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Introduction

The rapid growth in carbon disclosure in recent years represents a major success in the struggle to build awareness and action on climate change. Despite the Copenhagen debacle and Congressional inaction in the US, the measurement and reporting of carbon emissions at the product, facility and organization levels display considerable momentum. The growth of carbon disclosure is the result of three core drivers: regulatory compliance, pressure from non-governmental organizations (NGOs) and managerial information systems intended to facilitate participation in carbon markets, reduce energy costs and manage reputational risks. In this essay, we argue that the strategies pursued by ‘institutional entrepreneurs’ have played a key role in the successful institutionalization of carbon disclosure by bringing together companies, NGOs and government agencies. The Carbon Disclosure Project (CDP), in particular, has displayed strategic skill in presenting the project in ways that appeal to multiple stakeholders and building broad legitimacy for reporting standards.

Some 3000 organizations in 66 countries around the world now measure and disclose their emissions and climate strategies through CDP (Price Waterhouse Coopers, 2010). Carbon disclosure has become an important institution of governance, raising awareness about climate change, clean energy and energy efficiency, and generating legitimacy for the principle of external accountability. Most importantly, the rise of voluntary carbon disclosure has demonstrated to business the feasibility and potential benefits of carbon measurement and reporting, such as management of reputation and energy costs. In turn, this has opened political space for regulatory initiatives that mandate disclosure and formalize carbon accounting standards.

Despite the rapid uptake of carbon disclosure, there are some troubling questions about the trajectory along which the institution is evolving and its ultimate impact. Tensions exist between two ‘institutional logics’, a corporate logic of carbon risk management and carbon trading, and an NGO-oriented logic based on transparency and accountability. We argue that the field is drifting toward a more corporate logic, and that while this enhances the diffusion of disclosure, it also weakens it as a tool for driving the substantial cuts in greenhouse gas (GHG) emissions needed to address climate change. Our analysis also highlights that building new institutions requires not just discursive strategies to frame issues in a particular way, but also political and economic strategies

to construct an organizational coalition and a 'business model' for the new institution (Knox-Hayes, 2010b; Levy and Scully, 2007).

Carbon disclosure as governance

Carbon disclosure can be understood as an emerging institution that provides field-level governance in the broad sense of the term, as a multi-level, multi-actor system of rules, norms and standards that structure and constrain a field of action (Mol, 2008; Utting, 2002). Levy and Newell (2006) have also emphasized the role of markets and corporate decisions regarding operations and strategies as important aspects of governance. Carbon disclosure plays a role in three modes of governance; regulatory compliance, carbon trading and management and civil regulation through accountability and transparency.

First, carbon disclosure is critical for regulatory compliance. In 2009, the US EPA issued a requirement that large emitters start reporting their greenhouse gas emissions. Companies subject to mandatory cap-and-trade programs need to measure their carbon emissions in order to ensure compliance. In early 2010, the US SEC issued new guidance recommending comprehensive disclosure of 'material risks', listing considerations such as the impact of climate change regulation and international accords, the consequences of legal, technical, political and scientific developments, and the physical impacts of climate change.

Second, carbon information is integral to carbon markets and corporate carbon management. Carbon markets are emerging as a key form of governance, imposing emission caps and putting a price on carbon. Indeed, carbon as an intangible tradable commodity is constructed purely from specific informational protocols, necessitating the development of carbon accounting systems (Knox-Hayes, 2010a). Companies can also engage in voluntary carbon markets, for example, investing in Clean Development Mechanism (CDM) projects in developing countries. Financial companies engaged in carbon trading and consulting companies such as Point Carbon are also intensive consumers and producers of carbon information at a more aggregate level.

Many firms are implementing carbon management systems, sometimes as modules linked to their systems for accounting and logistics control. One key driver is the prospect of improving internal efficiencies to reduce energy costs and calculate carbon footprints at the product level. Increasingly, powerful firms are pushing their suppliers to engage in carbon accounting for product labeling and cost control purposes. While already well underway among major European retailers such as Tesco, Wal-Mart surprised its 80,000 strong supplier base with an initiative announced in June 2009 to provide an environmental impact label for every product on its shelves.

A third way in which carbon disclosure operates as governance is to exert pressure on organizations for accountability and transparency. This pressure, which Murphy and Bendell (1999) term 'civil regulation', primarily originates from NGOs. The institutionalization of standardized information reporting systems, such as the Global Reporting Initiative and the CDP, enables NGOs to undertake benchmarking and demand certain performance levels. Carbon disclosure also improves accountability to investors. A governmental energy agency director¹ observed:

Most of these companies are starting to provide very substantial analysis over the financial risk that climate change represents. The financial community will be very focused on figuring out which companies are threatened by climate legislation, what type of exposure, and how does that affect prospective investment. (Executive director, governmental energy association, Washington, DC, 29 November 2007)

The CDP is a non-profit UK-based organization that sends an annual questionnaire to companies on topics including GHG emissions, climate-related risks and opportunities, and management

programs and procedures. The core strategy for CDP has been to recruit institutional investors who in turn would pressure companies in which they invest for carbon disclosure. This strategy leverages disclosure to investors to pursue a broader civil accountability agenda. By 2009, CDP had signed up 475 investors with a total US\$55 trillion under management.

Each of these modes of disclosure-based governance is associated with actors whose interests diverge to some degree. Government agencies seek compliance, reporting companies and their investors want to manage energy costs and carbon risks, while NGOs seek civil regulation and transparency. The three governance modes overlap to some extent; for example, carbon information for market creation also serves regulatory compliance. Similarly, carbon information for accountability and transparency can also assist asset valuation for investors. The different modes, however, rely on information formats that differ in their detail and emphasis, creating tensions and competition for influence over the reporting protocols.

Advocates of carbon disclosure recognized early on the need for common standards, but the details have a critical impact on the shape of the carbon governance system and whose interests are served. Crucially, the institutionalization of carbon reporting relies on a successful project of ‘commensuration’, defined by Levin and Espeland (2002: 121) as ‘the transformation of qualitative relations into quantities on a common metric’. Just as financial reporting translates myriad activities into a common monetary metric, so carbon reporting renders complex operations involving multiple gases, sources and impacts into a common carbon metric, tCO₂e (tonnes of carbon dioxide equivalent). The commodification of carbon is a political project, requiring an extensive organizational infrastructure to define carbon units, allocate property rights and establish rules for trading (Knox-Hayes, 2009). One interviewee suggested that reconciling carbon products in different regions requires standardized disclosure:

We think about what kind of products are fungible on a regional basis – and what risk management tools are needed. This drives the development of products and demand for disclosure. (Vice president, exchange, New York, 8 November 2007)

These are not just technical, but also political questions. For example, the CO₂ produced by driving cars could be attributed to oil producers, refiners, the car manufacturer, or the final consumer. The release of a draft GHG Protocol in December 2009 for Scope 3 (activities upstream and downstream of the value chain) emissions generated considerable concern in the business community. While it was simple to agree, in principle, that carbon disclosure was a good idea, the devil is in the detail. Companies are apprehensive at the complexity and costs, and at the implicit principle that they are responsible for emissions beyond their direct control. For one thing, companies often report on their home country or main markets, but are unsure of how to report global operations or data for the full range of business units. Second, the world’s largest polluters have the expertise to conduct Scope 3 reporting in-house, while smaller companies likely do not have the necessary resources or expertise (Balch, 2009).

Actors’ strategies to promote carbon disclosure

The creation of new institutions such as carbon disclosure is facilitated by the agency of institutional entrepreneurs (Lawrence et al., 2009; Wijen and Ansari, 2007), whose strategies align cognitive frames and material interests in ways that structure networks of organizations into a coherent field. Though institutions are increasingly seen as primarily symbolic, discursive constructions (Phillips et al., 2004), here we follow Levy and Scully (2007) and posit that stable

institutions, and the strategies pursued to construct them, have mutually reinforcing discursive, material and organizational elements.

Notably, NGO advocates for carbon disclosure did not just focus on their own agenda of corporate accountability and reducing emissions, but also appealed to the interests of business, investors and governmental agencies. CDP framed carbon disclosure as 'win-win', satisfying environmental, social and economic goals. Carbon disclosure was described as analogous to financial accounting and an extension of corporate social and environmental reporting, activities which already have widespread legitimacy, clear authority structures and recognized benefits for multiple groups. For business audiences, CDP emphasized the potential financial benefits from energy savings and good public relations, and the voluntary nature of disclosure, which provides flexible implementation with little legal exposure. Investors were enticed with the claim that carbon disclosure would assist in valuing financial assets by revealing the degree of climate risk.

To appeal to NGOs and multilateral organizations such as UNEP, the emphasis was placed on improving corporate accountability and creating more inclusive and transparent governance mechanisms. The CDP was designed, like the Global Reporting Initiative, to provide a standardized format that would enable comparison across firms, rewarding strong performers with reputational benefits while pressuring non-disclosers and poor performers (Florini, 2003). In a similar way, the mandatory disclosure of Toxic Release Inventory data in the USA is widely viewed as a successful example of information-based governance (Graham, 2002).

As with other reporting initiatives, the CDP strove for broad legitimacy among multiple stakeholders. The director of a carbon accounting initiative explained:

Our goal is to design, disseminate and promote the use of an internationally accepted protocol for measuring and reporting entity level emissions. We want to achieve international acceptance, widespread adoption, use and endorsement. (Director, environmental NGO, London, 23 September 2008)

In order to get buy-in from these diverse groups, and in the absence of any governmental initiative, the development of reporting standards was undertaken privately as a joint project of the World Resources Institute (WRI) and the World Business Council for Sustainable Development. More recently, CDP has collaborated with the accounting firm Price Waterhouse Coopers (PWC). Though these efforts have succeeded in generating a set of widely accepted protocols, tensions have emerged that a private, voluntary initiative has difficulty in resolving:

In the WRI group we brought in academics, people from the industry and environment. ... The real challenge with the WRI protocol and ISO 14000 is that the devil is always in the details. The protocol and ISO standard are difficult documents and need to spell out in more detail how to apply to specific project types in particular geographies. ... There needs to be a regulator that sets the standard. Our institution is playing a quasi regulatory role, but it is a question of how long the voluntary markets can sustain themselves. (Vice president of policy, registry, Los Angeles, 27 August 2008)

Tensions in the carbon governance system

The difficulties in the development of specific reporting protocols reflect more fundamental tensions between competing sets of assumptions, goals and practices, or 'institutional logics'. The logic of 'civil regulation' views carbon disclosure as primarily a mechanism to empower environmental groups to play a more assertive role in corporate governance, increasing the transparency and accountability of corporations, and pressuring firms to reduce emissions. The logic of 'corporate environmental performance', by contrast, signifies the instrumental value of carbon disclosure to

business through the management of energy costs and risks, and facilitation of carbon trading. CDP strategies had helped manage these tensions, but without entirely resolving them.

CDP's roots in the logic of civil regulation are evident in the data format and in strategic parallels with the Global Reporting Initiative, which was launched by the environmental NGO Ceres (Levy et al., 2010). CDP reports provide aggregate carbon emissions data at the organizational level, a format geared toward external audiences, primarily NGOs. Although investors have signed up in large numbers to the initiative, which provides good publicity at little cost, a common complaint is that the data are not sufficiently detailed for assessing carbon risk and valuing assets. In a recent report, Rory Sullivan, the head of Insight Investment, suggests that while 'the CDP has done a really good and important job of encouraging companies to report – the question is whether that is enough? The CDP's assumption is that by getting companies to disclose you will trigger change in the investment community and the answer is that hasn't happened' (ENDS, 2008). Indeed, a survey commissioned by Ceres (2010) found that few asset managers include climate risks and opportunities in their investment analysis. Sullivan contends that 'signing up to the CDP allows investors to tick the box on climate change', but many of these investors do not consider climate change to be a material risk over the short periods in which they invest (ENDS, 2008). Another investment analyst remarked that 'initiatives like the CDP are mostly inconsequential when it comes to where investment dollars ultimately flow. ... The problem with the CDP is that it's really an activist organization parading as an investor group.'²

Paradoxically, CDP information is not very useful for NGO campaigns either, on account of the conflicting purposes of the information and compromises made to gain corporate acceptance. Emily Farnworth from the Climate Group, an NGO that promotes low-carbon energy policies, has suggested that CDP 'data is patchy and inconsistent, with only half [of reporting companies] using internationally recognized standards for reporting' (Farnworth, 2007). On the one hand, the CDP has strived to increase the standardization of reporting in successive versions of its survey, in order to facilitate comparisons across firms and sectors, but these aggregate level data are hard to interpret. On the other hand, it has attempted to cope with the complexity and diversity of reporting companies with more detailed sector-specific sections and questions inviting more qualitative responses, where firms can use a narrative style to describe various carbon-related strategies and initiatives. These more detailed and qualitative data are not directly comparable across companies or sectors.

Evolution of carbon disclosure and its limitations

The institutional development of carbon disclosure is a dynamic process, whose path reflects the outcome of strategic interactions between NGOs, business and government agencies in a particular economic, social and political context. The strategic compromises and fragile coalitions necessary to undertake institutional entrepreneurship and initiate field-level change inherently generate pressures that inhibit and circumscribe more systematic field transformation. In this case, CDP's strategy of positioning carbon disclosure as integral to carbon markets and management has helped carbon disclosure gain mainstream acceptance but also resulted in the dominance of an institutional logic based on market-oriented managerialism.

The evolution of carbon disclosure demonstrates the importance of establishing a viable institutional 'business model'. It is one thing to launch a new initiative with a 'win-win' discursive framing that promises benefits for all; institutional stabilization, however, requires a functioning economic circuit that provides material resources for participating organizations, reinforcing the symbolic dimensions of the institution. CDP is beginning to falter because it is not living up to expectations

regarding its value for external stakeholders. Investors remain unconvinced that carbon information is valuable in the pricing of financial assets and NGOs are not finding the data to be particularly useful in their campaigns. As a result, corporate managers are expressing some doubts about the value of investing in external disclosure in the absence of an audience (Farnworth, 2007).

The institution of carbon measurement and reporting is still growing, but the center of gravity is shifting. Business is increasingly interested in internal carbon information systems useful for measuring and managing GHG emissions at the facility, process, or product level. Data needs for regulatory compliance are also growing. Point Carbon, a consulting firm, estimates that 4.2 billion tonnes of CO₂ (and equivalents) were traded globally in 2008, with a value approaching US\$100 billion (Point Carbon, 2008). Carbon disclosure therefore holds the most potential value for corporate managers and software companies. In the last couple of years, most large accounting, law and management consultancy firms have set up carbon and clean energy practices. For these firms, carbon measurement, management and reporting, and the analysis of carbon markets, present a vast new market opportunity.

While reporting rates through CDP are reaching a plateau, there is a rapidly growing market for corporate carbon management systems that attempt to cover multiple purposes. The London-based consulting company Verdantix recently released a proprietary report on carbon management software,³ which notes that 'Many Board members would be horrified at the low quality and poor verification of carbon emissions data that is released into the public domain through channels like the Carbon Disclosure Project.' A recent spate of acquisitions demonstrates the spike of interest in this area: in 2009, for example, the giant software company SAP, which offers accounting and supply chain management modules, bought carbon software startup Clear Standards. These software packages aggregate emissions data from multiple sources across a company and integrate carbon price projections for planning purposes.

Conclusions

The evolution of carbon disclosure invites a critical assessment of its possibilities and limitations as a mode of governance. First, how does carbon disclosure operate as a process, in terms of the influence and interests of various actors? Second, is it effective at achieving the environmental goal of reducing emissions? The business and financial actors who thrive most directly from carbon financialization and disclosure hold a privileged position in the field of carbon governance, and enjoy increasing influence in structuring carbon reporting standards and information systems (Bumpus and Liverman, 2008). This ensures that powerful interests will continue to drive the growth and broad institutionalization of carbon disclosure. Yet it also raises some significant concerns. Carbon protocols and reporting formats are likely to evolve to reflect these actors' perspectives and interests, which could undermine their effectiveness in various ways. For example, controlling energy costs at the firm level does not map perfectly with GHG emission control across the whole value chain and life cycle. Reporting systems geared toward carbon trading, compliance and external sustainability reporting are unlikely to drive more radical restructuring of core product strategies.

More fundamentally, a carbon disclosure system dominated by business and finance exemplifies Barley's (2007) concern regarding the 'privatization of functions that have historically been the mandate of local, state, and federal governments'. Barley warned that 'people are now separated from their representatives by an asteroid belt of organizations, and among the most powerful of these are corporations and their trade associations'. The implication in the climate context is that political pressures on companies for dramatic emission reductions will be weakened. Rather than

being constrained by carbon disclosure, companies increasingly play a role in structuring the governance system, interposing themselves between our collective interest in environmental stability and government responsibilities

A major limitation of voluntary disclosure systems is the focus on managerial process, the lack of comparability across firms and the lack of sanctions for non-compliance (Gupta, 2008; Mason, 2008). In the absence of a significant carbon price, with consumers who are apathetic or confused, and investors unsure about the relevance of carbon information, carbon disclosure systems do not necessarily translate into substantial reductions. This is acknowledged in a 2010 CDP report that pointed to a 'carbon chasm' between national targets of GHG reductions between 15 and 30 percent by 2020, and the carbon commitments of the S&P100, the 100 largest companies based in the US, which average an *increase* of about 4 percent over the same time period. Given these challenges, it is fair to say that carbon disclosure has reached a strategic inflection point and is in need of critical reassessment. As the field shifts from an NGO-oriented logic, which emphasizes transparency and accountability, toward a corporate logic that enhances managerial control, there is a pressing question of the underlying merits of carbon disclosure and its effectiveness as a system of governance.

These conclusions bear important implications for the various actors involved in carbon disclosure, though their different objectives mean there is no single set of recommendations. A common thread for all actors is the crucial importance of gaining a deep understanding of the complexities of the field in order to develop effective discursive, economic and political strategies. For NGOs interested in furthering the goals of corporate accountability and reducing emissions, it is crucial to be cognizant of the longer-term effects of relying on reporting companies and the financial sector to advance carbon disclosure. In order to maintain a balanced coalition, it is therefore important to maintain close links with key allies, such as environmentalists, labor and community organizations, to ensure that carbon disclosure is valuable for these groups. At same time, disclosure has to be sufficiently detailed and relevant for investors, as well as meeting compliance needs. These competing demands certainly require considerable strategic and technical skills. Recognizing the weaknesses of a voluntary approach, a longer-term strategy could well entail leveraging the legitimacy of disclosure toward a mandatory reporting system.

Similarly, policy-makers cannot abnegate responsibility for long-term limitations on greenhouse gas emissions, and need to consider how to use carbon disclosure as part of a broader multi-pronged strategy that offers a real promise of economic gains through carbon management and acknowledges corporate need for streamlined reporting and common standards. For business managers, on the assumption that climate and rising energy prices remain long-term drivers, they face the challenge of developing information systems that meet multiple needs, from aggregate data needed for compliance, trading and external reporting, to the detailed data at the product and process levels that can drive reductions in emissions and fuel use. This presents a major opportunity for accounting and software companies.

The evolution of carbon disclosure also presents interesting avenues for future research. Our understanding of the dynamic and strategic dimensions of developing new institutions, or reshaping existing ones, is still quite rudimentary, and could benefit from connecting with the strategy literature, particularly streams relating to political strategy, collaborations and alliances. Future work could probe the interaction of the various actors and their strategies, in order to gain better insight into the conditions under which new institutions such as carbon disclosure might emerge and stabilize. The carbon disclosure case also highlights the importance of examining how institutions evolve over time, the shifting coalitions and logics behind them, and whether they are to remain effective in achieving their broader societal goals.

Notes

1. The quotes presented in the essay are from an NSF funded (0802799) study conducted by Janelle Knox-Hayes from 2007 to 2009. The study analyzed the institutional development of carbon emissions markets in the US and Europe. As part of the study, a number of agents in organizations that build and operationalize the carbon markets were interviewed including individuals at banks, brokerages, legal firms, exchanges, wire services and NGOs. All interlocutors were guaranteed anonymity; therefore, specific names are not listed, but rather firm type as well as the individual's position.
2. At: seekingalpha.com/article/163306-climate-change-and-corporate-disclosure-should-investors-care.
3. At: www.pressreleasepoint.com/verdantix-says-cfos-will-be-compelled-invest-carbon-management-software.

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David L. Levy is chair of the Department of Management and Marketing at the University of Massachusetts, Boston, and director of the Center for Sustainable Enterprise and Regional Competitiveness. His research examines corporate strategic responses to climate change, the growth of the clean energy business sector and the emergence of carbon disclosure as a form of governance. More broadly, his work explores strategic contestation over the governance of controversial issues in the context of global production networks. He has published and lectured widely on these topics, including 'The Contested Politics of Corporate Governance: The Case of the Global Reporting Initiative' (2010), in *Business and Society* 49(1) (with Halina Brown and Martin De Jong). He edits ClimateInc.org, a blog devoted to intelligent discussion of business and climate change.