

**PEAK OIL**  
**IMPLICATIONS FOR COTTESLOE**  
**WEST AUSTRALIA**  
**2011**

**In June 2011 Council resolved:**

- 1. To request a report be prepared to examine the potential impacts of Peak Oil on (1) The Cottesloe Town Council, (2) Cottesloe Businesses, and (3) The Cottesloe community;**
- 2. That the report examine policies and practices of leading councils in addressing Peak Oil and report on their potential to be used for the benefit of the Town of Cottesloe.**
- 3. That staff report back to Council in September 2011.**

This report has been prepared by the Town of Cottesloe's Sustainability Officer in response to the resolution.

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## **BACKGROUND**

### ***Why is oil considered to be important?***

Oil is the raw material for many products that are considered to be integral to modern life. Oil-based products include petrol, diesel, jet fuel, plastics, fertilizers, weed killers, medicines (including vaccines), asphalt, waste bins, and playground equipment.

Oil-based products are required for travel, to treat illness, to grow food, to construct urban environments and to generally maintain the high standard of living that we have become accustomed to in the twenty-first century.

Oil is precious because it delivers such a huge amount of energy from a small amount of fuel – no discovered fossil fuel source can replace oil. Fossil fuels, like oil, take over 500 million years of geological time to accumulate (Hubbert 1949), which also make it a finite resource.

### ***Where does the oil come from?***

Conventional crude oil extraction is from primary or secondary recovery methods from wells, relying on natural pressure, physical lift, water flood, and water or natural gas pressure maintenance. This process is preferred because less energy is required to obtain the product.

There are options to harvest oil from shale deposits and deep-sea reserves. Economic and environmental constraints make these deposits a less attractive option, though both have been utilised for years. Recoverable oil shale deposits are estimated to be between 500 mb to 1.1 trillion barrels (Bartis et al. 2005) but commercial large scale extraction of the resource has not been viable to date due to the low cost of crude oil. As the price of crude oil increases, and the resource declines, shale deposits become more viable.

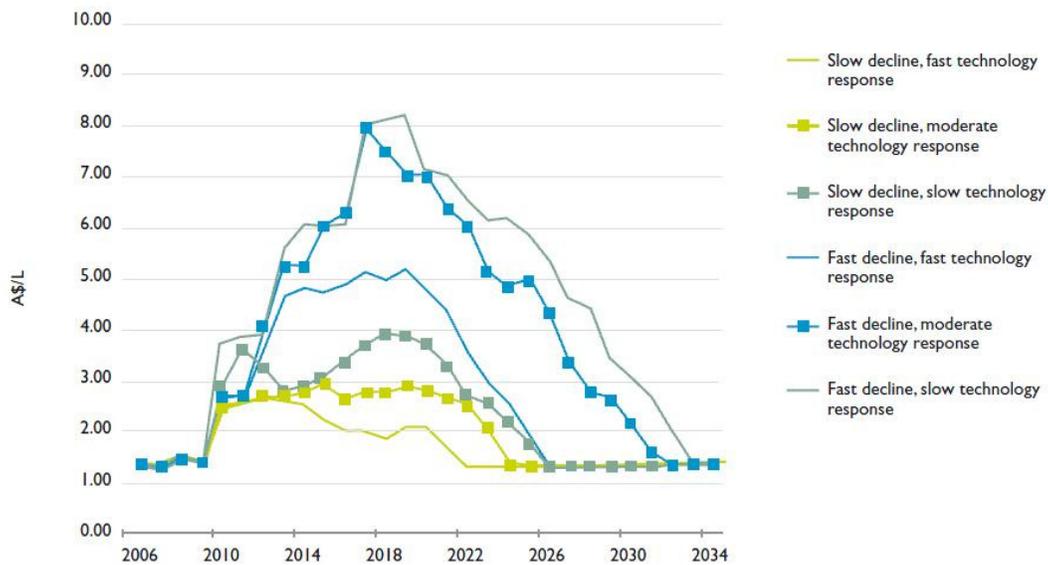
Deep-sea oil reserves are becoming increasingly essential as oil resources decline. The environmental risks from technology being stretched to work in these increasingly difficult conditions were demonstrated by the 2010 oil disaster in the Gulf of Mexico, Louisiana. A combination of regulatory and infrastructure oversights and break downs (Goldenberg 2010) resulted in what is now referred to as the worst oil spill in US history. 20,000 to 40,000 barrels (Allen and McNutt 2010) of oil was estimated to have spilt into the ocean each day over the 86 days that the well was ruptured. Oil from the spill covered wetlands and nursery grounds integral to marine ecosystems, which had many economic, social and environmental implications for the region.

### ***Cost and Demand of Oil***

In August 2011, the cost of oil was \$92.10 per barrel. Global oil demand in 2011 is approximately 89 million barrels per day (mb/d). There is general agreement that oil prices will rise (IEA 2010; Chen Rui 2010; Geoscience Australia and ABARE 2010; CSIRO 2008; Dodson and Sipe 2008) to balance markets (IEA 2010) and to reflect the costs associated with venturing into deep water fields and enhanced recovery techniques (Geoscience Australia and ABARE 2010).

One-year forecasts for oil range from \$106 per barrel (\$106/barrel) to \$113/barrel for crude oil. Global demand for oil is expected to increase due to the high level of growth in developing economies, such as China and India. Future prices are highly debated and rely on a combination of factors, including global demand, technology advancements to recover oil from deep-sea and shale deposits, and constrained global supply.

However, the CSIRO predicts that prices will continue to rise until technology and fuel advancements cause prices to decline (CSIRO 2008). Figure 1 shows a range of prices depending on the scenario of oil peaking and demand.



**Figure 1. Comparison of price impacts for different rates of post-peak decline in oil supplies and slow, moderate and fast technology and infrastructure responses. (Source: p30 CSIRO 2008)**

It is important to note that the costs associated with the proposed Carbon Tax legislation and subsequent Emissions Trading Scheme would be additional to the increased global oil costs in future. This may be more apparent if transport fuels are included in the carbon pricing mechanism in future.

***How did we become so reliant on oil?***

Since the end of World War II developed countries have planned and constructed their cities with the intention that vehicles will provide the primary transportation system. This has led to low-density planning and often resulted in long travel distances between home and work places; entertainment; and family networks. This phenomenon is referred to as “Urban Sprawl”. Perth is a prime example of this type of planning. Estimated to have a population of 1.5 million that extends over 120 km from north to south, Perth continues to sprawl even further in an attempt to provide housing to the growing population (10% growth a year). Public transport in Perth is underdeveloped and unable to service the increasing demand to placate traffic congestion and increasing petrol costs.

The high level of car ownership in Australia has meant that transport accounts for 14% of total greenhouse gas emissions (roughly equivalent to emissions from agriculture) (CSIRO 2008, p13). Road transport contributes 89% of total transport greenhouse gas emissions, with aviation, rail and shipping accounting for 6%, 3% and 2% respectively (CSIRO 2008, p13). Cities like Perth have been developed with a belief that oil will continue to be available, and will continue to be affordable, for the average household. This belief has been embedded in the Australian (and possibly global) culture, which has created an economic and social structure that reinforces an “oil dependent” culture.

Similar stories are apparent in relation to increased use of packaging, year round supply of food products that are often “out of season”, vaccines to prevent illness, fertilizers and pesticides to increase crop yields, and concrete urban environments that enhance storm water run off and provide safer roadways. All of these cultural expectations reinforce Australia’s dependence on oil.

### ***Implications if oil reserves suddenly run out?***

Australia has limited reserves of crude oil, containing only 0.3% of the world’s oil reserves (Geoscience Australia and ABARE 2010). This makes Australia increasingly reliant on imports of oil and vulnerable to changing market circumstances (CSIRO 2008), despite having an abundance of diverse energy resources. Australia has more than one third of the world’s known uranium resources, large coal deposits, substantial conventional and coal seam gas deposits (Geoscience Australia and ABARE 2010). Australia also has abundant renewable resources available in solar, wind, geothermal, hydro wave, tidal and bio-energy that are largely undeveloped.

There are many implications if the world’s oil reserves are depleted suddenly and Australia cannot access supplies. This is an extreme, worst case scenario, however, it highlights the most important issues:

- The cost of petrol and oil based products would increase substantially and possibly need to be rationed by governments to ensure that the most critical oil uses are provided (this is likely to have implications for air travel, commuters, and other less vital services that rely on fuels).
- The transportation industry is the most vulnerable to a sudden shortage of oil. Food transportation and distribution is the most vital service to be considered in the peak oil scenarios.
- Regional areas are often entirely reliant on car transport – they are very vulnerable to peak oil.
- Poorer people are more vulnerable to Peak Oil because they often live on the outskirts of cities that are poorly serviced by public transport and they have less disposable income to cope with increased fuel prices.

The International Energy Agency (IEA), which is the energy forum for 28 industrialised or OECD countries, has devised a *Response System for Oil Supply Emergencies* for its member countries (IEA 2011). Australia is a member of IEA. Figure 2 provides an

overview of the choices available when implementing an emergency response to a disruption of oil supply.

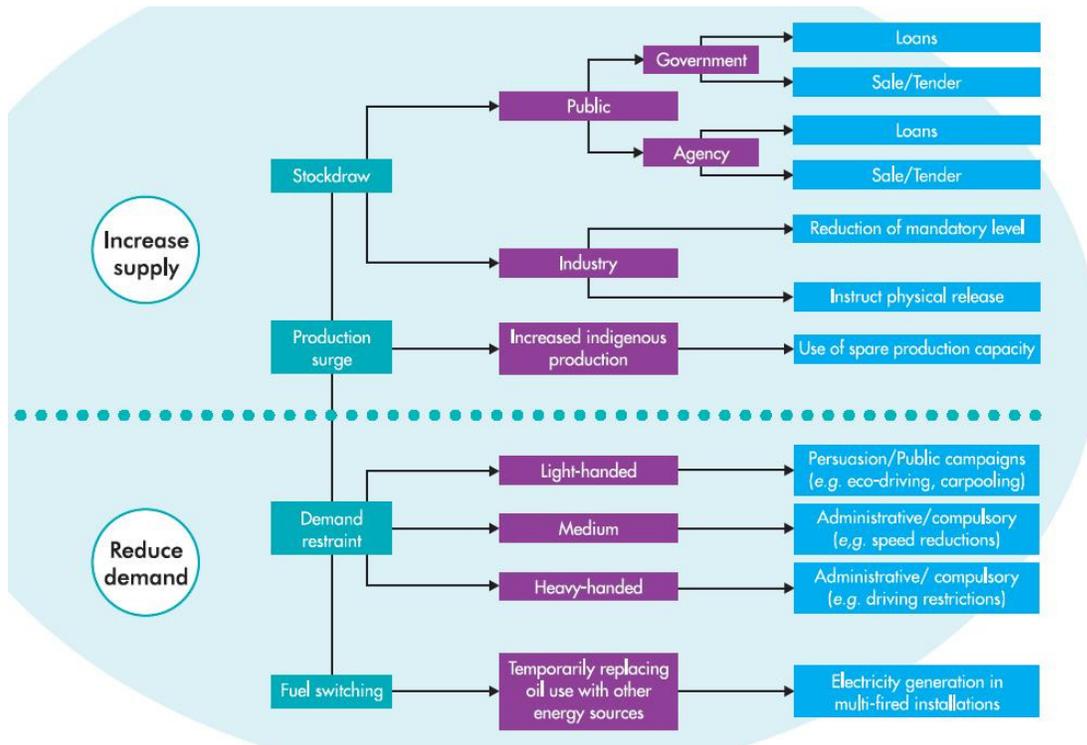


Figure 2. Managing an oil shortage will require a strategy of increasing supply while reducing demand (Source: IEA 2011, p6).

### What is Peak Oil?

“Peak Oil is the point in time when oil production reaches its maximum annual rate, after which the annual production rate declines each year.” (CSIRO 2008, p15).

The theory of peak oil was initially put forward by Geophysicist, M.K. Hubbert, who correctly predicted that American oil supplies would peak in the 1970s.

“The production curve of any given species of fossil fuel will rise, pass through one or several maxima, and then decline asymptotically to zero. Hence, while there is an infinity of different shapes that such a curve may have, they all have this in common: that the area under must be equal to or less than the amount initially present.” (Hubbert 1949, p105)

Although the terminology peak oil suggests a sudden decline after reaching a maximum value, Hubbert himself stated that this may not necessarily occur.

## **Peak Oil Scenarios**

There is agreement that peak oil will occur (Hubbert 1949; Bezdek *et al.* 2006; Australian Senate 2007, CSIRO 2008, Dodson and Sipe 2008, Hirsch *et al.* 2005, IEA 2010). There is, however, disagreement on when peak oil will occur. Estimates range from crude oil having reached its all-time peak in 2006 of 70 mb/d (IEA 2010, p6); to it being predicted in 2020, plus or minus seven years (Queensland Government 2007); or as late as 2030 (Australian Senate 2007).

There is also uncertainty about how peak oil will occur. Theories range from a sudden and complete “peak” event where the oil reserves reach maximum and decline. The other, more likely, theory is that oil reserves around the world will reach peak at various times.

Oil consumption has an obvious correlation with decline in the longevity of the resource availability. IEA presents three main scenarios of demand:

1. Current Policies Scenario – no change in policies as of mid-2010 (business as usual), i.e. no commitments are acted upon (IEA 2010).
2. New Policies Scenario – takes account of the broad policy commitments and plans that have been announced by countries around the world, including the national pledges to reduce greenhouse gas emissions and plans to phase out fossil-energy subsidies even where the measures to implement these policies haven't been announced or implemented yet (IEA 2010).
3. 450 Scenario – sets out an energy pathway that keeps emissions below 2°C through limitation of the concentration of greenhouse gas emissions in the atmosphere to less than 450 parts per million of CO<sub>2</sub> equivalent (IEA 2010).

After reviewing the three scenarios IEA states:

*The message is clear: if governments act more vigorously than currently planned to encourage more efficient use of oil and the development of alternatives, then demand for oil might begin to ease soon and, as a result, we might see a fairly early peak in oil production. That peak would not be caused by resource constraints. But if government do nothing or little more than at present, then demand will continue to increase, supply costs will rise, and the economic burden of oil use will grow, vulnerability to supply disruptions will increase and the global environment will suffer serious damage.*

(IEA 2010, pp6-7).

IEA's statement concurs with CSIRO's model of price impacts versus different rates of post-peak decline in oil supplies shown in Figure 1 (CSIRO 2008).

## CONTEXT

Investigating peak oil, and the potential for the Town to develop policies and practices that show leadership in this area, is a complementary pathway to the current carbon neutral project. Greenhouse gas abatement actions often achieve the same objective, moving away from non-renewable oil energy sources and changing to practices that favour renewable or less greenhouse gas intensive energy sources.

## AIMS

This report aims to:

- Determine the policies and practices leading councils are using to address peak oil to report on their potential to be used for the benefit of the Town, businesses and our community; and
- Determine the potential impacts of peak oil on the Town of Cottesloe, businesses and our community.

## LEADING COUNCIL'S POLICIES AND PRACTICES

### *Brisbane City Council, Qld*

Brisbane City Council (BCC) convened a Climate Change and Energy Taskforce in August 2006 to advise Council on preparing the City for climate change and peak oil. The “Final Report – A Call for Action” (BCC 2007) represents the work of this taskforce and its recommendations to Council.

The “Final Report” was the first step for BCC to identify the risks to Brisbane from both climate change and peak oil and to provide integrated solutions. The Report summarized peak oil as inevitable rise in petrol prices that will affect our economy and society:

- Peak oil is closely related to climate change and means that the world will not be able to increase the rate of oil production to meet growing demand, even though we may be far from emptying the world's oil wells.
- Over a period of years, petrol prices will continue to rise. This will create hardship for people who can't afford the increases but who rely on their cars for their primary mode of transport. It will also affect our economy through higher freight costs, flowing through to the price of goods, especially food.
- As a nation (or city), if we can reduce our reliance on foreign oil we will be able to stabilize our economy and improve public health, as well as positively influence Australia's balance of payments.

(piii BCC 2007).

BCC's integrated approach fits with addressing peak oil as part of the Town of Cottesloe's carbon neutral project.

## ***Marrickville Council, NSW***

Marrickville has committed to reducing transport related greenhouse gas emissions and their oil consumption through signing the Oil Depletion Protocol (ODP) and forming an internal working group to reduce oil consumption. In August 2007 Marrickville Council became the first local council in Australia to sign the ODP. The ODP was established to encourage a world-wide reduction in the consumption of, and dependence upon, oil. The protocol is an international agreement designed to deliver these reductions in a collaborative way. Individuals, businesses, non-government organisations and governments have signed up to the ODP. As a signatory to the ODP, Marrickville has committed to reducing its oil consumption by 3% per annum.

In the 2008-2009 financial year Marrickville reduced oil consumption by over 6% on 2007-2008 levels. Marrickville achieved this by reducing fuel and engine oil consumption through:

- introducing the use of a 20% biodiesel fuel across the heavy vehicle fleet;
- trialling the use of 100% biodiesel in four resource recovery trucks;
- encouraging the use of 10% ethanol blend fuel in the passenger vehicle fleet; and
- purchasing more fuel efficient and hybrid vehicles.

Marrickville Council reports annually on fuel consumption as part of their Sustainable Purchasing and Peak Oil Action Plan. Marrackville has only targeted their oil and fuel consumption, which has decreased by at least 3% each year over the three years of data provided on their website (2006/2007-2008/2009). The fuel related reductions have been achieved without huge changes to normal operations. Signing the ODP has helped to justify trialling of new fuel alternatives. Marrackville plans to increase their efforts of reducing oil consumption to their purchasing decisions in the near future.

The Town could become a signatory of the ODP as a political ongoing commitment to reducing oil consumption by 3% each year. This may help to raise the profile of peak oil. If Council chooses to become a signatory to the ODP then Cottesloe would be the first council in Western Australia to join. However, the ODP has been criticized as being outdated and ineffective in achieving its goals. The same outcomes could be achieved for Cottesloe by addressing peak oil through the Carbon Abatement Plan, which could also set reduction goals for oil consumption. To help raise the profile of peak oil Council should engage their community and support a consolidated lobbying position of State and Fed Governments through WALGA.

The Town should consider alternative fuel options as part of their strategy to reduce oil consumption and greenhouse gas emissions. Many of the new engine technologies and fuels are at varying stages of development (CSIRO 2008). There are also equity issues in relation to the quality of life for people in developing countries if biofuel production increases to a level that agricultural food production is diverted to biofuel manufacture (CSIRO 2008). The Town will need to consider the ethics behind options and ensure that we are not creating new problems while addressing climate change and peak oil. Since the Town's fleet is small, it seems appropriate to determine the feasibility of sourcing local biofuel resources if it can be done economically.

### ***Darebin City Council, Vic***

In 2009, Darebin Council adopted a combined Climate Change and Peak Oil Adaptation Plan (Taygfeld & Burton 2009). It took just over 12 months from commissioning to completion and involved every area of Council, from rubbish collection to aged care, identifying adaptation actions they would commit to.

The Adaptation Plan has a detailed background of the issues of both climate change and peak oil and then sets out a plan of action for Darebin to adapt across operational areas. This document is well researched and provides an excellent example for the Town if Cottesloe chooses to develop an integrated climate change and peak oil plan.

Darebin Council receives an annual report on progress, consistent with their internal Climate Change Action Plan and Community Climate Change Action Plan. It would be appropriate for Cottesloe Council to receive a combined annual reporting update on greenhouse gas emissions and peak oil, consistent with recommendation 5 in the Carbon Inventory Report 2009/2010.

### ***Maribyrnong City Council, Vic***

Maribyrnong City Council (MCC) developed a Peak Oil Policy that provides background information and three scenarios of peak oil occurring: long term; oil shocks or disintegration. The Policy seeks to regulate petro-chemical products within MCC operations.

MCC Policy covers selected oil-based products: petrol, diesel, LPG, natural gas, and non-recycled asphalt; since MCC has direct control over their use. MCC has set a 3% reduction target per year for the included oil-based products.

Indirect consumption of oil products will be addressed through MCC's purchasing policy and advocacy of State and National governments to address oil and petro-chemical use. MCC has set a target of increasing purchase of green products by 1.5% per year.

The MCC Action Plan provides a good example of what the Town could do to address peak oil. The MCC Action Plan defines the oil-based products that are targeted, which makes the process transparent. Three scenarios of peak oil, described in the Peak Oil Policy, identify and prioritise the urgency of actions. This example could be used by the Town to more accurately determine the impacts of peak oil on its operations and how it can make changes to build resilience.

In June 2009 MCC released a Peak Oil Contingency Plan that presents results from internal workshops to maximise Council's business continuity ability in the face of a short term supply crisis or a long term, gradual depletion in petroleum resources (p1, Fishman *et al.* 2009). This document also provides guidance for the Town to assess, in very good detail, how peak oil will impact upon operations and services and ways to build resilience.

## ***Lake Macquarie City Council, NSW***

Lake Macquarie City Council (LMCC) completed an Oil Vulnerability Study (2010) that also provides a good example of what the Town could do to address peak oil.

LMCC has committed to promoting understanding of the world's oil depletion problem, and to working with its citizens and other stakeholders to identify and raise public awareness and respond to the threats posed by predicted future oil supply vulnerability.

LMCC Goal:

To provide a policy and framework to assist Council and Lake Macquarie City citizens to respond responsibly and proactively in the face of a declining oil supply and associated rise in the cost of fossil fuel.

The Peak Oil Plan, policy and guidelines for LMCC are all in the same document. This document sets out support for a transition to reduce reliance on crude oil and shift to more sustainable energy supply.

Three months after the LMCC Vulnerability Study was released a LMCC Vulnerability Schedule of Activities (2010) was released that sets out activities for LMCC to achieve their goal.

## ***City of Stirling, WA***

The City of Stirling (COS) was the first West Australian municipality to develop a response to the emerging global energy crisis (COS Sustainability Annual Report 2009/2010). Peak oil is mentioned in the COS's Integrated Transport Strategy. The City is drafting a Peak Oil Strategy to respond to escalating oil prices and insecure supplies. The Strategy will provide a 'road map' to help COS implement a planned transition to the carbon-constrained future by identifying outcomes that will be needed to make their organisation and communities more sustainable.

## ***Shire of Mundaring, WA***

The Shire of Mundaring has prepared a Local Planning Strategy that sets out long term planning directions for the Shire and will guide land use planning over the next 10 to 15 years. One of the key themes for the Strategy is peak oil. The Shire is aware that as a regional municipality they are vulnerable to peak oil and so they are showing leadership in this area.

## **POTENTIAL IMPACTS OF PEAK OIL**

It is difficult to accurately predict the timing of peak oil because limited data is available and there is potentially a political influence of information. Consumption rate and dependence on oil-based products will also dictate when peaking will occur and the impact that it will have. The benefit of early mitigation is that it is cost-effective, reducing dependence on increasingly expensive fuels. The impacts of peak oil will be more distressing if the Cottesloe community and Council is given no time to adapt and adjust lifestyle and operations.

Cottesloe as a suburb falls within a low risk profile from peak oil since it is a metropolitan suburb and many residents enjoy a relatively high socioeconomic status. Factors that increase Cottesloe's resilience to peak oil include access to public transport and a healthy local business community. This may reduce community expectations for the Town to assist with adaptations from peak oil. However, it would be remiss to encourage complacency since peak oil is surrounded by uncertainty and has the potential to erode the high standard of life that is enjoyed in Cottesloe.

### ***Cottesloe Town Council***

As with all Councils, Cottesloe is vulnerable to increased transport, fuel and goods prices from peak oil. Any oil price increases will flow through freight costs to most other items in the economy. In sudden and extreme peak oil scenarios vulnerability is most severe because Council forecasts budgets for the financial year ahead. This limits the Town's capacity to respond to unexpected price increases. An example of this was the announcement of Western Power's increased streetlight tariffs for the 2011/2012 financial year after the Town's budget had been finalised. The Town now must adjust expenditure to cover electricity costs for street lighting. If the Town begins to shift away from dependence on goods with large travel miles and oil-based products then it will decrease its vulnerability to price increases associated with peak oil.

The Town, like many local governments, offers vehicles as part of the staff remuneration package to recruit experienced and/or qualified employees. The fleet relies on oil for fuel sources, which makes Council vulnerable to peak oil. All petrol and fuel is paid for by the Town. Figure 1 demonstrated the range of price increases that may occur from peak oil. Oil prices will affect weekly fuel bills, increasing from A\$40 in 2007 to between \$50 and \$220 in real terms in 2018 for a medium passenger vehicle (CSIRO 2008). The high end of this range should be considered as a worst-case scenario resulting from international oil supplies abruptly declining and fuel and vehicle manufacturers being unable to quickly provide alternative supplies and technologies. The Town has implemented a policy of purchasing smaller, fuel-efficient vehicles over fuel hungry larger vehicles. There may be scope to provide staff with a travel allowance instead of a car (providing the car is not required for operational needs) so that they can decide how much money they spend when commuting to work. This provides a financial incentive to use less fuel or public transport. The Town could also investigate options of alternative fuels for the fleet, which may consider hybrid or electric vehicles. Flexible working

arrangements, including agreements for certain staff to work from home, may also build resilience for the Town against increasing fuel costs.

**Table 1. Staff commuting distances to the Town of Cottesloe**

<b>Distance from Cottesloe</b>	<b>No of Staff</b>	<b>Percentage of Staff</b>
< 10 Km	3	7.5%
10 Km < 20 Km	20	50%
20 Km < 30 Km	14	35%
> 30 Km	3	7.5%
<b>Total</b>	<b>40</b>	<b>100%</b>

Many staff commute long distances to work each day (Table 1), which makes the Town vulnerable to peak oil. Although a survey has not been completed on the preferred mode of travel, it is apparent that most staff rely on cars as their primary mode of transport. Although Cottesloe is proximate to the train and bus lines most public transport services in Perth go to the city. It is likely that staff using public transport would need to catch connection services in the city, which normally doubles the commute time in comparison to car travel time. As fuel prices increase staff may find that the expense of driving to work each day becomes too cumbersome and be forced to find work closer to home or where they have direct public transport services. By introducing incentives for staff to use alternative transport (e.g. public transport, car pooling, and bicycles) the Town will become more resilient to peak oil.

Peak oil will affect most of the operations and services that the Town provides, since transportation and fuel cost increases will be added to goods, materials and contracted services. Important areas for consideration include emergency management response, which often relies on transportation; waste collection, which relies on fuels for transport; and road and infrastructure maintenance, which uses oil-based products and relies on fuel for completing tasks. All of these services may have a sudden, significant price increase if the extreme scenario of peak oil is realised. It is also important to consider peak oil when determining operational changes, such as the new location of the Town's Depot. If the agreed location is too far away then the Town will increase its vulnerability to the impacts of peak oil. The Town is not well positioned to cope with sudden increased costs across all business areas, which make it vulnerable to the impacts of peak oil.

### ***Cottesloe Business***

Local businesses in Cottesloe are vulnerable to product and goods price increases associated with peak oil. It seems likely that their major vulnerability to peak oil, however, is related to delivery and transportation. Proximity to the railway from Fremantle and Perth, and bus services on Stirling Highway, might alleviate this problem. However, if rail and buses are unable to cope with the sudden increased demand then local businesses may be forced to reduce stock or, in extreme events, shut down.

Cottesloe is a regional beach destination, making it a “must-see” for tourists, which creates a seasonal market for local business. Since tourism to WA relies predominantly on air travel it is likely that the time after peak oil will reduce customers for Cottesloe local businesses. Local business may wish to increase their promotion to the local market to build resilience against this vulnerability to peak oil.

If local businesses have time to adapt to these risks then they will be able to build resilience. Some ideas could include growing local gardens, selling local produce, even implementing “local” money to encourage the community to shop locally. Locally-grown and manufactured is the most resilient scenario against peak oil. Since local businesses create resilience for the Cottesloe community to access goods and services, it is important for Council to continue supporting businesses. It is already Council policy to support local businesses through the Purchasing Policy, which preferences Australian made and/or locally sourced.

### ***The Cottesloe Community***

The Cottesloe community falls within a low-vulnerability profile against peak oil (Dodson and Sipe 2008) since residents are typically wealthier, with access to good public transport services and more likely to walk or cycle in comparison to outer suburbs. Wealthier communities will be less impacted by increased fuel prices as the cost of transportation will be a lower percentage of their income. In other words, although price increases will have an impact, residents are able to use more of their disposable income to cover the cost. Commodity-rich residents who have money tied-up in investments may be more vulnerable to increased costs of goods and fuels if peak oil occurs suddenly.

A correlation has been found between the price of fuel and mortgage interest rates (Dodson and Sipe 2008). Dodson and Sipe found that as fuel prices increase, mortgage interest rates also increase. The 2006 census indicated that 50% of Cottesloe residents have monthly repayments of \$2,000 or more for their mortgages (WESROC 2010). 56% of Cottesloe residents that completed the 2006 census indicated that their individual weekly income was within the top 50-100% percentile (WESROC 2010). Weekly household income data from the 2006 census indicated 30% of the Cottesloe community earned over \$130,000 per year and another 30% earn \$52,000 to \$130,000. It is difficult to estimate the proportion of income that mortgages represent for residents but the income statistics suggest that the majority of the community are well placed to handle price increases from peak oil. However, it is possible that a sudden increase in both fuel prices and mortgage repayments could place some pressure on the local community.

Trends from the 2006 census, in comparison to the 2001 census, indicate that Cottesloe residents are increasing their reliance on car transportation. The 2006 census indicated that there was an increase in the number of two-car families and a decrease in the number of one-car families. Almost 60% of the Cottesloe community surveyed drove to work on the day of the census in 2006; 10% caught the train or bus; 2.4% walked; and 2.3% bicycled to work (WESROC 2010). About a quarter of the community surveyed worked locally, and 7.2% worked from home. The trend of increased car dependency creates vulnerability for the Cottesloe community to the impacts of peak oil.

Food security and access to healthcare for the Cottesloe community in response to peak oil impacts should be considered in great detail. The implications of peak oil on food supply for Cottesloe are not well understood. Hopefully Cottesloe will be resilient due to its proximity to Fremantle Port and the railway line. Increased reliance on locally grown food and a change to eating new foods will be necessary if supplies are disrupted significantly. Pharmaceutical products will increase in price and possibly be more difficult to source as oil prices increase. There may also be an increased need for home visits to the elderly as transport costs exceed their income. The community demographic may change if there is a shift towards multi-generational housing as children move in with older parents to live closer to the city, sharing costs, providing health care support, and growing food.

Community education is essential so that residents have time to adapt to peak oil. To identify the full implications of Peak Oil on the Cottesloe community it would be necessary to map high risk areas and ensure that they will have access to community transport and centres. It may be useful to survey community needs as part of a climate change and peak oil engagement process.

## **SUMMARY**

If Council chooses to act in response to peak oil from the findings in this report it will be necessary to acknowledge that there will be no rigid plan of action to quickly manage the problems. Due to the lack of certainty around the timing of peak oil a range of scenarios will need to be considered and the risks and implications of each upon the Cottesloe Town Council; businesses; and community will highlight the range and extent of vulnerabilities. Developing an integrated greenhouse gas emission and peak oil plan is an appropriate way to holistically consider the issues around global warming and depleting oil supply. The financial investment required to achieve these objectives would be clearer after the Carbon Abatement Plan has been completed. Local government is well placed to provide a catalyst that triggers action from the community and raise the profile of peak oil so that it becomes a priority for State and Federal Governments.

## **RECOMMENDATIONS**

1. That Council establish an oil consumption reduction target.
2. That Council support the community and local businesses by engaging them on the issue of peak oil and helping them to prepare for it.
3. That Council address its indirect vulnerability to peak oil by setting a purchasing target to reduce reliance on oil-based products by increasing use of recycled materials and/or shifting to greener alternatives.
4. That Council endorse reducing the Town's operational oil consumption through a Carbon Abatement Plan, which is being prepared as part of the Carbon Neutral Project, in order to address vulnerability to peak oil in a holistic way.

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