Chapter 8

8.1 Securing Australia's Energy Future, Federal White Paper, June 2004

8.2 The impact of the crude oil price on the Australian economy

8.1 Securing Australia's Energy Future, Federal Government White Paper, 18 June 2004

The major new actions announced in the White Paper are as follows:

- overhaul of the fuel excise system (off-road user excise exempt, replacement of large trucks, +4.5 tonnes, excise by road user charges) to remove $1.5 billion in fuel excise from businesses and households in the period to 2012-13;
- the establishment of a $500 million fund to leverage at least a $1 billion in private investment to develop and demonstrate low emission technologies with potential impact over 2020-30;
- emphasis on continued energy market reform;
- the provision of $75 million for Solar Cities trials in urban areas to demonstrate a new energy scenario, bringing together the benefits of solar energy (contribution to peak loads, etc.), energy efficiency and effective energy markets (two-three cities);

Sustainable centres

The Howard Solar Cities measure (funding $75 million over 2004-05 to 2007-08, with bulk of funding over 2006-08) is a very limited initiative. It does not represent 21st century sustainability thinking.

A more innovative and future oriented concept could be proposed as the Sustainable Centre Program by States/Territories or a more enlightened Federal Government. This program would comprise a project in each State and Territory to reflect the sustainability requirements and circumstances throughout Australia.

Centres would be mainly regional, that is outside capital cities, although this would not be a mandatory feature. Costs would be shared between federal, State and local governments and the private sector.

Sustainability elements of projects would cover demonstration of:

- renewable (or very low emission) energy: biomass, solar, wind, cogeneration;
- energy efficiency improvement and demand side management in new and existing facilities in the residential, commercial and industrial sectors;
- water management;
- transport system management (vehicle fuel economy, smart (ITS) traffic controls); and
- waste management (re-use, recycle, recovery: including conversion to energy).

Centres such as Kalgoolie, Pt Augusta, Shepparton, Launceston, Bega, Canberra, Toowoomba and Alice Springs would be considered and the concept could be extended to sustainable farms in each jurisdiction.

- the provision of $134 million to remove impediments to the commercial development of renewable technologies;

- incentives for petroleum exploration in frontier offshore areas as announced in the 2004-05 budget;

- tightening of air quality fuel standards;

- a requirement that larger (+0.5 PJ per annum) energy users undertake, and report publicly on regular assessments to identify energy efficiency opportunities; and

- fuel consumption standards (tested) for cars from 8.4 l/100 km, (1998) to 6.8 l/100 km in 2010.

In addition, retention of funding for Remote Power Generation (to displace diesel, but diesel fuel for this purpose would now be excise free) and the Greenhouse Gas Abatement Program (GGAP: results of the third GGAP round have so far been deferred by a year), and retention of the **current** Mandated Renewable Energy Electricity Target (scrapping of most MRET Review Panel recommendations), and continuing opposition to ratification of Kyoto Protocol mainly on grounds of non-inclusion, in target setting, of China, India, etc.

Most funding for the new initiatives announced will be concentrated in the 2006-07 period.

8.1.1 Overall

The Statement lacks a cohesive vision and comprises an unintegrated mix of initiatives most of which are likely to be ineffectual in dealing with the energy prerogatives of the 21st century.

8.1.2 Kyoto

Australia **may** achieve its 2008-12 Kyoto target: mainly due to land clearing reduction. But beyond 2012 there will probably be a more stringent global greenhouse regime, and additional land clearing emissions reduction will not be available. We cannot afford to depend on technology developments which **may** become commercial between 2020 and 2030. Australia needs an effective plan and supporting measures to effectively reduce the growth of greenhouse gas emissions in the 2012-25 period. That is, to **position** ourselves for inevitable carbon pricing in that period.

The White Paper does not present any strategy or measures for dealing with greenhouse in the 2012-25 period. The paper seems to assume, against the global policy trends, that no effective greenhouse policy action will be needed by Australia post-2012 until the 2020s. If so, global warming science rejected. If not and little action on abatement, why not adaptation measures.

If we are poised to achieve our Kyoto target by 2012 why don't we ratify? What is the penalty in ratifying? We can gain by:

- being involved with ratifiers in designing beyond 2012 policies; and

- from CDM/JI trading mechanisms only available to ratifiers.

Howard maintains we will not ratify mainly because of the non-inclusion of major emitters, such as China, India and the United States.

8.1.3 MRET

The decision to hold the MRET at its current level of 9,500 GWh by 2010 effectively terminates the MRET's stimulation of the renewable energy industry in Australia.

The program is starting to have an impact on producing greenhouse gas abatement (GHGA) and reducing renewable electricity and associated GHGA costs.

However, investment in the renewable electricity generation industry will virtually cease by 2008 as by then the capacity to meet the 2010 target will have been installed. Indeed, with the MRET provisions for pre-1997 renewable generators and solar hot water to contribute to the target, it is likely that investment in generation capacity could cease by 2006.

Overall the recommendations of the MRET Review Panel were sound. However, the 2010 target could have been increased to a true 2 per cent as announced by Howard in November 1997. As announced the target was to increase by 2010 the percentage contribution of renewable electricity to electricity supply by 2 per cent, from 10.6 per cent to 12.6 per cent.

Unfortunately, the press, commentators and politicians still fail to realise that the MRET 2 per cent MRET announced by Howard in 1997 is, today, only <0.5 per cent. Why? Because the target is set at 9,500 GWh and electricity demand growth is higher than anticipated in 1997.

There is an urgent need to get this message across. Many have tried, but to little avail.

Comments on the 18 June Energy Statement should state that Howard has failed miserably to deliver his 1997 commitment.

Note that since 1996 the federal government has:

- eliminated the promising Energy R&D Corporation (ERDAC);
- eliminated the promising Energy Efficiency Best Practice Program;
- eliminated support for energy information publications dissemination (Australian Energy News, IEA CADETT reports); and
- is now letting the MRET program wither and eventually die.

Message: if its beginning to work kill it.

8.1.4 Fund to encourage commercial development of renewable energy

The fund will provide $100 million over seven years for competitive grants to promote the strategic development of renewable technologies and $34 million to cover areas such as energy storage, grid connection arrangements and wind forecasting.

The $100 million will include $50 million from the existing Commercial Ready program. Program details on funding criteria, etc. are not provided in the Paper. Strong commercial potential is mentioned but what constitutes commercial and the timeframe for possible realisation of the potential is not discussed. In association with expansion of MRET the fund could be an important component of a long term strategy for renewable energy. But acting alone, without MRET expansion, the fund's effects are quite uncertain.

The $34 million encompasses $18 million for advanced electricity storage technologies, $14 million for assistance to wind forecasting and (implied) $2 million for investigation of more effective and equitable grid connection rules. Commercial storage of electricity has been an elusive goal for over 50 years: funding for storage R, D, D and C is useful, as a component of a LT strategy for renewables, but commercial application outcomes are very uncertain.

Improved wind forecasting would be beneficial to both generators and system operators, as would improved (clean, efficient, equitable) connection rules for renewable generators but should be integrated with an expanded MRET.

8.1.5 Funding for clean coal and other low emission technologies

This industry support fund of $500 million (over 4 years), levering a minimum of $1,000 million of private funding ($1 G/$2 P) for R, D, D and C of low emission technologies aimed at greenhouse gas abatement over 2020-30 will:

- favour large corporations as small, particularly renewable energy, companies will find it hard to raise the minimum 2/3 required;
- as such probably focus on geosequestration and associated technologies; and
- the commercial outcomes are uncertain and unlikely until well beyond 2020.

A useful initiative, if refined to provide practical assistance to small innovative companies but, as indicated above, it is not complemented with initiatives to produce greenhouse gas abatement (GHGA) in the 2012-25 period.

8.1.6 Renewables and geosequestration: a comparison

Geosequestration involves capture, transport and storage in geological structures of CO_2e emissions mainly from electricity generators.

Both geosequestration and renewables should be assessed and promoted. It is not an either/or consideration. Both can give significant GHGA and both will involve increases in electricity prices.

8.1.7 Costs

To get to greenhouse gas intensity levels comparable with producing coal based electricity from **available** gas turbine technology through geosequestration would, on current indications (IEA, etc.), cost more than producing electricity from renewables (see below). Costs of both are coming down but renewables are starting from a more advanced knowledge base. What the paper does not say is that even with the most optimistic projections of geosequestration costs wholesale prices of the geosequestered electricity would rise by at least 25 per cent.

Curiously (intentionally?) the table on page 142 of the Statement does not give costs for, and electricity price impacts of, geosequestration. Cost ranges for geosequestration are available (IEA, etc.) just as they are for renewables which are provided in the table.

The geosequestration cost estimate range is wide: $10/t CO_2e is quoted by Batterham, Chief Scientist/Rio Tinto consultant, but apparently from only for storage and widely critiqued as very optimistic, to +A$200 (IEA). A recent paper by MacGill and Outhred (UNSW) quotes a current estimated price of US$35-55/t CO_2e (A$50-78/t CO_2e) which translates into about A$40-85/MWh for black coal electricity and A$50-117/MWh for brown coal electricity. These are approximate costs which depend on the greenhouse gas intensity (GHGI) of specific generator outputs and the ease of CO_2e capture. Lower costs are for low GHGI and geosequestration compatible generators and higher costs are for higher GHGI, less compatible (existing) generators. **Current** costs of GHGA via renewables under MRET are in the A$20-40/t CO_2e range (A$16-60/MWh).

Costs for both renewables and geosequestration are projected to fall but technological development of renewables is more advanced. By promoting competition among generators and scale economies MRET is contributing to the reduction of the GHGA costs of renewables. On current information and projections, geo-sequestration is likely to be at least as expensive as renewables for abatement of greenhouse gas emissions and is very unlikely to result in any GHGA before 2025.

The electricity cost premium impact for MRET by 2020 under the MRET Panel Review recommendations is likely to be $3/MWh maximum and produce about 15 Mt of CO_2e abatement in 2020.

Under the recommendations the MRET target would increase to 20,000 GWh by 2020, and renewables would still only account for 11.9 per cent of electricity consumption, still 0.7 per cent below Howard's 1997 commitment of 12.6 per cent (10.6 per cent in 1996-97 plus the additional 2 per cent).

In 2025, IF geosequestration is ready to be applied, an equivalent amount of GHGA via this route, would very probably cost at least 50-100 per cent more than GHGA via renewables per MWh of electricity consumed.

And it must be recognised that application of geosequestration to existing generators is much more costly than application to new generators built and operated to be geosequestration compatible.

Why then, in the Statement, is MRET said to be too costly? Is geosequestration cost reduction by 2020 and beyond seen as more likely than renewables cost reduction? If so on what basis? What is the role of Batterham/Rio Tinto in this?

Are neither geosequestration nor renewables thought to be necessary because we can ignore global greenhouse concerns, or that we can insulate ourselves from these concerns or actions?

A balanced mix of energy sources and technologies is needed to confront the challenges of the 21st century. Renewables, via MRET and complementary measures, and geosequestration are likely to be important components of the mix.

8.1.8 GGAP

The Statement indicated that the Greenhouse Gas Abatement program was to continue. GGAP is a $400 million program announced in 2001 as a concession to Democrat's support for the GST.

$200 million has been allocated in the first 2 GGAP rounds.

In the third round firms have spent significant amounts in preparing proposals for GGAP funding. But 12 months later no announcement on successful proposals has yet been made. Speedy announcement of the third round successful proposals is required. And speedier processing of proposals for funding under the new measures will be required.

8.1.9 Energy efficiency improvement (EEI)

On page 110 very conservative estimates of EEI potential are given. What is the basis for these estimates? Database, criteria, stock turnover assumed?

The Statement should have included an assessment of the potential estimates: their strengths and weaknesses.

Minimum Energy Performance Standards (MEPS) in Australia lag well behind economic and international best practice. Steps to push MEPS to these levels are required.

On page 112 it is stated that the Commonwealth will work with States and Territories to require landlords and building owners to disclose energy performance information in leases and sales agreements. What is the timetable for implementation of this requirement?

Requiring 250 firms using over 0.5 PJ of energy per annum to conduct energy efficiency audits and report on them is a fine idea. However, without incentives or requirements to implement the EEI opportunities revealed history over the past 30 years tells us that few of the EEI opportunities will be acted on.

8.1.10 Greenhouse Challenge

Mandation to join what is essentially a business-as-usual (BAU) action program is likely to be ineffectual. Voluntary programs are useful to focus attention on issues but history tells us little beyond BAU action is taken.

8.1.11 Gas, cogeneration

Measures to increase market penetration of gas, particularly gas cogeneration, and the complementarity of gas and intermittent renewables are missing from the White Paper. Measures to increase the market penetration of gas could, at relatively low cost, produce a significant reduction of greenhouse gas emissions and position business for a carbon priced world.

8.1.12 Emissions Trading System (ETS)

Rejected as too expensive and disruptive despite EU, etc. ETS planning.

8.1.13 Fuel excise overhaul

Extension to **all** off-road petroleum (diesel, petrol) use is economically sound as excise is a (very imperfect) proxy for road user charges (direct road charges are vastly preferable) **but** will encourage inefficient fuel usage and the increase of a greenhouse gas emissions in the off-road transport sector.

8.1.14 Diesel fuel standards

Tightening diesel fuel standards in 2005-06 is likely to see more diesels in the car fleet as our fuel becomes more compatible with European (mainly) diesel “cars”. Modern diesel engines have fuel economies **on road** about twice those of petrol engines of similar capabilities. And their noxious emissions (particulates, SOx, NOx, etc.) are much lower. Diesel promotion would result in fewer GHG emissions and improved fuel economics, subject to resolution of refinery mix and noxious emissions issues.

8.2 The impact of the crude oil price on the Australian economy

In the past oil price shocks have had a recognisable negative impact on world and Australian economic growth. The 1973 and 1979 shocks led to two world recessions, a lengthy period of below trend growth as economics restructured to adjust to the higher oil prices. The paradox is that standard investigations of the impact of oil prices on individual economies generally indicate that the impact is relatively mild. That is, it would take very large increases in crude oil prices to trigger significant recessions. The objective of this section is to demonstrate how a rise in crude oil prices of between US$10 and US$20 a barrel can have the capacity to trigger a recession (defined as a GDP growth rate of between 0 and 0.5 per cent over a year).

The key to understanding how this can occur is to have an appreciation of the current drivers of economic growth in Australia.

8.2.1 Recent drivers of national economic growth

The core drivers of the Australian economy over the last few years has been household debt/household wealth driven growth. That is, where a combination of rapid increases in equity (including superannuation wealth) and dwelling stock wealth, relative to income, which induced households to take on more debt and use the debt to increase dwelling investment and consumption expenditure above the levels that would have been justified purely by household income levels. Until the mid 1990s the long term trend rate of growth of the economy had been near 3 per cent per annum. Over the late 1990s the Australian trend rate of growth accelerated to the 4 per cent mark. Since 2000, household wealth has continued to grow strongly. However, this has mainly been driven by the continued growth in the value of dwelling stock.

The situation is illustrated in Figure 8.2.1. Between 1997 and the end of 2003, the ratio of household wealth to consumption expenditure has increased by one third. This induced households to increase their debt to income ratio from 70 per cent to 130 per cent over the same period with the resulting increase in consumption expenditure driving down the household savings ratio. Between the end of 1996 and the end of 2003 the household saving ratio fell from 7 per cent to -0.5 per cent.

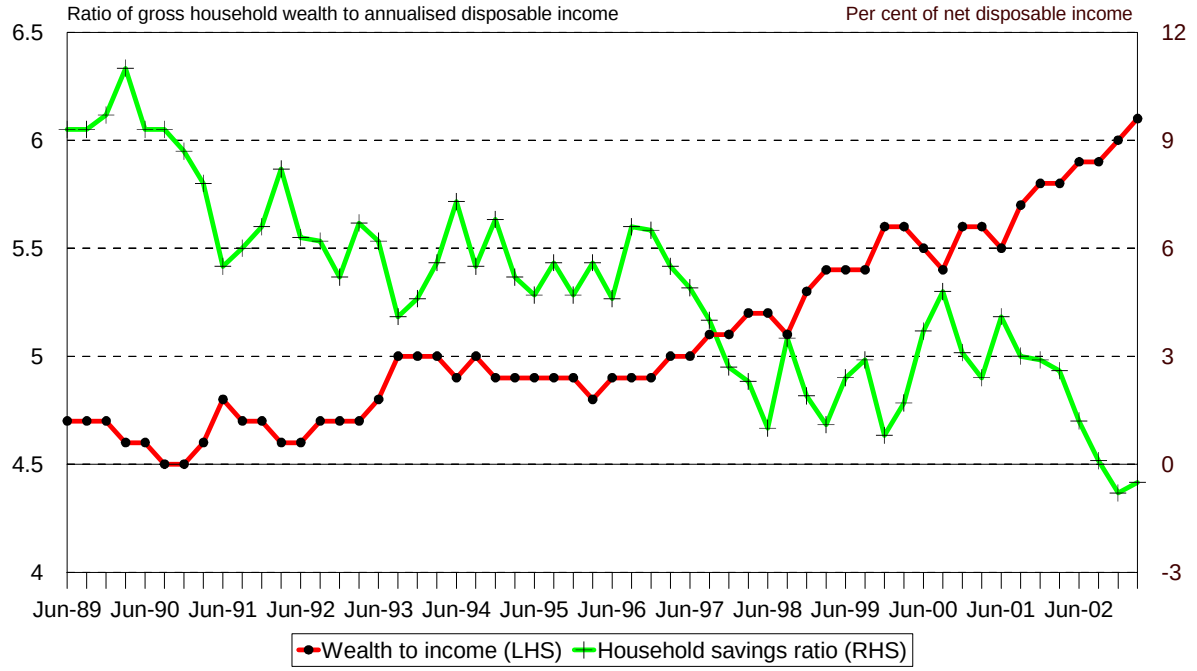
The fall in the household savings ratio over the period has meant that households have had to borrow increasingly larger amounts for consumption expenditure. From 2002-03 the borrowing for consumption expenditure was $50 billion and for 2003-04 it is likely to be in the vicinity of $60 billion.

Australian GDP growth in 2002-03 was 2.8 per cent. However, this was due to the drought. If it was not for the drought, the household wealth/debt driven growth for 2002-03 would have remained at around a 4 per cent growth rate. As the last column in Table 2.1 makes clear, household borrowings for consumption explained almost all of national GDP growth over 2001-02 and 2002-03.

In 2004 the Australian economic growth outlook is at a turning point. The precarious dynamics is one where wealth increases have been driving debt consumption with the use of the debt, via its impact on house prices, driving subsequent increases in wealth.

The situation is unsustainable as the Reserve Bank of Australia in late 2003 recognised and raised interest rates. Australian household debt to income and debt service ratios were high by both historical and international standards. If the boom was allowed to continue, the economy would have been plunged into a deep recession when households would have been forced to stop borrowing.

Figure 8.2.1: Wealth to income and household savings ratio



Source: Derived from ABS "National Accounts", Financial Accounts, the stock of dwellings and established house price series.

To a large extent the driver of the increase in house prices over recent years has been the ready availability of cheap credit. However, people are only willing to absorb the additional credit if they are confident about the future. A sustained increase in oil prices is likely to lead to adverse expectations of the future which, in turn, may well reverse the current drivers of growth.

Before this aspect is analysed further, a standard investigation of the impact of oil prices will be made using the IMP model of the Australian economy.

8.2.2 The impact on the Australian economy of an increase in the crude oil price

Table 8.2.1 shows the impact on key Australian economic aggregates of a $10 increase in the price of crude oil. From elsewhere in this report this has been calculated to add $2.8 billion directly to costs of the domestic economy.

Table 8.2.1 has the shock occurring in quarter 1. By quarter 12 the impact on the CPI increases from a direct effect of 0.4 per cent to an increase of 1 per cent over and above what would have otherwise been the case. The squeeze on household real disposable income by quarter 12 reduces private consumption expenditure by $0.5 billion, or nearly $2.0

billion in 2002 prices at annual rates. Overall real GDP is reduced by 0.3 per cent by quarter 12 compared to what otherwise would have been the case.

There will be further lagged adjustments. In the long run the result will be a reduction of real Australian GDP of around $3.0 billion at annual rates, or a further 50 per cent decline for the quarter 12 levels.

Even if the oil price shock was doubled, at worst the results in Table 8.2.1 would support a growth slowdown of around 0.5 per cent from trend.

8.2.3 The impact of a 5 per cent reduction in the median house price

Table 8.2.2 shows the impact of a (permanent) 5 per cent reduction in median house prices compared to what would otherwise have been the case. The wealth effect of this decline will be to reduce GDP by 0.8 per cent compared to what would otherwise have been the case. This result is based on the current balance sheet configuration of Australian households.

It would not be implausible to combine the oil price shock with the house price shock in an economic environment of more binding constraints to growth that Australia is currently entering. The combined effect of the two shocks, if telescoped into a more narrow time frame, would be to decrease Australia's economic growth by between 1.5 and 2.0 per cent. If allowance is made for the impact on other countries and the feedback effect on Australian exports, then the result will be a reduction in GDP growth of around 3 per cent. This would be likely to produce a recession.

The conclusion, given:

(i) the current structure of the Australian economy;

(ii) the balance in oil demand and supply; and

(iii) the high probability of major terrorist attacks on oil supply infrastructure,

then the Australian economy is potentially vulnerable to an oil price shock.

Table 8.2.1 US$10 per barrel increase in crude oil price: impact on Australian economy – change from what otherwise would have been the case

	Private consumption (2002 $m)	Public consumption (2002 $m)	Private investment (2002 $m)	Dwelling investment (2002 $m)	Exports (2002 $m)	Imports (2002 $m)	Gross domestic product (2002 $m)	Total employment ('000)	Average earnings ($/week)	CPI (base points)
quarter 1	-78	0	-1	-10	0	-13	-45	0	0	3
quarter 2	-10	0	-2	-23	-8	27	-68	0	0	3
quarter 3	-261	0	-2	-13	-19	-79	-182	-1	0.0	4
quarter 4	-238	0	-4	-18	-32	-97	-162	0	0.3	4
quarter 5	-183	0	-92	-34	-48	-163	-124	-1	0.8	5
quarter 6	-177	0	-83	-42	-58	-262	-154	-4	1.1	6
quarter 7	-331	0	-80	-50	-67	-272	-307	-6	1.4	6
quarter 8	-480	0	-79	-45	-75	-268	-460	-10	1.9	7
quarter 9	-501	0	-82	-63	-82	-247	-517	-13	2.8	7
quarter 10	-263	0	-83	-77	-86	-233	-337	-15	3.5	9
quarter 11	-254	0	-85	-120	-90	-247	-362	-14	4.1	10
quarter 12	-484	0	-89	-102	-94	-274	-537	-14	4.7	11
Per cent change										
quarter 1	-0.1	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.3
quarter 2	0.0	0.0	0.0	-0.2	0.0	0.1	0.0	0.0	0.0	0.3
quarter 3	-0.2	0.0	0.0	-0.1	0.0	-0.2	-0.1	0.0	0.0	0.4
quarter 4	-0.2	0.0	0.0	-0.2	-0.1	-0.3	-0.1	0.0	0.0	0.3
quarter 5	-0.2	0.0	-0.3	-0.4	-0.1	-0.5	-0.1	0.0	0.1	0.5
quarter 6	-0.2	0.0	-0.2	-0.5	-0.1	-0.8	-0.1	0.0	0.1	0.5
quarter 7	-0.3	0.0	-0.2	-0.5	-0.2	-0.8	-0.2	-0.1	0.1	0.6
quarter 8	-0.4	0.0	-0.2	-0.6	-0.2	-0.8	-0.2	-0.1	0.2	0.6
quarter 9	-0.4	0.0	-0.2	-0.8	-0.2	-0.8	-0.3	-0.1	0.3	0.6
quarter 10	-0.2	0.0	-0.2	-0.9	-0.2	-0.7	-0.2	-0.2	0.4	0.8
quarter 11	-0.2	0.0	-0.2	-1.3	-0.2	-0.8	-0.2	-0.1	0.4	0.9
quarter 12	-0.4	0.0	-0.3	-1.5	-0.2	-0.9	-0.3	-0.2	0.5	1.0

Table 8.2.2 Five per cent reduction in median house price: impact on Australian economy – change from what otherwise would have been the case

	Private consumption (2002 $m)	Public consumption (2002 $m)	Private investment (2002 $m)	Dwelling investment (2002 $m)	Exports (2002 $m)	Imports (2002 $m)	Gross domestic product (2002 $m)	Total employment ('000)	Average earnings ($/week)	CPI (base points)
quarter 1	-7	0	-1	-2	0	-1	-6	0	0	0
quarter 2	-17	0	-3	-4	0	-4	-15	0	0	0
quarter 3	-344	0	-54	-89	0	-75	-309	-4	-1	0
quarter 4	-516	0	-81	-133	0	-112	-464	-6	-1	0
quarter 5	-791	0	-124	-204	0	-172	-712	-9	-1	0
quarter 6	-1273	0	-199	-329	0	-277	-1145	-14	-2	0
quarter 7	-1685	0	-264	-435	0	-367	-1516	-19	-3	0
quarter 8	-2098	0	-328	-542	0	-457	-1888	-23	-4	0
quarter 9	-2648	0	-414	-684	0	-577	-2383	-29	-5	0
quarter 10	-2958	0	-463	-764	-1	-645	-2661	-33	-5	0
quarter 11	-3164	0	-495	-818	-1	-689	-2847	-35	-6	1
quarter 12	-3440	0	-538	-889	-1	-749	-3095	-38	-6	1
Per cent change										
quarter 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
quarter 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
quarter 3	-0.3	0.0	-0.1	-0.9	0.0	-0.2	-0.2	0.0	-0.1	0.0
quarter 4	-0.4	0.0	-0.2	-1.6	0.0	-0.3	-0.2	-0.1	-0.1	0.0
quarter 5	-0.7	0.0	-0.3	-2.4	0.0	-0.5	-0.4	-0.1	-0.2	0.0
quarter 6	-1.1	0.0	-0.6	-3.8	0.0	-0.8	-0.6	-0.2	-0.3	0.0
quarter 7	-1.5	0.0	-0.7	-5.1	0.0	-1.1	-0.8	-0.2	-0.3	0.0
quarter 8	-1.8	0.0	-1.0	-8.0	0.0	-1.4	-1.0	-0.3	-0.4	0.0
quarter 9	-2.3	0.0	-1.2	-9.2	0.0	-1.8	-1.2	-0.3	-0.5	0.0
quarter 10	-2.5	0.0	-1.3	-9.5	0.0	-1.9	-1.3	-0.4	-0.6	0.0
quarter 11	-2.6	0.0	-1.4	-9.4	0.0	-2.1	-1.4	-0.4	-0.6	0.0
quarter 12	-2.9	0.0	-1.6	-13.3	0.0	-2.4	-1.6	-0.4	-0.6	0.1