Private agri-food governance and greenhouse gas abatement: Constructing a corporate carbon economy

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Abstract

Private sector actors are playing an increasingly significant role in the definition and governance of ‘sustainable’ agri-food practices. Yet, to date little attention has been paid by social scientists to how greenhouse gas (GHG) emissions are addressed as part of private agri-food governance arrangements. This paper examines how private actors within agri-food supply chains respond to emerging pressure for measures to reduce GHG emissions from agriculture. Drawing upon the Anglo-Foucauldian governmentality literature, we introduce the notion of the corporate carbon economy to conceptualise the practical techniques that enable private agri-food actors to make GHG emissions thinkable and governable in the context of existing market, regulatory, and supply chain pressures. Using a case study of the Australian dairy industry, we argue that private agri-food actors utilise a range of techniques that enable them to respond to existing government environmental regulations, balance current market pressures with future supply chain requirements, and demonstrate improved eco-efficiency along food supply chains. These techniques – which include environmental self-assessment instruments, tools for measuring GHG emissions, and sustainability reporting – have little direct relevance to the ‘international climate regime’ of carbon trading, and carbon markets more broadly, yet individually and in combination they are crucial in enacting an alternative regime of GHG governance. In concluding, we contend that the growing use of sustainability metrics by international food companies is likely to have the most powerful implications for GHG governance in the agri-food sector, with potentially far-reaching consequences for how future action on climate change is rendered thinkable and practicable.

1. Introduction

It is widely recognised that globalising processes – including the emergence of a global economy, international regulatory bodies, and transnational corporations – as well as the growing dominance of neoliberal rationalities, are contributing to fundamental changes in agri-food regulation in which the state is no longer the predominant actor. As state capacities are re-ordered, and governance organised at a supra-national scale, private sector actors are emerging as particularly powerful in agri-food governance, becoming ‘rule setters rather than rule takers’ (Fuchs et al., 2011, p. 354). Indeed, as Busch and Bain (2004, p. 322) argue, ‘private rules, practices and institutions … are now at the center of transforming social, political, and economic relations throughout the global agrifood system’. In recent years, the influence of such rules, practices and institutions has extended to the transformation of environmental relations. International food companies are increasingly setting the global agenda on sustainable agriculture (e.g., Clapp and Fuchs, 2009; Loconto and Fouilleux, 2014), taking ‘pivotal roles in terms of rule-making, monitoring, compliance, and enforcement’ (Fuchs et al., 2011, p. 353). This is evident in the use of standards, certification and metrics aimed at minimising risk along supply chains, presenting to customers a responsible corporate image and/or responding to government, non-government organisation and community concerns regarding the environmental and social sustainability of goods and practices (e.g., Freidberg, 2013; Gunningham, 2009; Gunningham et al., 2004; Tallontire, 2007). However, other than the recent work of Freidberg (2013, 2014), there has been relatively little attention to how greenhouse gas (GHG) emissions – a well-recognised and growing threat to global agricultural sustainability (Angelo, 2010) – are addressed as part of private agri-food governance arrangements.

In this paper, we examine how private actors within agri-food supply chains respond to emerging pressure for measures to reduce GHG emissions from agriculture. The private sector has
had a crucial, yet little acknowledged, influence on ‘the design and implementation of climate governance mechanisms’ (Lemos and Agrawal, 2006, p. 316). While governments and international governmental organisations remain the most important actors in global climate governance, private actors have been instrumental in transforming climate change and GHG emissions into a calculable business risk through techniques such as governance by disclosure (Pattberg, 2012) and life cycle assessment (LCA) (Freidberg, 2013). Such techniques are being embraced by the corporate sector since they align comfortably with the corporate framing of sustainability as improved (eco)efficiency (Freidberg, 2014). Yet, it is important to acknowledge that private sector actors are subject to multiple pressures – economic, social, environmental and regulatory – in the calculation of risk. While these multifaceted pressures can provide incentives to address environmental concerns, tensions between the various pressures ‘may pull firms in different directions’ (Gunningham et al., 2004, p. 329). We introduce the notion of the corporate carbon economy to conceptualise how private sector actors seek to address GHG emissions in the context of these multiple pressures. In doing so, we build on the burgeoning social science literature on the ‘carbon economy’. Much of this literature focuses on state-based emissions trading systems and ‘the buying and selling of offsets through United Nations-controlled “compliance” markets . . . as well as through “voluntary” markets’ (Boyd et al., 2011, p. 601; see also Boykoff et al., 2009; Goodman and Boyd, 2011). The notion of the corporate carbon economy contributes to this body of literature through an analysis of how private sector actors ‘deploy strategic capacities, create alternative “mentality”s of rule, and render the issue of climate change “pra
tical”’ (Okereke et al., 2009, p. 73).

The paper investigates the construction of a corporate carbon economy focusing on the Australian agri-food sector, and concentrating specifically on the dairy industry. Agriculture in Australia provides an interesting context for two key reasons. First, the agriculture sector has developed in a markedly different direction to countries in Europe and North America due to the importance of exports of primary products – largely bulk commodities – to the country’s economy, and Australia’s strong commitment to neoliberal policy directions and especially trade liberalisation. This has resulted in the emergence of a form of highly productive agriculture shaped by neoliberalist policy directions, which has been labelled ‘competitive productivity’ (Dibden and Cocklin, 2005). The capacity of the Australian government to respond to environmental issues (including GHG emissions) has been constrained by its free trade position and opposition to payment of subsidies, including payment of agri-environmental incentives. At the same time, as price takers, Australian farmers are constrained in managing ‘resources for which there are no direct and immediate productivity benefits’ (Lockie, 2009, p. 422).

Second, policies to deal with emissions from agriculture and land management are highly contentious and frameworks for investment in climate action are unstable. The agricultural sector in Australia accounts for a substantial proportion of the nation’s GHG emissions. Indeed, it is the second largest source (after stationary energy), with 15.9% of the total in 2010; livestock production is particularly damaging, with methane from sheep and cattle comprising 10.7% of total GHG emissions (CSIRO, 2012). Yet, agriculture was excluded from the price on carbon introduced by the previous Australian Labor government in July 2012. Carbon pricing has been repealed by the current Coalition government, elected in September 2013, and opportunities to receive funding for farm-based carbon-reduction activities under a new Direct Action scheme are likely to be limited (see Section 4).

We are particularly interested in the tools used by the Australian dairy industry in addressing GHG emissions and making these workable in the face of existing market and supply-chain pressures. This industry has been active in efforts to improve its environmental image in recognition that it may eventually have to account for the adverse environmental impacts of intensive dairy farming (Higgins et al., 2010) as well as addressing the significant contribution to total agricultural emissions made by dairy cattle.1 Compared to the neighbouring New Zealand (NZ) dairy industry, Australia exports a far smaller proportion of their dairy products (38% in 2013/14 compared to 95% in NZ (Dairy Australia, 2014a)), and is less exposed than the NZ industry to carbon sensitive European markets.2 Nonetheless, there is growing pressure from upstream supply chain actors on Australian dairy processors to verify the sustainability of their products and supply chains (Dairy Australia, 2014b). As we discuss in this paper, this is leading to the development of various instruments and metrics that seek to position the Australian dairy industry to respond to those pressures.

In the following section of the paper we outline briefly the literature on the ‘carbon economy’, focusing particularly on how the growing role of private sector actors in international climate governance is theorised. This more recent work – which focuses on the techniques through which GHG abatement is rendered thinkable and practicable – is used to develop our theoretical contribution, the notion of the corporate carbon economy. We then provide an overview of the methods, sampling techniques and analytical techniques underpinning our case study of the Australian dairy industry. This is followed by a discussion of how Australian governments have sought to govern GHG emissions from Australia agriculture, and the current lack of incentives at a national level for farmers and agricultural industries to address GHG emissions. Discussion of the policy environment establishes the context for our dairy industry case study, in which we elaborate on the different techniques that have enabled dairy processors and upstream supply chain actors to make GHG abatement workable with existing objectives, market demand, and supply chain pressures. Finally, in the concluding section, we consider how these techniques – individually as well as collectively – contribute to an emerging corporate carbon economy.

2. Climate governance, private sector actors, and the carbon economy

Global warming, and human-induced climate change more broadly, is an area of growing interest for social scientists. Given the carbon dependence of contemporary industrial economies, the development of policy responses and mechanisms for reducing GHG emissions, and their capacity to contribute to a more sustainable future, have received much scholarly attention (e.g., Bailey and Wilson, 2009; Bailey et al., 2011; Goodman and Boyd, 2011; While et al., 2010). In particular, increased critical scrutiny is being given to the ‘carbon economy’, which, broadly defined, includes ‘any measure that seeks to assign commodity values and create markets for greenhouse-gas emissions’ (Bailey and Wilson, 2009, p. 2324). The commodification of emissions and development of markets for carbon abatement is based on the assumption that climate change is an outcome of market failure, a consequence of which GHG emissions and their environmental impacts have been externalised in the quest for economic growth. Such failure is claimed to be best addressed through market mechanisms aimed at internalising emissions as part of economic calculations (Redclift, 2009). In this sense, the use of market mechanisms for carbon abatement may be conceptualised as a form of ‘nature’s

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1 Emissions from cattle consist primarily of enteric methane, which has 21 times the global warming potential of carbon dioxide (Dairy Australia, 2007a; DCCEE, 2010).
2 In NZ the issue of ‘food miles’ has led to a focus on LCA as a means to demonstrate that NZ produce is less carbon-intensive than European produce (Saunders and Barber, 2007).
neoliberalisation’, which involves ‘the subjection of more and more areas of social and environmental life to the logics of capital accumulation’ (Castree, 2007, p. 8).

As with other recent work on nature’s neoliberalisation, scholars have tended to emphasise the limits imposed on capital in the process of neoliberalising nature, such as the measurement challenges involved in commodifying various greenhouse gases as standardised ‘carbon emissions’ so that they can be integrated into global circuits of capital (e.g., Bailey, 2007a; Bumpus, 2011; Goodman and Boyd, 2011; MacKenzie, 2009). They have also highlighted the political and environmental consequences of the growing use of market mechanisms in climate governance (Bailey, 2007b; Bailey and Wilson, 2009; Bailey et al., 2011; While et al., 2010), and the re-organisation of existing arrangements of governing ‘to ensure that they can operate in the service of carbon trading’ (Boyd et al., 2011, p. 607). Running through much of this work is the predominant emphasis on ‘international institutions and nation-states as the primary area of climate governance’ – referred to as the ‘international climate regime’ (Okereke et al., 2009, p. 66). While private sector actors are recognised as being increasingly important in addressing global environmental change, they are often studied as objects of climate governance, who react to international and state-based climate policy initiatives (see Bailey, 2007b; Kolk et al., 2008) rather than being active agents in their own right (Okereke et al., 2009; Pattberg, 2012). This does not necessarily imply that private sector actors are powerless in confronting state-based initiatives: they have successfully opposed and stalled climate change action in the United States, Britain and Europe (Bulkeley and Newell, 2010, p. 87), and substantially delayed the introduction of carbon pricing in Australia (Crowley, 2013). Recent work has observed the emergence of ‘self-regulation – the voluntary actions of firms in reducing their own emissions’ (Bulkeley and Newell, 2010, p. 92), driven by motives such as avoidance of regulation, the desire to demonstrate corporate social responsibility, minimising physical risks and reducing costs through energy saving (Kolk and Pinkse, 2008; Pulver and Benney, 2013). Efforts to reduce and demonstrate reductions in GHG emissions have been noted for the automotive, electric, oil and gas, chemicals, steel and electronics industries (Kolk and Pinkse, 2008), while the retail sectors in the UK, France, Japan and elsewhere have begun to explore ways to demonstrate their climate change credentials through carbon labelling schemes (Freidberg, 2014; Gadema and Ogletorpe, 2011; Ikizuki, 2009; Upham et al., 2011).

Okereke et al. (2009) argue that there is a pressing need to study the nature of climate governance beyond the ‘international regime’, and that this requires a shift in emphasis from who governs the carbon economy to how climate change is governed. Specifically, greater attention is needed to the actual processes and practical techniques through which various agencies ‘leverage their positions in the multiple arenas/centers of global climate governance’ (2009, p.74). Lövbrand and Stripple (2012) concur with Okereke et al. that more scrutiny is needed of how the carbon economy is governed. Drawing upon the Anglo-Foucauldian governmentality literature, they contend that the increased presence of ‘private market actors’ in GHG governance ‘represents a transformation of political rule that replaces formal and hierarchical techniques of government with more indirect regimes of calculation’ (2012, p. 658). These regimes may be characterised as neoliberal in that they seek to govern ‘through the entrepreneurship of autonomous actors – individuals and families, firms and corporations’ (Rose, 1999, p. 139). In order to study these emerging regimes of calculation, Lövbrand and Stripple focus on ‘the practical techniques that make up the carbon economy and the systematic ways of thinking that these techniques give rise to and rest upon’ (2012, p.660, emphasis in original). Such techniques are characterised by Lövbrand and Stripple in two main ways: (1) technologies of agency that seek to deploy or enhance individual capacities so that they are able to govern themselves as informed and responsible citizens; and (2) technologies of performance through which agencies responsible for governing are increasingly subject to calculative regimes for evaluating their performance (Dean, 2010, pp. 196–198). In their analysis, most emphasis is devoted to technologies of performance – standards, certification schemes and auditing practices – that constitute and render commensurate emission reduction activities. Technologies of agency are acknowledged as significant in the governance of climate change, but they are not applied in the paper. Lövbrand and Stripple (2012) are interested primarily in how technologies of performance enable carbon markets to be thinkable and operational. As we argue below, this potentially overlooks those technologies of performance and agency that contribute to addressing GHG emissions and a ‘carbon economy’, but may have very little to do with the construction of carbon markets.

In this paper we apply Lövbrand and Stripple’s (2012) governmentality-inspired approach to make sense of how private sector agri-food actors in the Australian dairy industry have rendered GHG emissions thinkable and practicable. However, we build on their application of this approach by examining the broader technologies of performance and agency that enable private agri-food actors to make GHG emissions thinkable and governable in the context of existing market, regulatory and supply chain pressures – what we define as the corporate carbon economy. These technologies are well documented in agri-food studies and include private sustainability standards schemes (Djama et al., 2011), eco-certification and labelling (Guthman, 2007), codes of conduct, voluntary agreements (Jansen, 2004), and private schemes that use voluntary incentives to improve farmers’ environmental management practices (Lockie and Higgins, 2007). While such technologies in general operate independently from carbon markets, they nonetheless have significant potential to ‘influence both national and international climate politics’ (see Okereke et al., 2009, p. 73). An important example is efforts by companies to measure their carbon emissions, expressed in terms of the carbon ‘footprint’ of their products, which is aimed predominantly at managing risk and reputation in their supply chains (Freidberg, 2014). Carbon footprinting and labelling are not yet widely used, but they are significant in rendering GHG emissions a calculable and governable issue. They enable firms to demonstrate corporate social responsibility as well as seize any economic opportunities offered, thus gaining ‘the public relations credit … from being seen to take a lead on the issue’ (Bulkeley and Newell, 2010, p. 93). Crucially, sustainability metrics such as LCA allow private sector actors to engage with GHG emissions in the context of existing supply chain objectives and pressures. In this way, technologies of performance and agency may have broader benefits for companies in GHG governance, allowing them to ‘maintain control over their own environmental activities, provide evidence of planning and interaction to address environmental problems, and influence future regulatory and competitive requirements’ (Rondinelli and Berry, 2000, p. 74). In the remainder of this paper we examine how technologies of performance and agency have made GHG emissions governable in the Australian dairy industry, and the ways in which these techniques constitute an emerging corporate carbon economy in Australian agriculture.

3. Methods

The data used in this paper are drawn from a case study of the Australian dairy industry, which formed part of a larger project on market and voluntary incentives for sustainable land management.
According to Creswell (2007, p. 73), case study research ‘involves the study of an issue explored through one or more cases within a bounded system’, such as a setting, context or industry. This approach is particularly useful where the researcher wishes to address ‘how’ or ‘what’ questions (Yin, 2003), and build an in-depth understanding of an issue or concern, as was the case in our research. For our dairy industry case study, we adopted qualitative methods of data collection that combined semi-structured interviews with key dairy industry stakeholders, and documentary analysis of government and industry reports and websites. The use of different qualitative methods is crucial for a case study approach, enabling detailed insights into the issue being investigated (Creswell, 2007). Semi-structured interviews of approximately 60–90 min were conducted with 10 key dairy industry stakeholders in Melbourne and the Gippsland region of Victoria between May 2010 and August 2011. Stakeholders were selected using a mix of purposive and snowball sampling and included representatives from dairy co-operatives and companies, Victorian state government agencies, regional dairy bodies, as well as state and regional natural resource management (NRM) staff. In this paper, identification codes for participants are assigned based on the date that they were interviewed (e.g., D101 refers to the first informant interviewed by the authors). The interviews with stakeholders focused broadly on the uptake of market-based and voluntary incentives for sustainable land management, including mechanisms for addressing GHG emissions. All interviews were transcribed for analysis. Open coding was firstly conducted to find common descriptors, followed by a second cycle of axial coding, which sought to develop connections and relationships between codes (Miles and Huberman, 1994). Axial coding enabled us to develop contexts around particular code labels that emerged through open coding, which were essential for us to interpret informant reports. Finally, the data were analysed using a thematic analysis by exploring patterns across the data.

4. Australian agriculture and greenhouse gas governance

As noted above, emissions from agriculture are estimated to comprise approximately 15.9% of total greenhouse gas emissions in Australia. The principal sources of these emissions are livestock – through enteric fermentation and the decomposition of animal wastes (DCCEE, 2010). Nevertheless, agriculture was given a special, favourable status within the developing Australian architecture for control of carbon emissions introduced after much debate in December 2011. The Clean Energy Act 2011 implemented a carbon pricing mechanism4 for Australia to reduce carbon pollution, set out how the carbon pricing mechanism would apply to businesses, and established a number of new institutional arrangements: a Clean Energy Regulator to administer the carbon pricing mechanism, the National Greenhouse and Energy Reporting scheme, the Renewable Energy Target and – of most relevance to agriculture – the Carbon Farming Initiative (DCCEE, 2012a), which we discuss below. The carbon pricing mechanism initially took the form of a tax on the country’s top 500 biggest polluters, but this was intended to transition from July 2015 to a fully flexible price under a cap-and-trade emissions trading scheme (ETS). The ETS was designed to redress previous market failures, where businesses and individuals tended to externalise the environmental consequences of production and consumption decisions. In the various iterations of this scheme, it was envisaged that agricultural enterprises would not be required to pay for the carbon they produced, largely because of the difficulty in measuring or estimating net emissions cost-effectively (Garnaut, 2008, p. 558). They would however incur increased costs for inputs such as fuel, electricity, farm chemicals and fertilisers, which were subject to the ETS. At the same time, the proposed Australian emissions trading scheme was globally unique in introducing ‘a project-scale system for creating domestic land-sector offsets, thus addressing a key domestic constituency and creating a test-bed for new approaches to land-sector management’ (EDF and IETA, 2013).

The Carbon Farming Initiative (CFI) is a carbon offsets scheme aimed at contributing to abatement by allowing ‘farmers and other land managers to earn carbon credits by storing carbon or reducing greenhouse gas emissions on the land’ (DCCEE, 2012b, p. 6). The CFI enables farmers and land managers to earn credits – which can then be sold to businesses wishing to offset their carbon pollution – for actions such as: reforestation and revegetation; reduced methane emissions from stock; reduced fertiliser pollution, and savannah fire management (DCCEE, 2011a, p. 93). The CFI was established to encourage reduction of GHG emissions in the farming sector while at the same time avoiding some of the problems posed by participation in an emissions trading scheme – such as the complexity of estimating and measuring agricultural emissions, the types of emissions that should be covered, and attributing responsibility for emissions, given the complexity of agricultural supply chains. However, questions were raised early on over its effectiveness due to the voluntary nature of the initiative and the lack of demand for Kyoto-compliant offset credits in global markets (Hug and Ahammad, 2011, p. 22). In addition, many of the submissions received during the period of public consultation raised concerns over issues such as the high administrative and monitoring costs for landholders, as well as the risk of creating perverse incentives such as conversion of productive agricultural land into agro-forestry (see DCCEE, 2011b). Nevertheless, by October 2013 the Domestic Offsets Integrity Committee (DOIC) had approved five agricultural methodologies5 including a Dairy Australia proposal for reducing GHG emissions from dairy cows through dietary changes (DOIC, 2013).

However, the defeat of the Labor Party at the 2013 Federal election, and the election of a conservative Coalition government led by Tony Abbott, has raised serious doubts over the future of a carbon pricing mechanism and of the CFI in Australia. One of the Coalition’s central policy promises was to abolish the ‘carbon tax’ paid by polluters, which it achieved with the passing of legislation in July 2014, and to rely instead on ‘Direct Action’ funded by taxpayers (Lyster, 2013). In accordance with this commitment, the government sought to amend the Carbon Farming Initiative6 by linking it to a newly established Emissions Reduction Fund (ERF) and shifting its focus from land-based abatement activities to ‘emissions reduction projects from across the economy’ (Parliament, 2014, p. 6). Concerns have been expressed that – unless separate activity or sector-based funding bands are defined – ‘there is a high probability that all available funding will be soaked up by a handful of very large projects with large abatement at low cost from facilities such as power stations’ (ADIC, 2014, p. 10).7

At face value, therefore, there appear to be few state-based incentives at a national level for agricultural industries or landholders to address GHG emissions. There are also few apparent drivers emanating from the retail sector, which has shown little support for such initiatives.

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4 A note was added 13 September 2013 about the change of government, but the case study was not updated.
6 As at 30 September 2014, the Bill remained stalled in the Senate due to opposition from Labor and the minor parties.
7 In the first round of the Emissions Reduction Fund auctions (15–16 April 2015), several land-based projects carried over from the former CFI were successful, but it is anticipated that ‘the second round of auctions would be harder for farmers to compete in’ (Locke, 2015, n.p.).
interest in demonstrating its environmental credentials. This has been attributed to Australia’s comparative freedom from food scares associated with industrial farming practices, and assumption that fresh produce, most of which is not imported, is ‘clean and green’ (Smith et al., 2010, p. 53). By contrast, supermarket chains in Britain (e.g., Tesco), France (LeClerc and Casino) and the US (Walmart) have experienced consumer pressure to improve the sustainability of their operations, including introducing ‘climate friendly’ practices throughout the supply chain (Freidberg, 2014). In the UK, Sainsbury’s dairy development scheme is certified mate friendly’ practices throughout the supply chain (Freidberg, 2014). In the UK, Sainsbury’s dairy development scheme is certified mate friendly’ practices throughout the supply chain (Freidberg, 2014). By contrast, supermarket

We argue that these techniques – individually as well as collectively – contribute to the construction of an emerging corporate carbon economy.

5. Australian dairy industry case study

The Australian dairy industry, which includes processors, producers and their representatives, and service organisations, is involved in relationships at a range of scales (Dibden and Cocklin, 2010). At a supra-national and national scale, industry bodies such as Dairy Australia are concerned with investing across the dairy supply chain and identifying opportunities for collective action that cannot be achieved by individual processors or producers alone. At national and sub-national scales, dairy processing companies are involved with governments in regulation of dairy food safety; while at sub-national and local scales processors must maintain positive relations with their farmer-supplier base in order to maintain continuity of supply, and with members of the public concerned about the environmental implications of intensive dairy operations. At the same time, it has become increasingly apparent that dairying will sooner or later be held responsible for the substantial GHG emissions associated with the raising of livestock (Higgins et al., 2010). Initiatives to address these issues have involved the use by dairy processors, and increasingly international food companies, of technologies of agency and performance to improve the environmental reputation of the dairy industry, anticipate future market demands or branding opportunities, and secure future food supply. In the remainder of the paper we examine the practical techniques that have enabled Australian dairy processors and international food companies to position themselves to address GHG emissions in the context of existing as well as anticipated future supply chain and market pressures. We argue that these techniques – individually as well as collectively – contribute to the construction of an emerging corporate carbon economy.

5.1. Environmental self-assessment tools – technologies of agency

When the Australian dairy industry was deregulated in 2000, the functions of the former statutory marketing authorities were transferred to other agents – to state-based food safety bodies, to dairy co-operatives and companies (charged with regulating suppliers to ensure milk quality and safety), and to a newly constituted company, Dairy Australia, which assumed responsibility for marketing and research and development (Dibden and Cocklin, 2010). Dairy Australia is funded by compulsory levies paid by farmers together with matching government funds for research and development. Recognising that environmental issues would become an increasing concern, with implications for the future competitiveness of the industry, a project – Dairying for Tomorrow (DfT) – was established in 2001 with seed funding from the federal government, and managed by Dairy Australia, to promote environmental management systems (EMS) to farmer-suppliers of milk processors (Dibden and Cocklin, 2005). The main way in which DfT sought to improve on-farm environmental management was through DairySAT, an environmental self-assessment tool, which allows farmers to ‘assess the environmental risks associated with their production; plan appropriate responses and, if they wish, record their actions with regard to NRM management’ (Dairy Australia, 2007b, p. 12). Federal funding for DfT enabled DairySAT to be tested and promoted at a regional level through a network of Natural Resource Management (NRM) coordinators appointed in each of eight dairying regions of Australia. DairySAT has since been rolled out through workshops and training courses to farmers throughout Australia. Due to demand from some farmers, an electronic version was made available in 2010 with the capacity for any data entered to be saved.3

DairySAT is consistent with the first stage of an environmental management system, which is based on a process of continuous improvement in environmental practices (Higgins et al., 2010). It enables farmers to identify through a checklist how their practices compare to industry best practice. If particular practices are identified as falling below industry standards, DairySAT incorporates an ‘action plan’ for farmers to improve their practices. In this way, DairySAT goes beyond simply raising awareness. It builds the capacities of farmers so that they are able address environmental issues (including GHG emissions) that may have previously been a low priority, or not considered a pressing issue at all, and it provides the knowledge for them to differentiate between ‘acceptable’ and ‘non-acceptable’ industry practices.

Dairy processors to date have generally used DairySAT as a tool to assist their suppliers in complying with environmental practices required by government or industry. At the same time, DairySAT is recognised as having the future potential to link to market incentives for reducing GHG emissions and enhancing environmental practices more broadly, as the following quote from a dairy processor representative illustrates:

What we’re trying to do [with DairySAT] is get them to an acceptable practice; and I guess an acceptable practice set by industry is something that we’re happy to work with. ... There’s no point us [the dairy company] saying ‘Well you need to do this’ and the industry saying ‘You need to do that’. It’s the consistent approach and it’s something that government supports as well.

From the perspective of this dairy processor representative, DairySAT can potentially be used as a tool for assessing and verifying farmers’ environmental performance. In this way, DairySAT is a practical technique that seeks to enhance or deploy dairy farmers’ possibilities of agency (see Dean, 2010) so that they have improved capabilities to self-govern their environmental conduct. This process of governing through the agency of farmers enables industry bodies, government agencies, and dairy processors to act ‘at a distance’ (Rose, 1999), aligning farmers’ conduct with broader industry objectives.

However, similar to other agricultural industries, the dairy industry is subject to multiple pressures – economic, social, environmental and regulatory (Gunningham et al., 2004, p. 325). For the representatives of the dairy processors we interviewed, the further development of DairySAT, and its linking to market incentives for improved environmental performance – including reductions in

GHG emissions – it is constrained by more immediate pressures such as:

(a) lack of consumer demand for environmentally certified milk, which ‘makes it hard to bring in an instrument to reward farmers for better management practices’ (D109);
(b) an emphasis on meeting basic food safety and quality standards, which, according to one industry representative (D108), is far more critical than environmental programmes; and
(c) the fear of losing suppliers which contributes to milk companies being hesitant to impose additional requirements on farmers, or reduce payments in order to expand environmental programmes, unless there is a clear market incentive or regulatory requirement for them to do so.

Some dairy processors, nonetheless, recognise that these pressures could easily shift in the future and that environmental instruments such as DairySAT might be valuable in ensuring ongoing market access. For example:

Where [our dairy company’s] EMS programme is going to be potentially helpful is actually in gaining new customers, potentially particularly in Europe. It may be able to get us our foot in the door a bit better with markets.

[D109]

The interesting development in more recent times, and we didn’t start with this in mind, is that we do see, and our farmers do see, that … dairy products produced under good practice in a range of areas is a marketing advantage. It may not necessarily be price, but it might be getting us into organisations like the EU and things of that nature.

[D110]

From the perspective of one dairy processor representative, managing future business risk involves a delicate balancing act in ‘trying to manage and position themselves to be slightly not too Green, you don’t want to be too Green ‘cause that might drive people away, but to be looking responsible … [i.e.] corporate social responsibility’ (D104). This quote illustrates the dilemmas faced by dairy processors in managing environmental concerns – including GHG abatement – in the context of other pressures. Environmental issues are recognised as an important part of managing overall business risk, and in demonstrating corporate social responsibility. However, placing too much emphasis on the environment is viewed as potentially risky for business if investment in GHG abatement and environmental programmes is not supported by markets and supply chains. This dilemma is illustrated also in the trialling of technologies of performance that seek to render GHG emissions calculable and amenable to potential auditing from overseas markets or upstream supply chain actors.

5.2. Tools for measuring GHG emissions – technologies of performance

Some of the processors we interviewed have trialled tools that enable measurement and potential auditing of GHG emissions. These technologies of performance have been used to assist dairy processors in preparing for possible changes in market and supply chain pressures, where evidence of GHG abatement becomes a requirement. For instance, in 2009 Murray Goulburn Cooperative (MGC) – the largest dairy processor in Australia – obtained government funding to update their online milk reporting system (MGF@RM) to incorporate a range of tools for measuring nutrient loss, nitrogen utilisation, energy use, and the effects of GHG abatement strategies. GHG emissions were measured using the Dairy Greenhouse Gas Abatement Strategies (DGAS) calculator. This is a Microsoft Excel software package designed as a decision support tool, which ‘allows dairy farmers to find the sources of greenhouse gases for individual farms and to see the direct impact of farm activity on the level of emissions’ (DfT, 2010, p. 4). The DGAS calculator then enables farmers ‘to vary the key inputs to the enterprise and compare the effects of changes on emission levels’ (Kildare et al., 2008, p. 1). In doing so, farmers can experiment virtually with different input scenarios to determine the production strategies that will be most effective in reducing emissions, without sacrificing productivity. Use of the package is supported by Dairy Australia which has made DGAS accessible to all farmers on its website. While DGAS was only trialled on a limited scale by MGC, its capacity to quantify farm GHG emissions, as well as inform farm decision-making on appropriate mitigation strategies, made it a potentially significant tool – especially when integrated into MGF@RM – in moving beyond simply raising awareness of environmental issues towards a system for auditing emissions. The capacity to integrate supplier GHG emissions as part of routine reporting provided a potential advantage for MGC should carbon footprinting become a future requirement for access to particular markets. Yet, in the short to medium term, integrating DGAS as a standard feature of MGF@RM is likely to be limited in the absence of clearer market incentives for dairy co-operatives and companies to account for the GHG emissions associated with milk production.

In 2011 Bega Cheese, another large dairy processor, became involved in a Dairy Australia-funded initiative involving LCA to determine the carbon footprint of selected dairy products. Research in several countries has found that carbon footprinting and carbon labelling are difficult to do accurately, and not well understood or valued by consumers compared with other credence attributes, such as quality, health claims and price (Gadema and Oglethorpe, 2011; Upham et al., 2011; Virtanen et al., 2011). Nevertheless, it may be important for producers in NZ and Australia, because of their heavy export orientation and remoteness from markets, to provide this kind of information (Guenther et al., 2012) to counteract the imputation of high ‘food miles’ with a life cycle assessment revealing the lower GHG emissions from less intensive production (Saunders and Barber, 2007; Saunders et al., 2006). The objective of the Dairy Australia project was to establish a ‘methodology for quantifying and reporting the carbon footprint of dairy products’ that ‘will help ensure access to international markets that are increasingly demanding information on environmental performance’ (Dairy Australia, 2011, p. 1). A final report was published in 2012 (Dairy Australia, 2012). However, Bega Cheese is not willing to move further on this until carbon footprinting becomes a requirement for maintaining access to export markets and/or government regulation obliges them to reduce emissions along the supply chain. Meanwhile, the company is using aspects of DairySAT to assist its suppliers in complying with industry environmental best practice and at the same time ensuring that it is positioned to maintain future access to valuable export markets.

Apart from the efforts of individual dairy companies to achieve improved environmental performance, the Dairy Manufacturers Sustainability Council (DMSC), founded in 2006, brings together a majority of dairy processors to demonstrate collectively the sustainability of the Australian dairy industry and to solve common environmental problems. In collaboration with Dairy Australia, the group has undertaken three triennial surveys on environmental sustainability in the Australian dairy manufacturing industry: in 2005 (the baseline report), 2007/08 and 2010/11 (Dairy Australia, 2013).
These surveys reported on progress against key economic, social and environmental performance indicators, including energy efficiency and GHG emission reductions. Case studies demonstrated specific innovations adopted to reduce emissions: an example is Murray Goulburn’s conversion of organic waste to biogas, which not only consumes 99% of on-site methane emissions but also reduces electricity consumption (Dairy Australia, 2013, p. 23). These initiatives, which seek to quantify environmental performance, are linked to the growing use of sustainability metrics by upstream supply chain actors – such as international food companies. As we argue below, such metrics are likely to have an increasingly powerful influence on how Australian dairy processors constitute GHG emissions as a thinkable and practicable issue.

5.3. Sustainability metrics – integrating technologies of agency and performance

According to Freidberg (2013, p. 572), in recent years there has been an important, underappreciated, yet fragile shift in supply chain governance strategies towards the use of metrics-based approaches for measuring sustainability. In the case of the dairy industry, sustainability metrics are starting to be used by global food companies – individually, and as part of broader multi-stakeholder initiatives, such as the Sustainable Agriculture Initiative (SAI) – to: (a) enable them to source sustainable dairy products and thereby demonstrate corporate social responsibility, and (b) measure the GHG impacts from dairy farms/suppliers. Through enabling private sector actors to define what counts as ‘sustainable’ practices, and producing numbers through which farmers can continuously reflect on and improve their ‘sustainability’, these metrics provide the basis for integrating existing technologies of agency and performance into a more systematic regime of corporate GHG governance. As an industry interviewee argued, rather than responding to consumer demand for sustainable milk products – which currently does not exist:

… companies are driving the sustainability metrics … as they are trying to line up where in the world sustainable food will be, sustainable food supplies … So it’s in their self-interest, it looks quite good on their corporate social responsibility reporting.

[D01]

The SAI Platform is an international food industry organisation aiming ‘to promote sustainable agriculture worldwide … through continuous improvement processes’ (SAI Platform, 2010, p. 1). SAI was founded in 2002 by Nestlé, Unilever and Danone, and currently has 60 members worldwide (http://www.saiplatform.org/). Its large Dairy Working Group includes the NZ dairy company Fonterra, which operates in Australia. SAI Platform recently developed a standardised methodology for the dairy sector to assess GHG emissions.

Unilever, one of the founding members of the SAI Platform, is one of the most prominent global food companies developing sustainability metrics with the aim of driving sustainability down the supply chain and verifying supply chain sustainability measures, particularly in cases where Unilever does not use third-party certification schemes (Dhawan et al., 2010). This reflects a commitment to sourcing 100% of the company’s agricultural raw materials sustainably by 2020, with the broader aim of ensuring long-term sustainability by 2020, with the broader aim of ensuring long-term sustainability (Dhawan et al., 2010). These initiatives, which seek to quantify environmental performance, are linked to the growing use of sustainability metrics by upstream supply chain actors – such as international food companies. As we argue below, such metrics are likely to have an increasingly powerful influence on how Australian dairy processors constitute GHG emissions as a thinkable and practicable issue.

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In addition to the SAC, Unilever has produced more specific implementation guides for particular industries, including dairying. The Sustainable Dairy Implementation Guide is aimed at providing ‘extra interpretation for Unilever’s dairy suppliers and their farmers on the requirements of the Unilever SAC, and guidance on how to fulfill those requirements’ (Unilever, 2011, p. 3). It also includes a section on metrics data requirements to assist dairy processors in working with their farmer suppliers. Many of the practices in the SAC and Implementation Guide are similar to DairySAT, but the use of metrics for verifying the fulfilment of those practices means that reporting is quantified and the data generated is measurable and comparable, whereas DairySAT is primarily a tool for the personal use of the farmer.

Australia recently became the first country in the world to comply with Unilever’s SAC. All dairy production accredited by Dairy Australia now meets the demands of this code (Unilever, 2013). While dairy products sourced from South East Asia and Australasia comprise only 5% of Unilever’s total dairy supply, compliance with the SAC is likely to increase pressure on dairy companies – particularly Murray Goulburn and Fonterra who are the main Australian Unilever suppliers – to develop their own sustainability metrics consistent with those developed by Unilever. In recognition of this, Dairy Australia is at the time of writing (late 2014) ‘working with milk companies to develop an industry sustainability reporting framework’ consistent with the Unilever SAC, and in which ‘selected sustainability indicators are clear, measurable, defendable and easily collated without significant cost and time burdens on farmers and processors’ (Dairy Australia, 2014b, n.p.). DairySAT is highly likely to form part of the sustainability reporting framework.

Greenhouse gas emissions form an important part of the metric reporting requirements in Unilever’s SAC. Embedded in the SAC is an online measurement tool – the Cool Farm Tool (CFT) – designed specifically to calculate net GHG emissions from agriculture. The CFT is intended to be used on-farm to assist farmers in identifying emissions hotspots, testing alternative management scenarios, and moving towards a reduction in net emissions (Cool Farm Tool, 2014). The reduction of GHG emissions is a significant part of Unilever’s goal of sustainable sourcing and is also viewed as crucial in being prepared ‘as this type of emissions reporting and disclosure becomes more prominent and potentially put into regulation’ (Cool Farm Tool, 2015, p. 2). Pre-empting of prospective future regulatory requirements often provides motivation for companies to adopt instruments for demonstrating responsible environmental stewardship practices (e.g., Freidberg, 2013; Van der Heijden, 2012).

The use of sustainability metrics through the Unilever SAC is a potentially powerful way of encouraging continuous environmental improvement in international dairy supply chains. It may also contribute to dairy processors competing with each other to provide supplier incentives for improved environmental stewardship, including GHG abatement. Significantly, in creating an alternative mentality of GHG governance (see Okereke et al., 2009), sustainability metrics contribute to the consolidation of a corporate carbon economy at an international scale, but at the same time also facilitate participation by dairy processors and farmer-suppliers in carbon markets. However, there is the risk that this may be yet another form of corporate ‘greenwashing’ (Jansen, 2004) that enables companies such as Unilever to verify improvements in
eco-efficiency, but does little to address the practices that have contributed to rising GHG emissions in the first place. In addition, the uptake of GHG ‘footprinting’ metrics across supply chains can result in dairy processors focusing on those dimensions of sustainability that are easier to measure. Since GHG emissions are often more amenable to measurement than other indicators of sustainability there is the risk that these will be taken up widely as a proxy for sustainable practices, in the process doing little to address biodiversity, animal welfare and farming livelihoods (Freidberg, 2014, p. 185; see also Bridge, 2011). As noted by one dairy industry stakeholder:

My concern is that carbon footprinting is one measurement, and only one measurement, of environmental credentials. If we’re going to be really fair dinkum as a dairy industry I think we need to go beyond that, and not let the international markets drive us on one indicator only. We need to be aware that there are several others and that we need to look at and to start identifying those.

Since our interviews with stakeholders, the dairy industry has developed a Strategic Framework that encompasses several dimensions of sustainability including: enhancing livelihoods, improving wellbeing, and reducing environmental impact (ADIC and Dairy Australia, 2012). The selection and evaluation of metrics-based performance indicators provides the foundation for the delivery of the Framework and for continuous improvement of sustainability for each indicator. This is highly consistent with the metrics-based approach to sustainability being developed by companies such as Unilever. Given the growing significance of metrics-based approaches in supply chain governance (Freidberg, 2014), it will be interesting to see how the implementation of the Strategic Framework in practice aligns with corporate frameworks, such as the Unilever SAC, and the performance measures that are given the most emphasis.

6. Conclusion

Private sector actors are playing an increasingly prominent role in environmental governance within the agri-food sector (Freidberg, 2013; Cunningham, 2009; Loconto and Fouilleux, 2014). The likely future impacts of climate change on global food production have recently seen this role extend to a concern with addressing GHG emissions. Through a case study of the Australian dairy industry, this paper has argued that private sector actors are not simply reacting to state-based climate policy initiatives. They use a range of techniques that enable them to variously respond to existing government environmental regulations and climate policies, balance current market pressures with future supply chain requirements, and, in the case of international food companies, demonstrate improved eco-efficiency along food supply chains. Following Lövbrand and Stripple’s (2012) governmentality-inspired approach, these techniques comprise technologies of agency and technologies of performance. As our paper shows, while GHG abatement is a growing priority, none of the technologies examined has a direct focus on carbon markets, or on market-based incentives for GHG abatement. This represents a key contrast with much of the carbon economy literature, which focuses predominantly on the ‘international climate regime’ (Okerere et al., 2009) of carbon trading, or carbon markets more broadly (e.g., Bailey and Wilson, 2009; Bailey et al., 2011; Boyd et al., 2011; Boykoff et al., 2009; Goodman and Boyd, 2011). These technologies – both individually and in combination – are enacted outside of the international climate regime and contribute to an alternative ‘mentality’ of GHG governance that we have termed the corporate carbon economy. As our analysis shows, this is evident in three areas.

First, environmental self-assessment tools such as DairySAT have been developed as a way of raising awareness among farmers of what constitutes ‘good’ environmental management. Such tools have been taken up by dairy processors largely to assist their farmer-suppliers in complying with government environmental regulations. However, building the capacities of dairy farmer-suppliers to meet processor environmental standards also enables dairy companies to respond to any future market incentives for improved environmental performance and potentially to participate in carbon markets. Raising awareness of on-farm environmental issues, as well as building farmers’ capacities to recognise those issues and ‘internalise’ positive environmental preferences (Lemos and Agrawal, 2006, p. 307), are arguably essential starting points for meeting current and future environmental standards imposed by processors as well as upstream supply chain actors. In this way, while techniques such as DairySAT appear to have little direct relevance to GHG governance as presented in the carbon economy literature, our analysis shows that it is important as a technology of agency in making a corporate carbon economy possible.

Second, technologies of agency and performance – such as DairySAT and techniques for measuring GHG emissions – that are voluntary and flexible enable GHG abatement to be made workable in the context of private sector goals and pressures. The need to adapt GHG abatement techniques in this way is little recognised in the carbon economy literature, yet is crucially important for private sector actors in ensuring that ‘sustainability fits their own business models’ (Freidberg, 2014, p. 185). How companies address sustainability issues needs to be located in the context of other often competing economic, social and regulatory pressures (Cunningham et al., 2004). As our paper shows, the capacity of dairy processors to spend money on environmental initiatives is constrained by lack of consumer demand for environmentally certified milk products, the priority of meeting food safety standards, and the fear of losing suppliers if additional requirements are placed on farmer-suppliers. At the same time, these processors recognise that they need systems in place, such as DGAS (Murray Goulburn) and LCA (Bega Cheese), so that they are able to adapt quickly should overseas markets in the future require evidence of environmentally sound farming practices or low GHG emissions. Going beyond minimum environmental regulatory requirements is not at present critical for dairy companies in maintaining competitiveness or a ‘licence to operate’ (Gunningham et al., 2004). This seems likely to change only if there are clear market incentives for the adoption of instruments for GHG measurement and abatement, or upstream supply chain actors, such as global food companies, place pressure on national dairy processors to develop sustainability reporting systems, which include metrics for GHG emissions. For the foreseeable future, dairy processors are likely to continue using technologies of agency and performance that incorporate GHG abatement as part of a broader suite of voluntary environmental management initiatives. Given the widespread use of such voluntary initiatives in the agri-food sector (Van der Heijden, 2012) they form a crucial dimension of the corporate carbon economy.

Third, the use of metrics by international food companies to measure and improve sustainability is increasingly influential in the governance of GHG emissions, and, as we argue, provides a way of integrating existing technologies of agency and performance into a more systematic regime of corporate GHG governance. As Clapp and Fuchs (2009, p. 13) point out, these companies play a crucial role in ‘setting the parameters and tone of debates about the sustainability implications of various models of organisation for global food and agriculture’. Therefore, the capacity of sustainability metrics...
developed by companies to drive changes down agri-food supply chains should not be under-estimated. As our analysis demonstrates, Unilever provides an excellent example of how a multi-national food company is embracing sustainability metrics as a way of ensuring longer term security and quality of their food supplies. Unilever’s SAC provides the architecture for the development and roll-out of these metrics. Through instruments such as the Cool Farm Tool, data on GHG emissions can be collected at a farm level and aggregated at a processor level to demonstrate compliance with the SAC. While these instruments are yet to have a noticeable impact on downstream suppliers in the Australian dairy industry, it is noteworthy that Dairy Australia is currently working with processors to develop a sustainability reporting framework. Such a framework is likely to be increasingly crucial for Australian processors in the future in meeting the sustainability requirements of companies such as Unilever. It may also result in conformity to corporate sustainability codes becoming the main priority for processors, in contrast to current priorities of meeting government regulatory requirements, and may overcome a reluctance to impose additional requirements (such as environmental programmes) on farmersuppliers. Through the development of sustainability metrics, which include GHG emissions, and the roll-out of these metrics through food supply chains, it is likely that a corporate carbon economy – driven largely by the supply chain objectives of multi-national food companies – will increasingly rival government efforts to establish carbon farming and offset schemes. In this context, it is more important than ever for social scientists to investigate the techniques through which private sector actors make GHG abatement thinkable, feasible, and practicable, and to critically analyse how these techniques contribute to the consolidation of corporate power, enabling and/or constraining progressive possibilities for climate action.

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