Constructing climate capitalism: corporate power and the global climate policy-planning network

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Abstract *In this article, I analyse the corporate hegemonic structures of power underlying the project of climate capitalism. I present climate capitalism as an emerging regime of accumulation founded on carbon markets and the ecological modernization of production, which could replace the prevalent carboniferous capitalist regime and provide a deeply needed reduction of carbon emissions. I map out the network of corporate-funded climate and environmental policy groups participating in climate capitalist knowledge production and mobilization to provide a critical appraisal of the possibility of such a transition. The positioning of these policy groups allows them to play a crucial role as intermediaries between regional and sectoral corporate interests and they provide a crucial link between energy and financial firms. However, energy–finance linkages are sparse, and a small number of individual capitalists carry a relatively thin network from the fossil fuel and nuclear sectors. These findings cast doubt on the hypothesis that a strong climate capitalist coalition is emerging.*

Keywords CLIMATE CAPITALISM, CLIMATE POLITICS, CORPORATE POWER, INTERLOCKING DIRECTORATES, KNOWLEDGE PRODUCTION AND MOBILIZATION, SOCIAL NETWORK ANALYSIS

Introduction: the climate capitalist project

In this article, I present an empirical analysis of certain channels of corporate power that underly the project of climate capitalism. Newell and Paterson (2010: 1) describe climate capitalism as 'a model which squares capitalism's need for continued economic growth with substantial shifts away from carbon-based industrial development', thereby implying 'a dramatic transformation of the entire global economy'. Following this definition, I use climate capitalism to describe a regime of capital accumulation founded on climatically benign production technologies and increased energy efficiency. Developed within the bounds of neoliberal environmentalism (see Castree 2010), climate capitalism is founded on market mechanisms, mainly carbon

trading and carbon taxes. The hope is that pricing access to the atmosphere's sink capacity will foster the technical innovations needed to make 'low emissions' production technologies and energy generation cost competitive, so thus move investments away from fossil fuel dependent commodity production (Böhm and Dabhi 2009; Newell and Paterson 2010).

Newell and Paterson (2010) argue that a broad coalition of actors from the corporate, political and civil society sectors has been mobilizing since the early 1990s around the project of a climate capitalist regime, and around its main policy instrument, namely carbon markets (see also Betsill and Hoffmann 2011; Böhm et al. 2012; Paterson et al. 2014). This coalition regroups a section of capital, including several firms from the oil and financial sectors, which have been working with UN agencies, other IGOs such as UNCTAD, the World Bank and the OECD, as well as many environmental NGOs. This coalition strategically seeks to reconcile environmental protection and economic growth and, by means of carbon trading, to turn climate change mitigation into an instrument of capital accumulation (Bumpus and Liverman 2008; Lohmann 2006; Newell and Paterson 2010). Thus, the crux of climate capitalism is to make reducing greenhouse gas (GHG) emissions profitable for a large enough number of corporations that would give their political support to the project and provide a wide basis for sustaining economic growth under transformed conditions of accumulation.

Given the developments of the last decade, the chances of success for climate capitalism appear uncertain. The project picked up momentum in 1997 when oil giants BP and Shell, followed by many other large companies, publicly supported carbon trading and promised to invest massively in renewable energy (Levy and Kolk 2002; Pulver 2007). The project seemed to have gathered sufficient speed after the Kyoto Protocol's first commitment period came into effect in 2005, for it led to the creation of several carbon trading markets, the most important being the European Union Emissions Trading Scheme (EU-ETS). However, after a brief period of enthusiastic trading, in May 2006 EU-ETS prices crashed following a massive over allocation of permits. The continued economic slump that followed the 2008 financial collapse, combined with the failure of the 2009 Copenhagen Climate Summit to adopt a new global agreement, ensured that the EU-ETS never recovered. Other carbon markets set up afterwards have not taken off (Levy and Spicer 2013; Vlachou 2014).[1] Still, given the current policy uncertainty, a growing number of firms now use an internal carbon price to account for future carbon pricing in their long-term planning. Some argue that climate capitalism might be here to stay irrespective of international agreements because the number of actors involved in it and the amount of investment it generates are now sufficient to propel it forward (Betsill and Hoffmann 2011; Grubb 2012; Paterson et al. 2014).

Whether climate capitalism can actually reduce GHG emissions is a different question altogether. Carbon markets and carbon offsetting schemes have attracted considerable criticism (from Böhm and Dabhi 2009; Lohmann 2006, 2008, 2011; Vlachou 2014). The notion of carbon budget draws attention to the incompatibility between the long time required to scale up carbon markets and other climate policies on the one

hand and, on the other hand, the short time frame left for decisive action (Le Quéré et al. 2013). On the grounds of such an analysis, Derber (2010) describes climate capitalism as a second and more subtle type of global warming denial. Going further, Lohmann (2008, 2014) argues that carbon markets justify inaction and shift the costs of global warming onto subordinate classes in the global South and future generations.

Historically, periods of crisis during which fundamental political economic arrangements are contested have fostered struggles among the dominant classes over what direction to take to achieve renewed stability (van der Pijl 1984, 1998). Corporate-funded think tanks and policy groups play a crucial role in such struggles by engaging in knowledge production and mobilization (KPM) on behalf of the classes or factions in which they are embedded (Carroll 2013; Carroll and Shaw 2001; van der Pijl 1998). By providing a venue for the corporate elite to debate different views about how best to overcome capitalism's contradictions, and by supporting the production of reports, books or media releases, these organizations create and disseminate knowledge that informs and legitimates certain types of economic governance while delegitimizing others. They further mobilize that knowledge through lobbying and networking activities – workshops, conferences and so forth – involving various constituencies from the corporate, political, media or cultural fields (Carroll and Carson 2003; Carroll and Sapinski 2010; Domhoff 2014). These networks cut across sectoral and national boundaries, thus facilitating a convergence of ideas and consensus building (Carroll 2013). Put otherwise, by means of their networking capacities, they provide an organizational basis for the emergence, articulation and diffusion of ideas within the factions and classes in which they embed themselves.

Such corporate elite organizations exist that perform these same functions within the field of climate politics. Many studies have discussed the KPM work of 'carboniferous capitalist'[2] policy groups and think tanks to deny the reality of anthropogenic global warming and to push it off the political agenda on behalf of a certain faction of the capitalist class (Jacques et al. 2008; McCright and Dunlap 2010). Similarly, proponents of climate capitalism rely on their own KPM organizations to build momentum around their project and gather support from multiple constituencies. These include globalizing corporate elites, heads of states, high-ranking bureaucrats, IGO personnel, the NGO sector and the public of core capitalist countries.[3] In this article, I use social network analysis to develop an empirical approach to climate political KPM. I focus on the network of corporate-funded climate and environmental policy groups (CEPGs) that are key agents of climate capitalist KPM. I seek to assess the role these organizations play within the broader network of corporate boards in which they embed themselves, and their capacity to forge a cohesive climate capitalist coalition. Specifically, I explore the following questions: (1) How is the field of climate capitalist KPM organized, and what role do CEPGs play in it? (2) What can the structure of the corporate KPM network reveal about the future of climate capitalism? After briefly discussing sample selection, I will examine the general structure of the network of interlocks linking CEPGs and large corporations, its geographical reach, the economic sectors represented and, finally, the extent to which CEPGs mediate energy and financial interests.

Data collection

The study is based on a judgement sample of eleven climate and environmental policy groups selected on the basis that (1) they are *transnational in scope*, in their reach and their mandate and (2) they have a *core function of KPM* supportive of either climate capitalism, or green capitalism more generally with climate change as one of their core issues. The analysis focuses on groups that develop a *general vision* of how the climate crisis should be addressed *within the framework of capitalism*. Hence, I excluded sector specific groups and associations, as well as simple advocacy coalitions. Table 1 provides basic information on the CEPGs making up the sample. Nine of the eleven groups were identified on the basis of the global climate politics literature. To ensure inclusivity, I used the *Yearbook of international organizations* (*YBIO*) online database[4] to identify organizations with similar characteristics by conducting a search using the string '(climatology OR "sustainable development") AND "business enterprise"'. I added two groups to the sample after reviewing the lists thus generated. Due to the changing nature of the field, one of the selected groups is now defunct, and new groups have appeared since the initial sampling took place at the end of 2010.

I drew on two different sources to collect data about corporate representation on CEPGs' boards of directors. First, using each CEPG's website, I listed all board members at the end of 2010 and recorded each of their corporate positions. Second, using the LexisNexis Corporate Affiliations business database, I collected information on each corporation, including all its board members at the end of 2010, the geographic location of its headquarters and its main sector of business according to the US standard industry classification (SIC) codes. Finally, going one step further, I collected data on each corporation that shared a director with the first set of corporations, thus providing a complete map of the first order neighbourhood of CEPGs, namely their *egocentric network* (Hanneman and Riddle 2011).[5]

The policy groups and their projects

CEPGs promoting climate capitalism deploy a diversified action repertoire to achieve their KPM objectives. All of them intensively lobby governments and UN agencies involved in the international climate negotiations to promote climate capitalism, and participate in the yearly Conference of the Parties, at which they are represented and hold side events addressed to corporate managers and policymakers (Tansey 2013). By virtue of their organizational structure, they also function as places where the corporate elite and other elites can meet, plan strategy, forge consensus on key issues and create a sense of community around the climate capitalist project. However, each CEPG specializes in certain aspects of KPM work and thus occupies a slightly different niche in the organizational ecology of climate capitalism, namely the variety of organizational forms and specializations present in the field (Hunt and Aldrich 1998). A major distinction in the sample is between (1) groups that are dedicated strictly to climate capitalism and (2) those that address climate change as part of their overall promotion of a more general 'green capitalism', as indicated in Table 1. I will discuss each category successively.

Table 1: Climate and environmental policy groups

Name (acronym)	Year est.	Headquarters	Membership	Agenda
Climate capitalist groups				
Business Council for Sustainable Energy (BCSE)	1992	Washington, DC (USA)	US 'alternative' energy sector[a]	Promotion of alternative energy to address energy security concerns
European Business Council for a Sustainable Energy Future (e5)	1996	Karben (Germany)	European 'alternative' energy sector[a]	Promotion of alternative energy to address climate change
Center for Climate and Energy Solutions (C2ES)	1998	Arlington, VA (USA)	Board regroups scientists, bankers and venture capitalists	Scientific and business case for carbon markets
International Emissions Trading Association (IETA)	1999	Geneva (Switzerland)	Over 150 TNCs, including many G500 corporations	Establish a global carbon market
Global Climate Forum (GCF)	2001	Berlin (Germany)	Forum of scientists and corporate elites	Scientific case for carbon markets
The Climate Group	2003	Woking (UK)	Alliance of corporations and municipal and state/ provincial governments	Provide tools to transition to climate capitalism
Copenhagen Climate Council (CCC)	2007	Copenhagen (Denmark)	Alliance of high-profile CEOs	Climate change as a business opportunity
Green capitalist groups				
Club of Rome	1972	Winterthur (Switzerland)	100 high-profile global elites, including scientists and corporate heads	Stimulate debate about global issues, including environmental issues
Global Environmental Management Initiative (GEMI)	1990	Washington, DC (USA)	About 25 US TNCs	Promotion of environmental management, provide environmental management tools
World Business Council for Sustainable Development (WBCSD)[b]	1996	Geneva (Switzerland)	About 200 of the largest TNCs, represented by their CEOs	Promotion of sustainable development and market-based regulation
United Nations Global Compact (UNGC)[b]	2000	New York (USA)	Representatives from business (12), labour (2), NGOs (4), and the UN (2)	Promotion of corporate social responsibility, including environmental responsibility

a. 'Alternative' energy refers in this context to solar, wind and geothermal energy as well as to large-scale hydroelectric dams, natural gas and nuclear.

b. Source: Carroll and Sapinski (2010).

Making the case for climate capitalism

The groups discussed in this section all work on different aspects of promoting the climate capitalist project, their sole endeavour. The International Emissions Trading Association (IETA) was founded in 1999 as a cooperative endeavour of the World Business Council for Sustainable Development (WBCSD) and the UN Conference on Trade and Development (UNCTAD). Based in Geneva, it is organized as a business association with a membership of more than 150 companies, and is steered by a board of 18 directors, most of them second-tier managers from member corporations. Its lobbying activities promote carbon markets as the best means to address climate change without disrupting capital accumulation, and the reports it produces analyse the functioning of carbon markets and the business opportunities they represent. It also organizes conferences that provide meeting opportunities for corporate elites, politicians and bureaucrats interested in carbon trading.

The Center for Climate and Energy Solutions (C2ES) was founded in 1998 under the name Pew Center on Global Climate Change. It is steered by a small board that regroups top- and second-tier managers, mostly from the energy sector. Its activities are similar to those of the IETA and it emphasizes objective expertise as the foundation of its work, thus calling on science to legitimize its promotion of climate capitalism. The Global Climate Forum, founded in 2001, offers a similar discourse that draws on scientific expertise about global warming to inform climate policy. Formed as a forum for elite academics, business people and NGO heads, it functions as a link between scientific research, climate politics and the climate capitalist project. In the same vein, the Copenhagen Climate Council (CCC), created to prepare for the 2009 Copenhagen Climate Summit, served as a forum for the top executives of some of the largest transnational corporations, elite scientists and high-ranking policy-makers. Its only agenda was to foster support from the corporate sector for a new international treaty founded on carbon markets.[6]

For its part, the UK-based Climate Group works on a slightly different register. It is active to develop on-the-ground projects in partnership with national- and local-level authorities and organizations. This provides it with opportunities to network with governments all the way down to the municipal level, and thus extend the political reach of the climate capitalist project locally. The Climate Group also develops and promotes tools to help companies ease their transition into the climate capitalist economy. Such efforts constitute a major part of building a strategic consensus around climate capitalism by reaching out and extending the benefits of joining the climate capitalist project to as many companies as possible.

Finally, the Business Council for Sustainable Energy (BCSE) and the European Business Council for a Sustainable Energy Future (e5) both represent companies from the non-coal/non-oil energy sectors, namely renewable energy sources such as wind, solar, hydro and geothermal, as well as nuclear and natural gas. They thus regroup interests that can be seen as making up the ‘leading edge’ of climate capitalism, that is corporations with a direct stake in a transition away from oil and coal. These two groups lobby for a binding agreement to regulate GHG emissions, using the language

of ecological modernization and promoting technological fixes and a market-based approach to global warming (Levy and Egan 2003).

The field of green capitalism

Because climate capitalism emerged in the broader context of corporate neoliberal environmentalism, it is crucial to look at global business organizations that promote the project within the wider field of 'green capitalism'. The four groups listed in the second section of Table 1 all occupy slightly different niches in this field. The World Business Council for Sustainable Development (WBCSD) was established in 1995 as a forum of CEOs of the largest corporations and is closely linked to the International Chamber of Commerce (ICC) (Carroll and Sapinski 2010). The United Nations Global Compact was created in 2000 as a partnership between the WBCSD, the ICC and the UN around issues of corporate social responsibility (Soederberg 2007), and brings corporate elites together with high-ranking UN officials as well as labour and NGO representatives (Carroll and Sapinski 2010). The WBCSD and the Global Compact collaborate closely, strongly emphasize the need for a regulatory framework to address GHG emissions, and promote various private codes of conduct and green certifications as the most appropriate means to reduce the corporate environmental footprint. The Global Environmental Management Initiative (GEMI) promotes environmental management and the integration of green capitalist objectives in business practices and provides tools with which to measure the progress of firms in that matter. Its activity is thus similar to that of the Climate Group, as it helps firms reap the benefits of green capitalism. Finally, the Club of Rome is a global elite forum and counts several high-ranking capitalists among its members, alongside intellectuals, retired heads of state and European monarchs. It is a bit of an outlier in that it promotes an analysis founded on mathematical models of the earth's future that emphasizes the finite nature of the biosphere and, in its discourse, develops a neo-Keynesian stance that stresses the need for a more just redistribution of wealth. Thus, although like other groups the Club of Rome takes a global technocratic managerial elite perspective, it deviates from the neoliberal approach and hence has lost much of its political influence since the 1970s and 1980s.

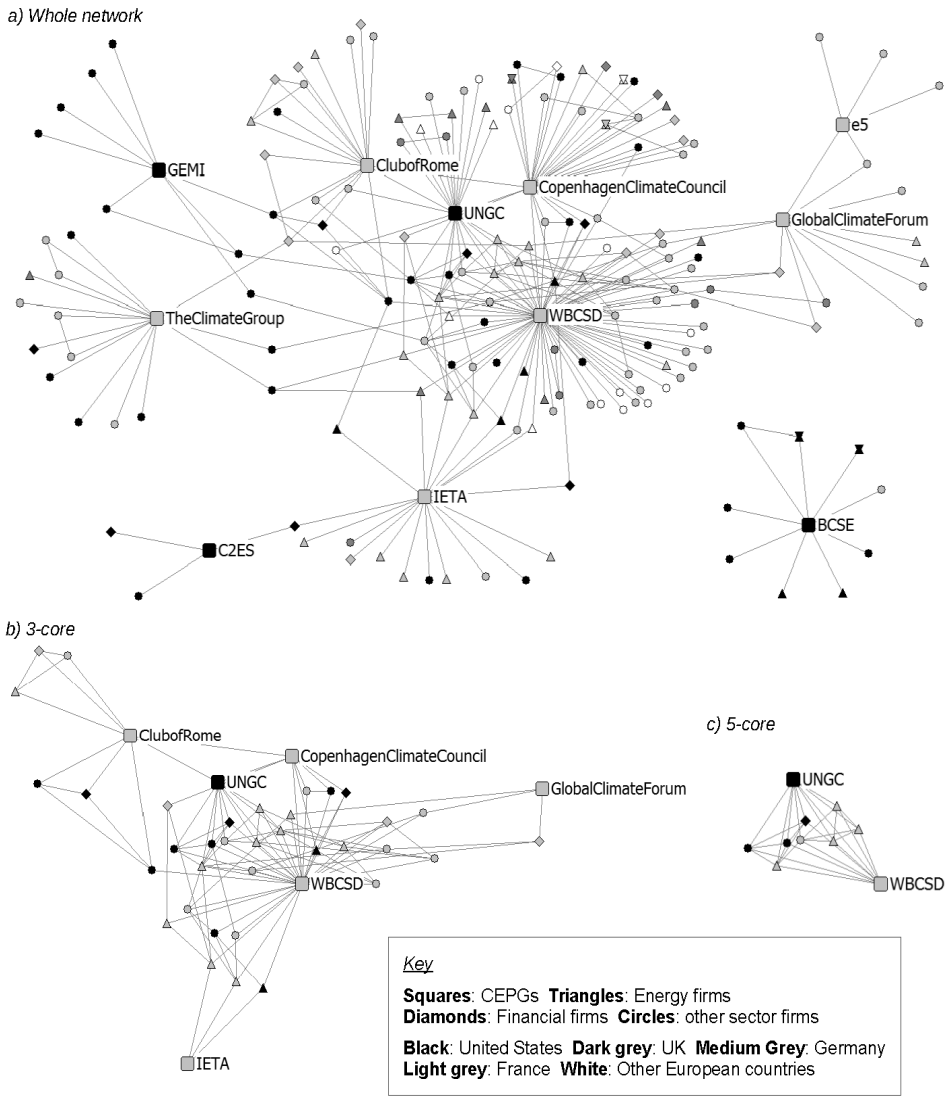
To summarize, CEPGs present a varied organizational ecology: in the field of climate politics, they adopt different KPM strategies, yet all promote a project of climate capitalism compatible with neoliberalism (Carroll and Shaw 2001). More than simple lobby organizations, *these groups participate to create the discourse and practices of climate capitalism, and mobilize such discourses and practices by reaching out to the global elite*. In the next section, I discuss this latter function of CEPGs in detail, as I explore their embeddedness in broader reaching networks of corporate power.

The corporate climate policy network

General structure of the network

Figure 1a shows a two-dimensional projection of the egocentric network of the eleven CEPGs. On this figure, each shape represents an organization, corporation or policy

Figure 1: Structure of the climate capitalist corporate network and k-core decomposition



group, and each line an individual attached to both organizations, thus creating an interlock between them. The projection uses UCINet's spring embedder algorithm (Borgatti et al. 2002) so that spatial proximity on the figure approximates proximity within the network (Freeman 2000). The *k*-core decomposition technique helps distinguish the general structure of the network. A *k*-core is a cluster of nodes within a social network in which each node links with at least *k* other nodes (Seidman 1983).

Thus, in a 3-core, all nodes have at least three links to other nodes in the 3-core; moreover, a 4-core can be nested in a 3-core, representing a denser sub-region in which all nodes have four or more links with each other, and so on. Here, the *k*-core decomposition reveals a 3-core within which several CEPGs are located (Figure 1b). A 5-core appears at the centre of the network (Figure 1c), which is made up of a small number of corporations and in which the WBCSD and the UNGC both participate.

Thus, we can distinguish CEPGs located closer to the dense centre of the network, within the 3-core, from those occupying peripheral positions. The former, which I call the 'core groups' include the CCC, the Club of Rome, the Global Climate Forum, the IETA, the Global Compact and the WBCSD. The others include the Climate Group, the C2ES, e5, the GEMI and the BCSE, the latter of which has no connection with the main component of the network. Three of the four green capitalist groups belong to the core. This is hardly surprising considering their broad mandate and deep involvement in the field of global politics, especially in the case of the WBCSD, which attracts a greater number of large corporations onto its board. Most CEPGs that are exclusively involved in climate politics, by contrast, tend to occupy peripheral positions, apart from the CCC, which is a high-profile group closely linked to the WBCSD, and the IETA, arguably, the most important carbon trading group.

Regional scope of CEPGs

Table 2 describes the geographical span that the network covers. The table shows that most firms have their headquarters in the North Atlantic core of the world system. At 28.1 per cent, US corporations account for over a quarter of all firms, which is more than twice the number located in the UK, the second most represented country with 10.5 per cent. Also well represented are other core capitalist European and Asian countries. The USA, the UK and France completely dominate the densely connected 3-core of the network.[7]

Further analysis confirms the hypothesis that North America and Western Europe dominate the climate capitalist KPM network. The *k*-coreness score represents the level of *k*-core at which each node is located in the network, and thus how close to the centre each node is located. Comparing the mean *k*-coreness of organizations headquartered in the North Atlantic and that of those located elsewhere, a permutation-based two-tailed t-test returns a significant result ($p=0.0071$, 10,000 permutations), which indicates that North Atlantic nodes in general appear closer to the core of the network. Moreover, the mean *k*-coreness of European nodes is significantly higher than that of other nodes ($p=0.0342$, 10,000 permutations), thus confirming that European firms are more involved in the climate capitalist KPM network. This is to be expected, as the climate capitalist project has been getting significantly greater traction in Europe, especially since the establishment of the EU-ETS (Levy and Spicer 2013; Paterson et al. 2014).[8]

Table 2: Location of headquarters of corporations directly linked to CEPGs

Country	Whole network		3-core only	
	N	%	N	%
Core North America				
USA	48	28.1%	11	31.4%
Canada	3	1.8%	0	0.0%
Core Europe				
UK	18	10.5%	7	20.0%
Germany	11	6.4%	2	5.7%
France	10	5.8%	8	22.9%
Other core Europe	46	26.9%	7	20.1%
Core Asia/Oceania				
Japan	9	5.3%	0	0.0%
China	7	4.1%	0	0.0%
Other core Asia/Oceania	3	1.8%	0	0.0%
Non-core countries				
India	4	2.3%	0	0.0%
Brazil	4	2.3%	0	0.0%
South Africa	2	1.2%	0	0.0%
Other non-core countries	6	3.5%	0	0.0%
Total	**171**	**100.0%**	**35**	**100.0%**

Table 3 details the regional composition of each CEPG's egocentric network,[9] allowing us to examine the specific role of the different CEPGs in the network. It shows that the boards of the groups identified above as part of the network core are regionally diverse, all presenting regional heterogeneity scores[10] over 0.600, except for the Club of Rome at 0.415 and the GCF at 0.153. Among core groups, even though it is regionally diverse, the board of the Global Compact draws the greatest part of its membership from Western Europe and core Asia/Oceania. Among non-core groups, the Climate Group's board membership equally represents Western Europe and North America, with seven links to each region, whereas the other groups are clearly anchored within regional networks, with heterogeneity scores close or equal to zero. Such a pattern first suggests that a degree of division of labour exists among CEPGs, with some of them working on a regional level and others working globally. Second, and relatedly, it also suggests that core CEPGs envision climate capitalism as a global project and that they are well positioned to broker between different regional corporate interests.

Table 3: Ego-networks of CEPGs: regional heterogeneity

CEPGs	Hetero-geneity[a]	Number of links[b]						Total no. of links
		North America	Western Europe	Core Asia/ Oceania	Non-core Asia	Sub-Saharan Africa	Latin America	
North America								
BCSE	0.198	8 (89)	1 (11)	0 (0)	0 (0)	0 (0)	0 (0)	9
C2ES	0.000	3 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	3
GEMI	0.000	8 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	8
UN Global Compact[c]	0.688	3 (13)	11 (48)	5 (22)	1 (4)	0 (0)	3 (13)	21
Europe								
CCC	0.661	8 (28)	14 (48)	4 (14)	3 (10)	0 (0)	0 (0)	29
Climate Group	0.560	7 (47)	7 (47)	1 (7)	0 (0)	0 (0)	0 (0)	15
Club of Rome	0.415	5 (29)	12 (71)	0 (0)	0 (0)	0 (0)	0 (0)	17
e5	0.000	0 (0)	5 (100)	0 (0)	0 (0)	0 (0)	0 (0)	5
GCF	0.153	0 (0)	11 (92)	1 (8)	0 (0)	0 (0)	0 (0)	12
IETA	0.609	6 (32)	10 (53)	2 (11)	0 (0)	1 (5)	0 (0)	19
WBCSD	0.641	16 (23)	37 (54)	7 (10)	2 (3)	2 (3)	5 (7)	67
Total	**-**	**64 (31)**	**108 (53)**	**20 (10)**	**6 (3)**	**3 (1)**	**8 (4)**	**204**

a. Higher heterogeneity scores represent a more regionally diverse board.
b. Row percentages in brackets.
c. The UNGC is located in New York City, though it should in effect be considered as an international organization.

Economic scope of CEPGs

All firms linked to CEPGs were classified by the economic sector representing their main source of revenue according to the US Standard Industrial Classification (SIC) codes found in either database used; these were then recoded into a smaller number of more general categories. Table 4 details the composition of the network in terms of these general categories. The energy sector, which certainly has a great interest in climate politics (see Levy and Kolk 2002; Newell and Paterson 2010), makes up fully a quarter of the climate capitalist network, with 43 corporations. In the energy sector, the companies mainly active in the renewable energy business are poorly represented, (n=5), especially compared with those whose main business is in fossil fuels and nuclear energy (n=38).[11] The latter 38 firms are large corporations with diversified investments and many have a renewable energy generation division as an extra line of business alongside their other operations (Derber 2010).[12] The energy sector is followed by 'business services', with 25 firms, a category that regroups environmental,

energy and other business consultant firms; law firms; and accountancy or auditing firms, which are often closely involved in climate policy as lobbyists, legal representatives or advisers for other corporations. Financial capital, with a total of 23 banks and insurance companies, is also well represented on the boards of CEPGs. Finally, manufacturing corporations from various sectors, which depend on fossil fuels as an input or as a source of energy, or whose activities entail the release of large quantities of GHGs, make up most of the remainder of the network (n=69).

Table 4: The climate corporate-policy network by industry sector

Industry sector	Whole network		3-core	
	n	%	n	%
Non-renewable energy[a]	38	22.2	12	34.3
Renewable energy[b]	5	2.9	0	0.0
Business services	25	14.6	1	2.9
Finance	23	13.5	7	20.0
Other manufacturing	21	12.3	5	14.3
Chemicals and pharmaceuticals	14	8.2	2	5.7
Telecommunications/Electronics	12	7.0	4	11.4
Agriculture and food/Forestry and paper	11	6.4	0	0.0
Built infrastructure	11	6.4	3	8.6
Media and printing	7	4.1	1	2.9
Transportation	4	2.3	0	0.0
Total	**171**	**100.0**	**35**	**100.0**

a. Includes fossil fuels and nuclear electricity generation (n=21), utilities depending on these forms of energy (n=16), and energy trading (n=1).
b. Includes wind, solar, and geothermal electricity generation.

Table 5 presents an analysis of the composition of each CEPG's ego-centric network according to the economic sectors with which it links. As in the regional analysis, heterogeneity scores again vary substantially. The BCSE, the CCC and the GCF have the most diversified networks in terms of the economic sectors represented on their boards, all linking substantially to multiple sectors. The GEMI and e5's neighbourhoods, by contrast, have very little diversity, with GEMI linking almost exclusively to industrial capital and e5 to business consultants. In general, heterogeneity scores are higher for core groups than for non-core ones. The patterns of sectoral links reveal a certain degree of specialization of the different CEPGs. On the one hand, most of the staffs of some boards are representatives of the manufacturing sector (GEMI, Climate Group); others reach out to both the manufacturing and non-renewable energy sectors (Global Compact, Global Climate Forum, WBCSD); while a majority of directors from the non-renewable energy sector steer the IETA. On the

other hand, only two CEPGs, the CCC and the Club of Rome, regroup representatives from both the financial sector and the manufacturing sector on their boards. In general, the financial sector is barely, if at all, represented on other CEPG boards. Geographically, we can note that the financial sector is entirely absent from North American CEPGs, with the exception of the C2ES.[13] Similarly, only the BCSE and the CCC link with the renewable energy sector, which is completely absent from all other boards.

Table 5: Ego-networks of CEPGs: heterogeneity of economic sectors

CEPGs	Hetero-geneity[a]	Number of links[b]					Total no. of links
		Non-renewable energy	Renew-able energy	Finance	Manufacturing, Transportation, Primary prod.	Business services	
North America							
BCSE	0.741	2 (22)	2 (22)	0 (0)	2 (22)	3 (33)	9
C2ES	0.444	0 (0)	0 (0)	2 (67)	0 (0)	1 (33)	3
GEMI	0.219	0 (0)	0 (0)	0 (0)	7 (88)	1 (13)	8
UN Global Compact	0.625	9 (45)	0 (0)	1 (5)	8 (40)	2 (12)	20
Europe							
CCC	0.716	3 (12)	3 (12)	7 (27)	11 (42)	2 (8)	26
Climate Group	0.578	1 (7)	0 (0)	2 (13)	9 (60)	3 (20)	15
Club of Rome	0.658	2 (13)	0 (0)	6 (40)	6 (40)	1 (7)	15
e5	0.375	0 (0)	0 (0)	0 (0)	1 (25)	3 (75)	4
GCF	0.727	3 (27)	0 (0)	2 (18)	4 (36)	2 (18)	11
IETA	0.604	11 (58)	0 (0)	3 (16)	2 (11)	3 (16)	19
WBCSD	0.562	18 (27)	0 (0)	4 (6)	40 (60)	5 (8)	67
Total	**-**	**49 (26)**	**5 (3)**	**25 (13)**	**87 (45)**	**26 (14)**	**192**

a. Higher heterogeneity scores represent a more regionally diverse board.
b. Row percentages in brackets.

Hence, Table 5 shows that most CEPGs do link, albeit in varying proportions, to multiple economic sectors interested in climate capitalism, which draws attention to their capacity to bring together representatives of firms with different interests to act as venues where corporate elites can work out a project that would reach across these differences. *Brokerage* is a measure of how much a node mediates relations between other nodes, and thus measures an organization's capacity to play such roles. Brokerage scores calculate the number of two-step paths between all pairs of nodes that each

CEPG mediates (Gould and Fernandez 1989). As shown in Table 6, CEPGs present several different brokerage profiles. We find that on the one hand, three of the core groups, the CCC, the IETA and, especially, the WBCSD, broker *between* multiple sectors, thus showing strong potential for mediating different corporate interests and building consensus around environmental and climate policy. Remarkably, the Climate Group, although only peripherally linked to the network, also brings together firms from multiple sectors, hence playing a similar role. On the other hand, CEPGs also broker relations *within* each sector. Thus, the Global Compact substantially links to only two sectors (see Table 5), but plays an important role in linking the different firms within each of these sectors, especially energy firms, fostering greater cohesion among them; the Club of Rome plays a similar role within finance. Due to the breadth of its network, the WBCSD also creates links among firms within the same sectors, thus playing a dual role of brokering both between and within sectors.

Table 6: Brokerage among economic sectors

CEPG	Brokerage between sectors	Brokerage within sectors
Climate capitalist groups		
BCSE	50	20
Copenhagen Climate Council	550	82
The Climate Group	182	24
e5	6	6
Global Climate Forum	98	12
IETA	218	124
C2ES	4	2
Green capitalist groups		
Club of Rome	162	34
GEMI	42	12
UN Global Compact	270	80
WBCSD	3712	622

Energy-finance connections at the core

Many authors have noted that the energy and financial sectors have played a crucial role in the emergence and functioning of climate capitalism (for example, Descheneau and Paterson 2011; Newell and Paterson 2010; Pulver 2007). More generally, these two sectors have been fundamental to the emergence and consolidation of corporate capitalism since the late nineteenth century (Scott 1997), and they would thus be expected to continue to play a crucial role in any future reorganization of the accumulation regime. Table 4 shows that energy and financial firms make up a greater proportion of the network's tightly connected 3-core than of the whole

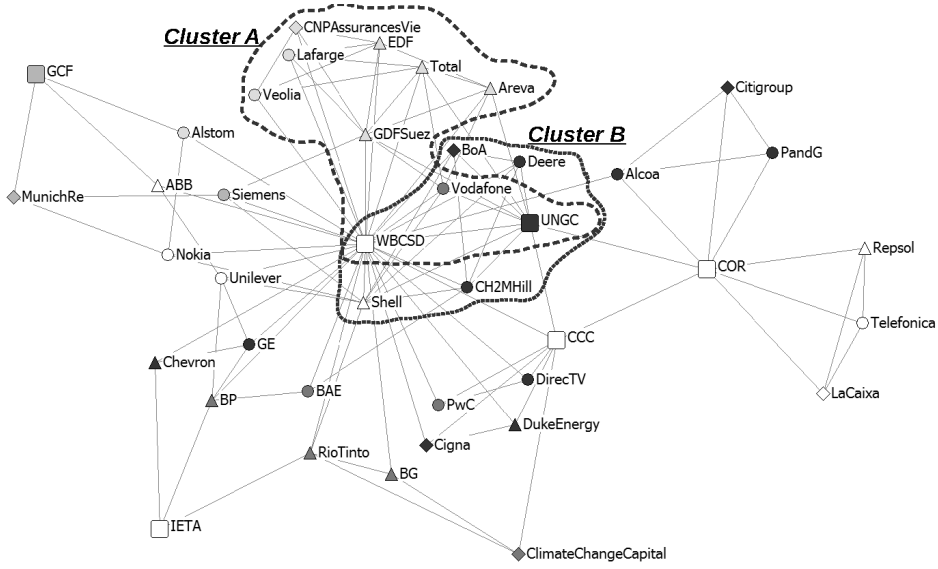
network, with respectively 34.3 per cent and 20.0 per cent of the core nodes. To assess better for the proximity of financial and industrial capital around the climate capitalist project, this section looks at the patterns of linkages at the network centre between financial firms, energy firms and firms from other sectors. Figure 2 zooms in on the nodes that make up the core of the network. Six CEPGs are part of this closely connected zone and, of these, the Global Compact and the WBCSD are located at the very heart of the network, being both part of a 5-core of densely interlocked nodes (see Figure 1c).

A *clique* designates a set of nodes that form a complete sub-graph, that is to say each node links to all other nodes in the set (Luce and Perry 1949). The different cliques found in a network may share one or more members in common, in which case they are said to be *overlapping cliques*. Distinguishing the different cliques present in a network and their overlap allows one to locate regions of greater cohesiveness; this is because the participation of a node in multiple cliques indicates that it occupies a more central structural position (Degenne and Forsé 2004: 94–7). There are mainly two formations of interest at the centre of the network. First, we find a set of six overlapping cliques comprising four or more nodes, which I designate as *cluster A* (as indicated in Figure 2). Seven of the eight firms constituting this cluster are located in France and four of them represent the energy sector. The second zone of high density in Figure 2, *cluster B*, is a set of two overlapping cliques that regroup American firms from various sectors. Both clusters include the Global Compact and the WBCSD.

Both clusters link with financial capital, which shows that at least some financial firms participate in the core of climate capitalist KPM. This is a relevant observation, given that these firms represent sources of funding for the realization of climate capitalist projects. Cluster A includes a major insurance firm, CNP Assurances. French state-owned firms also make up most of Cluster A, suggesting the potential for the French state, with which the corporate sector has historically maintained very close relations (Bourdieu and de Saint Martin 1978; Dudouet et al. 2014), to play a role as a source of capital. Cluster B, for its part, organizes mainly around the Bank of America (BoA), one of the largest US banks. Several other financial firms link into the network core through single individual interlocks (Cigna, Citigroup, Climate Change Capital, La Caixa, Munich Re).

The energy sector is also present in the network core and links closely to financial interests. As explained above, cluster A is mainly composed of energy firms invested in nuclear electricity generation (Areva, EDF) and fossil fuel extraction, refining and distribution (GDF-Suez, Total). These firms and the others making up the cluster are also involved in energy intensive sectors such as cement production (Lafarge) and large scale engineering projects (Areva, GDF-Suez, Veolia). Cluster B includes the major fossil fuel company Shell, which interlocks with Bank of America, as well as engineering firm CH2M Hill, involved in energy and power plant construction projects, and heavy manufacturing firm Deere. Three other interlocks of the core involve financial firms linking with energy firms: Cigna interlocks with Duke Energy, La Caixa with Repsol, and Climate Change Capital with both BG, a gas utility, and Rio Tinto, involved in extensive coal mining.

Figure 1: Corporate climate capitalist network, 3-core



Key
Squares: CEPGs **Triangles**: Energy firms **Diamonds**: Financial firms **Circles**: other sectors
Black: United States **Dark grey**: Germany **Light grey**: France **White**: Other European countries

In sum, we find multiple linkages between energy and financial firms at the centre of the climate corporate policy-planning network. However, these connections rest on a relatively small number of individual capitalists. Cluster A is brought together by ten individuals and cluster B rests on only two people who support multiple interlocks between firms and participate in the governance of CEPGs. Thus, the bulk of the work of bridging between energy, finance and other core firms falls on CEPGs. Yet, the two CEPGs that link the most to the financial sector are the CCC and the Club of Rome (see Table 5), and the former has ceased existing as a CEPG while the latter advocates a marginal version of climate capitalism. Hence, according to the observations presented above, energy and financial firms have linkages around climate capitalist KPM work, but the main CEPGs do not mediate them and they rely on a small number of key individuals.[14]

Discussion and conclusion

The CEPGs studied here have been created in response to perceived threats to the prevailing accumulation regime from the impacts of climate change on the one hand and alternative projects proposing to radically reorganize political economic relations on the other. The project of climate capitalism which CEPGs contribute to create is driven by a section of the corporate elite that seeks to establish new bases for accumulation within a broadly neoliberal order. Hence, the stated goal of climate

capitalism is, in the long term, to divert financial flows from the oil and coal sectors and GHG emitting electricity production, and to redirect them towards supporting the ecological modernization of capitalist production processes. In political economic terms, this involves implementing a new regime of accumulation that partially internalizes certain environmental externalities and decouples economic growth from the growth of GHG emissions. The KPM activities of corporate-funded CEPGs are crucial for conceptualizing the new regime and for mobilizing broad corporate elite support for it. As well, the networks they assemble constitute an essential infrastructure around which the climate capitalist section can organize. CEPGs thus represent important sites of corporate power.

The results of the empirical analysis presented above show that CEPGs bring together corporate elites from Europe and North America, and mobilize elites within each region. They reach across multiple economic sectors and within each sector to provide forums for corporate representatives to meet, discuss and potentially smooth out points of contention. They thus help to move beyond narrow economic interests to develop consensual positions on what a regime of climate capitalism should look like and how best to gather support for it. The analysis uncovered a complex organizational ecology among CEPGs and the corporate network in which they are embedded. Thus, certain CEPGs act as regional hubs whereas others stretch across the North Atlantic and reach out to emergent economies. Similarly, some regroup directors mostly from industrial firms, while others bring industrial and financial capitalists together. Importantly, all CEPGs interlock with corporations that are not otherwise in direct contact with each other.

A more fine-grained analysis of the specific firms at the denser core of the network revealed two things. First, the core of the network regroups the French nationalized nuclear and fossil fuels sectors, and part of the British and US fossil fuel sector. On the one hand, the nuclear sector presents itself as an alternative to fossil fuels, but requires large state subsidies to support the construction of new infrastructure, and its growth prospects depend partly on a capitalist climate transition. On the other and, given the rapid pace of change in climate policy, participation in CEPGs gives fossil fuel corporations first-hand information on the latest policy developments. Their multiple investments may also include some renewable energy, in which case they have an interest in expanding these markets (Derber 2010). However, as Jones and Levy (2007) note, fossil fuel firms that support climate capitalism do not necessarily plan to move rapidly away from their core business strategy, but are rather trying to mitigate the uncertainty that the potential regulation of GHG emissions creates. They seek to avoid any devaluation of their fixed assets, whether of production infrastructure or of fossil fuel reserves.[15] To this end, on the one hand they 'hedge their bets by making modest investments in low-carbon technologies and products' (Jones and Levy 2007: 669) and work to open up new markets for these technologies (Derber 2010; Jones and Levy 2007; Levy and Spicer 2013). On the other hand, they organize politically to structure a regime of climate capitalism that is compatible with their ultimate interests. The presence of several fossil fuel firms at the heart of the climate

capitalist KPM network is consistent with such a strategy on their part, namely that of a very long-term transition away from fossil fuels, combined with a regime that would allow them to expand their control of replacement energy sources.

Second, the empirical analysis suggests that the potential exists for the eventual emergence of a climate capitalist coalition that would bring together firms from the most influential economic sectors and be capable of replacing the current carboniferous capitalist regime. However, this it is by no means assured. Financial capital is present in the capitalist KPM climate network and links with the energy sector through the intermediary of CEPGs. However, only a handful of the largest financial institutions participate in the CEPGs included in the study.[16] In addition, the small number of corporate elites supporting the core interlocks creates a structural weakness in the network, for these few individuals can resign from boards, retire or die, thereby dislocating the network (see Heemskerk 2013: 91).

Thus, in conclusion, the evidence examined here offers some measure of support for the argument that a broad coalition has emerged in favour of climate capitalism and carbon markets (for example, Newell and Paterson 2010; Paterson et al. 2014). The thin architecture of the inter-corporate network and modest involvement of financial capital, however, point to cautious conclusions about the chances of a climate capitalist regime emerging. This is in contrast with other accounts that focus on the number, variety and breadth of carbon markets, carbon accounting schemes and other climate capitalist initiatives around the world as indicative of the progression of a new regime (for example, Betsill and Hoffmann 2011; Bulkeley et al. 2012; Paterson et al. 2014). More important is the question of the main actors of climate capitalism and, by implication, its likely content and goals. The involvement of fossil fuel firms at the heart of the KPM network delineated here suggests a weak climate capitalism compatible with these firms' interests, thus casting doubt on the possibility of a timely reduction in GHG emissions.

Many questions remain. The study focused on a relatively small number of organizations. As explained above, it did not include organizations exclusively dedicated to the financial sector. Neither did it cover generalist policy groups such as the World Economic Forum or the International Chamber of Commerce, which have long been venues for the furtherance of corporate elite interests (Carroll and Carson 2003; Carroll and Sapinski 2010) and places where climate capitalism is actively discussed. In addition, this study has not addressed the issue of building support for climate capitalism outside the corporate elite, among political elites and global civil society, a necessary aspect of the process of securing legitimacy for such a project. Future research should address these topics.

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Notes

1. The price of carbon at the European Climate Exchange still hovers around €5/tonne at the time of writing, and both the Chinese municipal-level markets and the recently launched joint California–Québec market have been trading close to their floor prices. According to Vlachou (2014), these dismally low prices, combined with the extreme volatility of carbon markets, are unlikely to promote hoped-for long-term investments in low emissions technologies.
2. The expression is from Mumford (2010); Newell and Paterson (2010) counterpose the carboniferous capitalist and the climate capitalist projects.
3. In fact, a diversity of projects compete in the field of climate politics, including proposals for a 'green new deal', de-growth toward a steady-state economy, and eco-socialism (Candeias 2013; Wainwright and Mann 2013). Climate capitalism developed within this contested field as much as an alternative to carboniferous capitalism as a response to such potentially counter-hegemonic projects. Climate capitalist KPM thus consists of designing ways to address climate change that avoid radical social and economic changes and stay within the confines of neoliberalism (Newell and Paterson 2010; Wright et al. 2013).
4. Union of International Associations (2012).
5. For cases not listed in Corporate Affiliations, I referred to Bureau van Dijk's Mint Global database; for cases absent from both databases, I relied on firms' original annual reports.
6. The CCC stopped its activities shortly after the Copenhagen Climate Summit.
7. The sampling strategy used for this study provides information about which corporations are involved in the governance of CEPGs, including their geographical location. This does not allow one to extrapolate about how corporations from the rest of the world that are not part of the CEPGs network relate to climate politics. Asian countries of the capitalist core, China, Japan, South Korea and Taiwan, are not represented at all in the sample of policy groups. This is because the groups active in these countries are either not global in scope or are affiliates of the WBCSD, in which case they were excluded from the study.
8. The near-complete absence of German firms is unexpected given the lead the country has taken in developing and implementing ecological modernization principles (see for example, Strunz 2014), and its prominent position in the European and global interlocks network (Carroll et al. 2010; Windolf 2002). This is due to a decrease in board size and corresponding number of interlocks of German firms in the year data were collected (see Heemskerk 2013: 92). Preliminary analysis indicates this decrease may itself be due to a generational effect, as older well-interlocked corporate directors retire (thanks to Eelke Heemskerk for suggesting this interpretation).
9. Categories are as follows: (1) North America, (2) Western Europe, (3) Core Asia and Oceania, (4) Eastern Europe, (5) Middle East and North Africa, (6) non-core Asia/Oceania, (7) Sub-Saharan Africa, and (8) Latin America and Caribbean. These categories were first proposed by Smith (1997). I adjusted them according to Kentor's (n. d.) more up-to-date measure of nation-state positions in the world-system to account for the most recent changes in the global political economy. This means in effect considering mainland China, including Hong Kong and South Korea as core Asian countries alongside Japan.
10. Heterogeneity is calculated as '1 minus the sum of the squares of the proportions of each value of the categorical variable in ego's network' (Blau 1977). A higher score indicates a more diversified neighbourhood.
11. Firms of the renewable energy sector are generally relatively small and thus have fewer resources available for participation in policy groups.

12. Although BP, which had been very closely involved in developing the climate capitalist project since the mid-1990s (Paterson et al. 2014), recently sold off many of its renewable energy assets and at the time of writing had not committed to further investments in that sector. Shell and Chevron also backtracked on their investments in renewables.
13. This does not mean that the financial sector has no interest in climate capitalism, but only that it tends to organize sectorally instead of joining the generalist CEPGs that are the focus of this study.
14. The financial sector does organize around the climate capitalist project. However, it does so in sector specific policy groups such as the Climate Markets & Investments Association and the Institutional Investor Group on Climate Change, which seldom interlock with firms from other sectors.
15. An important task for them as, at the time of writing, the global divestment movement is picking up speed (see van Renssen 2014).
16. As explained above, financial capital is involved in the climate capitalist project through specialized financial forums, generalist policy groups like the International Chamber of Commerce, and ownership of industrial capital (see Peetz et al. 2013). However, the core CEPGs have established themselves as the main organizations where the climate capitalist project is planned; firms with a major interest in the issue would be expected to be represented on their boards.

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