SDG 13 and the entwining of climate and sustainability metagovernance

Charnock, Robert; Hoskin, Keith

DOI:
10.1108/AAAJ-12-2018-3790

Document Version
Peer reviewed version

Citation for published version (Harvard):
Charnock, R & Hoskin, K 2020, 'SDG 13 and the entwining of climate and sustainability metagovernance: an archaeological-genealogical analysis of goals-based climate governance', *Accounting, Auditing and Accountability Journal*, vol. 33, no. 7, pp. 1731-1759. https://doi.org/10.1108/AAAJ-12-2018-3790

SDG 13 and the Entwining of Climate and Sustainability Metagovernance: An archaeological-genealogical analysis of goals-based climate governance

Journal:	*Accounting, Auditing & Accountability Journal*
Manuscript ID	AAAJ-12-2018-3790.R2
Manuscript Type:	Research Paper
Keywords:	Sustainable Development Goals, SDG 13, metagovernance, archaeological-genealogical analysis, the Paris Agreement on climate change, accounting for sustainable development

SDG 13 and the Entwining of Climate and Sustainability Metagovernance: An archaeological-genealogical analysis of goals-based climate governance

Abstract

Purpose – This paper brings insights from accounting scholarship to the measurement and reporting challenges of metagovernance approaches to sustainable development. Where scholarship on metagovernance—the combination of market, hierarchical and network governance—proposes deductive approaches to such challenges, we contend that a historically-informed 'abductive' approach offers valuable insight into the *realpolitik* of intergovernmental frameworks.

Design/methodology/approach – The paper adopts a Foucauldian 'archaeological-genealogical' method to investigate the inclusion of climate change as a Sustainable Development Goal (SDG). It analyses more than 100 documents and texts, tracking the statement forms that crystallise prevailing truth claims across the development of climate and SDG metagovernance.

Findings – We show how the truth claims now enshrined in the Paris Agreement on Climate Change constrained the conceptualisation and operationalisation of SDG 13: *Take urgent action to combat climate change and its impacts*. The paper thereby reframes recent measurement and reporting challenges as outcomes of conceptual conflicts between the technicist emphasis of divisions within the United Nations and the truth claims enshrined in intergovernmental agreements.

Originality/value – This paper demonstrates how an archaeological-genealogical approach may start to address the measurement and reporting challenges facing climate and SDG metagovernance. It also highlights that the two degrees target on climate change has a manifest variability of interpretation and shows how this characteristic has become pivotal to operationalising climate metagovernance in a manner that respects the sovereignty of developing nations.

Keywords – Sustainable Development Goals, SDG 13, metagovernance, archaeological-genealogical analysis, accounting for sustainable development, the Paris Agreement on climate change.

Paper type – Research paper.

1.0 Introduction

This paper investigates what it sees as an emergent accounting problematic in the governance of sustainable development. The implementation of both the Sustainable Development Goals (SDGs) and the Paris Agreement on climate change has been criticised for developing measurement and monitoring practices that overly prioritise technical and statistical issues at the expense of their political feasibility (Singh et al. 2016; Pintér, Kok, and Almassy 2017; also see Breidenich and Bodansky 2009). Yet, the question remains: how to reconcile the *realpolitik* of intergovernmental agreements with the contemporary requirement to exercise that *realpolitik* via an expertise-based discourse. Indeed, it is within such discourses that accounting has significant roles to play, both in the 'decision contests' over choices and in the implementing and managing of options chosen (Hopwood 2009).

We particularly see this as important for SDG 13: *Take urgent action to combat climate change and its impacts* (UNDP 2016). On the one hand, the late 20th-century saw a proliferation of intergovernmental organisations, established to grapple with the scientific, political, societal and economic dimensions of climate change. On the other, SDG 13 intersects with a particularly well-developed global governance framework, the United Nations Framework Convention on Climate Change (UNFCCC). SDG 13 thereby provides a site for studying the entwining of multiple expert discourses, articulating a form of goals-based governance in a way that navigates the parallel operation of two global governance mechanisms.[1]

We therefore intend to respond to Bebbington and Unerman's calls for research into "the development […] of the use of (potentially novel) accounting tools in this SDG-related area of emergent practice" (2018, p.9).[2] For our study of the intersection of the UNFCCC and the SDGs, their call for engagement with *metagovernance* scholarship is especially relevant. This literature recognises the growing interest in new forms of governance as "problems have emerged that cannot be managed or resolved readily, if at all, through top-down state planning or market-mediated anarchy" (Jessop 2003, p.103). So we engage with insights from scholarship on metagovernance—understood as the combination of market, hierarchical and network forms of governance (Meuleman and Niestroy 2015)—as a way to enrich our understanding of the aforementioned criticisms being levelled at the SDGs and the UNFCCC.

Metagovernance scholars have suggested that these measurement-related criticisms may potentially be resolved by deriving contextual understandings, either from analysis of conflicting governance styles (Meuleman 2008; 2014) or of the different political and cultural traditions, traits and ways of thinking of different participating

[1] This is not the only point of intersection. Parties to the United Nations Framework Convention on Climate Change (UNFCCC) are required, under Article 4, paragraph 1(c) (UNFCCC 1992, p.5), to cooperate by sharing technologies and control approaches aimed at reducing greenhouse gas emissions in areas that span multiple SDGs – this includes agriculture (SDG 2), energy (SDG 7), industrialisation (SDG 8), cities (SDG 11) and forests (SDG 15).

[2] This call is also being made beyond accounting, with Fukuda-Parr and McNeill arguing—in their introduction to a *Global Policy* special issue on the SDGs—that the SDGs are shaping development norms and that the "choice of measurement tools–the target and indicator–is essential in defining the norm itself and becomes a critical point of contestation" (Fukuda-Parr and McNeill 2019, p.6).

nations (Grin, Rotmans, and Schot 2010; Meuleman 2013). However, following Triantaffilou's critique, we wish to avoid repeatedly asking "*who* is governing the network's actions?" (Triantafillou 2007, p.190, emphasis added) and instead explore the *how* of governing: namely, how a set of devices, methods and techniques "mobilizes the self-steering capacities of the network?" (Ibid.).

The paper's core contribution, therefore, is built on Triantafillou's (2007) critique, centring our study on climate-related accounting. Yet we argue that Triantaffilou's instrumentation-focus provides an incomplete picture, as the scope of analysis must encapsulate the role of 'statements' alongside 'devices, methods, and techniques'. As such, one objective of this paper is to reframe the tension lying between two seemingly essential contemporary forms of sustainable development practice—the *ideational* crafting of intergovernmental agreements and the *technical* emphasis of implementation mechanisms. Here we draw on Foucault's analyses of the intersections between power relations and knowledge relations (Foucault 1977, 23–31; 2007; 2008) to develop an approach for exploring both what accounting says and what it 'makes sayable'.

This, of course, builds on Spence and Rinaldi's (2014) inquiry into how the construction of quantifiable measurements is interconnected with "vocabularies and procedures for the production of truth" (Spence and Rinaldi 2014, p.438). In addition to their 'vocabularies and procedures', we also include the statement form (Ezzamel and Hoskin 2002; Hyman 2006; Ezzamel 2012; Bassnett, Frandsen, and Hoskin 2018) so that our study may focus on the ways in which new and alternate truths come to prevail. We may thereby analyse the roles of accounting in the 'modes of veridiction' across contemporary discourses of science, social science and political economy, through which are played out what Foucault called the 'truth games' of a given era (Foucault, 1995: 315).[3]

Hence, we are proposing that accounting scholarship has the potential to re-orientate metagovernance insights into the ongoing technical challenges faced in implementing the SDGs. Specifically, by tracking the roles that accounting statement forms play in these truth games, analytical focus shifts to the mutual constitution—through the interplay of text with context—of *both* metagovernance approaches *and* the measurement, monitoring and managing practices and statements that enact them.

However, this is not purely through a genealogical study of knowledge and power *practices*. Instead we draw on Foucault's own methodological concern set out in *The Archaeology of Knowledge* (Foucault 2002) to demonstrate how genealogical analysis needs also to constitute an *archaeology* of governance 'statements' (Foucault 1971; 1978; Davidson 1986; Miller and Napier 1993; Webb 2012). This secondary contribution of the paper, applied to our SDG 13 problematic, allows us to track the different statement forms that enshrine prevailing truth claims. It thereby enables us to trace the shifting truth

[3] Foucault claimed that his work, as a 'Critical History of Thought', asked how in different eras humans are differently constituted as 'subjects' and so differently constitute the 'objects' of their knowledge (including the subject as object). In the interplay of such forms of 'objectivation' and 'subjectivation', he says: 'what we might call "truth games" arise…(as) the rules according to which….what a subject may say stems from the question of the true and the false. In short, the critical history of thought…..is the history of "veridictions" understood as the forms according to which discourses capable of being deemed true or false are articulated on a domain of things' (Florence 1994, pp.314-5).

games—and their potentially constitutive effects—throughout the evolution of climate metagovernance. In doing so, our study uncovers conflicting truth claims that were central to tensions between the metagovernance approaches of the UNFCCC and SDGs, and how the two have become inexorably entwined. In particular, we show how UNFCCC primacy on climate change and respect for national sovereignty have, over time, come to prevail as truth claims that constrain how progress towards SDG 13 may be measured, monitored and managed.

This paper applies this archaeological-genealogical mode of analysis to the study of more than 60 reports and proceedings—ranging from conferences, research institutes, intergovernmental organisations, non-governmental organisations and state agencies—in addition to over 55 academic texts—from disciplines such as climatology, meteorology, economics and law. This enables an investigation into the shifting truth claims that guided the creation of instrumentation to operationalise goals-based governance on climate change. We see this in both the SDGs (Kanie and Biermann 2017) and the Paris Agreement (Falkner, Stephan, and Vogler 2010; Falkner 2016), as well as the collision of these two governance frameworks that has clearly resulted in a newly interwoven instance of metagovernance.

The remainder of this paper is structured as follows. The next section further situates this study within metagovernance and sustainable development literatures, with the subsequent section detailing our archaeological-genealogical approach. Section 4 presents the archaeology-genealogy in six stages. The first two subsections take an archaeological approach to investigating why certain types of statements were made and how they were reproduced. The three subsections that follow centre on the shifting truth games through which governance arrangements emerged, destabilised, and were remoulded. Section 4.6 then turns to the collision of climate and SDG metagovernance and how this constrained the creation of SDG 13. Finally, Section 5 provides concluding remarks.

2.0 Metagovernance and the Problem of Coordination

As Bebbington and Unerman contend, the United Nations' SDG *metagovernance* architecture will require "the technologies of accounting, target setting and reporting" (2018, p.18). They highlight this as an opportunity for accounting scholars to bring their "wealth of knowledge and experience to understanding the possibilities and pitfalls in private sector governance" (Ibid., p.13) into collaborations with established veins of research on sustainability governance. Indeed, as noted, metagovernance research has already begun to study how derived contextual understandings may ameliorate the challenges of developing appropriate measurement and monitoring practices. What is more, developing such practices for complex governance arrangements appears to be a core problematic for metagovernance, and one on which there may be fruitful grounds for collaboration with accounting scholars.

For instance, as one of the early proponents of metagovernance, Jessop argued that there has been growing interest in new forms of governance as "problems have emerged that cannot be managed or resolved readily, if at all, through top-down state planning or market-mediated anarchy" (Jessop 2003, p.103). Specifically, these problems exacerbated the "complexity, plurality, and tangled hierarchies found in prevailing modes

of co-ordination" (Ibid., p.108). This work built on the prior notion of "meta governability" (Kooiman 1993, p.47), which saw newly emerging forms of interactions between the public and private sectors as shifts from "'one-way steering and control' to 'two-way or multi-way designs'" (Ibid., p.35). He captures the essence of this 'meta governability' as "let them control themselves" (Ibid., p.47) so that governance may "cope much better with uncertainty, instability, even chaos, long-term perspectives, broader orientations and great diversity of life-styles and meanings" (Ibid., p.48).

Building on this work, Jessop focussed his attention on coordination as a central problem of metagovernance, which sought to organise "the conditions for governance" in a manner that combined "market, hierarchy, and networks" so as to ameliorate the limitations and draw on the benefits of each (Jessop 2003, p.108). This was not to deride the role of the state. Rather, it opposed the top-down hierarchical view of regulation, arguing instead that coordination occurred in the 'shadow of hierarchy' via negotiated decision making (Jessop, 2003, citing Scharpf 1994). Indeed, this move away from seeing governance as a form of sovereign rule has been advanced through several lines of inquiry. These include how changing notions of democratic governance shape the potential roles of politicians and public managers (Jessop 2004; Sørensen 2006; Sørensen and Torfing 2009) as well as how the state may establish the rules for network governance (Sørensen and Torfing 2007), the imbalances that allow dominant actors to hold power (Meuleman 2014; Albareda and Waddock 2016), how multiple actors may act as metagovernors (Derkx and Glasbergen 2014; Fransen 2015) and inquiries into the rationales of a metagovernor (Meuleman 2008). So the question has shifted from one of how a sovereign may rule to how certain individuals or organisations may act as 'metagovernors'.

Indeed, this theme has been maintained in more recent applications of metagovernance to the sustainable development agenda, which has shed considerable light on the potential roles of different types of organisations as metagovernors. In drawing lessons from what the authors refer to as successful decentralized sustainable development solutions, Christopoulos *et al*. attempt to link metagovernance processes to particular actors working on sustainable development, from intergovernmental organisations to NGOs and private actors (Christopoulos, Horvath, and Kull 2012). Similarly, Derkx and Glasbergen, in arguing that metagovernance has tended to centre on the metagovernance roles of state actors, direct their attention to the metagovernance approaches taken by voluntary standard setters on labour, sustainable tourism and organic agriculture (Derkx and Glasbergen 2014). On the other hand, Fransen criticises existing metagovernance scholarship for focussing on identifying a single metagovernor and the potential roles they can play (Fransen 2015, p.314). However, this view appears somewhat akin to Christopoulos *et al*. (2012) in that Fransen uncovers the multiple actors working on transnational private sustainability governance, perhaps nuanced by the observation that these actors were not attempting to achieve convergence but were rather producing multiple labelling standards.

Yet, this core theme in metagovernance scholarship has been criticised precisely for "repeatedly […] spending time resolving the question: who is governing the network's actions?" (Triantafillou 2007, p.190). That is, the literature has started to develop a theoretical understanding of combinations of governance styles, however it has rested on the assumption that processes of combining are governable by particular individuals or organisations. Triantafillou's view, on the other hand, is that the problems posing

coordination challenges should be studied through the governing technologies that provoke and guide participatory dialogue between an array of actors (Ibid., pp.183-4, 197-8). This appears of relevance to a more recent concern with the tensions and misalignments that arise in metagovernance arrangements of a greater complexity, in terms of the number and range of actors involved as well as the multiple jurisdictions traversed.[4]

Meuleman and Niestroy raise this concern with regards to the multiple worldviews, values and traditions that come into conflict with the normative assumptions underpinning the SDGs (Meuleman and Niestroy 2015, pp.12313-4). However, in taking the actor-mix of the SDGs as the starting point for their study, the authors look to take a deductive approach to resolving this misalignment of governance styles, culture and normative assumptions. While this draws on metagovernance scholarship that seeks to derive contextual understandings from governance styles (Meuleman 2008; 2014) or the politics and culture of participating organisations and nations (Grin, Rotmans, and Schot 2010; Meuleman 2013), the approach becomes rather more challenging for intergovernmental agreements that involve almost all of the world's nations. It is here, we contend, that Triantaffilou's call to study metagovernance through its governing technologies offers potential respite, opening up the possibility for an abductive approach to unveiling the truth claims embedded in these intergovernmental agreements. This, in turn, provides a basis for exploring the tensions that underpin challenges to the recent measurement and monitoring approaches developed by the UNSD and UNSC (Pintér, Kok, and Almassy 2017).

Indeed, in this regard, Triantafillou's argument resonates with certain themes pursued by accounting scholars as well as Bebbington and Unerman's call for accounting scholars to engage with metagovernance debates (2018, p.13). We see potential parallels with studies on control premised on 'following the inscriptions' (Robson 1992), the coordination of industrial change through an ensemble of instrumentation (Miller and O'Leary 2007), or more recently the dynamics of assemblages that shape social movements (Martinez and Cooper 2017). These studies, while far from an exhaustive list and each differing in emphasis, investigate the interdependencies between instrumentation and coordination. Yet, as with Triantafillou's arguments, the instrumentation-focus of such studies offer less insight into "how accounting technologies [...] *can be used to steer* actions and outcomes" (Bebbington and Unerman 2018, p.12, emphasis added). To clarify, we do not intend to engage in a normative study. Rather, we place further emphasis on how instrumentation is articulated, as such articulations have the potential to provide common interpretations and, in turn, shape the effects of those instruments. It is to conduct such a study that our archaeological-genealogical analysis, detailed in the following section, investigates the shifting statement forms (see Bassnett, Frandsen, and Hoskin 2018) through which climate governance is articulated.

[4] Indeed, metagovernor-centric approaches may work well to analyse metagovernance frameworks involving a relatively small set of nations, but become especially challenging when studying intergovernmental agreements that involve almost all of the world's nations.

3.0 A Genealogical Approach as Archaeological-Genealogical

Given the provenance of genealogical analyses from Foucault's work, none has ever been far from an engagement with statements and so with the archaeological dimension of human thinking, action and conduct. The practices that occasionally constitute the genesis of new ways of thinking and acting, and enable the formation of particular knowledge discourses and ways of exercising power, can only do so through a mix of verbal and non-verbal procedures. In retrospect, systematically new sets of statements—with different concerns, concepts and objects of knowledge—begin to be articulated in seemingly well-formed manners within what will take shape as a new set of knowledge fields (Foucault 1971)—in our modern era as the 'knowledge disciplines' and their sub- and inter-disciplinary offshoots. Such knowledge forms and fields then become the basis for being 'heard' at all and not silenced from the outset. So in any governmental situation (and for our paper, metagovernance), these become the the basis for seeking to articulate 'truth claims' that will conform to the principles of whatever constitutes the appropriate form of 'governmental reason'.[5]

For instance, when Miller and Napier (1993) call for a focus on "surfaces of emergence" (Miller and Napier 1993), one of the things that takes place at the surface is the making of statements, both oral and written. This category of the written includes both those statements which have a temporal linear flow modelled on that of speech, the textual-narrative form, and those which are made through a different linearity, within boxes where knowledge is articulated through mixes of words, numbers and linear graphics, and where both the construction and the reading practices have a different artfulness.

Such statements, it has been argued (e.g. Ezzamel and Hoskin 2002; Hyman 2006; Ezzamel 2012; Bassnett, Frandsen, and Hoskin 2018) include all accounting statements, from those articulated before 3000 BCE in Mesopotamia via cuneiform naming and counting signs incised within delineated spaces on clay tablets to those made in double entry and modern cost and management accounting systems. Furthermore, they also include all those statements made in the tables, charts, figures, graphs and equations that have become so integral to the playing of 'truth games' in knowledge fields since the 1500s and 1600s (e.g. Thompson 1998; Hyman 2006) and which are now so significant a presence across the various disciplines brought to bear on the problem field we have named as 'sustainable development'.

Our point here is that statements in general and this form of statement in particular are integral to undertaking any contemporary manifestation of 'governmental reason', including the form that has taken shape and become mobilised as metagovernance. Drawing on a recent usage developed in the history of writing systems, which designates the narrative forms of writing whose template is speech as 'glottographic' writing systems, Hyman (2006) proposes that the clay tablet accounting system is the first in a line of 'non-glottographic' statement forms which now constantly

[5] It is worth noting Foucault's remarks, at the start of The Birth of Biopolitics', on how his governmentality project has not studied "the development of real governmental practice [… but] the art of governing, that is to say, the reasoned way of governing best and […] reflection on the best possible way of governing […] government's consciousness of itself' (Foucault, 2008: 2).

proliferate. Furthermore, he proposes that 'glottographic writing', far from being 'fully fledged' writing, is only a sub-system of writing, with 'non-glottographic' writing constituting its complement (cf. Bassnett, Frandsen & Hoskin, 2018).[6]

So in contrast to a focus on the contextual (*cf.* Meuleman 2008, 2014) we propose that we may get a different handle on the dynamics and structure of metagovernance through what we might call a focus on the 'textual'. In particular, where such a focus includes an explicit commitment to engaging with accounting as a key feature of the 'textual', once accounting is understood not just as distinctive form of practice but also distinctive form of making statements. In this regard we seek to explore, within the field of metagovernance, the potential value of the kind of archaeological-genealogical project that Foucault describes himself as undertaking as he seeks to understand the emergence of the modern construct of 'the man of desires': namely a study which locates itself "at the crossing-point of an archaeology of the problematisations of, and a genealogy of the practices of, the self" (Foucault 2012, p.18).[7]

Thus we here take up Foucault's focus on what gets said, as statements, as what needs analysing as the 'archaeological' complement to the genealogical analysis of practices. Furthermore, given how, as he says, what such statements say frequently would require 'an infinite number of sentences' to capture, we pay specific attention to their role in the playing out of the truth games that are integral to conducting the metagovernance of climate change. In particular, to their role in the conceptualisation, articulation and deployment of SDGs as key devices in agreeing and implementing any current strategy proposed for managing and controlling sustainable development.

So our approach investigates how sets of discursive and non-discursive practices come into being and how they interact in the formulation of conduct (Anaïs 2013). It does not attempt to trace the origins of current practices, rather it attends to the recurrence of discourses, their engagement in different scenes as well as those moments where they are absent (Foucault 1978). In this regard, the researcher "[deprives] certain practices of their self-evidence" in order to "extend the bounds of what may be thought, to enable the invention of new ways of administering our lives" (Miller and Napier 1993, p.645). For the study at hand, this interplay of the archaeological with the genealogical explores how goals-based governance—as a central feature of metagovernance (Meuleman and Niestroy 2015)—has been, and continues to be, wrought through truth games playing out over several decades and numerous forums.

---

[6] The essential difference of such statements from narrative forms is analysed by Foucault in *The Archaeology of Knowledge* (2002, pp.92-3), as he dismisses the claim of the grammatical sentence to be the archetype of the statement since there are many "statements that do not correspond to the linguistic structure of sentences", citing among others "a genealogical tree, an accounts book, the calculation of a trade balance [...] a graph, a growth curve, an age pyramid, a distribution": of all these he remarks that they "have a highly rigorous grammaticality" but not conforming to "the criteria [...] of a natural language". Most significantly of all he notes that *what* they say as well as how they say it goes beyond speech and narrative text, as "in a great many cases, only an infinite number of sentences could equal all the elements that are explicitly formulated in this kind of sentence".

[7] Arnold Davidson was cautioning in 1986 that "it would be a mistake to think that Foucault ever abandoned his archaeological method" (Davidson 1986); for more recent repetitions of the same point see (Webb 2012; Koopman 2013; Hoskin 2017).

The empirical core of this study is a documentary analysis of more than 60 reports and proceedings—ranging from conferences, research institutes, intergovernmental organisations, non-governmental organisations and state agencies—in addition to over 55 academic texts—from disciplines such as climatology, meteorology, economics and law. Data gathering was initially guided by a skeleton timeline of climate governance events, constructed from numerous informal conversations, interview insights from other research projects as well as several accounts from climate historians (Agrawala 1998; Bodansky 2001; Tol 2007; Weart 2008; Bodansky 2010; Christoff 2010; Randalls 2010). As certain events and statements came into focus during this research, further data gathering and analysis was conducted to probe further and develop deeper and more nuanced insights.

In this regard, analysis of this initial documentation enabled a more 'archaeological' approach of data gathering that centred on how and why certain forms of statement came into being (Prior 2011; also see Edgley 2014, p.259; Morales, Gendron, and Guénin-Paracini 2014, p.172). However, for our archaeology-genealogy, this now included both glottographic and 'non-glottographic' forms in the 'population of relevant statements'. That is, the second phase of data gathering centred on identifying and investigating "ways of writing the world" through which practices of climate governance became "historically bound together" (Hoskin and Macve 1986, p.107). This was key to exploring the linking of "local issues to larger questions, and vice versa" (Miller and Napier 1993, p.634), as discourses became embedded in the practices of goals-based governance that "emerge[d] as central to a certain way of calculating" the problem of climate change.

4.0 An Archaeological-Genealogical Analysis of Goals-Based Governance

In 1992 the United Nations Framework Convention on Climate Change (UNFCCC) was established to guide intergovernmental negotiations on climate change treaties (Oppenheimer and Petsonk 2005). Its overarching goal was "to achieve […] stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system" (UNFCCC 1992, p.4). The interpretation of 'dangerous' and the target concentration for stabilising atmospheric GHGs were not set out, but they became a focus for climate talks from the 1990s onwards. However, by the time the UNFCCC and its overarching goal were established, a target-based approach to mitigating climate change had been debated within North American policymaking for well over a decade. Indeed, as early as 1975 proposals for an appropriate target for mitigating the effects of climate change had emerged.

4.1 Nordhaus Poses Climate Policymaking as a Decentralised Optimisation Problem

We now see William D. Nordhaus' interventions into climate policymaking as articulations of a particular mix of accounting and management derived statements, crafted after he encounters knowledge discourses of scientific fields that were already articulating a concern with climate change. As a Yale economist, he began piecing together a cross-disciplinary discourse that selected from constructs of 'warming', 'rates of change' and 'sea-level rise', and translated these through an 'accounting' and then 'management' lexicon to initiate the possibility of what will become known as economic

analyses of optimal policy responses. These involve prioritising a cost-benefit view of climate change in papers (Nordhaus 1975a; 1977) produced as outcomes from his time as a Research Scholar at the International Institute for Applied Systems Analysis (IIASA), in Austria, where the physical chemist Cesare Marchetti and the meteorologist Allan Murphy guided his exploration of the climatic literature (Nordhaus 1975b).

This work would engineer a major discursive recasting of the problems IIASA had been working on. Rather than the scientific matter of "how can we limit the concentration of atmospheric carbon dioxide to a reasonable level?" the working paper reframed this as the economic problem of "how much would a control path *cost* if it were implemented on an *efficient* basis?" (Ibid., p.9, emphasis added). Furthermore this 'control path' was to be derived from the adoption of a classic form of strategic management statement, that of long-term *targets*, in what he saw as an unprecedented way of problematizing the climate change problem, as he remarked that he knew of "no attempts to suggest what might be reasonable standards, or *limits to set in a planning framework*" (Ibid., p.22, emphasis added).

Given this reframing of the climate change problematic, Nordhaus, the economist, could begin to put in circulation a form of discourse and concatenation of statements that existed previously neither in the established field of economics or the nascent one of climate change science. Specifically he could articulate and put in circulation the example target of keeping the climate system within a variation of 2°C, which he justified as the maximum warming in the "temperature pattern observed in the last 100,000 years" (Nordhaus 1977, p.342).

Thus equipped with the strategic yet accounting based combination of cost-benefit and long-term target thinking, Nordhaus could and did begin producing statements through which the climate, economics and policymaking could be simultaneously assessed. In doing so, he not only drew on the naming of climate change—through categories such as CO_2 concentrations and levels of warming—but also drew on the ability to count those categories so as to monetise them. Indeed, it was through the monetisation of certain costs and benefits that Nordhaus' statements brought together climate science, economics and policymaking through the appropriation of accounting and strategic management discourses. As Nordhaus articulated, in a form of words familiar in long-range business planning settings but here translated to an economic-scientific discursive frame:

> *"The central question for economists, climatologists, and other scientists remains: How costly are the projected changes in (or the uncertainties about) the climate likely to be, and therefore to what level of control should we aspire?" (Ibid., p.346).*

He accompanied these claims of 'central questions' with non-glottographic statements that set out the costs of climate policies over time (Figure 1)[8] and that set out

[8] While it appears peculiar that, in Figure 1, energy consumption would be higher under the controlled 100% increase in CO_2 scenario than the uncontrolled scenario, Nordhaus explains that this surprising result is because, first, consumption is not constrained and, second, "in later periods (when the nonfossil fuel production becomes most significant), consumption is higher because of the lower thermal efficiency of non-fossil sources" at the time (Nordhaus 1977, p.345).

the costs of alternative control approaches (Figure 2).[9] These were advice-form statements which set out how the fossil fuel mix in carbon-intensive sectors *ought* to change under different emissions scenarios. As well as contrasting this with the current mix, they also present this tension as one to be resolved through economic optimisation.

Of course, these non-glottographic statements cannot engage in any imperative claim for how these tensions must be resolved. Here, Nordhaus' 1977 paper appraised the prospects of climate control strategies, arguing that an efficient programme for controlling carbon dioxide concentrations "requires little change in the energy allocation for 20 to 40 years" (Ibid., p.346). Moreover, Nordhaus argued, this allowed time for technological development of alternatives to both fossil fuels as well as nuclear fission. Climate change was not restricted to speaking about the science of its causes and impacts but was now made articulable as an economic optimisation problem, one that addressed both the level of control and the timing of those controls.

[INSERT FIGURE 1 HERE]

[INSERT FIGURE 2 HERE]

However earlier efforts to tackle acid rain had demonstrated how nations were interconnectedly "protective of both their sovereignty and their pollution prerogatives [… and were] especially resistant to suggestions that they add pollution control costs to the already high cost of producing electric power." (Rosencranz 1981, p.514). Yet Nordhaus' optimisation emphasis did not only produce economic renderings of the climate problem. Nordhaus also addressed international climate politics, arguing that setting a firm long-term target provided "a way to decentralize the controls so that nations, producers, and consumers have proper incentives to implement the control strategy on an individual level" (Nordhaus 1977, p.342). So we see an early parallel with Meuleman and Niestroy's argument for metagovernance approaches that allow for the creation of tailored and differentiated governance styles (Meuleman and Niestroy 2015, p.12303). That is, agreement on a long-term target was a way of enabling a decentred approach through which nations (as well as regional governments within nations) would have the sovereign right to derive their own climate policies.

While Nordhaus was just one economist starting to work on global warming, this archaeological-genealogical analysis now turns to the reproduction of the statement forms (forms that combine economic, political and scientific knowledges, and that link the future to the present) enabled via a target-based planning approach to global warming.

[9] In each of these figures, the 100% increase in CO_2 scenario (commonly referred to as 'climate sensitivity') was used as an approximate correspondence with the target of keeping the climate system within a variation of 2°C.

4.2 The Reproduction of Statement Forms: From the National Research Council (NRC) 1983 report onwards

It is perhaps unsurprising that, given that he was one of the lead authors on the 1983 National Research Council (NRC) Report, Nordhaus' cost-benefit and long-term target-based approach to policymaking was further developed in that report. The report was also, in retrospect, perhaps the most significant of the early 'comprehensive' assessments of climate science and policy (National Research Council 1983). It maintained Nordhaus' emphasis on policy responses that, simultaneously, were economically optimal and would facilitate a decentralised, tailored and differentiated response (*cf.* Meuleman and Niestroy 2015). The policy assessment framework it proposed was intended to "lend itself to different levels of universality" and "be susceptible of disaggregation" (National Research Council 1983, p.457). To do so, the report avoided stipulating "some 'bottom line'" for policy choices, instead stating that there "will be as many bottom lines as there are users of the framework, according to their interests and responsibilities over space, time, and people" (Ibid., p.463).

However, the report also sought to develop Nordhaus' claims regarding how global warming should be controlled, placing greater emphasis on the need to reduce uncertainty in the policy appraisal process. This began to undermine Nordhaus' proposal of a two degrees target as temperature targets needed to be converted into carbon dioxide concentrations before they could be used in policy analysis. Even then, the conversion would differ depending on probabilistic modelling of climatic responses to carbon dioxide. To avoid this issue, the report adopted carbon dioxide concentration[10] limits as the metric for long-term targets (Figure 3). From these, the report set out the years when "emissions would need to be reduced below an uncontrolled path" (Ibid., p.169), noting that:

> *"To effect a significant reduction of CO_2 emissions in an orderly and efficient way probably requires planning and policy measures decades in advance, for the infrastructure and capital stock associated with fossil fuels cannot quickly be scrapped and replaced without high economic cost." (National Research Council 1983, p.169)*

[INSERT FIGURE 3 HERE]

The point being made here is not that the report replicated the non-glottographic statement forms enabled by Nordhaus' target-based approach to climate policy. Rather, their reproduction entailed their elaboration, both in terms of the ideas embedded in those statements as well as the instruments that would mobilise them. Yet this was now also to be in line with the newly prevailing truth claim of ensuring certainty in the policymaking process. Furthermore, this claim underpinned the elaboration of instrumentation for climate action, with the report calling for "a strong fundamental research program" (Ibid., p.181) to create the informational infrastructure required for policy analysis and for monitoring the impact of implemented policies:

[10] These concentrations are stated as 'ppm', or 'parts per million' of carbon dioxide in the atmosphere.

> *"There is not one U.S. long range global energy or economic model that is being developed and constantly maintained, updated with documentation, and usable by a wide variety of groups. [...] Efforts to evaluate the effectiveness for CO_2 control of energy policies of particular nations or groups of nations in a globally consistent framework have been lacking" (National Research Council 1983, p.173).*

In this regard we see a contrast to Triantaffilou's view of metagovernance, who argues that it is the instrumentation that provokes and guides participatory dialogue between an array of actors (Triantafillou 2007, pp.183-4, pp.197–8). Rather, it is the statements that both interpret and mobilise those instruments which guide the development and enmeshing of governmental technologies. In this regard, target-based governance does not merely guide policymaking towards a particular instrument (the target), but it creates a space in which the ever-shifting statement forms—through which truth claims are articulated and fought over—represent ongoing processes of both conflict and adjustment between policymaking and governmental technologies. In other words, it is the articulation and contestation of truth claims via a range of statement forms that carves out the contours for how and what new instrumentation is developed.

Thus, beyond engineering adjustments to the target itself (as seen in the 1983 NRC report), the elaboration of these statements uncovered challenges regarding what short-term actions were required to work towards the future that a long-term target envisaged. In particular, a proceedings report from two Villach-Bellagio workshops held in 1987 proposed that, even with a long-term target, "an adjustment process in reaching [that] target will be required and interim targets would have to be set" (Jäger 1988, p.25).[11] Interim targets, the report proposed, may be different for developed and developing countries, and may be adjusted "to take into account the changes in scientific knowledge, the introduction of new technologies and the time required to do this, and changing perceptions of the problem" (Ibid., pp.25-6).

Furthermore, analyses had started to consider the warming effects of a range of GHGs, rather than only CO_2. However, the warming effects of each GHG were different, increasing the complexity of assessments. The Villach-Bellagio report recommended that "all GHGs must be made intercompatible" (Ibid., p.33) through a concept such as 'CO_2 equivalent' (CO_2e)[12] to "allow a total emissions picture to be obtained in warming terms" (Ibid.). What is peculiar to CO_2e is that it is a renaming to enable an aggregated form of counting. GHGs had individual names as well as the category, GHGs. Yet, for the purposes of analysis and monetization of costs and benefits, it was considered necessary to develop

[11] Building on the foundations created at the First World Climate Conference in 1979, the International Council of Scientific Unions (ICSU), United Nations Environment Programme (UNEP) and the World Meteorological Organisation (WMO) held a series of conferences in Villach, Austria, in 1980, 1983 and 1985. The two 1987 workshops were organised to respond to conclusions reached at the 1985 Villach conference, with the ISCU, UNEP and WMO also forming the Advisory Group on Greenhouse Gases (AGGG) to guide and build on these workshops. The first of these two workshops centred on the impact of increased concentrations of GHGs, which was discussed from the 28th September to the 2nd October 1987 in Villach, Austria. These discussions inform the second workshop, which explored "policy steps that should be considered for implementation in the near term" (Jäger 1988, p.iii) and was held from the 9th to the 11th November 1987 in Bellagio, Italy.

[12] This is detailed in the report as "expressing the amount of each GHG in terms of the amount of CO_2 that would produce the same radiative effect" (Jäger 1988, p.33).

a means of commensuration to enable the aggregation of impacts across the range of gases (see MacKenzie 2009).

Along with this newly emergent instrumentation—interim targets and conversions into CO_2e—the workshop set out three management steps as the ideal process for guiding strategies to control climatic changes. That is, it sought, on the basis of the prevailing advisory statement forms, to establish an *imperative* recommendation of the steps that should be taken in order to work towards what carbon control ought to look like, as expressed in the following:

> *"first, determine the target (e.g. rate of global surface temperature change) that should be reached if large-scale environmental and social problems are to be avoided; second, specify the changes of rates of GHG emissions that would be needed to reach this target; third, regulate GHG emissions so that the environmental target can be reached" (Ibid., p.33).*

As such, the conference not only started developing instrumentation to guide efforts towards a common long-term target, it also set out the steps to be taken in operationalising the decentralised deployment of such instrumentation. It is through this more prescriptive approach to climate policy that we begin to see how the elaboration of Nordhaus and the NRC's work that their statements gained purchase. Put differently, the influence of these statements, and the truth claims they embodied, became visible in early policymaking debates on climate change. Yet, these truth claims do not circulate alone. Rather, it is through the conflict between a multiplicity of claims—that is, through *truth games*—that governance arrangements are wrought, potentially achieve a temporary stability, and are eventually and inevitably destabilised. Indeed, it is to the truth games between climate policymaking debates and the proliferation of climate denial that this archaeological-genealogical analysis now turns.

4.3 On "Truth Game" battles between Climate Denial and Target-based Planning

Throughout the 1980s—amidst rising political resistance from the Reagan administration (see Weart 2008, pp.140-142)—economists, climatologists and meteorologists continued developing a target-based approach to policymaking. However, their arguments conflicted with a combative set of counter-truth claims espoused by the emerging climate denial movement. Resistance or denial were, in part, provoked once it became apparent that tackling climate change would require extensive reforms to energy infrastructure. But the articulation of counter-truth claims move the challenge to climate change directly onto the epistemological battleground of 'science', as such claims were couched in the self-same form that statements took in the scientific milieu, as a mix of glottographic narrative and interpretation with non-glottographic tables, charts and graphs. Climate denial claims thus centred on challenging and destabilising the apparent certainty of science and scientific findings, as well as calling into question whether the cause of any such effects was anthropogenic (Newell 2000).

Countering the proliferation and accumulation of climate denial statements became central to the international governance arrangements that began to take shape in the 1980s. In particular, the Intergovernmental Panel on Climate Change (IPCC) was established in 1988 to produce periodic reports that synthesised and summarised

climate-related research (IPCC 1990; Agrawala 1998). Their reports synthesised climate science, providing a basis for counter-claims to those promulgated by the climate denial movement. Regardless, the fossil fuel lobby stood in staunch opposition to the IPCC reports, claiming that the IPCC was "'yielding to pressure from industry to foresee yet higher atmospheric pollution as acceptable'" and called on governments "not to accept IPCC recommendations" on the grounds that it had been biased by "academics seeking to attract funding for their work" from fossil fuel lobbies (Newell 2006, p.112). With several organisations from the denial lobby—Climate Council, Mobil Oil and the National Coal Association—acting as reviewers of the working group reports (Ibid.), each 'side' developed seemingly parallel but different kinds of truth-claim strategy. The denier strategy was to repeatedly challenge the climate scientists' truth claims through questioning the degrees of *certainty* of the scientific results; while climate scientists focussed on the *integrity* of their methods and the probabilities associated with, or levels of significance of, their climate science findings. All of this played out within the IPCC as well as during the media coverage of published reports.

However, whereas the IPCC was deeply immersed in these games—as the counter to as well as an object of climate denial claims—other key climate science supporters were more insulated and could press ahead with their workstreams and research agendas. In particular, the AGGG had not disbanded. Having "grown out of the results of the two-stage workshop process held in Villach and Bellagio in late 1987" (Rijsberman and Swart 1990, p.iii), the AGGG renewed their calls for target-based climate policy, guided by adjustable interim targets. This is not to say its work was isolated from the truth games. Rather, the AGGG continued elaborating their target-based policy planning instrumentation, yet did so in a manner that could potentially manoeuvre around climate denial claims. Specifically, they continued to argue that "it is now time to define long-term environmental goals as a basis for short-term emission targets" (Ibid., p.iv), and addressed claims of scientific uncertainties by proposing a mechanism that would enable the periodic review of those targets:

> *"Although important scientific uncertainties remain, they should not keep us from implementing policies that would help achieve the targets identified here. Rather, the uncertainties should be used as a reason to periodically review and adjust targets" (Ibid., p.iii)*

However this submission also documents a new approach adopted by those advancing a target-based approach to climate policy. Where earlier debates had paid particular attention to the selection of a long-term target, the AGGG now sought to counteract the emerging climate denial claims by espousing a narrative that tied discussions on target-based policymaking to a more abstract goal:

> *"The underlying objective of all climate policies is to limit effects or impacts of climatic change on society to socially acceptable levels, or in general terms, to safeguard the global environment for future generations." (Ibid., p.vii).*

In this regard, it is not that targets were derived from a global goal (*cf.* Triantafillou 2007), but that the overarching climate objective emerged in an attempt to defend target-based planning debates via recourse to a seemingly unopposable global goal.

Similarly, the document contained a new statement form to enable correspondence between that overarching goal and the selection of long-term targets (Figure 4). This 'traffic-light' chart provides a non-glottographic statement that may be used to convert some long-term global goal into a specific long-term target. Conversely, it aggregates and makes comparable the alternative scenarios that correspond to the selection of long-term targets. Further, the traffic light system sets out scenarios for what climate action may seek to achieve while guiding the reader towards a focus on particular long-term targets (i.e. less than 2°C or, for some, less than 1°C of warming). In doing so, the seemingly unopposable long-term climate goal—stated in the quote above and proposed as a countermove to the proliferation of climate denial claims—becomes tethered to the question of what the tolerable degree of risk is for global warming and, through Figure 4, the corresponding long-term target.

[INSERT FIGURE 4 HERE]

While the IPCC may have been formed in response to climate denial claims, the notion of an overarching objective on climate change gained purchase. Indeed, this took centre stage in the formation of the UNFCCC in 1992. When opened for signature on the 4th of June 1992, 154 nations became signatories to this international framework to guide negotiations on climate change treaties (Oppenheimer and Petsonk 2005). In doing so, they committed to developing an international legal framework on tackling climate change (to which the next section turns its attention) as well as recognising that such efforts would be in pursuit of the long-term objective set out in Article 2:

> *"The ultimate objective of this Convention and any related legal instruments that the Conference of the Parties may adopt is to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system." (UNFCCC 1992, p.4).*

4.4 The Kyoto Protocol and Operationalising Article 2 of the UNFCCC

By the mid-1990s the intergovernmental UNFCCC climate talks had become focussed on developing "a protocol or another legal instrument" (UNFCCC 1995, p.4) to guide international efforts to prevent dangerous anthropogenic interference in the climate system. As such, the recognition of Article 2 of the UNFCCC as an overarching objective temporarily set aside the question of a long-term target. However, when the Kyoto Protocol was produced in 1997, short-term emissions reduction targets were at the heart of negotiations (Oberthür and Ott 1999, p.123). The Protocol was argued to represent a "watershed in international climate and environmental policy" (Oberthür and Ott 1999, p.136-7) by placing centrally-determined and supposedly 'binding' targets on nations. As seen in the Villach-Bellagio proceedings report (Jäger 1988), these provided interim targets that were differentiated between nations. Industrialized nations (referred to in the Kyoto Protocol as Annex I nations) were expected to take a leading role by reducing their overall emissions of GHGs "by at least 5 per cent below 1990 levels in the commitment period 2008 to 2012" (UNFCCC 1998, p.3).

Yet, climate denial was rife. Moreover, these truth claims had moved beyond scientific uncertainties and now reached to the economic consequences of climate action. One crucial manifestation was in the Byrd-Hagel resolution from the United States' Senate, which required 'meaningful participation' from developing countries in order for the United States to ratify the Kyoto Protocol (Gupta 2010, p.645). Even though the Kyoto Protocol was signed by President Clinton, President Bush withdrew support and it was never ratified by the United States. Moreover, the Kyoto Protocol represented a legalistic approach to intergovernmental climate action, however it lacked an effective enforcement mechanism.[13] While Annex I parties—primarily developed nations—acknowledged the need for a compliance system to support the binding emissions targets, they were unwilling to agree a system for punishing non-compliance that involved "financial penalties or trade measures" (Wang and Wiser 2002, p.196). In this regard, achieving Article 2 of the UNFCCC through differentiated interim targets appeared, for the time, unworkable.

However, while not at the core of work to craft the Kyoto Protocol, there remained considerable discussion on whether Article 2 could be defined via a long-term quantitative target. In particular, this began to link statements regarding the scientific basis of climate change and the imperative to tackle the problem, with the IPCC assessing assessing "the state of knowledge concerning Article 2 of the [UNFCCC]" (Smith et al. 2001, p.915). Their work, however, was not to identify some single limit beyond which anthropogenic interference became 'dangerous'. Interpreting 'dangerous' had invited new conflict over truth claims for climate action, whereas the IPCC synthesised climatic research so as to facilitate discussions regarding the definition of 'dangerous anthropogenic interference'. A non-glottographic statement was produced to summarise the IPCC's 56-page synthesis of the latest research in the form of a heat map (Figure 5) resembling the 'traffic light' system previously proposed by the AGGG (see Figure 4). In contrast to the AGGG version, the IPCC divided the assessment across five 'reasons for concern', with their reasoning centring on the incommensurability of impacts: "It does not appear to be possible—or perhaps even appropriate—to combine the different reasons for concern into a unified reason for concern that has meaning and is credible" (Ibid., p.957). Yet, this provided a statement form that aggregated and rendered comparable five reasons for concern, enabling the promulgation of imperative statements on what constituted 'dangerous climate change'. These could then be converted into a corresponding threshold for the quantified increase in global mean temperature.

[INSERT FIGURE 5 HERE]

It was not until the collapse of the 2009 climate talks in Copenhagen that UNFCCC discussions turned to the matter of a long-term climate target. During the talks, the legalistic approach to defining interim targets, which were to be prescribed for both Annex I and Non-Annex I nations, raised concerns. China, in particular, reignited

[13] See Wang and Wiser (2002) for an extensive discussion of the facilitative and enforcement mechanisms that were developed in an attempt to operationalise the Kyoto Protocol (Wang and Wiser 2002).

arguments regarding the protection of national sovereignty, claiming that centrally-determined emissions reduction targets represented "a potential 'external threat' to its sovereign right to define its energy path to development" (Christoff 2010, p.648; also see Jaeger and Jaeger 2011). While numerous tensions arose during the 2009 talks, the encroachment on national sovereignty was exposed as a standpoint that could not be embedded in an inflexible emissions reduction target that "defines and restricts China's future 'emissions space'" (Christoff 2010, p.648). This added to the metagovernance imperative for decentered, tailored and differentiated responses (Meuleman and Niestroy 2015), as these became principles to uphold in the name of a new truth claim, respect for national sovereignty.

In this light, the collapse of the Copenhagen talks marked a destabilization of the long-standing Kyoto-approach of climate governance. The shifting parameters of the climate change truth game had undermined the centralized legalistic approach, and it is the reformulation of this governance approach—away from a legalistic and towards a diplomatic approach—that the next section explores.

4.5 The Two Degrees Target: Embedding analytical flexibility to protect national sovereignty

Recalling that temperature targets had been marginalized in the 1980s due to the uncertainty of converting warming levels into emissions concentrations, it was this same uncertainty that gave rise to temperature targets at the 2009 Copenhagen talks. While numerous long-term targets for stabilising emissions concentrations and reducing emissions had been developed through the Bali Action Plan, developing countries objected to emissions reduction targets that implied constraints on their own emissions (Bodansky 2010, p.235). Using a temperature target as the long-term goal, however, was met with more support. This was precisely because temperature thresholds introduced a degree of flexibility to the interpretation of the long-term target, due to the inherent uncertainties in converting it into concentration thresholds. And so it was the flexibility of the two degrees target that enabled it to embed the newly prevailing truth claim of tackling climate change in a manner that respected national sovereignty. The final text of the Copenhagen Accord recognised the "scientific view that the increase in global temperature should be below 2 degrees Celsius" (UNFCCC 2009, p.1) adding that "[t]his would include consideration of strengthening the long-term goal referencing various matters presented by the science, including in relation to temperature rises of 1.5 degrees Celsius" (Ibid., p.3).[14]

The intention here is not to present the two degrees target as uncontroversial. Clearly the Trump Administration's stance on the Paris Agreement is a new test of the UNFCCC. Similarly, the two degrees target faces considerable scepticism on scientific and economic grounds (Hulme 2012; Seager 2012; Victor and Kennel 2014). However, the point is that the target emerged as an instrument that could, at the time of the

[14] This final statement of the Accord, Bodansky argues, was a response to the Maldives and small island states (Bodansky 2010, p.235) who believed the two degrees target would see a disastrous sea-level rise for their low-lying territories.

Copenhagen conference, embed multiple truth claims into an 'agreeable' conference text. It provided a quantitative target that translated the UNFCCC's overarching goal into a form more amenable to decentralised, tailored and differentiated policy analysis and planning (*cf.* Meuleman and Niestroy 2015), while also conveying a seemingly scientific basis and, crucially, the flexibility that provided assurances that the UNFCCC process respected national sovereignty.

Indeed, this also requires further refinement to the notion that instrumentation may guide the self-steering capacities of governance arrangements (*cf.* Triantafillou 2007). Specifically, the two degrees target is unsuited to a Kyoto-approach to climate governance, as it would invite considerable conflict over how it should be converted into interim targets assigned, via international law, to individual nations. Rather, it is those self-steering capacities that the Copenhagen Agreement began to change. Instead of an approach based on international law, it provided the beginnings for a metagovernance approach that envisaged a common aspirational target that could be used to guide a decentred and diplomatic effort to coordinating intergovernmental climate action.

Yet the Copenhagen Agreement totalled a mere three-pages, setting out the long-term target—and a vision of how that target would be used—that would guide a post-Kyoto approach to intergovernmental climate action. This vision also became highly influential in the IPCC's work, with the two degrees target featuring prominently in its Fifth Assessment Report, published in 2014. While the report maintained the IPCC's approach to synthesising research on a range of matters, it also produced a non-glottographic statement (Figure 6) that captured how the two degrees target corresponds to risks, and also how it translates into targets for emissions reductions. As a composite of three diagrams, the figure embodies prevailing truth claims on tackling climate change through a complex set of aggregations and translations. It may be read by comparing the risks at different levels of warming via the heat maps in chart (a), then following a level of warming across to graph (b) to identify the corresponding range for the cumulative level of CO_2 emissions, then down to graph (c) where the y-axis translates that range into a corresponding range for the percentage change in annual GHG emissions to be achieved by 2050. While this is not quite a 'simple' diagram, it replicates an array of non-glottographic and glottographic statement forms into one composite diagram. As such, it crystallises the prevailing truth claims and accompanying instrumentation on how to control carbon towards some supposedly optimal level of warming, and so capturing how long-term warming targets are to be made immanent.

[INSERT FIGURE 6 HERE]

Beyond scientific assessments of the two degrees target, the years following the Copenhagen talks also saw annual UNFCCC discussions to develop instrumentation to enact the envisaged decentred and diplomatic approach to climate governance. National sovereignty claims became a key guide to this elaboration of instrumentation. Even as early as the Cancun talks in 2010, new measurement, reporting and verification practices started being developed, supposedly "in a manner that is non-intrusive, non-punitive and respectful of national sovereignty" (UNFCCC 2011, p.11).

More significantly, perhaps, was the introduction of nationally determined contributions (NDCs), during the 2013 Warsaw talks. In their NDC, each nation would detail their planned level of emissions reductions and associated implementation

strategy, developed "in the context of […] achieving the objective of the Convention as set out in its Article 2" (UNFCCC 2014, p.4). In contrast to the centrally-determined interim targets of the Kyoto Protocol, allowing nations to formulate their own targets and plans was a move to respect national sovereignty (Maljean-Dubois 2016, p.155). The core requirement on nations is that they communicate these to the UNFCCC as part of a pledge and review system. In addition, the NDCs allowed flexibility in the types of short-term targets a nation could adopt. While this multiplicity of possible targets ran counter to earlier emphasis on comparability of efforts across nations, the NDCs were intended as providing the basis for diplomatic efforts to cultivate national-level pledges.

By November 2015, as the Paris talks loomed, the aggregated NDCs amounted to policy plans that could limit warming (should they be implemented) "to around 2.7°C by 2100" (UNFCCC 2015a). This was, in the view of the Executive Director of the UNFCCC, "by no means enough" (Ibid.). However the hosting French Government expressed its hopes to establish a periodic review process through which NDC pledges could be 'ratcheted' (Harvey 2015). Indeed, this was enshrined in the Paris Agreement, which would require NDCs to be submitted for a 'global stocktake' every five years that strengthened the targets and plans communicated in their preceding NDC (UNFCCC 2015b, p.23).[15] Yet, this global stocktake was met with considerable scepticism from developing nations, who perceived this as a mechanism that would encroach on their national sovereignty (Brun 2016, p.119). So, while the NDCs were designed as a backbone for the Paris Agreement that was respectful of national sovereignty (Maljean-Dubois 2016, p.155), this further emphasised that transparency framework guiding the stocktake process must also "be implemented in a facilitative, non-intrusive, non-punitive manner, respectful of national sovereignty, and avoid placing undue burden on Parties" (UNFCCC 2015b, p.16).

However, just 3 months prior to the Paris talks, the SDGs were announced. It is to the emergence and crafting of the SDGs that this paper now turns, and especially how UNFCCC's metagovernance approach to climate change constrained the inclusion and formulation of SDG 13.

4.6 As Metagovernance Worlds Collide: Linking climate truths to the SDGs

In 2010, at the High Level Plenary Meeting of the UN General Assembly, governments called for a process to advance the development agenda beyond 2015 (UN General Assembly 2010), the target date for achieving the Millennium Development Goals (MDGs). Known as the Post-2015 Development Agenda process, this work continued to pursue the poverty agenda of the MDGs (Fukuda-Parr 2017) while noting—in their 2012 Report to the UN Secretary-General—that "economic and food crises are compounded by the global environmental crisis, of which climate change has the most ominous

[15] It has been suggested that this ratchet mechanism is part of a recognition – which this paper sees as early as 1983 in the NRC report – that learning, innovation and technological deployment occurring between stocktakes will reduce the cost of more ambitious emissions reductions (Bailey 2015).

implications" (United Nations 2012, p.13).[16] In contrast to this focus on the poverty agenda, preparations for the 2012 Rio+20 conference (formally known as the UN Conference on Sustainable Development, or UNCSD) were starting to carve out a new goals-based governance arrangement for the sustainable development agenda. The seeds of these discussions had been sowed in November 2011, through a proposal tabled by the Colombian and Guatemalan representatives that read:

> *"The international community urgently needs benchmarks so that it can harness and catalyse multidimensional and multisectoral approaches to addressing critical global challenges. [… One] of the outcomes of the Rio Conference to be held in June 2012 should be the adoption of a set of Sustainable Development Goals, modelled on the Millennium Development Goals." (Kamau, Chasek, and O'Connor 2018, pp.40-41).*

The Rio+20 decision to develop goals for sustainable development saw the formation of the Open Working Group on the SDGs (OWG) of the UN General Assembly, comprised of member states. While the Post-2015 Development Agenda process fed into OWG deliberations, the OWG was tasked with formulating a 'universal' agenda as opposed to the MDG orientation towards establishing priorities for low-income countries (Fukuda-Parr and McNeill 2019; Fukuda-Parr 2019). So even though the Post-2015 process emphasised the potential impacts of climate change on the poverty agenda, climate change itself became a core part of the OWG remit. Furthermore, developing targets and indicators became central to the OWG's work, which went beyond the selective inclusion of targets in the MDGs by using the SDGs as a basis for "elaborating and negotiation a UN development agenda, and deliberately adopting the language of numbers to articulate global norms"(Fukuda-Parr and McNeill 2019, p.6). Yet, with its growing remit to conceptualise and operationalise sustainable development, the OWG turned into a new forum in which truth claims were articulated and fought over, with the prospect of shaping the emergent instrumentation for climate governance.

Indeed, the lead-up to the OWG process had witnessed much conflict between approaches ventured in a range of reports and debates. An especially pertinent truth claim emerged that saw the SDGs as an opportunity to accelerate action on climate change. While proponents recognised that the UNFCCC had noted the two degrees target in the 2010 Cancun Agreement, their arguments centred on the need to reduce warming further to ensure the survival of low-lying island states as well as to limit impacts across the sustainable development agenda. These arguments, which had been raised and refined during UNFCCC deliberations, were now being transposed into the proxy battleground provided by the SDGs. These were manifest in the United Nations Sustainable Development Solutions Network (UNSDSN) 2014 report, which suggested adopting the two degrees target. It did, however, caveat this with the footnote:

> *"Recent scientific evidence suggests the need to reduce the long-term temperature increase to 1.5°C or less. The global emission reduction target under*

[16] It should be noted that the seventh MDG was to 'ensure environmental sustainability', however this framework for measuring progress towards this goal faced considerable criticism and some suggest that those more familiar with the inner workings of the MDG processes described MDG 7 as a "dog's breakfast" (Bates-Eamer et al. 2012, p.25).

> *the UNFCCC should be regularly updated in view of the growing body of scientific evidence." (UNSDSN 2014, p.30)*

An opposing view saw the two degrees target as unproblematic and the SDG process as a technocratic matter of identifying and developing appropriate indicators for achieving that target. This built on the work of Joseph Stiglitz, Amartya Sen and Jean Paul Fitoussi—who were commissioned by President Nicolas Sarkozy to assess alterative measurement tools for economic and social progress (Stiglitz, Sen, and Fitoussi 2009)—and also mobilised OECD principles of ensuring indicators are "valid, relevant and effective in measuring what they purport to measure" (Bates-Eamer et al. 2012, p.8). As with the Stiglitz *et al.* report (2009, p.81), The Centre for International Governance Innovation and the Korea Development Institute produced a synthesis report for how the two degrees target could be converted into a 450ppm concentration target and then a 'budget' of 1,400 gigatons of GHG emissions by 2050.

Yet, in the midst of this conflict, a third view emerged that claimed the SDGs should not encroach on UNFCCC territory. So when the UN Secretary-General tasked a 'high-level panel of eminent persons' to develop recommendations for the development agenda after 2015, the report adopted the two degrees target while noting "The proper place to forge an international agreement to tackle climate change is the UN Framework Convention on Climate Change" (United Nations 2013, p.55). Indeed, a direct intervention from the UNFCCC Executive Secretary, Christiana Figueres, similarly urged the OWG chairs not to include a goal that might conflict with the UNFCCC process (Kamau, Chasek, and O'Connor 2018).

It is in this regard that the truth games shaping the UNFCCC process leading up to Paris also came to constrain the development of the SDGs. Yet those truth games were still playing out, turning deliberations over a climate SDG into proxy truth games for the Paris talks. These competing claims manifested in the inclusion of a standalone climate goal, SDG 13, with a crucial footnote:

> *"Acknowledging that the United Nations Framework Convention on Climate Change is the primary international, intergovernmental forum for negotiating the global response to climate change" (UN General Assembly 2015, p.23).*

Even though other SDGs are similarly interrelated with other intergovernmental agreements and conventions, SDG 13 is the only goal accompanied by a footnote, indicated by the asterisk in its title: *Take urgent action to combat climate change and its impacts**. For instance, the SDG 13 targets place particular emphasis on certain aspects of climate change, such as resilience and adaptive capacities to disasters, educational priorities on climate change, climate finance to be provided by developed nations, as well as capacity-building. The point, however, is that integrating GHG mitigation into the SDGs was to be achieved via the complex aggregation of truth claims crystallised in Figure 6 and the associated instrumentation. Further, the SDGs were not to provide an alternate forum for articulating and contesting claims on how to control carbon emissions. So as well as being a metagovernance approach that looks to coordinate different styles and sites of regulation, the SDGs are also constituted and constrained by the metagovernance approach and infrastructure enshrined in the Paris Agreement.

One of the central instruments interlinking the two metagovernance frameworks is the UNFCCC NDCs (Section 4.5). Indeed, the United Nations' 2017 (UN Economic and Social Council 2017, p.14) and 2018 (United Nations 2018, p.10) progress updates on SDG 13 both emphasise the number of Parties to the UNFCCC that have ratified the Paris Agreement and that have communicated their first NDC. In this regard, while the overarching goals and objectives of each framework may represent the vision of two different metagovernance frameworks, they largely harness the same instrumentation—instrumentation that embodies the truth claims of target-based governance of climate change—for enacting those visions.

What this also highlights is that the criticisms of the measurement, monitoring and management practises developed for the SDGs (Pintér, Kok, and Almassy 2017), at least with regards to SDG 13, appear at one with those that have been levelled at UNFCCC measurement and monitoring practices in a post-Copenhagen era of climate governance (Singh et al. 2016; Cuckston 2018; also see Breidenich and Bodansky 2009). So where recent international agreements embody what may be considered a metagovernance approach (Meuleman and Niestroy 2015), the accounting challenges this brings (*cf.* Bebbington and Unerman 2018) may still be investigated through the shifting instrumentation that has emerged to tackle those sustainable development issues.

5.0 Concluding Remarks

This paper set out to investigate the accounting challenges that have become apparent in the implementation of frameworks for goals-based governance, as enshrined in the SDGs. Its point of departure was when it began to rethink what was at stake in the criticisms levelled at the UNSC and UNSD for privileging statistical and technical issues in the design of SDG measurement, monitoring and management practices, at the expense of policy compatibility (Pintér, Kok, and Almassy 2017). This tension, we contend, is foundational to recent critiques of practices developed to operationalise both the SDGs and the Paris Agreement on climate change (Singh et al. 2016; Pintér, Kok, and Almassy 2017; also see Breidenich and Bodansky 2009). Responding to Bebbington and Unerman (2018), the paper has recognised that these issues have received considerable attention from metagovernance scholars, who suggested that such challenges may be mitigated by deriving contextual understandings from the apparent governance styles (Meuleman 2008, 2014) or national characteristics (Grin, Rotmans, and Schot 2010; Meuleman 2013).

Yet the problem that subsequently arose was whether this deductive approach to the *con*textual alone could be sufficient for metagovernance scholars to resolve this conflict between disciplines. Indeed, this paper has sought to show how contextual approaches become especially difficult where intergovernmental agreements involve almost all of the world's nations, as with the SDGs and the Paris Agreement. We therefore recognise, and have sought to develop, Triantafillou's critique that metagovernance scholarship has tended to repeatedly ask "who is governing the network's actions?" (Triantafillou 2007, p.190). Where he proposes that scholars should attend to the instrumentation that may "stimulate the self-steering capacities of networks" (Triantafillou 2007, p.197), we argue that it is the *dispositif* of metagovernance that guides its development (Foucault 1980b). In this light, Triantafillou's instrumentation-

focus provides an incomplete picture. It is statements that imbue instruments with meaning, and it is statements that provoke and guide the development of further instrumentation.

This is especially pertinent when modern disciplinary knowledge battles must always *also* be fought out at the level of the textual. For while contextual differences clearly matter, governance choices are arguably never purely an exercise of power but of power predicated on claims to knowledge, as power seeks validation through claiming to act, in one mode or another, in the name of truth (Foucault 2008; 2014, pp.6-17). Indeed, Foucault recognised modern forms of 'governmental reason' meant that plans and proposals could now be judged in terms of (often quantified) "propositions subject to the division between true and false" (Foucault, 2008, p.18). We therefore look to demonstrate the empirical value of 'non-glottographic statements' for studying the efforts and conflicts through which the superiority of certain truth claims may be temporarily established. This is precisely because the prevailing truth claims become crystallised through accounting-infused versions of this statement form: perhaps nowhere more clearly than in the construction of the marvellously complex yet empirically rich statement we have presented as Figure 6 here.

Indeed, our archaeological-genealogical approach unearths the shifting truth claims that must be embodied in newly emergent accountings that look to operationalise SDG 13. In particular, the incorporation of a climate goal was achieved via a concession acknowledging UNFCCC primacy, and the targets of SDG 13 were effectively prohibited from addressing any aspect of climate mitigation, limiting its focus to targets and indicators regarding adaptation to the physical impacts of climate change (Section 4.6). That is, the correct forum for mitigation targets—the significance of which is emphasised by SDG 13 being the only goal caveated through an asterisk—was deemed to be the UNFCCC. So the truth claims that must be embodied in operationalisations of SDG 13 have become inexorably entwined with the metagovernance approach of the UNFCCC. In particular, we see the ideational manifested in the imperative for flexible interpretations of the agreements and mechanisms, which runs counter to the technical emphasis of UN agencies' development of new accountings.

So, in response to Bebbington and Unerman's (2018) call on accountants to engage with metagovernance scholars, we contend that accounting statements play a central role in developing the infrastructure that enables metagovernance arrangements to coordinate action. Put bluntly, such statements both provide and guide the creation of a calculative infrastructure that enables the aggregation and translation processes through which metagovernance takes shape and is implemented. Thus, and in contrast to deductive (Meuleman 2008; 2013; 2014; Grin, Rotmans, and Schot 2010) and inductive approaches (Triantafillou 2007), we argue for an abductive approach to studying contemporary measurement and monitoring challenges in global metagovernance arrangements (Niederberger and Kimble 2011; Singh et al. 2016; Neeff et al. 2017; also see Breidenich and Bodansky 2009). Our approach focuses on the interplay between statements and practice in order to chart the shifts in prevailing truth claims, which shape the conditions of possibility for forging and operationalising intergovernmental metagovernance arrangements.

This core contribution is interlinked, therefore, with a secondary methodological contribution by demonstrating how genealogical analysis needs also to constitute an *archaeology* of governance 'statements' (Foucault 1971; 1978; Davidson 1986; Miller and

Napier 1993; Webb 2012). By returning to Foucault's own methodological concern (Foucault 2002), we have seen this archaeological-genealogical approach as appropriate to analysing the kinds of truth game that arise from the fact that climate change involves so many uncertain and non-linear eventualities. And we have sought also to suggest how this double form of analysis may help resolve or dissolve the apparent gap between the *realpolitik* of global metagovernance arrangements and their operationalisation via measurement and monitoring practices. We thereby seek to make more visible how a genealogical approach "*à la Foucault*", so to speak, always entails an archaeological dimension. In a similar way, we have sought, noting the proliferation and intertwining of metagovernance ideas and initiatives, to uncover the limits of those 'target-articulating' possibilities adopted in practice as 'least bad metagovernance options', in the search for effective strategies for sustainable development governance (Foucault 1971, 1978; Hoskin and Macve 1986; Miller and Napier 1993).

This form of analysis has finally, therefore, enabled a first attempt at making more visible the shifting truth and counter-truth games over climate governance across several decades—and how these constrained and delayed many initiatives—and also led to the form of words articulated subsequently in SDG 13. In this respect, we should perhaps applaud, or at least silently appreciate, the interpretive flexibility enacted (as crystallised in the complex composition of Figure 6) in the 'two degrees target' as the least bad means of respecting national sovereignty, and as the continuing 'device' drawn upon in producing the NDCs through which commitments—both with regards to the Paris Agreement and to progress towards SDG 13—are communicated on a periodic basis.

Looking across the SDGs, we believe that the archaeological-genealogical form of analysis we advance has much potential in revealing the truth games through which this metagovernance arrangement has been wrought. Moreover, there will be specific measurement, monitoring and management challenges across the goals, targets and indicators, which extend beyond technical and statistical matters to the conflict between prevailing and changing truth claims. Further archaeological-genealogical investigations could provide the basis for both problematising prevailing truths within UNSD and UNSC as well as developing alternative measurement, monitoring and management practices.

However this mode of analysis need not be restricted to metagovernance. It appears relevant to a much wider range of contexts where what is at stake is establishing 'what is true' (see also Spence and Rinaldi 2014, p.438). We are reminded here of how the 18th century potter Josiah Wedgwood's measurement of production cost turned cost from a concept into a fact (Hopwood 1987) and how discounted cash-flow analysis turned claims that nationalized industries should be efficient from general invocations assessed *post hoc* into the basis for comparisons, made in advance, between alternative options (Miller 1991). So we therefore contend that by more closely attending to the methodological concerns of Foucault we are able to further investigate the role of accounting and accounting statements in constituting what is true.

Works Cited

Agrawala, Shardul. 1998. "Context and Early Origins of the Intergovernmental Panel on Climate Change." *Climatic Change* 39 (4): 605–20. https://doi.org/10.1023/A:1005315532386.

Albareda, Laura, and Sandra Waddock. 2016. "Networked CSR Governance: A Whole Network Approach to Meta-Governance." *Business & Society*, 0007650315624205.

Anaïs, Seantel. 2013. "Genealogy and Critical Discourse Analysis in Conversation: Texts, Discourse, Critique." *Critical Discourse Studies* 10 (2): 123–35. https://doi.org/10.1080/17405904.2012.744321.

Bailey, Rob. 2015. "Prospects for Climate Success in Paris." *Council of Councils* (blog). November 4, 2015. http://www.cfr.org/councilofcouncils/global_memos/p37220.

Bassnett, S, A-C Frandsen, and Keith W. Hoskin. 2018. "The Unspeakable Truth of Accounting: On the Genesis and Consequences of the First 'non-Glottographic' Statement Form." *Accounting, Auditing & Accountability Journal* 31 (7).

Bates-Eamer, Nicole, Barry Carin, Min Ha Lee, Wonhyuk Lim, and Mukesh Kapila. 2012. "Post-2015 Development Agenda: Goals, Targets and Indicators."

Bebbington, Jan, and Jeffrey Unerman. 2018. "Achieving the United Nations Sustainable Development Goals: An Enabling Role for Accounting Research." *Accounting, Auditing & Accountability Journal* 31 (1): 2–24. https://doi.org/10.1108/AAAJ-05-2017-2929.

Bodansky, Daniel. 2001. "The History of the Global Climate Change Regime." *International Relations and Global Climate Change*, 23–40.

———. 2010. "Copenhagen Climate Change Conference: A Postmortem, The." *American Journal of International Law* 104: 230.

Breidenich, Clare, and Daniel Bodansky. 2009. *Measurement, Reporting and Verification in a Post-2012 Climate Agreement*. Pew Center on Global Climate Change Arlington, VA.

Brun, Aslak. 2016. "Conference Diplomacy: The Making of the Paris Agreement." *Politics and Governance* 4 (3): 115–23. https://doi.org/10.17645/pag.v4i3.649.

Christoff, Peter. 2010. "Cold Climate in Copenhagen: China and the United States at COP15." *Environmental Politics* 19 (4): 637–56. https://doi.org/10.1080/09644016.2010.489718.

Christopoulos, Stamatios, Balazs Horvath, and Michael Kull. 2012. "Advancing the Governance of Cross-Sectoral Policies for Sustainable Development: A Metagovernance Perspective." *Public Administration and Development* 32 (3): 305–23. https://doi.org/10.1002/pad.1629.

Cuckston, Thomas. 2018. "Creating Financial Value for Tropical Forests by Disentangling People from Nature." *Accounting Forum* 42 (3): 219–34. https://doi.org/10.1016/j.accfor.2018.07.001.

Davidson, Arnold. 1986. "Archaeology, Genealogy, Ethics." In *Foucault: A Critical Reader*, edited by D Hoy, 221–33. Oxford: Blackwell.

Derkx, Boudewijn, and Pieter Glasbergen. 2014. "Elaborating Global Private Meta-Governance: An Inventory in the Realm of Voluntary Sustainability Standards." *Global Environmental Change* 27 (July): 41–50. https://doi.org/10.1016/j.gloenvcha.2014.04.016.

Edgley, Carla. 2014. "A Genealogy of Accounting Materiality." *Critical Perspectives on Accounting* 25 (3): 255–71. https://doi.org/10.1016/j.cpa.2013.06.001.

Ezzamel, Mahmoud. 2012. "Accounting and Order." In *Accounting and Order*, 73–95. Routledge.

WORKS CITED

Ezzamel, Mahmoud, and Keith W. Hoskin. 2002. "Retheorizing Accounting, Writing and Money with Evidence from Mesopotamia and Ancient Egypt." *Critical Perspectives on Accounting* 13 (3): 333–67.

Falkner, Robert. 2016. "The Paris Agreement and the New Logic of International Climate Politics." *International Affairs* 92 (5): 1107–25. https://doi.org/10.1111/1468-2346.12708.

Falkner, Robert, Hannes Stephan, and John Vogler. 2010. "International Climate Policy after Copenhagen: Towards a 'Building Blocks' Approach." *Global Policy* 1 (3): 252–62. https://doi.org/10.1111/j.1758-5899.2010.00045.x.

Florence, Maurice. 1994. "Foucault, Michel, 1926-." In *The Cambridge Companion to Foucault*, edited by Gary Gutting, 1st ed., 314–19. Cambridge: Cambridge University Press.

Foucault, Michel. 1971. "Orders of Discourse." *Social Science Information* 10 (2): 7–30.

———. 1977. "Discipline and Punish, Trans." *Alan Sheridan (New York: Vintage, 1979)* 191.

———. 1978. "Nietzsche, Genealogy, History."

———. 2002. *Archaeology of Knowledge*. 2nd edition. London ; New York: Routledge.

———. 2007. *Security, Territory, Population: Lectures at the College De France, 1977 - 78*. Springer.

———. 2008. *The Birth of Biopolitics: Lectures at the Collège de France, 1978-1979*. Translated by Graham Burchell. Springer.

———. 2012. *The History of Sexuality, Vol. 2: The Use of Pleasure*. Vintage.

———. 2014. *On the Government of the Living: Lectures at the Collège de France, 1979-1980*. Springer.

Fransen, Luc. 2015. "The Politics of Meta-Governance in Transnational Private Sustainability Governance." *Policy Sciences* 48 (3): 293–317. https://doi.org/10.1007/s11077-015-9219-8.

Fukuda-Parr, Sakiko. 2017. *Millennium Development Goals: Ideas, Interests and Influence*. 1 edition. London ; New York, NY: Routledge.

Fukuda-Parr, Sakiko. 2019. "Keeping Out Extreme Inequality from the SDG Agenda – The Politics of Indicators." *Global Policy* 10 (S1): 61–69. https://doi.org/10.1111/1758-5899.12602.

Fukuda-Parr, Sakiko, and Desmond McNeill. 2019. "Knowledge and Politics in Setting and Measuring the SDGs: Introduction to Special Issue." *Global Policy* 10 (S1): 5–15. https://doi.org/10.1111/1758-5899.12604.

Grin, John, Jan Rotmans, and Johan Schot. 2010. *Transitions to Sustainable Development: New Directions in the Study of Long Term Transformative Change*. Routledge.

Gupta, Joyeeta. 2010. "A History of International Climate Change Policy." *Wiley Interdisciplinary Reviews: Climate Change* 1 (5): 636–653. https://doi.org/10.1002/wcc.67.

Harvey, Fiona. 2015. "World's Climate Pledges Not yet Enough to Avoid Dangerous Warming – UN." *The Guardian*, October 30, 2015, sec. Environment. http://www.theguardian.com/environment/2015/oct/30/worlds-climate-pledges-likely-to-lead-to-less-than-3c-of-warming-un.

Hopwood, Anthony G. 1987. "The Archeology of Accounting Systems." *Accounting, Organizations and Society* 12 (3): 207–34. https://doi.org/10.1016/0361-3682(87)90038-9.

———. 2009. "Accounting and the Environment." *Accounting, Organizations and Society* 34 (3–4): 433–39. https://doi.org/10.1016/j.aos.2009.03.002.

WORKS CITED

Hoskin, Keith W. 2017. "Getting to the Surface of Things: Foucault as Theorist and Historian of Management and Accounting." In *Foucault and Managerial Governmentality*, 43–63. Routledge.

Hoskin, Keith W., and Richard H. Macve. 1986. "Accounting and the Examination: A Genealogy of Disciplinary Power." *Accounting, Organizations and Society*, Special Issue Accounting, Knowledge Power, 11 (2): 105–36. https://doi.org/10.1016/0361-3682(86)90027-9.

Hulme, Mike. 2012. "On the Two Degrees Climate Policy Target." *Climate Change, Justice and Sustainability: Linking Climate and Development Policy*, 122–125.

Hyman, Malcolm D. 2006. "Of Glyphs and Glottography." *Language & Communication*, The Concept of Language in the Academic Disciplines, 26 (3): 231–49. https://doi.org/10.1016/j.langcom.2006.03.001.

IPCC. 1990. "Climate Change: The IPCC Scientific Assessment." WMO / UNEP.

Jaeger, Carlo C., and Julia Jaeger. 2011. "Three Views of Two Degrees." *Regional Environmental Change* 11 (S1): 15–26. https://doi.org/10.1007/s10113-010-0190-9.

Jäger, Jill. 1988. *Developing Policies for Responding to Climatic Change: A Summary of the Discussions and Recommendations of the Workshops Held in Villach (28 September-2nd October 1987) and Bellagio (9-13 November 1987) under the Auspices of the Beijer Institute, Stockholm*. WCIP ; 1. Geneva? World Meteorological Organization.

Jessop, Bob. 2003. "Governance and Meta-Governance: On Reflexivity, Requisite Variety and Requisite Irony." In *Governance as Social and Political Communication*, 101–16.

———. 2004. "Multilevel Governance and Multilevel Metagovernance. Changes in the EU as Integral Moments in the Transformation and Reorientation of Contemporary Statehood." In *Multi-Level Governance*, edited by Ian Bache and Matthew Flinders, 49–74. Oxford ; New York: OUP Oxford.

Kamau, Macharia, Pamela Chasek, and David O'Connor. 2018. *Transforming Multilateral Diplomacy: The Inside Story of the Sustainable Development Goals*. 1 edition. London New York: Routledge.

Kanie, Norichika, and Frank Biermann, eds. 2017. *Governing through Goals: Sustainable Development Goals as Governance Innovation*. Cambridge, Massachusetts: The MIT Press.

Kooiman, Jan. 1993. *Modern Governance: New Government-Society Interactions*. London, UNITED KINGDOM: SAGE Publications. http://ebookcentral.proquest.com/lib/bham/detail.action?docID=456783.

Koopman, Colin. 2013. *Genealogy as Critique: Foucault and the Problems of Modernity*. Indiana University Press.

MacKenzie, Donald. 2009. "Making Things the Same: Gases, Emission Rights and the Politics of Carbon Markets." *Accounting, Organizations and Society* 34 (3–4): 440–55. https://doi.org/10.1016/j.aos.2008.02.004.

Maljean-Dubois, Sandrine. 2016. "The Paris Agreement: A New Step in the Gradual Evolution of Differential Treatment in the Climate Regime?" *Review of European, Comparative & International Environmental Law* 25 (2): 151–60. https://doi.org/10.1111/reel.12162.

Martinez, Daniel E., and David J. Cooper. 2017. "Assembling International Development: Accountability and the Disarticulation of a Social Movement." *Accounting, Organizations and Society*. https://doi.org/10.1016/j.aos.2017.02.002.

Meuleman, Louis. 2008. *Public Management and the Metagovernance of Hierarchies, Networks and Markets: The Feasibility of Designing and Managing Governance Style Combinations*. Contributions to Management Science. Physica-Verlag Heidelberg. //www.springer.com/gp/book/9783790820539.

WORKS CITED

———. 2013. "Cultural Diversity and Sustainability Metagovernance." In *Transgovernance*, 37–81. Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-642-28009-2_2.

———. 2014. "Governance Frameworks." In *Global Environmental Change*, 885–901. Handbook of Global Environmental Pollution. Springer, Dordrecht. https://doi.org/10.1007/978-94-007-5784-4_59.

Meuleman, Louis, and Ingeborg Niestroy. 2015. "Common But Differentiated Governance: A Metagovernance Approach to Make the SDGs Work." *Sustainability; Basel* 7 (9): 12295–321. http://dx.doi.org.ezproxyd.bham.ac.uk/10.3390/su70912295.

Miller, Peter. 1991. "Accounting Innovation beyond the Enterprise: Problematizing Investment Decisions and Programming Economic Growth in the U.K. in the 1960s." *Accounting, Organizations and Society* 16 (8): 733–62. https://doi.org/10.1016/0361-3682(91)90022-7.

Miller, Peter, and Christopher Napier. 1993. "Genealogies of Calculation." *Accounting, Organizations and Society* 18 (7–8): 631–47. https://doi.org/10.1016/0361-3682(93)90047-A.

Miller, Peter, and Ted O'Leary. 2007. "Mediating Instruments and Making Markets: Capital Budgeting, Science and the Economy." *Accounting, Organizations and Society* 32 (7–8): 701–34. https://doi.org/10.1016/j.aos.2007.02.003.

Morales, Jérémy, Yves Gendron, and Henri Guénin-Paracini. 2014. "The Construction of the Risky Individual and Vigilant Organization: A Genealogy of the Fraud Triangle." *Accounting, Organizations and Society* 39 (3): 170–94. https://doi.org/10.1016/j.aos.2014.01.006.

National Research Council. 1983. "Changing Climate: Report of the Carbon Dioxide Assessment Committee." Washington DC: The National Academies Press. http://www.nap.edu/catalog/18714/changing-climate-report-of-the-carbon-dioxide-assessment-committee.

Neeff, Till, Zoltán Somogyi, Corinna Schultheis, Esther Mertens, Joachim Rock, Johannes Brötz, Karsten Dunger, Katja Oehmichen, and Sandro Federici. 2017. "Assessing Progress in MRV Capacity Development: Experience with a Scorecard Approach." *Climate Policy* 17 (2): 203–12. https://doi.org/10.1080/14693062.2015.1075375.

Newell, Peter. 2000. "Climate for Business: The Political Influence of the Fossil Fuel Lobbies." In *Climate for Change*. Cambridge University Press. http://dx.doi.org/10.1017/CBO9780511529436.005.

———. 2006. *Climate for Change: Non-State Actors and the Global Politics of the Greenhouse*. Cambridge University Press.

Niederberger, Anne Arquit, and Melinda Kimble. 2011. "MRV under the UN Climate Regime: Paper Tiger or Catalyst for Continual Improvement?" *Greenhouse Gas Measurement and Management* 1 (1): 47–54. https://doi.org/10.3763/ghgmm.2010.0009.

Nordhaus, William D. 1975a. "The Political Business Cycle." *Review of Economic Studies* 42 (2): 169.

———. 1975b. "Can We Control Carbon Dioxide?" In *WP-75-063*. IIASA. http://pure.iiasa.ac.at/365.

———. 1977. "Economic Growth and Climate: The Carbon Dioxide Problem." *American Economic Review* 67 (1): 341–46.

Oberthür, Sebastian, and Hermann E. Ott. 1999. *The Kyoto Protocol: International Climate Policy for the 21st Century*. Springer Science & Business Media.

Oppenheimer, Michael, and Annie Petsonk. 2005. "Article 2 of the UNFCCC: Historical Origins, Recent Interpretations." *Climatic Change* 73 (3): 195–226. https://doi.org/10.1007/s10584-005-0434-8.

WORKS CITED

Pintér, László, Marcel Kok, and Dora Almassy. 2017. "Measuring Progress in Achieving the Sustainable Development Goals." *Governing Through Goals: Sustainable Development Goals as Governance Innovation*, 99.

Prior, Lindsay. 2011. "Using Documents in Social Research." In *Qualitative Research: Issues of Theory, Method and Practice*, edited by David Silverman, 3rd Edition, 93–110. London: SAGE.

Randalls, Samuel. 2010. "History of the 2°C Climate Target." *Wiley Interdisciplinary Reviews: Climate Change* 1 (4): 598–605. https://doi.org/10.1002/wcc.62.

Rijsberman, Frank R., and R J. Swart. 1990. "Targets and Indicators of Climate Change: Report of Working Group II of the Advisory Group on Greenhouse Gases." Stockholm Environment Institute.

Robson, Keith. 1992. "Accounting Numbers as 'Inscription': Action at a Distance and the Development of Accounting." *Accounting, Organizations and Society* 17 (7): 685–708. https://doi.org/10.1016/0361-3682(92)90019-O.

Rosencranz, Armin. 1981. "The International Law and Politics of Acid Rain" 10: 13.

Scharpf, Fritz W. 1994. "Games Real Actors Could Play: Positive and Negative Coordination in Embedded Negotiations." *Journal of Theoretical Politics* 6 (1): 27–53. https://doi.org/10.1177/0951692894006001002.

Seager, Joni. 2012. "Death by Degrees: Taking a Feminist Hard Look at the 2° Climate Policy." *Kvinder, Køn & Forskning* 0 (34). https://tidsskrift.dk/index.php/KKF/article/view/44305.

Singh, Neelam, Jared Finnegan, Kelly Levin, David Rich, Mary Sotos, Dennis Tirpak, and Davida Wood. 2016. "MRV 101: Understanding Measurement, Reporting, and Verification of Climate Change Mitigation." *World Resources Institute Working Paper, August.(Http://Www. Wri. Org/Publication/Mrv-101-Understanding-Measur Ement-Reporting-and-Verification-Climate-Change-Mitigation)*. http://www.wri.org/sites/default/files/MRV_101_0.pdf.

Smith, Joel B., Hans-Joachim Schellnhuber, M. Monirul Qader Mirza, S. Fankhauser, R. Leemans, Erda Lin, L. Ogallo, et al. 2001. "Vulnerability to Climate Change and Reasons for Concern: A Synthesis." *Climate Change*, 913–967.

Sørensen, Eva. 2006. "Metagovernance: The Changing Role of Politicians in Processes of Democratic Governance." *The American Review of Public Administration* 36 (1): 98–114. https://doi.org/10.1177/0275074005282584.

Sørensen, Eva, and Jacob Torfing. 2007. "Theoretical Approaches to Metagovernance." In *Theories of Democratic Network Governance*, 169–82. Palgrave Macmillan, London. https://doi.org/10.1057/9780230625006_10.

———. 2009. "Making Governance Networks Effective and Democratic Through Metagovernance." *Public Administration* 87 (2): 234–58. https://doi.org/10.1111/j.1467-9299.2009.01753.x.

Spence, Laura J., and Leonardo Rinaldi. 2014. "Governmentality in Accounting and Accountability: A Case Study of Embedding Sustainability in a Supply Chain." *Accounting, Organizations and Society* 39 (6): 433–52. https://doi.org/10.1016/j.aos.2012.03.003.

Stiglitz, Joseph E, Amartya Sen, and Jean-Paul Fitoussi. 2009. "Report by the Commission on the Measurement of Economic Performance and Social Progress." *Commission on the Measurement of Economic Performance and Social Progress*.

Thompson, G. F. 1998. "Encountering Economics and Accounting: Some Skirmishes and Engagements." *Accounting, Organizations and Society* 23 (3): 283–323. https://doi.org/10.1016/S0361-3682(97)00010-X.

WORKS CITED

Tol, Richard S. J. 2007. "Europe's Long-Term Climate Target: A Critical Evaluation." *Energy Policy* 35 (1): 424–32. https://doi.org/10.1016/j.enpol.2005.12.003.

Triantafillou, Peter. 2007. "Governing the Formation and Mobilization of Governance Networks." In *Theories of Democratic Network Governance*, 183–98. Springer.

UN Economic and Social Council. 2017. "Progress Towards the Sustainable Development Goals." E/2017/66. UN Economic and Social Council. http://www.un.org/ga/search/view_doc.asp?symbol=E/2017/66&Lang=E.

UN General Assembly. 2010. "Keeping the Promise: United to Achieve the Millennium Development Goals, Resolution Adopted by the General Assembly, United Nations A." RES/65/1, United Nations.

———. 2015. "RES/70/1. Transforming Our World: The 2030 Agenda for Sustainable Development." UN General Assembly Resolution A/RES/70/1. New York: UN General Assembly. http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E.

UNFCCC. 1992. "United Nations Framework Convention on Climate Change." https://unfccc.int/resource/docs/convkp/conveng.pdf.

———. 1995. "UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE CONFERENCE OF THE PARTIES: DECISIONS ADOPTED BY THE FIRST SESSION (BERLIN)." Edited by Marinn Carlson and Annie Petsonk. *International Legal Materials* 34 (6): 1671–1710.

———. 1998. "The Kyoto Protocol to the United Nations Framework Convention on Climate Change." Kyoto, Japan: United Nations. http://unfccc. int/resource/convkp/kpeng. html.

———. 2009. "Report of the Conference of the Parties on Its Fifteenth Session, Held in Copenhagen from 7 to 19 December 2009." http://unfccc.int/resource/docs/2009/cop15/eng/11a01.pdf.

———. 2011. "Report of the Conference of the Parties on Its Sixteenth Session, Held in Cancun from 29 November to 10 December 2010." United Nations.

———. 2014. "Report of the Conference of the Parties on Its Nineteenth Session, Held in Warsaw from 11 to 23 November 2013." FCCC/CP/2013/10/Add.1. UNFCCC.

———. 2015a. "Global Response to Climate Change Keeps Door Open to 2 Degree C Temperature Limit New UN Report Synthesizes National Climate Plans from 146 Countries." UNFCCC. October 30, 2015. http://newsroom.unfccc.int/unfccc-newsroom/indc-synthesis-report-press-release/.

———. 2015b. "Adoption of the Paris Agreement." UNFCCC.

United Nations. 2012. "Realizing the Future We Want for All: Report to the Secretary-General." Koninklijke Brill NV. https://doi.org/10.1163/2210-7975_HRD-9823-0056.

———. 2013. "A New Global Partnership: Eradicate Poverty and Transform Economies through Sustainable Development." *The Report of the High-Level Panel of Eminent Persons on the Post-2015 Development Agenda.*

———. 2018. "The Sustainable Development Goals Report." New York: United Nations. https://unstats.un.org/sdgs/files/report/2018/thesustainabledevelopmentgoalsreport2018.pdf.

UNSDSN. 2014. "An Action Agenda for Sustainable Development." UN Sustainable Development Solutions Network. http://unsdsn.org/resources/publications/an-action-agenda-for-sustainable-development/.

Victor, David G., and Charles F. Kennel. 2014. "Climate Policy: Ditch the 2 °C Warming Goal." *Nature* 514 (7520): 30–31. https://doi.org/10.1038/514030a.

WORKS CITED

Wang, Xueman, and Glenn Wiser. 2002. "The Implementation and Compliance Regimes under the Climate Change Convention and Its Kyoto Protocol." *Review of European Community & International Environmental Law* 11 (2): 181.

Weart, Spencer R. 2008. *The Discovery of Global Warming*. Rev. and Expanded ed. New Histories of Science, Technology, and Medicine. Harvard University Press,.

Webb, David. 2012. *Foucault's Archaeology: Science and Transformation*. Edinburgh University Press. http://edinburgh.universitypressscholarship.com/view/10.3366/edinburgh/9780748624218.001.0001/upso-9780748624218.

	1970	1980	2000	2020	2040	2100
	(Actual)					
Energy Consumption, United States, 10^{15} btu/yr						
Uncontrolled CO_2	71	76.	92.	155.	250	395.
100 percent increase CO_2		76.	92.	142.	160.	405.
Global Carbon Emissions, 10^9 tons/yr						
Uncontrolled CO_2	4.0	6.9	10.7	18.4	40.1	45.4
100 percent increase CO_2		6.9	10.7	16.6	16.0	4.9
Carbon Emission Tax ($/ton)						
Uncontrolled CO_2	.00	.00	.00	.00	.00	.00
100 percent increase CO_2		.14	1.02	8.04	67.90	87.15

Notes: Carbon emissions are tons of carbon dioxide, carbon weight, while carbon taxes are calculated dual variables in the efficient program, and have the dimension of 1975 dollars per ton carbon weight of emission. Source is Nordhaus (1976).

Figure 1: Energy Consumption, Carbon Emissions, and Carbon Emission Taxes (Nordhaus, 1977, p.345)

	Path			
	1 Uncon-trolled	2 200% Increase	3 100% Increase	4 50% Increase
Discounted Total Cost, Billions of 1975 Dollars	$0	$30	$87	$540
Discounted Total Cost as Percent of Discounted World *GNP*	0%	.06%	.12%	.81%

Figure 2: Cost of Carbon Dioxide Control Programs (Nordhaus, 1977, p.346)

CO_2 Limit (ppm)	Initial Growth Rate of Annual Carbon Emissions		
	1.5%/yr	2.5%/yr	3%/yr
500	2005	1995	1990
600	2025	2010	2000
700	2040	2025	2010
800		2035	2020

Figure 3: Required Action Initiation Times for Various CO_2 Ceilings (National Research Council 1983, p.168)

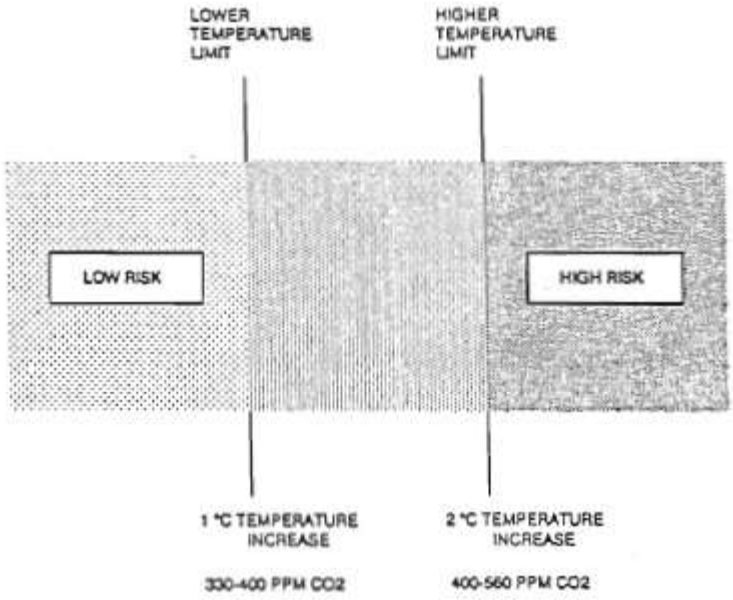

Figure 4: Proposed targets for absolute temperature change and CO_2-equivalent concentrations (Rijsberman and Swart 1990, p.ix)

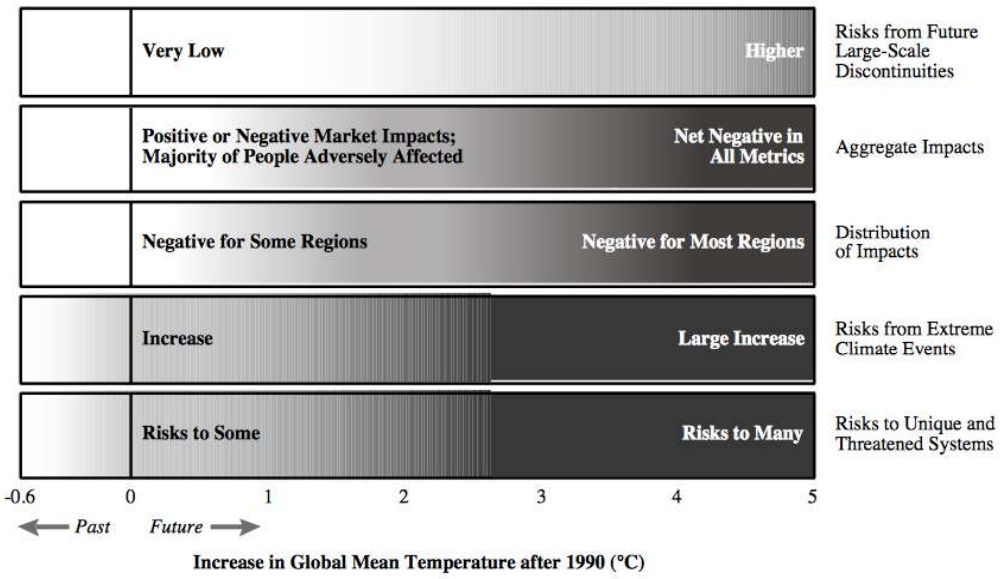

Figure 5: "Impacts of or risks from climate change […] White means no or virtually neutral impact or risk, light grey means somewhat negative impacts or low risks, and dark grey means more negative impacts or higher risks." (Smith et al. 2001, p.958).

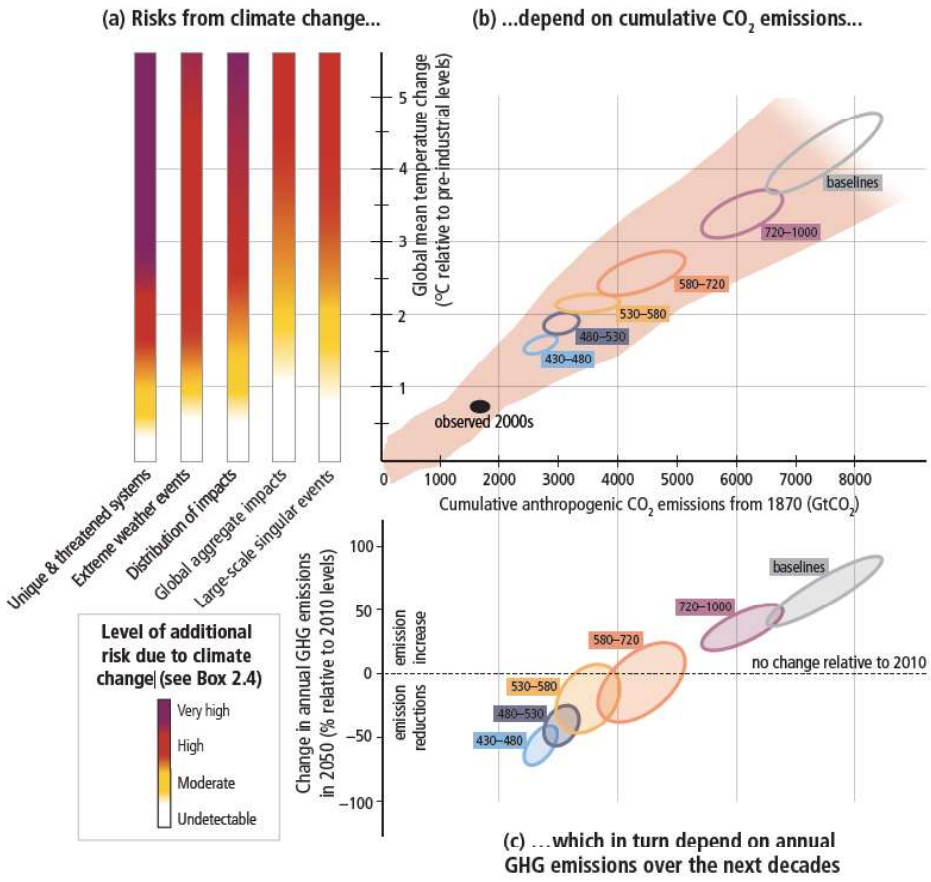

Figure 6: "The relationship between risks from climate change, temperature change, cumulative carbon dioxide (CO_2) emissions and changes in annual greenhouse gas (GHG) emissions by 2050." (IPCC 2014, p.18).