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THE PROSPECTS FOR ADDRESSING AGRICULTURAL EMISSIONS WITHIN THE CURRENT REGIME COMPLEX FOR CLIMATE CHANGE

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I Introduction

Globally, climate change is an ever increasing concern. Climate science and technology are constantly developing, allowing us to better understand the changing climate. Global warming is a result of greenhouse gas emissions from human activities being continually discharged into the atmosphere, causing the atmosphere to thicken and the planet to warm.[1] Evidence of Earth's warming is becoming increasingly apparent; the National Oceanic and Atmospheric Administration confirmed 2015 was Earth's warmest year on record.[2] Of the fifteen warmest years on record, fourteen have occurred in this century – with the exception of 1999.[3] Climate scientists have warned 2016 will conform to tradition and set a new record.[4] This trend is likely to continue unless emissions are significantly reduced. The warmer the atmosphere the more energetic and humid it becomes and, combined with higher ocean surface temperatures and sea-levels, this creates the ideal environment for increasingly destructive weather events.[5]

The solution is clear – mitigate. Mitigation involves reducing the level of anthropogenic greenhouse gas emissions into the atmosphere. States are implementing mitigation strategies, but not at a pace fast enough to limit the planet's warming to below the internationally subscribed temperature of 2ºC above pre-industrial levels.[6] The knowledge that climate policy transformation is necessary is nothing new, but the policies with the most potential are often the least palatable. Economist Nicholas Stern conveyed disappointment with the lack of movement internationally on climate change, had he known how the situation would evolve he would have emphasised the risks of a temperature rise of four-or-five-degrees: "I think I would

[1] These greenhouse gases include, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), halocarbons (human-made compounds that contain chlorine or bromine and carbon atoms), and water vapour.[1] Each gas is converted to a CO_2 value for atmospheric warming, allowing the emissions from all gases to be compared.

[2] National Oceanic and Atmospheric Administration "State of the Climate: Global Analysis for Annual 2015" (2016) National Centers for Environmental Information <www.ncdc.noaa.gov>.

[3] National Oceanic and Atmospheric Administration "State of the Climate: Global Analysis for Annual 2015", above n 2.

[4] NASA "2016 Climate Trends Continue to Break Records" (20 July 2016) NASA Climate <www.nasa.gov>.

[5] Kevin Trenberth, Distinguished Senior Scientist in the Climate Analysis Section at the National Center for Atmospheric Research "The Russian Heat Wave and Other Recent Climate Extremes" (speech to the New Zealand Climate Change Research, Victoria University of Wellington, 15 July 2011).

[6] Adoption of the Paris Agreement FCCC/CP/2015/10/Add.1 (29 January 2016), art 2(1)(a).

have been a bit more blunt."[7] The longer mitigation is postponed or overlooked in favour of adaptation or ignoring the problem altogether, the more costly mitigation options become and the time frame to enact change is diminished.

This paper will analyse the prospects for the increasingly popular government strategies to reduce consumption of 'high carbon' foods, meat and dairy. Livestock contribute 14.5 per cent of all human-induced emissions.[8] Reductions in this area will have a significant impact on the levels of anthropogenic gases entering the atmosphere. To successfully contribute to reductions in dangerous greenhouse gas emissions, regulations would need to work within the current climate change regime. Despite state efforts to craft an integrated and comprehensive regime for climate change internationally, a regime complex has formed, featuring loosely linked regimes to realise the benefits from cooperation.[9] This international framework provides the opportunity for successful climate change policy in the agricultural sector, focused on 'high carbon' nutriment. The regime complex for climate change provides many advantages and opportunities for states willing to undertake action to reduce emissions and prevent global temperature levels rising more than 2°C.

Recent climate change discussions in Paris have significantly reduced the temperature limit states have resolved to remain below. If the objectives set out at the United Nations Climate Change Conference Paris 2015 (Paris Conference) are to be achieved, states have a complex task ahead implementing strategies to limit the global temperature rise to 1.5°C.[10] Less than a year after the Paris Conference was concluded, many scientists are now describing the 1.5°C target as impossible.[11]

[7] Heather Stewart and Larry Elliott "Nicholas Stern: 'I got it wrong on climate change – it's far, far worse" *The Guardian* (online ed, United Kingdom, 26 January 2013).

[8] P.J. Gerber and others *Tackling climate change through livestock – A global assessment of emissions and mitigation opportunities* (Food and Agriculture Organization of the United Nations, 2013), at 15.

[9] Robert O. Keohane and David G. Victor "The Regime Complex for Climate Change" (2011) 9(1) Perspectives on Politics 7, at 8.

[10] Article 2(1)(a).

[11] Robin McKie "Scientists warn world will miss key climate target" *The Guardian* (online ed, United Kingdom, 6 August 2016).

With increased agricultural production it is clear emissions from this sector will continue unabated. This is not the first paper to report on the increasingly dangerous effects the agricultural sector is having on the climate.[12] Neither is it the first to determine that regime complexity has emerged in the climate change issue area.[13] This paper looks to provide a new perspective on the issue of agriculture and climate change by addressing the prospects for policies reducing agricultural emissions within the regime complex for climate change. Currently agriculture is largely ignored in international climate change action. This paper sheds new light on the issue, drawing on recent movements and increased calls internationally for this sector, one of the largest single contributors to climate change, to be brought in line with climate change action across the board. There has been no scholarly article written on this issue from the perspective of the regime complex. Within the current regime complex, room for real policy change exist. There is no quick fix, but the combination of regime complexity and the increasing awareness of agriculture's impact indicates that a novel climate policy in this area has real potential.

This paper explores the current regime complex for climate change and the prospects for an international climate initiative addressing the agricultural sector. It is divided into four substantive Parts. Part II contextualises the regime complex for climate change, including its evolution and development, and surveys the current literature on regime complexity. Part III uncovers the extent of agriculture's emissions contribution and explains the work being done currently to address this issue. This section looks to the increasing awareness of agriculture's impact and a willingness to explore demand-side mitigation in this sector in future. Part IV analyses the effective support for addressing agricultural emissions within the regime complex for climate change, drawing on the main dimensions of the regime complex including, its flexibility and adaptability, the interconnectedness through linkages, and the ability to form 'clubs'. Part V looks to the challenges agricultural policy would encounter, including fragmentation, competition, and power dynamics within the regime complex.

[12] See P.J. Gerber and others *Tackling climate change through livestock – A global assessment of emissions and mitigation opportunities* (Food and Agriculture Organization of the United Nations, 2013); Rob Bailey, Antony Foggatt and Laura Wellesley *Livestock – Climate Change's Forgotten Sector: Global Public Opinion on Meat and Dairy Consumption* (Chatham House, The Royal Institute of International Affairs, 3 December 2014).

[13] See Robert O. Keohane and David G. Victor "The Regime Complex for Climate Change" (2011) 9(1) Perspectives on Politics 7; Kenneth W. Abbott "The Transnational Regime Complex for Climate Change" (2012) 30(4) Environ Plann C Gov Policy 571.

II Regime complexity within the climate change arena

In providing context for discussion on addressing agricultural emissions within the current regime complex, Part A sets out the characteristics of regime complexity and the explanations for this phenomenon. Further, Part B establishes the origins of the international law framework for climate change, highlighting the nature of linked, overlapping institutions covering this issue area. Part C will draw on these conclusions to demonstrate the existence of the regime complex for climate change and the features that will be drawn on in Parts IV and V.

A Regime complexity

In engaging with global issues, international law has developed a range of mechanisms to address difficult challenges. The regime complex is one development whereby the structure of international law has formed a loosely coupled set of regimes in an issue area, which are more or less linked in complementary ways.[14] Kal Raustiala and David Victor coined the term 'regime complex' to describe: "an array of partially overlapping and non-hierarchical institutions governing a particular issue-area".[15] On an institutional framework scale, this ranks somewhere between a hierarchical institution imposing regulations and an institution with no identifiable core and non-existent linkages.[16] The regime complex forms in a way that is not entirely fragmented, nor on the other hand fully comprehensive.

Different cooperation problems lend themselves to different tasks and structures. Robert Keohane and David Victor, in their work establishing the existence of the regime complex for climate change, point out three forces that account for the variation in the institutional outcomes, from integration to fragmentation.[17] First, the distribution of interests weighted by

[14] Emilie Bécault "Democratizing global environmental governance? The case for transnational climate governance" in Jan Wouters and others (eds) *Global Governance and Democracy: A Multidisciplinary Analysis* (Edward Elgar Publishing, Gloucestershire, 2015) 63 at 71.

[15] Kal Raustiala and David G. Victor "The Regime Complex for Plant Genetic Resources" (2004) 58(2) International Organization 277 at 279.

[16] Joseph S. Nye Jr. *The Regime Complex for Managing Global Cyber Activities* (Centre for International Governance Innovation, paper series no. 1, May 2014) at 7.

[17] Keohane and Victor "The Regime Complex for Climate Change", above n 9, at 8.

power: where all powerful interests converge, a singular international institution is considered the best vehicle for cooperation.[18] Second, uncertainty: states looking for cooperation with a number of actors on complex issues will encounter uncertainty.[19] This is a numbers game, the more states cooperating, the deeper connections run and the harder it becomes to make 'reliable promises' due to states being uncertain about the gains they will make through cooperation and the exposure to risks through regulation.[20] As a result, states tend to form smaller groups, these 'clubs' are easier to manage and vary in membership depending on shared interests.[21] Third, linkages: institutional support increases cooperation and effectiveness in decision-making, strengthening the incentive for compliance.[22] Through linkages deal-making is encouraged, this supports integration and states are incentivised to cooperate on a common problem.

The regime complex combines a multitude of actions through loosely linked regimes. These structures form through a process of 'contested multilateralism'; contemporary multilateralism is characterised by informal and formal competing coalitions and institutional arrangements.[23] These arrangements are implemented to disrupt the status quo.[24] Julia Morse and Robert Keohane explain how progress occurs through contested multilateralism:[25]

> Contested multilateralism involves the use of different multilateral institutions to challenge the rules, practices, or missions of existing multilateral institutions. *More precisely, the phenomenon of contested multilateralism occurs when states and/or non-state actors either shift their focus from one existing institution to another or create an alternative multilateral institution to compete with existing ones* … When these challenges to dominant institutions are successful, they typically increase the complexity of an international regime by adding elements to it or strengthening formerly weaker institutions with it.

While this process may seem counterproductive, with a common goal in mind, institutions utilise the available flexibility to improve actions and processes in order to move closer to

[18] Keohane and Victor "The Regime Complex for Climate Change", above n 9, at 9.

[19] At 9.

[20] At 9.

[21] At 9.

[22] At 9.

[23] Julia C. Morse and Robert O. Keohane "Contested Multilateralism" (2014) 9(4) Rev Int Organ 385 at 386.

[24] Morse and Keohane, above n 23, at 386.

[25] Morse and Keohane, above n 23, at 387.

achievement of global goals. Florian Rabitz identifies three state strategies in the literature: forum shopping, where actors select venues best able to promote specific policy preferences; regime shifting, involving states moving from one regime to an alternative regime and shifting the issue possibly in conjunction with politics relevant to the issue area; and strategic inconsistency, encompassing states attempting to force change by explicitly forming rules in a regime incompatible with another institution.[26] These are not necessarily clear-cut and a combination may be used in an attempt to gain the most advantage from an institutional network of this type. These conditions can cause greater uncertainty within a regime complex as unintentional outcomes often occur and, without a hierarchical structure with rules, accountability is difficult.[27]

Like any structural framework, the regime complex offers both advantages and disadvantages. If the central norms in the regime complex are to an extent complimentary, cooperation can be promoted through a regime complex.[28] To enhance effective cooperation, Michael Struett et al. emphasise information and knowledge must be generated and distributed to all interested parties in order for the various institutions to reconstruct the problem in a collective way.[29] Conflicting core norms will only stimulate fragmentation and damaging action by various parties.[30] The regime complex can involve 'path dependency', whereby the costs of transforming strategies increase over time, this entrenches existing patterns and as a result any new initiatives need to operate, or at least respond, to existing parameters of the structure.[31]

Institutions are often legally inconsistent as the regimes are developed and implemented in separation, and not necessarily negotiated in conjunction with, or at the same time, as other regimes.[32] Chaos can ensue where institutions become too dispersed within a regime complex. This fragmentation can lead to actors encouraging veto points and gridlock, discouraging

[26] Florian Rabitz "Regime complexes, critical actors and institutional layering" (2016) J Int Relat Dev 1 at 4.

[27] Michael J. Struett, Mark T. Nance and Diane Armstrong "Navigating the Maritime Piracy Regime Complex" (2013) 19(1) Global Governance 93 at 95.

[28] Struett, Nance and Armstrong, above n 27, at 94.

[29] Struett, Nance and Armstrong, above n 27, at 94.

[30] Struett, Nance and Armstrong, above n 27, at 94.

[31] Struett, Nance and Armstrong, above n 27, at 95.

[32] Raustiala and Victor, above n 15, at 280.

further investment.[33] Amandine Orsini et al. develop the definition of a regime complex, understanding it as: [34]

> … a network of three or more international regimes that relate to a common subject matter; exhibit overlapping membership; and generate substantive, normative, or operative interactions recognized as potentially problematic whether or not they are managed effectively.

The regime complex arrangement allows a variety of approaches to be undertaken to address a common issue. The loose coupling that exists within a regime complex permits cooperation among actors in some areas, while at the same time disagreements exist between them in others.[35] Transaction costs are likely to be higher without a single comprehensive institution governing the issue area, instead multiple venues will each subscribe to their own administrative rules.[36] It is important to note, what this structure lacks in coherence it makes up for in flexibility and adaptability – allowing both state and non-state actors to adjust to uncertainty.[37]

The regime complex analysis is not limited to multilateral inter-state institutions. The structure involves actors connected by a common issue, action may be undertaken by states, international organisations, at the regional level and non-governmental organisations.[38] Within a regime complex non-state actors play an important role. While these actors are unlikely to create legally binding regulations, their efforts are influential in the private sphere and have a unique opportunity to influence behavioural change.[39] The regime complex encourages linkages to develop, therefore states have the ability to build on these non-state movements. Karen Alter and Sophie Meunier characterise regime complexity as "the presence of nested, partially overlapping, and parallel international regimes that are not hierarchically ordered."[40] The non-

[33] Keohane and Victor, above n 9, at 16.

[34] Amandine Orsini, Jean-Frédéric Morin, and Oran Young "Regime Complexes: A Buzz, a Boom, or a Boost for Global Governance?" (2013) 19(1) Global Governance 27 at 29.

[35] Joseph S. Nye Jr. *The Regime Complex for Managing Global Cyber Activities*, above n 16, at 9.

[36] Keohane and Victor, above n 9, at 16.

[37] Joseph S. Nye Jr. *The Regime Complex for Managing Global Cyber Activities*, above n 16, at 9.

[38] Orsini, Morin, and Young, above n 34, at 36.

[39] Kenneth W. Abbott "The Transnational Regime Complex for Climate Change" (2012) 30(4) Environ Plann C Gov Policy 571 at 579.

[40] Karen Alter and Sophie Meunier "The Politics of International Regime Complexity" (2009) 7(1) Perspectives on Politics 13 at 13.

hierarchical nature of the regime complex allows state and non-state actors to adopt climate change issues to be dealt with in connection with other institutions; all actors are in pursuit of a solution to a common problem.

B Development of the climate change framework

Climate change is a global issue, its effects are not limited to state boundaries, and neither will it target the largest emitting countries. The nature of this problem means an international effort has been the favoured approach for state attempts to tackle it. Members of the international community have taken numerous steps to formulate a regime to combat climate change. These actions have had varying results. The inaugural agreement for the international community on climate change was considered a success in terms of international cooperation, the United Nations Framework Convention on Climate Change (UNFCCC) established in 1992 at the Earth Summit in Rio, currently boasts 197 parties.[41] The first international collaboration was a comprehensive treaty designed to facilitate cooperative international action, including the study of causes, the policy options for mitigation, and the exchange of information and technology.[42] Initially, the international goal was to limit the rise in temperature to below 2ºC above pre-industrial levels. However, the lack of movement following its entry into force on 21 March 1994, and the apparent unwillingness of states to adapt their national policies to achieve a reduction in emissions, means the Convention has been rendered considerably ineffective.[43]

Under the UNFCCC, at best the objective set out to stabilise the greenhouse gas concentrations in the atmosphere, if shown they were caused by humans, so as to avoid "dangerous anthropogenic interference with the climate system".[44] The Convention failed to introduce a

[41] United Nations Framework Convention on Climate Change 1771 UNTS 165 (opened for signature 9 May 1992, entered into force, 21 March 1994). See also: "Status of Ratification of the Convention" United Nations Framework Convention on Climate Change <http://unfccc.int>.

[42] Barbara Buchner "The Dynamics of the Climate Negotiations: A Focus on the Developments and Outcomes from The Hague to Delhi" in Michael Bothe and Eckard Rehbinder (eds) *Climate Change Policy* (Eleven International Publishing, Utrecht, 2005) 19 at 22.

[43] Michael Northcott *A Political Theology of Climate Change* (Wm. B. Eerdmans Publishing Co., Michigan, 2013) at 166.

[44] Article 2.

regulatory structure by which states could measure reduction efforts. Francesco Bosello et al. highlight the essential flaw in the UNFCCC structure: [45]

> The benefits induced by a ton of carbon abated are experienced irrespectively of where this ton has been abated … The global public good nature of emissions reduction creates the well known incentive to free ride. This is one of the biggest problems in reaching a large and sustainable international mitigation agreement …

The UNFCCC's non-binding nature and the impracticable state commitments undermined the international effort and in effect prevented it from fulfilling its purpose. It did not take long for the international community to realise the need for a more comprehensive treaty dealing with climate change.

The UNFCCC took effect in 1994 and within a year negotiations for a protocol had begun.[46] While still adopting a top-down treaty approach, the Kyoto Protocol introduced stricter guidelines for reducing damaging greenhouse gas emissions. The predominant feature of the Kyoto Protocol is its mandatory emission reduction targets.[47] States agreed limitations should be placed on greenhouse gas emissions and committed to pursuing limitation and reduction commitments with the objective of reducing emissions below 1990 levels between 2003 and 2012.[48] Ralph Chapman describes the top-down treaty approach as an 'article of faith': [49]

> … based on the assumption that such an approach – including a Kyoto-type United Nations-mandated reduction target – could avoid 'free riding' by self-interested countries, and offers the best chance of getting all the major players on board.

In reality, the Kyoto Protocol placed no binding obligations on developing nations and the United States never ratified the agreement leading to its effect being primarily symbolic.[50] This

[45] Francesco Bosello, Carlo Carraro and Enrica De Cian *An Analysis of Adaptation as a Response to Climate Change* (Copenhagen Consensus on Climate, 2009) at 15.

[46] Karen Webster *International Environmental Agreements: Process, Governance and Case Studies* (A Preliminary Compilation Report for the Oil Depletion Protocol, November 2006) at 25.

[47] John P. Rafferty (ed) *Climate and Climate Change* (Britannica Educational Publishing, New York, 2011) at 291.

[48] Kyoto Protocol to the United Nations Framework Convention on Climate Change 2303 UNTS 162 (opened for signature 16 March 1994, entered into force 16 February 2005), art 3.

[49] Ralph Chapman *Time of Useful Consciousness – Acting Urgently on Climate Change* (BWB Texts, Wellington, 2015) at 39-40.

[50] Keohane and Victor, above n 9, at 10.

comprehensive approach was unsuccessful – in response to an integrated regime to address climate change, the international community encouraged a multiplicity of regimes – out of this, a regime complex emerged.[51]

In response to immense difficulties in achieving climate change targets through these agreements, governments looked to form smaller groups of countries to deal with climate issues. These efforts included the Asia Pacific Partnership (APP) involving the United States and six countries on the Asian rim agreeing in 2005 to cooperate on low-carbon technology research and development.[52] The Group of Eight (G8) was already in existence when they picked up the climate change issue and have released regular statements on climate change.[53] This spurred meetings of the most important industrialised and developing countries, the Group of 20 (G20), who similarly adopted climate change as an agenda issue, particularly seeking low-cost emissions reduction measures.[54] Established in 2009, as a successor to the Major Economies Meeting on Energy Security and Climate Change (MEM), The Major Economies Forum (MEF) includes states responsible for approximately 80 per cent of global emissions.[55] This venue enables large emitters to deal with climate change issues "without entering the labyrinth of UN diplomacy".[56]

Though the UNFCCC never truly developed as a core regulatory statute, the international community has continued to cooperate through mechanisms under the treaty framework, as well as through separate institutions that have taken up the climate change issue. Multilateral initiatives under the UNFCCC and the Kyoto Protocol have continued to play a role in climate change action. Particularly the United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (REDD) and the Clean Development Mechanism (CDM) have continued to be utilised as tools to reduce emissions and improve management of forests (acting as carbon 'sinks' absorbing carbon from

[51] Keohane and Victor, above n 9, at 12.

[52] Keohane and Victor, above n 9, at 10.

[53] Keohane and Victor, above n 9, at 10.

[54] Keohane and Victor, above n 9, at 11.

[55] Council on Foreign Relations *The Global Climate Change Regime* (International Institutions and Global Governance program, Council on Foreign Relations, 19 June 2013).

[56] Council on Foreign Relations *The Global Climate Change Regime*, above n 55.

the atmosphere). These initiatives continue to encourage valuable international cooperation within the current climate change framework.

The international community have prioritised information sharing; various studies have been undertaken by international organisations and assessment bodies to improve the quality of climate change knowledge. The Intergovernmental Panel on Climate Change (IPCC) collates scientific data and presents the international community with the conclusions from scientific reviews. Since the IPCC launched in 1988, it has released five multivolume assessment reports about the state of scientific, technical and socio-economic knowledge on climate change, as well as the causes, potential impacts and response strategies.[57] The World Health Organisation (WHO) has set up the Global Programme on Climate Change and Health, guided by a World Health Assembly Resolution endorsed by all Member States.[58] Similarly, the United Nations Food and Agriculture Organisation (FAO) has established a number of programmes addressing climate change effects in areas particularly relevant to the FAO and their findings on climate change issues are reported to the international community.[59] These are only a few examples of the many international organisations that have adopted the climate change issue and undertaken research on how climate change is relevant to their field. This information is then disseminated to the international community, better informing all actors addressing the issue.

The international community has recently moved away from a top-down approach, in favour of a bottom-up response to climate change. In December 2015, the international community for the first time made large strides in the agreement for action on climate change. The Paris Conference had leaders calling for an aggressive global effort to keep greenhouse gas emissions 'well below' a 2ºC increase.[60] Further, states committed to pursuing efforts to limit the global temperature increase to 1.5ºC.[61] This involved states submitting their own targets through Intended Nationally Determined Contributions (INDCs), whereby each state committed to

[57] "IPCC Activities" Intergovernmental Panel on Climate Change <www.ipcc.ch>.

[58] WHO "Global Programme on Climate Change & Health" World Health Organisation <www.who.int>.

[59] FAO "FAO's Work on Climate Change" Food and Agriculture Organisation of the United Nations <www.fao.org>.

[60] Adoption of the Paris Agreement, above n 6, art 2(1)(a).

[61] Article 2(1)(a).

making tailored emission reductions and increasing this commitment every five years.[62] States have committed to distinct reduction levels within individual time frames. Unfortunately, even if all states meet their pledge, temperature rises are still set to reach 2.7ºC above pre-industrial levels by 2100.[63] It is unclear whether the voluntary approach seen at the 2015 Paris Conference will be an effective method for mitigating climate change but, without a doubt, room exists for improvement on the previous push for a top-down approach.

C Regime complexity and climate change

The climate change regime complex has unfolded through the development of an array of regimes and institutions working towards solutions to the global climate threat. The UNFCCC is an international treaty, with almost universal membership, through which it was thought a comprehensive climate change regime would form. Ideally institutions would gravitate to the UNFCCC as the core of the climate change network.[64] Despite efforts to craft a fully integrated comprehensive regime, a regime complex has formed as a response to climate change.[65] This framework consists of loosely linked, partially overlapping regimes.[66] Keohane and Victor are quick to point out, by no means are regime complexes superior to other institutional forms – in fact they doubt the climate change regime complex will achieve the desired reduction in emissions in time to prevent damage.[67] Instead they reason that international cooperation in reality is unlikely to be integrated and comprehensive; the loosely coupled regime is inevitable.[68]

Climate change as a global issue has characteristics that indicate efforts are unlikely to result in an integrated comprehensive regime, nor be fully fragmented.[69] The multiplicity of problems

[62] Article 4(9).

[63] "Climate pledges will bring 2.7°C of warming, potential for more action" (8 December 2015) Climate Action Tracker <http://climateactiontracker.org>.

[64] Keohane and Victor, above n 9, at 7.

[65] Keohane and Victor, above n 9, at 7.

[66] Keohane and Victor, above n 9, at 8.

[67] At 19.

[68] At 15.

[69] Keohane and Victor, above n 9, at 13.

make it difficult to organise cooperation around one single comprehensive regime: "no single country has the power to impose a solution on all others."[70] Further, the uncertainty involved in signing up to a comprehensive regime and its demands may deter states.[71] Strategically, the difficulties involved regarding bargaining and concessions may outweigh the benefits gained from a comprehensive climate regime.[72] At the heart of the regime complex are issue linkages leading to deeper cooperation. States pursue linkages among issues that will support their interests; avoiding a fragmented system where a lack of cooperation may undermine the interests of the investing state.[73] Varying links within the regime complex connect venues cooperating on climate issues; linkages are a crucial dimension of the regime complex and will be examined in Part IV.

The climate change regime complex is a result of a combination of the distribution of interests, a persistent uncertainty and a small number of tight linkages emerging in this issue area. The effect these pressures have on the formation of a regime complex are helped by what Keohane and Victor describe as "path-dependence and organisational practices".[74] Actors enter the climate change regime at various times and make their mark in different ways.[75] When this occurs, states are unlikely to pursue fundamental changes in these working arrangements in which they have already invested.[76] In light of this, Keohane and Victor suggest investment in an effective regime complex may prove successful in combating the problem of climate change, prioritising the flexible and adaptable regime complex, "rather than continuing to pursue the elusive goal of a comprehensive, integrated regime – a goal that is both unattainable and distracts policy-makers from more effective strategies".[77] The regime complex has two distinct advantages; flexibility across issues allowing institutions to adapt to different conditions.[78] Further, an ability to adapt over time compared to single comprehensive regimes,

[70] Keohane and Victor, above n 9, at 13.

[71] Keohane and Victor, above n 9, at 13.

[72] Keohane and Victor, above n 9, at 13.

[73] Keohane and Victor, above n 9, at 13–14.

[74] At 14.

[75] At 14.

[76] At 14.

[77] At 19.

[78] Keohane and Victor, above n 9, at 15.

better preparing a regime complex for modifications in climate change arrangements.[79] Adaptability and flexibility are particularly important in a situation such as climate change "in which the most demanding international commitments are interdependent yet governments vary widely in their interests and ability to implement them".[80]

The regime complex for climate change has developed with distinguishable links between institutions, but no identifiable core – despite efforts for a single unified approach, most notably the creation of the UNFCCC.[81] Several organisations have formed around this primary climate change effort, but significantly, the organisational structure has not emerged in a hierarchy, "instead, what we observe is an array of regulatory elements that is only partially organised hierarchically".[82] A multi-level climate change solution is advocated for by Nobel Prize winner, Elinor Ostrom:[83]

> Reliance on a single 'solution' may in fact result in more of a problem than a solution. It is important that we recognize that devising policies related to complex environmental processes is a grand challenge and that reliance on one scale to solve these problems is naïve.

The climate change regime is made up of multilateral institutions and clubs, unilateral initiatives and agreements, as well as investments in technologies and scientific development in the climate change arena. Uncertainty within the regime complex can lead to states forming smaller member groups, which Keohane and Victor label 'clubs'.[84] Areas where this has occurred in past climate efforts include those discussed above, the APP, MEF, G8, and G20, implemented in the time between the Kyoto Protocol and the Paris Conference.

A comprehensive system under the UNFCCC is no longer the favoured method for climate action. The UNFCCC acts as a component of the regime complex, rather than the quintessential

[79] Keohane and Victor, above n 9, at 16.

[80] Keohane and Victor, above n 9, at 7.

[81] Keohane and Victor, above n 9, at 7.

[82] Keohane and Victor, above n 9, at 12.

[83] Elinor Ostrom "A Multi-Scale Approach to Coping with Climate Change and Other Collective Action Problems" (2010) 1(2) The Solutions Journal 27 at 32.

[84] At 9.

element of climate change governance.[85] There is a possibility that over time, the UNFCCC will evolve into a 'core' for an integrated climate change system.[86] However, currently the regime complex provides everything the international community is seeking to deal with the climate change problem. Climate change strategies will be most effective where the advantages of adaptability and flexibility are embraced and states work to minimise the regime's negative consequences.

This paper will assess the prospects for addressing agriculture's emissions within the regime complex for climate change, analysing the proposed strategies alongside the main dimensions of the regime complex. To draw conclusions on the prospects of addressing agricultural emissions within the current framework it is necessary to consider the elements of the regime complex that contribute to its effectiveness. Oran Young acknowledged effectiveness as applied to environmental regimes can be subject to different formulations, "perhaps the core concern is the extent to which regimes contribute to solving or mitigating the problems that motivate those people who create the regimes."[87] In the case of climate change, the measure of effectiveness likely would involve the assessment of the performance of the regime relative to the situation in a business as usual (BAU) approach, but also measured against an ideal outcome – known as the collective optimum.[88] In assessing policy changes in the agricultural sector, the ideal outcome would be a reduction in emissions at a level that contributed to halting the global temperature increase below 2ºC.

Keohane and Victor not only analyse the existing structures and define the regime complex for climate change, the authors also provide six criteria from which a regime complex may be evaluated. Regime complexes that achieve positively in each category are likely to be normatively more justifiable than those scoring lower.[89] The following criteria were outlined:[90]

[85] Keohane and Victor, above n 9, at 19.

[86] Keohane and Victor, above n 9, at 19.

[87] Oran R. Young "Effectiveness of international environmental regimes: Existing knowledge, cutting-edge themes, and research strategies" (2011) 108(50) Proc. Natl. Acad. Sci. USA 19853 at 19854.

[88] Young "Effectiveness of international environmental regimes: Existing knowledge, cutting-edge themes, and research strategies", above n 87, at 19854.

[89] At 16.

[90] At 16-17.

(1) *Coherence*. Where the various specific regimes within the regime complex are compatible and mutually reinforcing the regime complex is coherent. On the other hand, the regimes could be incompatible and mutually detrimental, weakening the coherence of the regime complex.
(2) *Accountability*. Within the regime complex the elements should be accountable to appropriate actors including states, non-governmental organisations and publics.
(3) Determinacy. Where the rules of the regime complex are determinate this serves to enhance compliance and reduce uncertainty within the regime complex.
(4) *Sustainability*. Sustainable regimes reduce uncertainty by ensuring the elements are reinforcing and extra components may be built in, in case of failure in other components.
(5) *Epistemic quality*. The quality of knowledge within a regime complex is important, of particular concern is the need for consistency between the rules and scientific knowledge.
(6) *Fairness*. Institutions will be subject to the power dynamic of the international system, therefore fairness cannot achieve the utopian ideal. However, fairness can be realised within the regime complex by ensuring benefits are accessible and states willing to cooperate are not discriminated against.

Currently the regime complex ranks low on these criteria.[91] A successful policy affecting meat and dairy consumption would aim to improve fulfilment of these criteria in an effort to increase the effectiveness of the regime complex, rather than contributing further to the ineffectiveness of the system. These criteria will inform the discussion in Parts IV and V of this paper where the prospects of addressing agricultural emissions are evaluated.

III Addressing agricultural emissions

The following section will look at the current discussion on agriculture and climate change and possible avenues to address the emissions from this sector as they can no longer be ignored. Part A establishes the scientific basis for addressing the agricultural sector within the international climate change framework. Part B identifies the lack of agricultural policy in the climate change framework and identifies an emerging trend within the international

[91] Keohane and Victor, above n 9, at 17.

community, whereby states are dealing with health and environmental concerns by establishing guidelines to tackle meat consumption behaviours. Lastly, as transforming agricultural policy is a relatively new concept, Part C draws on studies into demand-side mitigation policies; in addition, a recent British think tank proposal provides practical policy recommendations for a clearer picture of the changes anticipated in this area. This proposal will be examined in Parts IV and V to illustrate how the regime complex could be both a benefit and a challenge to any novel agricultural policy.

A Agriculture's impact on the climate

Global consumption of meat and dairy is a major contributor to climate change. However, the impact of the agricultural sector on climate change is relatively unknown and global action has been limited due to the difficulties the issue poses. This section explores the available science assessing agriculture's impact on the changing climate. Moreover, it will uncover the relatively minimal targeted action in this area in comparison to emissions from transport, power and industry and the reasons for this. The 2013 FAO report on the connection between livestock and climate change, estimated emissions from the agricultural sector to be 7.1 gigatonnes of carbon dioxide equivalent (GtCO2-eq) per annum.[92] These emissions were calculated encompassing emissions attributable to all aspects of the processes, including feed production, livestock production, slaughter, processing, transport and retail.[93] In combination, the production of meat, eggs and dairy account for almost 15 per cent of greenhouse gases globally.[94] The full extent of livestock's impact is felt when the 7.1 GtCO2-eq global emissions are compared with estimates that direct emissions from global transport were responsible for 7.0 GtCO2-eq in 2010.[95] These numbers indicate the agricultural sector is a significant contributor of greenhouse gases and demands international attention.

[92] P.J. Gerber and others *Tackling climate change through livestock – A global assessment of emissions and mitigation opportunities*, above n 8, at 15.

[93] P.J. Gerber and others, above n 8, at 7.

[94] P.J. Gerber and others, above n 8, at 15.

[95] Ralph Sims and others "Transport" in Ottmar Edenhofer and others (eds.) *Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge University Press, 2014) 599 at 648.

Agriculture's emissions are unlikely to decrease in the near future without the introduction of mitigation efforts. The 2012 FAO report examining the future of the global agricultural sector predicts by 2050 meat production alone is likely to increase by almost 200 million tonnes – a 76 per cent increase.[96] An increase in demand will reflect an increase in production unless changes are made. Nearly 90 per cent of these production increases would occur in developing countries.[97] Food demand is forecasted to increase by 60 per cent by 2050.[98] The demand globally for food products generally will increase steadily, without climate change mitigation in this sector, emissions will mirror this increase. International cooperation in this area is of paramount importance if we are to remain 'well below' an increase in temperature of 2°C.

Despite the sizeable impact agriculture has on emissions, the sector's contribution to climate change is relatively unknown compared to transport and other sectors. In 2014, British think tank Chatham House conducted a multi-country, multilingual survey assessing the respondents from 12 countries thoughts on climate change and agriculture.[99] Over twice as many respondents accredited the emissions from transport as a driver for the changing climate as compared to livestock.[100] These numbers reflect the low awareness of the emissions generated in this sector. The conclusion for a quarter of all respondents was that the production of meat and dairy makes little or no contribution to climate change.[101] Interestingly, this conclusion varied between countries; respondents from Brazil, China, France, India and Japan were most likely to attribute emissions to the sector, while Russian and United States' participants were most likely to conclude the livestock sector had little impact on climate change.[102] Research suggests the lack of attention given to the issue of rising agricultural emissions means livestock are less recognised as a contributor to climate change, but with higher awareness came a

[96] Nikos Alexandratos and Jelle Bruinsma *World Agriculture Towards 2030/2050: the 2012 Revision* (Food and Agriculture Organization of the United Nations, ESA Working Paper 12-03, 2012) at 96.

[97] Alexandratos and Bruinsma, above n 96, at 96.

[98] Alexandratos and Bruinsma, above n 96, at 7.

[99] Ipsos MORI/Chatham House *Public Awareness of the Relationship between Meat and Dairy Production and Climate Change: A Twelve Country Survey* (commissioned by Chatham House and Glasgow University Media Group, and undertaken by Ipsos MORI, 2014).

[100] Laura Wellesley, Catherine Happer and Antony Froggatt *Changing Climate, Changing Diets: Pathways to Lower Meat Consumption* (Chatham House, The Royal Institute of International Affairs, 25 November 2015) at 23.

[101] At 23.

[102] At 23.

willingness to reduce meat and dairy consumption.[103] Transport is a well-known contributor to climate change, while the agricultural sector – contributing roughly the same in total emissions – is yet to attain the same awareness level globally. The necessary perception of cause and effect is underdeveloped, potentially leading to a lack of pressure internationally to make targeted changes in this sector.

B Climate action in the agricultural sector

Within the regime complex for climate change, it is possible for measures addressing meat and dairy consumption to prove an effective means of reducing greenhouse gas emissions. In the past, UNFCCC negotiations have overlooked livestock. Efforts to create a specific work stream on agriculture have failed and instead the focus has been on a reduction in deforestation, forest degradation initiatives and enhancing developing countries' forest carbon stocks.[104] With little action on agriculture's contribution to climate change, the FAO submitted a proposal for the launch of a work programme specific to agriculture to the Ad Hoc Working Group on Long-term Cooperative Action (AWG-LCA) a subsidiary body of the UNFCCC.[105] While this work programme is yet to eventuate, the European Union Commission has successfully dedicated a work programme to climate change research and innovation in the area of agriculture and forestry.[106] It is possible within the current regime complex for states to develop and invest in initiatives without conforming to a comprehensive regime. A strategy focused on agricultural emissions could emerge through linkages in the current regime complex, similar to the REDD approach.

International networks exist to address the impact agriculture has on the climate, distributing information to the necessary actors and increasing public dialogue. One such network is the Food Climate Research Network, fostering "informed dialogue and critical thinking needed to

[103] Bailey, Foggatt and Wellesley, above n 12, at 19.

[104] Xavier Mayes "Livestock and Climate Change: An Analysis of Media Coverage in the Sydney Morning Herald" in Talia Raphaely and Dora Marinova (eds) *Impact of Meat Consumption on Health and Environmental Stability* (IGI Global, Pennsylvania, 2015) at 92.

[105] Leslie Lipper *Roadmap to Agriculture at the UNFCCC Climate Talks* (Prepared by the Economics and Policy Innovations for Climate-Smart Agriculture (EPIC) Programme at FAO, 14-25 May 2012).

[106] European Commission Decision C(2016)4614 EN Horizon 2020 Work Programme 2016 – 2017 (25 July 2016).

build mutual understanding and collective action on food systems sustainability".[107] Informed dialogue on this issue has been helped in large part by the Third Working Group for the IPCC's report on agriculture and climate change in 2007.[108] This undertaking was the first direct linkage in terms of information distribution between the agricultural sector and climate change. Following this, the FAO undertook further research into agriculture's impact in 'Tackling Climate Change Through Livestock' published in 2013. These international reports were the beginning of informed dialogue on this issue. Contributions have since been made to the discussion by organisations and think tanks in several proposals and reports on the dangers of the sector and policy options to address the issue. Many of these reports are informed by the IPCC data collected from numerous studies on agricultural emissions. Despite continued scrutiny of the problem, as of yet, no international initiative has been undertaken in this area.

Despite what this paper has previously indicated regarding the lack of action for climate change mitigation in the agricultural sector, some changes have started to take effect. One such movement worth mentioning here, is an emerging trend involving governments endorsing national guidelines on reduced meat and dairy consumption. Governments are establishing guidelines for low-meat consumption and attributing the benefits of this diet to promoting individual health and the health of the environment.[109] These pioneering countries include, China, Sweden, the Netherlands, and Denmark, with an unsuccessful attempt in the United States to the disappointment of many.[110] The primary motivation for these dietary recommendations are health related issues which can be mitigated against by consuming less meat. However, of note is the support in countries such as China for the guidelines as a method of reducing the impact meat and dairy consumption have on the environment. Similarly, there is growing awareness of climate change globally and a willingness to make changes at an individual level.[111] Climate change is a top priority in Latin America, where an average of 74

[107] "About FCRN" Food Climate Research Network <www.fcrn.org.uk>.

[108] Pete Smith and others "Agriculture" in Bert Metz and others (eds) *Climate Change 2007: Mitigation. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge University Press, 2007) 497.

[109] Antony Froggatt and Laura Wellesley "China Shows Way with New Diet Guidelines on Meat" (21 June 2016) Chatham House, The Royal Institute of International Affairs <www.chathamhouse.org>.

[110] Froggatt and Wellesley "China Shows Way with New Diet Guidelines on Meat", above n 109.

[111] Jill Carle, Bruce Stokes and Richard Wike "Global Concern about Climate Change, Broad Support for Limiting Emissions" (5 November 2015) Pew Research Center <www.pewglobal.org>.

per cent of the population consider it a very serious problem.[112] An opportunity exists within the current climate change structure for these states to implement permanent policy in this area and encourage an international initiative.

Attempts to address agricultural emissions through dietary guidelines were unsuccessful in the United States. While some governments have cited the impact meat and dairy products have on the environment, the United States unfortunately fell short of this. Widespread calls for the United States Dietary Guidelines Advisory Committee (DGAC) to take environmental criteria into account in the development of their dietary recommendations were ultimately unsuccessful.[113] While the guidelines set out by the DGAC addressed sustainability broadly, there was no mention of the considerable impact meat and dairy have on the environment and the need to reduce consumption:[114]

> An important reason for addressing sustainable diets, a new area for the DGAC, is to have alignment and consistency in dietary guidance that promotes both health and sustainability. This also recognizes the significant impact of food and beverages on environmental outcomes, from farm to plate to waste disposal, and, therefore, the need for dietary guidance to include the wider issue of sustainability. Addressing this complex challenge is essential to ensure a healthy food supply will be available for future generations.

The Centre for Biological Diversity, following the release of the 2015 Dietary Guidelines, called for the United States Department of Agriculture to address the key issue: the need to reduce American consumption of meat and dairy for the health of its people, food security and the health of the planet.[115] Attempts in the United States have so far been unsuccessful, but the increasing acknowledgement of sustainability as a consideration should not be underestimated. As agriculture's detrimental environmental impact becomes known, the United States may be forced to build on their environmental considerations in national dietary guidelines.

[112] Carle, Stokes and Wike "Global Concern about Climate Change, Broad Support for Limiting Emissions", above n 111.

[113] Froggatt and Wellesley "China Shows Way with New Diet Guidelines on Meat", above n 109.

[114] Barbara Millen and others *Scientific Report of the 2015 Dietary Guidelines Advisory Committee* (United States Dietary Guidelines Advisory Committee, February 2015) at 375.

[115] "USD letter April 2016" Center for Biological Diversity (April 2016) <www.takeextinctionoffyourplate.com>.

In China, the approach linking dietary recommendations with environmental grounds for change in consumption habits has been remarkably well received. The latest in a wave of governments tackling excessive meat consumption, the Chinese Nutrition Society has recommended individuals limit their consumption of meat to between 40g and 75g a day.[116] This is a significant development. China, the world's largest emitter of greenhouse gases, has encouraged its people to limit their meat and dairy consumption due to the impact on the environment. This could bode well for future action in the agricultural sector. The campaign, taglined "Less Meat, Less Heat, More Life" will convey the benefits of lower meat consumption across China, the draw card – actor Arnold Schwarzenegger and director James Cameron urging the public to adopt these changes.[117] The Chinese Nutrition Society has aimed to reduce consumption by a staggering 50 per cent.[118] This task is being undertaken in conjunction with WildAid's "5 To Do Today" campaign initiated in China to influence behaviour and attitudes in support of climate change action.[119] For a big player such as China to shed much needed light on this overlooked area of climate policy shows incentives exist for states to implement changes – a win-win for states to address both unhealthy and unsustainable consumption habits.[120]

A number of European countries have generated guidelines taking into account the environmental impact of meat and dairy. A recent report released by the Netherlands Nutrition Centre specifically addressed the need to limit 'high-carbon' meats in a balanced and sustainable diet.[121] The story is very similar in Sweden, but the movement progresses one step further; the Swedish Government formed a working group to discuss the implementation of a 'meat tax' and whether this could potentially lead to more sustainable food consumption.[122]

[116] Froggatt and Wellesley "China Shows Way with New Diet Guidelines on Meat", above n 109.

[117] Brad Plumer "China is urging people to eat less meat — which could have a big climate impact" (21 June 2016) Vox <www.vox.com>.

[118] Neil Connor "Climate change campaigners welcome China's plan to halve meat consumption" *The Telegraph* (online ed, Beijing, 21 June 2016).

[119] Matt Grager "James Cameron, Arnold Schwarzenegger Speak Out for Reduced Meat Consumption" (20 June 2016) WildAid <http://wildaid.org>.

[120] Froggatt and Wellesley "China Shows Way with New Diet Guidelines on Meat", above n 109.

[121] April Fulton and others "Another Nation Trims Meat From Diet Advice" *National Geographic* (online ed, The United States of America, 23 March 2016).

[122] Juliette Aplin "Signal of change / Sweden considers meat tax to encourage sustainable diets" (9 March 2016) Futures Centre <www.thefuturescentre.org>.

While no policy changes have been made as of yet, Sweden is signalling their preparedness to make considerable modifications in this sector. The question remains: will this signal be picked up by the international community? Head of the Market Department for the Swedish Board of Agriculture, Gabriella Cahlin pointed out that while regulation in this area could reduce emissions, without international cooperation, states will be at a disadvantage:[123]

> Rules, taxes, and subsidies can push things in the right direction. But it's imperative that these are at an international level, otherwise there is a risk production will simply be moved where the tax burden is lower, not where production is sustainable.

This is the crux of the problem. If only one country is receptive to change in this sector, it will have neither the numbers to incentivise joining the international movement, nor the numbers to affect real emission reductions.

In addition to state efforts domestically, there have been increased civil society movements addressing livestock and climate change. These civil society movements have utilised demand-side measures to affect the agricultural sector's contribution to climate change. One such movement is 'Meat Free Monday' a not-for-profit campaign launched by Paul, Mary and Stella McCartney to draw attention to the detrimental environmental impact of meat consumption and encourage limiting meat consumption to slow climate change.[124] This movement encourages individuals to eat 'meat free' on Mondays reducing their consumption of meat and, as a result, their environmental impact. This was developed from the 2003 international campaign 'Meatless Monday' founded by Sid Lerner in association with the Johns Hopkins Bloomberg School of Public Health that now runs in 36 countries worldwide.[125] Ghent, Belgium was the first city to officially implement weekly vegetarian days in May 2009.[126] Demonstrating the increasing public concern, Brazilian supermarket chain Pão de Açúcar agreed to stop stocking beef linked with deforestation in April 2016, following public outcry.[127]

[123] "Slap carbon tax on meat to reduce emissions" *The Local DK* (online ed, Denmark, 22 January 2013).

[124] "About Meat Free Monday" (2016) Meat Free Mondays <www.meatfreemondays.com>.

[125] "Meatless Monday Global Connect" (2016) Meatless Monday Global <www.meatlessmonday.com>.

[126] Ian Traynor "Day of the lentil burghers: Ghent goes veggie to lose weight and save planet" *The Guardian* (online ed, United Kingdom, 14 May 2009).

[127] Chris Arsenault "Brazil's largest grocery chain pledges to chop deforestation, slavery from supply chain" *Reuters* (online ed, United States of America, 8 April 2016).

Greenpeace and local groups had protested the beef linked to deforestation by labelling the meat in supermarkets elucidating the products' environmental impact.[128]

European countries continue to be forerunners in the discussion for policy action in this sector. In 2014, British think tank Chatham House published a report 'Livestock – Climate Change's Forgotten Sector' emphasising the need for change in the agricultural sector if the current path for climate change is to be avoided.[129] Chatham House followed this with a 2015 report on the opportunities available to reduce agricultural emissions: 'Changing Climate, Changing Diets: Pathways to Lower Meat Consumption'.[130] This report seeks to provide methods by which the cycle of inertia may be broken and positive government action can take place.[131] In 2016 Denmark's leading think tank, Det Etiske Råd (The Danish Council of Ethics), released a recommendation for the Danish Government to consider implementing a tax on red meat – "inarguably the most destructive food on the planet".[132] In addition, China has indicated a willingness to enact real policies that will alter the planet's warming trajectory. These players will be extremely influential in the coming years as this trend continues and calls for agricultural policy changes become more mainstream. Antony Froggatt and Laura Wellesley summarise the key role these actors play in addressing agricultural emissions:[133]

> As big players on the regional and global stages, China, the US and Europe have a central role to play in throwing light on an as yet overlooked area of climate policy, and in exporting lessons learned and policies tested to their regional, cultural and political alliances.

Governments will look to each other for guidance. The current system within which international action on climate change is undertaken may prove to be both a benefit and a burden for the increasingly popular recommendations for reduced meat consumption.

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[128] "Brazilian supermarket giant Pão de Açúcar stops buying deforestation beef" (1 April 2016) Greenpeace <www.greenpeace.org.uk>.

[129] Bailey, Foggatt and Wellesley, above n 12.

[130] Wellesley, Happer and Froggatt, above n 100.

[131] Wellesley, Happer and Froggatt, above n 100, at 9.

[132] Ulrika Lomas "Denmark Ponders Tax On Meat" *Tax-News* (online ed, Brussels, 3 May 2016).

[133] Froggatt and Wellesley "China Shows Way with New Diet Guidelines on Meat", above n 109.

C Potential strategies addressing agricultural emissions

The science appears to be in consensus regarding the necessary mitigation options available in the agricultural sector – primarily demand-side changes. This involves reducing the demand for high-carbon goods. This paper deals principally with dietary change. With a 2°C limit set globally, and a commitment to keep 'well below' this temperature increase, a decrease in consumption of high carbon foods is crucial to making progress. In assessing potential mitigation options for climate change, the IPCC acknowledged the demand-side options for the agricultural sector, including dietary change and waste reduction, could make significant reductions in emissions as well as provide for greater food security globally.[134] One scientific study by Fredrik Hedenus et al. demonstrates a radical dietary shift, in addition to substantial productivity improvements and technical mitigation measures may reduce emissions by 75 per cent.[135] The study concludes:[136]

> To meet the 2°C target with a probability larger than 50%, global GHG emissions have to drop to about 10 Gton CO2eq/year or less by the second half of this century. The prospects for achieving such very deep emission cuts vary across sectors. As indicated in this study, deep cuts in emissions from food and agriculture do not seem plausible without large changes in consumption towards less GHG intensive food, in particular less ruminant meat and dairy.

To meet the 2°C goal there needs to be a stronger advancement of technology in this area.[137] Demand-side mitigation strategies have the potential to dramatically decrease agricultural sector emissions, but they deal only partly with the complex problem the agricultural sector poses for climate change mitigation.

A similar study determining the importance of food-demand management for mitigating climate change looked at food waste and dietary changes. This study was based on a 'healthy diet' according to nutritional evidence, the adjusted diets included necessary levels of protein

[134] Smith, P. *et al*. in *Climate Change 2014: Mitigation of Climate Change* (eds Edenhofer, O. *et al*.) Ch. 11 (IPCC, Cambridge Univ. Press, 2014).

[135] Fredrik Hedenus, Stefan Wirsenius and Daniel J.A. Johansson "The importance of reducing meat and dairy consumption for meeting stringent climate change targets" (2014) 124(1) Climatic Change 79 at 86.

[136] Hedenus, Wirsenius and Johansson, above n 135, at 88.

[137] Hedenus, Wirsenius and Johansson, above n 135, at 88.

and maintained a daily caloric intake of 2,500 by increasing pulses and staples.[138] Where a 'healthy diet' was adopted, these demand-side measures were found to reduce total greenhouse gas emissions by 45 per cent.[139] The greenhouse gas emissions savings were almost exclusively attributable to a reduction in livestock (5.6 out of 6 GtCO2-eq per annum).[140] This emissions reduction was made possible by a decrease in methane emissions from ruminant animals and an increase in carbon being absorbed from the atmosphere by land returned from crop and pasture to natural vegetation.[141] Scientists Bojana Bajželj et al. concluded:[142]

> Implementation of healthy diets would therefore greatly benefit both the environment and the general health of the population in regions where excessive consumption of energy-rich food occurs, or may develop.

Although the IPCC has pointed out that the factors involved in the calculations are uncertain, the potential for successful mitigation in this area is clear.[143] The possibility of significant emissions reductions in the agricultural sector has sparked a number of proposals and state action towards encouraging changes in meat and dairy consumption in an effort to limit the temperature rise to below 2°C.

The Chatham House 2015 proposal elicits recommendations that will be drawn on in this paper to decipher appropriate responses to the issue of agriculture and how best the regime complex can promote the successful implementation of policy. One way Chatham House has approached this issue is through investigating demand-side measures to reduce emissions. Chatham House undertook research on the issue of the cycle of inertia that exists in this area – governments fear the repercussions of intervention, while low public awareness means they feel no pressure to intervene – and how this can be broken.[144] Changing consumption behaviours is one

[138] Bojana Bajželj and others "Importance of food demand management for climate mitigation" (2014) 4 Nature Climate Change 924 at 926.

[139] Bajželj and others, above n 138, at 926.

[140] Bajželj and others, above n 138, at 926.

[141] Bajželj and others, above n 138, at 926.

[142] Bajželj and others, above n 138, at 926.

[143] Pete Smith and others "Agriculture, Forestry and Other Land Use (AFOLU)" in Ottmar Edenhofer and others (eds.) *Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge University Press, 2014) 811 at 816.

[144] Wellesley, Happer and Froggatt, above n 100, at 16.

approach to reduce emissions. The task may seem daunting, but policies are already being implemented in some states and the potential for development in this area is high. The report argued that although reducing consumption of high emission foods, predominantly meat and dairy, is a difficult task – it is not impossible; it is no more challenging than other sectors that have undergone transformation.[145] This promising strategy deals with the increasing demand for livestock products and accordingly the steady rise in emissions. The key findings from the proposal will inform Parts IV and V, assessing how the dimensions of the regime complex may impact initiatives addressing agricultural emissions.

Following the Paris Conference states have committed to individual targets on top of a requirement to report on emission reductions, therefore successful domestic mitigation policies are crucial.[146] The agricultural sector provides a unique set of challenges for any state willing to undertake climate strategies in this area. Currently state action has revolved around consumption recommendations and guidelines offered in conjunction with health policy. Civil society action has gained traction – including 'Meat Free Monday' and protests in Brazil over beef linked with deforestation. Similarly, the IPCC, FAO, think tanks and various other organisations have conducted research into the effects livestock have on greenhouse gas emissions and possible mitigation options. Taken together, these processes indicate a movement towards permanent climate action in this sector. This raises the question: how will states choose to implement this strategy?

Various approaches to demand-side mitigation strategies are available. States may choose to limit their action on this issue to domestic policies encouraging lowered consumption.[147] For China and other states issuing guidelines this would be the extent of their cooperation. Governments have the resources necessary to influence diets to become more sustainable. Citizens expect government leadership regarding demand-side measures and government inaction sends the signal that this issue is not of great concern.[148] For consumption behaviour changes to be successful, the role of governments is crucial. States looking to retain control of

[145] Wellesley, Happer and Froggatt, above n 100, at 5.

[146] Adoption of the Paris Agreement, above n 6, art 4(9).

[147] Wellesley, Happer and Froggatt, above n 100, at 11.

[148] Wellesley, Happer and Froggatt, above n 100, at 16.

their decisions in this area and gain information from their international interactions may implement domestic guidelines for reducing meat and dairy consumption and allow this to trickle down without incentivising and disincentivising these products.[149] This paper will focus on the opportunities for international cooperation in this area. However, it is important to note the option exists for states to continue with a BAU approach as is the attitude for many states currently choosing to ignore this issue.

If states are willing to engage in further international cooperation, the regime complex provides the opportunity for implementation of a consumption strategy on an international level.[150] The most recent international treaty on climate change was concluded under a year ago.[151] Therefore, it is unlikely agriculture will be addressed by the international community as a whole until the next treaty is established. During this period there is an opportunity for smaller initiatives and clubs to undertake changes in agricultural policy, similar to the development of the REDD initiative.[152] State efforts could evolve in the form of a 'club' whereby countries agree to be bound by the terms of the agreement – in this case states could agree to address agriculture through a range of strategies or pledge to invest in innovation and technological development. The initiatives already in motion domestically indicate a willingness for some states to address this issue. These states, all currently traversing different paths toward the same goal could utilise the regime to their advantage. Possible international cooperation on the issue of agricultural emissions will face significant advantages and disadvantages within the current climate change regime complex, these will be analysed in Parts IV and V.

IV Support for addressing agricultural emissions within the regime complex

In determining whether there is support for restricting agricultural emissions within the current regime complex for climate change, it is necessary to analyse the features of the complex that will enable this policy movement to gain traction. The main dimensions of the regime complex

[149] Wellesley, Happer and Froggatt, above n 100, at 10.

[150] Wellesley, Happer and Froggatt, above n 100, at 44.

[151] See Adoption of the Paris Agreement, above n 6.

[152] Deborah Murphy, Matthew McCandless and John Drexhage *Expanding Agriculture's Role in the International Climate Regime: Capturing the opportunities* (International Institute for Sustainable Development, June 2010) at 5-6.

earlier established are now being applied to the concept of addressing agricultural emissions. Part A draws upon the advantages of flexibility and adaptability recognised by Keohane and Victor in their work on the regime complex for climate change. Part B discusses the opportunities for an international 'club' to form to deal with this issue. Part C explores the potential for greater investment in innovation and technology. Part D focuses on the potential for linkages in addressing agricultural emissions, encouraging integration and increasing the likelihood of success. Through analysing the interaction between these dimensions and a novel climate strategy addressing agricultural emissions, this paper will demonstrate this policy has the potential to improve the effectiveness of the regime complex, evaluated against the criteria laid out by Keohane and Victor and discussed earlier in Part II.

A Flexibility and adaptability

The regime complex provides significant benefits for the implementation of low-meat consumption policies. While the system lacks integration and cohesion around a common core, it allows for willing states to implement climate action in a flexible, adaptive approach, without the rigidity of a fully comprehensive regime.[153] Stern notes climate talks have transformed from a "divisive focus on legally binding targets and compliance mechanisms, towards an approach that mixes decentralized and voluntary emissions pledges with a centralized process for recording and monitoring progress".[154] The Paris Conference reflects this movement towards voluntary pledges.[155] Previous climate agreements have encountered difficulties due to ambitious targets and time limits placed on states.[156] This method meant states were both unwilling and unable to carry out the tasks assigned. Large polluters, the United States, pulled out of Kyoto in 2001 and while they have received some blame for its failure, ultimately the

[153] Keohane and Victor, above n 9, at 8.

[154] Nicholas Stern "Economic Development, Climate and Values: making policy" (2015) 282(1812) Proc. R. Soc. B. 1 at 7.

[155] Raymond Clémençon "The Two Sides of the Paris Climate Agreement: Dismal Failure or Historic Breakthrough?" (2016) 25(1) Journal of Environment & Development 3 at 5.

[156] Lal Pandey "The limits of climate change agreements: from past to present" (2014) 6(4) International Journal of Climate Change Strategies and Management 376 at 378-379.

Kyoto Protocol was the wrong tool for the job.[157] Other states followed suit in 2011 when Canada, Japan and Russia stated that they would not take on further Kyoto targets.[158]

The regime complex promotes flexibility, making it possible for states to implement measures domestically, analyse the success of these measures against other approaches, and adopt the most effective.[159] Emission reduction controls can therefore be tailored specifically to each state.[160] Keohane and Victor describe the advantage flexibility offers:[161]

> Without a requirement that all rules be bound within a common institution, it may be possible to adapt rules to distinctively different conditions on different issues, or for different coalitions of actors. Different states could sign on to different sets of agreements, making it more likely that they would adhere to some constraints on greenhouse gas emissions.

Within this context, states may approach meat and dairy consumption policies without the target constraints common to a comprehensive and integrated regime. The regime complex provides new opportunities for states to volunteer pledges reflecting their capacity to enact changes in the consumption of 'high carbon' foods in their respective countries. Any meat and dairy policy will need to be tailored to national contexts; attitudes to climate change differ, any approaches must be sensitive to political, cultural and social factors.[162] Appropriate targets would differ by country, as policy priorities vary across countries and regions.[163] With the emergence of INDCs, the ability for states to commit flexibly to a climate policy provides a symbol of hope. States may be more willing to commit to agricultural sector changes on their own terms.

[157] Gwyn Prins and Steve Rayner "Time to ditch Kyoto" (2007) 449 Nature 973 at 973.

[158] Carroll Gantz *Refrigeration: A History* (McFarland and Company, North Carolina, 2015) at 219.

[159] Keohane and Victor, above n 9, at 15.

[160] Keohane and Victor, above n 9, at 15-16.

[161] At 15.

[162] Wellesley, Happer and Froggatt, above n 100, at ix.

[163] Wellesley, Happer and Froggatt, above n 100, at 53.

Adaptability is high within a regime complex.[164] Without limiting structures and a cohesive framework, a variety of strategies can be tested.[165] Adaptability is an important advantage for a novel policy addressing meat and dairy consumption where various methods for regulating consumption and agricultural processes can be tried. Unintended consequences may flow from government intervention in this sector; governments should be prepared to modify their strategies and monitoring and evaluating processes as they move forwards.[166] It may be beneficial for states to mirror the approach taken in forming the United Nations REDD initiative, particularly the encouragement of experimental innovation in the area of forest 'sinks' and the now well established actions to reduce deforestation.[167] The loosely-linked regime complex could provide an opportunity for states to implement different policy options in the agricultural sector and assess the success of each approach in order to find the best strategy going forward. Any initiative undertaken by states in this sector will be a novel approach to dealing with the climate change issue. Therefore, it is important for governments to conduct comprehensive research into approaches and test different intervention methods.[168] The regime complex's adaptability will prove beneficial for states; by testing different strategies and modifying approaches, states have a greater chance of moving forward with successful policies in this area.

B Ability to form 'clubs'

Uncertainty within the regime complex can lead to smaller groups of states forming agreements to manage climate change. The regime complex allows the formation of different 'clubs' of willing states.[169] Economist William Nordhaus describes the characteristics of a club:[170]

[164] Keohane and Victor, above n 9, at 16.

[165] Keohane and Victor, above n 9, at 16.

[166] Wellesley, Happer and Froggatt, above n 100, at 50.

[167] "About the UN-REDD Programme" United Nations Environment Programme: Climate Change REDD+ <www.unep.org>.

[168] Wellesley, Happer and Froggatt, above n 100, at 50.

[169] Keohane and Victor, above n 9, at 18.

[170] William Nordhaus "Climate Clubs to Overcome Free-Riding" (2015) 31(4) Issues in Science and Technology (online ed).

> A club is a voluntary group deriving mutual benefits from sharing the costs of producing a shared good or service. The gains from a successful club are sufficiently large that members will pay dues and adhere to club rules to gain the benefits of membership.

These groups consist of states looking to combine climate policy efforts, in pursuit of more effective developments, strategies and results. As was indicated earlier in this paper, some countries are more aware of the impact of their agricultural emissions and more willing to implement changes in this sector than others. Interestingly, the greatest potential for change lies in the emerging economies.[171] These states including, China, India and Brazil are projected to become some of the largest emitters of greenhouse gases in the agricultural sector in the next few decades as their populations grow and their meat and dairy consumption levels increase.[172] It is crucial these states take action prior to the dramatic increase in demand for meat and dairy products. Where public awareness of agriculture's impact on emissions increases, there may be an increased push for policy changes. The formation of a club of willing states could deliver first mover advantages in this area, by benefiting from exports of policy solutions and technologies.[173] As early adopters, states would have the ability to mould the club structure, rules and excludability mechanisms. In particular, first movers would have control over the extent of the climate policy in this area as club founders, whether it be a club for research and development, or a stricter club imposing tariffs.

In developing the concept of a 'climate club', William Nordhaus expands on the clubs model. A climate club involves a number of countries joining forces to create a group with incentives in place for emission reductions, while externally erecting tariff barriers on imports from states outside the club.[174] Tariff barriers are essential to the success of this model, they provide the catalyst for the cycle of incentives – an incentive is created for the state to develop internal incentives for individuals to engage in emission reduction practices.[175] A climate club's popularity may not be immediate, but with strong incentives and tariffs, potential for growth

[171] Wellesley, Happer and Froggatt, above n 100, at 22.

[172] Bailey, Foggatt and Wellesley, above n 12, at 5.

[173] Javier De Cendra de Larragán *Distributional Choices in EU Climate Change Law and Policy: Towards a Principled Approach?* (Kluwer Law International, The Netherlands, 2011) at 293.

[174] Robert Shiller "How Idealism, Expressed in Concrete Steps, Can Fight Climate Change" *New York Times Economic View* (online ed, United States of America, 27 March 2015).

[175] William Nordhaus "Climate Clubs: Overcoming Free-riding in International Climate Policy" (2015) 105(4) American Economic Review 1339 at 1351.

exists. The economic advantages of membership could draw states to the club as it develops.[176] The appearance of moral credibility and devotion to the international cause may also attract state membership. The idea has been put forward for a climate club involving states agreeing to membership and, in turn, imposing a carbon tariff on non-members to incentivise club membership and increase effectiveness.[177] In terms of meat and dairy consumption strategies, a 'meat and dairy' tax is likely an extreme club option. The concept of a 'meat and dairy' tax has been floated in a few countries, including Denmark, Sweden, and the Netherlands.[178] Applying the climate club concept to the agricultural sector would likely involve a 'meat and dairy' tax, as this would act as a tariff imposed on carbon emissions. At this stage of the movement to address agricultural emissions this option is unlikely. But it is a possible future interpretation of the climate club concept as a method of dealing with agricultural emissions.

The more likely club scenario would involve those states currently implementing domestic guidelines, and those willing to do so in future, establishing a club to communicate information about strategies, scientific developments and results. This type of club could be developed tomorrow and would be the first substantive step in the direction of addressing agricultural emissions through an international initiative. In the fight against climate change many states have made a name for themselves as 'green' countries, aligning themselves with the emission reduction efforts.[179] Members of a strong and innovative climate club will gain credibility in the international community, especially as more states invest in the club and its practices.[180] David Victor puts forward the strongest case for clubs within the regime complex, it "lies in the ability of small groups to develop and demonstrate solutions to hard problems – and for those solutions to expand into more widespread use".[181] The increasing number of states indicating a willingness to delve deeper into the issue of meat and dairy consumption may increase communication and interconnectedness. Ideally, the developments made within a club

[176] Nordhaus "Climate Clubs to Overcome Free-Riding", above n 170.

[177] Nordhaus "Climate Clubs: Overcoming Free-riding in International Climate Policy", above n 175, at 1340.

[178] See discussion in Part III, section B.

[179] Matthew Paterson and Michael Grubb "The International Politics of Climate Change" (1992) 68(2) International Affairs (Royal Institute of International Affairs 1944-) 293 at 305.

[180] Geoff Bertram "William Nordhaus's Climate Club Proposal: thinking globally about climate change economics" (2016) 12(2) Policy Quarterly 23 at 27.

[181] David G. Victor *The Case for Climate Clubs* (E15 Expert Group on Measures to Address Climate Change and the Trade System, January 2015) at 1.

of this type would influence the international community's approach to the issue of agriculture and climate change – demonstrating that tackling this issue is not an impossible task.

A club created to deal with the issue of agriculture, whether this club works to develop ideas and strategies in this area or implements specific policies, should encourage membership from all states willing to invest in this issue. These states would receive the benefits, particularly distribution of information, strategies and results. By allowing benefits to flow to all willing states, this institution would increase fairness within the regime complex for climate change. Similarly, the regime complex is most effective where components have been built in to reinforce one another and withstand shocks.[182] The formation of a strong group of states willing to address agricultural emissions will improve the sustainability of the climate change regime complex. The Paris Conference introduced individual state targets, the development of a club to ensure states are investing in promising demand-side emission reductions in the agricultural sector will reinforce the participating states' commitments in Paris. A club will provide the certainty in this policy area that is currently lacking in the climate change regime.

C Investment in technology and innovation

Investment must be made into research and development if technology is to have a role to play in mitigating and adapting to climate change. One way the regime complex has worked to improve the flow of funds to research and development is through instruments such as the Clean Development Mechanism (CDM) where developed states buy emission credits from states implementing emission reduction practices.[183] These funds are then invested into further technological developments.[184] A major issue contributing to the lack of action so far in the agricultural sector is the lack of support for innovation.[185] Without a strong signal from governments to endorse low-meat consumption, private investment in research and development for alternatives is low.[186] Technology innovation clubs can take advantage of

[182] Keohane and Victor, above n 9, at 17.

[183] "Clean Development Mechanism (CDM)" United Nations Framework Convention on Climate Change <http://unfccc.int>.

[184] "Clean Development Mechanism (CDM)", above n 183.

[185] Wellesley, Happer and Froggatt, above n 100, at 50.

[186] Wellesley, Happer and Froggatt, above n 100, at 50.

private incentives to effect research and other investments that would make limiting emissions more feasible.[187] Support for innovation in the agricultural sector will increase as incentives to invest in new mitigation strategies are established, particularly through 'innovation clubs'. An innovation club could mirror the structure of the voluntary clubs discussed earlier, whereby states willing to make changes could form a club and look to invest in technology and development dealing with agriculture and climate change.

States may look to form a club within the regime complex to aid strategic and technological development efforts, rather than as a tool to ensure state participation. Under the UNFCCC alone there were a lack of incentives for investment in crafting new climate change technology.[188] The regime complex provides the environment for states with converging interests to form innovation clubs to investigate possible climate change action.[189] Keohane and Victor propose successful innovation clubs would contribute the necessary resources to each climate change facet and eventually make the situation easier to solve and provide for a more sustainable political structure.[190] Robert Shiller recognised the possibility of a community forming based on the belief in socially responsible investing in 'green' companies, essentially excluding high polluting companies.[191] The same could be true of a community formed to invest in 'green' innovation in the agricultural sector – essentially an innovation club. Stern described the potential for formulating climate change approaches as a community:[192]

> … if countries (and sub-national actors) understand the attractiveness of moving quickly to decarbonize their economies for their own domestic reasons, then international climate cooperation becomes more about coordination, sharing lessons, and accelerating and supporting otherwise-beneficial domestic transitions, albeit with developed countries moving faster and providing more of the necessary technologies, finance and other support for the transitions in developing countries.

As Stern has acknowledged, the responsibility to invest in these technological developments falls on countries with enough resources. It is essential states willing to implement policy

[187] Keohane and Victor, above n 9, at 20.

[188] Keohane and Victor, above n 9, at 18.

[189] Keohane and Victor, above n 9, at 18.

[190] At 18.

[191] Shiller "How Idealism, Expressed in Concrete Steps, Can Fight Climate Change", above n 174.

[192] Stern "Economic Development, Climate and Values: making policy", above n 154, at 7.

changes in this area are able to share information and technology freely amongst themselves to ensure all members are equipped with the resources to develop successful policy. As of yet, no groups of states have formed to invest in reducing agricultural emissions.

There is strong potential for an innovation club designed around policies affecting meat and dairy consumption. States have already indicated a willingness to provide dietary guidelines domestically for both health and environmental purposes. With 85 per cent of all research and development coming from only six countries, the formation of an innovation club should be simple.[193] China and a number of European states contribute largely to innovation in the climate sector, in addition these states are encouraging their citizens to make more environmentally friendly consumption choices. Together, these factors indicate a successful innovation club could develop. Club members could install incentives for stricter guidelines on meat and dairy consumption, placing greater emphasis on innovation in the agricultural sector to reduce emissions and greater emphasis on sustainable farming practices. Significantly, the emergence and improvement of inexpensive low emission technologies will lower the cost of emission reductions.[194] The advances so far in addressing agriculture's impact may provide the catalyst for the formation of the first innovation club.

As noted earlier in this paper, the first international report on the impact of agriculture on the environment was released by the IPCC in 2007. Almost 10 years later, an international effort to deal with this issue is yet to eventuate. Currently there is room for improvement in the consistency between the regime's rules and scientific knowledge. To build the case for government intervention, it is important to invest further in research on the economic incentives for change in this area – including the costs of high meat consumption. This information will provide the necessary evidential foundation for policy makers to reduce consumption levels.[195] Further research and development is needed into what constitutes an internationally 'healthy diet'. This will need to include what levels of meat and dairy consumption are considered healthy for both individuals and the climate. A compelling evidence base can be established for implementing new consumption policies, while adding to existing policy objectives

[193] Keohane and Victor, above n 9, at 19.

[194] Keohane and Victor, above n 9, at 18.

[195] Wellesley, Happer and Froggatt, above n 100, at 50.

including managing healthcare costs and reducing emissions.[196] Investment in technology and innovation in this area will enhance the regime's epistemic quality. An innovation club would ensure states are pursuing strategies in this area in order to correct the agricultural policy in line with other climate policy.

D Linkages within the current regime complex

The prospects for meat and dairy consumption policies are greatly improved within the regime complex due to the linkages available between different facets. Linkages increase interconnectedness between components of the regime complex and prevent the regime becoming too fragmented, an issue that will be discussed further in Part V. This paper identifies potential linkages forming between developments in the agricultural sector and regime complex institutions already in existence, specifically information and technology linkages. There is also an opportunity to link agriculture and climate change with the increasingly prevalent issue of dietary health. These linkages could prove to be supportive of further integration within the regime complex and will develop a more sustainable regime.

Opportunities exist for linkages connecting agricultural emission controls addressing unsustainable food consumption, and investment efforts in science and innovation. An innovation club allows for greater investment in technological development. Keohane and Victor emphasise the importance of linkages between investment and technology:[197]

> Efforts to promote greater innovation in low-emission technologies also benefit from loose linkages to effective emission controls in at least some key markets — so that innovators see a market pull for new ideas that can become profitable.

Governments within an innovation club provide internal incentives to change practices and behaviours to reduce emissions, encouraging investment in these reductions both domestically and internationally. Where states have an influence in a number of venues within a regime complex, there is increased pressure on the state to cooperate in activities, "small groups can be imbued with trust, which leads to a willingness to solve problems collectively and makes

[196] Wellesley, Happer and Froggatt, above n 100, at 48.

[197] Robert O. Keohane and David G. Victor *The Regime Complex for Climate Change* (The Harvard Project on International Climate Agreements, January 2010) at 15.

taking risks less costly."[198] States working towards a novel climate policy on agriculture will have an added incentive of ensuring success as this will reflect on the state in future. Therefore, investing in the project is in each state's interests. Strong support for innovation, development of plant-based alternatives and livestock consumption mitigation options will promote investment in these areas and support for technology.[199] Technology and development linkages will improve the regime's epistemic quality as well as deepening integration. Investing in agricultural emissions research will place a spotlight on the issue; encouraging the international community to acknowledge the impact of this sector and reflect this in the rules within the climate change regime.

A further linkage ensuring greater prospects for strategies addressing agricultural emissions, is the provision of information between institutions within the regime complex. In the same vein as technology sharing, information can be utilised by different actors for a variety of purposes, in pursuit of a common objective – to combat climate change. Information on climate dangers and strategies for emission controls have been, and continue, to be shared within the regime complex.[200] This approach is essential to tackling a global problem that requires active participation to reach a solution. In the past, the IPCC's findings on the gas levels considered 'safe' in the atmosphere have been used for conference agendas and as indicators for state target setting.[201] Similar to existing linkages within the regime complex, states willing to implement consumption strategies could utilise data collected by the FAO, IPCC and other research conducted by international organisations, states or assessment bodies in the course of analysing strategies. A significant challenge facing states initiating changes to the agricultural sector is the lack of awareness of the impact the industry has on the environment. Chatham House lays out the importance of increasing national debate on this issue:[202]

> Increasing public awareness about the problems of overconsumption of animal products can help disrupt the cycle of inertia, thereby creating more enabling domestic circumstances and the political space for policy intervention. Governments have a role to play here, as do the media, the scientific community, civil society and progressive business.

[198] Alter and Meunier "The Politics of International Regime Complexity", above n 40, at 18.

[199] Wellesley, Happer and Froggatt, above n 100, at 51.

[200] Council on Foreign Relations *The Global Climate Change Regime*, above n 55.

[201] Keohane and Victor, above n 9, at 14.

[202] Wellesley, Happer and Froggatt, above n 100, at 46.

This step is necessary if a mitigation strategy is to be successful. Knowledge of the issue and the various steps being adopted to deal with it must be accessible to the public and disseminated in a way that allows for individuals to gain a greater understanding of the motivations driving the policy changes.

The regime complex would encourage linkages enabling the effective flow of information for states implementing changes as awareness increases. A failure exists in the linkage between diet and climate change, as a result public pressure is low for the international community to take action.[203] Currently the lack of agricultural policy does not equal the knowledge the international community has of its impacts. A group of states could form to discuss climate strategies, much like the MEF, addressing particularly strategies in the agricultural sector. This club could connect with the IPCC, FAO and other organisations willing to share their data, strategies and, in some cases, experiences for addressing agricultural emissions. Ensuring linkages exist for information sharing will promote coherence within regime complex and improve epistemic quality. States and institutions making it known that they are prepared to share information on their research, strategies and results in this climate change area will likely encourage further integration. Linkages will allow for resources to be channelled from one element to another; the regime complex will become more coherent as a result, as the components reinforce their compatibility.

It is likely linkages to institutions and issues outside the regime complex for climate change will similarly increase integration in this issue area. Reinforcing this novel climate policy is its promising linkage to an international 'healthy diet'.[204] The primary motivation for the recent emergence of guidelines on meat consumption appears to be health promotion. In delivering the message to individuals, the government will need to broaden the message further than just a climate change concern. It will be most lucrative to link the climate message with concerns personal to the individual such as price, health and local environmental conditions – emphasising the co-benefits of reduced consumption.[205] States have combined the risks of a

[203] Wellesley, Happer and Froggatt, above n 100, at 23.

[204] Further research is needed into what constitutes a 'healthy diet'; see discussion in Part IV, section C.

[205] Wellesley, Happer and Froggatt, above n 100, at 12.

high meat and dairy diet, with the impacts these foods have on the environment.[206] This linkage could prove very rewarding for states implementing a strong regulation, such as a 'meat and dairy' tax, as it provides a greater incentive at both a state level and individual level to conform to 'healthy' limitations when consuming these 'high carbon' foods. Chatham House emphasised the importance of linkages in this area to help build the case for government intervention:[207]

> International recommendations are needed to help governments elaborate and integrate environmental standards into dietary guidelines. These could be developed among relevant international bodies such as the World Health Organization, Food and Agriculture Organization or Intergovernmental Panel on Climate Change, and would provide a benchmark against which national plans and consumption patterns can be assessed.

By cultivating these issue linkages with a 'healthy diet' these organisations will be connected to the regime complex. Importantly, the greater the linkages in this area, the less uncertainty exists for states when assessing whether to broaden their investment in the regime.[208]

The issue linkage between agricultural emissions and sustainability, both in terms of human health and the health of the environment, is crucial to ensuring any policy changes have longevity within the regime complex. The strategies governments adopt to address consumption behaviours could align with the broader sustainability agenda – namely, the Sustainable Development Goals adopted in 2015.[209] As the global community moves to realise these goals in the next fifteen years, the proposed meat and dairy consumption policies could capitalise on this effort and stress the importance of a reduction in meat consumption globally to foster sustainable, equitable resource use across all sectors.[210] Strong linkages with other institutions with similar interests, such as the WHO and FAO, will improve the effectiveness of the regime complex both in terms of determinacy and sustainability. Keohane and Victor note determinacy helps build confidence, "despite a broad and shifting distribution of interests, important actors are making efforts to coordinate policy and manage the climate problem."[211]

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[206] See discussion in Part III, section B.

[207] Wellesley, Happer and Froggatt, above n 100, at ix.

[208] Keohane and Victor, above n 9, at 17.

[209] *Transforming our world: the 2030 Agenda for Sustainable Development* GA Res 70/1, A/Res/70/1 (2015).

[210] Wellesley, Happer and Froggatt, above n 100, at 44.

[211] At 17.

Large international institutions combining efforts on this climate policy will make it easier to determine an internationally accepted consumption policy from which states can adapt their approaches. The presence of strong institutions will reduce the uncertainty states feel in this issue area.

V Challenges facing initiatives addressing agricultural emissions

This section will concentrate on the challenges facing action addressing agriculture's contribution to climate change globally, primarily stemming from the dynamics of regime complexity. Part A identifies a tendency for the negatives and difficulties that arise by the nature of the regime complex to be underestimated or ignored. Part B discusses the influential power dynamic within the regime complex as a factor to consider in determining the prospects of any climate change policy. Part C analyses the problem of fragmentation within a regime complex and the power play dynamics connected with this. Competition within the regime complex encourages a range of responses to a shared problem, Part D highlights the potential negative feedback effects of competition and the issue this may pose to a novel climate change policy addressing agricultural emissions.

A Tendency to ignore the negatives

The drawbacks of the regime complex must be taken into account when determining the prospects for implementation of policies addressing meat and dairy consumption. Numerous scholars have sought to understand the origins of the regime complex, but it is essential the consequences of international regime complexity are not ignored. The effects of regime complexity on specific policy implementation must be considered. Alter and Meunier highlight the trend for international cooperation enthusiasts to emphasise only the positive effects of cooperation.[212] The reality of regime complexity, Alter and Meunier explain, is a whole other story:[213]

> … where the problem is diagnosed the same way by diverse actors and the understanding of the solution is similar and agreed upon, international regime complexity will not meaningfully affect

[212] Alter and Meunier "The Politics of International Regime Complexity", above n 40, at 19.

[213] At 20-21.

> international cooperation. But where there is significant political disagreement, we are both more likely to find international regime complexity and to find that this complexity is causally important.

The feedback effects can be negative, including: ongoing competition between international organisations and non-governmental organisations; the spread of events from one sector to another in ways a state cannot anticipate or control; and blurring of accountability.[214]

International regime complexity significantly affects the dynamic interactions between actors and the strategies adopted.[215] Actors may choose to adopt strategies including forum shopping, regime shifting and strategic inconsistency within a regime complex.[216] This is done "with the ultimate goal of redefining the larger political context so as to ultimately reshape the system of rules itself". [217] If not dealt with correctly, these strategies could prove significant challenges for any potential climate change policy addressing livestock emissions. Keohane and Victor did not focus on the challenges regime complexity poses for climate change action, instead the authors praised the advantages of embracing regime complexity. Nevertheless, the authors did acknowledge the regime complex ranks low on effectiveness based on their six criteria. This section will discuss a number of challenges actors willing to implement strategies in this area may face, and similarly the opportunities these pathways present for developing solutions to climate change issues. Some of these challenges will reduce the effectiveness of the regime complex for climate change should they occur in the process of attempting to address agricultural emissions.

B International power dynamic

The influence power has in the political economy must be taken into account when analysing the regime complex. Newell, in his account of the transition towards a regime complex for climate change found, following the Kyoto Protocol, a discernible trend "towards the diversification and proliferation of forms of climate governance no longer gravitating around

[214] Alter and Meunier, above n 40, at 20.

[215] Alter and Meunier, above n 40, at 15.

[216] See discussion at Part II, section A.

[217] Alter and Meunier, above n 40, at 17.

the inter-state regime with the UNFCCC at its centre".[218] The prevailing structure has allowed political elites to work for cooperation in some areas of climate change, while resisting policies in others.[219] This leads Newell to ask: "Whose rules rule?"[220] The regime complex is inevitably dealing with a constant power play. Newell states it plainly:[221]

> The forms of power that operate to accommodate the threat that far-reaching action on climate change poses to the existing organization of the global political economy result in a disconnect between *regulation of* capital, which remains weak and fragmented, and *regulation for* capital, which establishes rules of the game and property rights necessary for new waves of accumulation.

The advantage of the regime complex for powerful states is demonstrated by their neglect to govern areas of energy and trade resulting in a reduction in the impact and effectiveness of reducing carbon emissions.[222] The same can be said for agriculture. The sector has remained relatively untouched by various climate change agreements and components of the regime complex.[223]

The prevalent political structure contributes effectively to the lack of action addressing agriculture's emissions. Parr, who speaks of human destruction of the climate in terms of criminal justice, blames the political structure for the lack of action internationally:[224]

> Because human activities cause this environmental damage, our species is culpable for a crime we are committing against ourselves. But in our defence, humanity is largely trapped by the political form of liberal state power, which facilitates the smooth functioning of global capitalism – the source of the problem.

States will commit to climate change strategies that coincide with their economic interests. Greenhouse gas emissions will continue to increase in a world where unregulated, exponential

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[218] Peter Newell "Political Economy" in Karin Bäckstrand and Eva Lövbrand (eds) *Research Handbook on Climate Governance* (Edward Elgar Publishing, Gloucestershire, 2015) 25 at 31.

[219] Newell "Political Economy", above n 218, at 31-32.

[220] At 31.

[221] At 32.

[222] Newell, above n 218, at 32.

[223] International Food & Agricultural Trade Policy Council (IPC) and the International Centre for Trade and Sustainable Development *International Climate Change Negotiations and Agriculture* (ICTSD-IPC Platform on Climate Change, Agriculture and Trade, Policy Focus No. 1, 2009) at 9.

[224] Natasha Lennard and Adrian Parr "Our Crime Against the Planet, and Ourselves" *International New York Times* (online ed, United States of America, 18 May 2016).

growth holds sway. [225] An international initiative addressing agricultural emissions may never eventuate as strong international actors will not seek to disadvantage themselves by adopting policies in this area. Initially, any action taken to address agricultural emissions domestically could cause the country's goods and services to loose competitiveness, placing a financial burden the state.[226] For regulations such as a tax on livestock products, this places a large burden on the citizens of the state to take responsibility for the emissions from this sector. For any states within the climate change regime complex, it is an unattractive proposal to start to regulate an area as large and influential as agriculture without the guarantee that other states would be bound to follow suit.

The prevailing power dynamic suggests that any action not in the interests of large players will be unsuccessful. This was a likely factor prompting the United States in their decision not to adopt guidelines for meat consumption based on the environmental impacts of the agricultural sector. The United States Department of Agriculture rejected calls for the DGAC guidelines to include a reference to the impact meat and dairy consumption have on climate change; major food producers and manufacturers, as the USDA's primary stakeholders, were likely influential in this decision.[227] On the other hand, China has linked health and environmental concerns in their guidelines and as a result the policy changes were in line with state interests. However, this policy works in China's favour as the country's meat and dairy consumption is relatively low compared to the United States.[228] Instead their emissions primarily come from fossil fuel and industrial processes.[229]

Keohane and Victor propose a successful regime complex will encourage a 'race to the top' whereby efforts by one country will be imitated by others.[230] Unfortunately, the issue of

[225] Robert J. Antonio "The Unbearable Lightness of Politics: Climate Change Denial and Political Polarization" (2011) 52(2) the Sociological Quarterly 195 at 200.

[226] Francesco Bosello, Carlo Carraro, and Enrica De Cian "Market- and Policy-Driven Adaptation" in Bjorn Lomborg *Smart Solutions to Climate Change: Comparing Costs and Benefits* (Cambridge University Press, Cambridge, 2010) 222 at 230.

[227] Markham Heid "Experts Say Lobbying Skewed the U.S. Dietary Guidelines" *Time* (online ed, The United States of America, 8 January 2016).

[228] OECD "Meat consumption" (2016) OECD Data <https://data.oecd.org>.

[229] EPA "Global Greenhouse Gas Emissions Data" (2016) US Environmental Protection Agency <www.epa.gov>.

[230] At 19.

addressing agricultural emissions is difficult as countries are unenthusiastic about policies that may be detrimental to their agricultural industry. In Denmark, calls by the Danish Council of Ethics to implement an initial tax on beef, with the intention of extending this to apply to all foods at varying levels depending on climate impact, were met with varying responses.[231] While some praised the Danish think tank for pushing Denmark to improve its climate sustainability, the Government made it clear they are unlikely to unleash such a "bureaucratic monster" on the Danish taxpayer, "Maybe it would get beef consumption to fall in Denmark, but it wouldn't do much of anything for the world's CO_2 emissions."[232]

If enough states call for changes in agricultural climate change policy, there could be a shift in accountability. Currently no institution has attempted to hold states accountable for their agricultural sectors, but the regime complex allows for greater participation by actors, therefore the opportunity for improvement in accountability exists. A group of states willing to address agricultural emissions – likely made up of states with less reliance on their agricultural industry – could draw attention to the issue and place political pressure on other states to address this untapped area. Alter and Meunier explain how accountability is developed: [233]

> Accountability politics is another sort of systemic feedback effect. On the one hand, international regime complexity blurs which institution is authoritative, and thus makes it harder to asses which actors or institutions to hold accountable. On the other hand, international regime complexity can create access for more actors, and thereby be a force for greater political accountability.

Similarly, in encouraging various actors to participate in the regime complex and promote accountability, this will improve the regime's fairness. Ultimately, if an action is not in the interests of the powerful states they are unlikely to support the initiative, they may go as far as to seek to undermine progress in this area through regime shifting and reshaping the rules to their advantage. Without an initiative or club formed to address agricultural emissions and draw attention to these tactics, the likelihood of increasing the regime complex's accountability is low.

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[231] Adam Withnall "Denmark ethics council calls for tax on red meat to fight 'ethical problem' of climate change" *The Independent* (online ed, United Kingdom, 27 April 2016).

[232] "Could Danes face a 'red meat tax' to help climate change?" *The Local DK* (online ed, Denmark, 25 April 2016).

[233] Alter and Meunier "The Politics of International Regime Complexity", above n 40, at 20.

C Fragmentation within the regime complex

Regime complexity provides the opportunity for actors to minimise linkages and maximise separate networks. When state preferences diverge states may block attempts to clarify the rules; as a result ambiguity continues and countries are able to select their preferred rule or interpretation "with the rules themselves or the hierarchy across rules remaining fundamentally ambiguous, agreements get defined and redefined across time and space".[234] Alter and Meunier describe this occurrence: [235]

> International regime complexity adds a new twist to implementation politics: *international regime complexity reduces the clarity of legal obligation by introducing overlapping sets of legal rules and jurisdictions governing an issue.*

This is known as fragmentation of international law. Fragmentation is a prominent issue within the regime complex for climate change, and a potential challenge facing any policy addressing livestock emissions. Eyal Benvenisti and George Downs set out three ways fragmentation destabilises international law. First, multiple venues for issue specific cooperation provide powerful states with an advantage and the ability to retain the power they possess, as decentralised mechanisms are not well suited to coalition building in a fragmented system.[236] Second, powerful states have the ability to abandon or threaten to abandon a venue, if their demands are not met, for a more sympathetic venue.[237] Third, the authors suggest the fragmented system's character advocates an absence of design and obscures the role of intentionality – meaning powerful states can rely on fragmentation strategies as an alternative approach to achieving the same result – maintaining their power hierarchy.[238] Fragmentation undermines the normative integrity of international law and works to sabotage the evolution of a democratic and egalitarian international regulatory system.[239]

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[234] Alter and Meunier "The Politics of International Regime Complexity", above n 40, at 16.

[235] At 16.

[236] Eyal Benvenisti and George W. Downs "The Empire's New Clothes: Political Economy and the Fragmentation of International Law" (2007) 60(2) Stan. L. Rev. Law Review 595 at 597.

[237] At 597.

[238] At 597-598.

[239] Benvenisti and Downs, above n 236, at 597.

Powerful states may utilise fragmentation as a tool to maintain the status quo. This is a significant challenge undermining the prospects for international action addressing the agricultural sector. States with an economic interest in the agricultural sector, particularly high exporters, will want to avoid policies that may be detrimental to their economies. By ensuring the movement does not gain support, powerful states are able to control the power they possess in this area.[240] Powerful states may embrace the decentralised nature of the regime complex, limiting support for this policy movement to one part of the whole climate change system. As the international climate change regime stands, large industrialised and developing nations retain a lot of power as the problem requires participation by the whole of the international community.[241] The United States withdrawal from the Kyoto Protocol in 2001 demonstrates it is necessary for large emitters to participate if a climate change initiative is to be effective.[242] These states are aware of the power they possess and will likely exploit this power by threatening withdrawal from an agreement where policies are not in their interests. Many states will be opposed to the addition of agriculture as an area for climate change reform. Fragmentation will continue to support the powerful states agendas, unless a concerted effort is made to draw attention to the states seeking to avoid addressing agricultural emissions.

An anti-fragmentation group could deal with this issue. Benvenisti and Downs emphasise that the positive interactions in the European Union demonstrate that fragmentation can be overcome by developing a region-wide regulatory policy.[243] Further, the authors propose if an anti-fragmentation group formed from developing democracies, and the group's members have enough sway, a push away from regime-shifting and strategic tactics could be successful.[244] The suggested democracies making up this group are India, Brazil, South Africa, and South Korea due to their similar histories, democracies and economic positions.[245] A group of states willing to address agricultural emissions could form an anti-fragmentation group to ensure

[240] Benvenisti and Downs "The Empire's New Clothes: Political Economy and the Fragmentation of International Law", above n 236, at 597.

[241] Arunabha Ghosh and Ngaire Woods "Developing Country Concerns about Climate Finance Proposals" in Richard Stewart, Benedict Kingsbury and Bryce Rudyk (eds) *Climate Finance: Regulatory Funding for Climate Change and Global Development* (New York University Press, New York, 2009) 157 at 159.

[242] Nordhaus "Climate Clubs to Overcome Free-Riding", above n 170.

[243] At 629.

[244] At 629.

[245] At 629.

powerful states could not utilise the regime complex to their advantage. As discussed above, the greatest potential for addressing agricultural emissions lies in emerging economies. Similarly, research suggests these states are more receptive to low-meat consumption strategies to address climate change.[246] These states could form a club to deal with agricultural issues and draw attention to fragmentation tactics should they occur. A successful anti-fragmentation group would add to the regime's accountability through ensuring states are being held accountable for their actions; if states are utilising fragmentation to reach their desired result, they are failing to fulfil their responsibilities as actors in the climate change framework.

D Competition within the regime complex

A regime complex encourages competition, which in effect drives change. Using the CDM as an example, Keohane and Victor propose added competition between offset schemes, where currently a monopoly stands in the way of change, will "reverse the perverse incentives that have plagued the CDM".[247] However, Alter and Meunier describe events 'reverberating' in other areas as a consequence of a regime without hierarchy as potentially negative:[248]

> … changes within one institution could reverberate across parallel institutions. The international cooperation game board may shift as actors meet and are informed by their experiences in multiple forums (leading to changes in their policy preferences) and because events in one arena can reverberate in ways that states cannot fully anticipate or control.

In theory, the lack of hierarchy among the regimes could allow for forum shopping, encouraging institutions to lower standards to attract membership.[249] There is a risk that where organisations are competing, actors are less incentivised to coordinate efforts "thereby generating the types of persistent inefficiencies frequently lamented, such as repetitive efforts, turf battles, and uncoordinated policy that has achievements by one organization later undermined or erased".[250] However, there are advantages to competition driven by regime complexity, by encouraging multiple institutions the inefficient deadlock within a single

[246] Wellesley, Happer and Froggatt, above n 100, at 22.

[247] At 15.

[248] At 20.

[249] Rabitz "Regime complexes, critical actors and institutional layering", above n 26, at 4.

[250] Alter and Meunier "The Politics of International Regime Complexity", above n 40, at 19.

institution is no longer an issue as states have other options.[251] Similarly, competition spreads the risk that one failure will extinguish the entire movement, and helps to promote productive experimentation by encouraging actors to adopt different approaches, this can force organisations to improve their performance.[252]

Any policy changes made by willing states in the agricultural sector will have feedback effects in other climate change areas, such is the nature of the regime complex. This difficulty arises in addressing agricultural emissions, whether this is done through a carbon tax, a climate club or domestic mechanisms involving labelling and consumption guidelines. States looking to address agricultural emissions through any mechanism are essentially aiming to reduce consumption of agricultural products. This will affect the FAO, WHO and other international organisations with linkages to these areas and other states (especially those reliant on agricultural sector exports). Depending on the form these actions take, trade may be affected and particular trade agreements will form barriers to this.[253] Competitiveness can be utilised in the regime complex as greater incentives exist for investment in an innovation club that allows member states to directly receive the benefits. If technology is shared among club members it can maintain its value. In a comprehensive regime investment in technology and innovation is shared among the international community. States willing to participate in addressing agricultural emissions can embrace competition within the regime complex as a way to provide benefits of investment to those willing to invest. This may transpire in a variety of ways including, a club for states to share information, an innovation club; states could go as far as to implement a climate club imposing tariffs.

The emergence of calls for action in the agricultural sector may encourage competition within the realm of the current climate change treaty framework. The UNFCCC, the subsequent Kyoto Protocol and the recent Paris Agreement have steered well clear of the issue of agriculture, therefore bringing this sector within the ambit of climate discussions may allow states to contemplate this issue in carrying out their commitments under the treaty framework. While

[251] Alter and Meunier "The Politics of International Regime Complexity", above n 40, at 19.

[252] Alter and Meunier "The Politics of International Regime Complexity", above n 40, at 19.

[253] See Nicholas Rivers and Brandon Schaufele "The Effect of Carbon Taxes on Agricultural Trade" (2014) Canadian Journal of Agricultural Economics 1; Geoff Bertram "William Nordhaus's Climate Club Proposal: thinking globally about climate change economics" (2016) 12(2) Policy Quarterly 23.

this sector needs to be addressed, states must be careful not to undermine the current framework. Investments in additional regime complex components to work on a shared issue will develop the regime's sustainability.[254] Investments in institutions are unlikely to be made where the durability of the regime is questionable.[255] Increased investment in institutions could promote competition between components. However, if the components reinforce each other – likely through linkages – the regime will become more sustainable. States should make it a priority that any initiative is compatible with the current framework, improving the regime's coherency. This can be done by encouraging linkages, welcoming participation by all willing states, and ensuring the objectives are in line with the international community's goal of limiting an increase in temperature levels to 2ºC.

VI Conclusion

The Fourth Assessment Report of the IPCC proposes that deep cuts in global greenhouse gas emissions are needed to hold the increase in global average temperature below 2ºC above pre-industrial levels.[256] De Conto and Pollard are well respected scientists in the field of Antarctic climate change research, in 2003 they reported on the temperature drop needed in order to initiate ice-sheet growth in Antarctica.[257] Their recent findings indicate, "Antarctica has the potential to contribute more than a metre of sea-level rise by 2100 and more than 15 metres by 2500, if emissions continue unabated."[258] Perhaps these extreme predictions will not come to fruition for centuries, if they do at all. But scientists agree, even if emissions were cut to zero tomorrow the anthropogenic emissions over past decades will continue to warm the planet.[259] In the 25 years since the IPCC First Assessment Report was released, declaring the dangers of the changing climate, the international community have attempted to formulate a response with

[254] Keohane and Victor, above n 9, at 17.

[255] Keohane and Victor, above n 9, at 17.

[256] Bert Metz and others (eds) *Climate Change 2007: Mitigation. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge University Press, 2007) at 100.

[257] Robert M. DeConto and David Pollard "Rapid Cenozoic glaciation of Antarctica induced by declining atmospheric CO_2" (2003) 421 Nature 245.

[258] Robert M. DeConto and David Pollard "Contribution of Antarctica to past and future sea-level rise" (2016) 531 Nature 591 at 591.

[259] Thomas Lukas Frölicher, Michael Winton and Jorge Louis Sarmiento "Continued global warming after CO_2 emissions stoppage" (2014) 4 Nature Climate Change 40 at 40.

little success. The Council on Foreign Relations, an independent think tank, has described the current regime as "grossly inadequate".[260] Perhaps the key is, as Keohane and Victor argue, to embrace regime complexity and utilise its advantages.

The climate change regime's ultimate objective is to stabilise the climate through a reduction in greenhouse gas emissions. The continuing rise of greenhouse gas emissions demonstrates the effectiveness of the regime is low.[261] The criteria put forward by Keohane and Victor to evaluate the regime's effectiveness – namely, coherence, accountability, determinacy, sustainability, epistemic quality and fairness – are shown to be useful in evaluating a potential institutional arrangement addressing agricultural emissions. Dimensions of the regime complex, particularly linkages and the potential for clubs and investments in technology and innovation, improve the regime's ranking in all criteria. However, it is clear the regime complex is rife with challenges, chiefly the potential for fragmentation within the regime, the negative feedback effects from competition between the regime's components and the constant power play that will inevitably effect the ability to address emissions. These challenges will to a greater or lesser extent reduce the regime's accountability, fairness and coherence.

The regime complex for climate change undoubtedly provides immeasurable benefits for the implementation of a sustainable consumption strategy for emission control. However, to realise its full potential, many dimensions of the regime complex will need to be capitalised upon. The emerging trend among nations to recommend low-meat consumption gives these states the opportunity to become first movers in this aspect of climate policy. Governments implementing innovative strategies in response to climate change have the potential to form a strong and magnetic climate club. The regime complex encourages the formation of these clubs and, in particular, clubs focusing on investment in research, technology and innovation. Significantly, the regime complex affords states the ability to set individual schedules, increasing state cooperation and buy-in to the ultimate objective. The linkage opportunities between various aspects of the regime will allow for successful implementation of agricultural policies as each linkage serves to make the regime's components more compatible and deepens cooperation.

[260] Council on Foreign Relations *The Global Climate Change Regime*, above n 55.

[261] Steinar Andresen "International Regime Effectiveness" in Robert Falkner (ed) *The Handbook of Global Climate and Environment Policy* (Wiley-Blackwell, Chichester, 2013) 304 at 316.

The regime complex advantages – valuable adaptability in the constantly evolving climate change field and superior flexibility – are essential elements for the implementation of a novel emissions reduction initiative in the agricultural sector. Nicholas Stern has called for the international community to adopt a new perspective in dealing with climate change:[262]

> If we look at the issues in terms of collaboration, dynamism and opportunity rather than division, stasis and burden, we are much more likely to get domestic progress and international agreement.

Maybe this time the international community will see the universal benefits of implementing strong mitigation strategies, even if these benefits are uncertain and in the future.

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[262] Stern "Economic Development, Climate and Values: making policy", above n 154, at 7.

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