Greenhouse Gas Emissions, Political Visibility and Earnings Quality

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Abstract

Using Australian data, this study examines whether there is a significant difference in earnings quality between companies required by the National Greenhouse Gas Energy Reporting (NGER) Act to provide carbon emission disclosures and those not affected by the Act. The Act was implemented across three years from 2009-2011 with decreasing thresholds of emission levels progressively covering more companies in these years The findings reveal that earnings quality (proxied by accruals-based earnings management) of companies affected by the Act is significantly higher than that of companies not affected by the Act. Additional tests reveal that companies reporting under the NGER Act exhibit higher earnings quality than was the case before the companies' emissions met the reporting requirements. NGER-affected firms also tend to exhibit better earnings quality than a randomly matched sample of firms not affected by the Act. Furthermore, there is a positive relationship between earnings quality and emission levels within the sample of NGER-affected firms. The findings hold when alternative measures of earnings management are considered. The results are consistent with the theory that firms facing political visibility due to high greenhouse gas emissions opt for enhanced financial reporting quality to maintain organizational legitimacy.

Keywords: Greenhouse Gas Emissions, Earnings Management, Earnings Quality, Legitimacy

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1. Introduction

Climate change is an emerging issue that has attracted the attention of regulators, the media, academics and organisation (Stern, 2007; Ratnatunga and Balachandran, 2009; Hahn, Reimsback and Schiemann, 2015). Many scientists agree that climate change, which is powered by carbon emissions, is going to bear cruel and perverse effects on the economy and the very fabric of society (see, for example, the Economist, July 15, 2017, p. 58). As a result, political, business and academic commentators, both internationally and in Australia have been debating how to respond to this imminent risk at the policy level (Gerrans and Hutchinson, 2000; Robbins, 2001; Commonwealth of Australia, 2007; Gedenne, Kennedy and McKeive, 2008; Garnaut, 2008, 2011; Clarke and Crawford, 2012). The corporate sector is the key target of policy intervention in this respect as corporations are seen as major actors in and interdependent with the broader social environment (Gray, Kouhy and Lavers, 1995, Cavaco and Crifo, 2014).

To control some of the perverse effects of climate change, governments and regulators have called for the voluntary adoption of corporate social responsibility initiatives, including disclosure of greenhouse gas (GHG) emissions (Luo and Tang, 2014), whether through the Carbon Disclosure Project (e.g. O'Dwyer & Owen, 2005; Kolk, Levy and Pinkse, 2008; Luo and Tang, 2014) or independently of that project. Nevertheless, legislation requiring corporate carbon emission disclosures has become commonplace in Western countries. In 2007, the Australian Government enacted the *National Greenhouse Energy Reporting Act* (NGER Act), the first of its kind in Australia.

NGER requires high carbon dioxide emitters to report their emission numbers to the public through special reporting to government. While extensive literature exists on voluntary corporate environmental disclosures (e.g., see, Blacconiere and Patten, 1994; Cahan, Chavis, and Elmendorf, 1997; Alciatore, Dee, and Easton 2004; Patten and Trompeter, 2003; Patten, 2002), whether mandated disclosure of a measurable aspects of corporate environmental performance is associated with corporate reporting behaviours has yet to be examined. Prior research shows that quantified carbon performance information is value-relevant (Liesen et al., 2017). Compared to voluntary disclosures which are prone to greenwashing motives, mandatory disclosure of quantified information may influence decision-makers' perception of corporate environmental performance. This may in turn influence managers' use of enhanced financial reporting quality as a strategy to compensate for potential loss of legitimacy arising from disclosure of carbon emissions.

Drawing on legitimacy theory and the political cost hypothesis from agency theory, this study examines the relationship between environmental performance and financial reporting quality in the context of mandated carbon dioxide disclosure in Australia. The disclosures are made to the government and are subsequently made publicly available, while other environmental or sustainability reporting remains voluntary. We focus on financial reporting quality because of the central role of financial reporting in the allocation of scarce capital resources and the economic welfare of capital markets. We predict a positive association between earnings quality and carbon emissions as a measure of environmental performance. Prior research shows that earnings quality[3] (proxied by lower earnings management) is positively associated with the level of environmental disclosures (Hong and Andersen, 2011; Yip, van Staden and Cahan, 2011; Kim, Park and Wier, 2012; Pyo and Lee, 2013; Schafer, 2012; Bozzolan, Fabrizi, Mallin and Michelon, 2015; Jordaan, de Klerk & de Villiers, 2018; Wang, Cao and Ye, 2018; Rezaee and Tuo, 2019). This association is attributed to increased public scrutiny created by social and environmental factors (Patten and Trompeter, 2003; Chih, Shen and Kang, 2008; Prior, Surroca and Tribo, 2008; Heltzer, 2011; Yip et al., 2011; Kim et al., 2012; Schafer, 2012; Bozzolan et al., 2015).

The broader corporate social responsibility (CSR) literature provides a suitable starting point to examine the relationship between carbon emissions and financial reporting quality. CSR disclosure complements financial disclosure and affects analysts' behavior in a favorable way (Dhaliwal,

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[3] Throughout the paper, the term earnings quality and financial reporting quality are used interchangeably.

Radhakrishnan & Tsang, 2012). Prior research shows that environmental disclosures are value relevant (Clarkson, Li, Pinnuck and Richardson, 2015), and companies with high quality financial reporting are also high-quality CSR reporters (Martínez-Ferrero, Garcia-Sanchez & Cuadrado-Ballesteros, 2015). The financial reports of socially responsible firms are more value relevant than those of less socially responsible ones (Gao and Zhang, 2015). Further, particularly for better environmental performers, CSR can be a catalyst for transparency in financial reporting. For example, firms with environmental initiatives exhibit lower earnings management (higher earnings quality) (Litt, Sharma and Sharma, 2013), and socially responsible firms report higher earnings quality (Hong and Andersen, 2011; Scholtens and Kang, 2013; Kim et al., 2012; Bozzolan et al., 2015). However, CSR can be used to avoid scrutiny (Jordaan et al., 2018), and mask earnings management especially in countries with higher investor protection and where attention to CSR is not expected (Martínez-Ferrero, Banerjee & García-Sanchez, 2016; Jordaan et al., 2018).

While, in general, firms that have a strong CSR reporting commitment (in the form of disclosures) tend to be better environmental performers, a stronger commitment does not always suggest that the firm is a better CSR performer (Cowen and Deegan, 2011; Ahmad and Haraf, 2013). We argue that examining direct measures of environmental performance, such as carbon emission levels, would enable refining the arguments of prior research in this area. We posit that higher emitters may use more transparent financial reports as a strategy to defend organisational legitimacy when they are challenged through the political visibility created due to legislation. Prior studies show a potential positive association between the presence of environmental legislation and the level of corporate disclosures (Blacconiere and Patten, 1994; Alciatore et al., 2004; Freedman and Patten, 2004; Vormedal & Ruud 2009). However, these studies involved direct cash flow consequences for affected companies in the vein of the classic Jones (1991) earnings management examination of UK tariff-avoiding companies. Hall and Stammerjohan (1997) examines a similar issue when actual litigation with a potential for financial damages against oil firms, again a situation where there are potential direct cash flow consequences. In the Australian context, the legislation itself imposes no immediate direct costs on companies other than those of processes and systems needed to measure emissions. Therefore, the research site is ideal in that it eliminates emission cost to the firm as a potential confounding variable.

The motivation for the study emanates from two sources. First, broadly speaking the issue of carbon emissions and its effects on climate change is one of the foremost problems facing economies and societies worldwide. Understanding how carbon emissions affect various dimensions of corporate phenomena, including financial reporting quality, is a small step in providing some understanding of the indirect effects of carbon emissions on the welfare of the capital market through financial reporting quality. Second, this study fills a void in the earnings quality, environmental reporting and environmental performance literature. Prior studies have investigated earnings management practices in association with voluntary environmental reporting and performance across a number of countries (Cahan et al., 1997-US; Chih, et al., 2008-43 countries; Prior et al., 2008 – 26 countries; Sun, Salama, Hussainey and Habbash, 2010-UK; Gargouri , Francoeur & Shabou, 2010-Canada; Hong and Andersen, 2011-US; Yip et al., 2011-US; Heltzer 2011-US; Kim et al., 2012-US; Scholtens and Kang 2013 – 10 Asian countries; Pyo and Lee 2013-Korea; Bozzolan et al. 2015-24 countries; Martinez-Ferrero et al. 2016 – 26 countries). However, no study to date has investigated the association between environmental performance, reporting of that performance, and earnings management where the catalyst is environmental performance disclosure legislation.

Consistent with our prediction, firms affected by the NGER Act are associated with significantly higher earnings quality (proxied by accruals-based earnings management) than those that are not affected by the Act. The findings also reveal that these firms have lower levels of absolute discretionary accruals compared with matched prior year and randomly selected companies not affected by the Act. Furthermore, companies with higher GHG emissions affected by the legislation from its inception in 2009 to 2011, when the minimum reporting emissions threshold is reached, are associated with lower absolute discretionary accruals. The findings hold when using alternate measures of discretionary accruals. Companies in the most highly environmentally sensitive industries of mining and metals, and energy are positively associated with higher discretionary accruals. The year 2010 variable is also

positive and significant, suggesting that the Global Financial Crisis (GFC) had an impact on corporate reporting behaviour. The results suggest that higher emitters subject to the NGER Act provide better quality financial reporting. This evidence is consistent with transparent financial reporting being used as a strategy to mitigate negative political externalities (Yip et al., 2011), and thereby as a technique for managing legitimacy.

This study makes several contributions to the literature. First, the research context involves a setting ideal for investigating the impact of implementation of environmental disclosure legislation on corporate earnings management. This is so because the legislation differentially affects companies contingent on their level of emissions, allowing the population of listed companies to be used to estimate discretionary accruals, avoiding overfitting of the earnings management model applied. Secondly, the research context permits a research design that enables testing both legitimacy and agency theory arguments concurrently, with support found for both.

Thirdly, the research setting does not involve direct costs to companies other than costs of implementing the systems and processes necessary to comply with the Act. During the period of study, there was no imposition of financial penalties or caps on emissions, factors that could potentially confound motivations for earnings management or accurate reporting of emissions. Further, under the legislation, detailed methodologies for calculation of emissions were provided and the possibility of random auditing existed, enhancing the likelihood that reporting of emissions was consistent and accurate. This is important since GHG disclosures are not always commensurable or comparable (Wegener, Labelle and Jerman, 2019) discretionary disclosures of GHG emission amounts are not necessarily consistent across disclosure medium (Depoers, Jeanjean and Jerome, 2016). The same issue applies to discretionary reporting more generally compared to mandatory reporting (Mio, Venturelli and Leopizzi, 2015).

Although earnings management in the context of environmental performance has been examined previously, this study is one of the first to use actual corporate GHG emissions, the primary contributor to anthropogenic climate change (Hahn et al., 2015), as the measure of performance and hence the variable of interest. Fourthly, this paper broadly contributes to the ethics literature on environmental issues and accruals-based earnings management. In particular, it suggests that firms that must report high emissions are also more likely to avoid opportunistic earnings management.

The remainder of this paper proceeds as follows. Section 2 provides background to the legislation, which is followed by explanation of the theoretical framework, literature review and hypothesis development in Section 3. Section 4 explains the research methodology, followed by reporting and discussion of results in Section 5. The paper concludes in Section 6, with limitations and future research opportunities.

2 Background to the Australian *National Greenhouse Energy Reporting Act* (NGER Act) 2007

The NGER Act of 2007 was the first of its kind in Australia to require entities to disclose emissions to the public through the Clean Energy Regulator. The timeframe and reporting requirement thresholds under the Act are highlighted in Table 1. Facility thresholds and the corporate group thresholds were reduced over time (2009-2011), thereby progressively increasing the number of firms subject to the Act. Potentially affected entities were required to register with the regulator in 2007-2008 for reporting of emissions data to the regulator effective from the 2008-2009 fiscal year. The first public disclosure cycle under the NGER Act occurred in financial year 2009, with thresholds for reporting requirements decreasing each year to 2011 and then stabilizing.

The NGER Act provides the framework and guidelines for the required disclosures in relation to emissions, energy generation and consumption. One of the purposes identified in the Act is to assist Australia in meeting its international emissions reporting obligations. It can be argued that the aim here is to inform stakeholders, both local and international, about the emissions that each firm makes in order to provide a basis for comparison and decision-making.

Table 1
National Greenhouse Energy Reporting Act Thresholds and Timing

Facility threshold	25 Kilotonnes (kt) /100 Terra Joules (TJ)			
Corporate group threshold	First reporting year 2008/2009 125 kt/ 500TJ	Second reporting year 2009/2010 87.5 kt/ 350TJ	Third reporting year 2010/2011 50 kt/ 200TJ	Fourth reporting year 2011/2012 onwards
Entities to apply for registration by	31st August 2009	31st August 2010	31st August 2011	31st August 2011
Entities to provide data report by	31st October 2009	31st October 2010	31st October 2011	31st October 2012 and yearly there after
Government to publish data by	28th February 2010	28th February 2011	28th February 2012	28th February 2013 and yearly there after

3 Theoretical Framework, Literature review and Hypothesis Development

3.1 Theoretical Framework

Legitimacy theory and the political cost hypothesis from agency theory form the conceptual framework for this study. Environmental performance is increasingly becoming a significant component contributing to the level of organizational legitimacy. High emission levels expose companies to political scrutiny (Alrazi, de Villiers and van Staden, 2015; Lindblom, 1993). Dowling and Pfeffer (1975) argue that organisations seek to establish congruence between the social values of the organisation and its activities with those of the social system in which they operate. Organisations use environmental and social disclosures to manage threats in the form of legal, economic or social sanctions that may arise due to disparities between organisations' activities and social norms. The framework proposed by these authors remains largely unchanged and underdeveloped (Deegan, 2002, p.303) with few other studies that extend it, Suchman (1995) being an important exception. The Suchman (1995) extension has been successful and effective in explaining organisational legitimacy (Mobus, 2005). The present study builds on Suchman's framework of legitimacy (1995) and deploys it in the context of environmental performance, rather than disclosure.

Studies examining the relationship between environmental performance and financial reporting quality often have employed the agency theory framework (e.g. Chih et al., 2008; Prior et al., 2008; Heltzer, 2011; Litt et al., 2013, Yip et al., 2011, Kim et al., 2012). Several studies adopted systems theories such as stakeholder theory (e.g., Hong and Anderson 2011), institutional theory (Chih et al., 2008) and legitimacy theory (e.g., Sun et al., 2010). The present study argues that when a catalyst such as legislation requiring disclosure of actual CSR performance is implemented, the legitimacy of an organisation is threatened exposing the firm to greater political scrutiny. The political costs argument of agency theory maintains that exposure to political scrutiny and associated costs influence corporate reporting behavior (Watts and Zimmerman, 1986). As GHG emissions disclosures increase corporate political visibility, we argue that legitimacy and agency theories are intertwined in a way that makes it difficult to separate the two in a context such as that examined in this study.

3.2 Literature review

Increasingly a link between voluntary financial or non-financial reporting and measures of financial reporting quality is being documented in the ethics and broader management literature (e.g., Jo and Kim, 2007; Jo and Kim, 2008; Francis, Nanda and Olsson, 2008; Gao and Zhang 2015). In particular, the link between non-financial performance (or reporting of such performance) and the association with earnings management has attracted considerable research attention. Corporate social and environmental issues can be a major catalyst for earnings management because potential public scrutiny originating from social and environmental activities of the firm may lead companies to use financial reporting as a legitimacy management mechanism. For instance, Cahan et al. (1997), consistent with political cost theory (Watts and Zimmerman, 1986) find evidence of earnings management through income decreasing accruals in the chemical industry surrounding moves by the US legislature to mandate contributions to a fund for chemical cleanups. Johnston and Rock (2005) provide evidence that once the legislation was introduced, chemical companies employed income-reducing discretionary accruals to minimise exposure to the fund. Patten and Trompeter (2003) examine earnings management at the time of the 1984 chemical leak in Bhopal, India and find income-decreasing accruals within the industry. Further, pre-event environmental disclosers exhibited less income-decreasing behaviour than others in the industry. These studies provide evidence of the use of disclosures and accounting numbers to manage political pressures.

Beyond disclosures, some studies investigate the association between corporate social responsibility performance and earnings management, while others investigate all three aspects (performance, disclosures and earnings management) concurrently. It is important to note that while in general, firms that have a strong CSR reporting commitment tend to be better environmental performers, a stronger commitment does not necessarily translate into better CSR performance (Cowen and Deegan, 2011; Ahmad and Haraf, 2013). For instance, Chih et al. (2008) examine CSR reporting, CSR performance and earnings management in a global setting. They investigate CSR and various measures of earnings management, using inclusion in both the FTSE4Good Global Index plus FTSE All-World Developed Index (Global) to indicate socially responsible companies and compare their earnings management with those of companies included in the latter index only. They use the Kinder, Lydenberg and Domini (KLD) database[4] index scoring as the basis for individual company CSR scores. They examine approximately 1,650 companies across 46 countries between 1993 and 2002 in terms of income increasing and income decreasing earnings management. They use the contemporaneous correlation between change in accounting accruals and change in operating cash flow to measure earnings smoothing, size deflated accruals to measure earnings aggressiveness, and the Burghstahler and Dichev (1997) approach to measure avoidance of earnings declines or losses. They find that firms with higher CSR commitment are not prone generally to income smoothing or avoidance of earnings losses or declines. However, they do find that most companies engaged in CSR activities are characterised by earnings aggressiveness and volatility of profits across years.

Chih et al. (2008) posed four interrelated theoretical hypotheses; namely, the myopia avoidance hypothesis (which predicts a negative association between CSR reporting and performance and earnings management), the predictable earnings hypothesis (which posits a positive relationship between CSR firms and income smoothing), the multiple objective hypothesis that argues focusing on other than shareholder wealth distracts managers (which relates to the aggressive agency problem), and the institutional hypothesis (which argues that CSR is a function of the institutional setting and unrelated to earnings management). Hence, the multiple objective hypothesis is supported, and results reveal this is especially so in richer rather than poorer countries. Gao and Zhang (2015) however, find evidence of earnings smoothing engaged in by CSR performers based on the KLD database, but smoothing for higher rather than lower CSR performers is more informative and hence more value relevant. They find

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[4] The KLD index (a proprietary database owned by Morgan Stanley Capital International (MCSI)) provides an environmental, social and governance index rating system particularly for US and also international companies, which acts as a benchmark for investors.

other evidence of higher earnings quality by high CSR performers in terms of higher Tobin's Q and a stronger current return-future earnings relationship.

Adopting the Chih et al. (2008) theoretical framework, Heltzer (2011) examines the relationship between earnings management and CSR using KLD data to generate subsamples of companies with environmental "strengths" (six categories) and "concerns" (seven categories); a simple measure of the net number of each is used in her study. With a sample of 2,171 US firms, it is found that firms with at least one environmental concern have relatively greater income-increasing discretionary accruals. This relationship becomes stronger for firms with multiple environmental concerns. These findings do not support a political cost hypothesis, but rather the institutional hypothesis (CSR is unrelated to earnings management in the case of environmental strengths) and myopia avoidance hypothesis (in the case of environmental concerns). That is, "socially irresponsible firms are more likely to hide unfavorable earnings, as they are less concerned with fostering stakeholder relationships than they are with reporting higher earnings" (Heltzer 2011: 66). The findings differ across subsamples, suggesting that the relationship between corporate environmental responsibility and earnings management is asymmetric.

In a study that questions the direction of the relationship between CSR and earnings management, Prior et al. (2008) investigate the association between earnings management (measured as signed discretionary accruals using Kothari et al. (2005)), CSR reporting and financial performance. They find a positive association between earnings management practices and CSR reporting and financial performance. The authors argue that managers use CSR practices in a perverse way to mitigate the negative externalities created by earnings management practices. In other words, CSR reporting is used as a tool to manage stakeholder threats to managers and possibly to organisations as an outcome from managing earnings. Also, consistent with agency theory, the results are more significant in politically-sensitive sectors (i.e., regulated industries). A cross-country study by Martinez-Ferrero et al. (2016) and Jordaan et al. (2018) in a South African context report findings that are consistent with those of Prior et al. (2008). Martinez-Ferrero et al. (2016) find that companies use CSR (measured as performance scores) as a strategic mask to shield the negative effects on cost of capital and reputation of engaging in earnings management. They conclude that when combined with CSR, earnings management practices "are ignored, or not punished significantly by investors and non-financial stakeholders" (page 318). This shielding effect is not so effective in countries with a commitment to CSR, however, in the context of this current study it is difficult to argue that Australia has a strong commitment to CSR where disclosure of CSR activities in traditional corporate reports is voluntary. Jordaan et al. (2018) report that South African companies with better CSR performance measured using the Johannesburg Stock Exchange (JSE) Socially Responsible Investment Index were more likely to engage in discretionary accruals, but this was not the case for real earnings management activities.

Adopting signaling, agency and stakeholder-legitimacy theories, Sun et al. (2010) using a sample of UK firms, examined the influence of corporate governance on the association between environmental disclosure and earnings management. The UK is an interesting setting because under amendments to its *Companies Act* 2006, companies must report essential environmental issues in their annual reports and accounts. Using Kothari et al.'s (2005) approach to estimating earnings management, they find no association between discretionary accruals and environmental disclosure. However, some corporate governance attributes, namely audit committee diligence and board size (in some tests), do affect the relationship. The result suggests that UK corporate managers do not use environmental disclosure as a technique to reduce the probability that public policy actions will be taken against their companies.

In a Canadian context, Gargouri et al. (2010) examine the relationship between corporate social performance and earnings management, measuring corporate social performance based on a privately developed social investment database[5]. They found that corporate social performance is positively

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[5] Michael Jantzi Research Associates – Canadian Social Investment Database. Various indicators for corporate governance, environment, and employees are used in this database and scored from 2004 sourced on information derived from various data sources such as annual reports, proxy circulars, codes of business conduct (Gargouri et al., 2010, p. 321).

associated with earnings management (measured using Dechow, Richardson & Tuna (2003) and dichotomized into high and low earnings manipulators), particularly in relation to activities around the environment and employees. The authors conjecture that the management of earnings arises because environmental activities increase costs, consequently reducing financial performance. Hong and Andersen (2011) investigate the relationship between CSR and earnings management and look at both accruals and activity-based earnings management. Using a US sample of 8078 non-financial firm-year observations, they conclude that CSR firms have higher quality accruals (Dechow and Dichev, 2002; Francis, LaFond, Olsson and Schipper, 2005) and less activity-based earnings management (Roychowdhury, 2006).

Using the political cost hypothesis (Watts and Zimmerman, 1978) as an explanatory framework, Yip et al. (2011) find a negative association between CSR and earnings management in the oil and gas industry, but a positive relationship in the food industry. The authors argue that these differential industry results are linked, consistent with the political cost hypothesis, directly to political scrutiny considerations and not necessarily ethical considerations.

Using the opportunism perspective of agency theory, Kim et al. (2012) examine whether firms that have higher CSR commitment behave in a more socially responsible manner in their accounting policy choices than firms with lower commitment levels (measured using KLD scores). The authors argue that CSR firms that expend effort and resources in implementing CSR practices to meet ethical expectations of society are likely to provide more transparent financial information and undertake lower levels of earnings management (i.e. produce higher quality financial reporting). Based on US data for 18,160 firm-year observations between 1991 and 2009, they find that CSR firms are less likely to engage in earnings management of either an accrual-based (using Kothari et al. (2005)) or activity-based (using Cohen, Dey and Lys (2008)) nature and are less likely to be the subject of SEC investigations.

In the context of Asia, Scholtens and Kang (2013) examine the relationship between corporate social responsibility and earnings management for 139 companies for 2008 from 10 countries[6]. CSR data comes from the 2009 Asian Sustainability Rating (ASR) report[7]. Their findings reveal that companies with better CSR performance are less likely to engage in either earnings smoothing or earnings aggressiveness, with the effect more pronounced in countries with stronger law enforcement. Similarly, Pyo and Lee (2013) reported that firms with greater CSR performance exhibited through higher donations report lower discretionary accruals and exhibit greater accounting conservatism. This relationship is heightened when CSR reports are filed with the Global Reporting Initiative. Similarly, Bozzolan et al. (2015) find that CSR-oriented firms are less likely to be involved in earnings management activities, but if they do engage in earnings management, accrual-based rather than real earnings management activities, which are considered to be more costly in terms of future performance, are more likely to be used.

In a non-voluntary disclosure context, Toukabri, Jilani and Ben Jemaa (2014) examine 682 US firms that disclose social information on an obligatory basis from 1997-2008. Social and environmental disclosures are scored simplistically from 0-3, depending on the number of corporate reports (notes to the financial statements, environmental report or a report on sustainable development) in which disclosures occur. Earnings management is measured using the Dechow et al. (2003) model. No association is found between disclosure score and earnings management.

Litt et al. (2013) use internal cultural theory and external monitoring theory (which has broad parallels with agency theory's political cost hypothesis) as the theoretical framework through which to examine companies' environmental initiatives and earnings management. They document a negative relationship between environmental initiatives (measured as the sum of scores from 1-5 for each of the

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[6] Australia, China, Hong Kong, India, Japan, Malaysia, Pakistan, Philippines, Singapore and Thailand.
[7] To qualify for inclusion, companies are assessed based on six aspects, namely Governance, Codes, and Policies; CSR Strategy and Communication; Marketplace and Supply Chain; Workplace and People; Environment; Community and Development.

five environmental initiatives[8] reported by KLD), and (separately) an indicator for at least one environmental initiative) and earnings management (measured as per Kothari et al., 2005).

Overall, prior research focuses on the association between CSR performance or CSR reporting and earnings management in the absence of any specific catalyst or legislative implementation. Prior studies did not investigate the impact of new environmental legislation on performance, disclosure or earnings management. Furthermore, prior research has not employed an objective measure of actual emissions performance, GHG emissions subject to verification, as an explanatory variable. Against this background, we develop our hypothesis on the impact of environmental legislation requiring disclosure of carbon emissions on earnings management of companies affected by the Act.

3.3 Hypothesis Development

Due to the nature of the NGER legislation and the political visibility that it brings, it is argued here that changes in the dynamics are created with the relevant publics about environmental performance and financial reporting quality. In particular, a question that could threaten organisational legitimacy is whether organisations meet their social and environmental responsibilities in the presence of poor financial reporting quality, and whether poor financial reporting quality and poor environmental performance lead to societal pressure for increased environmental legislation.

It is argued under legitimacy theory that organisations may use various strategies to manage threats to their legitimacy (Suchman, 1995) including increased voluntary disclosures and/or reduced levels of earnings management. Prior research suggests that the level of earnings management may be lower for firms that have higher levels of environmental disclosures (Chih et al., 2008; Prior et al., 2008; Francis et al., 2008; Hong and Andersen, 2011; Yip et al., 2011; Kim et al., 2012). While in general, firms that have a strong CSR reporting commitment (in the form of disclosures) tend to be better environmental performers, a stronger commitment does not necessarily suggest that the firm is a better CSR performer (Cowen and Deegan, 2011; Ahmad and Haraf, 2013). By contrast, the level of GHG emissions, which is an objective measure, could be taken as a proxy for environmental performance. Higher emitters may also employ enhanced financial reporting quality as a strategy to defend organisational legitimacy when they are challenged through the political visibility created due to legislation, in this case the NGER Act. This leads to the following hypotheses:

> **Hypothesis 1**: *Firms reporting under the NGER Act have higher quality earnings than firms not affected by the Act.*

> **Hypothesis 2**: *For firms reporting under the NGER Act, emissions are positively associated with the quality of reported earnings.*

4 Research Method

An OLS regression model is used to test the relationship between mandated disclosure of environmental performance and earnings management. The dependent variable is the absolute value of discretionary accruals (and its variants) and the level of emissions for a given year is the independent variable of interest.

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[8] These include: i) a company's use and/or development of environmentally beneficial products or services, ii) a notably strong pollution prevention program, iii) a substantial user of recycled materials, or being a major factor of the recycling industry itself, iv) a demonstrated commitment to climate-friendly practices, and v) a company's superior commitment to management systems, voluntary programs, and other environmentally proactive activities (Litt et al., 2013, p. 84).

4.1 Sample selection and data collection

Only listed companies are the subject of this study, although the NGER Act applies to all legal forms of entity, contingent on their emissions volume. This approach is taken due to the difficulty in acquiring the requisite financial and non-financial data for unlisted entities[9].

The mandated emissions-related data are gathered from the Online System for Comprehensive Reporting (OSCAR) database through the Clean Energy Regulator. The first NGER year data is extracted from the mandatory disclosures made by NGER Act-affected companies that fall into the highest threshold to the Clean Energy Regulator by 31st October 2009 pertaining to the 2008-2009 fiscal year, published on that Agency's website in February 2010. The second NGER year data are extracted from the mandatory disclosures made by affected companies relating to the 2009-2010 fiscal year and made publicly available in February 2011. Similarly, the third NGER year data are gathered from the disclosures made by affected companies that fall into the third cycle for the 2010-2011 fiscal year and published in February 2012. It is important to note that the NGER Act works on a fiscal year (1st July - 30th June) basis, with public disclosure of prior year CO_2 numbers at the end of February of the following year, but companies' statutory reporting of financial information does not necessarily coincide. An additional random sample of companies is also selected as a comparison to the NGER Act-affected companies.

The data supplied by affected entities to the government is subject to random audit by the Clean Energy Regulator, which creates an incentive for accurate reporting and compliance with the legal requirements. Corporate governance variables are sourced through the Connect4 Boardroom and SIRCA Corporate Governance databases, supplemented from actual annual reports where necessary. Financial data are obtained from the Morningstar *DatAnalysisPremier* database. Banking and financial services sectors are excluded because the asset structure of these companies does not lend itself to estimation of discretionary accruals (McNichols, 2000). For estimation of discretionary accruals, the population of listed companies (except for those in banking and financial services) is used, including both NGER Act-affected and non-affected companies.

The total sample consists of 439 firm year observations, which includes 226 NGER-affected firm year observations, 99 matched prior year observations for the same companies prior to falling under the NGER Act, and 114 randomly selected companies. In relation to the randomly selected companies, 50 companies were randomly selected for each NGER year studied (2009 – 2011), however, some companies were excluded due to lack of data, which resulted in 114 companies in total. The NGER Act-affected population for the period comprises public sector, private and public companies (listed and unlisted) and consists of 948 firm-year observations. We selected listed companies with all required data, consisting of 104 unique listed companies responsible for 226 firm-year observations, representing 24 per cent of NGER reporters in those years.

Bartov, Gul and Tsui (2000) evaluate the ability of cross-sectional earnings management models to detect earnings management in comparison to their time-series counterparts. They used the Jones (Jones, 1991) and Modified Jones (Dechow, Sloan & Sweeney, 1995) models to examine the association between discretionary accruals and audit qualifications. It was found that the two cross-sectional models were consistently able to detect earnings management.

Prior research has identified several approaches to measuring earnings management (e.g. Jones, 1991; Dechow et. al., 1995; Warfield, Wild and Wild, 1995; DeFond and Subramanyam, 1998; Bartov et al., 2000; Kothari et al., 2005; Dechow, Hutton, Kim and Sloan, 2012; Hong and Andersen, 2011; Kim et. al, 2012). Following the recommendations of Bartov et al. (2000), earnings management is estimated using a cross sectional variant of the Kothari et al. (2005) model (following Kim et al., 2012) using the

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[9] This research does not aim to examine the validation or accuracy of the publicly available data. It is assumed that the data, which is submitted to Australia's Clean Energy Regulator, is accurate.

absolute values of discretionary accruals. Additional analysis is carried out using cross-sectional variants of the Jones model (Jones, 1991) and Modified Jones model (Dechow et al., 1995) respectively.

4.2 Regression model

We used a regression model adapted from Kim et al. (2012) and Becker, DeFond, Jiambalvo and Subramanyam (1998) to test the hypothesis for all firm-years clustered by company identity. Absolute value of discretionary accruals is used as the dependent variable and the volume of emissions (measured as a dichotomous variable above and below the median, being 1 and 0 respectively) as the test variable.

We control for company size as prior studies suggest that company size is associated with earnings management (Prior et al., 2008; Hong and Andersen, 2011; Kim et al., 2012). Furthermore, Watts and Zimmerman (1986), under the debt-covenant hypothesis, state that managers of firms with high debt-equity ratios are expected to choose accounting policies and methods that assist in avoiding covenant violations. This is supported by various other studies (e.g. Sweeney, 1994; Jaggi and Lee, 2002; Alciatore and Dee, 2004). Leverage, measured as the debt to equity ratio, is therefore included as a control. We also control for industry because prior studies suggest that Industry sector is correlated with earnings management (Sun et al., 2010; Cho, Freedman and Patten, 2012) and with disclosure of environmental information (Brammer and Pavelin, 2006). Profitability has been shown to be associated with financial performance (Yip et al., 2011; Kim et al., 2012), therefore, ROA is included as a control. There are also a number of controls derived from the Becker, DeFond, Jiambalvo and Subramanyam (1998) model. These variables include controls for operating cash flows and accruals.

We use the first equation to test earnings quality of the NGER-Act affected companies compared with non-reporting companies (including matched prior year for the same companies and a random non-affected sample group).

$$ABS\_DA_{it} = \alpha + \beta_1 NGER_{it} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 ROA_{it} + \beta_5 DOPRCASH_{it} + \beta_6 DABSACCR_t + \beta_{7-10} INDUSTRY_{it} + \beta_{11-12} YEAR_{it} + \beta_{13-17} CORPGOV_{it} + \varepsilon - Equation\ 1$$

Where for company i at time t:

ABS_DA	=	Absolute value of discretionary accruals using the Kothari et al (2005) method, Modified Jones Model (Dechow et. al. 1995) and the Jones Model (Jones, 1991),
NGER	=	A dichotomous variable where 1 indicates an NGER-Act affected company, and otherwise 0,
SIZE	=	Size measured as natural log of total assets,
LEV	=	Debt to equity ratio, measured as total debt divided by total equity,
DOPRCASH	=	Inverse value of cash flows from operations
DABSACCR	=	Absolute value of total accruals deflated by total assets,
ROA	=	Return on assets
INDUSTRY	=	A dichotomous variable indicating metals sector, mining sector, materials sector, energy sector, or utility sector, where 1 indicates a specific sector, otherwise 0,
YEAR	=	A dichotomous variable indicating reporting year between 2009-2011, where 1 indicates a specific year, otherwise 0
CORPGOV	=	Corporate governance variables (separately) consisting of square-root of board size, the square-root of number of independent directors and the number of audit committee meetings. This also includes a Big 4 control dummy and Carbon Disclosure Project membership control dummy.

The second equation tests earnings quality and its relationship with emissions. A similar equation is used with the emissions variable replacing the NGER Dummy.

$$ABS\_DA_{it} = \alpha + \beta_1 EMSDUMMY_{it} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 DOPRCASH_{it} + \beta_5 DABSACCR_t + \beta_6 ROA_{it} + \beta_{7-10} INDUSTRY_{it} + \beta_{11-12} YEAR_{it} + \beta_{13-17} CORPGOV_{it} + \varepsilon - Equation\ 2$$

Where for company i at time t:
Variables are as defined and measured previously except for EMSDummy.

EMSDUMMY	=	A dichotomous variable based on total GHG emissions, where 1 indicates total emissions above the median, and otherwise 0,

Emissions is measured dichotomously based on whether the firm's emission falls above or below median value since the sample comprises high emitters. The analysis uses STATA's robust regression technique, which adjusts for White's (1980) heteroscedasticity issues associated with panel data.

5 Analysis and results

5.1 Descriptive statistics

Table 2 presents an overview of the total sample of 439 companies (226 NGER Companies, 99 matched prior year companies and 114 random companies). The total sample is well represented when compared to the population across most industry sectors. Similarly, when looking at the representation of the NGER affected companies, with the prior year and random samples, there is also a comparable spread in the percentages.

Table 3 provides an overview of the key variables, including their means, medians and standard deviations across all companies for the overall sample, broken down by NGER affected, prior year matched and the random sample. The absolute value of discretionary accruals (ABS_DA) has a mean (median) of 0.15 (0.06). Emissions have a mean of 1,505 (362) mega tonnes. Company size (SIZE) has a mean of \$7,530 million and a median of \$1,355 million. This suggests that the sample captures companies which are of different size.

Table 4 provides a combined Pearson's correlation coefficients and Spearman's rho correlation coefficients matrix for the transformed variables. In relation to the Pearson's correlations, interestingly, the absolute value of discretionary accruals (ABS_DA) has a correlation with the NGER company indicator (NGER). However, it does not appear to have a significant correlation with emissions (EMSDUMMY). Variance inflation factors (VIFs) are reported later in the analysis so that assessment of multicollinearity can be made.

5.2 Regression results

Table 5 Panel A provides results for the full sample with the absolute value of discretionary accruals. Panels B and C provide results for positive and negative discretionary accruals respectively. We find a negative and significant relationship with absolute value of discretionary accruals, ABS_DA, ($p<0.05$) for NGER companies compared with non NGER companies, suggesting that companies affected by the Act manage earning less through accruals. A similar result is observed for the positive signed discretionary accruals ($p<0.1$). The same relationship does not exist for negative discretionary accruals. Indicators for the Mining and Energy Industry sectors have a positive relationship with the absolute value of discretionary accruals ($p<0.01$), suggesting these companies in environmentally sensitive sectors manage their earnings more through accruals. The year 2010 is significant, likely due to the effects of the GFC affecting the Australian market in that year. Companies during this period in general appear to manage earnings in this period compared to other years. Board size is positively associated, although the relationship is weak ($p<0.1$).

Table 6 Panel A compares the NGER sample with a random sample of companies that are not affected by the NGER Act. The results remain significant for the absolute value of discretionary accruals, where NGER-affected companies have lower earnings management ($p<0.1$). Panel B further compares NGER-affected companies with the same companies in the prior year when the company was not subject to the Act and acts as a pseudo matched sample. The results remain significant for the absolute value of discretionary accruals. The results reported in Tables 5 and 6, support H1. Table 7 presents the results

Table 2
NGER-affected listed company industry representation compared with population

Industry Sector	Total Sample Panel A				NGER Discloser sample Panel B		Prior Year Matched NGER sample Panel C		Random sample Panel D	
	Sample	Prop. of Sample	Population	Prop. of Listed	Sample	Prop. of Sample	Sample	Prop. of Sample	Sample	Prop. of Sample
Consumer Discretionary	47	11	472	8	21	9	8	8	18	16
Consumer Staples	35	8	150	3	22	10	9	9	4	4
Energy	63	14	783	13	28	12	14	14	21	18
Financials	11	3	842	14	5	2	2	2	4	4
Health Care	27	6	416	7	6	2	4	4	17	15
Industrials	68	15	602	10	37	16	17	17	14	12
Information Technology	8	2	315	5	0	0	0	0	8	7
Materials	45	10	240	4	32	14	13	13	0	0
Metals & Mining	109	25	2,006	33	59	26	25	25	25	22
Telecommunication Services	8	2	78	1	4	2	2	2	2	2
Utilities	18	4	96	2	12	5	5	5	1	1
Totals	**439**	**100%**	**6,000**	**100%**	**226**	**100%**	**99**	**100%**	**114**	**100%**

This table compares industry representation of sample companies with that of all listed companies over the sample period.

Table 3

Descriptive statistics

Variables	Total Sample Panel A (N=439)					NGER Reporter Population Panel B (N=226)					Prior Year Matched NGER Sample Panel C (N=99)					Random Sample (N=114)				
	Min	Max	Mean	Mdn	Std. Dev.	Min	Max	Mean	Mdn	Std. Dev.	Min	Max	Mean	Mdn	Std. Dev.	Min	Max	Mean	Mdn	Std. Dev.
ABS_DA	0.00	4.19	0.15	0.06	0.34	0.00	0.79	0.10	0.05	0.14	0.00	3.67	0.14	0.06	0.38	0.00	4.19	0.26	0.10	0.51
DA	-4.19	3.67	0.02	0.02	0.37	-0.27	0.79	0.05	0.02	0.17	-0.21	3.67	0.11	0.03	0.40	-4.19	0.88	-0.12	-0.01	0.56
NGER	0.00	1.00	0.51	1.00																
EMISSIONS (Mt)N=226	*50*	*18100*	*1505*	362	*2948*	50	18100	1505	362	2948										
SIZE ($M)	0	158000	7530	1355	20700	5	158000	11000	3564	24700	1	136000	8120	2427	20300	0	1120	110	28	202
LEV%	-4.85	13.01	0.60	0.34	1.23	-1.31	9.90	0.65	0.41	0.99	-2.98	13.01	0.85	0.49	1.69	-4.85	7.93	0.28	0.00	1.14
ROA%	-17.47	5.18	-0.02	0.06	1.17	-0.30	0.36	0.07	0.07	0.07	-17	5	0	0.07	2	-10.82	1.01	-0.38	-0.06	1.29
OPRCASH ($M)	-5960	28000	753	110	2790	-5960	28000	1140	231	3520	-1430	18400	726	1279	2300	-90	163	7	0	32
ABSACCR ($M)	0	9490	351	54	1050	0	9490	518	123	1300	0	6220	363	65	906	0	156	8	2	20
MINING	0.00	1.00	0.25	0		0	1	0.26	0		0	1	0.25	0		0	1	0	0	
MATERIALS	0.00	1.00	0.10	0		0	1	0.14	0		0	1	0.13	0		0	0	0.00	0	
ENERGY	0.00	1.00	0.18	0		0	1	0.18	0		0	1	0.19	0		0	1	0.19	0	
INDUSTRIAL	0.00	1.00	0.15	0		0	1	0.16	0		0	1	0.17	0		0	1	0.12	0	
YR2010	0.00	1.00	0.31	0		0	1	0.33	0		0	1	0.27	0		0	1	0.32	0	
YR2011	0.00	1.00	0.30	0		0	1	0.42	0					0		0	1	0.32	0	
BDSIZE (no.)	0.00	20.00	8.29	8	3.10	4	20	9.24	9	2.84	0	19	8.83	8	3.11	3	16	6	6	2
INDDIR (no.)	0.00	14.00	5.13	5	2.60	0	14	6.08	6	2.33	0	13	5.57	5	2.64	0	10	3	3	2
AUDMEET (no.)	0.00	14.00	3.91	4	2.37	0	13	4.61	4	2.04	0	14	4.56	4	2.39	0	10	2	2	2
BIG4	0.00	1.00	0.77	1		0	1	0.91	1		0	1	0.84	1		0	1	0.42	0	
CDP	0.00	1.00	0.30	0		0	1	0.41	0		0	1	0	0		0	1	0.04	0	

ABS_DA= Absolute value of discretionary accruals using the Kothari et. al (2005) model; DA= Discretionary accruals using the Kothari et. al (2005) model; NGER= A dichotomous variable where companies reporting under NGER is coded as 1, and otherwise 0; EMISSIONS= Total emissions disclosed to the Clean Energy Regulator (volume of greenhouse gases emitted in Megatonnes), SIZE= Organisation size measured in millions, LEV= Debt (short-term debt + long-term debt) to equity (shareholder equity) ratio, OPRCASH= The cash flows from operations, ABSACCR= The absolute value of total accruals, ROA= Return on assets, YR2010 & YR2011 = Year control variables; BDSIZE = The number of directors on the board, INDDIR= The number of independent directors within the board, AUDMEET= The number of audit committee meetings per year, MINING= Dummy variable indicating metals & mining sector coded as 1, otherwise 0, MATERIAL = Dummy variable indicating material sector coded as 1, otherwise 0, ENERGY= Dummy variable indicating energy sector coded as 1, otherwise 0, INDUSTRIAL= Dummy variable indicating industrial sector coded as 1, otherwise 0, BIG4= Dummy variable indicating a Big4 auditor coded as 1, otherwise 0; CDP= Dummy variable indicating voluntary membership and disclosure to the Carbon Disclosure Project; CDP= Dummy variable indicating 1 if first-time discloser, 0 otherwise.

Table 4
Panel D - Pearson's & Spearman's Correlations

Variable	ABS_DA	NGER	EMSDummy	SIZE	LEV	ROA	ABSACCR	OPRCASH	MINING	MATERIAL	ENERGY	INDRL	YR2010	YR2011	BDSIZE	INDDIR	AUDCOM	BIG4	CDP
ABD_DA		-.154**	-0.083	-0.059	0	-.198**	-0.02	-0.05	.211**	-0.092	0.029	-.099*	.103*	-0.008	-0.016	-.112*	-.167**	-.185**	-0.06
NGER	-.177**		.ᶜ	.174**	0.044	0.075	.165**	.143**	0.03	.133**	-0.02	0.025	0.034	.265**	.316**	.373**	.303**	.344**	.249**
EMSDummy	-0.058	.		0.13	0.017	-0.053	.194**	.226**	-0.05	.254**	.209**	0.084	0.019	-.162*	.142*	.230**	0.081	0.107	.405**
SIZE	-.264**	.511**	.420**		.392**	0.048	.731**	.655**	0.069	-0.059	-0.073	-0.077	-0.021	-0.004	.408**	.428**	.278**	.187**	.418**
LEV	-.354**	.211**	0.088	.481**		.143**	.203**	0.005	-.114*	-0.054	0.01	0.041	-0.029	-0.082	0.074	0.091	.226**	0.072	.130**
ROA	-.205**	.184**	-.134*	.364**	.240**		0.051	0.041	-0.024	-0.07	-0.02	0.033	0.027	-0.049	0.001	0.058	.104*	0.033	0.022
ABSACCR	-.171**	.488**	.326**	.890**	.430**	.304**		.724**	0.093	-0.071	-0.078	-0.058	0.011	-0.036	.393**	.444**	.263**	.159**	.394**
DOPRCASH	-.290**	.477**	.366**	.822**	.376**	.516**	.756**		.171**	-0.054	-0.076	-0.067	-0.03	0.015	.392**	.442**	.268**	.141**	.342**
MINING	.259**	0.03	-0.05	-0.092	-.251**	0.03	-0.019	-0.038		-.194**	-.273**	-.246**	0.045	-0.006	0.014	0.015	-0.094	-.117*	0.003
MATERIAL	-.135**	.133**	.254**	.140**	0.083	0.03	0.055	.114*	-.194**		-.161**	-.145**	-0.017	-0.007	0.017	0.063	0.019	.134**	0.09
ENERGY	.186**	-0.02	.209**	-0.016	-.123**	-.228**	-0.004	-0.091	-.273**	-.161**		-.204**	-0.042	-0.015	-.122*	-0.079	-0.056	0	-0.043
INDUSTRIAL	-.156**	0.025	0.084	0.045	.230**	-0.027	0.063	0.02	-.246**	-.145**	-.204**		-0.03	0.01	0.049	0.005	0.022	0.074	0.076
YR2010	.180**	0.034	0.019	-0.015	-0.076	-0.003	-0.005	-0.06	0.045	-0.017	-0.042	-0.03		-.439**	0.006	0.011	-0.034	-0.033	-0.034
YR2011	-0.066	.265**	-.162*	-0.049	-.133**	-0.075	-0.05	-0.014	-0.006	-0.007	-0.015	0.01	-.439**		0.046	0.012	-0.042	-.109*	-0.037
BDSIZE	-.192**	.353**	.139*	.664**	.290**	.276**	.606**	.566**	-0.034	0.047	-.105*	0.039	-0.006	0.046		.872**	.407**	.344**	.451**
INDDIR	-.222**	.418**	.256**	.712**	.333**	.318**	.643**	.632**	-0.037	.101*	-0.063	0.014	-0.006	0.014	.872**		.440**	.417**	.493**
AUDMEET	-.166**	.328**	0.122	.530**	.329**	.272**	.492**	.432**	-.105*	0.036	-0.031	0.032	-0.032	-0.047				.350**	.251**
BIG4	-.187**	.344**	0.107	.541**	.238**	.255**	.491**	.468**	-.117*	.134**	0	0.074	-0.033	-.109*					.234**
CDP	-.114*	.249**	.405**	.617**	.230**	.209**	.559**	.595**	0.003	0.09	-0.043	0.076	-0.034	-0.037					

Pearson's correlations is bolded and the bottom half of the table and the top half is the results for Spearman's correlations. **Correlation is significant at the 0.01 level (2-tailed) and *Correlation is significant at the 0.05 level (2-tailed), ABS_DA= Absolute Discretionary accruals using the Kothari et al (2005) method, NGER= A dichotomous variable where companies reporting under NGER is coded as 1, and otherwise 0; EMSDUMMY= A dichotomous variable based on the total emissions where 1 indicates total emissions above the median, and otherwise 0, SIZE= Organisation size measured as the natural log of total assets, LEV= Debt (short-term debt + long-term debt) to equity (shareholder equity) ratio, DOPRCASH= The inverse value of the cash flows from operations, ROA= Return on assets, YR2010= Dummy variable indicating year 2010 coded as 1, otherwise 0, YR2011= Dummy variable indicating year 2011 coded as 1, otherwise 0, MINING= Dummy variable indicating metals & mining sector coded as 1, otherwise 0, MATERIAL = Dummy variable indicating material sector coded as 1, otherwise 0, ENERGY= Dummy variable indicating energy sector coded as 1, otherwise 0, INDUSTRIAL= Dummy variable indicating industrial sector coded as 1, otherwise 0, BDSIZE = The square-root of the number of directors on the board, INDDIR= The square-root of the number of independent directors within the board, AUDMEET= The number of audit committee meetings per year, BIG4= Dummy variable indicating a Big4 auditor coded as 1, CDP= Dummy variable indicating 1 if first-time discloser, 0 otherwise.

Table 5
Regressions of discretionary accruals

Variables	Dependent Variable = ABS_DA Panel A: Sample with NGER, Matched Prior year and Random companies (N=439; 217 Clusters) -H1			Dependent Variable = DA (Positive DA) Panel B: Sample with NGER, Matched Prior year and Random companies (N=265; 150 Clusters) – H1			Dependent Variable = DA (Negative DA) Panel B: Sample with NGER, Matched Prior year and Random companies (N=174; 123 Clusters) -H1		
	Coeff.	**Std. Err.**	**t**	**Coeff.**	**Std. Err.**	**t**	**Coeff.**	**Std. Err.**	**t**
NGER	-0.06	0.02	-2.34**	-0.05	0.03	-1.78*	0.04	0.03	1.12
SIZE	-0.02	0.01	-1.30	0.00	0.01	0.01	0.03	0.02	1.23
LEV	0.02	0.03	0.91	0.04	0.04	0.85	0.00	0.01	-0.40
ROA	0.01	0.01	0.57	0.00	0.01	-0.10	-0.01	0.03	-0.30
DABSACCR	0.09	0.23	0.37	-0.33	0.26	-1.25	-0.18	0.24	-0.77
DOPRCASH	0.32	0.22	1.50	0.65	0.77	0.84	-0.34	0.23	-1.45
MINING	0.15	0.05	2.86***	0.21	0.05	4.34***	0.02	0.12	0.16
MATERIAL	0.04	0.03	1.46	0.06	0.03	2.21**	-0.02	0.04	-0.39
ENERGY	0.10	0.04	2.80***	0.11	0.04	2.57**	0.03	0.06	0.50
INDUSTRIAL	-0.01	0.02	-0.35	0.01	0.02	0.60	0.07	0.06	1.16
YR2010	0.11	0.03	3.89***	0.14	0.04	3.59***	-0.09	0.06	-1.50
YR2011	0.04	0.03	1.42	0.02	0.03	0.88	-0.10	0.08	-1.25
BDSIZE	0.14	0.08	1.67*	0.02	0.04	0.53	-0.35	0.19	-1.89*
INDDIR	-0.06	0.05	-1.39	0.01	0.03	0.32	0.21	0.11	1.95*
AUDMEET	-0.01	0.02	-0.52	0.01	0.02	0.67	0.06	0.04	1.67*
BIG4	-0.06	0.06	-0.93	-0.04	0.06	-0.75	0.05	0.10	0.51
CDP	0.01	0.03	0.22	0.02	0.03	0.72	0.01	0.04	0.15
_constant	0.15	0.17	0.86	-0.09	0.25	-0.37	-0.16	0.38	-0.43
F-Statistic		3.65			5.99			1.59	
Prob		.001			.001			.078	
Adj. R^2		0.26			0.27			0.38	
Mean VIF		2.01			1.89			2.72	

***=significant at 1%, **=significant at 5%, *=significant at 10%. ABS_DA= Absolute Discretionary accruals using the Kothari et al (2005) method, DA= Discretionary accruals using the Kothari et al (2005) method, NGER= A dichotomous variable where companies reporting under NGER is coded as 1, and otherwise 0, SIZE= Organisation size measured as the natural log of total assets, LEV= Debt (short-term debt + long-term debt) to equity (shareholder equity) ratio, DOPRCASH= The inverse value of the cash flows from operations, DABSACCR= The absolute value of total accruals deflated by total assets, ROA= Return on assets, YR2010= Dummy variable indicating year 2010 coded as 1, otherwise 0, YR2011= Dummy variable indicating year 2011 coded as 1, otherwise 0, MINING= Dummy variable indicating metals & mining sector coded as 1, otherwise 0, MATERIAL = Dummy variable indicating material sector coded as 1, otherwise 0, ENERGY= Dummy variable indicating energy sector coded as 1, otherwise 0, INDUSTRIAL= Dummy variable indicating industrial sector coded as 1, otherwise 0, BDSIZE = The square-root of the number of directors on the board, INDDIR= The square-root of the number of independent directors within the board, AUDMEET= The number of audit committee meetings per year, BIG4= Dummy variable indicating a Big4 auditor coded as 1, CDP= dummy variable indicating first time reports as 1, otherwise 0 .

Table 6
Regressions of discretionary accruals

Variables	Dependent Variable = ABS_DA Panel A: Sample with NGER and Random companies (N=340; 216 Clusters) – H1			Dependent Variable = ABS_DA Panel B: Sample with NGER and Matched Prior companies (N=325; 105 Clusters) – H1		
	Coeff.	**Std. Err.**	**t**	**Coeff.**	**Std. Err.**	**t**
NGER	-0.07	0.04	-1.74*	-0.03	0.02	-1.47*
SIZE	-0.01	0.01	-1.18	0.00	0.01	0.38
LEV	-0.01	0.01	-1.05	0.02	0.03	0.73
ROA	0.43	0.28	1.53	0.00	0.00	-0.59
DABSACCR	-0.37	0.29	-1.26	-0.83	0.59	-1.40
DOPRCASH	0.77	0.41	1.89*	0.82	0.69	1.20
MINING	0.12	0.06	2.17**	0.16	0.04	4.36***
MATERIAL	0.04	0.03	1.33	0.01	0.03	0.55
ENERGY	0.09	0.03	2.88***	0.07	0.05	1.46
INDUSTRIAL	0.00	0.03	-0.17	-0.01	0.02	-0.53
YR2010	0.13	0.03	4.03***	0.09	0.03	2.85***
YR2011	0.05	0.03	1.89*	0.01	0.02	0.37
BDSIZE	0.19	0.11	1.83*	0.01	0.04	0.15
INDDIR	-0.10	0.06	-1.71*	0.00	0.02	0.20
AUDMEET	0.00	0.02	0.13	0.01	0.02	0.78
BIG4	0.00	0.06	0.03	-0.06	0.06	-1.00
CDP	-0.03	0.03	-1.07	0.03	0.03	0.78
_constant	0.02	0.16	0.14	-0.03	0.28	-0.11
F-Statistic		3.44			5.18	
Prob		.001			.001	
Adj. R^2		0.35			0.29	
Mean VIF		7.76			1.69	

***=significant at 1%, **=significant at 5%, *=significant at 10%. ABS_DA= Absolute Discretionary accruals using the Kothari et al (2005) method, NGER= A dichotomous variable where companies reporting under NGER is coded as 1, and otherwise 0, , SIZE= Organisation size measured as the natural log of total assets, LEV= Debt (short-term debt + long-term debt) to equity (shareholder equity) ratio, DOPRCASH= The inverse value of the cash flows from operations, DABSACCR= The absolute value of total accruals deflated by total assets, ROA= Return on assets, YR2010= Dummy variable indicating year 2010 coded as 1, otherwise 0, YR2011= Dummy variable indicating year 2011 coded as 1, otherwise 0, MINING= Dummy variable indicating metals & mining sector coded as 1, otherwise 0, MATERIAL = Dummy variable indicating material sector coded as 1, otherwise 0, ENERGY= Dummy variable indicating energy sector coded as 1, otherwise 0, INDUSTRIAL= Dummy variable indicating industrial sector coded as 1, otherwise 0, BDSIZE = The square-root of the number of directors on the board, INDDIR= The square-root of the number of independent directors within the board, AUDMEET= The number of audit committee meetings per year, BIG4= Dummy variable indicating a Big4 auditor coded as 1, CDP= dummy variable indicating first time reports as 1, otherwise 0 .

Table 7
Regressions of discretionary accruals and Emissions

Variables	Dependent Variable = ABS_DA Panel A: Sample with NGER companies (N=226; 104 Clusters)			Dependent Variable = ABS_DA (Alternate using Modified Jones model) Panel A: Sample with NGER companies (N=226; 104 Clusters)			Dependent Variable = ABS_DA (Alternate using Jones Model) Panel A: Sample with NGER companies (N=226; 104 Clusters)		
	Coeff.	**Std. Err.**	**t**	**Coeff.**	**Std. Err.**	**t**	**Coeff.**	**Std. Err.**	**t**
EMSDUMMY	-0.05	0.02	-2.16**	-0.11	0.04	-2.54**	-0.09	0.04	-2.26**
SIZE	0.00	0.01	0.07	0.01	0.02	0.53	0.01	0.02	0.47
LEV	-0.01	0.01	-0.95	-0.03	0.02	-1.45	-0.04	0.02	-1.58
ROA	0.25	0.21	1.16	0.64	0.52	1.23	0.46	0.47	0.97
DABSACCR	0.14	0.21	0.68	-0.80	0.58	-1.38	0.40	0.47	0.85
DOPRCASH	-0.31	0.21	-1.49	0.35	0.53	0.66	-0.78	0.54	-1.44
MINING	0.15	0.02	6.95***	0.15	0.03	5.02***	0.03	0.03	1.16
MATERIAL	0.04	0.02	2.25**	0.05	0.03	1.51	0.03	0.03	0.96
ENERGY	0.12	0.03	3.56***	0.47	0.08	5.63***	0.42	0.08	5.40***
INDUSTRIAL	0.02	0.02	1.16	0.03	0.03	1.11	0.02	0.03	0.66
YR2010	0.12	0.03	4.51***	0.29	0.06	4.45***	0.20	0.06	3.14***
YR2011	0.01	0.01	0.6	0.02	0.03	0.59	0.03	0.02	1.18
BDSIZE	0.00	0.03	-0.02	-0.01	0.05	-0.16	0.00	0.04	-0.05
INDDIR	-0.01	0.02	-0.45	-0.01	0.04	-0.35	-0.02	0.04	-0.54
AUDMEET	0.02	0.01	1.84*	-0.02	0.04	-0.44	-0.02	0.03	-0.61
BIG4	0.01	0.03	0.23	-0.05	0.08	-0.63	-0.06	0.06	-0.88
CDP	0.00	0.02	-0.05	0.06	0.04	1.49	0.06	0.04	1.53
_constant	-0.02	0.10	-0.17	-0.07	0.27	-0.27	0.02	0.24	0.09
F-Statistic		5.03			7.13			3.15	
Prob		.001			.001			.001	
Adj. R^2		0.33			0.40			0.37	
Mean VIF		2.03			2.03			2.03	

***=significant at 1%, **=significant at 5%, *=significant at 10%. ABS_DA= Absolute Discretionary accruals using the Kothari et al (2005) method, EMSDUMMY= A dichotomous variable based on the total emissions where 1 indicates total emissions above the median, and otherwise 0, SIZE= Organisation size measured as the natural log of total assets, LEV= Debt (short-term debt + long-term debt) to equity (shareholder equity) ratio, DOPRCASH= The inverse value of the cash flows from operations, DABSACCR= The absolute value of total accruals deflated by total assets, ROA= Return on assets, YR2010= Dummy variable indicating year 2010 coded as 1, otherwise 0, YR2011= Dummy variable indicating year 2011 coded as 1, otherwise 0, MINING= Dummy variable indicating metals & mining sector coded as 1, otherwise 0, MATERIAL = Dummy variable indicating material sector coded as 1, otherwise 0, ENERGY= Dummy variable indicating energy sector coded as 1, otherwise 0, INDUSTRIAL= Dummy variable indicating industrial sector coded as 1, otherwise 0, BDSIZE = The square-root of the number of directors on the board, INDDIR= The square-root of the number of independent directors within the board, AUDMEET= The number of audit committee meetings per year, BIG4= Dummy variable indicating a Big4 auditor coded as 1, CDP = dummy variable indicating first time reports as 1, otherwise 0 .

for the relationship between emissions (EMSDUMMY) and the absolute value of discretionary accruals. The results are negative and significant, suggesting that companies which are higher emitters have lower earnings management. Therefore, H2 is supported as well. The results are consistent when using alternate estimations of discretionary accruals, specifically the Modified Jones (1995) and Jones (1991) models.

We have also tested robustness of the results to alternate measures of earnings management. The results remain strong and consistent when the Jones model (Jones, 1991) and the Modified Jones model (Dechow et. al., 1995) are used, confirming the robustness of the original results. Overall, the results show that when companies are made more politically visible after introduction of the NGER Act, they manage their earnings less and so increase the transparency of their financial reporting so as to minimise threats to their legitimacy. The findings are consistent with legitimacy management techniques, whereby organisations with higher levels of emissions and hence likely to be more political visible use disclosure methods to reduce that political visibility, be it financial or otherwise (O'Donovan, 2002; Patten, 2002; Deegan, Rankin and Tobin, 2002; Haque and Deegan, 2010; Cowen and Deegan, 2011; Yip et. al., 2011).

In sum, two hypotheses are tested; the first investigates the levels of earnings management between NGER Act affected companies and prior year and randomly selected companies; the second tests whether earnings management is constrained for companies with higher levels of emissions following the legislated requirement to disclose GHG emissions data. For the overall sample, NGER Act-affected companies have lower earnings management compared to non-affected companies. Similarly, for NGER Act-affected companies, higher emissions are related with lower levels of earnings management, and therefore these companies report with higher earnings quality.

6 Conclusion

Companies that are politically visible coupled with higher emissions, are likely to have lower levels of earnings management[10]. The companies may use more transparent financial reporting as a tool to defend legitimacy in the eyes of the public and government, and thereby manage external threats (Sun et al., 2010; Hong and Andersen, 2011; Yip et al., 2011; Kim et al., 2012). The overall results extend existing research by presenting empirical evidence that companies use earnings management techniques as a strategy to mitigate external threats arising from the introduction of environmental performance disclosure legislation. The results are consistent with both legitimacy theory and the political cost hypothesis of agency theory. It is found that amongst high GHG emitting companies, those with higher emissions levels are associated with lower levels of earnings management. It is also found that companies in more environmentally sensitive sectors have higher levels of earnings management compared to non-sensitive sectors. Financial reporting therefore, appears to be used as a legitimisation mechanism (Sun et al., 2010; Yip et al., 2011; Bozzolan et al. 2015).

The theoretical implications of this study relate to the use of earnings management as a strategy for legitimisation. Furthermore, the combination of political cost hypothesis and legitimacy theory provides a different lens and future direction in terms of theory application. The results could inform government policy by illuminating the need for consideration of financial reporting quality in mandating non-financial disclosures as happened with the NGER Act. These findings have additional implications in relation to financial transparency which examines issues around legitimacy, ethical practice and reputation as factors affecting corporate financial reporting, and possibly in the future, in relation to

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[10] Additional analysis in order to test for earning management in the presence of higher profitability and higher emissions reveals interesting results. When raw emissions (natural log) are interacted with ROA, the interaction variable is positive and significant for signed discretionary accruals. The results are not significant for income-increasing discretionary accruals. However, the results are positive and significant for income-decreasing earnings management.

integrated reporting. By having more transparent financial reporting, it appears that high emitting firms seem to consider the long-term view.

There are several limitations which can be identified in this study. First, the population size is limited in that only over 24 per cent of the total population for each year of NGER Act-affected entities (the population includes both listed and non-listed entities). It is not possible to obtain all required corporate characteristic data for organisations subject to the NGER Act and not listed on the Australian Securities Exchange (ASX). Another limitation can be attributed to the lack of independent verification of the GHG emissions disclosed to the Department of the Environment through the Clean Energy Regulator. However, it is worth noting that complying organisations are subject to random audits initiated by a government officer, and therefore the data can arguably be relied on as being accurate for the purposes of this study. Finally, Martínez-Ferrero, Gallego-Álvarez & García-Sánchez (2015) argue that the relationship between CSR and earnings management is bidirectional. However, this study uses a reliable measure of environmental performance (emissions) rather than CSR more generally, unlike many prior studies that use commercial ratings or scores for CSR performance that are based on corporate CSR disclosures.

Future research could examine the financial reporting quality of NGER-affected companies in later years of the Act's operation. Particularly, this could be done for years 2012-2014, when Australia's carbon tax was in operation. Such a study could also be conducted on non-listed entities and public sector organisations.

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