Start-Up Compliance Costs of the Carbon Tax for Australian Liable Entities

Nthati Rametse

The implementation of the Carbon Tax on the 1st July, 2012 presented the overall commitment for Australia to stabilise greenhouse emissions in an effort to prevent climate change. This paper discusses the start-up compliance costs of the Australian carbon tax for liable entities, for the period up until 30th June 2012. The study contributes to compliance costs literature by assessing the magnitude of the implementation costs of a new tax. A survey of 35 liable entities undertaken in September 2012 and telephone interviews with ten of these entities conducted in April, 2013, estimated the start-up compliance costs at $1,795,762 per liable entity. Although a majority of respondents (60 per cent), supported the government’s plan for a clean energy future, most of these enterprises (65 per cent), find the carbon tax complex. In conclusion, despite the high gross carbon tax start-up compliance costs there are potential benefits to be derived as a result of the carbon tax implementation. Whist the carbon tax is in place, policies that target reduction of carbon tax compliance costs for business are vital.

JEL CODES: H2, K32, M13

1. Introduction

Like the rest of the world, the Australian economy and the environment are affected by the global climate change. Consequently, this has caused a concern that needed policy makers to quickly take action. The United Nations Framework Convention on Climate Change in 1993 set out the provision that encouraged industrialised countries to stabilise the greenhouse emissions. The Kyoto Protocol was adopted on the 11th November, 1997, and entered into force on 16th February, 2005 (United Nations, 1998). The Kyot Protocol controls the release of Green House Gases (GHGs) from human activities. Moreover, the Garnaut Climate Change Review (2008), commissioned by Australia’s Commonwealth, State and Territory Governments in 2007, noted that carbon dioxide emissions (CO₂) from fossil fuels represent the largest and fastest growing source of GHGs, up to 3 per cent in the early 21st Century.

Australia under Prime Minister Kevin Rudd ratified the Kyoto Protocol in 2007. Thus, the election of the Labour government resulted in committing Australia to devise national measures to meet its emission target of 108 per cent of 1990 emission levels. These include “certain regulations and standards, the uptake of renewable energy technologies, and more efficient methods of using energy” (Stathakis and Griffiths 2009, p3). Despite the political debate on costs and benefits of introducing the carbon tax in Australia, coupled with the Australian Liberal Party’s criticism on this issue (Sydney Morning Herald, 16 August, 2010), the Australian Senate, on the 8th November, 2011 passed a legislation that introduced the carbon tax, starting on the 1st July, 2012. The carbon tax forces polluters or liable entities to pay per tonne of the carbon they release into the atmosphere. Start-up compliance costs are the costs incurred by enterprises in preparing to comply with the tax legislation.

Nthati Rametse, Lecturer, RMIT University, College of Business, School of Management, GPO Box 2476V, Melbourne 3001, Australia. Email: nthati.rametse@rmit.edu.au.
The motivation for this study was whilst challenging for Australia to find ways of achieving its target obligations, how this tax would impact on Australians, in particular, around 500 Australian direct carbon-emitting companies. Studies (for example, BCA 2007), have confirmed the importance of Australian businesses, particularly large businesses, as they contribute a significant portion of total tax revenues. In 2008-09 large business represented 63 per cent ($37.8 billion) of income tax collections from companies and 53 per cent ($20.2 billion) of total net GST (Inspector-General of Taxation, 2011). Additionally, “the business tax burden is far wider, and consequently heavier, than generally assumed” (BCA 2007, p.2). The Australian Industry Group (AiGroup) and Deloitte (2011) reported around 37 per cent of respondents anticipating a carbon pricing-related regulation to be a major driver of increased compliance costs in the next three years (AiGroup and Deloitte, 2011). This then raises the questions: Will carbon liable entities incur high costs of implementing the Australian carbon tax? Will these liable entities expect to derive benefits resulting from the implementation of the carbon tax?

The current political debate on repealing the Australian carbon tax is beyond the scope of this paper. The primary focus of this research was to estimate gross start-up tax compliance costs of the Australian carbon tax for the year up until June, 2012. The findings of this study differ from other studies. Prior to the implementation of the carbon tax, some studies (for example, RIS, 2011) used existing research of start-up compliance costs of similar taxes, to assess the magnitude of carbon tax start-up compliance costs. Moreover, studies that estimated start-up compliance costs of the Australian carbon tax prior to its implementation provided their magnitude based on expectations. This study differs as its results are based on factual responses from liable entities, hence provides robust estimates. This study’s findings also confirm that a majority of liable entities from a highest turnover range (over $700 million) expected benefits in record-keeping resulting from carbon tax implementation. Most compliance costs studies have found smaller businesses benefiting more as they have less complex systems than larger businesses (Sandford and Hasseldine, 1992; Rametse and Pope, 2002). Investigation of the “economies of scale” of carbon start-up tax compliance costs for liable entities in Australia was also central to this study. Additionally, an expectation by businesses on benefits from better record keeping and investment in renewable technologies brought about by the carbon tax was explored. The study’s objective was to also investigate the attitudes of liable entities towards the government’s plan for a clean energy future and the extent of the complexity of the carbon tax itself.

The significance of this research is that although start-up compliance costs in economic terms are “sunk costs” that may never be recovered; this study is a contribution to the body of literature in understanding the costs incurred by liable entities resulting from the implementation of a carbon tax. On the international front, countries yet to introduce a similar tax, for example South Africa, will learn from the Australian experience regarding the magnitude of the cost of implementing a carbon tax from the perspective of liable entities. Furthermore, they could also learn ways to mitigate these compliance costs from the Australian experience. Whilst making international comparisons is important, figures should be treated with caution as they “would be more likely to mislead than enlighten” (Sandford 1995, p405). This is due to different tax structures, systems and processes of various countries.

The purpose of this paper is to report on the preliminary findings of the cost of implementing the carbon tax from a survey of 314 Australian liable entities, which was undertaken between
September, 2012 and April, 2013. To begin with, section 2 discusses the context of the Australian carbon tax. The studies that relate to the tax compliance costs are reviewed in section 3. The fourth section focuses on the methodology and the data collection process used in this study. Section 5 and 6 present the theoretical framework and the analysis of the results respectively. Section 7 provides conclusions.

2. The Context of the Australian Carbon Tax

A carbon tax is charged on polluters, at a price of $23 at the start (from 2012-2013), increasing to $24.14 in 2013-2014 and $25.40 from 2014-2015. Businesses that are liable for pollution, as per the Clean Energy Act 2011 criteria, are required to monitor their own carbon pollution levels and report them to the Clean Energy Regulator (a government body that is responsible for administering the carbon tax legislation), under the National Greenhouse and Energy Reporting System (NGERS). The price is fixed for the first three years and flexible from 1st July, 2015.

The reason behind a carbon tax is its ability to force businesses to find new ways to reduce pollution. A Swedish study concluded that the carbon tax reduced emissions of carbon dioxide in line with Swedish environmental policy (SEPA, 1992). The Australian government has noted that on account of the carbon price, goods and services that are produced with energy will be more expensive. Baranzini, Goldemberg and Speck (2000) state that the carbon tax incentive effect is a ‘direct effect’ through price increases, stimulating conservation measures, energy efficient investments, fuel and product switching, and changes in the economy’s production and consumption structures.

The government acknowledged that although households will experience rising costs in some goods and services, the overall impact on prices will be minimal. In order to compensate their cost of living, around 9 out of 10 households will receive tax cuts and increased payments. Furthermore, the carbon tax revenue will be used to support jobs in the industries that are predominantly affected and build a new clean energy future. Baranzini et al (2000) also identified this as an “indirect effect” incentive, through the recycling of the collected fiscal revenues, hence important. Recycling revenues to households could be through personal income taxation cuts and to business through reduction in the wage costs and changes in the corporate tax scheme. If these fiscal revenues are not distributed, carbon taxes impose a higher cost to polluters (Baranzini et. al, 2000). Thus, higher costs are a result of abatement costs, plus the tax that liable entities still have to pay on their residual energy consumption. Abatement costs are all the costs related to emissions reduction activities, for example, fuel switching and technology change (Baranzini et. al, 2000).

Liable entities, which are required to report their own total emissions each year, include all facilities that cause emissions of GHGs that have a CO$_2$-e of 25 kt or more per year (RIS, 2011, p55). These entities are predominantly coal-fired electricity generators, mining companies, and steel and aluminium manufacturers.

The Regulation Impact Statement (RIS, 2011) asserts that the carbon tax would result in business certainty in the short-term as the tax rate is known. The RIS focuses on how the new tax law would impact on the taxpayer compliance costs as far as operating costs are concerned. The RIS also state that in the long-term, where the tax rate may change, business uncertainty may occur. Additionally, while the RIS (2011) notes that a carbon tax is a source of government revenue which could provide transitional assistance to both households and
businesses, such as supporting the development of low emissions technologies; it acknowledges it does not guarantee that any particular emissions outcome will be reached. The government believes that it is important for Australia to support international objectives and obligations, environmental effectiveness and budget neutrality.

Unlike the implementation of the Australian Goods and Services Tax (GST), the Australian Competition and Consumer Commission (ACCC) does not have a role in formally monitoring, setting or restricting price increases linked to the carbon price, assigned by Government. The ACCC can, however, act against false and misleading conduct under the *Competition and Consumer Act 2010* (ACCC, 2013). The ACCC reported that within three months of the introduction of the carbon tax there were low complaint levels due to the ACCC’s commitment in a balance between education and quick pursuit of early enforcement (Daily Telegraph, 2013).

3. Literature Review

Current compliance cost research has mostly built on the work of the United Kingdom (UK) Professor Sandford (Sandford, 1973, Sandford, Godwin and Hardwick 1981; Sandford, Godwin and Hardwick, 1989; Sandford and Hasseldine 1992; Sandford, 1995). However, although Sandford recognized the theoretical importance of start-up costs, he did not make any estimates in this area, probably because at the time of his various studies, the taxes he investigated were well established in the UK (Rametse and Pope, 2002). The carbon tax start-up compliance cost study builds upon Rametse and Pope (2002) research on start-up compliance costs of the Australian Goods and Services Tax (GST), which was a new tax at the time of its investigation.

In 2006, total estimated tax compliance costs in Australia, reported by 64 respondents were $101.1 million, with an average of $1.6 million (BCA, 2007, p29). Pope (1994) estimated the compliance costs of Commonwealth taxes at $7,873 million in 1990/91, representing 11.9 per cent of the $65,931 million revenue from these taxes (Pope 1994, p92). Evans, Ritchie, Tran-Nam and Walpole (1997) disclosed the magnitude of tax compliance costs experienced by small businesses. The study confirmed that small business bears a highly significant proportion of business social compliance costs at 89 per cent, in particular, internal time costs at 90.7 per cent (Evans et al, 1997, p78). The key findings of nearly all tax compliance cost studies are that overall compliance costs are significant and regressive.

Compliance costs are those costs incurred by taxpayers, or third parties such as businesses, in meeting the requirement laid upon them in complying with a given tax structure, over and above payment of the tax itself (Sandford, et al, 1989, p10). Thus, the carbon tax start-up compliance costs are those costs incurred by businesses in preparing to comply with the carbon tax legislation. Sandford et al (1989, p16) term these costs ‘commencement costs’, which arise with the introduction of a new tax or a major change in a tax. Compliance costs and administrative costs equal the operating costs of a tax system. Administrative costs are public sector costs of a particular tax system, borne by Government. These costs would not have been incurred had the new tax not been introduced. Some empirical studies tend to exclude administrative costs from compliance costs estimation, probably because researchers do not have control over data from governments, hence difficult accessing it. This research recognises the importance of measuring administrative costs, mainly to obtain their complete picture relative to compliance costs, particularly their inter-relationship. However, it was not
possible to extend this research to capture and measure administrative costs of introducing a carbon tax due to lack of resources.

Carbon tax start-up compliance costs, for liable entities, include the emitter’s establishment of internal administration systems for monitoring and reporting; quantifying emissions for the base period and its allocation application strategy; the external verification costs imposed and legal costs (Pope and Owen, 2009). Internal administration systems include new computer systems, other equipment and time spent on training new bookkeepers and staff to operate the carbon tax. There are other costs which are incurred after a new tax is established. These are termed recurrent/regular costs as they are continuing costs expended in running a tax system (Rametse and Pope, 2002). Pope and Owen (2009) assert that these costs include “strategy and risk management; monitoring reporting of emissions and verification costs; associated accounting functions, including balance sheet entrées; familiarization with register software and trading platforms. Penalty costs and sanctions by the Clean Energy Regulator and the Australian Competition and Consumer Commission (ACCC) on pricing requirements are inclusive to these costs. Third party audits to ensure the accuracy of emission reports are also important costs for businesses. This study has investigated only start-up compliance costs and not recurrent costs, as emitting enterprises would not have been in a position to identify the continuing cost of complying with the carbon tax legislation within a short period of its establishment.

Psychological costs, which are non-monetary and almost immeasurable, include emitters and staff anxiety and stress arising from complying with the carbon tax requirements (Rametse and Pope, 2002). Psychological costs of tax compliance are normally excluded from the calculation of compliance costs since they are difficult to measure (Sandford and Hasseldine, 1992). Woellner, Coleman, McKerchar, Walpole and Zetler (2000) attempted to measure psychological costs as they believe that this area has been largely neglected due to the lack of a reliable measurement method. This study has omitted psychological costs as they are difficult to measure.

It is assumed that the establishment of the carbon tax will also result in emitting businesses deriving managerial benefits. Managerial benefits are the benefits that may be derived by business taxpayers as a result of complying with the tax requirements. The benefits, usually enjoyed by small businesses, may be in the form of improved financial and management systems due to stringent record keeping requirements for tax substantiation (Lignier, 2008). As well, the RIS (2011) notes that involving third party auditing would benefit the business in ensuring confidence in the accuracy of reports is maintained. It must be noted that in the area of tax compliance costs, managerial benefits are not considered in isolation since these benefits may be deducted from gross compliance costs to arrive at net compliance costs. This study has excluded managerial benefits from the calculation of start-up compliance costs of the carbon tax as businesses may notice the benefits at a later stage when they are familiar with the tax. Moreover, large businesses are not expected to derive considerable managerial benefits as they generally have well-established systems compared to their small business counterparts. This study however, questioned liable entities if they expected benefits in keeping records for carbon tax purposes.

The literature on start-up compliance costs of a new tax, in particular, the carbon tax, is very limited. Studies that are more relevant to start-up tax compliance costs of the carbon are the Canadian Federation of Independent Business (CFIB, 1991); the Australian study (Clare and
Connor, 1998), the Mauritian study (Pillai 2000) and the Australian study (Rametse and Pope (2002) because they all estimated start-up tax compliance costs (Table 1). Pope and Owen (2009) discussed a German study on Emission Trading Scheme (ETS) by Betz (2008). Betz estimated the start-up compliance costs of an ETS for the European Union at between €50,000 and €60,000 per German emission site, which approximates AUD100,000-AUD120,000 per site. Recurrent compliance costs had been estimated at around €35,000 per site (excluding sanctions at €40 per missing tonne of CO₂), or around AUD70,000 (Pope and Owen, 2009). Recurrent (ongoing) costs are expected to be lower than start-up costs due to the taxpayers’ familiarity with an established tax system. Rametse and Pope (2002) investigated the start-up compliance costs of the Australian GST at $7,888 per small business. Additionally, Rametse (2007) reported Aggregate GST start-up compliance costs at $5,677 million, representing 4 per cent of taxation revenue from all sources and around 10 per cent of business taxation revenue. This confirms that start-up compliance costs represent a significant amount of business taxation revenue.

The RIS (2011) shows the estimated compliance costs associated with the Carbon Pollution Reduction Scheme (CPRS), calculated by Ernst and Young. Start-up compliance costs were estimated at $296 million ($319 m in 2012-13) and $107 m (annual ongoing) ($115 m from 2012-13). This shows that start-up compliance costs are significant, at around 64 per cent higher than annual on-going compliance costs. The figures were reviewed by George Wilkenfeld and Associates (GWA) in 2006 to estimate compliance costs associated with introducing the NGER scheme (RIS, 2011). GWA confirmed the costs to be likely in the order of $222 m (start-up) ($239 m in 2012-13) and $87 m (ongoing) ($94 m from 2012-13) (RIS, 2011, p40). Thus, compared with CPRS estimates, whilst start-up compliance represents a slightly lower amount (61 per cent) of NGER scheme recurrent costs, the estimates are still significant in proportion to recurrent costs. RIS (2011) explains that for the CPRS, the companies could have included items that may not have been required for compliance. Furthermore, the requirements of the carbon price mechanism are different from those of the CPRS.
Table 1: Major Studies on Business Start-up Compliance Costs, 1991-2008

<table>
<thead>
<tr>
<th>Country</th>
<th>Researcher</th>
<th>Regulation Researched</th>
<th>Research Methods/Sample Size/Business Researched</th>
<th>Key Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>Canadian Federation of Independent Business (CFIB 1991)</td>
<td>Canadian start-up compliance costs of the GST</td>
<td>Survey of 25,362 small businesses</td>
<td>Start-up costs represented 45 per cent recurrent costs</td>
</tr>
<tr>
<td>Britain</td>
<td>National Audit Office (1994)</td>
<td>Large business start-up costs for the GST component of the impact of the Single European Market</td>
<td>Visits to Customs and Excise headquarters and 14 local offices</td>
<td>Start-up costs were estimated at 72 per cent of recurrent costs.</td>
</tr>
<tr>
<td>Canada</td>
<td>Gunz, Macnaughton and Wensley (1995, 1996)</td>
<td>Start-up compliance costs of Canadian Research and Development Tax Incentives</td>
<td>Surveyed 51 companies</td>
<td>Start-up costs represented 84 per cent of recurrent costs</td>
</tr>
<tr>
<td>Mauritius</td>
<td>Pillai (2000)</td>
<td>Start-up compliance costs of the GST in the Mauritius hotel industry</td>
<td>Survey of 82 small and large hotels.</td>
<td>Start-up costs represented 223 per cent of recurrent compliance costs.</td>
</tr>
<tr>
<td>Australia</td>
<td>Rametse and Pope (2002)</td>
<td>Start-up compliance costs of the GST for Australian small businesses</td>
<td>Surveyed 868 small businesses</td>
<td>Start-up costs were $7,600 (including time) per small business; Regressivity of start-up costs evident</td>
</tr>
<tr>
<td>Germany</td>
<td>Betz (2008)</td>
<td>Start-up compliance costs of an Emission Trading Scheme (ETS) for the European Union</td>
<td>The author was involved in the implementation of the ETS, hence able to gather data</td>
<td>Start-up costs were between €50,000 and €60,000 per German emission site</td>
</tr>
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</table>

4. Research Methodology, Data Collection and Measurement Issues

This study collected information using a survey questionnaire and follow-up telephonic interviews with entities liable for the carbon tax. This was done in three stages. A pilot study was conducted in the first stage, mainly to test the validity of the questionnaire. The questionnaire was distributed to five liable entities, compliance costs experts and accountants, for comments and suggestions. This enabled problematic questions to be identified and refined. The duration of the start-up period dated from the date liable enterprises started to prepare to comply with the Clean Energy Act 2011 (which sets up the carbon price mechanism), which received royal assent on the 18th November, 2011, up until 30th June,
2012. This was done to separate start-up costs from temporary learning costs, to avoid including costs that enterprises incurred after the implementation date (Rametse and Pope, 2002).

During the second stage, the refined questionnaire was mailed to liable enterprises. The survey drew respondents from a population of 314 Australian-wide liable carbon emitters, known as liable entities, obtained from the Clean Energy Regulator’s website. The researchers expected at least 500 enterprises to have registered for the carbon tax as originally estimated by the government. However, according to the Clean Energy Website, as at 30th June, 2012, only 314 enterprises had been identified as liable entities. The questionnaire was distributed to these entities between September 2012 and December, 2012. The response rate was very low, at 11 per cent, after allowing for out-of-frame replies. The third stage involved telephone interviews, conducted in April, 2013, to elicit further clarification of respondents’ information that was captured by the questionnaire. This gave the research the opportunity to solicit information on respondents’ attitudes towards the carbon tax’s implementation.

The start-up costs included direct costs and hours spent by liable entities in preparing to comply with the carbon tax. The Australian Bureau of Statistics (ABS 2012) shows that the average weekly earnings per person in Australia as at May 2012 were $1,053.20. The earnings were divided by 38 hours. Thus, a rate of $27.69 was calculated and used in this study to convert the estimation of internal hours spent in complying with the carbon tax to monetary terms.

5. Conceptual Framework

As a contribution to the compliance cost literature, this model represents carbon tax start-up compliance costs analytical framework (Figure 1). Economic start-up tax compliance costs of the Australian carbon tax for liable entities costs may be estimated and they include both monetary and time costs in dealing with the requirements of tax authorities. Carbon tax start-up compliance costs are divided into internal administrative systems and external verification costs. Internal administrative systems’ costs are own time of managers, staff and monetary costs. These costs include time spent in ensuring that accounting processes are compatible with the carbon tax, learning the carbon tax requirements and training staff. Other time spent is on establishing internal systems to monitor and record carbon emissions and costs that may had been imposed by the Clean Energy Regulator, as well as the ACCC. Monetary costs include capital expenditure such as computers and related software for financial accounting systems, capital equipment acquired for emission reduction and miscellaneous costs such as stationery and telephone expenses. External time costs comprise predominantly monetary start-up costs incurred by liable enterprises on accounting and legal fees charged by accountants, lawyers and third party auditors in preparation for audits for emission reports’ accuracy. Expected immeasurable benefits, for example, record-keeping and investment in renewable technologies resulting from the carbon tax implementation, indirectly relate to start-up compliance costs. Attitudes on the carbon tax start-up costs cannot be measured directly, but can suggest issues of significance to compliance costs.
6. Results and Analysis

6.1 Profile of respondents

As shown in Table 2, respondents who completed the survey questionnaire were mostly companies (88.6 per cent) and the public sector (11.4 per cent). Thus, the findings cannot be generalised to other groups such as sole traders, partnerships, non-profit organisations, trusts and super funds. The mostly frequently stated business activities were electricity, gas and water and manufacturing (37.1 per cent, respectively). These were the stationary energy and industrial processes sectors set out by the Kyoto Protocol (RIS, 2011, p.43). The next were the mining, local government and waste treatment and disposal services (8.6 per cent). Agriculture, fishing and forestry and paper recycling represented 2.9 per cent of the respondents.
Table 2: Profile of Survey Respondents

<table>
<thead>
<tr>
<th>Legal Structure</th>
<th>Number of Respondents</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company</td>
<td>31</td>
<td>88.6</td>
</tr>
<tr>
<td>Public Sector</td>
<td>4</td>
<td>11.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>35</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Main Business Activity</th>
<th>Number of Respondents</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture, Fishing &amp; Forestry</td>
<td>1</td>
<td>2.9</td>
</tr>
<tr>
<td>Mining</td>
<td>3</td>
<td>8.6</td>
</tr>
<tr>
<td>Electricity, Gas &amp; Water</td>
<td>13</td>
<td>37.1</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>13</td>
<td>37.1</td>
</tr>
<tr>
<td>Local Government</td>
<td>3</td>
<td>8.6</td>
</tr>
<tr>
<td>Paper Recycling</td>
<td>1</td>
<td>2.9</td>
</tr>
<tr>
<td>Waste Treatment and Disposal Services</td>
<td>3</td>
<td>8.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>35</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Annual Turnover</th>
<th>Number of Respondents</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than $250,000,000</td>
<td>10</td>
<td>28.6</td>
</tr>
<tr>
<td>$250,000,000 to $349,999,999</td>
<td>2</td>
<td>5.7</td>
</tr>
<tr>
<td>$350,000,000 to $499,999,999</td>
<td>3</td>
<td>8.6</td>
</tr>
<tr>
<td>$500,000,000 to $699,999,999</td>
<td>2</td>
<td>5.7</td>
</tr>
<tr>
<td>More than $700,000,000</td>
<td>18</td>
<td>51.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>35</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Additionally, the proportion of the liable entities was not representative of the sample size. The turnover of enterprises that responded ranged from less than $250 million to over $700 million. A majority of the respondents (51.4 per cent) were from the turnover exceeding $700 million, followed by 28.6 per cent from less than $250 million turnover. Table 3 shows the types of greenhouse gases (GHG) that are emitted by the surveyed enterprises. GHGs are gases in the atmosphere that absorb and re-emit heat, thereby keeping the atmosphere warmer than it otherwise would be (Brander and Davis 2013). As much as the GHGs occur naturally in the earth’s atmosphere, these gases, often referred to as the “Kyto gases”, contribute most to human-induced climate change (Brander and Davis 2013; RIS, 2011). The government, RIS (2011, p.42), noted that, as liable entities were already reporting the GHGs prescribed by the Kyoto Protocol, under the NGERS, these would not contribute to the implementation risks or to compliance costs.

A majority of respondents (85.7 per cent) indicated that they were liable for emitting carbon dioxide (CO₂). It is not surprising as it had been confirmed that amongst other GHGs, CO₂ is the gas most emitted by human activities, in terms of the amount released in the atmosphere and total impact on global warming (Garnaut Climate Change Review, 2008; Brander and Davis, 2013).

Around 94.3 per cent of respondents confirmed they were scope 1 (Direct) emitters, emitting GHGs from sources they own and control, for example, fossil fuels they burn on site. Around 57.1 per cent of respondents were scope 2 (Indirect) emitters. This means they are liable for emissions that they purchase, but which are generated off site, for example, offsite generation of electricity, heat or steam (Table 3).
Table 3: Type of Emissions and Emission Scope Status

<table>
<thead>
<tr>
<th>Type of Emissions</th>
<th>Number of Respondents</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon Dioxide (CO₂)</td>
<td>30</td>
<td>85.7</td>
</tr>
<tr>
<td>Methane (CH₄)</td>
<td>20</td>
<td>57.1</td>
</tr>
<tr>
<td>Nitrous Oxide (N₂O)</td>
<td>11</td>
<td>31.4</td>
</tr>
<tr>
<td>Per Fluorocarbons (PFCs)</td>
<td>2</td>
<td>5.7</td>
</tr>
<tr>
<td>Carbon dioxide equivalent (CO₂e)</td>
<td>1</td>
<td>2.9</td>
</tr>
<tr>
<td>Sulphur hexafluoride (SF₆)</td>
<td>1</td>
<td>2.9</td>
</tr>
<tr>
<td>Emission Scope Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scope 1 – Direct emitter</td>
<td>33</td>
<td>94.3</td>
</tr>
<tr>
<td>Scope 2 – Indirect emitter</td>
<td>20</td>
<td>57.1</td>
</tr>
</tbody>
</table>

Conversely, by annual turnover, the highest direct emitters and indirect emitters were liable entities within the turnover range of more than $700,000,000 (55 per cent and 40 per cent, respectively). Consistent with a study by VECCI and Sustainability Victoria (2011) that investigated Small and Medium Sized Enterprises (SMEs) carbon emissions, the medium sized enterprises emissions were higher than those of small business groups. For example, Scope 1 emissions were 23.8 tonnes for the small business group and 290 tonnes for the medium enterprise group. As for the Scope 2, small business group’s emissions were 38.9 tonnes per annum and 522.3 tonnes per annum for the medium size enterprise group (VECCI and Sustainability Victoria 2011, p13).

6-2 Key Findings

Non-response Bias:

Some enterprises do not respond to questionnaires due to lack of time and painstaking activity of completing lengthy questionnaires. This study used Allers (1994) idea of testing the respondents’ perception of relative carbon tax’s start-up compliance costs burden. Allers (1994, p49) asserts that if, somehow, the decision not to respond is systematically related to the object of study, that is, compliance costs, the representativeness of the sample is in a serious danger. It is thus important to establish if non-response is related to the area under investigation, for example, start-up tax compliance costs. Moreover, the literature reveals that critics of compliance costs postal questionnaires (e.g. Tait, 1988) argue that those who are motivated to reply to surveys are those with higher compliance costs, and they tend to overestimate the true value of compliance costs. A strategy that is normally undertaken in surveys is to choose a larger sample in order to obtain sufficient response to enable data analysis. However, in the absence of a larger sample size, as was the case with this study, Aller’s innovative technique can be considered and has since been used by other compliance costs researchers. This persuades respondents to answer just one question, if they know they will not be bothered anymore (Allers 1994, p111). Allers included a post-card, which required non-respondents to answer one question only. The same question was asked in the full questionnaire. Allers then compared the perception of relative costs for respondents and non-respondents. Furthermore, an assessment of the accuracy of respondents’ perceptions against recorded costs was made. The results of Aller’s study indicated that the business survey results were biased downward by non-response rather than upwards as theoretically argued by the critics.

In this research, the devised post-card requested respondents to indicate if they were willing to complete the questionnaire, and if not, their willingness to answer only one question on the post-card. Using a five level Likert scale, respondents were requested to indicate the level of
their carbon tax start-up compliance costs in comparison with those of other businesses in their industry. The same question was also asked in the full questionnaire. The results are consistent with those of Allers, as survey results are biased downward by non-response rather than upwards (Table 4). For example, 51 per cent and 40 per cent of respondents and non-respondents respectively indicated that their level of carbon tax start-up compliance costs were ‘average’, whilst 22.9 per cent and 20 per cent of both respondents and non-respondents ranked their costs at ‘high’. Both respondents and non-respondents (2.9 and 2.6 respectively) indicated a similar burden at ‘very high’, with downward bias for non-respondents (Table 4).

<table>
<thead>
<tr>
<th>Table 4: Questionnaire versus Postcards Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respondents (Questionnaire)</td>
</tr>
<tr>
<td>Number</td>
</tr>
<tr>
<td>Very Low</td>
</tr>
<tr>
<td>Low</td>
</tr>
<tr>
<td>Average</td>
</tr>
<tr>
<td>High</td>
</tr>
<tr>
<td>Very High</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

**Carbon Tax Start-up Compliance Costs:**
The Australian carbon emissions liable entities reported that they incurred an average of $1,795,762, per enterprise, before considering any offsets, in preparing to comply with the carbon tax (Table 5). These comprised both the internal and external costs of $451,317 and $1,344,445 respectively. On average, the respondents reported internal costs (excluding their time costs) of $403,239 (Table 5). The internal costs included equipment costs of $364,712; stationary costs of $12,327 and education costs on the carbon tax, amounting to $26,200. The enterprises also reported spending 1,735 hours in the establishment of internal administration systems for monitoring and reporting. Time spent, valued in dollars, amounted to $48,078 (at an opportunity cost of $27.69 per hour). External costs of $1,344,445 comprised external advisers’ fees of $1,275,931 and other outside services of $68,514. External costs were the most significant, comprising around 75 per cent of total start-up compliance costs. Gunz, et al (1996) study reported start-up costs on external consultants to be twice as high as for the recurrent compliance costs.

<table>
<thead>
<tr>
<th>Table 5: Mean Estimated Gross Carbon Tax Start-up Compliance Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost Category</td>
</tr>
<tr>
<td>Internal Costs</td>
</tr>
<tr>
<td>Equipment costs</td>
</tr>
<tr>
<td>Stationary costs</td>
</tr>
<tr>
<td>Carbon tax education</td>
</tr>
<tr>
<td><strong>Total Internal Costs (without time)</strong></td>
</tr>
<tr>
<td>Total time costs</td>
</tr>
<tr>
<td><strong>Total Internal Costs</strong></td>
</tr>
<tr>
<td>External Costs</td>
</tr>
<tr>
<td>External Advisers</td>
</tr>
<tr>
<td>Other outside services</td>
</tr>
<tr>
<td><strong>Total External Costs</strong></td>
</tr>
<tr>
<td>Total Start-up Compliance Costs</td>
</tr>
</tbody>
</table>
Comparing with Betz (2008) ETS start-up compliance costs of between €50,000 (A$100,000) and €60,000 (A$120,000) per German emission site, this study has estimated overall start-up compliance costs of $1,795,762 per liable entity. Although these are different taxes and tax cultures (Sandford, 1995) comparison provides the magnitude of start-up compliance costs. This research’s figure is much higher (93 per cent) than Betz’s study. This could be that the start-up compliance costs for this study are gross figures, which did not take into account offsets. Moreover, Betz’s study excluded sanctions of €40 per missing tonne of CO2. Again, although this could have been influenced by a smaller sample size, the respondents could have also overstated their costs as a tactic to lobby the government to change various carbon tax policy issues. Moreover, although questionnaire specified that the start-up compliance costs was for the carbon tax, some respondents could have included the costs they incurred since reporting their emissions under the NGER Act (2007). The researcher telephoned the respondents that presented high costs and they confirmed the costs to be those related to the carbon tax. Moreover, the non-response bias test lends credibility of this study. These start-up costs of $1,795,762 are also similar to the total tax compliance costs of $1.6 million per business, estimated by BCA (2007, p29) in 2006, although not related to a specific tax. In comparison with the RIS (2011), the GWA estimates discounted the compliance costs of seeking assistance, whilst for this study outside advisers’ fees were included and represented 75 per cent of the overall start-up compliance costs.

**Components of Internal Time Costs:**
The total internal time spent in preparing for the carbon tax implementation has three main components (Table 6). These are staff time spent on learning and training employees on the carbon tax requirements ($39,083 or 81 per cent of total internal time costs). The second component is the time spent on establishing systems for record keeping on verification of deductible expenditures relating to the carbon tax. This amounted to $5,040, representing just 10 per cent of the total internal time costs. This is because these enterprises are large and already have well established systems for record keeping. Included to these are the compliance requirements for reporting and record keeping under the Jobs and Competitiveness Program. The final component is the ACCC pricing and anti-profiteering requirements and the Clean Energy Regulator’s compliance requirements, which may include fines. This amounted to $3,944 or 8 per cent of the total internal time costs, a figure lower than Rametse and Pope (2002, p417) study, which the internal time costs represented 29 per cent of the total time costs. This is probably because under the GST regime, the ACCC had a formal role in monitoring, setting or restricting price increases. The ACCC confirmed to have conducted an extensive education campaign in the lead up to the introduction of the carbon tax and had quickly pursued some early compliance outcomes (The Daily Telegraph, 2013). This explains the low time spent on the ACCC compliance requirements.
Table 6: Estimated Mean Internal Time Spent of Carbon Tax Start-up

<table>
<thead>
<tr>
<th>Component</th>
<th>Hours</th>
<th>Cost</th>
<th>Number of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal (Staff)</td>
<td>1,411</td>
<td>39,083</td>
<td>35</td>
</tr>
<tr>
<td>Internal (Record Keeping)</td>
<td>182</td>
<td>5,051</td>
<td>17</td>
</tr>
<tr>
<td>Internal (ACCC and Clean Energy Regulator)</td>
<td>142</td>
<td>3,944</td>
<td>12</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,735</strong></td>
<td><strong>48,078</strong></td>
<td><strong>35</strong></td>
</tr>
</tbody>
</table>

**Equipment Costs:**
In order to address the joint cost problem, where a computer and its associated software may be used for carbon tax compliance work, update and/or any equipment acquired for emission reduction, the respondents were requested to separate such costs. Only one liable entity reported spending $100,000 on new equipment (additional power cables relating to emission reduction) for carbon tax compliance and an average of $264,712 was incurred on updating equipment for carbon tax compliance. Equipment costs represented 20 per cent of total start-up compliance costs. Equipment costs for Rametse and Pope (2002) represented around 40 per cent of total start-up costs of the GST. This confirms that smaller businesses incur higher start-up compliance costs of equipment compared to large businesses as large businesses already have established computer systems prior to the introduction of a new tax.

**6-3 Distributional Effects of the Gross Carbon Tax Compliance Costs**
In absolute terms, the start-up compliance costs of the carbon tax should, theoretically, increase with the size of the firm, since larger polluting firms utilise more resources in their emission and/or production process. For example, in addition to costs related to emissions reduction activities (abatement costs), liable entities still have to pay the tax on their residual energy consumption, hence higher start-up compliance costs. However, it can be seen from Table 7 that the trend is not profound as it is influenced by less respondents in the turnover range of between $250 million to $349.9 million; and $350 million to 499.9 million. However, this theory is evident in enterprises with less than $250 million turnover incurred mean gross carbon tax start-up compliance costs of $674,111 and those with more than $700 million turnover, incurred $42,101,263. As percentage of turnover, carbon tax start-up compliance costs tend to decrease as the size of the firm increases, for example, enterprises of less than $250 million turnover mean start-up compliance costs of the carbon tax are around .54 per cent of annual turnover. Businesses within the turnover range of $250 million to $499.9 million incurred carbon tax start-up costs of .12 per cent, followed by .03 per cent for enterprises in the turnover range of $500 million to $699.9 million. Enterprises with over $700 million turnover incurred the highest total costs of $1,738,622 (Table 7). It must be noted that the questionnaire did not elicit information on the emission size to enable the calculation of costs by emission size. This is because liable entities are defined by the amount of CO₂ emissions.
Table 7: Mean Gross Carbon Tax Start-up Compliance Costs by Turnover and as Percentage of Turnover (including time costs)

<table>
<thead>
<tr>
<th>Turnover</th>
<th>Mean Costs</th>
<th>Total Costs</th>
<th>Percentage of Turnover</th>
<th>Number of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than $250,000,000</td>
<td>674,111</td>
<td>27,838</td>
<td>.54</td>
<td>10</td>
</tr>
<tr>
<td>$250,000,000 to $349,999,999</td>
<td>27,722</td>
<td>1,145</td>
<td>.01</td>
<td>2</td>
</tr>
<tr>
<td>$350,000,000 to $499,999,999</td>
<td>478,905</td>
<td>19,777</td>
<td>.11</td>
<td>3</td>
</tr>
<tr>
<td>$500,000,000 to $699,999,999</td>
<td>202,923</td>
<td>8,380</td>
<td>.03</td>
<td>2</td>
</tr>
<tr>
<td>More than $700,000,000</td>
<td>42,101,263</td>
<td>1,738,622</td>
<td>5.26</td>
<td>18</td>
</tr>
<tr>
<td><strong>Total Costs</strong></td>
<td><strong>42,101,263</strong></td>
<td><strong>1,795,762</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6-4 Sources of Advice
As shown in Table 8, the top three ranked sources of advice for carbon tax compliance that the liable entities used are industry seminars (94.3 per cent), consultants (57.1 per cent) and other government departments (65.7 per cent). The Jobs and Competitiveness Plan was ranked fourth (19.3 per cent). The Jobs and Competitiveness Program “provides ongoing assistance to entities that face high carbon costs and are constrained… to pass through costs in global markets” (Clean Energy Regulator, 2011). This confirms that industry seminars are important as they amongst the top three ranked for GST advice (Rametse and Pope, 2002).

Table 8: Sources of Advice

<table>
<thead>
<tr>
<th>Sources of advice</th>
<th>Number of Respondents</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry Seminars</td>
<td>26</td>
<td>94.3</td>
</tr>
<tr>
<td>Consultants</td>
<td>20</td>
<td>57.1</td>
</tr>
<tr>
<td>Other Government Departments</td>
<td>23</td>
<td>65.7</td>
</tr>
<tr>
<td>Jobs and Competitiveness Plan</td>
<td>7</td>
<td>19.3</td>
</tr>
<tr>
<td>Accountant</td>
<td>4</td>
<td>11.5</td>
</tr>
<tr>
<td>Internal Energy Policy Advisor</td>
<td>4</td>
<td>11.5</td>
</tr>
<tr>
<td>Legal Advisor</td>
<td>2</td>
<td>5.7</td>
</tr>
<tr>
<td>Google Search</td>
<td>1</td>
<td>2.9</td>
</tr>
</tbody>
</table>

6-5 Benefits in Record Keeping and Investment in Renewable Technology

Record Keeping
Around 56 per cent of liable entities expected to benefit in keeping records for carbon tax purposes, and 43 per cent confirmed that they will not derive such benefit. The benefit in record keeping for carbon tax purposes entails enterprises saving money by doing more of their own accounts and giving less work to outside advisers, third party auditors, management decisions, cash flow management, etc. In contrast, only 34 per cent of small businesses confirmed that they will benefit from record keeping for GST purposes (Rametse and Pope 2002). By annual turnover, surprisingly, a majority of those who expected to benefit from keeping records for carbon tax purposes were enterprises from turnover range of $700 million (63 per cent), followed by enterprises from a turnover range of less than $250 million (32 per cent). It was expected that, consistent with other studies (for example, Rametse and Pope, 2002, p435), a majority of enterprises from a lower turnover range would benefit more from record keeping than larger businesses. This is because, as noted by Rametse and Pope (2002),
larger businesses tend to have their records well-kept because they have more sophisticated systems than smaller businesses.

**Investment in Renewable Technology**

Respondents were also requested to indicate if they think investing in renewable energy technologies will benefit their businesses. Around 60 per cent believed that they would benefit, while 46 per cent said their business will not benefit from investing in such technologies.

One liable entity confirmed that investing in renewable energy would result in the community benefitting from their facility. This business is from the waste treatment and disposal services sector. The industry engages in the treatment or disposal of solid, liquid and other waste types (including hazardous waste). Other businesses included are those mainly engaged in operating landfills, combustors, incinerators, compost dumps and other treatment facilities (except sewage treatment facilities), including waste transfer stations (IBS Report, 2013). The IBS Report (2013) notes that government regulation, including the carbon tax and higher landfill disposal costs, contribute to greater waste treatment volumes and diverting waste from landfill. This is because firms in the industry continue to treat and dispose of waste generated by households and business. Thus, investing in renewable technologies relevant to waste treatment and disposal will generally benefit the community.

By annual turnover, a majority of liable entities that expected benefiting from investing in renewable technology were from over $700,000,000 annual turnover range (58 per cent). These were followed by those from the smallest turnover range of under $250,000,000 (36 per cent). Similarly, a majority of businesses that confirmed that they would not benefit from renewable technology investment were from more than $700,000,000 annual turnover (44 per cent).

**6-6 Fair Compensation Claims from Government**

Respondents were requested to state the amount they could claim from Government for the time and money they spent in setting up new systems specifically for carbon tax compliance. This question aimed at checking the consistency of the measurement of the total mean start-up compliance costs. Around 83 per cent of liable entities responded to the question on fair compensation. The following range was provided. Around 12 per cent sought $32,000 or less, whilst 29 per cent sought $100,000 or less. Additionally, 21 per cent sought $1,000,000 or less, while 20 per cent sought $1,100,000. The highest 3 per cent sought $26,000,000. The mid-point fair compensation sought by one respondent was $175,000. Overall, liable entities indicated that they would claim $1,266,748 (or 70 per cent of the total start-up compliance costs) from Government for time and money spent on preparing to comply with the carbon tax. Similarly, small enterprises confirmed that they would claim around 92 per cent of the total GST start-up compliance costs (Rametse and Pope, 2002).

**6-7 Attitudes**

The researcher acknowledged that there were various factors that determined the start-up compliance costs of the Australian carbon tax for liable entities. Since some of these factors could not be measured directly, respondents' attitudes on the implementation of the carbon tax were elicited to suggest their importance to compliance costs. The questionnaire included a five point Likert attitude scale to measure and summarise certain situations relevant to the carbon tax compliance. Five major statements were summed up to determine
enterprises’ attitudes on start-up compliance costs of the carbon tax. Respondents were requested to indicate with a tick whether they “strongly agreed”, “agreed”, “neutral”, “strongly disagreed”, or “disagreed”. Although a majority (60 per cent), supported the government’s plan for a clean energy future, most of these enterprises (66 per cent), found the carbon tax compliance requirements complex. Tax complexity is a prevailing issue that has caused an outcry by the Australian enterprises, in particular, small businesses (Coleman and Evans, 2003; Rametse and Yong, 2009).

Around 86 per cent of the businesses believe that monitoring their business’ carbon pollution, as well as self-reporting to be time consuming. A majority (62 per cent) believe that NGER reporting will enable their businesses to make appropriate GHG emission investment decisions. Around 46 per cent of respondents, “strongly disagreed” and “disagreed” to the statement, “carbon tax has caused investment uncertainty for my business” and 37 per cent “strongly agreed” and “agreed”. The enterprises that disagreed to this statement commented that the carbon tax was incorporated as part of their normal business activities. Moreover, as noted by Stathakis and Griffiths (2009), a carbon tax might provide certainty in the cost of compliance and lower administrative costs, making in possibly easier to plan long-term investments if the tax rate remains fixed or known for the period of the investment. Thus, as liable entities knew the fixed rate was $23, they were able to better plan their long-term investments, hence the implementation of the carbon tax did not cause investment uncertainty for a majority of respondents (46 per cent).

7. Conclusions

This study has answered the main research question as gross carbon tax start-up compliance costs for liable entities are indeed high, at $1,795,762 per enterprise. These costs are higher than those estimated by the RIS (2011), but similar the total tax compliance costs of $1.6 million per business, estimated by BCA (2007). The RIS (2011, p40) estimates discounted external advisers’ costs, which for this study represent 75 per cent of the total start-up costs. Comparing with the German study (Betz, 2009); this research’s costs are much higher (93 per cent). As noted by Sandford (1995), caution must be exercised with international comparisons due to different tax structures, cultures and processes. Start-up compliance costs are expected to decrease over time when liable entities become familiar with this tax (Sandford et al., 1989). The economies of scale and regressivity of costs for liable entities is apparent, as confirmed by most compliance costs studies (for example, Pope, 1994; Evans et al., 1997; Rametse and Pope 2002). Despite the high implementation costs, scientific evidence suggests that climate change is real and urgent global action is eminent to tackle it. The study has also answered the question: Will liable entities expect to derive benefits as a result of the implementation of the carbon tax? A majority of liable enterprises confirmed that they expected to derive benefits in record keeping, a situation which differs from findings of most compliance costs research, as large businesses, compared to small enterprises, have sophisticated systems for record keeping purposes. However, this finding is in agreement with RIS (2011) which noted that involving third party audits would benefit enterprises in ensuring confidence in the accuracy of reports.

Although a majority of liable entities supported the overall government’s plan for a clean energy future, they still perceived their compliance responsibilities negatively because of the costs and time associated with these activities. Further analysis of costs by business activity, type of emissions, emission scope and attitudes (inclusive of qualitative responses) is yet to
be reported. Whilst the Australian Labour Party, with the support from the Australian Greens, had taken the initiative to address climate change, through the implementation of the carbon tax, there had been a continuing debate on this issue. This is confirmed by the Coalition government’s intention to repeal this tax with effect from 1 July, 2014 (Exposure Draft Legislation and Consultation Paper 2013), with the Greens and the Australian Labour Party, rejecting the bill, to repeal the carbon tax. Overall, the RIS (2011) notes that by not acting on climate change, Australia will miss out on the investment, innovation and jobs that the global transformation to clean energy will bring.

This paper contributes to the body of knowledge for countries yet to introduce the carbon tax as the literature in the area of start-up compliance costs is very limited. Whilst the carbon tax is still in place, the government must continue to provide incentives to liable enterprises that aim at mitigating recurrent compliance costs. Further research on the operating start-up compliance costs of any new tax may be undertaken, subject to availability of resources. The limitation of this study is the smaller sample size that generated a lower response rate, hence the results cannot be generalised to the entire liable entities’ population. Telephonic interviews with these liable entities, however, provided the richness of the data, especially on their perceptions towards the carbon tax implementation. Moreover, the non-response bias test and the fair compensation amount that liable enterprises confirmed they could claim from Government make the figures credible. The questionnaire omitted soliciting information on the emission size. Otherwise, this study would have assessed start-up compliance costs by size of emission.

References


Swedish Environmental Protection Agency [SEPA, 1992]. Strategies to Prevent Climate Change, SEPA Report 4186.

