to discuss these issues in Wellington on 15 November. About 70 people attended. A list of speakers, and most of the presentations, are available on the SEF website at <http://www.sef.org.nz/conferences.html>.

Presentations covered Government policy on electric vehicles, the implications of the uptake of electric vehicles for our energy system in general and renewable energy in particular, achieving a 100% electric public transport system, and Meridian Energy's plans to promote electric vehicles in New Zealand.

Attendees were still standing round discussing the issues 15 minutes after the seminar ended - which is usually a sign things have gone well.

A Yahoo! group has been set up to discuss the issues arising from the seminar, including the possibility of reviving the currently-inactive New Zealand Electric Vehicles Association. You can find out more about this group at: <http://tech.groups.yahoo.com/group/nzeva/>, and you can join it by sending a blank email to [nzeva-subscribe@yahoogroups.com](mailto:nzeva-subscribe@yahoogroups.com)

*Tim Jones*

## Govt Limousine Purchase Decision

### Background

As noted in EnergyWatch Issue 44, page 18, the limousine purchase arose from a December 2006 Ministry of Transport report, which found that a greener fleet could save 550 tonnes of carbon dioxide emissions and \$500,000 in fuel costs every time the fleet is rotated. The 45-car fleet is for official Crown business and is used by Ministers, judges and the Governor-General, and guests of the Government including visiting foreign dignitaries.

Three models of diesel-powered car were considered on a trial basis for possibly replacing at a similar purchase price, the existing petrol-powered fleet of predominantly Ford Fairlane

Ghia cars (but with some Holden Statesman cars).

Reference: NZ Herald, 15/2/07

### **The Cars Considered**

The three diesel-powered models originally considered as replacements and used on a trial basis were the Peugeot 607, the Chrysler 300 and the Skoda Superb.

Excluding the dealer's markup and with a bulk buying discount, it is believed that any of these cars could have been purchased by the Government for around \$50,000 each. It was noted in a TV3 News item on 19/12/07 that one of the unsuccessful bidders had confirmed that their car could have been purchased for around \$50,000.

However, somewhere along the way between February and December 2007, the purchasing brief appears to have been changed and bids were actually received on 15 different cars, including a petrol-powered Lexus RX400h hybrid car which retails for about \$106,200. It was reported that the Lexus hybrid car had come close to winning the tender. There was no longer any mention of the fact that the original stated intention of the Government was that the chosen car should cost about the same as the Ford Fairlane Ghia car which it will be replacing.

### **The Decision**

On 19 December it was announced that the Government had decided to purchase 34 BMW 730Ld diesel cars, weighing nearly two tonnes each. The reason for a reduction from 45 to 34 cars was not explained. The first 13 cars will arrive in June 2008 and the balance of 21 cars will be phased in over the following three years. The cars will each be kept for three years, instead of the present 27 months. The Department of Internal Affairs, which manages the limousine contract, refused to release the cost of the BMW cars or the details of the 15 other tenders submitted by car companies, citing "commercial sensitivity".

On the same day, the NZ Herald speculated that the cars would cost \$170,000 each based on

their price in Europe, but it was later reported that the Government had got a particularly good deal and the cars were being purchased for around \$90,000 each, including a two-year-plus servicing guarantee. The heavy discount surprised car industry sources.

The Climate Change Minister, David Parker, was reported as saying that the decision to purchase the BMW cars was because the Government "walks the talk" on sustainability, but the expected fuel consumption improvement is actually quite modest, from 10.21 litres/100 km (27.7 mpg) for the Fairlane to 8.1 litres/100 km (34.9 mpg) for the BMW, and the reduction in carbon dioxide emissions is reported to be from 260 to 212 grams per kilometre.

The Energy Efficiency and Conservation Strategy issued in October set an efficiency target of 6.5 litres per 100 km travelled so, as pointed out by the Co-Leader of the Green Party, Jeanette Fitzsimons, the fuel efficiency of the BMW is "way worse than the average they are going to impose on the rest of New Zealand".

However, at least one of the other models under consideration, the 2.2 litre four cylinder diesel Peugeot 607, could have met that efficiency standard. It has a reported fuel efficiency of 6.4 litres/100 km and a carbon dioxide emissions figure of only 170 grams per kilometre.

### **Comments on the Decision**

Your Editor believes that purchasing limousines which do not meet the Government's own suggested average fuel efficiency standard and which are reported to cost nearly twice as much as the present cars being used (and some of the replacement cars originally being considered) sends entirely the wrong message on climate change mitigation measures.

The correct message on climate change mitigation which the Government should be conveying is that by being clever and using the latest available technology, it is possible to make considerable energy savings and reductions in greenhouse gas emissions at little or no additional cost.

*Continued on Page 7*

# Contribution from SEF Members

## Report from Germany

In July, SEF members Stephan Heubeck and Steve Goldthorpe were given a tour of renewable energy projects in the Rhoen area in North Bavaria. Here are their observations. (Contact Steve for photos)

The projects are set up and supervised by the Bavarian farmers' association (BBV) without government or state funding assistance. However they are facilitated by (and wouldn't exist without) Germany's guaranteed feed-in electricity tariffs for renewable energy (EEG).

### PV Farm

Near the village of Grossbairdorf there is a photovoltaic installation comprising rows and rows of PV panels in a gently sloping south facing field. The PV panels are fixed on steel frames (about 1 metre above the ground) which are made of recycled highway lane dividers, simply driven in the ground like fence posts. The PV panels themselves are medium efficient thin film modules (6.5% electrical efficiency), which are angled at only about 35°. The ground beneath the panels is in pasture, which could easily (within a few weeks) be returned to other purposes. It is intended to occasionally bring sheep into the fenced PV fields to maintain the grass. Part of the project has been in operation for 3 years - feeding electricity into the grid.

Stage 1 of the project with a peak generation capacity of 1 MW, covering 4 ha of land, was completed in 2005. Based on an annual generation capacity of 880 MWh per installed MW peak capacity per year (actually achieving up to 1000 MWh/MWp/year), the project receives a feed-in tariff of 0.4342 €/kWh, guaranteed for 20 years (EEG). The project costs totalled 4 million €. Three quarters of the cost were financed through 3.5%p.a. bank loans, the remainder raised from dozens of local residents and local farmers. The investment, which can be incremental, provides a return of about 6.2% p.a. to the private investors. This return on

investment is attractive in Germany at present where there is no growth in housing demand. This local co-ownership structure provides a lot of community support for the project.

Stage 2 of the project, currently under construction, will be completed before the end of 2007. With a peak generation capacity of 0.86 MW it will cover 3.5 ha of land, but will otherwise be a copy of stage 1. Due to the gradual digression of the feed-in tariff guaranteed through the EEG, stage 2 will only receive 0.3796 €/kWh for 20 years. Fortunately technical progress has also brought down the set up costs for stage 2, which will total 3.1 million €. Replicas of the project in other locations are under consideration.

### Biogas facility

Near the town of Bad Kissingen the BBV has established a biogas facility based on a 625kWe base load GE reciprocating engine generator. The biogas (~ 55% CH<sub>4</sub> / ~ 45% CO<sub>2</sub>) for the engine is produced in three sequential anaerobic digesters made of reinforced concrete (about 15 metres in diameter) which are insulated and heated to a constant 35°C. Each day 35 tonnes fresh matter (FM) @ 35% dry matter (DM) of biomass feed material is loaded into the first digester from three large concrete biomass storage compounds of about 10,000 tonnes capacity.

At the moment the plant utilises only maize silage (which is delivered in September and October) but other energy crops such as Sorghum and Rye whole crop silage are considered as additional feed materials in the future. Currently 36 local farmers are involved in supplying maize silage (which is a commercial crop - not a by-product) to the biogas facility. A total of 300 hectares of medium quality arable land is required to grow the feed for the biogas plant; i.e. 1% of the land area within 10km of the plant. The nutrient-rich residues from the digesters are returned to the land, which means that the nutrient/fertiliser requirements of the energy crops are almost completely met by the residues from last year's crop.

The generator is achieving a 99% on-line factor, and the produced electricity is sold to the grid for 0.16 €/kWh. Waste heat from the engine is used to heat a health spa facility in the town, which is connected to the biogas plant through a fully insulated 2.4km long hot water loop. The nearby use for the by-product heat is an essential feature of the project and crucial for its feasibility.

Like the PV farm, the biogas plant is locally financed. Local farmers (whose fields are no more than 10km distant from the biogas facility) were invited to join the project if they agreed to supply energy crops from at least 2ha of their land (and take back the digester residues) for the next 20 years, as well as provide a starting capital payment of 5000€ for every hectare of land dedicated to energy crop production. The price for the biomass feed material is derived from the price of milling wheat and will total 25€/t (FM) this season and 28€/t (FM) next season. The combination of several favourable factors (guaranteed feed in tariff, waste heat utilisation, short transport distances, relatively low feed material costs, cooperative financing and organisation structure) has allowed the project to achieve a return on investment of more than 30% p.a. for its 36 shareholders during its first year of operation.

A copy of this biogas project is currently under construction at another village, where the waste heat will be used to heat greenhouses, and to provide base load for an existing district heating scheme based on the combustion of woody biomass.

## Summary

Both the projects described above are optimised to be commercially viable at a scale of operation that is a good fit with private co-operative finance. The scale is too big for individual ownership, but too small for ownership by big corporations. An important aspect of the organisation of these projects is a real sense of ownership of the facilities by the local communities.

From an energy capture perspective, the electricity yield from the biogas facility is about

18 MWh/year per hectare plus co-generated heat to a local application. In contrast, the PV farm yields about 220 MWh/year per hectare. However, the very different investment costs per produced unit of electricity have to be taken into account as well. Both projects require the support of the national grid. The biogas project delivers a constant electricity output, whilst the PV project delivers a diurnally and seasonally fluctuating electricity output. Neither project has load following capability, but the biogas plant could be converted to peak load generation with the addition of gas storage, if the economics supported such a change.

These projects work well in the context of the economic conditions in rural Germany and are an impressive outcome of the 40 pages of paper that is known as the Renewable Energies Act (EEG). One has to question why New Zealand, with similar or even better conditions for such distributed generation projects, hasn't started to take steps towards facilitating such modest scale projects?

Perhaps the message that bigger is not always better needs to be promoted more actively to the decision-makers.

These examples show that when a more holistic view of project feasibility is considered, it is possible to convert the existing top-down supply system grid into a reliable, resilient, low carbon and domestically controlled electricity network.

Projects like the ones described above are vital steps towards the electricity network of tomorrow.

*Stephan Heubeck and Steve Goldthorpe*

## ***Govt Limousines continued...***

It would be quite a ridiculous position for the Government to say that a saving of about 2.1 litres/100 km in fuel consumption compared with the Ford Fairlane justifies spending nearly twice as much money on the purchase of Ministerial cars.

Refs: NZ Herald 19 & 21/12/07, Dominion Post 19 & 20/12/07

*John Blakeley*

# Peak Oil

## NZES Looks the Other Way

The Government's just-released New Zealand Energy Strategy (NZES) continues the present Government's disappointing record of denying the importance of the forthcoming peak in world oil production as a major issue for New Zealand.

The draft NZES dismissed Peak Oil in three paragraphs. The final NZES consigns the issue to a text box on page 47. It outlines two positions in the debate: the 'mainstream' view that oil supplies should be sufficient to meet demand to 2030, and the 'peak oil' perspective that oil production levels are at or near their ultimate peak. It then falls back on the International Energy Agency's World Energy Outlook 2006 Reference Scenario — which, by definition, is the 'mainstream' view — and its assurance that, though world oil demand is projected to rise from 84 million barrels per day in 2005 to 116 million barrels per day in 2030, unconventional oil, and conventional oil which is currently uneconomic to exploit, will meet the shortfall. The NZES text box concludes:

“So, while there will, at some point, be peak 'cheap' oil from conventional sources, the world has plentiful supplies of fossil-based oil.”

Comforting — but probably wrong. Even the International Energy Agency's Medium-Term Oil Market Report 2007, covering the next five years, paints a much less rosy picture of future supplies in its first sentence:

Despite four years of high oil prices, this report sees increasing market tightness beyond 2010, with OPEC spare capacity declining to minimal levels by 2012.

There is a detailed discussion of this IEA report at <http://www.energybulletin.net/32514.html>

The faith the Government shows in the ability of such 'unconventional' sources of oil as oil

shales and natural gas liquids to replace declining conventional oil production is not being borne out by the production profile of these sources. To take the much-publicised Alberta oil sands as an example, the oil sands of Alberta currently produce about 1.2 million barrels per day, or 1.4% of the world oil production total. The Canadian Association of Petroleum Producers (CAPP) has said the oil sands will pump out as much as four million barrels a day by 2020. If this projection by the industry association is correct, that's equivalent to 4.7% of current daily production — but only 3.6% of projected demand in 2020. What's more, it takes the equivalent of one barrel of energy to produce three barrels of oil sands oil, and 10 barrels of water to produce one barrel of oil from surface mining (compared to 2 barrels from underground mining). Such environmental and EROEI (Energy Returned on Energy Invested) issues call into question the CAPP projection.

Reliance on unconventional sources also has to be viewed in the context of a global annual decline rate in existing fields which the IEA estimates at 4% — meaning that 3.2 million barrels per year of additional production must come on stream just to maintain existing supplies — and the increasing likelihood that exports from major oil exporters will fall even if their overall oil production has not yet peaked, as they retain a higher percentage of their oil for internal use — a situation which is already happening in Iran, and which has been forecast to occur in Mexico, Saudi Arabia, Venezuela, Nigeria, Algeria and Russia by 2012.

In short, then, the Government's continued refusal to acknowledge Peak Oil as a serious issue does not reflect the accumulating evidence. The Government should adopt a risk management approach to Peak Oil, as it already does to climate change. It should acknowledge that planning needs to start now to prepare the nation for the effects of peaking oil production. At some point, circumstances will force this

acknowledgement to be made. My concern is that it will be delayed until it is too late to take effective action.

The New Zealand Government's stance is in stark contrast to the Labour Government in Queensland, which set up an Oil Vulnerability Taskforce in 2005. The Taskforce has just reported, and it has made detailed recommendations about the measures the Queensland Government needs to take to decrease the state's vulnerability to Peak Oil. It's not yet known to what extent the Queensland Government will take up these recommendations, but the point is that the Queensland Government has already started planning, while the New Zealand Government has been sitting on its hands.

It wouldn't be fair to conclude without saying that the NZES and the NZEECS have many good features, and that they have been considerably strengthened compared to their draft versions, in response, in part, to submissions by SEF and by individual SEF members. These features include the 90% renewables target for electricity generation (although SEF contended in its submission that an even higher percentage could be achieved), and the plan to increase the use of wood for domestic heating. The strong emphasis on reducing greenhouse gas emissions from transport is also welcome, although the delay until significant reductions begin is still longer than the situation requires.

It's excellent that the Government recognises the need to respond to the threat of climate change. Many of the steps proposed to deal with this will also be helpful in mitigating the effects of Peak Oil. My concern is that, by choosing to sideline one of these two related threats to our economy, society and energy system, the Government is still not responding with sufficient speed to either the scope or the urgency of the problems that face us.

*Tim Jones  
Convenor, Sustainable Energy Forum*

## **Presentation to ESR Conference - Australian Senate Inquiry Summary**

*Summary prepared by John Blakeley*

As presented to the Engineers for Social Responsibility Conference on "Engineers and Peak Oil" in Auckland on Saturday 24 March 2007.

### **Background**

This 200 page report is dated February 2007. Public hearings were held between April and August 2006.

The inquiry was prompted by the question of whether Australia should be concerned about "Peak Oil". The term refers to the theory that, for fundamental geological reasons, global conventional oil production will reach a peak and then start an irreversible decline soon enough to be of concern.

### **Future Oil Supply and Demand**

#### **The IEA View**

The International Energy Agency (IEA) in its World Energy Outlook 2005, predicts that in a "reference scenario" world demand for oil will grow:

- From 82 million barrels per day in 2004
- To 92 million barrels per day in 2010, and
- To 115 million barrels per day in 2030

at an average growth rate of 1.3% per year over the period.

It assumes that most of the increased demand for oil will be supplied by a large increase in OPEC production, particularly in the Middle East.

The IEA argued that resources are adequate to meet projected demand, although it said "reserves will have to be proved up in order to avoid a peak in production before the end of the projection period (2030)".

However it noted that financing the investment needed to find and exploit the resources is a serious challenge.

The core document used to support the assumption that oil supply will not be constrained before 2030 appears to be the US Geological Survey's World Petroleum Assessment 2000 (USGS2000) document. This estimated that the world's total conventional oil and natural gas liquids produced up to 1995, or with potential to be added to reserves between 1995 and 2005, is about 3,345 billion barrels.

Of this about 1,000 billion barrels has already been produced.

## Opposing Views

"Peak oil" commentators commonly predict a peak of conventional oil production somewhere between now and 2030. They fear that declining production after the peak will cause serious hardship if mitigating action is not started soon enough.

"Peak oil" commentators mostly estimate an ultimately recoverable resource (total production past and future) of conventional oil much lower than official agencies such as the USGS. This affects the timing of the peak as the rate of production should be expected to peak when about half the ultimately recoverable resource has been produced.

The main areas of disagreement are:

1. Estimates of current reserves: Peak Oil commentators argue that estimates of remaining reserves are unreliable and probably overstated, particularly in the Middle East.
2. Estimates of future reserves growth: "Reserve growth" is the commonly seen increase in the estimated reserves of already discovered oil fields over time. USGS 2000 estimated future world reserve growth by analogy with past reserve growth in the USA.

Peak oil commentators argue that this is unsound since US reserve growth has been enlarged by factors which do not apply worldwide or will not apply as much in the future.

3. Estimates of future oil discoveries: New oil field discoveries have declined greatly since the 1960's. USGS 2000 estimates of future discoveries, to be realised, would require a drastic turnaround of this declining trend.

Peak oil commentators argue that the declining trend of oil discovery reflects geological fundamentals and should be expected to continue.

## Estimated Timing of Peak Oil

The timing of peak oil is debated. However, the concept appears to be well accepted including by official agencies.

The US Energy Information Administration (USEIA) in 2000 estimated a peak between 2020 and 2050 depending on assumptions made about demand growth and the size of the ultimately recoverable resource.

In a similar exercise, the IEA in 2004 estimated a peak of conventional oil production between 2013 and 2037 depending on assumptions.

Many commentators predict an earlier peak.

The USEIA study found that widely differing estimates of the ultimately recoverable resource (URR) make surprisingly little difference to the timing of the peak. The exponential growth of demand is the dominating factor.

From this it follows that an optimistic view of long term oil supply cannot rely only on a high estimate of the URR. It must also rely on an optimistic view of market forces and technological progress to bring alternative fuels on stream in a timely way in sufficient quantity to serve the post (conventional) oil age.

## Investment Needed to Maintain Production

The upstream developments needed to offset depletion of existing oil fields and to supply demand growth will require a very significant investment. The IEA's recent World Energy Outlooks have stressed that there is no guarantee that this will be forthcoming.

## The Prospect of Non-Conventional Oil

All scenarios of future oil production assume increased exploitation of non-conventional oil (heavy oil, tar sands, shale oil) to offset declining conventional oil.

Peak oil commentators argue that large scale exploitation of these resources will be too difficult and costly to make much difference to the peak oil problems which they predict.

The IEA notes that “producing such a massive amount of resources can only be done over long periods of time ...simply mobilising the capital.....is likely to take several decades.”

## Implications for the Price of Oil

Demand for oil is relatively inelastic, because for its major use in transport there are no easy substitutes. This means that a relatively small shortfall in supply can cause a large increase in price. This will increase the volatility of the price in response to small changes in supply when there is little spare capacity.

The IEA now expects that the price of crude oil will ease to about US\$47 per barrel by 2012 then increase to US\$55 by 2030 (in 2005 dollars). Prices are likely to remain volatile. Some commentators believe that much higher prices are possible especially in the light of present prices.

Note: The crude oil price in March 2007 was hovering around US\$57 per barrel. It started the year at around US\$61 then dipped suddenly to US\$55 in the first week of January, its lowest level since June 2005, before rising again. Since March 2007, it has progressively increased to around US\$80 per barrel in mid-September, exceeding the previous record figure (of nearly US\$79) set on 8 August 2006 and in late December 2007, it was around US\$95 per barrel after reaching a peak of US\$99 on 21 November.

## New Warnings in World Energy Outlook 2006

The IEA's World Energy Outlook 2006 (WEO 2006) gives serious new warnings about the energy future. It regards current trends as “neither secure nor sustainable”.

It stresses the need for energy policy to be consistent with environmental goals and chiefly, the need to reduce greenhouse gas emissions.

(It is interesting that the IEA is now linking energy policy goals with climate change goals, as in the past that link has not been strongly made by official agencies).

The WEO 2006 proposed an “alternative policy scenario” to reduce the growth of energy use and the greenhouse gas emissions. A key finding is that energy savings measures reduce the total investment required to meet the demand for energy services.

## Comment on Peak Oil Concerns

The essence of the peak oil problem is risk management. The risks are high if peak oil comes earlier than expected, or if economies cannot adapt quickly enough to the post-peak decline.

Australian governments need better information from which to decide a prudent response to the risk.

## Economic and Social Impacts of Possible Higher Fuel Prices

The general impact of a long term higher oil price would be reduced economic growth. A price increase transfers income from oil-consuming to oil-producing nations, and the net economic effect is negative.

Industries in which fuel is a higher proportion of input costs will be relatively more affected. Those include transport (particularly aviation), mining and agriculture.

Among consumers, higher fuel prices are likely to have the most effect on those who are highly reliant on car transport and lack alternatives. These people tend to be outer suburban residents and rural and regional communities.

The expected future concentration of oil production in fewer countries increases the risk of disruptions to supply.

# Alternatives to be Considered

## Gaseous Fuels: Natural Gas, LPG and Hydrogen

### Natural Gas

Natural gas as a vehicle fuel has advantages and disadvantages. Advantages include its ready availability and claimed lower emissions. Disadvantages include the size and weight of storage tanks; the limited range of vehicles; the energy costs of compressing or liquefying the gas; the lack of refuelling infrastructure; and doubt about the long term gas price.

The claimed environmental advantages of natural gas are not completely clear. Greenhouse gas emissions from the use of natural gas are lower than petrol or diesel. However on a “well to wheels” basis, the advantage may be reduced or neutralised by the energy cost of compressing or liquefying the gas; the unintended leakage of methane (which is a powerful greenhouse gas); and by release of carbon dioxide which is found in natural gas reservoirs.

### LPG

Australia is the world’s largest per capita user of automotive LPG and the number of LPG vehicles is increasing, encouraged by recently established government subsidies. LPG is superior to regular petrol in greenhouse terms. However there are some doubts about the long term adequacy of supply, depending on what proportion of the vehicle fleet is converted.

### Hydrogen

Hydrogen has been put forward as a transport fuel. However there are formidable technical challenges before it could be widely used.

In the committee’s view it might be considered for the distant future, but it is not a useful option for the current or medium term.

### Synthetic Fuels

Processes to produce liquid fuels from gas or coal are well proven.

### Gas

Gas-to-Liquid (GTL) diesel is compatible with existing refuelling infrastructure and can be blended with conventional diesel. Plants have tended to be built when gas prices are low.

The well-to-wheels greenhouse gas performance of the output liquid is debated. One study shows greenhouse gas emissions higher than conventional diesel, though lower than conventional petrol.

### Coal

Coal-to-Liquids (CTL) is seen by some as a viable method of producing liquid fuel on a large scale in the near future. Capital costs per barrel produced daily are somewhat higher than for a GTL plant.

A plant currently proposed for the LaTrobe Valley is estimated to cost \$5 billion to produce 60,000 barrels per day, 80 percent of which would be diesel. The output liquid has high well-to-wheels greenhouse gas emissions. If a charge was made for carbon dioxide emissions in future, this would affect its viability.

### Carbon Capture and Storage

The CTL plant proposed for the LaTrobe Valley would include carbon capture and storage (CCS). CCS has been demonstrated on a relatively small scale in several parts of the world, and the committee was told it is “well on the path of being proven”.

It appears that there are grounds for cautious optimism that CCS technology has good prospects for success. However the committee also noted the comments in the recently released IEA World Energy Outlook 2006 that CCS has not yet been demonstrated on a commercial basis.

### Large Capital Investment Required

Significant production of GTL or CTL fuel will require large capital investment and long lead times, and involve risks that are hard to manage, such as the long term price of oil and gas.

### Oil from Shale

Oil from shale could theoretically make a significant contribution to Australia’s transport fuel requirements.

However there are serious economic, technical and environmental obstacles to commercialising it. It is suggested that oil from shale is only viable when the long term crude oil price reaches US\$70-95 per barrel.

## Supply Side Responses: Biofuels

The two most commonly discussed biofuels are ethanol and biodiesel.

### Ethanol

Ethanol blended with petrol is widely used as a vehicle fuel in some countries. In Australia it is currently produced from sugar cane (generally using molasses), grain and grain residues.

Some submissions argued that the availability of affordable feedstocks is a major factor limiting greater ethanol production. Production of ethanol from lignocellulose, though not yet proven on a large commercial scale, offers potential to greatly increase production and improve the energy return on the energy invested.

A 10% ethanol blend (E10) has fewer greenhouse gas emissions than neat petrol. The net effect on other emissions is less clear.

The 2005 Biofuels Taskforce found that the long term oil price would have to average US\$42-47 per barrel (2004 dollars) for new ethanol producers to be viable after 2015 without assistance (depending on the feedstock used).

The main barrier to growth is the commercial risk for investors considering the uncertainty of the future price of petrol and ethanol, and current consumer resistance to ethanol.

The committee supports the development of a fuel ethanol industry, but notes the significant barriers that need to be overcome before it becomes a mainstream fuel. It appears that production from lignocellulose is the only realistic way to make ethanol a mainstream fuel.

### Biodiesel

Biodiesel is a diesel-like fuel made from chemically modifying vegetable oils or animal fats. A limited amount of biodiesel is already

produced in Australia, but is available at only a few locations. A major challenge for increasing production is obtaining affordable feedstocks.

Biodiesel has lower emissions of pollutants and greenhouse gases than conventional diesel.

The committee considers that biodiesel can make a small but worthwhile contribution to Australia's fuel mix. However the economics of the industry are precarious, particularly if government assistance is reduced, as is the current policy.

### General Comment on Alternative Fuels

The committee acknowledges that a massive investment in large scale production will be essential if they are to replace conventional fuels to any significant degree. Corporations see this as risky.

Some alternative fuels face consumer acceptance, barriers. There are also long lead times associated with many of these projects. Unless risks can be quantified or controlled, investment will not be forthcoming.

## Demand Side Responses

### Increasing the Fuel Efficiency of Vehicles

Since 1979 the fuel efficiency of light vehicle engines has improved significantly. However the efficiency of the light vehicle fleet has improved more slowly as consumers have moved to larger, more powerful vehicles.

A current voluntary code agreed in 2003 between the government and the Federal Chamber of Automotive Industries (FCAI) calls on FCAI members to improve the national average fuel consumption of new passenger cars to a target of 6.8 litres/100km (41.6mpg) by 2010. The actual figure in 2001 was 8.28 litres/100km (34.1mpg).

This would require a significant improvement on the trend of the decade before 2001.

Other suggestions in submissions to improve the fuel efficiency

- Measures to encourage smaller and hybrid cars, for example by adjusting registration fees to favour them;

- Measures to encourage diesel cars; and
- Increasing the fuel excise to encourage the use of new fuel-efficient vehicles (this could be coupled with lower registration charges to be tax-neutral overall.)

### **Congestion Charges**

A congestion charge is a road charge tailored to target the most congested times or places. For example, a carbon charge to enter a Central Business District, or a toll that varies according to the time of day.

A congestion charge, by discouraging some users, reduces congestion. This improves fuel efficiency, as vehicles will use more fuel in congested conditions.

While the economic case for congestion charging is strong, politically it has been difficult to implement because of the perception that it is “yet another tax on motorists”.

The committee suggests that Australian governments should take a more active role in educating the public about the benefit of congestion charges.

### **Encouraging Walking, Cycling and Public Transport in Cities**

Many submissions argued for increased use of walking, cycling and public transport as a way of reducing fuel use. Ambitious goals for increasing the public transport mode share are commonly seen in official plans.

Many submissions target the Commonwealth Government to be more involved in improving urban public transport infrastructure, as happens in many other federal countries. The Commonwealth’s policy is that public transport is the responsibility of the states.

### **Integrating Transport Planning and Land Use Planning**

Car-dominated transport habits reflect patterns of urban development which make high car use necessary.

Submissions stressed that turning this situation around requires better public transport and

planning policies to shape urban development so that public transport networks can work efficiently and attract more “choice” customers.

### **More Use of Rail for Long Distance Freight**

Many submissions argued for more use of railways for long distance freight. Trains use about one third the fuel of trucks per net tonne/kilometre.

If there is a long term rise in the price of fuel, this will favour rail, because fuel is a greater proportion of total costs for road transport than for rail.

### **Fringe Benefits Taxation of Employer-Provided Cars**

Many submissions argued that concessionary tax treatment of cars as a fringe benefit should be abolished on the grounds that:

- It encourages car use and undesirably distorts economic behaviour.
- As a way of assisting the Australian car industry it is poorly targeted, as now only 29% of new cars are Australian made.

The concession arises because the statutory formula which most people use to calculate the tax obligation overestimates the amount of business use of the car in question and therefore some of the private use is untaxed.

A considerable number of recommendations are made in the report.

### **Footnotes**

#### **Additional Editor’s Comments**

#### **1. Liquid Fuels from Coal in NZ**

At a meeting in Dunedin on Friday 16 March 2007 the Minister of Energy, David Parker, indicated that Peak Oil is not accepted as an argument for consideration in the draft NZ Energy Strategy (NZES) due to the existence in NZ of “hundreds of years worth” of coal reserves.

Mr Parker said it may be a factor in the thinking of Government Officials working on the NZES,

but Peak Oil isn't of prime urgency to them in developing the strategy. The drive towards greater sustainability in NZ's energy supplies is driven much more by climate change considerations.

EnergyWatch Issue 41, September 2006 reported that Solid Energy is investigating a \$1 billion project to convert coal into diesel at a plant in Southland. There is also strong interest from the L & M Group and a consortium of overseas investors to develop a synthetic fuel plant in Southland. This would convert lignite into diesel and other fuels but would add substantially to NZ's greenhouse gas emissions. The plant's heat by-product could be utilised to generate up to 500MW of electricity.

## **2. Importation of LNG into NZ**

Detailed consideration is at present being given by Genesis Energy and Contact Energy to the importation of liquefied natural gas (LNG) into New Zealand through the Port of New Plymouth from about 2012 onwards as a "back up option" when gas supplies from the Maui field are likely to be dwindling. However the availability of LNG on international markets could be subject to extreme fluctuation in price and quantity available.

The Association for the Study of Peak Oil and Gas (ASPO) in their Newsletter No. 72 - December 2006, pg 5 note that the North American Region has depleted much of its gas, having produced almost 1200Tcf (Terra cubic ft) out of an estimated total of 1450Tcf including an assumed 21Tcf from new discovery.

Production peaked in 2001 at 26Tcf per year. It is now about 21Tcf and is set to decline to 17Tcf in 2010 and 7Tcf in 2020, in a rather steep decline which is typical of gas fields (i.e. dropping to one third of current output by 2020).

Also Canada currently exports about 50% of its gas production to the USA and when this is no longer available, the US may be looking elsewhere to import LNG with a consequent effect on LNG price and availability.

The situation may be compounded if several planned new major gas fields do not proceed on schedule. At the moment, major new developments in Qatar, Russia and Nigeria are all "on hold" because of cost blowouts and if these developments do not proceed, the LNG market may become very tight worldwide.

This information should cause Genesis and Contact to think very hard before proceeding with their plans for importation of LNG into NZ.

A new report by PriceWaterhouseCoopers (March 2007) predicts that LNG will supply 31% of global gas by 2010, with production set to double from 2005 levels. However this report did assume that global expansion in LNG production would be driven by Qatar, Nigeria and Australia and it warns of the "enormous ups and downs" of the LNG sector.

*John Blakeley*

## **Oil Price Rise to US\$150/ Barrel?**

### **Lord Oxburgh's Comments**

Lord Oxburgh, the former chairman of Shell, has issued a stark warning that the price of oil could hit US\$150 per barrel, with oil production peaking within the next 20 years.

He accused the industry of having its head "in the sand" about the depletion of supplies, and warned: "We may be sleepwalking into a problem which is actually going to be very serious and it may be too late to do anything about it by the time we are fully aware".

In an interview with The Independent on Sunday published on 17 September ahead of his address to the Association for the Study of Peak Oil in Ireland, Lord Oxburgh, one of the most respected names in the energy industry, said a rapid increase in the price of oil was inevitable as demand continued to outstrip supply. He said: "We can probably go on extracting oil from the ground for a very long time, but it is going to get very expensive indeed."

“And once you see oil prices in excess of US\$100 or US\$150 per barrel, the alternatives simply become more attractive on price grounds if on no others.”

Lord Oxburgh added that the major oil companies must invest more heavily in developing viable alternatives to oil and gas. “If you look at it from oil companies’ point of view, effectively what they’re doing at the moment is continuing business as usual, and sticking their toes in the water in a number of areas which might become important in the future. But at present there is a relatively poor business case for making significantly greater investment in these new areas”.

Commenting on whether “Peak Oil”, the point when global oil production goes into terminal decline, was likely to be reached in the near future, he said: “In a way it scarcely matters; what really matters is the gap between production and demand. I don’t know whether there is going to be a peak in world oil production, whether it’s going to plateau and then slowly come down. It could well plateau within the next 20 years, and I guess I would be surprised if it hadn’t” (by then).

The price of crude oil closed above US\$80 a barrel for the first time on 13 September, as a hurricane in Texas raised supply concerns. US light crude hit \$80.20, two cents higher than the price it touched the previous day. Oil prices have risen 30 percent since the start of this year and are four times higher than their 2002 level.

The latest figures from the US Energy Information Administration shows that global liquid fuels production in August was almost a million barrels per day lower than the same period in 2006.

The International Energy Agency (IEA) has forecast what it calls an oil “supply crunch” by 2012, a prediction that Lord Oxburgh said could possibly come to pass. Lord Oxburgh is currently chairman of D1 Oils, a biodiesel company (which might indicate some vested interest in talking up the future price and scarcity of oil?).

#### **Editor’s Note:**

As noted on page 11 of this issue of Energy Watch, in 2005 the IEA was still predicting the price of crude oil to ease to US\$47 per barrel by 2012, then increase to US\$55 by 2030 (in 2005 dollars). These figures now certainly need to be revised upwards.

#### **Comments on SEF News:**

Dave McArthur noted that in a meeting held in about 2003 to discuss transport investment priorities in the Wellington Region, he had stood up and said that the exercise was pointless because the investment programme was based on (then) recent Government predictions that the price of oil would be US\$19 per barrel in 2004, whereas he predicted it would be over US\$40. Many at that meeting thought that he was a “nutter” to even suggest this.

However in a 2005 letter to the Cook Strait News he then predicted that the price of oil would reach US\$80 per barrel in 2008 which evoked ridicule and laughter from many so-called “highly educated folk” who he knew. He now suggests that his 2008 prediction may well be wrong but on the opposite side to what most people in 2005 thought would be the case.

The observation by Lord Oxburgh that global liquid fuels production in August was almost 1 million barrels per day lower than in the same period in 2006 is a relatively small but significant change. With global production now averaging about 85 million barrels per day, that is a reduction of around 1.2 percent compared with a year earlier.

Commenting on this, Alan Thatcher said that Lord Oxburgh’s statement suggests that the world may already be over the peak but questioned why our petrol price isn’t currently around NZ\$5 per litre and rising (instead of being around NZ\$1.60 per litre).

He suggested that possible reasons might be:

- The present relative strength of the NZ dollar.
- That demand is falling in response to rising price (probably unlikely in NZ).

- That oil companies are cross subsidising the wholesale price of refined products with some of the profits they are making on crude oil.

In regard to the second point, he noted that demand certainly fell in response to rising prices in NZ in 1974 and again in 1978. In inflation adjusted terms, the US dollar price of oil is now approaching 1978 levels, but in 1978 oil was used for many purposes which have now largely been replaced by other energy sources such as natural gas.

Now oil is used mainly for transport purposes and (in the Northern Hemisphere) for home heating. He posed the question “Where is the falling demand, if it exists, coming from?”

Responding to Alan’s comments Ted Howard (ASPO, Nelson) noted that all commodity prices are rising, due to oil prices rising.

He suggested that the present oil price increase is possibly more linked to increasing geo-political tension (oil-related of course) than to supply problems, though the fact that the recently asked for OPEC supply increase has not eventuated is also part of the reason.

He noted that there is some demand destruction going on, such as that caused by the collapsing housing bubble in the USA, and rationing/restriction of oil supply in some developing countries.

He has also heard that some poorer folk in NZ are resorting to other transport modes as they find it harder to afford to keep a warranted/registered car on the road.

Reference: Various SEF News Postings, 20 to 26/9/07.

## “A Crude Awakening”

This US-produced film was shown at the Academy Theatre in Auckland on Sunday 26 August as part of the Jasmax International Film Festival.

It appeared to have been made about 2004 following the invasion of Iraq but while Colin

Powell was still US Secretary of State. Among the key points made in the film are:

- The Bush Administration is closer to the US oil industry than any previous administration and there was evidence of planning for US oil companies to take over the operation of the Iraqi oil fields after the invasion in March 2003. But that never happened because sufficient security could not be established.
- The USA now uses about 25% of the world’s oil but it has only 2% of the world’s remaining oil reserves. This is clearly not a sustainable situation!
- In regard to the Peak Oil situation, the film noted that politicians around the world are quite good about telling people what to do about coping with crises once they actually arise. However, they are very poor at telling people what to do about planning for crises which are still some years into the future.
- Except for the Middle East, almost everywhere else in the world oil reserves are running down. Future predictions of oil supply meeting demand into the future are based on the assumption that Saudi oil (in particular) can increase from 12 million barrels per day (bpd) now to around 30 million bpd by 2020. This is most unlikely to happen, and to maintain the Saudi oil fields, they should not be expected to ever produce any more oil than they do now.
- The per capita income of the Saudi people (in present-day dollars) has decreased from around US\$25,000 to about US\$6,000 over the last 30 years and many people live in abject poverty while the ruling elite live in absolute luxury. This is potentially a very unstable situation.
- Since the 1960’s, the ruling elite in Saudi Arabia has had a bargain with the USA that Saudi Arabia will provide the USA with sufficient oil for its needs in exchange for US protection to them both from their own people and their enemies in nearby countries.

*John Blakeley*

# Vehicles

## Congestion a “Tool”?

On 4 May 2007 a judgement was issued by the Environment Court approving a Plan Change to allow the development to proceed of the site of the former Mt Wellington Quarry in Auckland now known as Stonefields. This will involve 2,400 accommodation units of various types and densities for about 6,000 people, together with a retail and commercial centre, a school and reserves.

One of the key issues raised by some submitters during the hearing on 16-18 April was the effect of traffic generated by this large new development on the surrounding roading network which is already congested at peak times.

In the decision, Judge C.J. Thompson noted that the proponents of the Stonefields development are not required to resolve infrastructural problems outside its boundaries although they may be required to contribute, by way of financial contributions, to the cost of doing so.

He also noted that the evidence of the traffic engineers was that, as embodied in the Auckland Regional Land Transport Strategy 2005, it is accepted that it is no longer possible to continue to provide road space for vehicles, sufficient for congestion-free movement.

The corollary is that the Region needs to introduce special measures that reduce demand for travel, particularly by private vehicles. To that end the traffic engineers regard congestion as, in part, an educative and motivating process to encourage non-car travel.

Reference: Environment Court Decision, 4/5/07.

On 15 May 2007, the Auckland Regional Council’s transport policy committee met to discuss the proposed Auckland Manukau Eastern Transport Initiative which is a group of public transport and roading projects around the Tamaki River suburbs.

Transport committee chairman, Dr Joel Crayford, said that it was crucial that pieces of infrastructure be added carefully to ensure that more general traffic was not encouraged before extra public transport was in place.

In other words, if the new roading links come first, then more cars is what you get, whereas if people are irritated by congestion, they will take public transport, so staging is important.

In effect Dr Crayford was saying that congestion is a necessary “irritant” to give people a push towards public transport for their daily travel, rather than using cars.

Reference: NZ Herald, 16/5/07.

Arguing in favour of providing bus lanes over the length of most of Remuera Road and St Johns Road, Daniel Newcombe, senior transport planner for Auckland City Council acknowledged that traffic was often heavy along Remuera Road which averages more than 22,000 vehicles per day on some stretches. But he said that the only realistic way to increase capacity to handle growth from the new Mt Wellington quarry subdivision and other developments was to add more buses rather than cars to the traffic mix travelling along these roads.

Reference: NZ Herald, 31/5/07.

### Editor’s Comments

Up until about a couple of years ago, both business leaders and community leaders in Auckland were stating that the city’s traffic congestion was costing up to \$1 billion per year in lost time and productivity and that the problem had to be remedied in order to assist the economic growth of Auckland and the country as a whole.

Now it seems that the thinking has changed completely, at least as far as community leaders are concerned, and traffic congestion is now regarded as a necessary “irritant” and an “educative and motivating process” to encourage more non-car travel which will be vital if Auckland is to continue to grow in accordance with the Regional Growth Strategy.

In a submission prepared in May 2007 to Auckland City Council on their Annual Plan, the Eastern Bays Community Board noted the significant delays now being deliberately imposed by Council's measures to force residents into public transport. They noted that the roading in the inner city area is "controlled chaos" and that Auckland City seems to have lost sight of the fact that commercial and business-related trips are an essential part of the economic growth of the city, and in its efforts to force drivers from their vehicles, the cost of disruption to the business community has not been considered.

#### .....And A Footnote

A motoring column, "The Good Oil" in the NZ Herald, noted that the column had just reached its 10th anniversary and among the news items which had tickled readers' fancies the most was in December 2006 when a St Johns resident worried about traffic congestion from the Mt Wellington Quarry Housing Development (now Stonefields) was told by an Auckland City planner not to go out in her car during the rush hour.

The planner said he wants Aucklanders to stay at home during the rush hour so that there won't be a rush hour and roads will be empty for everybody else to use.

The column concluded "Such thinking will get the planner a job in Wellington!"

Reference: NZ Herald, 8/9/07.

## Hybrid Vehicles

### Diesel-Electric Hybrid Improves Economy

Peugeot is displaying its new diesel/electric 308 hatchback at the Frankfurt Motor Show in September which will go into production in 2010.

Peugeot says that diesel hybrid technology provides the best reduction in fuel consumption and emissions, and that tests against a petrol/electric hybrid prove this.

The hybrid 308HDi emits 90 grams of CO<sub>2</sub> per kilometre and has a fuel economy of 3.4 litres/100km (83mpg).

By comparison, the cleanest vehicle at present on NZ roads is the petrol/electric Toyota Prius which emits around 105 grams of CO<sub>2</sub> per kilometre and has a fuel consumption around 4.5-5.0 litres/100km (57 to 63mpg).

The hybrid 308 is powered by a 1.6 litre turbo-diesel engine producing 80kW and an electric motor/generator delivering a continuous 16kW which can be intermittently boosted to 22kW.

The vehicle also offers an electric-only Zero Emission Vehicle (ZEV) mode for journeys into regulated urban centres.

Peugeot says that the 308's aerodynamics and the use of Michelin's new energy saver tyres, which reduce rolling resistance, help to improve performance.

To extend the battery range, kinetic energy recovered during deceleration and braking is used to recharge the batteries.

A special button provides access to the all-electric ZEV mode.

Reference: NZ Herald, 6/9/07.

### Hybrids Less Suitable for Larger Vehicles

Honda has announced that it will drop the hybrid model from its Accord range in the USA next year.

Sales of the Accord hybrid in the US have been slow since its introduction in October 2004 and totalled only 1,702 in the first five months of 2007, down 40% from the same period a year ago. This is a very small number of hybrid sales, bearing in mind that the Accord is one of the best selling larger cars on the US market.

The slow sales of the Accord hybrid are a big disappointment for Honda which had high hopes that the power and performance would broaden the hybrid segment.

Honda stated that they had found that hybrids are more fuel efficient in smaller vehicles which is the direction which they are pursuing, noting that from a fuel efficiency standpoint in the longer term, diesel makes more sense than hybrid technology for larger vehicles.

Also, the German company, Robert Bosch, expects diesel engines to triple their share of the light vehicle market in the US within a decade, thanks to their better fuel efficiency.

Bosch said that they expected diesel's share of passenger cars and light trucks in the US to rise from 5% now to around 15% by 2015.

Reference: NZ Herald, 7/6/07.

In November 2005 (EnergyWatch 38, pg 23) we noted that diesel engines are more efficient and economical than petrol units and they are best on the open road, but they can't beat hybrid fuel usage in the city.

We noted that Toyota acknowledges that its petrol-electric hybrids lose their competitive edge on the open highways but Toyota is forging ahead with the technology, largely on the basis of petrol's greater appeal in Japan and the important US market (whereas the diesel is increasingly becoming the engine of choice for new car buyers in Europe).

We also noted a comparison between two four wheel drive SUV's, a Mercedes Benz M-Class CDI diesel against a petrol-electric Lexus RX400h in a trial across the USA from New York to San Francisco over a 5,200km journey.

Overall, the M-Class consumed 11% less fuel than the Lexus in the coast-to-coast comparison, returning an average fuel consumption of 9.1 litres/100km (31.1mpg) compared with 10.2 litres/100km (27.7mpg) for the Lexus.

## World New Vehicle Sales

### Toyota Passes GM....

In the first quarter of 2007, Toyota outsold General Motors (GM) by 90,000 vehicles.

Toyota is widely expected to challenge GM this year for the top spot in global sales, a position which GM has held for 76 years.

Toyota sales rose 9% to 2.35 million units for the quarter. GM sales rose 3.6% to 2.26 million units.

Toyota has achieved growth everywhere in the world, whereas GM's significant growth has only been in China.

Toyota's sales include cars sold under the Lexus luxury brand and the youth-oriented Scion badge, as well as vehicles from Daihatsu and Hino. GM sells cars and trucks under a dozen brands, including European cars from Opel and Saab.

Toyota has built up its reputation worldwide with affordable cars seen as reliable, durable and fuel efficient, whereas in the USA in particular, GM continues to rely heavily on high profit margin but gas-guzzling vehicles, including SUV's, pickup trucks and people-carrying vans.

This year Toyota has plans as a group to sell 9.34 million vehicles, up 6% from 2006. GM does not provide a global sales forecast.

Reference: NZ Herald, 28/4/07.

Toyota plans to sell 10.4 million vehicles globally in 2009, a sales target that would put the Japanese car maker ahead of a record set by GM 30 years ago.

The company plans to boost sales not only in North America and Europe, but also in emerging markets such as Brazil, India, China and Russia. However sales in Japan are expected to stay relatively stable. GM's industry record of 9.55 million new vehicles sold was set in 1978.

Toyota said that it will achieve growth by targeting emerging economies with low cost models and will also woo buyers with ecological technology such as clean diesel engines.

Toyota has been closing the gap with GM, with its sales in the US especially benefiting from the popularity of its Camry sedans, Prius petrol-electric hybrids and other models with a reputation for good economy.

Toyota and its group of companies, including subsidiaries Daihatsu and Hino, sold 8.8 million vehicles worldwide in 2006, trailing GM at 9.1 million vehicles.

Toyota has said that it plans to sell 9.34 million vehicles in 2007 and 9.8 million vehicles in 2008.

Reference: NZ Herald, 5/9/07.

### ....and China Passes Japan

China's automotive market overtook Japan in 2006 to become the second largest in the world with annual new vehicle sales of 7 million. (The USA remains the largest market with a forecast total vehicle sales in 2007 of 16.5 million, down 90,000 on 2006).

Reference: Herald on Sunday, 20/5/07.

Note that the total population of China is usually estimated at being between 1.2 and 1.3 billion.

Because of China's already-clogged city arteries, the Chinese Government is reluctant to see car ownership extended to the masses - conveyed via punitive taxation - which means that the demand for baby cars remains small.

It is in the larger car sizes where most of the increased demand is occurring. While the whole Chinese car market has increased by 35% in the first two months of 2007 compared with the same period in 2006, demand for larger cars has grown

The total new market in China matched that in Japan in 2006 and is expected to double Japan's new car market within four years by 2010.

This is of serious concern in regard to increasing greenhouse gas emissions as well as increasing pollution within city environments

Reference: Autocar (UK), 2/5/07.

### ....and What About India?

Rising incomes and new models are boosting sales of bigger sedans and premium cars in India. More growth is expected as at present

only eight in every 1,000 Indians owns a car. (This compares with about 600 in every 1,000 New Zealanders owning a car).

There are approximately 8 million cars in India for an estimated population of 1.05 billion people.

Annual new passenger vehicle sales in India are forecast to nearly double from around 1 million in 2006 to 2 million by 2010. More than two-thirds of the market is for small cars.

Reference: NZ Herald, 8/9/07.

## GM Moves From Rear Drive

Rear-wheel-drive vehicles use more fuel on average than front-wheel-drive ones because they are heavier and typically used for high-performance driving.

In the light of stricter fuel economy standards from the US Federal Government, General Motors (GM) says that it is evaluating its future line up of rear-wheel-drive vehicle models.

There is now a proposal by the Bush Administration for the car manufacturing companies to raise corporate average fuel economy (cafe) standards by 4% annually so as to average 8.3 litres/100km (34.0mpg) by the year 2017.

This would increase the requirement from this year's 10.2 litres/100km (27.5mpg) and it has been suggested that this could add US\$5,000 to the average cost of a new vehicle in the USA.

GM has stated that it has put a hold on future rear-wheel-drive vehicles and has noted that reducing carbon dioxide vehicle emissions can only be achieved by burning less fuel.

The US Supreme Court has recently ruled that the US Environmental Protection Agency can regulate emissions of carbon dioxide, a gas that contributes to global warming.

Reference: NZ Herald, 21/4/07.

# Vehicle Emission Controls

## New Rules on Vehicle Emissions Too Costly?

As reported in a previous issue (EnergyWatch 44, pg19) prices of imported used cars could rise sharply because of Government plans to get older vehicles off the roads.

Predictably the Motor Trade Association (MTA) has reacted to this by stating that new measures to tighten emissions standards will not work as people will not be able to afford the approved cars and will instead continue to use their older cars with unacceptably high emissions.

An MTA spokesman said that there are an enormous number of vehicles that must be replaced so that our national fleet will be at what is now deemed to be an acceptable standard.

“This is the result of close to 20 years of an almost totally deregulated vehicle importing environment. There are 2.6 million vehicles registered, and their average age is 12 years”.

**Editor’s Note:** the above figure actually relates to the number of cars on the roads. As reported earlier this year (EnergyWatch 43, pg 14), at the end of 2005 there were 2,671,375 cars registered in NZ and 486,843 trucks, making a total number of vehicles around 3.15 million.

However environmentally-friendly business leaders have welcomed the Government’s proposals and want them to go even further.

Peter Nielson, chief executive of the NZ Business Council for Sustainable Development (NZBCSD) said buyers of newly registered, low-emissions vehicles should be paid up to \$3,000 as a cash incentive to help speed the clean-up of one of the oldest and dirtiest vehicle fleets in the world.

“Perhaps it is best to just get on with a nationwide cash scrappage fee scheme. It could possibly start with the highest-mileage vehicles first” he said.

A poll conducted by NZBCSD showed 84% of people would support incentives being paid

to buyers of fuel efficient, low-emissions cars, that is, cars that use eight litres of fuel or less per 100km (more than 35.4mpg) and meet European standards.

Associate Transport Minister, Judith Tizard, and Transport Safety Minister, Harry Duynhoven said that people will be asked for their views on the Government’s proposed new measures which include:

- Update existing minimum standards for new imported vehicles.
- Tighten emissions standards for used vehicle imports.
- Propose emissions testing of used imported vehicles at point of entry to the vehicle fleet.
- Prohibit removal of, or tampering with, a vehicle’s existing emissions control equipment if such an action would adversely affect the vehicle’s emissions.

The two ministers said that a Ministry of Transport report in 2002 found that about 400 people died prematurely in NZ each year from the effects of vehicle-exhaust emissions.

Reference: NZ Herald, 28/5/07.

Minimum exhaust standards for second hand imported petrol vehicles are to come into force in 2008 and a minimum requirement for diesel vehicles will follow in 2009.

Car dealers have said that this move will backfire if motorists cannot then afford to replace older cars with newer models.

The Government said in December 2006 that a minimum exhaust standard for second-hand imported cars would be the same as Japan had introduced on new cars between 2000 and 2002.

The Independent Motor Vehicle Dealers Association said it supported the Government’s goal of reducing fuel consumption and greenhouse gases, but believed emissions standards had to be introduced in stages, to ensure that they did not force too many people

of modest means to hang on even longer to older vehicles.

The Association also noted it was estimated that up to 78% of second-hand vehicles now being imported would not meet the proposed new standards.

Reference: NZ Herald, 29/3/07.

## Industry Split over Emissions of Imports

Motor industry groups are at odds over the Government's proposed emissions rules for used petrol-engined second-hand vehicle imports.

From 2008, they will have to comply with year-2000 Japanese standards for new cars. The year 2005 Japanese standard for new car emissions will apply from 2010, and the 2009 standard from 2013.

The legislation is aimed at cleaning up NZ's vehicle fleet, at an average age of 12.1 years one of the oldest in the developed world.

The Motor Industry Association supports the legislation, but the Motor Trade Association and the Imported Motor Vehicle Dealers Association do not. They want the Government to ease in emissions regulations over a longer period, believing that in its present form, the legislation will "cut too deeply into the supply of (used) vehicles needed to progressively update the national fleet".

Both the National and the Labour parties in NZ were warned 14 years ago that they needed to impose an age limit on used vehicle imports, because international emissions regulations were tightening at such a rate that NZ would face a vehicle emissions crisis that would one day compromise its green image.

Reference: NZ Herald, 14/7/07.

## Dirty Old Vehicles Damage NZ Image

The Chairman of Toyota NZ, Bob Field, has said that the state of the NZ car fleet is inconsistent

with our international image for being an environmentally responsible nation.

Motor vehicle industry lobby groups have been advocating a delay in applying the draft new vehicle emissions rule. In response to this, Mr Field said that the presentation of NZ's "100 percent pure" image requires a vehicle exhaust emission standard that is competitive with other developing countries.

He said that it was disappointing that the proposed vehicle emission standard was being watered down to preserve access to imported used vehicles, because this will guarantee that we lag permanently behind the rest of the world in transport emissions.

Mr Field also believes that the proposed vehicle emission rule is being phased in too slowly and that the Government has a real chance to deliver some long overdue credibility to our international image by cleaning up our vehicle fleet, which is old and dirty compared with our major trading partners.

"NZ has the highest number of vehicles per capita in the world and the average age of our vehicles is 12 years, which is around 50% older than the Australian fleet average of 8.5 years" Mr Field said.

Reference: NZ Herald, 2/8/07.

## And Hyundai Agrees

The South Korean car maker, Hyundai agrees with Toyota and is backing the plans of the NZ Government for tougher emissions testing of second-hand vehicle imports.

Philip Eustace, Executive Director of Hyundai Motors NZ said "How can we say that we have a clean green country if we don't support the new emissions rules?"

Mr Eustace also said "why should we spend half a billion dollars in Wellington to upgrade the rail system, and two billion dollars in Auckland to upgrade public transport, including electrifying the railway system, yet continue to fill the roads with dirty used vehicle imports?"

Mr Eustace suggested that NZ should improve its public transport and get old cars off the roads. If that leads to fewer cars on our roads, then we have achieved the objective.

Reference: NZ Herald, 3/3/07.

## Getting Rid of Older Vehicles

The biggest challenge in improving the motor vehicle fleet in NZ is to get more older unsafe, polluting and fuel-inefficient vehicles permanently off our roads.

- Recent figures show that 236,000 vehicles were imported into NZ last year. Of these, about 100,000 were new and 136,000 vehicles were secondhand imports.
- During the same year 175,000 vehicles with an average age of 17.7 years were de-registered. Of these, nearly 92,000 vehicles throughout NZ were written off or otherwise rendered unusable by insurance companies. There was little accounting for the other 83,000 vehicles on which registrations quietly lapsed and if not disposed of properly, can pose an environmental threat and a potential health hazard from leaking oil and general disintegration. New incentives are needed to help ensure that more of these vehicles are properly disposed of.
- The balance of 61,000 is the number of vehicles added to the NZ fleet during the 2006 year, which is also of great concern as if this situation continues over the next decade, this will mean an additional 610,000 vehicles on our roads by 2017!

In my view, politicians need to “grasp the nettle” not just to ensure that more de-registered vehicles are properly disposed of, but also to ensure that it becomes uneconomic for people to continue to operate the older and more fuel-inefficient vehicles on our roads. To be effective, such measures will mean that it will become unaffordable for people to continue to operate these vehicles, with a consequent reduction in their personal mobility. However, from a politician’s point of view, this mobility

reduction would be likely to produce a substantially negative voter reaction.

Reference: NZ Herald, 19/11/07

*John Blakeley*

## Pollution Rule Tough for US Car Makers

Vermont and several other states in the USA have scored a victory in their battle to get car makers to comply with rules aimed at reducing global warming.

A Federal judge ruled that individual states can regulate greenhouse gas emissions from vehicles, rejecting car maker’s claims that firstly federal law pre-empts state rules, and secondly that technology can’t be developed to meet these rules.

The presiding judge said that there was no doubt that the greenhouse gas emissions regulations presented great challenges to auto makers, but that the court was not convinced that they could not meet the challenges of the Vermont and California regulations.

Automotive industry executives had testified that the regulations adopted by California and 11 other states (and pending in three more states) would not be able to stop global warming but would impose devastating extra costs on the industry.

For the rules to take effect, the US Environmental Protection Agency (EPA) must grant a waiver applied for by California under the Federal Clean Air Act.

California has won several such waivers, allowing it to set up more stringent anti-pollution standards than those of the Federal Government. The waiver request was given a big boost by a US Supreme Court decision in April 2007 ruling that carbon dioxide was a pollutant that should be regulated. (The background to this case was described in EnergyWatch 43 pp 24-25).

The Governor of Vermont said that most of his state’s greenhouse gas emissions come from motor vehicles, so if the state was going to reduce its carbon footprint, it needed to set a high but achievable standard for automobiles.

A hearing is set for 22 October 2007 in a similar case in California, but lawyers for national environmental groups in the Vermont trial said that the Vermont ruling makes it likely that the California case will be dismissed.

Reference: NZ Herald, 22/9/07

## ...and Tough European Requirements

In 2012, the European Commission (EC) plans to implement legislation which will cut average exhaust emissions of carbon dioxide for new cars in Europe from about 160 gm/km now, to 130 gm/km. The planned restrictions are part of European Union efforts to fight climate change.

European car makers are working on technology to pre-empt a likely EC requirement of 90 gm/km in 2020.

European environmentalists want even tougher limits - 120 gm/km in 2012 and 80 gm/km in 2020. An 80 gm/km target by 2020 would double fuel efficiency of new vehicles within a decade.

European car makers are expected to miss a voluntary goal to reduce the average carbon dioxide output from new cars to 140 gm/km by 2008, a fact that has given weight to arguments for binding legislation.

Asian car makers have until 2009 to meet the voluntary goal of 140 gm/km for their cars which are sold in Europe.

The 2012 target, however, will almost certainly be compulsory and apply to all new cars sold within the 27-nation EU block, including cars made in the USA.

The new technology being developed includes carbon dioxide-reducing stop-start systems. These electric systems work by shutting the engine off when the car is stopped then starting it up again when the accelerator is pressed or the foot brake is released.

There are only a handful of cars in NZ at the moment that can better even the present 160 gm/km European emissions figure, most of them

smaller models including the petrol-powered Smart 2-door coupe and the Honda Jazz; the diesel-powered Volkswagen Polo, Fiat Grande Punto and Kia Cerato; and the Toyota Prius and Honda Civic hybrids.

Reference: NZ Herald, 28/7/07

A spokesperson for the Italian luxury sports car maker said that Ferrari wanted to reduce its average carbon dioxide emissions from 400 gm/km at present to 280-300 gm/km by 2012. "We have to face the challenge of reducing consumption but not affecting the performance of the car", he said.

The EC is preparing legislation to require average carbon dioxide emissions from new cars to come down to 130 gm/km by 2012.

The NZ Government is looking at a draft proposal for 170 gm/km by 2015.

All of the major car makers in Europe are still far away from the EU target of 130 gm/km average per new vehicle by 2012, but some are making progress.

Reference: NZ Herald, 8/12/07.

## Diesel Slow to "Catch On" in Japan

Diesel passenger car sales have taken off in Europe where they now make up more than half of all new cars sold, due to their superior economy and efforts to control carbon dioxide emissions.

But after a powerful smear campaign by Tokyo's popular governor in the 1990's, deriding them as smelly, noisy and polluting, diesel cars all but disappeared off the roads in Japan, the world's third largest vehicle market.

But the introduction recently of new exhaust technology (in the form of filters that trap and then burn off pollutants), has improved diesel's image.

Reference: NZ Herald, 3/11/07

# Fuels

## World Natural Gas News

### Europe

Natural gas for vehicles can reduce carbon dioxide emissions by 20-25% over the average petrol car.

However when using renewable biomethane made from various natural waste products, including agricultural or urban waste, and sewage gas, carbon dioxide emissions can be reduced by 100% over the average petrol car.

The European Commission wants the auto manufacturers to reduce carbon dioxide emissions per vehicle to 130 grams per km by 2012. The EU is also supporting binding targets to blend 10% of liquid biofuels in petrol by 2020.

The European Natural Gas Vehicles Association wants instead to take the approach of replacing 10% of the petroleum fuel in the transport sector with natural gas, and even more using renewable biomethane. They point out that mandating too much liquid biofuels could have serious effects on the food chain, land use patterns, food and fuel prices into the future and still not achieve cleaner air goals in terms of carbon dioxide emissions.

### Dominican Republic

Within the next three years, 143,000 natural gas vehicles are expected to be in operation in the Dominican Republic following the inauguration of that country's first natural gas compression and distribution plant. There are expected to be 140 such CNG stations operational by then.

The President of the Dominican Republic was present to launch the plant which will service industrial and domestic gas users as well as transport.

Reference: NGV Global, 16/5/07.

### Brazil

Brazil is among the world leaders in the uptake of alternative fuels, and is currently the second

highest ranking country in the world in terms of natural gas vehicles, with more than 1.375 million such vehicles on the road.

Reference: NGV Global, 9/5/07.

### Australian Exports to China

China's ravenous demand for Australian liquefied natural gas (LNG) was clearly illustrated by the appearance of a second Chinese buyer (China National Offshore Oil Company) for the output of the Gorgan gasfield.

Petro China had already agreed to buy 1 million tonnes of LNG from Gorgan in a 20 year deal worth A\$7.2 billion. The project was approved by the Western Australian Government, subject to conditions.

This same company also signed Australia's biggest ever trade deal, worth A\$45 billion to take 20 years of supply from the Woodside Petroleum-managed Browse Basin off Broome in Western Australia.

Reference: The Australian, 8/9/07.

## More Gas in Maui After All

Despite earlier reports that the Maui field was rapidly running out of gas, the operators of the field, Shell (83.75%), Todd (6.25%) and OMV (10%), have announced that they have "proved up" a further 60.8 petajoules (PJ) of gas. This has firmed up contracted commitments to downstream buyers with Contact Energy receiving 37.5PJ while Vector will get 23.3 PJ. This further allocation was made under their right of first refusal (ROFR) agreement, at the time when this gas was converted from P50 (50% probability) to P85 (85% probability).

Both these companies had earlier secured entitlements in October 2006 to a combined total of a further 275 PJ of Maui gas until 2014 under a pre-existing ROFR process (Contact 170 PJ and Vector 105 PJ). In the case of Vector, the ROFR was because they bought the Natural Gas Corporation (NGC).

Reference: NZ Energy & Environmental Business Week, 6/6/07.

**Comment:** In February 2003 an Independent Expert fixed the total amount of recoverable gas under the Maui contract at 1 January 2003 as being 3562 PJ. Adding 275 PJ and then 60.8 PJ to this figure gives a total of 3898 PJ, getting close to the original 1973 Maui contract amount (of 4060 PJ) - in fact 95% of that original contract amount

The field operators state “we look forward to a positive outcome from future reviews as we move through the contract period”. This perhaps indicates that ultimately, output from the Maui gas field will exceed the original 1973 contract amount, especially if more gas is obtained from pockets in the field, or from new wells outside the original Maui field (such as on the northern side of the Ihi geological fault).

## Future NZ Gas Availability

Credit rating agency Standard and Poors (S&P) is warning that a lack of new gas field discoveries in NZ will see gas prices rise sharply in the medium to long term.

In its latest six-monthly report on NZ energy companies, S&P notes that while Contact Energy has recently expressed confidence about its future gas supplies, this confidence is not well-founded

The report notes that the new Pohukura field, and the confirmation of an extra 200 petajoules (PJ) of Maui gas (later changed to 275 PJ), will ease immediate pressure, but it also notes that the additional gas finds are very much smaller than Maui and are likely to be a lot more expensive per unit of gas produced.

Reference: NZ Energy & Environmental Business Week, 9/5/07.

### Editor's Notes:

1. It is noted that Genesis Energy have already agreed to pay a lot more than the Maui gas price in order to enable the Kupe field to be developed (refer EnergyWatch 41, pg 17) so it is not surprising that other additional gas will also be a lot more expensive.

2. An analysis of NZ's estimated remaining gas reserves (including the additional Maui gas) indicates that at assumed present rates of consumption, there will be a sharp drop off in available gas around the year 2015 leading to a big deficit opening up between gas availability and the present rate of consumption (refer EnergyWatch 41, pg 19) unless by then New Zealand has commenced imports of LNG.

## Tui Oil Field's Impact

The offshore Tui field (in Taranaki) opened in July 2007 with crude oil production running at 40,000 barrels per day (bpd) during its first two months of production and is already having a significant impact on NZ's balance of payments.

Trade figures show that August recorded the highest value for crude oil exports ever, and with Tui oil going to Australian refineries, exports to Australia reached a record monthly total.

Some analysts say that Tui's exchange - earning capacity will help underpin the NZ dollar's strength over the next two years.

With minor modifications still being made to production facilities, output is expected to be ramped up to 50,000 bpd over the next few weeks (by November) and Tui is on target to produce 12 million barrels of oil over its first 12 months of production.

Sales from Tui are based on the Tapis oil price which commands a premium over Brent and West Texas crude. It is a high quality, sweet light crude and is being marketed to various refineries, mostly in Australia but also in South-east Asia.

Reference: NZ Energy and Environment Business Week, 3/10/07.

The Taranaki oil field Tui has neared its target of maintaining production at 50,000 barrels per day. The offshore field averaged 49,302 barrels per day last week.

Reference: NZ Herald, 28/11/07

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