SUSTAINABLE DEVELOPMENT AND GREEN TRANSPORT IN AUSTRALIA

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Abstract:
Environmental pollution is one of the main restrictions of sustainable development. We examine whether or not freight transport is sensitive of the environment in Australia, particularly in the state of Victoria. Because, freight transports is one of the significant factors of environmental pollution. In the study we discuss the decision taken by the government of Victoria; and what kind of measurement is applied by the government. We also discuss which policy should be followed to achieve green transportation. The aim of the study is to determine the effects of environmental measurement on growing of the transport sector. The economics of Australia has a structure growing fast, in order to parallel the increasing growth of the transport sector. It tries to apply Kyoto protocol to the transport sector. In conclusion, the environmental pollution and CO$_2$ emissions decrease in Australia although the transport sector grows day by day.

Keywords: Transportation, Freight, Environment, Green Transport, Road Transport, Truck, Australia

JEL Classification: L62, L91, L92, N7, N77, O18, O56, Q01, Q51, Q53, R40, Q32, Q56

1. INTRODUCTION

In the world, vehicle ownership and traffic have grown so fast. It makes a big problem for environment. In this study we imply the effects of freight transport particularly trucks on the environment in Australia. The environmental problems of freight transport are examined on three ways. First is air pollution, second is water pollution and third is accident caused environmental pollution.

The share of transport in emission among power industry households increases. Growth in transport emissions is the key challenge for most developed economies. At the present, the share of emission in transport is almost 10%. One of industrial countries is Australia. In Australia the per capita is more than 24000 US$ and the population is over 20000000. Heavy-duty trucks emission standards are 1.30 for Diesel powered. Australia fares well by comparison with other countries. Road transport is the major source of GHG emissions from the Australian freight sector (Rare Uncommon thinking).

Transport is now the worst performing sector under the Kyoto Protocol and seriously jeopardises the achievement of (Europe’s) Kyoto targets (Sperling, 2009).

Although transportation provides the economy with numerous benefits, these positive aspects are not without associated costs. There will be a growing challenge in the 21st century to ensure efficient transportation facilities and mobility by maintaining our present system and developing new facilities to meet the growing needs of individuals and organizations (Peirson, Vickerman, 1998:68).

Compared to other advanced capitalist nations, Australia has a relatively small heavy industry sector. But the per capita is height and the consumption is height too so the items transport arouse by day by as depend of per capita.
2. ENVIRONMENTAL EFFECTS

It is possible to identify the environmental effects in many ways, but it is classified as: macro effects, meso effects and micro effects.

Macro effects are Green gas effects, renewable sources, Meso level effects are emissions, general effects and Micro effects are noise annoyance, visual intrusion, health irritants, erosion or destruction of heritage, physical impacts on hydrology or hydrogeology (Kilbsy:2). These effects are known as external costs though.

Environmental impacts are distinguished according to their geographic scale-global, regional and local, while public health impacts are distinguished according to their time scale-long term, medium term, short term (Kemp & Moors, 2003:313).

Public awareness of global warming increases, there is more focus by shippers and transporters on reducing CO₂ footprints (Penman, 1994: 165). Commercial trucking, especially long haul where most fuel is consumed, places high importance on fuel efficiency, simply because fuel is a major part of a fleet’s operating cost. There are two sides in CO₂ emission, domestic and international (Faure, 2003: 18).

Air pollution costs refer to damage caused mainly by motor vehicle emissions. This costs estimation includes human health, environmental damage and avoidance actions (such as restrictions on sports and other personal physical activities during air pollution events) resulting from various air emissions produced by motor vehicles (Siriukiapanichkul, 2006:11).

According to the US National Climate Data Centre (2001), global temperatures increased by over 1 degree Fahrenheit over the course of the last 120 years, and will likely rise even more during this century (Siriukiapanichkul, 2006:14).

3. SOME STATISTICAL DATA

In the period from 1971-72 to 2012-13 the total road freight estimate for Australia increased from 27.0 billion tkm (tonne-kilometres) in 1971-72 to 203.6 billion tkm in 2012-13 (Australian Government, Department of Infrastructure and Regional Development, Bureau of Infrastructure, Transport and Regional Economics, Information Sheet).

Road transport is the major source of GHG (Green House Gases) emissions from the Australian freight sector. The share of road transportation is 88%. Greenhouse Gases (GHG) emissions by sectors transportation is 6% (Hashmi 2008). The share of the transport in global warming is 20% and the share of the industry is 57% (Bruggink, 2003: 279).

We can see that the role of transport in the global warming is very high. Emissions of CO₂ from Fuel Combustion (Mt CO₂) in Australia were 259.8 in 1990 years but in 1999 this rate was 321.6, therefore the change of the rate 99/90 was 23.8 %. Target was +8%.

Table 1: Commercial road vehicles account for a disproportionate share of road-related GHG emissions and vehicle related air pollution in our cities (2008)

<table>
<thead>
<tr>
<th>Vehicle</th>
<th>% of Australian Fleet</th>
<th>GHG Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passenger Vehicles</td>
<td>77.9 %</td>
<td>60 %</td>
</tr>
<tr>
<td>Commercial Vehicles</td>
<td>18 %</td>
<td>38 %</td>
</tr>
<tr>
<td>Other</td>
<td>4.1 %</td>
<td>2 %</td>
</tr>
</tbody>
</table>

Source: Rare Uncommon thinking

In the table 1, the proportions of commercial vehicles are low but GHG contribution is high with compare to the percentage of the passenger vehicles. Another meaning is that the numbers of the passenger vehicles are much higher than the numbers of the commercial vehicles but the rate of GHG contribution of commercial vehicles is much higher than the passenger vehicles.
Table 2: Bulk and non-bulk Australia domestic freight task, total (billion tkm) and by mode (% share)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Road</td>
<td>83.5 31%</td>
<td>139.4 37%</td>
<td>192.1 34%</td>
</tr>
<tr>
<td>Rail</td>
<td>91.1 34%</td>
<td>136.9 36%</td>
<td>258.6 46%</td>
</tr>
<tr>
<td>Coastal Shipping</td>
<td>93.8 35%</td>
<td>104.5 27%</td>
<td>114.8 20%</td>
</tr>
<tr>
<td>Total</td>
<td>268.4</td>
<td>380.8</td>
<td>565.5</td>
</tr>
</tbody>
</table>

Source: SAFC (South Australian Freight Council) Green Transport, March 2014

Table 2 indicates that the domestic freight task by mode in road and rail increases but it decreases in coastal shipping. Domestic freight task tends to the road and the rail by mode in the 2000s.

Table 3: Economic Growth Rates (%)

<table>
<thead>
<tr>
<th></th>
<th>Australia</th>
<th>OECD</th>
<th>Japan</th>
<th>USA</th>
<th>China</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010-2011</td>
<td>2.2</td>
<td>2.6</td>
<td>1.9</td>
<td>2.7</td>
<td>9.8</td>
</tr>
<tr>
<td>2011-2012</td>
<td>3.6</td>
<td>1.9</td>
<td>1.5</td>
<td>2.2</td>
<td>8.5</td>
</tr>
<tr>
<td>2012-2013</td>
<td>2.7</td>
<td>1.0</td>
<td>0.2</td>
<td>1.8</td>
<td>7.8</td>
</tr>
<tr>
<td>2013-2014</td>
<td>2.4</td>
<td>2.2</td>
<td>1.9</td>
<td>2.4</td>
<td>7.5</td>
</tr>
<tr>
<td>2014-2015</td>
<td>2.6</td>
<td>2.8</td>
<td>1.3</td>
<td>3.0</td>
<td>7.3</td>
</tr>
</tbody>
</table>


Table 3 give us the economical growth of Australia by years. The rate is slightly down but it is positive and the rate is stable. It can be seen that the economy grows in Australia.

Table 4: Exports and Imports in Australia

<table>
<thead>
<tr>
<th></th>
<th>2005-2006</th>
<th>2012-2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exports ($Billion)</td>
<td>130.9</td>
<td>221.3</td>
</tr>
<tr>
<td>Imports ($Billion)</td>
<td>122.2</td>
<td>184.4</td>
</tr>
</tbody>
</table>


In table 4, it is seen that the foreign trade in Australia increases in the year. The rate of export is greater than the rate of the import. Additionally the share of export is bigger than the share of the import in Australia in 2012-13.


4. SOLUTIONS

Many researchers believe that air pollution can be significantly reduced by a policy focus in the following areas. Transport policy, travel demand management and land use planning models.

Control of \(CO_2\) emissions from heavy duty trucks requires unique metrics, technologies and public policies. The role of trucking in the Australian economy increases nowadays. There are only two fundamental strategies for \(CO_2\) reduction from heavy trucks: improved fuel efficiency and expanded use of alternative low-carbon fuels. Using current...
or foreseeable technologies, it is unlikely that diesel engines will be replaced over the next 20 years, although it is likely that diesel hybrid systems will be deployed. Pure electric drive trains, including battery fuel cell or plug in hybrid electric system, will not be possible in the heavy duty truck sector without a major breakthrough in battery or fuel cell technology, except in very limited local operation (Quinet, Vickerman, 2004: 137).

Besides making the existing transport system more sustainable there should be an effort towards system innovation involving radical change in the way in which we satisfy our mobility needs.

Rail roads offer the logistics manager cost-effective energy efficient transport of large quantities of goods over long distances (Kent, 2006: 89).

Australia try to decrease the environmental pollution derived from transport by supporting the infrastructure on railways. The State government’s Infrastructure Planning Council after making some encouraging statements about sustainability, demanding that the true social environmental and economic costs of transport be recognised talking about integrating the public transport system and changing behavioural patterns, then concludes that by 2020 ‘the road system will be fully connected including the completion of the metropolitan freeway and ring road system and other key regional (road) project’ (Victoria, Infrastructure Planning Council, 2001). (OECD: 2001)

There are immediate opportunities available to federal and state governments to reduce carbon emissions in the short term. The first is the greater utilisation of rail for long distance freight. Rail freight is one of the most carbon-efficient methods for transporting freight long distances. Road accounts for 89% of greenhouse gases from the freight transport sector. Rail accounts for 6% (Harvey, 2008).

One intermodal freight train travelling between Sydney and Melbourne replaces 150 trucks and saves 45,000 litres of fuel and 44 tonnes of greenhouse gases.

Freight sector management framework is to develop urban freight infrastructure, to optimise road network utilisation for freight and to encourage investment in GHG positive freight technologies.

Vehicle monitoring systems are widely used by the freight transport industry and are under continual improvement. They provide an effective means of managing vehicle performance. Aggregated drive train and vehicle technologies have the potential to deliver significant benefits in terms of reduced fuel consumption (Cline, 1992).

A range of tyre management techniques and technologies are currently available as a cost effective means to achieve incremental but significant improvement in fuel consumption.

5. CONCLUSIONS

It can be estimated that the environmental pollution derived from freight transport is taken care on the data and the literature in Australia. Particularly the government and business side work to decrease the negative effects of environmental problems. They try to control the rate of emission under the global targets and Kyoto range.

While the growth rate of economy increases, the environmental problems decrease during the last days. It will be better in the future, because the measurements to stable the issue are implemented. Some measurements to decrease the pollution involve the innovation in transport like diesel hybrid systems, pure electric drive trains, including battery fuel cell or plug in hybrid electric system. Besides the government conduct new legislations and act to achieve the target taken by the industrialised countries about the global warming.

On the other side, the rail road transportation is more sensitive on the environment than the road. Therefore the councils in every state in Australia especially in Victoria plan to investment the infrastructure on rail roads, because the emission of CO₂ is put down. Besides, the owners of the trucks are more efficient than before. They follow new technology while they compete with each other and the competitors in the other countries.

In Victoria there is a big port in Melbourne and many containers are delivered inland through road and rail road. It is known that it has one of the more efficient rail roads in freight transport to transfer the containers to the inside of the middle Australia.

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